

IS THE U.S. TAX SYSTEM PROGRESSIVE?

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**Is the U.S. Tax System Progressive?**

John Doe

Central Michigan University

**Author Note**

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IS THE U.S. TAX SYSTEM PROGRESSIVE?

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**Abstract**

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## IS THE U.S. TAX SYSTEM PROGRESSIVE?

Is the U.S. Tax System Progressive?

### Introduction

The United States' taxation laws have gone through many changes. Initially, state and federal governments collected money by imposing taxes on a variety of sources, such as excise taxes, tariffs, and custom duties (U. S. Treasury, 2010). On February 3, 1913, the adoption of the Sixteenth Amendment allowed the federal government to impose income taxes (U. S. Treasury, 2010). Since then, the tax rates have changed many times to meet the growing need for revenue and manipulate the economy by providing incentives to encourage or discourage economic activity. Since the 1950's, the government has attempted to control economic fluctuations like business cycles by manipulating income tax rates. In 1951, the House of Representatives passed a 12.5% tax increase, the biggest tax increase in history. In 1954, the tax reduction was directed toward private investments. Other reductions occurred in 1962, 1966, 1969, 1971, 1975, and 1981. These were mainly to spur investment as unemployment rate was at its highest. In 1975, President Ford signed into law a tax refund of \$22.8 billion. Most recent examples of manipulations are: In 1977, President Ford proposed permanent tax cut, and in 1979, he suggested automatic adjustment that would keep the tax rate constant for families. Other tax changes include the Economic Recovery Tax Act of 1981, the Tax Reform Act of 1986, The Clinton adjustment of 1993, The Tax Payer Relief Act of 1997, and the Economic Growth and Tax Relief and Reconciliation Act of 2001 (U. S. Treasury, 2010). All these actions were taken to either lower marginal tax rates or raise marginal tax rates (Clinton, 1993). But the purpose was either to spur economic activities or to solve budgetary problems or both.

Looking at the economic fluctuation during the last 50 years, as shown in Figure 1, one can see that the economy has gone through many business cycles that have required intervention

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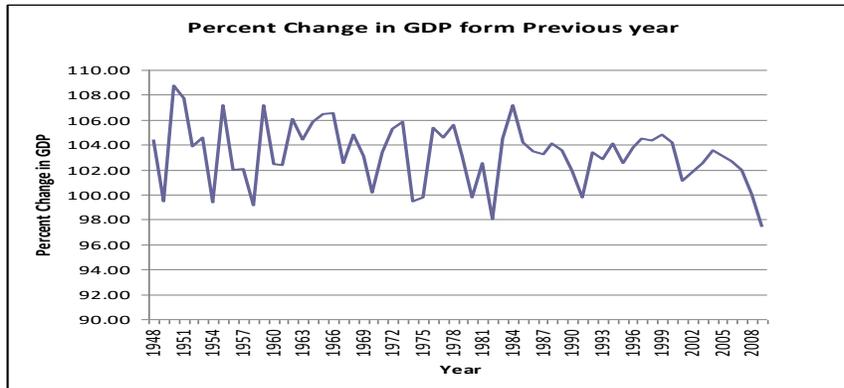
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## IS THE U.S. TAX SYSTEM PROGRESSIVE?

to save it. One of the tools federal and state governments have used is taxation as a vehicle to manipulate economic activity. As these tax changes were made, the federal government deficit and debt skyrocketed, as shown in Figures 2, 3, and 4, Figure 5 shows that as of January 20, 2011, the U.S. debt stood at over \$14 trillion (Figure 4) or 93% of the gross domestic product, and the deficit for the fiscal year 2009-2010 stood close to \$ trillion. The new Congress elected in November 2010 was trying to control spending while advocating lower taxes. The question most people may ask is who pays taxes and has the tax system become progressive or regressive?

Figure 1

*Percent Change in GDP from 1948-2008*



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Figure 2

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*U.S. Federal Deficit from 1950 - 2010*

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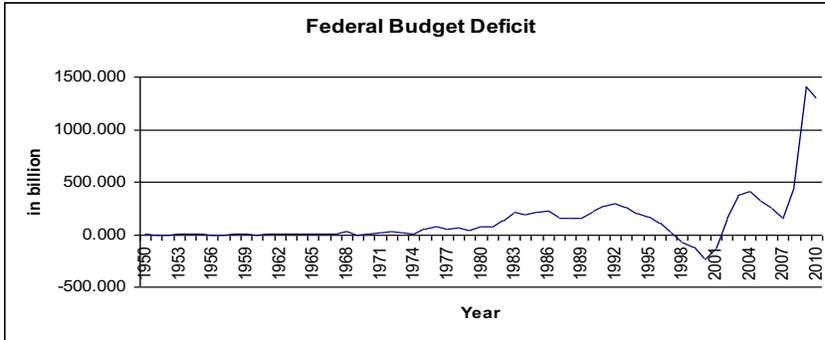
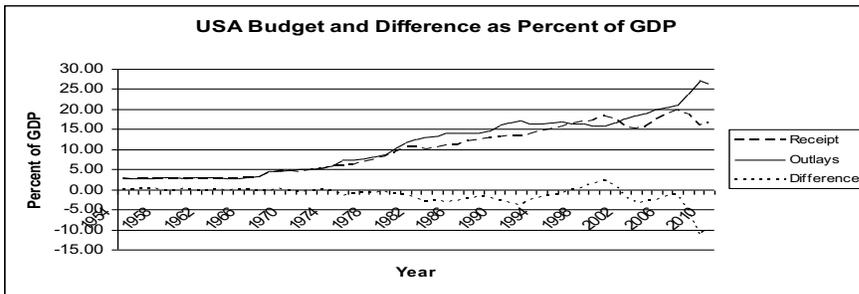


Figure 3

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*USA Federal Government Receipts, Outlays, and Differences as Percent of GDP*

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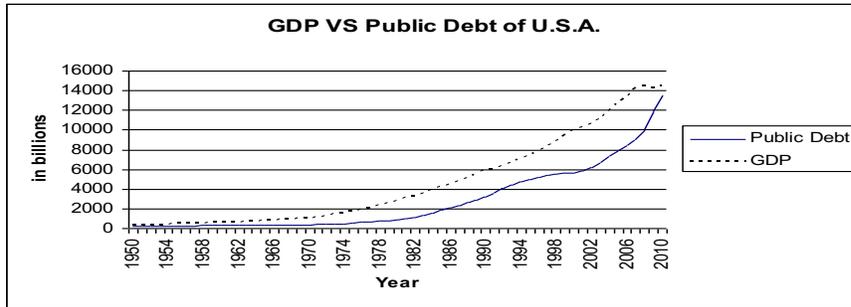
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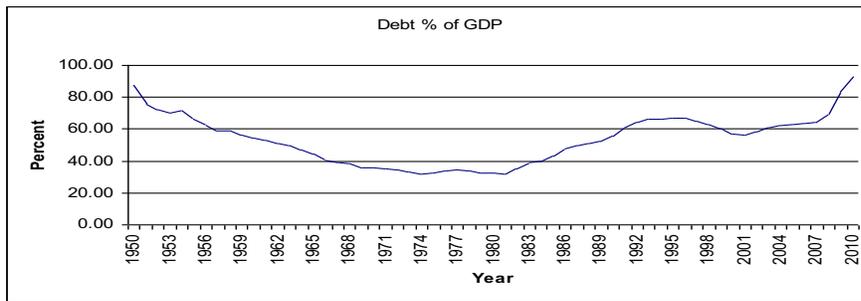
**Figure 4**

U.S. GDP vs. Public Debt 1950-2010



**Figure 5**

Debt as a Percent of GDP 1950-2010



Fiscal Policies and Their Purposes

As can be seen from Figure 1, the U.S. economy has gone through many business cycles that have required government intervention in order to revive the economy. The two methods of revival are fiscal policy and monetary policy. Fiscal policy encourages investment and consumption by more government spending or changing tax rates. On the other hand, monetary policy encourages investment and consumption by reducing discount rates, or increasing the money supply.

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Fiscal policy has been used by governments in times of crisis, which are indicated by high unemployment, inflation, a large budget deficit or other socioeconomic problems. To be effective, fiscal policy changes must be timely. The government may change fiscal policies to affect economic activity for multiple purposes: to boost housing sales, encourage investment in infrastructure, lower corporate tax rates, or allow deductions for the purchasing of new machinery. Fiscal policy can also boost consumer demand by lowering tax rates or giving a tax holiday for a certain period of time. According to Myles (2000), "Through its effect on the return to investment or the expected profitability of research and development, taxation can affect what choices are made and, ultimately, the rate of growth".

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Fiscal policy is based on the traditional Keynesian that suggests cutting taxes and deficit spending to stimulate aggregate demand (Sutherland, 1997, p. 148). Most economists believe that fiscal policy is an important growth determinant. Easterly and Rebelo (1993) state, "This deep-seeded belief that taxation, public investment, and other aspects of fiscal policy can contribute to growth miracle as well as enduring stagnation has been articulated in the context of growth models during the past three decades" (p. 10).

In addition to using fiscal policy to influence the economy, fiscal policy is also used by politicians to prove that they are doing something (Taylor, 2000, p. 27). However, monetary policy can be effective as countercyclical. Further, "monetary policy has a comparative advantage in achieving countercyclical goals," says Taylor (2000, p. 27). In that,

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"implementation lags are much shorter for monetary policy than for fiscal policy" (Taylor, 2000, p. 27). Further, monetary policy can be easily rescinded once it achieves its purpose. In addition, tinkering with discretionary fiscal policy makes it harder for the Federal Reserve to determine the need and scope of monetary policies. Therefore, Taylor (2000) concludes that it is better for

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fiscal policy to function as an automatic stabilizer while allowing monetary policy to try and keep "the aggregate demand close to potential GDP" (p.34). Taylor (2000) states that "Empirical evidence suggests that monetary policy has become more responsive to the real economy, suggesting that fiscal policy could afford to become less responsive".

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Fiscal policy can shift aggregate demand and can change real GDP. Therefore, fiscal policy should be carefully managed to keep the real GDP close to the potential GDP under inflationary conditions (Taylor, 2000, p. 26). In addition to fiscal policy influencing GDP, fiscal policy "reduces deadweight loss and create[s] greater efficiency" (Taylor, 2000, p. 26). Taylor (2000) states, "Running a budget surplus to keep real interest rate down provides for more private investment and higher economic growth. Unemployment component, payroll tax policy and other laws affecting the labor market can change the natural rate of unemployment."

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Regardless of the purpose, fiscal policy involves changing the tax structure, which could favor one sector of the economy more than others. There are discretionary changes in taxes and spending that can act as an automatic stabilizer (Taylor, 2000, p. 26). The effect of an automatic stabilizer on spending and taxes is much larger "than even the proposed discretionary changes" (Taylor, 2000, p. 26). Taylor (2000) states, "Both types of changes in taxes and spending impact aggregate demand, but the automatic ones are more predictable and work more quickly than the discretionary ones."

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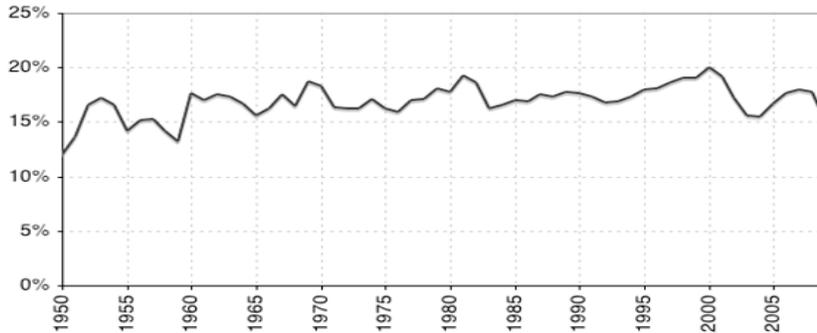
Figure 6 shows that the tax revenue has stayed within 15% to 20% of the GDP. The fluctuation is the result of automatic stabilizer, where a drop in GDP results in a drop in revenue. Other fluctuations are the result of changing the marginal tax rate or other incentives that spurred economic activity. Regardless, taxes as a percent of GDP have stayed within 15% to 20%.

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**Figure 6**

*Taxes as a Percent of GDP, 1950-2005*



Source: <http://www.deptofnumbers.com/blog/2010/08/tax-revenue-as-a-fraction-of-gdp/>

However, the federal government outlays have increased from less than 2.78% of the GDP in 1954 to almost 26.29% of the GDP in 2010, as shown in Figure 3. At the same time, receipts have increased from 2.62% of the GDP in 1954 to 16.65% of the GDP in 2010. Figure 3 also shows that receipts remained equal to outlays until 1982, but receipts dropped below the outlays afterwards except for in 2001 and 2002, when receipts exceeded outlays, resulting in the first surplus in 46 years. Sadly since then the outlays have exceeded the receipts, causing large deficits. These deficits have become a basis of political argument about who can cut spending to balance the budget. The question is whether the budget should be balanced via tax increase, spending reduction, or both. Further, if taxes have to be raised, who should pay more? The question is: what is the fairest way to increase or decrease taxes? Answering these questions requires knowing who is paying the most taxes now. This paper will evaluate the history of taxation in the United States to answer these questions.

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**Taxation in the United States**

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Governments tax people, businesses, or other sources of income to generate revenue.

However, governments should be careful not to impose taxes that are so high that they discourage economic activities, resulting in loss of revenue (Fullerton, 1981, p. 4). Further, even Smith (1776) argued about the inverse relationship between marginal tax rate and tax revenue. In other words, tax receipts and tax rates have a concave relationship. That is, higher tax rates after a certain point would result in decreasing revenue, called the "prohibitive" range. Saez (2003) states, "The elasticities of taxable income and adjusted gross income are around 0.4 and significant but the elasticities of wage income are in general insignificant and close to zero" (p. 1231).

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Goolsbee's (2000) study confirms that "the short-term elasticity of taxable income with respect to the net-the-tax should exceed one, but taking out the temporary component yield longer-run elasticities between zero and .4" (p. 375). Therefore, Goolsbee (2000) concludes "that taxing the rich can lead to dramatic shifting of taxable income in the years immediately surrounding a tax change.... But after the shifting is done, the total changes in taxable income... seem to be more limited" (p. 375). Feldstein (1995) found that "there is very substantial response of taxable income to change in marginal tax rates" (p. 552). However, this study found that the changes in tax rates have less impact on tax revenue (Feldstein, 1995, p. 552). Further, high marginal tax rates create significant deadweight losses due to changes in economic behavior (Feldstein, 1995, p. 552). Therefore, Feldstein (1995) suggests that governments should keep these behaviors and effects in mind when developing tax policies and spending levels.

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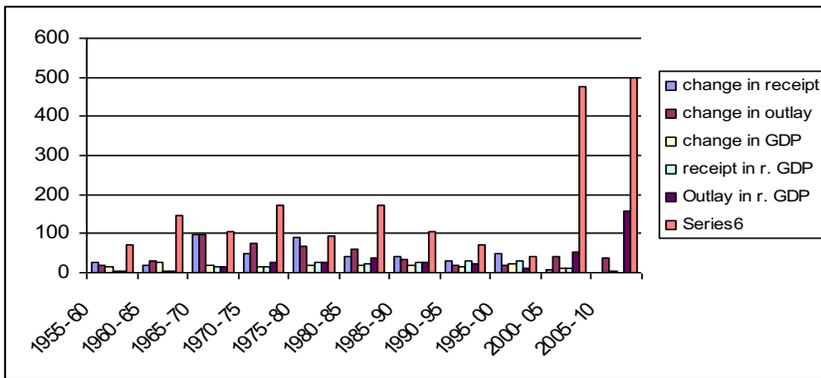
**Table 1**

*Change in Receipt, Outlay, and GDP 1955-2010*

		Five Year		% Change	% Change	Percent
	% Change	% Change	% change	in Receipt	in Outlays	Change
Year	in Receipt	in Outlay	in GDP	in r. GDP	in r. GDP	in
						outlays
						to receipt
1955 - 60	25.51	17.33	13.22	4.89	3.46	70.89
1960 - 65	20.32	30.70	27.53	2.07	3.06	147.37
1965 - 70	99.10	99.14	18.28	14.37	15.23	105.99
1970 - 75	47.34	76.40	14.28	14.80	25.30	171.01
1975 - 80	89.90	67.33	19.66	26.30	24.99	95.02
1980 - 85	39.80	61.23	17.30	21.00	36.12	172.00
1985 - 90	41.18	34.10	17.30	25.90	27.65	106.77
1990 - 95	30.03	17.53	13.19	29.81	21.31	71.48
1995 - 00	49.39	18.13	23.45	31.68	12.87	40.62
2000 - 05	7.48	40.79	12.58	10.83	51.65	477.07
2005 - 10	0.43	38.31	4.80	1.55	158.86	10264.85

**Figure 7**

*Percent Change in Receipt, Outlay, and GDP 1955-2010*



Tanzi (1969) found that the long-run elasticity is estimated at 1.42. Blackburn (1967) concluded that for every 1% increase in taxpayer income, the federal personal income tax

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revenue will rise by about 1.4% (p. 168). Tanzi (1969) found the same relationship between taxes and revenue (p. 209).

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Table 1 and Figure 7 show changes in receipt, outlay, and GDP over time. Notable changes in these values are:

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• 1955-1960

- GDP increased by 13.22%
- Receipts increased by 25.51%
- Outlays increased by 17.33%
- Change in receipt to change in GDP was 4.89%
- Change in outlays to change in GDP was 3.46%
- Change in outlays to change in receipts was 70.89%
- Receipts increased by \$16.16 trillion
- Outlays increased by \$11.46 trillion

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• 1960-1965

- GDP increased by 27.53%
- Receipts increased by 20.32%
- Outlays increased by 30.70%
- Change in receipt to change in GDP was 2.07%
- Change in outlays to change in GDP was 3.06%

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• 2000-2005

- Receipts increased by 7.48%
- Outlays increased by 40.79%
- GDP increased by 12.58%

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• 2005-2010

- Receipts increased by .43%
- Outlays increased by 38.31%
- GDP increased by 4.80%
- Change in receipts to change in GDP was 1.55%
- Change in outlays to change in GDP was 158.86%
- Change in outlays to Change in receipt was 10264%

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The table clearly indicates that in most years the percent increases in receipts and outlays are larger than the percent increase in GDP except during 2000-2005 and 2005-2010. The change in outlays compared to change in receipt was 10264%. That is, receipt in 2010 was \$2,205 trillion in 2010 compared to receipt in 2005 of \$2,196 trillion, an increase of \$9 billion. The outlay, on the other hand, was \$3,483 trillions in 2010 compared to outlays in 2005 of \$2,518 trillions, an increase of \$965 billion. Thus, it resulted in an increase of 10265% of the outlays in relation to receipts.

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As Figure 2 indicates, the budget deficit has increased to almost \$1.46 trillion in 2011 and accounts for almost 9% of the GDP. Figure 3 also indicates that outlays have increased from 2.78% of the GDP in 1954 to almost 26.29% of the GDP in 2010. The receipts have increased from 2.62% of the GDP in 1954 to almost 16.65% of the GDP in 2010. As shown in Table 1, the outlays have outpaced the receipts in almost every five year span, except for from 1955-1960, 1985-1990, 1990-1995 and 1995-2000. In most years, tax rates or taxes have been reduced while expenditures have continued to increase every year. As a result, the federal budget has always been in the red. Under the Keynesian philosophy, it is economically justifiable during recessionary periods to deficit spend, and under the automatic stabilization philosophy, revenue

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should rise during boom periods. Still, deficits have persisted every year, whether the economy is in recession or in boom.

Realizing that the budget deficit is at its highest level in history at \$1.45 trillion, the discussion in Congress in 2011 was about how to reduce spending while keeping taxes at the same level that President Bush approved. The Republicans insist on lower taxes while knowing that during periods with a weak economy, revenue will either remain the same or rise slightly during the 2010-2011 recovery years. The question is: What is the justification for keeping taxes low while being unable to cut spending to match receipts? Another question is: Can taxes be raised to cover spending, or can spending be cut to match receipts? The current Congress insists on cutting spending, claiming that "we are mortgaging the future of our children." They blame spending as the cause of large deficit; however, Manage and Marlow (1986) suggest that "... it seems incorrect to focus on hypothesized symptom of deficit rather than causes of deficits". They further suggest that most of the policy decisions are aimed at controlling symptoms and not causes (Manage & Marlow, 1986, p. 617). Therefore, Congress's continued failure to attack causes will have no or little effect on the national deficit.

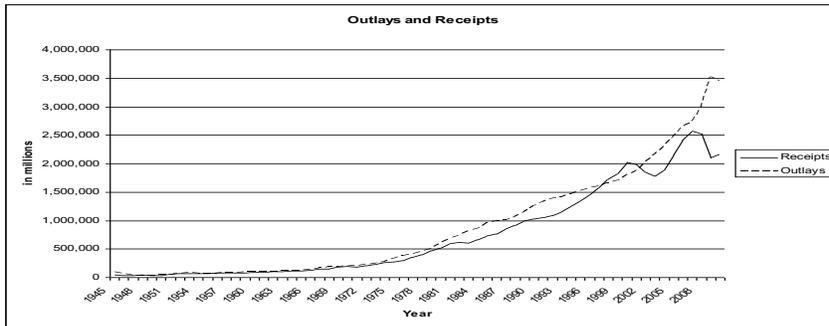
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Figure 8

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Outlays and Receipts of the U.S. Federal Government 1945-2008

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Normally, one's spending should be constrained by receipts and relative cost. The same should apply to governments. The government's income comes from direct and indirect taxes. However, governments have the ability to exceed their income by borrowing. Thus, the government's receipts consist of direct and indirect taxes and debt. The urge to overspend is the result of relative costs. These costs are based on the need to get reelected. Manage and Marlow (1986) suggest that when the cost of debt increases relative to the cost of reelection, the outcry over deficit becomes loud. It seems that the U.S. government was running deficits through most of its history without any real attempt to reduce or eliminate it. However, since the November 2010 election, where the Tea Party showed its power by electing Members to Congress, the Republicans are advocating controlling spending. This outcry is based on the assumption that by reducing spending, the deficit will also be reduced, helping Republican Congresspeople get reelected. Manage and Marlow (1986) state "The key, however, is the total funding level which must balance out aggregate spending" (p. 625). Therefore, higher taxes or cutting spending may not solve the deficit problem.

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### Progressive and Marginal Taxes

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Progressive tax is defined as when the marginal rate of tax on additional dollars is higher than the average rate on all income. Thus, progressive taxes imply that if revenue increases faster than the total income, then the elasticity will be greater than 1.

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An automatic stabilizer results in increased revenue due to increased income. This increase can be calculated by the average rate responsiveness (ARR), which is the difference between the effective marginal rate (EMR) and the average tax rate (ATR) (Johnson & Lambert, 1999, p. 3). Thus,  $ARR = EMR - ATR$ .

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IS THE U.S. TAX SYSTEM PROGRESSIVE?

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A change in marginal tax rate can cause taxpayers to change the way they collect their income. For example, they can change investment strategy, the form of compensation, expenses and itemized deductions, and compliance (Feldstein, 1995, p. 553). It is more likely for higher income groups to change the way they collect their income because they have the discretion to do so (Feldstein, 1995, p. 553). Further, higher marginal tax rates could encourage tax payers to take defensive legal or illegal steps to reduce taxes.

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Feldstein (1995) found a substantial response of taxable income to changes in marginal tax rates. He calculated an elasticity of taxable income with respect to marginal tax rate of at least one and stated that it "could be substantially higher" (Feldstein, 1999, p. 570). Feldstein and Feenberg (1996) stated that "...high-income taxpayers would have reported 7.8 percent more taxable income in 1993 than they did if their tax rate had not increased" (p. 90). This conclusion was supported by Long (1999), stating, "... it is not surprising that upper-income tax rate increases legislated in 1993 raised far less revenue that would have generated had there been no behavioral responses by taxpayers to the higher rates" (p. 686).

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Taxes and tax rates are controversial items and are constantly debated, as they represent the deep, abiding, and contradictory attitude toward wealth in this country (Kornhauser, 1994, p. 119). The income tax controversy reflects it. Kornhauser (1994) states, "Today it is an amalgam of consumption and income provisions, of progressive rates and tax expenditures which undermine progressivity" (p. 116). Progressivity is a contentious issue. The question is always raised about appropriate tax rates, exemption amounts, and certain types of income. Therefore, Kornhauser (1994) states, "the debates show great partiality for preferences, and the tax laws reflect this" (p. 167). The current rates are based on taxing income as well as consumptions, earned and unearned income, and progressivity.

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IS THE U.S. TAX SYSTEM PROGRESSIVE?

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History of Taxes

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Marginal tax rates and the associated income brackets have changed over the years. In

1941, the minimum marginal tax for married couples filing jointly was 10% for those with an income between \$0 and \$2,000, 59% for those with an income between \$44,000 and \$50,000 and 81% for those with an income over \$5 million. The rates were spread over 24 income brackets.

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The marginal rate for income brackets was increasing at the rate of 3% for every \$2,000 in income up to \$5 million. In 1942, the rate was changed to 19% for income between \$0 and

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\$2,000 and 88% for those with an income over \$200,000. Without changing the number of

income brackets, in 1944, the rates were changed from 19% to 23% at the lowest income level

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and to 94% at the highest income level. In 1946, the number of income brackets stayed the same,

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and the rates were lowered to 23% at the lowest income and to 91% at the highest income. In

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1951, marginal tax rates were changed slightly without changing the income brackets. Marginal

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tax rates were changed again in 1952 without changing the income brackets. In 1955, income

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brackets were increased by \$2,000 from the lowest income bracket of between \$0 and \$4,000 to

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the highest of \$400,000 and above while keeping the rates unchanged.

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The rates and income brackets were changed again in 1964. The minimum rate was set at

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16% for those with an income between \$0 and \$1,000 to 77% for income above \$400,000. The

tax rates were increasing at half-a-percent for each \$1,000 increase in income. In 1965, the rates

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were lowered again to a minimum of 14% to a maximum of 70% without changing the income

brackets but lowering the maximum taxable income from \$400,000 to \$200,000. In 1977, taxable

income brackets were changed to set at a minimum of \$3,200 and the maximum income at

\$203,200, but the rates were left unchanged. In 1979, the income brackets were changed starting

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at 14% for income starting at \$3,400 to 70% for income above \$215,400. The tax rates and income brackets were changed again in 1982. The minimum tax rate was lowered to 12% for income between \$3,400 and \$5,500 to 50% for income above \$85,600. As a result, the number of brackets was decreased from 16 in 1981 to 13 in 1982. The tax rates were lowered again in 1983 and another income bracket was added. The minimum tax rate was 11% for income between \$3,400 and \$5,500 and 50 percent for income above \$109,400.

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In 1984, marginal tax was decreased for most brackets, but the number of brackets was increased. In 1985, the number of income bracket stayed the same, but the income levels were increased in each bracket. The minimum tax rate was 11% for income between \$3,540 and \$5,720 and 50% for income above \$169,020. In 1986, the income levels in each bracket were changed again. The minimum tax rate was 11% for income between \$3,670 and \$5,940 and 50% for income above \$175,250. In 1987, a major change occurred by reducing the number of brackets from 15 to 5, and the income brackets were between \$0 and \$3,000 to above \$90,000.

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The lowest marginal tax rate was set at 11% and highest rate was set at 38.5%. The rates and the brackets were changed again in 1993. The five brackets started at 15% for income less than \$36,900 to 39.6% for income over \$250,000. Since then, the income levels in each bracket were increased every year while tax rates remained the same. In 2002, an income bracket was added between \$0 and \$12,000 with a marginal tax rate of 10% while the other rates and income brackets were almost the same. In 2003, the highest rate was lowered from 38.6% to 35% and the other rates were reduced by 2% except the two rates at the bottom which remained at 10% and 15%. The income level in each bracket was increased for these rates. Since 2003, the tax rates remained the same until 2011, but income levels in each bracket were increased every year during those years. The tax rates and income brackets for 2011 are:

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## IS THE U.S. TAX SYSTEM PROGRESSIVE?

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Table 2

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*Tax Rates Table for 2011*

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Marginal Rate	Tax Income Bracket	
	Over	Less Than
10 percent	0	\$ 17,000
15	\$ 17,000	\$ 69,000
25	\$ 69,000	\$ 139,350
28	\$ 139,350	\$ 212,300
33	\$ 212,300	\$ 379,150
35	\$ 375,150	-

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### Tax Compliance

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Countries need to tax their citizens to cover the cost of the services they provide.

However, some may resist paying their full share of taxes or paying their taxes at all. Cummings

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et al. (2004) found that "compliance behavior and tax morale can be explained by differences in the fairness of tax administration, in the perceived equity of the fiscal exchange, and in the

overall attitude towards the respective governments across the countries." (p. 2). Tax morale is

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defined as the intrinsic motivation to pay taxes (Alm & Torgler, 2006, p. 5). There is

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considerable evidence that enforcement efforts can increase compliance. However, compliance

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has been shown by many studies to be related to the fairness of tax administration, the perceived

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fiscal exchange, and the overall attitude towards the respective governments (Cummings et al.

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2006, p. 2).

Tax compliance is a human behavior affected by many factors. A threat of punishment

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and increased enforcement are likely to affect compliance. However, some theories, such as the

prospect theory and rank dependent expected utility theory, advocated that social norms may

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explain better compliance than the threat of punishment. However, Cummings et al (2009) found

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that the perception of the fairness of tax and government behavior is major factor in explaining compliance with tax. In comparison, taxpayers in the United States have higher compliance than other European countries (Alm et al., 1995, p. 15).

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**Who Pays Taxes?**

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A tax law is framed to collect taxes from income such as wages, dividends, interest, capital gain and so on. The legislators pass tax law, called statutory tax function, to set a basis for income earners to pay a certain amount of taxes. What taxpayers pay, however, is subject to economic income, which may result in different amount of taxes than the statutory rate.

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There are two reasons for the difference in the effective tax rate and the statutory rate.

First, taxable income and economic income are never the same due to the prevailing tax laws.

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Economic income is reduced by many deductions or loopholes. Second, tax law influences taxpayers' behaviors by changing either the timing of receiving income or the form in which it is received (Gouveia and Strauss, 1994, p. 318). Therefore, the question is: how close are the statutory and effective rates? In addition to this basic question, another question should be, what percent of the income in each income group is paid in taxes? Also, what percent of the GDP is received by each income group and what percent of total taxes is paid by each income group? Further, is there a difference between the statutory and effective tax rates in each income group?

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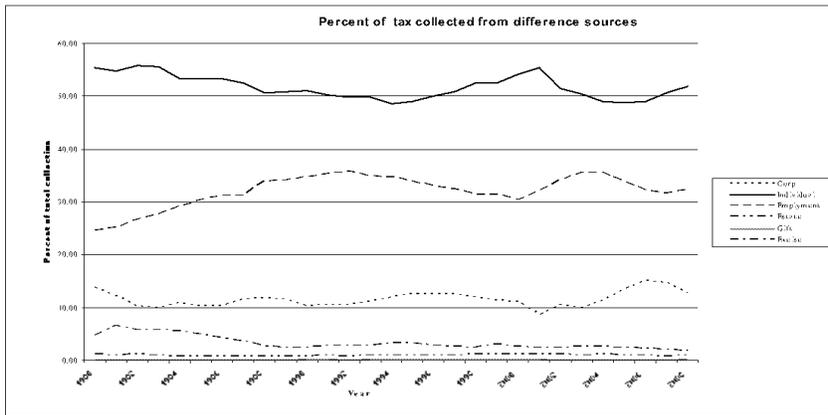
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IS THE U.S. TAX SYSTEM PROGRESSIVE?

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**Figure 9**

Sources of Taxes 1906-2008



Taxes are collected from different sources. Figure 9 shows the share of taxes from different sources:

- corporate taxes
- individual taxes
- employment taxes
- estate taxes
- gift taxes
- excise taxes.

Corporations' income tax share was 13.94% of the total taxes in 1980, and its share was 12.91% in 2008. However, their share of taxes went down to as low as 8.77% in 2001. Individual income tax share was 55.36% of the total taxes in 1980, and it was 51.95% of the total taxes in 2008. The share of the employment tax was 24.71% of the total taxes, and it

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went up to 32.17% of the total taxes in 2008. The share of estate taxes was 1.21% in 1980, and it was .97% in 2008. The share of gift taxes was .04% in 1980, and it was .12% in 2008. The share of excise taxes was 4.74% in 1980, and it was 1.88% in 2008. Interestingly, the excise taxes have almost constantly gone down each year.

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Figure 10 and Table 3 show the share of different sources of taxes as a percent of gross national income (GNI). The total amount of taxes collected as a percent of GNI was 18.67 in 1980, and it was 19.25% in 2008. The share of corporate tax as a percent of GNI was 2.60% in 1980, and it was 2.48% in 2008. The share of individual tax as a percent of GNI was 10.34% in 1980, and it was 10.00% in 2008. The share of employment tax as a percent of GNI was 4.61% in 1980, and it was 6.19% in 2008. The share of estate tax as a percent of GNI was .23% in 1980, and it was .19% in 2008. The share of excise tax as a percent of GNI was .88% in 1980, and it was .36% in 2008.

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Table 3

Sources of Taxes as a Percent of Total Taxes and GNI 1980-2009

Sources of Taxes	Percent of Total Taxes		Percent of Gross National Income		
	1980	2009	1980	2008	2009
Corporation	13.94	9.61	2.60	2.48	1.74
Individual	55.34	50.12	10.34	10.00	9.21
Employment	24.71	36.59	4.61	6.91	6.64
Estate	1.21	.92	.23	.19	.17
Gift	.04	.13	-	.02	.02
Excise	4.74	1.99	.88	.36	.36
<b>Taxes as a share of GNI</b>			<b>18.66</b>	<b>19.25</b>	<b>18.14</b>

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Sources of Taxes as a Percent of Total Taxes and GNI

Sources of Taxes	Percent of Total Taxes		Percent of Gross National Income	
	1980	2009	1980	2009
Corporation	13.94	9.61	2.60	1.74
Individual	55.34	50.12	10.34	9.21
Employment	24.71	36.59	4.61	6.64
Estate	1.21	.92	.23	.17
Gift	.04	.13	-	.02
Excise	4.74	1.99	.88	.36
<b>Taxes as a share of GNI</b>			<b>18.66</b>	<b>18.14</b>

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Figure 10

Taxes as a Percent of Gross National Income 1980-2008

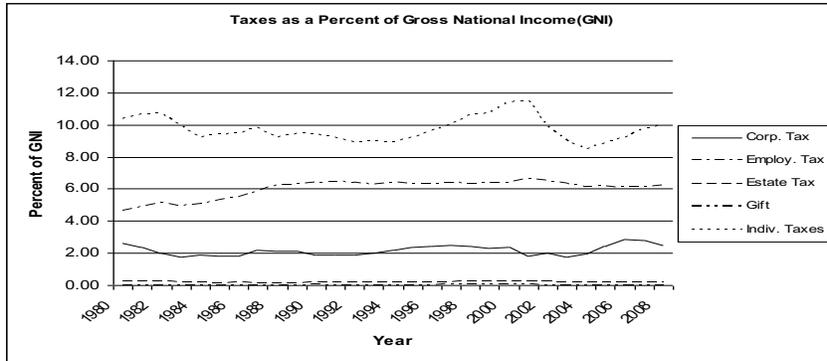


Figure 11 shows the type of household as a percent of the economically active population. The number of economically active people was 108,905,000 in 1980 and 154,353,000 in 2008. Single person households were 16% of the economically active population in 1980 and 20% in 2008. Households that were couples without children were 31% in 1980 and 21% in 2008. Households of couples with children were 21% in 1980 and 17% in 2008. Households of single parents were 6% in 1980 and 7% in 2008. Households classified as other were 7% in 1980 and 10% in 2008. This data shows that the number of potential taxpayers has increased by almost 42% between 1980 and 2009, but taxpayers payed less in taxes in 2008 compared to 1980.

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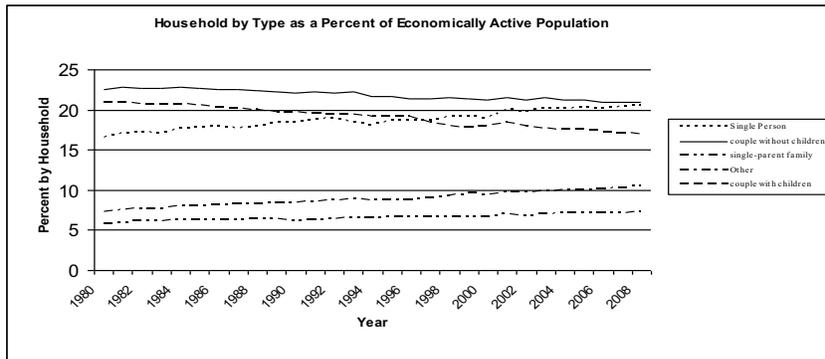
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**Figure 11**  
*Household by Type as a Percent of Economically Active Population 1980-2008*



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**Table 5**  
*Taxes as Percent of Taxable Income 1993-2009*

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All returns, total	20.74	20.85	21.19	21.58	21.56	21.52	21.92	22.41	21.87	20.43	18.81	18.94	19.27	19.41	19.45	19.58	19.16
No adjusted gross income																	
\$1 under \$5,000	17.32	16.78	17.10	17.05	16.54	15.15	14.81	14.79	12.58	11.34	12.04	8.89	9.04	9.58	9.60	9.81	9.81
\$5,000 under \$10,000	15.46	15.38	15.24	15.28	15.21	14.95	14.98	15.10	11.96	10.38	10.15	9.81	9.82	9.99	10.00	10.13	10.22
\$10,000 under \$15,000	15.12	15.09	15.46	15.07	15.02	14.89	14.91	14.91	14.36	10.53	10.11	9.97	9.92	9.98	9.97	9.98	9.90
\$15,000 under \$20,000	15.02	15.10	15.04	15.05	14.97	14.91	14.90	14.92	14.88	11.57	11.03	10.87	10.75	10.65	10.49	10.35	10.20
\$20,000 under \$25,000	15.04	15.06	15.01	15.01	14.95	14.93	14.91	14.92	14.93	12.03	11.73	11.62	11.57	11.52	11.41	11.35	11.23
\$25,000 under \$30,000	15.13	15.08	15.04	15.04	14.96	14.93	14.93	14.93	14.94	12.46	12.20	12.04	12.01	11.95	11.88	11.84	11.74
\$30,000 under \$40,000	16.00	15.94	15.84	15.68	15.56	15.42	15.37	15.33	15.22	13.15	12.69	12.59	12.48	12.44	12.38	12.32	12.21
\$40,000 under \$50,000	16.30	16.35	16.35	16.43	16.34	16.28	16.25	16.26	16.16	14.38	13.79	13.66	13.50	13.38	13.22	13.11	12.85
\$50,000 under \$75,000	17.78	17.59	17.44	17.35	17.18	17.05	17.04	17.05	16.87	15.43	14.65	14.54	14.47	14.45	14.37	14.36	14.18
\$75,000 under \$100,000	20.69	20.61	20.33	20.22	19.91	19.51	19.45	19.38	19.03	17.65	15.64	15.44	15.27	15.11	14.98	14.98	14.83
\$100,000 under \$200,000	24.10	23.96	23.74	23.60	23.11	22.74	22.59	22.70	22.33	21.39	19.06	18.73	18.50	18.29	17.99	18.06	17.80
\$200,000 under \$250,000	30.12	30.08	29.99	29.62	28.68	28.09	27.97	28.35	28.25	27.64	25.35	24.91	24.58	24.51	24.36	25.03	22.15
\$250,000 under \$500,000	34.32	34.34	34.34	33.96	32.76	31.76	31.90	32.21	32.69	32.35	28.81	27.90	27.50	27.57	27.52	29.08	26.64
\$500,000 under \$1,000,000	35.62	35.46	35.52	34.75	32.29	30.62	31.13	32.89	33.92	33.61	29.52	28.16	28.15	27.90	27.91	29.57	29.62
\$1,000,000 under \$1,500,000								32.98	34.00	33.83	29.81	28.40	27.96	27.86	27.87	29.57	30.42
\$1,500,000 under \$2,000,000								32.63	33.91	33.99	29.48	27.86	27.62	27.71	27.52	29.29	30.77

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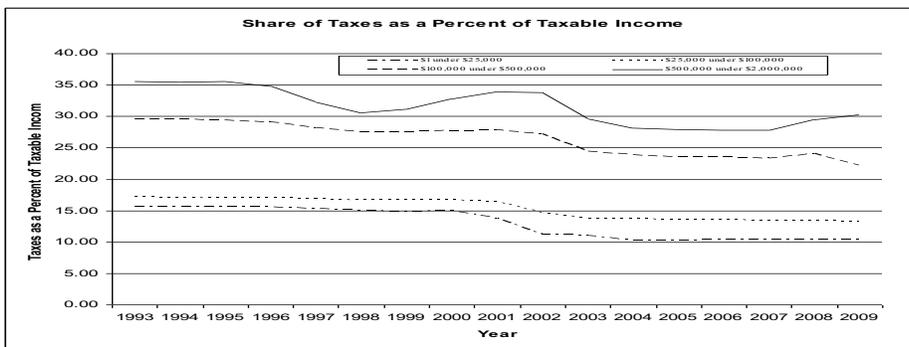
Table 5 breaks down income groups and taxes as a percent of taxable income. The first row in the table shows the total taxes for all income groups combined as a percent of total taxable income. It shows that total taxes as a percent of taxable income have been decreasing from 20.74% in 1993 to 19.18% in 2009. The table further indicates that taxes as a percent of taxable income have decreased for all of the groups except the income groups of \$1 million or above, indicated in the last two rows. However, for the income group of \$1 million to \$1.5 million, percent of taxable income decreased from 32.96% in 2000 to 30.42% in 2009, and for the income group of \$1.5 million to \$2 million, it decreased from 32.63% in 2000 to 30.77% in 2009. This data shows that higher income groups pay more in taxes. The averages for all the income groups indicate that as income increased, the percent of income paid in taxes increased, except for the income group of million or more. The Internal Revenue Service did not report this group's income until 2000. Therefore, the average does not include the years from 1993 through 1999, which may have resulted in a lower average.

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Figure 12

Taxes as a Percent of Taxable Income 1993-2009



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Figure 12 shows taxes paid as a percent of income. The figure is based on Table 5. However, some income brackets were combined to create four income groups in order to reduce

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the clutter of lines. As can be seen in the figure, taxes as a percent of taxable income for the income group between \$500,000 and \$2,000,000 have gone down from 35% in 1993 to 30% in 2009. Figure 13 also indicates that taxes as a percent of taxable income for the income group between \$100,000 and \$250,000 have gone down from 28% to 22%. Taxes as a percent of income for the income group between \$25,000 and \$100,000 have gone down from 17% to 13%, and, finally, taxes as a percent of taxable income for the income group between \$1 and \$25,000 have gone down from 16% to 10%. This means that taxes as a percent of taxable income have decreased for all income groups. The question is: whose taxes have gone down the most? The difference in percent from 1993 to 2009 indicates that almost every income group has benefitted from lower tax rates, but the income group between \$25,000 and \$100,000 has benefitted the least with a 4% decline, and the income group between \$500,000 and \$2,000,000 has benefitted the most with a 7% decline. Therefore, higher income earners are saving more in taxes.

Figure 13 shows percent of taxes paid per dollar of taxable income. The figure shows that taxpayers in the income groups of \$500,000 to \$1 million, and \$1 million, and \$1.5 million, pay more as a percent per dollar of taxable income. Taxpayers in the income group of \$100,000 to \$200,000 also pay more as a percent per dollar of taxable income. The average percent of taxes per dollar for all income groups varies between 21% per dollar in 1993 to 17% per dollar in 2009. However, as the figure indicates, percent per dollar dropped in 2002 and rose again in 2007.

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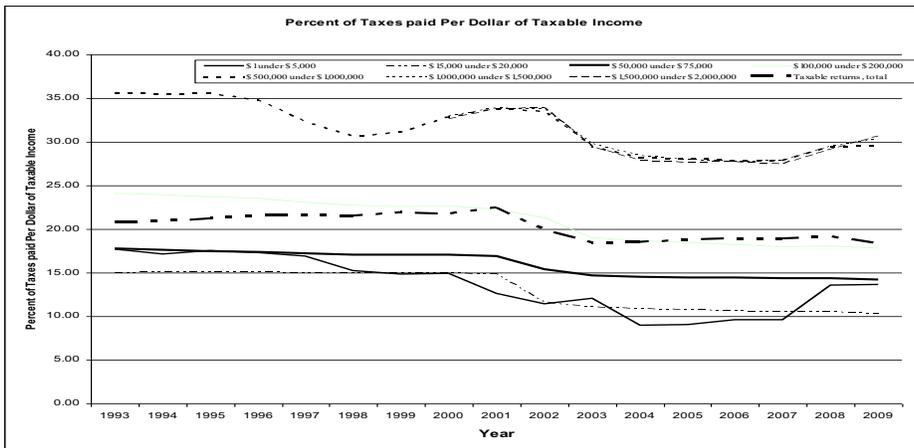
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Figure 13

Taxes Paid per Dollar of Taxable Income



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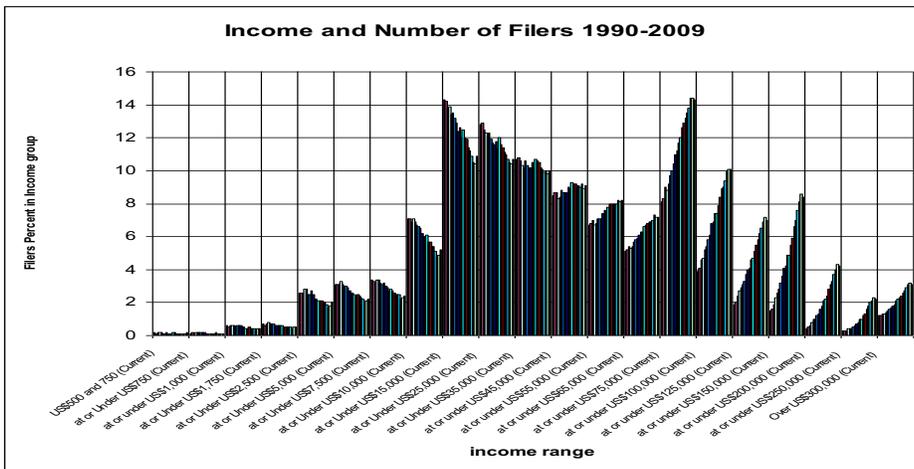
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Figure 14

Income and Number of Filers



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Figure 14 shows the number of filers in each income group. The data for years 1990-2009 indicates that the number of filers since 1990 has decreased in the lower income brackets of \$500 to \$35,000, as indicated by the bars on the left in Figure 15. Taxpayers in this bracket accounted for 54% of filers in 1990, and it dropped to 20% of filers in 2009. The number of filers in the income bracket of \$55,000 or below has decreased from 75% in 1990 to 52% in 2009. This indicates that the number of filers with incomes above \$55,000 increased from 25% in 1990 to 48% in 2009. Thus, it indicates a positive economic trend in that more and more taxpayers are moving into higher income groups.

The number of returns of taxable income was 91 million in 1993, while the total number of employed people was 119 million and the total number of registered businesses was 2.13 million. This makes a total of 121.3 million potential tax filers. This means that only 76.4% of potential taxpayers filed tax returns in 1993. In 2009, the total number of employed people was 141.2 million, and the number of registered business was 3.21 million, so there were a potential 144.4 million income earners. In 2009, 104 million tax returns were filed. This means that only 72% of potential taxpayers filed tax returns. In 1993, a total of \$2.45 trillion of taxable income was reported when the GDP was \$ 8.5 trillion, which is 28.25% of the GDP. In 2009, a total of \$5.9 trillion of taxable income was reported when the GDP was \$12.9 trillion, which is 39.51% of the GDP. The percent change in taxable income reported in each group is shown in Table 6.

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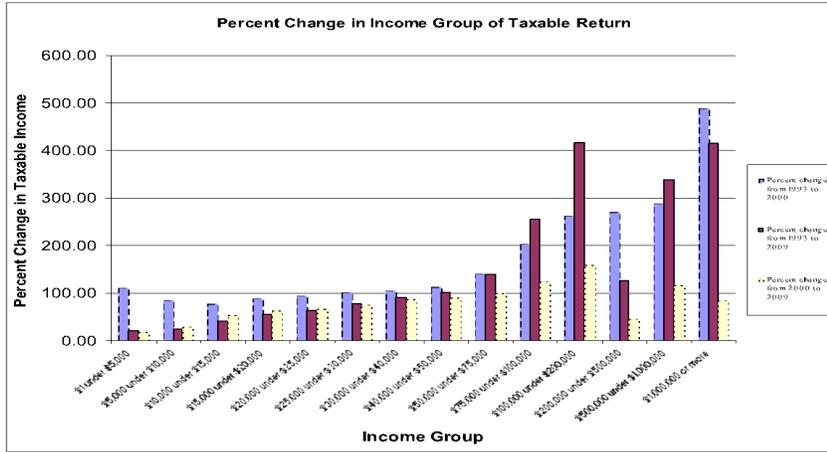
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Figure 15

Percent Change of Reporting Taxable Income by Income Group 1993-2009



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Figure 15 is based on the data in Table 6. The table shows that the amount of reported taxable income between \$1 to \$5,000 went up 110.81% from 1993 to 2000. During the same period, the amount of reported taxable income of more than \$1,000,000 went up 489.64%. From 1993 to 2009, the amount of reported taxable income between \$1 and \$5,000 went up 20.34%, and the amount of reported taxable income of more than \$1,000,000 went up 415.13%. However, the amount of reported taxable income between \$1 and \$5,000 went up 18.36% from 2000 to 2009. During the same period, the amount of reported taxable income of more than \$1,000,000 went up 84.78%. This trend indicates that more taxpayers have moved into higher income brackets, and the bad economy in 2009 decreased the percent change from 2000 to 2009 compared to from 1993 to 2000.

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Table 6

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Percent Change in Income Group Reporting Taxable Income 1993-2009

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Size of adjusted gross income	Taxable Income Percent change From 1993 To 2000	Taxable Income Percent change from 1993 to 2009	Taxable Income Percent change from 2000 to 2009
All returns, total.....	185.21	207.39	111.97
No adjusted gross income.....			
\$1 under \$5,000.....	110.81	20.34	18.36
\$5,000 under \$10,000.....	84.43	24.89	29.48
\$10,000 under \$15,000.....	77.29	41.42	53.59
\$15,000 under \$20,000.....	89.40	55.83	62.45
\$20,000 under \$25,000.....	94.78	63.47	66.96
\$25,000 under \$30,000.....	102.51	77.85	75.94
\$30,000 under \$40,000.....	106.10	91.39	86.13
\$40,000 under \$50,000.....	113.11	102.02	90.20
\$50,000 under \$75,000.....	140.20	139.46	99.47
\$75,000 under \$100,000.....	204.62	254.81	124.53
\$100,000 under \$200,000.....	262.18	416.81	158.98
\$200,000 under \$500,000.....	269.88	125.48	46.49
\$500,000 under \$1,000,000.....	288.67	338.34	117.21
\$1,000,000 or more.....	489.64	415.13	84.78

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Below, Figure 16 shows that in 1993, the taxable income as a percent of GDP was .024 for the income group between \$1 and \$5,000 and it was 6.06% for the income group between \$50,000 and \$75,000, and 1.77% for the income group of more than \$1 million. In 2000, the taxable income as a percent of GDP was .021% for the income group between \$1 and \$5,000, 6.45% for the income group between \$50,000 and \$75,000, and 6.58% for the income group of more than \$1 million. In 2009, the taxable income as a percent of GDP was .003% for the income group between \$1 and \$5,000, 5.60% for the income group between \$50,000 and \$75,000, and 4.86% for the income group of over \$1 million.

This data shows that the share of income as percent of GDP has increased from 1.77% in 1993 to 6.58% in 2000 and to 5.60% in 2009 for the income group of more than \$1 million. This indicates that taxpayers in higher income groups are getting a larger share of the GDP. Figure 16

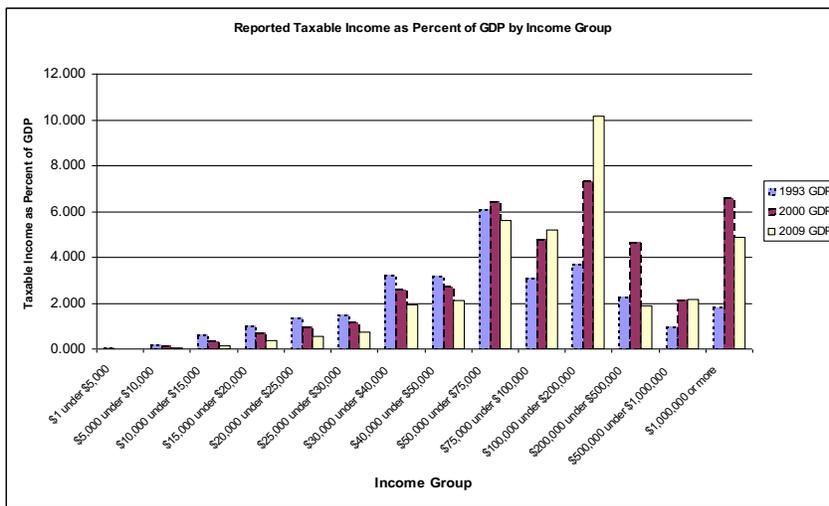
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shows that the taxable income as a percent of GDP has declined since 1993 for income groups below \$50,000. However, taxable income as a percent of GDP increased from 6.06% to 6.45% among the \$50,000 to \$75,000 income group from 1993 to 2000, but it decreased from 6.45% to 5.60% from 2000 to 2009. Furthermore, taxable income as a percent of GDP increased for the income groups of \$75,000 and \$200,000 from 1993 to 2000 and from 2000 to 2009. However, taxable income as a percent of GDP decreased from 6.58% to 4.85% for the income groups of \$200,000 and higher from 2000 to 2009. Unfortunately, taxable income as a share of GDP in all income groups dropped in 2009 due to economic problems except in the income group between \$100,000 and \$200,000.

Figure 16

Reported Taxable Income as Percent of GDP, 1993-2009



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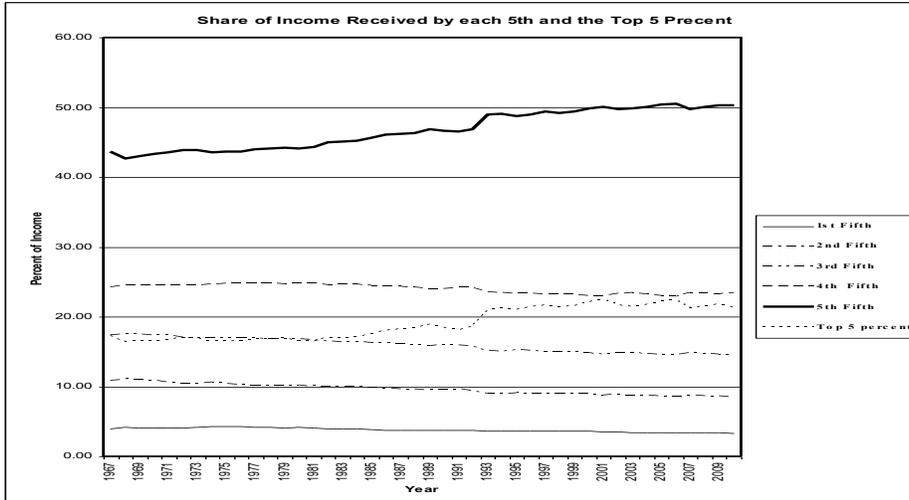
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Distribution of Income 1967-2009

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Figure 17 shows the share of income for each fifth of the population from the years 1967 to 2009. As the figure indicates, the share of income belonging to the top 20%, or the 5<sup>th</sup> fifth, has increased every year since 1967. For example, in 1967, the top 20% received 44% of the total income and they received 50% of the total income in 2009. Their share has remained within 44 to 50% of the income. In addition, the share of income received by the top 5% has increased from 16% in 1967 to 21% in 2009. On the other hand, the share of income of the bottom fifth has gone down from 4% to 3.27%. The share of income received by the bottom 80% of the population has remained the same or has gone down.

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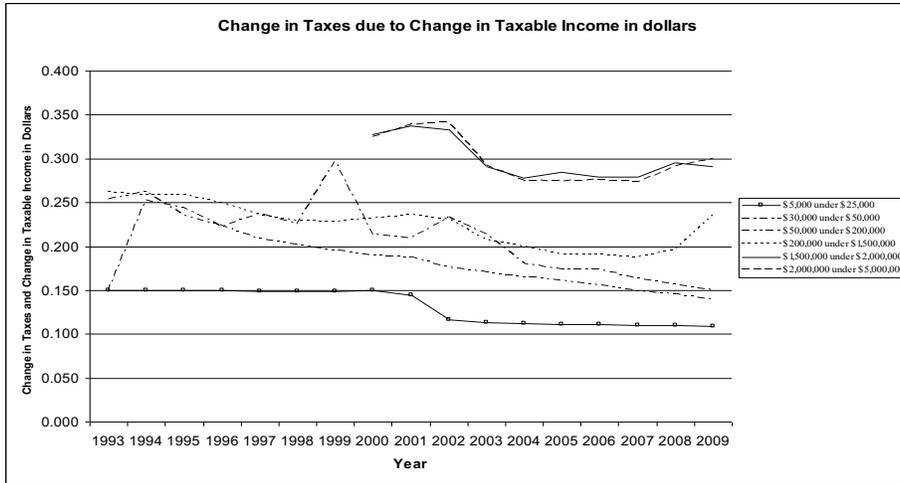
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Figure 18

Change in Taxes Paid Per Dollar due to Change in Income 1993-2009



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Figure 18 shows how much a taxpayer is paying in taxes for each dollar increase in their income. The change was calculated from the difference in taxes and change in taxable income. As the figure indicates, taxpayers paid more in taxes as they moved from lower income groups to higher income groups. For example, taxpayers in the taxable income group between \$2 million and \$5 million paid \$0.32 per dollar of taxable income in 2000, and the rate dropped and then increased to \$0.299 per dollar in 2009. The same trend can be seen for the taxable income group between \$1 million and \$2 million. However, the tax paid per dollar dropped for all other taxable income groups except for the taxable income group of \$200,000 to \$1.5 million. As can be seen, the rate dropped but then went up in 2008 and 2009. As all the rates indicate, most of the taxes paid per dollar of taxable income have dropped since 1993.

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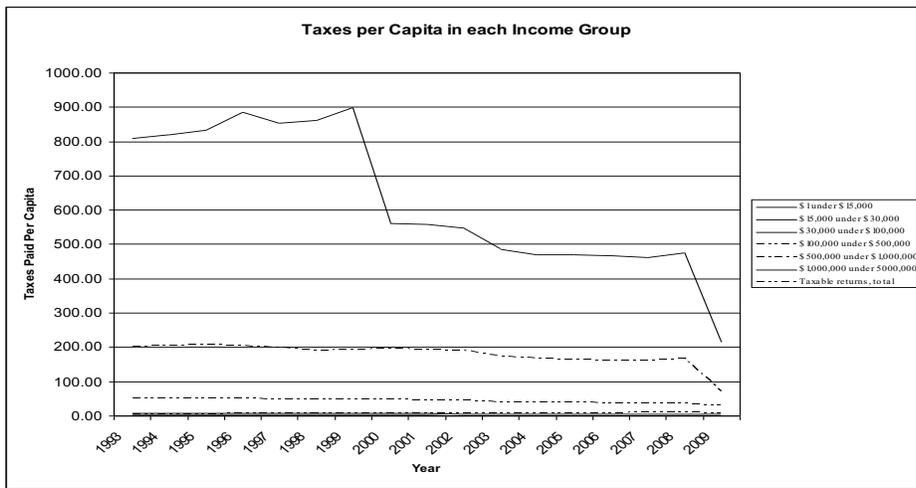
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Figure 19

Taxes Paid Per Taxpayer in Each Income Group 1993-2009



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Figure 19 shows how many taxes were paid per taxpayer in each income group. Taxpayers in higher income groups from \$1 million to \$5 million paid higher taxes; they paid \$810 per taxpayer in 1993 and \$213 per taxpayer in 2009. Taxpayers in the income group from \$500,000 to \$1 million paid \$202 per taxpayer in 1993 and \$71 per taxpayer in 2009. Taxpayers in the income group from \$100,000 to \$500,000 paid \$49 per taxpayer in 1993 and \$28 per taxpayer in 2009. Taxpayers in the income group between \$30,000 and \$100,000 paid \$7 per taxpayer in 1993 and paid \$5 per taxpayer in 2009. Overall, all taxpayers paid an average tax of \$6 per taxpayer in 1993 and \$8 per taxpayer in 2009.

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**Table 7**

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*Income Group and Share of Taxes Paid per Tax Filer 1993-2009*

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Size of adjusted gross income	Taxes Paid																
	Per tax filed Per capita																
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All returns, total.....																	
\$1 under \$15,000.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
\$15,000 under \$30,000.....	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1
\$30,000 under \$100,000.....	7	7	7	7	7	7	7	7	7	6	5	5	5	5	5	5	5
\$100,000 under \$500,000.....	49	49	49	49	47	46	46	46	45	44	40	39	39	38	37	37	28
\$500,000 under \$1,000,000.....	202	205	206	205	198	192	193	195	194	192	172	168	165	163	162	168	71
\$1,000,000 under \$1,500,000.....	810	821	832	885	854	862	897	360	363	360	320	305	305	300	299	309	169
\$1,500,000 under \$2,000,000.....								515	520	520	460	441	434	428	427	444	315
\$2,000,000 under \$5,000,000.....								889	902	900	783	749	745	745	737	767	458
Taxable returns, total.....	6	6	6	7	7	8	9	9	8	8	7	8	8	9	9	9	8
\$1,000,000 under 5,000,000.....	810	821	832	885	854	862	897	560	558	548	485	469	470	466	463	475	213

Table 7 shows the average tax paid by taxpayer in each income group. Taxpayers in the income group between \$15,000 and \$30,000 paid an average of \$2 per taxpayer in 1993 and \$1 in 2008, a drop of 50%. Taxpayers in the income group between \$30,000 and \$100,000 paid an average of \$7 per taxpayer in 1993 and \$5 per taxpayer in 2009, a drop of 29%. Taxpayers in the income group between \$100,000 and \$500,000 paid an average of \$49 per taxpayer in 1993 and they \$28 per taxpayer in 2009, a drop of 43%. Taxpayers making more than \$1 million in 1993 paid an average of \$810 per taxpayer in 1993 and \$213 per taxpayer in 2009, a drop of 79%. This data indicates that the higher the income, the more they saved in taxes as indicated by the large drop in rate in 2009.

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These analyses of taxes so far indicate that the tax rates and amount of taxes paid have been going down for each income group. However, higher income groups have benefitted more than the other income groups. The trend may indicate a regression in the tax system. In order to prove whether the tax system is progressive or regressive, one needs to analyze using other commonly used measures.

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## IS THE U.S. TAX SYSTEM PROGRESSIVE?

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### Analyzing for Progression and Regression?

The United States has reformed taxes many times. The reforms have resulted in changes in the rate schedule, allowable deductions and exemptions, and exemptions of incomes subject to tax. The question is how these changes have affected tax progressivity. One study found that progressivity may have been reduced or eliminated by reforms (Hayes et al., 1995, p. 465). Additionally, Hayes et al. (1995) found that these reforms reduced progressivity. Other researchers have concluded that tax reforms seem "to have the federal tax system in the direction of less progressivity" (Piketty, and Saez, 2007, p. 1).

The major changes in the tax rate occurred in 1964, when the marginal rate for incomes above \$400,000 was reduced from 91% to 77%. It was then reduced to 70% for those with income levels of \$200,000 or more. The marginal rate was changed to 50% on income over \$85,600 in 1983. In 1983, the 50% rate was also applied to income over \$100,000. Income rates also changed in 1984, 1985, and 1986. However, drastic changes in the marginal rates occurred in 1987. These changes settled the highest rates at 35% for income over \$379,150. During these changes, the tax rates decreased and income levels increased, but Social Security and Medicare contributions increased. The question is, have these tax reforms affected the progressivity of taxes?

Piketty and Saez (2004) define progressive taxes as taxes "in which the share of income paid in taxes rises with income," and regressive taxes as taxes "in which the share of income paid in taxes falls with income." (p. 4). However, Piketty and Saez (2007) modified the definition somewhat to state, "... a tax system can be defined as progressive if after-tax income is more equally distributed than before-tax income, and regressive if after-tax income is less equally distributed than before-tax income" (p. 5). Duncan and Peter (2010) define progressivity as taxes

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that are designed to collect a greater proportion of income from the rich relative to the poor (p. 5).

Tax progressivity is normally misunderstood. There are many suggested indexes for measuring progressivity, but there is no commonly used method. Some methods measure the distribution of tax burden, the effect of tax burden, or the effect of taxes on the distribution of income, though some may not consider the later as a measure of progressivity.

Many studies have considered the progressivity of taxes through different measures, such as the Kakwani progressivity index, the Kakwani distribution index, the Standard Tax Rate (STR), the Suits S index, the Gini Index, and the Lorenz curve (Silber, 1994; Dunbar & Groff, 2000; Thorensen, 2004; Alm et al., 2005; Iyer et al., 2008; Stroup, 2005). According to Conceicao and Ferreira (2000), "A measure of economic inequality provides, ideally, a number summarizing the dispersion of the distribution of income among individuals. Such a measure is an indication of the level of inequality of a society" (p. 2). Stroup (2005) argues that progressivity is often measured by how much is paid in taxes by certain income groups. He argues that this measure does not relate tax share to income share (Stroup, 2005, p. 205). Stroup (2005) states tax progressivity is to be determined by marginal taxes, which are calculated via the share of income tax paid in relation to income share earned (p. 206).

If one uses the Piketty and Saez (2004) definition of progressivity, one may conclude that the U.S. tax system is progressive. Table 7 shows that as income increased, taxpayers paid more in taxes. In 1993, the lowest income group was paying 17.31% of their income in taxes, and highest income group was paying 35.63% of their income in taxes. In 2009, the lowest income group paid 9.90% of their income in taxes and the highest income group paid 27.66% of their income in taxes. This shows that the rate of taxes paid dropped for the groups.

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Using many measures of taxes progressivity, consider the results. Table 7 shows the average tax paid by taxpayer in each income group. Taxpayers in income group between \$15,000 and \$30,000 paid an average of \$2 per taxpayer in 1993 and they paid \$1 in 2008, a drop of 50 percent. Taxpayers in income group between \$30,000 and \$100,000 paid an average of \$7 per taxpayer in 1993 and they paid an average of \$5 per taxpayer in 2009, a drop of 29 percent. Taxpayers in income group between \$100,000 and \$500,000 paid an average of \$49 per taxpayer in 1993 and they paid an average of \$28 per taxpayer in 2009, a drop of 43 percent. Taxpayers making more than a million dollars in 1993 paid an average of \$810 per taxpayer in 1993 and they paid an average of \$213 in 2009, a drop of 79 percent. Obviously, this indicates that the higher the income, the more they saved in taxes as indicated by the lower rate in 2009.

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IS THE U.S. TAX SYSTEM PROGRESSIVE?

Figure 20

Average Marginal Tax Paid by All Income Group 1993-2009

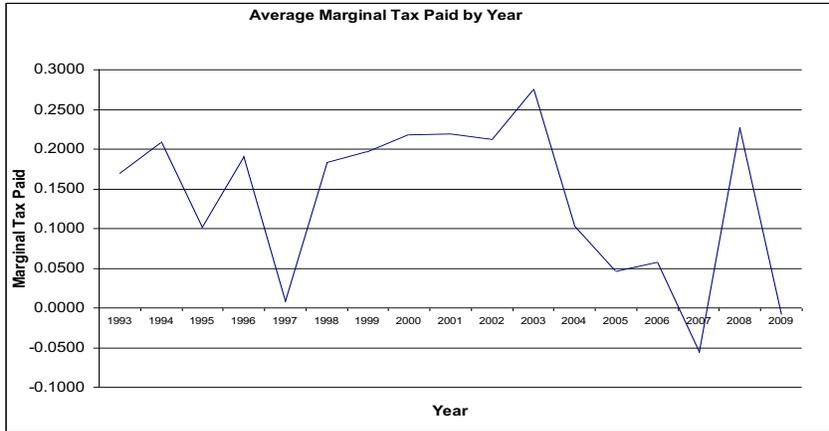


Figure 20 shows the average marginal tax paid each year by all income groups. As shown, the average marginal tax paid by all the tax filers fluctuates wildly. However, the precipitous drops in 1997 and 2007 were the result of economic downturn, as shown by the drop in GDP in Figure 1. Below. Figure 21 shows the average marginal tax paid by each income group for the years 1993 to 2009. The figure indicates that additional dollars paid in taxes for each dollar of income is negative for incomes between \$75,000 and \$100,000 for the years 1993 to 2009. The same trend is also true for all incomes above \$75,000 except those in income groups between \$100,000 and \$200,000 and between \$5 million and \$10 million. Filers in income groups between \$5,000 and \$75,000 paid more in taxes for each dollar of income.

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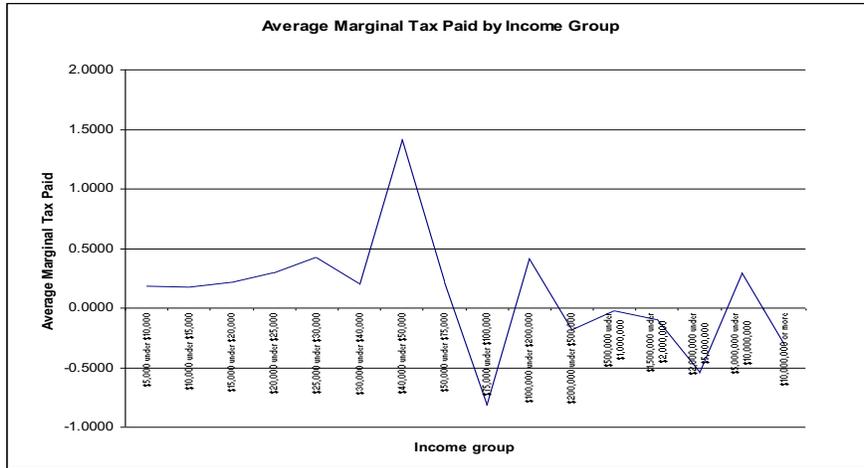
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IS THE U.S. TAX SYSTEM PROGRESSIVE?

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Figure 21

Average Marginal Tax Paid by Income Group, 1993-2009



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Gini coefficients are most often used to measure inequality. The coefficient varies between zero and one. One means complete inequality and zero means complete equality. According to Farris (2010), "The Gini index offers... a single number that measures how equitably a resource is distributed in population... It allows us to illustrate how equity has changed in a given situation over time..." (p. 851). Using the Gini index, Figure 23 shows the reported adjusted gross income. As the figure indicates, the income distribution has become unequal. In 1993, the Gini index was .189, indicating more equality of reported gross income. In 2009, the Gini index was .3565, indicating more inequality of income.

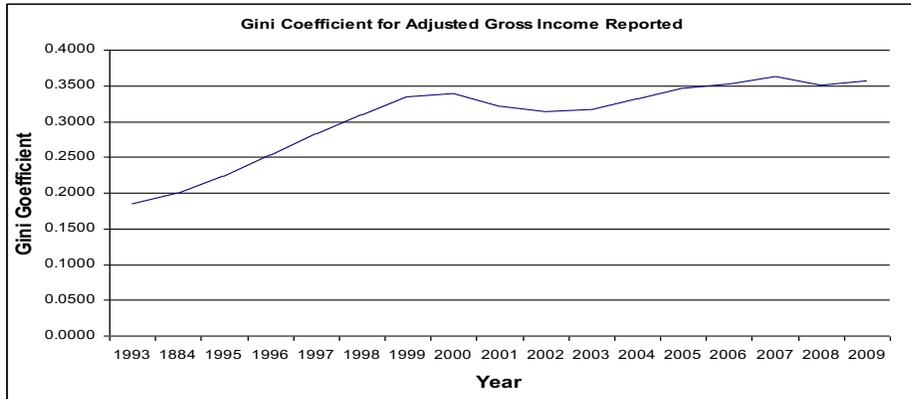
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IS THE U.S. TAX SYSTEM PROGRESSIVE?

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Figure 22

Gini Coefficient of Reported Adjusted Gross Income 1993-2009



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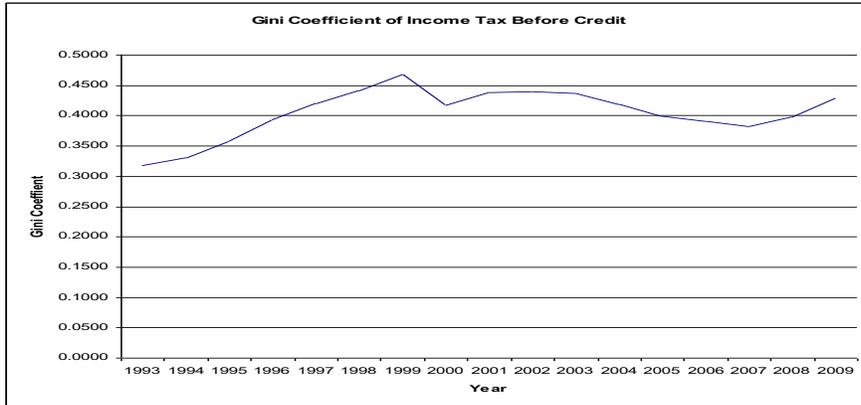
Figure 22 shows the Gini index of the reported average income tax before credit declared by tax filers for the years 1993 to 2009. In 1993, the index was .32, indicating inequality of taxes paid. It went up to as high as .4532 in 1999 and then dropped to .38 in 2007. Regardless, the indices indicate inequality of taxes paid, although it shows that inequality has decreased from 2004 to 2006. However, the GINI index has started to edge up every year since.

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IS THE U.S. TAX SYSTEM PROGRESSIVE?

Figure 23

Gini Coefficient of Reported Income Tax Before Credit 1993-2009



Hale (2001) suggested using skewness, dispersion, variance, and coefficient of variation to measure inequality. These are commonly used statistical measures that describe the behavior of a distribution. Therefore, these can also be used to indicate a spread of distribution. It means that the bigger the spread, the larger the inequality. However, coefficient of variation describes the peak of distribution. Therefore, a smaller coefficient of variation indicates more equality.

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Figure 24

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Descriptive Statistics of Average Taxable Income 1993-2009

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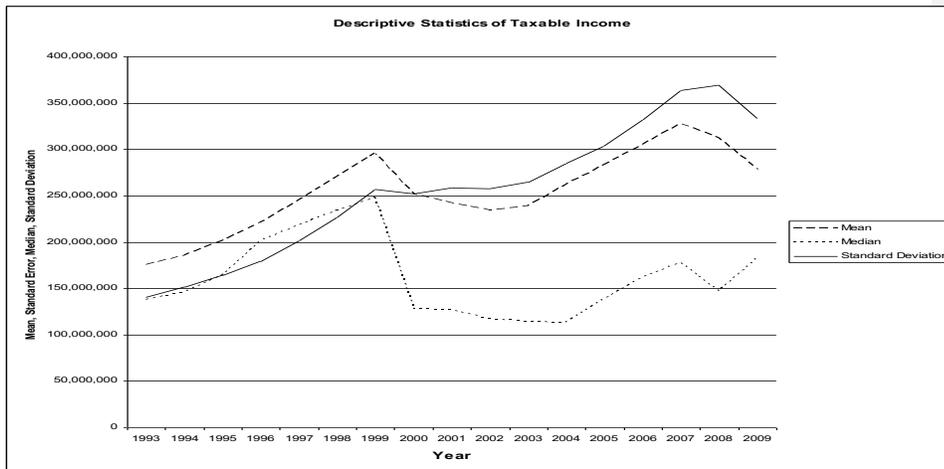


Figure 24 shows the mean, median, and standard deviation of the average reported taxable income for each year from 1993 to 2009. The standard deviation increased each year, indicating a bigger spread of reported taxable income. However, the average median of reported taxable income has dropped since 1999 and has stayed lower. The median average reported income dropped while the mean stayed higher, showing higher inequality of taxable income.

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Figure 25 shows the mean, median, and standard deviation of average taxes paid before credit from 1993 to 2009. The standard deviation increased each year, indicating a bigger spread of taxes paid. However, the median of taxes paid has dropped and stayed lower since 1999, indicating that more taxpayers' incomes have fallen. On the other hand, the average taxes paid is higher, indicating that rich are getting richer.

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IS THE U.S. TAX SYSTEM PROGRESSIVE?

**Figure 25**

*Descriptive Statistics of Income Tax Paid before Credit 1993-2009*

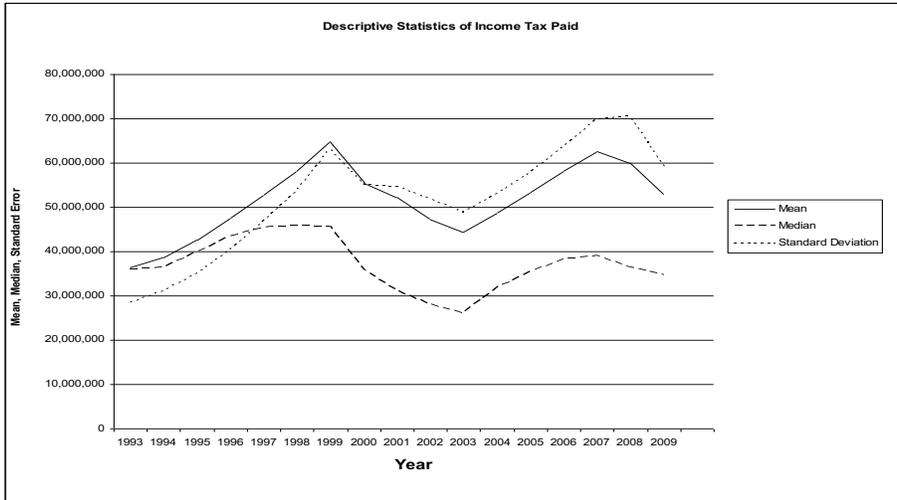


Figure 26 shows the coefficients of variation. As shown, the coefficients of variation for average reported taxable income have continued to increase every year. Average taxes paid each year and number of tax filers have likewise increased each year. These trends also indicate increasing inequality.

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IS THE U.S. TAX SYSTEM PROGRESSIVE?

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Figure 26

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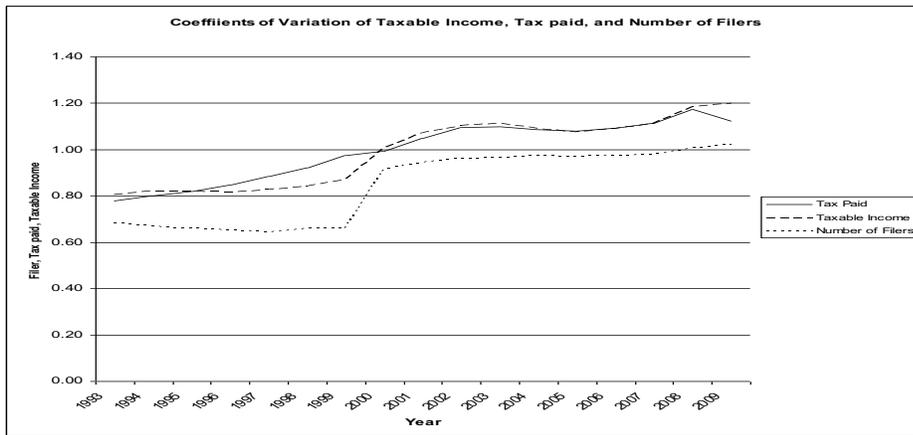
Coefficients of Variation of Reported Taxable Income, Taxes Paid, and Number of Filers 1993-

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Since most of the inequality measures can be affected by grouped data, these measures perform well if they are calculated using complete, individual point data (Hale, 2001). However, the majority of available income tax data is aggregate data. For this type of data, the Theil (T) method is more appropriate for measuring inequality. The Theil measure goes from zero, which means complete equality, to one, which means complete inequality. Also, the T can be calculated using group rather than individual data (Hale, 2001).

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Additionally, both Suits (S) and Kakwani (K) measure progressivity. Kakwani's index utilizes a measure of tax concentration and Suits measures tax progression. Suits (S) measures progressivity by relating the cumulative percent of tax payment to the cumulative percent of income (Formby, et al., 1978). Kakwani's (K) index uses tax concentration to measure progression. "Both measures are based on the difference between income and taxes, but Suits integrates this difference with respect to income and Kakwani with respect to return (R)" (Fromby et al. 1981, p. 1018). According to Fromby et al. (1981) "... the Suites and Kakwani indices, although identical in intent, are fundamentally different measure of tax progression." (p 1019). According to Formby et al (1978), "The only difference is ... simply the slope of the Lorenz curve" (p 3). Thus, they believe that it can result in "different estimates of the degree of progressivity" (Formby et al., 1978, p. 3). They also believe that there is no reason to believe that one gives better results than the other. Regardless, results of both measures have been provided in Table 8, along with results from GINI (G), and Theil (T) measures for readers to compare the outcomes.

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Table 8

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*Comparison of Suits, Gini, Kakwani, and Theil Measures 1993-2009*

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**Suits (S), Gini (G), Kakwani (K), and Theil (T) Measures**

	S	G	K	T
1993	0.157	0.560	0.096	0.1651
1994	0.157	0.565	0.000	0.1647
1995	0.161	0.574	0.097	0.1622
1996	0.164	0.586	0.099	0.1587
1997	0.156	0.599	0.096	0.1565
1998	0.149	0.603	0.094	0.1606
1999	0.151	0.611	0.095	0.1591
2000	0.151	0.620	0.097	0.1556
2001	0.157	0.590	0.100	0.1687
2002	0.184	0.579	0.121	0.1727
2003	0.166	0.586	0.109	0.1771
2004	0.159	0.603	0.106	0.1757
2005	0.155	0.623	0.104	0.1693
2006	0.152	0.628	0.103	0.1688
2007	0.149	0.635	0.102	0.1676
2008	0.165	0.609	0.110	0.1822
2009	0.177	0.587	0.115	0.2004

Table 8 summarizes all the common measures of inequality. All **four of** the measures, indicate inequality of taxes, **as all** of them have shown a constant increase since 1993. Interestingly, all of them show a drop during economic recession, **such as from 1997 to 1999**, except **for Gini**, which dropped in 2001 and 2002. **S, K, and T** all dropped again in 2006 and 2007, **but Gini did not drop until** 2008 and 2009. Regardless, all the measures indicate increasing inequality.

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Another way to measure inequality is to compare changes between the share of income and tax paid over time. In 1993, 77% of tax filers had a taxable income under \$50,000, received 38.04% of the total taxable income and paid 28.81% of all taxes. Filers reporting incomes between \$50,000 and \$100,000 made up 18.10% of all filers; they received 31.78% of the total taxable income and paid 28.74% of the total taxes. Filers with a reported income between \$100,000 and \$1 million made up 4.44% of all filers; they received 24.04% of the total taxable income and paid 31.88% of the total taxes. Filers with a reported income of more than \$1 million made up .07% of all filers; they received 6.15% of taxable income, and paid 10.56% of total taxes. In 1996, 72% of the tax filers reported taxable income under \$50,000, and they received 30.42% of the total taxable income and paid 22.07% of all the taxes. Filers reporting an income between \$50,000 and \$100,000 made up 20.81% of the filers; they received 31.54% of the total taxable income and paid 26.94% of the total taxes. Filers reporting an income between \$100,000 and \$1 million made up 6.23% of all filers, and they received 28.91% of the total taxable income and paid 36.30% of the total taxes. .11% of the filers reported income of more than \$1,000,000, received 9.13% of taxes, and paid 14.69% of total taxes. In 2000, 65.37% of the tax filers reported taxable income under \$50,000, received 21.12% of the total taxable income and paid 14.59% of all the taxes. 24.33% of the filers reported income between \$50,000 and \$100,000, received 27.78% of the total taxable income and paid in taxes 22.37 of the total taxes. 10.07% of the filers reported income between \$100,000 and \$1,000,000, received 34.84% of the total taxable income and paid 40.42 of the total taxes. .23% of the filers reported income of more than \$1,000,000, received 16.26% of taxes, and paid 22.61% of total taxes. In 2004, 60.29% of the tax filers reported taxable income under \$50,000, received 18.35% of the total taxable income and paid 12.16% of all the taxes. 27.31% of the filers reported income between \$50,000 and

**Deleted:** in ...etween the share of income and tax paid over time. In 1993, 77 percent... of the ...ax filers had reported...a taxable income under \$50,000,... received 38.04 percent... of the total taxable income and paid 28.81 percent... of all the ...axes. Filers reporting incomes between \$50,000 and \$100,000 made up ...8.10 percent... of all the ...ilers reported income between \$50,000 and \$100,000,... they received 31.78 percent... of the total taxable income and paid in taxes...28.74% of the total taxes. Filers with a reported income 4.44 percent of the filers reported income ...etween \$100,000 and \$1 million,000,000,...made up 4.44% of all filers; they received 24.04 percent... of the total taxable income and paid 31.88% of the total taxes. F.07 percent of the f...lers with a reported income of more than \$1,000,000...illion made up .07% of all filers; they,...received 6.15 percent... of taxable income,...and paid 10.56 percent... of total taxes. In 1996, 72 percent... of the tax filers reported taxable income under \$50,000, and they received 30.42 percent... of the total taxable income and paid 22.07 percent... of all the taxes. Filers 20.81 percent of the filers ...eporting aned...income between \$50,000 and \$100,000 made up 20.81% of the filers; they,...received 31.54 percent... of the total taxable income and paid 26.94% of the total taxes. 6.23 percent of the ...f...lers reporting aned... income between \$100,000 and \$1 million,000,000...made up 6.23% of all filers, and they received 28.91 percent... of the total taxable income and paid 36.30% of the total taxes. .11 percent... of the filers reported income of more than \$1,000,000, received 9.13 percent... of taxes, and paid 14.69 percent... of total taxes. In 2000, 65.37 percent... of the tax filers reported taxable income under \$50,000, received 21.12 percent... of the total taxable income and paid 14.59 percent... of all the taxes. 24.33 percent... of the filers reported income between \$50,000 and \$100,000, received 27.78 percent... of the total taxable income and paid in taxes 22.37 of the total taxes. 10.07 percent... of the filers reported income between \$100,000 and \$1,000,000, received 34.84 percent... of the total taxable income and paid 40.42 of the total taxes. .23 percent... of the filers reported income of more than \$1,000,000, received 16.26 percent... of taxes, and paid 22.61 percent... of total taxes. In 2004, 60.29 percent... of the tax filers reported taxable income under \$50,000, received 18.35 percent... of the total taxable income and paid 12.16 percent... of all the taxes. 27.31 percent ... [20]

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\$100,000, received 28.69% of the total taxable income and paid in taxes 22.66 of the total taxes. 12.17% of the filers reported income between \$100,000 and \$1,000,000, received 38.30% of the total taxable income and paid 44.52 of the total taxes. .23% of the filers reported income of more than \$1,000,000, received 14.26% of taxes, and paid 20.65% of total taxes. In 2009, 54.52% of the tax filers reported taxable income under \$50,000, received 15.05% of the total taxable income and paid 9.49% of all the taxes. 28.78% of the filers reported income between \$50,000 and \$100,000, received 27.33% of the total taxable income and paid in taxes 20.64% of the total taxes. 16.48% of the filers reported income between \$100,000 and \$1,000,000, received 45.31% of the total taxable income and paid 50.83 of the total taxes. .23% of the filers reported income of more than \$1,000,000, received 12.31% of taxes, and paid 19.02% of total taxes.

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This data shows that more filers have moved into higher income brackets. The percent of

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filers in the income bracket from \$50,000 and \$100,000 increased from 18.10% in 1993 to 28.78% in 2009. Filers with incomes between \$100,000 and 1,000,000 increased from 4.44% in 1993 to 16.48% in 2009. Lastly, filers with incomes of more than \$1 million increased from 0.07% in 1993 to .23% in 2009. The share of taxes paid by these income groups has also changed. For filers reporting an income under \$50,000, the share of taxes paid decreased from 28.81% in 1993 to 9.49% in 2009. For the \$50,000 to \$100,000 income bracket, the share of taxes paid decreased from 28.74% in 1993 to 20.64% in 2009. For filers with incomes of \$100,000 to \$1 million, the share of taxes increased from 31.88% in 1993 to 50.83% in 2009. Lastly, filers reporting an income of over \$1 million increased from 10.56% in 1993 to 19.02% in 2009.

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Comparing 1993 with 2009, filers in the income group between \$50,000 and \$100,000 received 4.45% less in taxable income and paid 8.10% less in taxes. Filers in the income group between \$100,000 and \$1,000,000 received 21.27% more in taxable income and paid 18.95% more in taxes. Filers in income group of more than \$1 million received 6.16% more in taxable income and paid 8.46% more in taxes. Comparing 2002 with 2009, after the Bush tax took effect, filers in the income group between \$50,000 and \$100,000 received 3.87% less in taxable income and paid 4.42% less in taxes. Filers in the income group between \$100,000 and \$1 million, received 8.94% more in taxable income and paid 6.72% more in taxes. Filers in the income group of more than \$1 million, received 1.97% more in taxable income and paid 2.37% more in taxes.

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These results indicate that taxpayers in higher income groups are paying higher taxes. However, Figure 21 indicates that the average marginal tax paid per year has dropped since 2003, and Figure 22 indicates that the average marginal tax by income groups above \$75,000 has either been negative or smaller compared to taxpayers in income groups below \$75,000.

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Conclusion

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Income tax makes up a major share of federal and state budgets which cover many vital services for society. The costs of these services have increased and need to be covered. The U.S. has run on a deficit for more than fifty years, and there is no end in sight. One of the ways to cover the cost is to either increase the sources of taxes or increase the tax rate. The U.S. will have to either cut services or run a deficit if they fail to generate enough revenue.

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Many politicians are insisting on reducing expenses and tax rates. Unfortunately, the emphasis is on cutting taxes, whether expenses can be reduced or not. Most of those advocating cutting taxes argue that taxes are unfair to the rich and, if taxes are reduced, the economy will improve. This paper did not deal with the issue whether reducing taxes will spur economic growth or not. However, the paper did deal with the issue of tax fairness.

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This paper analyzed tax data to measure inequality in order to determine whether taxes are fair. This research indicated that taxes are unequal. The conclusion is based on the four measures of inequality: Suits, Kakwani, Gini, and Theil. Other measures such as average marginal tax rate, coefficient of variation, dispersion, median, and mean, all indicate inequality as well. Therefore, the tax system is unfair when measured for progressivity. This paper does not support the idea that the rich are paying higher shares of taxes and that their tax rates need to be reduced. As a result, this paper doesn't sustain the concept of politicians advocating that the rich are paying higher shares of their income in taxes. As for the argument for taxes spurring the economy, one needs to prove whether or not tax cuts for rich improve economic growth. That is beyond the scope of this paper and may be pursued in further research.

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How do these statistics relate to whether or not taxes are progressive? Can that relationship be explained after giving the statistics? Additionally, would these statistics fit better in the section on who pays taxes? Then they can just be briefly referenced here before analyzing them.

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Kakwani isn't cited as an author in the paper. This author either needs to be cited in the paper, or this citation can be removed from the References.

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