# Federal Debts and Deficits: Past, Present and Future

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**Section 1: Introduction**

"*Reduction of the public debt will make more capital available to private business. Most of the funds previously tied up in Treasuries [government bonds] will add to the demand for corporate securities. Interest rates will fall some, and equity prices may rise. Some potentially productive investments that had been held back by the old, slightly higher, level of interest rates will now be more valuable. Some businesses will take advantage of lower interest rates to finance productive investments that would not otherwise have been profitable" – Robert Solow* (as cited in Friedman, 2001).

When Milton Friedman was asked about Robert Solow's introductory quote, the United States government's finances had been experiencing a surplus (where the government brings in more tax revenue than it spends), something that has only happened once (during the late 90s) since the mid-1960s (Friedman, 2001). What has been more typical since the 1960s is for the United States government to run a deficit (when the government spends more money than it brings in via tax revenue). As Solow's quote illustrates, the amount of debt the United States government holds is important for interest rates, investment decisions, and economic growth. Given that the amount of debt held by the public today stands at double the amount held when Friedman commented on Solow's quote (standardized by GDP), understanding the national debt is paramount.

Due to the potential economic implications of the national debt, it is important to understand what it is, how it is financed, what drives changes in the national debt over time, and where the national debt is projected to go. The goal of this paper is to describe the national debt, its causes, what may have changed about the composition of spending which leads to the national debt, and projections of the national debt. In Section 2, we describe what the national debt is and the difference between the national debt and a deficit (or surplus). In Section 3, we describe what the debt has looked like during the sample period 1962–2019. In Section 4, we describe discretionary spending, a key component of the federal budget, and how discretionary spending has impacted the growth of the debt over time. In Section 5, we describe mandatory spending, a growing component of the federal budget; we also describe changes in mandatory spending over our sample period. Section 6 is devoted to a discussion on government revenues and tax expenditures. In Section 7, we describe projections of the federal budget for the period 2020–2030. Section 8 discusses the economic implications of the federal debt. Section 9 looks at how the COVID-19 pandemic will impact the federal budget and debt.

**Section 2: What is the Debt?**

When we consider the fiscal state of the nation, we can consider two sets of measures: flows and stocks. Recall that a **flow** variable is measured over an interval of time; whereas a **stock** variable is measured at a point in

time and represents an existing amount or quantity. The **government budget balance** is the difference between government revenues and government expenditures over the course of a year and, therefore, is considered a flow variable. For instance, when the government balance sheet shows that government expenses exceed government revenues, we say that the government "ran a **deficit**." Alternatively, the government may find itself in a **surplus** when there is an excess of revenues over expenses in a single year.[1] If revenues equal expenses, we say the government's budget is **balanced**. The **debt** is the sum of all past deficits and surpluses. A deficit would increase the size of the debt, and a surplus would lower the debt. Since the debt is measured at a point in time and is an accumulation of all past deficits and surpluses, the debt is a stock variable. We can consider an example to make the idea concrete. In 2019, the federal government spent $4.447 trillion, but the federal government only collected revenues of $3.462 trillion. That means the federal government "ran a deficit" of about $992.1 billion. The deficit added to the stock of pre-existing government debt, which at the end of 2019 was equal to about $22.7 trillion.

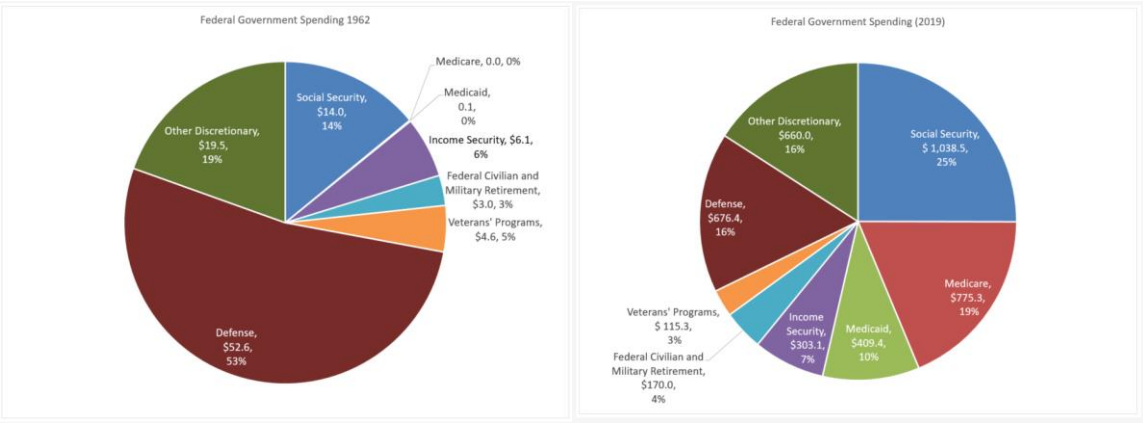
You may be thinking, why does the federal government spend so much money? The federal government spends so much money because of the number and size of their programs. Why are there so many programs and why are they so large? Economists sometimes refer to the federal government as a large insurance company with a military.[2] We say the government acts as a large insurance company because it provides income support for bad outcomes, unemployment, illness, and disability that may not be covered by private insurance companies. For example, the federal government spent $1,038.5 billion on Social Security and $775.3 billion on Medicare in 2019. As we will discuss, the insurance aspect of the government has grown over time in terms of the size and the number of programs. In addition to this function, the United States government spends a significant amount on defense. For example, the federal government spent $676.4 billion on national defense in 2019. These three programs alone— Social Security, Medicare, and Defense— account for almost $2,500 billion ($2.5 trillion) of spending. In addition to these programs, there are other (smaller) programs that the federal government runs or supports, such as education, Medicaid, research grants, welfare, the FDA, etc. Figure 1 depicts total government expenditures for 1962 compared to expenditures in

[1] Since deficits and surpluses are measured over an interval, they are considered a flow variable. For an individual, a flow variable would be the income she earned over the course of the year and the difference between her income and her spending would be *saving*, if this difference was positive, or her level of *dissaving* if her income was less than her spending. At the individual level, her wealth would be a stock variable, where her wealth is the total value of her assets less her debt obligations.

[2] It is not clear where the quote originated, but it can be traced back to a comment made by Peter Fisher in 2002 when he served as undersecretary of the United States Treasury. (Thoma, 2013)

2019. Not only has the amount of government spending changed over time, but so has the composition of government spending. In particular, notice how spending has shifted from the military to Social Security and Medicare/Medicaid.

**Figure 1: Government Spending 1962 and 2019**




Source: Congressional Budget Office.

When discussing government expenditures, economists, politicians, and political commentators frequently refer to two types of spending by the government: **discretionary** and **mandatory**. These concepts will be thoroughly discussed and developed in Section 4 and Section 5, but we will briefly define these concepts here. Currently, about half of discretionary spending is devoted to defense and national security (15 percent of the total government budget in 2019). About half is dedicated to other programs such as veteran's benefits (4 percent of the government budget), education (2 percent of the total budget), and transportation (2 percent of the total budget).[3] Discretionary spending is so-called because Congress may act to increase or decrease the amount of discretionary spending in a given year's budget. For instance, from 1992 to 2001, the dollar value of expenditures on defense was consistently around or below $300 billion dollars per year.[4] However, following 9/11, the spending on the military increased to $350 billion in 2002 and $400 billion in 2003. The spending on the military increased because Congress felt that the increase was prudent after 9/11. Because Congress uses its discretion to set the military's budget, it is considered discretionary spending.

Mandatory spending is so-called because it is spending on programs as a direct result of prior promises written by the federal government. For instance, the interest on the debt must be paid if the government expects to be

[3] In addition to the education and transportation, the other components of discretionary spending include food and agriculture (3%), energy and the environment (1%), housing (1%), international affairs (1%), and science (1%).
[4] The end of the Cold War marked by the dissolution of the Soviet Union witnessed a decline in defense spending in the United States. The decline in defense spending was often referred to as a "peace dividend" because what was once spent on defense and national security could be redirected to other government programs or given back to citizens through lower taxes.

able to borrow money in the future. Hence, interest payments on the debt are considered a part of mandatory spending. In the United States, mandatory spending is predominantly composed of three programs: Social Security, Medicare, Medicaid, and interest payments on the debt.[5]

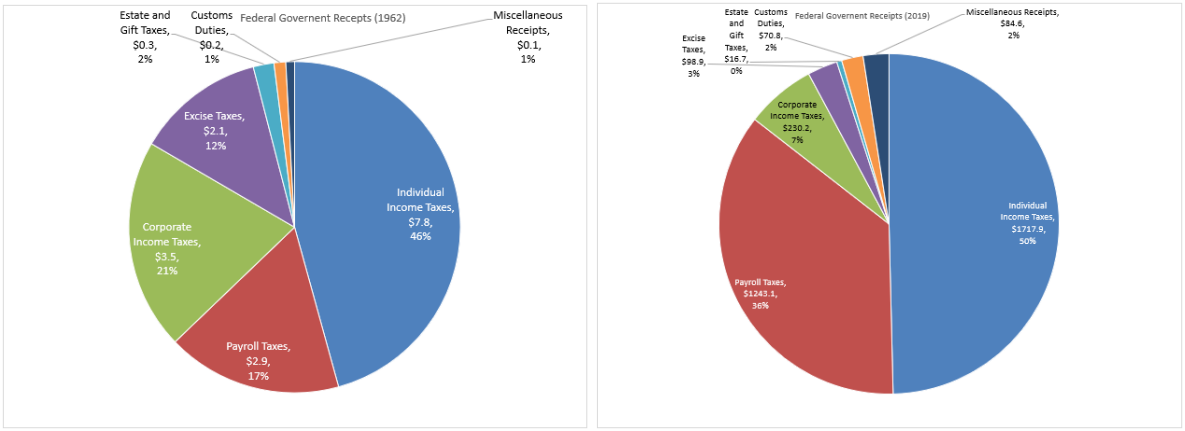
Before the COVID-19 pandemic and the government actions taken to address the health issues associated with the novel coronavirus and its economic impact, the budget outlined for the United States for 2020 was for $1.406 trillion of discretionary spending (about one-third of the federal budget) and $2.859 trillion of mandatory expenditures (about two-thirds of the federal budget).[6] Discretionary spending is not forecasted to increase much by 2030, increasing to $1.790 trillion per year (an increase of 34%). Mandatory spending, on the other hand, is expected to increase by much more in 2030, rising to $4.878 trillion (an increase of 78%). A discussion of why mandatory spending is forecasted to see such a large increase is presented in Section 7.

Now that you know about what the government spends its money on, you may be asking, "where does the government get that money?" Figure 2 depicts tax revenues in 1962 and 2019 by source. The biggest difference between 1962 and 2019 is that payroll taxes are a much larger share of revenues and corporate taxes are a much smaller share of revenues in 2019 compared to 1962. If the government does not raise enough revenue to finance its expenditures through tax revenues it must cover the difference by borrowing.[7] Over the course of the year, the United States brings in trillions of dollars in revenues by taxing income, corporations, capital gains, imports, and other activities. However, as we have seen, tax revenues are not always enough to cover all the bills that the government racks up. To cover the deficit, the government issues bonds. Bonds can be thought of as a loan where the government borrows from other government agencies, individuals, businesses, state and local governments, or people, businesses, and governments from other countries. The bonds, which can also be referred to as "treasury securities," pay the holder of the bond interest, which is tied to the duration of the bond. For instance, a treasury bill (or T-Bill) is a bond that has a very short time to maturity (about three months). Historically, T-Bills have paid very little interest. Conversely, a 30-year treasury bond historically tends to pay a higher interest rate. In either case, the treasury bonds that your grandparents bought you for a birthday or graduation present, regardless of their time to maturity, helped to finance

[5] There are a few other categories that are included.
[6] In Section 9, we will discuss the implications of the coronavirus on the deficit and debt.
[7] Another way a government can pay for its deficits is to simply print more money. This is referred to as **monetizing the debt**. To date, the United States government has not monetized the debt. However, this is not without historical precedent. Following World War I, and without other means to repay other nations, Germany paid its debt obligations by printing more money. This resulted in hyperinflation and destabilized Germany's economy.

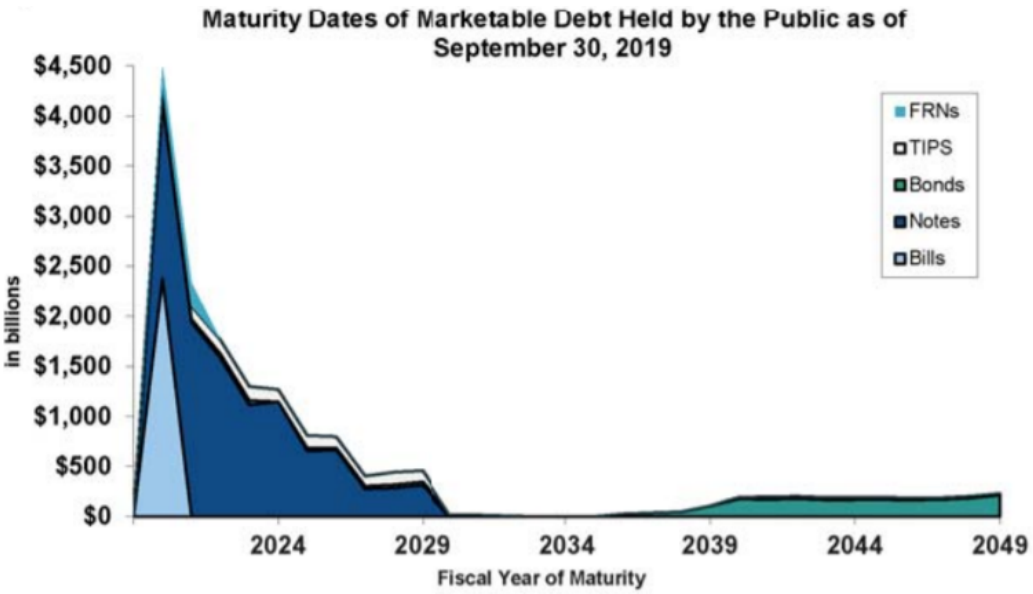
the government's deficit. Figure 3 is taken directly from the Government Accountability Office (2019, p. 22) and presents the time to maturity for debt owed by the US government. Their figure shows that the majority of government debt is due to be paid back in the next ten years and a significant proportion is due prior to 2024.

**Figure 2: Tax Revenues by Source**




Source: Congressional Budget Office.

**Figure 3: Maturity Dates of Federal Debt**




Source: Government Accountability Office.

**Section 3: How Has the Debt Changed over Time?**

Each year, the United States federal government expenditures may come in below budget (a surplus), may come in above budget (a deficit), or exactly on budget. That means that each year the debt may increase, decrease, or remain the same. In this section, we will examine how the debt has changed over time by first examining the flows (surpluses or deficits) over time, and then examining how the stock of the debt has changed over time.

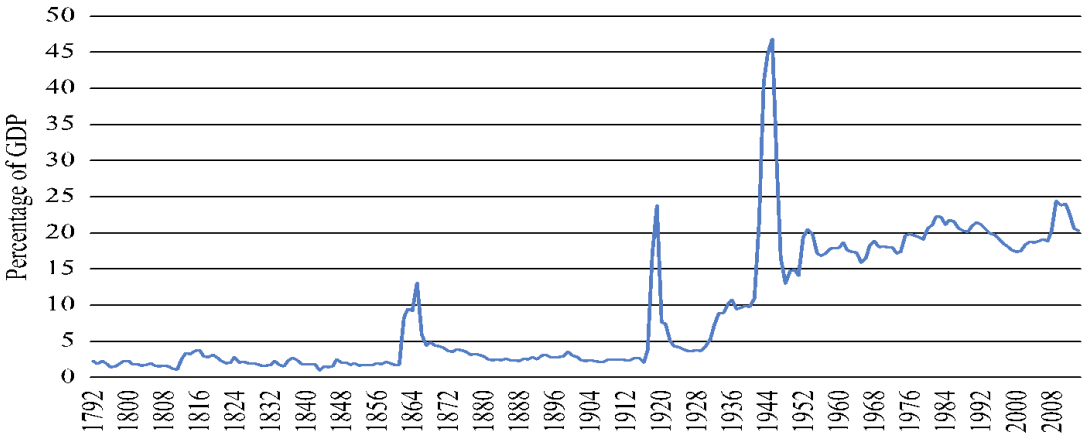
In the subsequent discussions, we use Gross Domestic Product (GDP) to benchmark flows and stocks; that is, we will look at debts and deficits relative to GDP.[8] Using GDP as a benchmark has several advantages. First, we will not need to worry about prices in different years if all measures are reported as a percentage of GDP. If we take the ratio of the nominal value of the debt and nominal GDP, current prices in the numerator and denominator will cancel. Second, thinking about things as a percentage of GDP allows us to make comparisons of government activities relative to the size of the economy. The total size of economic activity in the United States is different today than it was 45 years ago; scaling by GDP allows us to see how the deficits and debts are changing relative to the size of the economy. Therefore, spending $10 billion in 1975 is very different from spending $10 billion in 2030 due to inflation and the difference in the size of the U.S. economy. In addition, it makes it easier to compare government activities across countries at a point in time.[9] Due to these three points, we measure deficits/surpluses and debt relative to GDP.

For most of the paper, we will focus on the debt and deficit from 1962 through 2019. We emphasize this period because we have detailed breakdowns of government expenditures and government receipts. However, in order to get a longer run view of the expenditures and receipts in the United States, we show the historical fiscal situation, with figure 4 depicting federal expenditures as a share of GDP from 1792 until 2008 (Miron, 2016). What is clear from this figure is that during each war in US history through the 1970s there is a notable increase in expenditures. We can see these increases in expenditures for the War of 1812, the Civil War (1860s), World War I (1914-1918), World War II (1939-1945), the Korean War (1950-1953), and the Vietnam War (1965-1975). What is also interesting about these increases in expenditures is that the level of expenditures do not seem to return to the previous levels they were before the start of the conflicts.

**Figure 4: Historical Federal Expenditures as a Share of GDP**

[8] Recall that Gross Domestic Product (GDP) is the market value of all newly produced goods and services produced within an economy typically measured over the course of a year. Since it is measured over an interval of time, GDP is a flow variable. Also, since GDP is the market value of goods and services produced within a period of time, it is a measure of a country's income. Therefore, dividing the deficit (or the debt) by GDP informs us how big the deficit (debt) is relative to a country's income in a year.

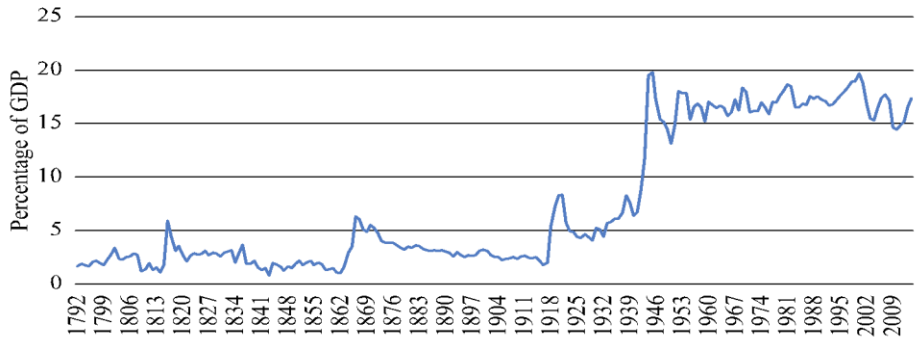
[9] In Appendix A, we compare the size of the US government in terms of spending and debt to other countries.




Source: Miron (2016)

Figure 5 depicts federal revenues over this time period as well. We can see that there is also an increase in revenues that occur around these conflicts. To lower the burden on the US population, the costs of the war were spread out over time. Figure 5 shows that government receipts tend to decline after the end of the wars but receipts typically remain above the pre-war levels after each conflict. While government receipts were never above 10 percent of GDP prior to World War II, government receipts have been above 15 percent of GDP for nearly every year since the end of World War II.

**Figure 5: Historical Government Receipts as a Share of GDP**

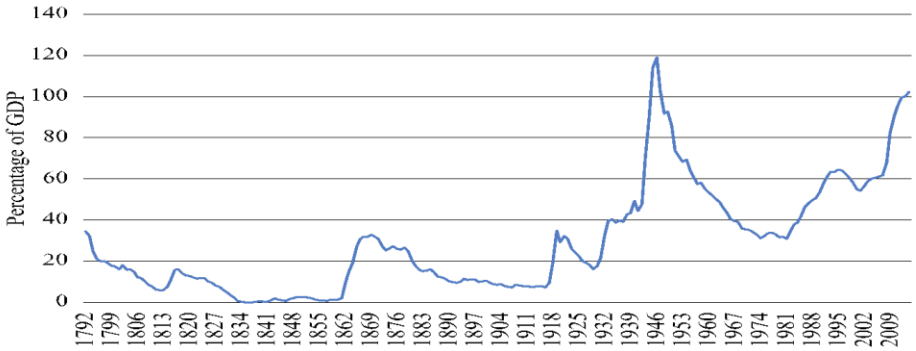



Source: Miron (2016)

Figure 6 depicts the historical government debt as a share of GDP. Since wars are typically financed over time, we see that the debt-to-GDP ratio rises during war times and then tends to decline over time. Following the

Civil War the debt-to-GDP ratio falls but does not return to zero. In fact, after each war, government debt does not return to the pre-war government debt levels. In addition, we see over the last several decades that the debt-to-GDP ratio has continued to rise and it is at levels that are similar to the peak of World War II. Whether this should be a concern or not depends on the factors that are driving the debts and deficits and to these factors we now turn our attention.

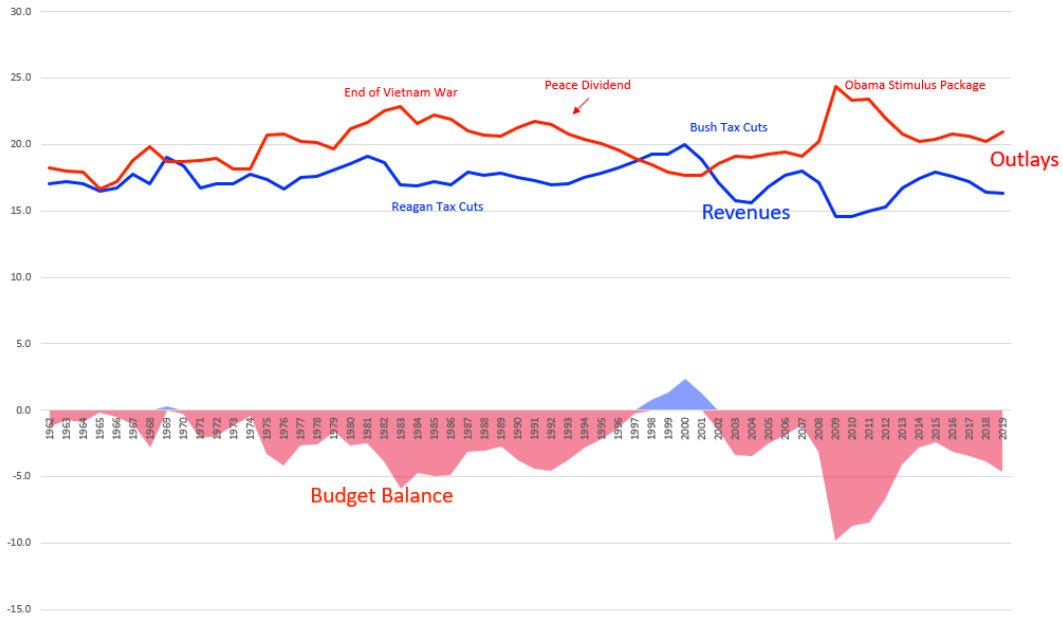
**Figure 6: Historical Debt-to-GDP Ratio**




Source: Miron (2016)

We now turn to examining expenditures by the federal government budget balance over a more recent period, 1960 to 2019. Figure 7 depicts federal government expenditures as a share of GDP. Expenditures, on average, are centered at around 20% of GDP for the period 1962–2019. A strong trend is not present in the data. However, you can clearly see increases in expenditures during the Vietnam War and the two Gulf Wars and a reduction in spending following the collapse of the Berlin Wall, which marked the end of the Cold War. Figure 7 also depicts federal government revenues as a share of GDP; over this time period, the revenues averaged 17.3% of GDP. The government budget balance is the difference between revenues and expenditures, which is the shaded area in Figure 7. When the government is running a deficit (surplus), the area is shaded in red (blue). We can see that through most of the period from 1962–2019 the government was running a deficit. The larger deficits in some of these years are partially driven by tax cuts, increased spending for the wars in Iraq and Afghanistan, and the abnormally low revenues and abnormally high spending that occurred after the Great Recession. It is not uncommon for the deficit to increase during a recession, and we will explain why this is in Section 6.

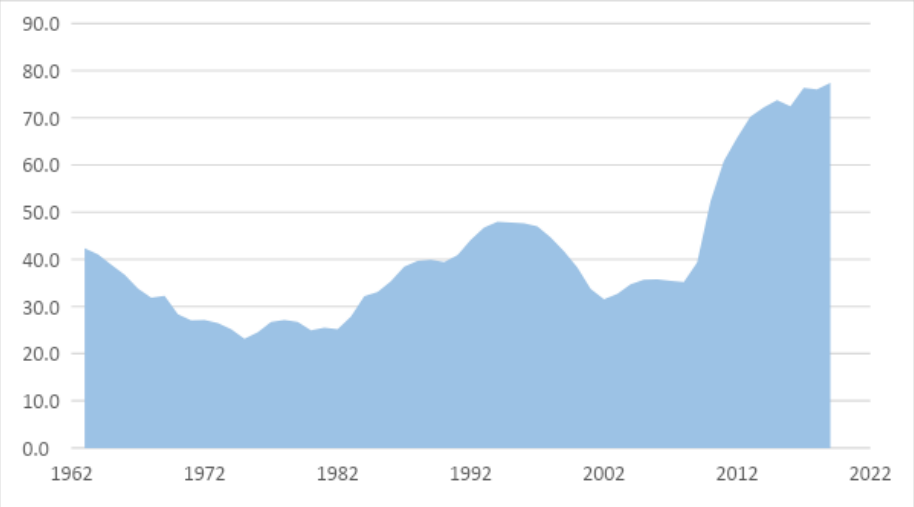
**Figure 7: Outlays, Revenues and the Budget Balance as a Percentage of GDP**




Source: Congressional Budget Office.

At the end of 2019, the total debt of the US government was $22.7 trillion or 104% of GDP! However, some of the government debt is held by other government agencies. The total amount of intragovernmental borrowing is $5.9 trillion. We typically do not count the amount of money the government borrows from itself, so a more meaningful measure of the US debt is the **debt held by the public.** The debt held by the public includes debt held by individuals, corporations, state or local governments, the Federal Reserve Banks, foreign governments, and entities outside the US. Over the period 1962–2019, the period where we have reliable data, there is a trend of growth in the debt. In 1962, the federal debt was equal to 42.3% of GDP. By 2019 that figure stands at 79% of GDP. While the debt has been growing over time, the growth rate has not been constant. There were several episodes of declining federal debt as a percentage of GDP. Notably, the late 60s, early 70s, and late 90s, were all periods where the debt as a percentage of GDP declined. The evolution of the federal debt from 1962 to 2019 is depicted in Figure 8.

**Figure 8: Federal Debt Held By Public**




Source: Congressional Budget Office.

**Section 4: Discretionary Spending**

As stated in Section 2, there are two kinds of broad categories of spending that make up the federal budget: discretionary and mandatory spending. Discretionary spending is referred to as discretionary because it is based on elected officials' discretion as opposed to mandatory spending, which is based on prior commitments. Discretionary spending is broken into two sections: defense and nondefense spending. Defense spending is spending on the military, such as payroll for military personnel, tanks, weapons, and maintenance on equipment. Non-defense spending is spending on other discretionary items, such as NASA, education, fire departments, and low-income housing provided by the Department of Housing and Urban Development. Defense spending accounted for 3.2% of GDP in 2019 (51% of discretionary spending and 15% of the overall budget), and non-defense spending accounted for 3.1% of GDP in 2019 (49% of discretionary spending and 15% of the overall budget). Discretionary spending comprised about one-third of the federal budget in 2019.

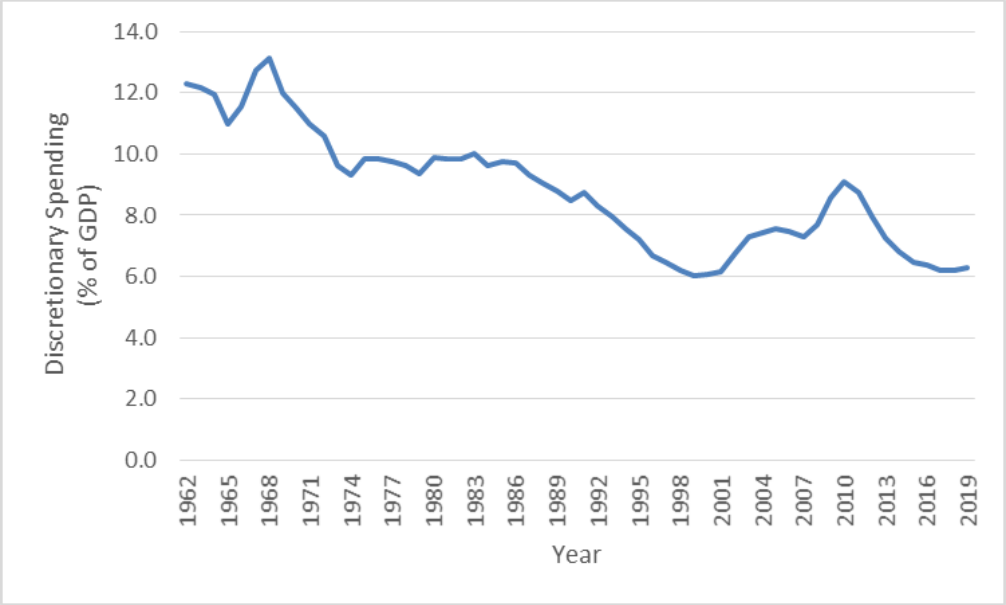
Discretionary spending's impact on the federal budget has decreased over the past 50 years. Figure 9 shows that discretionary spending has declined as a percentage of GDP. In the early 1960s, discretionary spending amounted to more than 12% of GDP. That number decreased to just over 6% in 2019, virtually halving itself in the process.

As stated in Section 2, defense spending is the largest component of discretionary spending. Over the last 50 years, defense spending has decreased in almost every observable way. While we spend more on defense in 2019 than we did in 1962, even after adjusting for inflation, defense spending has decreased as a share of discretionary spending

from over 70% of discretionary spending to 50% of discretionary spending. It has also decreased from 50% of the entire federal budget to about 15% of the entire federal budget. Finally, defense spending has decreased from 9% of GDP to just over 3% of GDP.

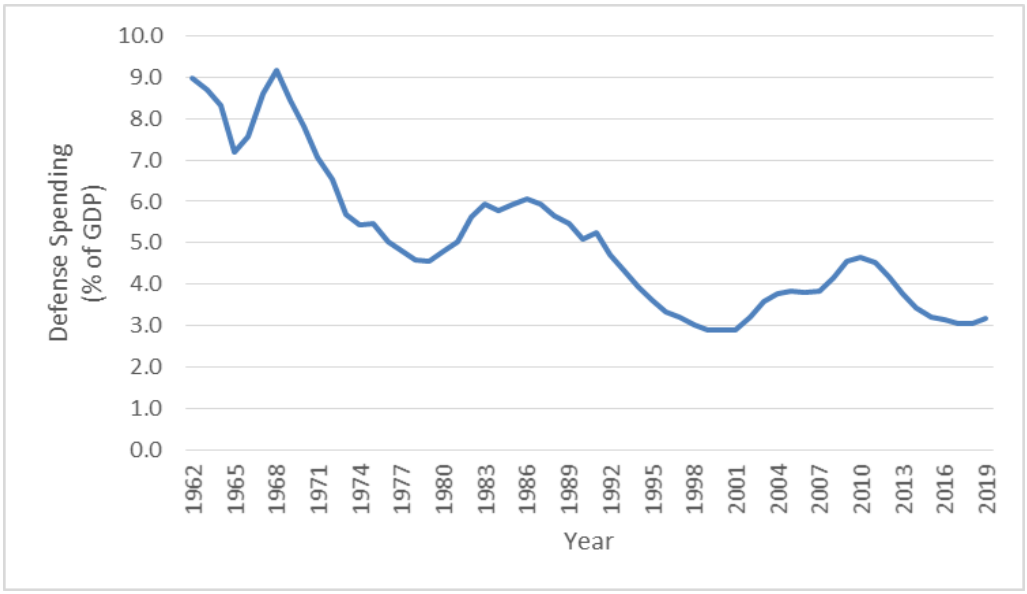
While defense spending has decreased, non-defense discretionary spending has stayed very constant over time. Non-defense discretionary spending has had a maximum of almost 25% of the overall federal budget and a minimum of 15% of the overall budget since the 1960s. At the same time, non-defense discretionary spending increased its share of discretionary spending from 30% of discretionary spending to 50% of discretionary spending. As a percentage of GDP, non-defense spending has also stayed remarkably constant, fluctuating around 4% for the entire period.

**Figure 9: Discretionary Spending as a Percentage of GDP**



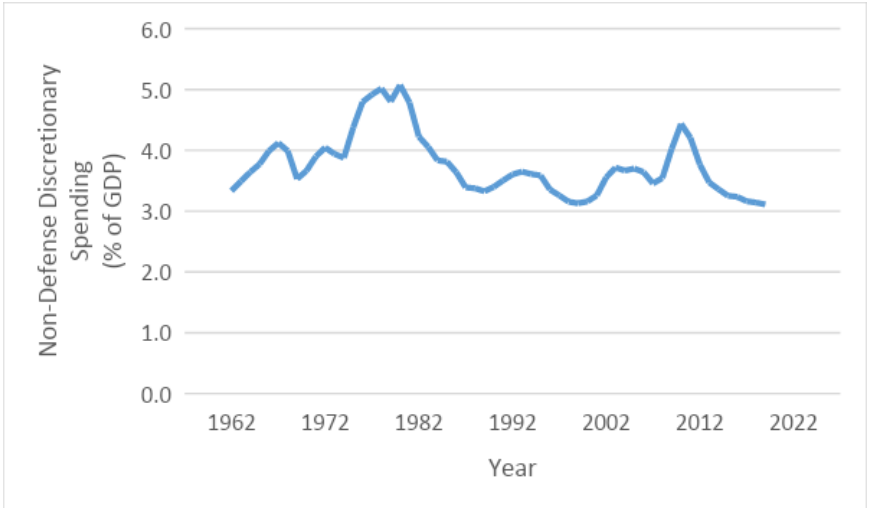

Source: Congressional Budget Office.

**Figure 10: Defense Spending as a Percentage of GDP**




Source: Congressional Budget Office.

**Figure 11: Non-Defense Discretionary Spending as a Percentage of GDP**




Source: Congressional Budget Office.

**Section 5: Mandatory Spending**

In addition to discretionary spending, the government budget also contains mandatory spending. Mandatory spending comprises about two-thirds of the federal budget and is called mandatory spending because it relates to spending caused by prior promises made by the federal government. The four largest components of mandatory spending are Social Security (35% of mandatory spending and 24% of the overall budget), Medicare (20% of mandatory spending and 14% of the overall budget), Medicaid (13% of mandatory spending and 9% of the overall budget), and interest payments on the debt (12% of mandatory spending and 8% of the overall budget).

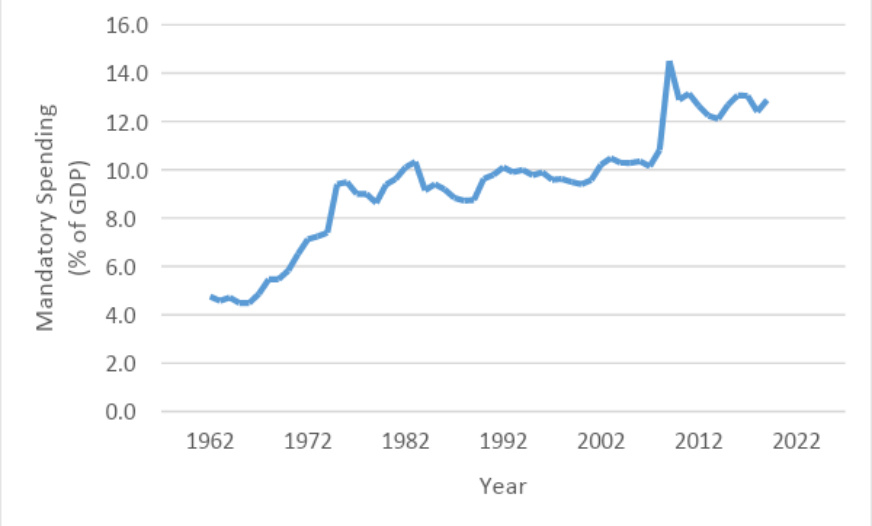
We account for mandatory spending separately from discretionary spending because of the reason it occurs. The federal government has made prior promises and commitments to pay for specific programs that it must honor. As we have alluded to earlier, interest payments on the debt are part of mandatory spending. Imagine if the United States government reneged on its promise to pay the interest owed and/or pay off its debt. It would likely become difficult for the United States to find people willing to borrow from to finance future deficits. Think of it this way: would you be willing to lend money to a friend if he (continually) fails to pay you back? In much the same way, people would be less willing to lend to the government if it reneged on its interest payments or if it did not pay back its principal. Therefore, for the government to guarantee itself the best position of being able to finance future deficits, the government needs to pay interest on time. For example, suppose that Congress determines it is necessary to run a deficit in 2020 due to increased spending and decreased tax revenues because of COVID-19. Failing to pay interest on the debt in 2019 would have made 2020's deficit harder to finance.

Some of the mandatory spending programs are also referred to as entitlement programs because people have paid into these programs with the expectation that they would receive benefits at a later date. Social Security is one of these programs. Imagine what would happen if those in Congress decided to immediately end Social Security in the name of a more balanced budget. The elected officials responsible for such a decision would undoubtedly risk their chances of reelection by telling many senior citizens they will no longer be receiving their monthly Social Security checks that they have been planning on receiving. For these reasons, mandatory spending is much more rigid than discretionary spending and is accounted for separately in many analyses.

To understand how mandatory spending has impacted the federal deficit and debt, we need to look at how it has changed over time. Figure 12 shows that mandatory spending has ballooned from about 4.8% of GDP in 1962 to about 12.9% of GDP in 2019, an increase of 169%! As we know, there are four main components of mandatory

spending that we can examine to see what is driving the growth. Figure 13 shows how Social Security spending has increased over time. The figure shows a clear upward trend in Social Security spending. In 1962, Social Security spending amounted to 2.4 percent of GDP. By 2019, Social Security spending had increased to 4.9 percent of GDP. That means that 2.5 percentage points of the 7.1 percentage point increase in mandatory spending was caused by Social Security. Why has this happened? The main driver is that there are more retirees now than ever before. The increase in the number of retirees is being driven by the fact that people are living longer than they were back in 1962, and the retirement age to claim Social Security has not changed enough to keep pace. Between 1962 and 2019, life expectancy in the United States increased by 7 years (MacroTrends, 2020). However, the age of retirement for Social Security has only increased from 65 to 67 (National Academy of Social Insurance, n.d. b). Therefore, people are living an additional 5 years on Social Security, which has increased the amount of spending on the program. In addition to people living longer, the baby boomers are starting to retire. As this large segment of the population moves into retirement, it will lead to an additional strain on the Social Security system. In 2019, Social Security outlays were $1,038 billion; they are expected to increase to $1,926 billion by 2030. That is the annual rate of increase of almost 6%, which is much faster than the expected growth of GDP over the same period of time.

**Figure 12: Mandatory Spending as a Percentage of GDP**

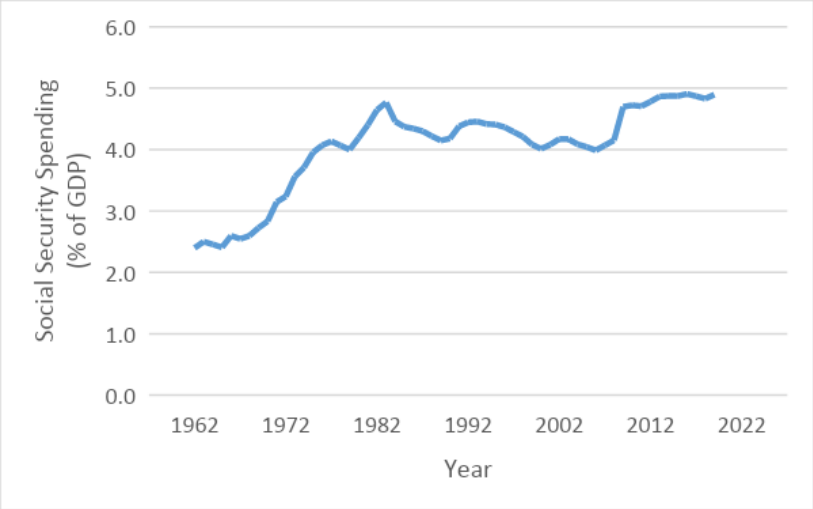



Source: Congressional Budget Office.

Social Security spending has increased so much that in 2018 the program began to operate in a deficit (Entin, 2018). The deficits will lead to Social Security's insolvency as early as 2034 if current projections are correct (National

Academy of Social Insurance, n.d. a). In the coming years, Social Security payments will continue to increase as the baby boomers retire and begin to collect Social Security.

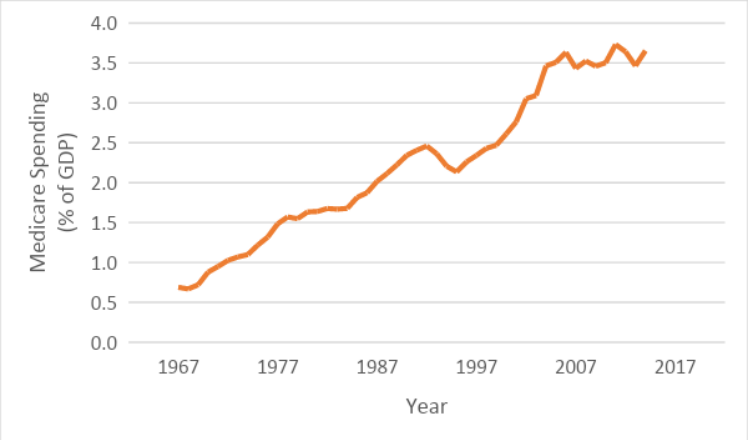
**Figure 13: Social Security Spending as a Percentage of GDP**




Source: Congressional Budget Office.

Medicare spending did not begin until 1967, but expenditures on Medicare have seen an increase from effectively 0% of GDP in 1962 to 3.7% of GDP in 2019. The 3.7 percentage point increase accounts for over half of the increase in mandatory spending in the sample period. The growth can be seen in Figure 14. Medicare has expanded as rapidly as it has for many of the same reasons that Social Security spending has—namely, the aging of the population. Medicare is designed to act as a public health insurance provider for older Americans. However, Medicare spending has increased faster than Social Security because Medicare spending increases not only with the age of citizens, but also with the price of medical services. As medical costs have increased over the last 50 years, so has the percentage of GDP needed to provide Medicare.

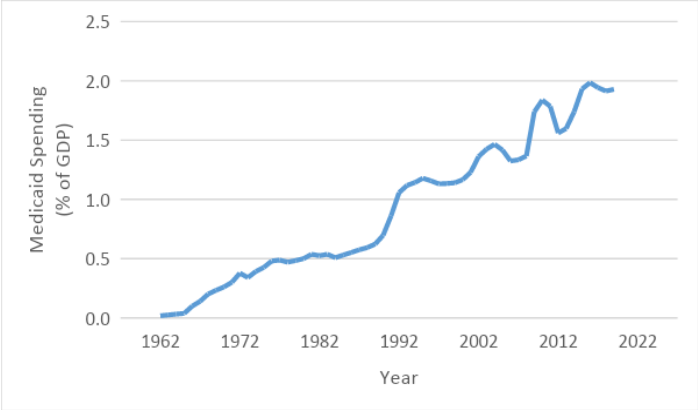
**Figure 14: Medicare Spending as a Percentage of GDP**




Source: Congressional Budget Office.

Medicaid is similar to Medicare, but instead of acting as insurance for older Americans, Medicaid acts as health insurance for poor Americans. Medicaid spending has increased from 0% of GDP in 1962 to 1.9% of GDP in 2019. The increase was particularly pronounced during the early 90s, during the great recession, and with the passage of the Affordable Care Act (also known as "Obamacare") and subsequent Medicaid expansion in 2010. The increase in Medicaid expenditures comprises about 27% of the rise in mandatory spending in the sample period. The full time series can be viewed in Figure 15. While most of the other components of mandatory spending do not show much of a cyclical pattern, Medicaid does. The reason for this is straightforward: when the economy goes into a recession, more people will qualify for and receive payment from Medicaid, and when the economy is expanding, fewer people will be eligible for Medicaid, and more periodic payments are likely to go out.

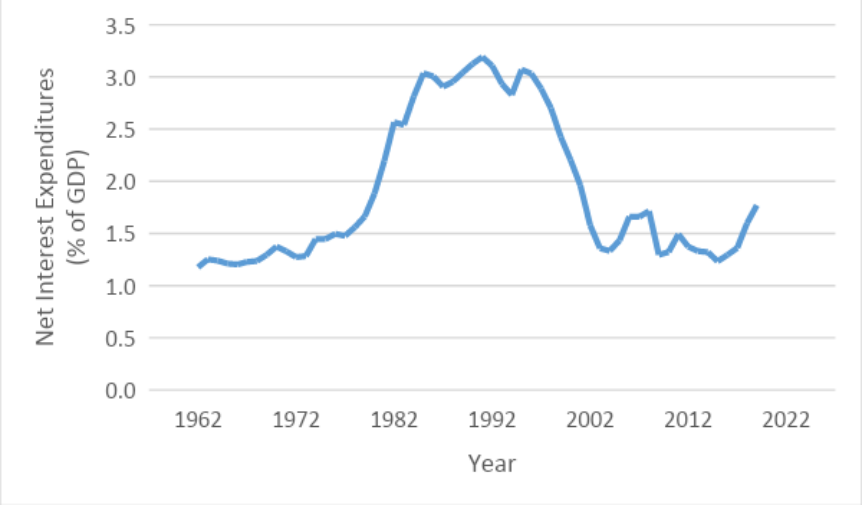
**Figure 15: Medicaid Spending as a Percentage of GDP**




Source: Congressional Budget Office.

Interest payments have not increased by much since 1962. In 1962, interest payments amounted to 1.2% of GDP, and today, interest payments are about 1.8% of GDP. However, Figure 16 shows that the time series has been far from flat. As interest rates rose in the 1970s, so did interest expenditures by the federal government. From 1981 to 2001, net interest expenditures accounted for more than 2%, and often more than 3%, of GDP. Due to the variability of interest rates, two things are certain for the growth in interest payments: higher interest rates will lead to larger interest payments, and higher levels of debt will lead to greater interest payments. The latter will be discussed in further detail in Section 7.

**Figure 16: Net Interest Expenditures as a Percentage of GDP**




Source: Congressional Budget Office.

**Section 6: Government Revenues and Tax Expenditures**

In 2019, the Federal Government collected $3,462.2 billion in taxes. That comes out to about $22,000 *per employee* or $10,500 for *every person* in the United States. As a share of GDP, tax revenues were a little over 16 percent (16.3% to be precise) in 2019. The tax revenues for the federal government come primarily from three sources: individual income taxes, payroll taxes, and corporate income taxes. These three taxes account for more than 90% of tax revenues. Figure 2 depicts tax receipts in 2019. Federal income taxes account for about 50 percent of federal tax revenues. Payroll taxes, which include taxes collected to fund Social Security, Medicare, and part of Medicaid, account for about 36 percent of federal tax revenues. Corporate income taxes account for about seven percent of federal

revenues. Excise taxes and customs duties (tariffs) account for three percent and two percent. All other taxes account for a little over two percent of the government's revenue.

Most working-age individuals are required to file an income tax return with the federal government. When filing their tax returns, individuals report and pay taxes on all forms of income they receive. Most forms of income, often referred to as **ordinary income**, get taxed at the same rate no matter how the income was earned. **Ordinary income** includes wages and salary, tips, interest income earned from savings and financial investment, and short-term assets. Some forms of income, like long-term capital gains and some forms of dividend income, are taxed at more favorable rates.[10] You might be interested in how much you would pay in taxes if you earned $55,000 from your wages in 2019. The first thing to note is the $55,000 is not your taxable income. The government allows you to deduct some **expenditures** from your income to arrive at your taxable income.[11] When filing their taxes, individuals have a choice of declaring a **standard deduction** or **itemizing** all of their deductions.[12] The standard deduction in 2019 was $12,200. If you took the standard deduction, then your taxable income would be $42,800. Now, we can determine your total tax bill. The marginal tax rate is the tax rate you pay on your last dollar earned. The tax rate schedule for federal income is provided in Table 1. The United States tax rate schedule is designed to make income taxes in the United States a **progressive tax**; a progressive tax is one where there is a higher tax on individuals with higher incomes.[13] In order to calculate your tax liability, you would pay no taxes on any income up to $9,700. For all income earned between $9,700 and $39,475, you are taxed at 12%, so your taxes owed on this income would be $3,573 $\left(= 0.12 * (39{,}475 - 9{,}700)\right)$. In addition, for all income above $39,475, you would owe 22 cents per dollar. Since your taxable income was $42,800, you would owe an additional $731.50 $\left(= 0.22 * (42{,}800 - 39{,}475)\right)$ for the income earned in the 22 percent tax bracket. Therefore, your total income tax is $4,304.50. Note people often state

[10] An example of a capital gain would be the difference in the price of an asset between the time you purchased the asset and when you sold it. For example, if you bought stock in a company in 2000 at $100 and sold the stock in 2020 for $185, then you incurred a capital gain of $85. There are reasons the government taxes capital gains at a lower rate than ordinary income. One reason is because they want to encourage investors to save and another reason is that capital gains are not indexed to inflation.

[11] An example of a deduction that many people take is the interest payments on their home mortgage.

[12] Most people choose to take the larger of the two deductions.

[13] A Table 1 indicates, the federal income tax rate in the United States is progressive in terms of the marginal tax rate as your taxable income increases you pay a higher marginal tax rate. However, for some people with higher income that may not always be the case as some people are very good at finding deductions or have high enough income to hire a tax accountant to reduce their taxable income as much as possible. For some individuals, like Warren Buffet, most of their income comes from long-term capital gains and this income is taxed at a lower tax rate.

what tax bracket they are in and this refers to the marginal tax rate on the last dollar they earned; it is not the marginal tax rate they pay on every dollar they earned.

**Table 1: Tax Rate Schedule for Single Filers in 2019**

| Taxable Income Range | Marginal Tax Rate |
|---|---|
| $0 - $9,700 | 0% |
| $9,700 - $39,475 | 12% |
| $39,475 - $84,200 | 22% |
| $84,200 - $160,725 | 24% |
| $160,725 - $204,100 | 32% |
| $204,100 - $510,300 | 35% |
| $510,300 & higher | 37% |

In addition to income taxes, workers also have payroll taxes withheld.[14] For 2020, payroll taxes include a 6.2% tax on income up to $137,700, designed to fund Social Security. Therefore, the maximum amount someone will have deducted from their paychecks for Social Security is $8,573.40. Unlike Social Security taxes, the payroll taxes that are designed to help fund Medicare are not capped at any income. The Medicare portion of the payroll tax is a 1.45% tax on income up to $200,000 and 2.35% for all income over $200,000. Thus, for a wage earner that has $100,000 in income, they will have $7,650 of payroll taxes withheld from their check for Social Security and Medicare. In addition, to these withholdings, the employer must also contribute 6.2% of your income for Social Security and 1.45% of your income for Medicare. The contribution by the employer means that, for a worker that has $100,000 in income, the cost to the employer is $107,650, and the total contributions to Social Security and Medicare are $15,300 or 15.8% of the worker's income.

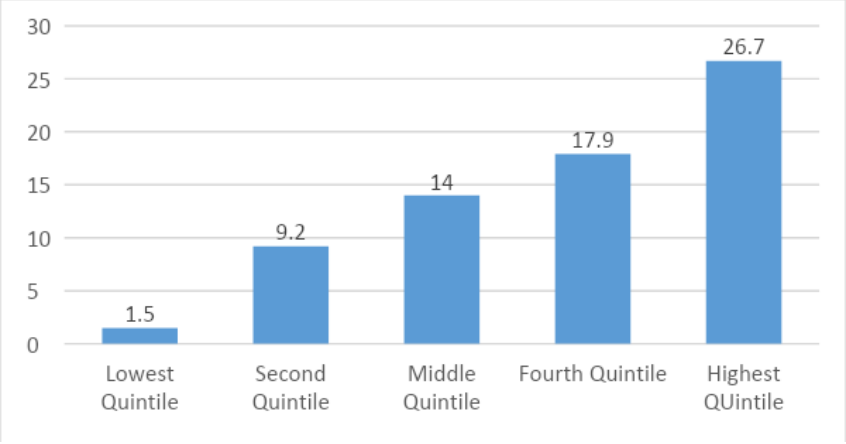
Corporate income taxes account for about 7 percent of federal tax revenue. The current tax rate on profits in the United States is 21 percent. The corporate income tax rate was lowered from 35 percent to 21 percent as part of the 2017 Tax Cuts and Jobs Act. One reason for the reduction in the tax rate was that the 35 percent tax rate was one of the highest corporate tax rates in the world. With such a high tax rate, this may have provided an incentive for some

[14] These taxes are also known as FICA taxes where FICA stands for Federal Insurance Contributions Act.

corporations to locate their headquarters in countries that taxed profits at lower rates. One might think that it is better to tax corporations than it is to tax individuals, but it is important to remember that people pay all taxes. Thus, increasing the corporate income tax means that someone will have to pay additional taxes. These additional taxes may be paid directly by the owners of the company (the shareholders). Still, employees may also bear some of the costs associated with a higher corporate tax rate. A higher corporate tax rate may reduce the amount of capital a business buys, resulting in workers being less productive, and lower productivity may result in lower pay. The Congressional Budget Office estimated that for every dollar brought in by the corporate income tax, about 75 percent of the tax burden is paid by shareholders and 25 percent by the workers.

To get a sense of the progressivity of the United States Federal Taxes, Figure 17 depicts the average tax rates by income quintile. The average tax rate is computed as the total amount of federal taxes paid divided by total income before transfers and taxes. In 2015, the lower-income earners (the lowest quintile) had an average tax rate of 1.5%, and the top quintile had an average tax rate of 26.7 percent.[15] Using data from the Congressional Budget Office, Cowen and Tabarrok (2018) report that the top 20% of all income earners paid nearly 60% of all federal taxes. Taken as a whole, the Federal income tax looks quite progressive, but it is not for all sources of taxes. In particular, the least progressive tax is the payroll tax since it is capped for Social Security. The individual income tax, on the other hand, is the most progressive since there can be a negative income tax, where individuals receive income from refundable tax credits like the Earned Income Tax Credit (EITC).

**Figure 17: Average Tax Rate by Income Quintile**




Source: Bellafiore (2019)

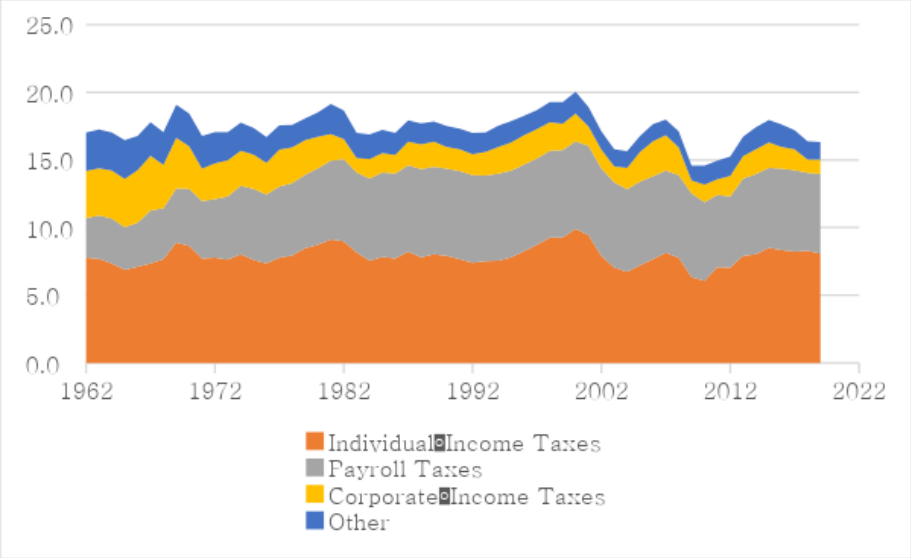
[15] The top one percent income earners had an average tax rate of 33%.

Over the last few years, taxes on imported goods have received a lot of coverage as President Trump has increased tariffs on imported steel and aluminum as well as on a wide range of goods imported from China. In 2019, taxes raised from customs duties (tariffs) amounted to $70.8 billion, an increase of almost $30 billion from 2018. While this is a relatively large increase, there are two important factors to keep in mind. First, as a share of GDP, tariff revenue is still relatively small. The increase in taxes on imported goods increased tariff revenue from 0.2 percent to 0.3 percent of GDP. Similar to corporate income taxes, the entity that pays the tax may not be the entity that faces the burden of the tax. Recent studies indicate that the price of foreign goods has increased almost one-to-one with the tariff, which implies that U.S. consumers are incurring the burden of the tax.

To get a better historical view of tax revenues, Figure 18 depicts the tax receipts (revenues) as a share of GDP. Historically, we can see that tax revenues are typically between 15 to 20 percent of GDP. You can also detect a cyclical component to revenues. Most notably you can see the drop in revenues during the Great Recession and a reduction in revenues during 2001.[16] A decline in revenues is also present around other periods when there is a decline in activity. There are several reasons why tax receipts may decline more than GDP during a recession and rise faster than GDP during an expansion. First, as GDP falls (increases) during a recession (expansion), some individuals will move into lower (higher) marginal tax brackets, and this will mean that tax revenues will be more responsive than GDP to recessions. Also, during a recession, it is more likely that the government will lower taxes to help boost economic activity as it did during the Great Recession. Likewise, it is easier for the government to raise taxes while the economy is doing well.

**Figure 18: Tax Receipts (1962–2019)**

[16] Some of the decline in revenues in 2001 and 2009 could be attributed to reductions in the tax rates that were intended to boost economic growth.

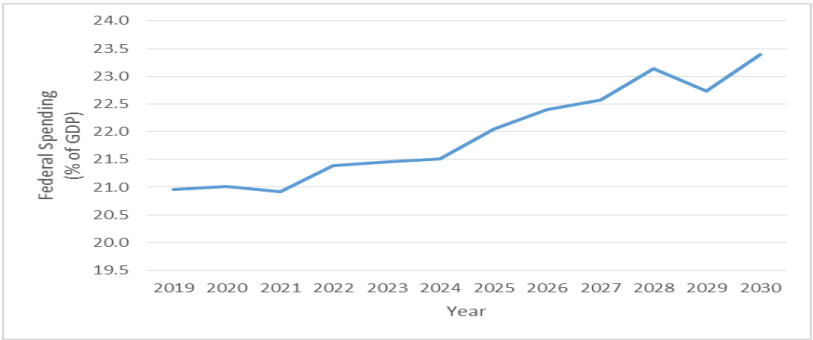



Source: Congressional Budget Office.

**Section 7: Debt and Deficits in the Future**

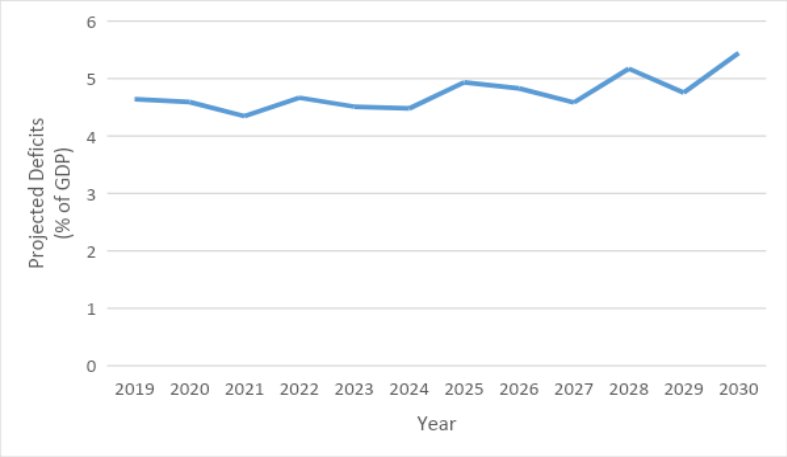
Now that we have seen what the historical picture of the debt, deficits, mandatory spending, discretionary spending, and revenues look like, let's look at projected spending levels and deficits for 2020–2030. Figure 19 shows that federal spending as a percentage of GDP is projected to increase from 21% to about 23.5% during the 2020s. The projected increase in spending will culminate in a projected deficit increase of about 1% of GDP per year, from just under 5% to just under 6%. The growth will be driven by increases in mandatory spending, which is projected to increase from just under 13% to just over 15% of GDP per year. Net interest on the debt is also projected to increase during the 2020s from under 2% to over 2.5% of GDP per year. Finally, discretionary spending is projected to continue its decline from 6.25% to 5.6% per year. What should be clear is that the increases in the deficit are likely to be driven primarily by the increases in mandatory spending.

**Figure 19: Projected Federal Spending as a Percentage of GDP**



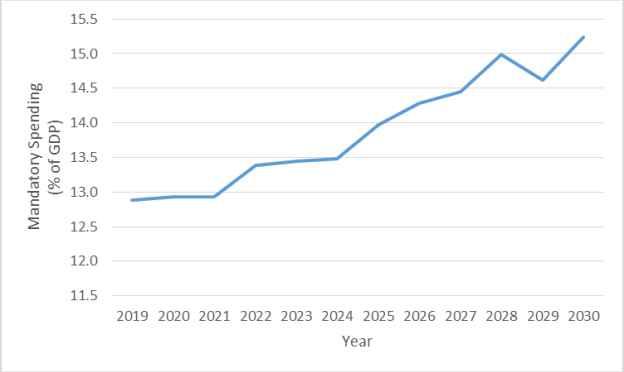

Source: Congressional Budget Office.

**Figure 20: Projected Budget Deficits as a Percentage of GDP**



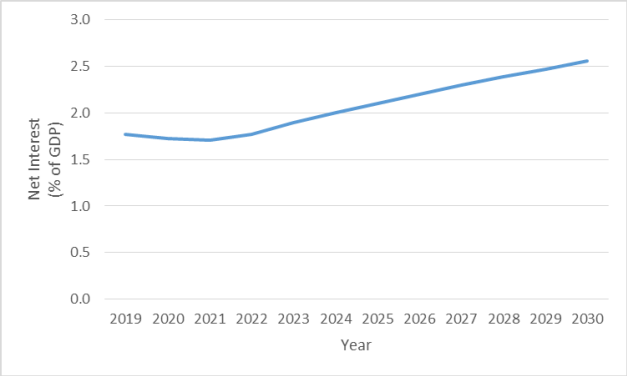

Source: Congressional Budget Office.

**Figure 21: Projected Mandatory Spending as a Percentage of GDP**



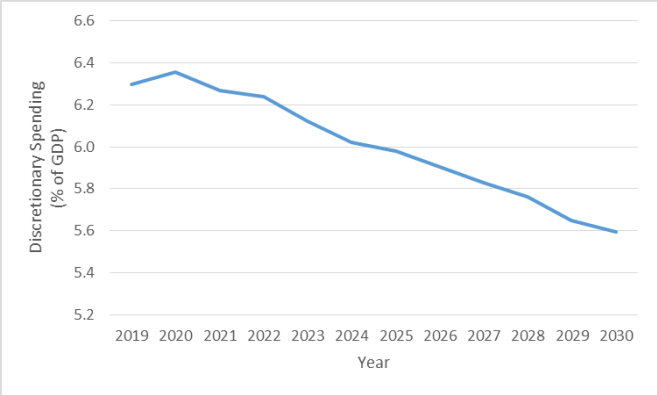

Source: Congressional Budget Office.

**Figure 22: Projected Net Interest Spending as a Percentage of GDP**




Source: Congressional Budget Office.

**Figure 23: Projected Discretionary Spending as a Percentage of GDP**




Source: Congressional Budget Office.

The forecast at the start of 2020 by the Congressional Budget Office projected that the deficits were expected to increase the debt held by the public from 78 percent to nearly 100 percent by 2030. It would also climb to 130 percent of GDP by 2040 and 180 percent of debt by 2050. Why will the debt grow so much in the next 30 years? As we have discussed already, mandatory spending is expected to grow because of an aging population and rising health care costs; projected growth on these programs is projected to be 6.1% annually from 2019–2049, while revenues are expected to grow at only 3%. What will be the economic implications of the increased debt? The next section discusses the economic impact of the debt and deficits.

**Section 8: The Economic Implications of the Debt and Deficit**

There are several reasons to have concerns about the current and projected path of government spending and revenues and the corresponding additional debt with these deficits. Given the amount the government borrows each year, the borrowing may impact credit markets, and this may slow economic growth. The reason for this is that the government borrows in the same credit markets as businesses and consumers, and when the government borrows more, it can put upward pressure on the price of credit; that is, interest rates can rise. If interest rates rise, then firms may be less likely to borrow to build new factories, buy new machines, or invest in other projects that may promote growth. Less investment in physical capital can slow down economic growth. Besides, as mentioned early, fewer plants, machines, and equipment will lower worker productivity and likely reduce the wages of workers as well. Another cause of concern is that when the debt gets too high, some investors and financial officers in foreign

governments may start to worry that a government with a high debt will not be able to pay off the debt, or may not be able to make its "next round" of interest payments.

These concerns may result in the government offering a higher interest rate in order to attract investors. However, the higher interest rates will add to future debt and may cause some potential investors to be even more concerned about the ability to make scheduled payments. Another cost of the debt is that it may restrict fiscal flexibility. When the debt becomes too large, it may be difficult for the federal government to respond to economic events like it would otherwise. In response to the COVID-19 pandemic, there have been concerns raised by some economists, politicians, and political observers about the implications of the fiscal response to the pandemic.

Another concern that can arise when the debt becomes too large is that it may lead to inflation. Most governments have an option that we do not have when we go to pay off our debt. For the private sector, we hope to finance our obligations by using income we expect to receive in the future, or by using or selling some of our existing assets (drawing money out of our savings account or selling our car) to help pay our debt. The government can hope to finance its debt by using future tax revenues or selling off some of its assets, but it can also print money–you and I cannot legally do that. If the government began **monetizing the debt**, it would simply print new money and pay off the debt with the newly minted currency. Increasing the money supply faster than the growth of real GDP tends to lead to inflation. In some cases, it has resulted in periods of **hyperinflation**.[17] A classic example of this was the inflation Germany experienced following World War I when they had to pay war reparations. The Germans resorted to printing money because it was the only way to pay back their debt obligations.[18] More recent examples of countries monetizing their debt would include Zimbabwe in the early 2000s and Venezuela beginning in 2016.

While there are reasons to be concerned about the debt, there are some reasons not to be as worried. Currently, with interest rates so low, the interest owed to newly issued debt may not create that much of a future burden. A second reason not to be too concerned about the debt is that much of the debt is held by citizens of the United States. In some sense, we simply owe the money to ourselves. A third reason to not be as concerned about the debt is that it is possible that we can reduce the burden of the debt if we can raise GDP growth in the future. As we said earlier, government revenues rise when the economy is growing faster, and if we can boost GDP growth over a period of years, we would

[17] Hyperinflation is typically defined as periods in which inflation exceeds 50 percent per month.

[18] In addition to Germany, Austria and Poland experienced high inflation following World War I as a result of financing their debt and government expenditures by printing money.

reduce the burden of the debt. In fact, the Congressional Budget Office, in making its debt projections, calculates the impact of more rapid productivity growth on the debt and deficit.

In the end, most economists believe that the government will need to address the rising debt. In order to reduce the long-run debt, government spending will need to be reduced and the government will need to raise more revenues. This poses quite a political challenge! We think most would agree that a politician that runs her campaign on: "I promise to raise your taxes and reduce government-provided goods and services," would have a hard time garnering many votes. Most people are in favor of raising taxes, as long as it is not their taxes that are raised. Some have argued that we should just raise the taxes on the rich, but increasing the taxes on the top one percent or 10 percent of income earners will not bring in enough revenue to balance the budget. Therefore, an increase in taxes needs to be more broad. Even more troubling, we have seen that most of the increase in government spending is coming from increases in mandatory spending. Therefore, if the government decides to reduce spending, many will view this as the government breaking a promise that it has made with the American people. In order to make changes in mandatory spending more palatable, the government will need to phase in the changes so that the impact will not be incurred by the people that are receiving the benefits or about to receive the benefits; while allowing enough time for the rest of us to plan accordingly.

**Section 9: The Impact of COVID – 19**

In response to the coronavirus pandemic, the federal government passed several bills to try to address the health-related issues associated with the pandemic as well as the pandemic's effect on the economy. In particular, on March 6th, the government passed the Coronavirus Preparedness and Response Supplemental Appropriations Act of 2020. At $8 billion, this was a relatively modest act that was designed to address health-related issues associated with coronavirus. Among other things, the Act included some funding for research and development for support of front-line workers. On March 17th, the Family First Coronavirus Act was passed. The Family First Act likely had a nearly $200 billion impact on the deficit. The Family First Act was primarily designed to provide financial support for those families that have been impacted by COVID-19. It included support for the family leave, offered financial support for low-income households, and increased unemployment benefits. It also supported medical testing by providing free tests for individuals whose doctor recommended they be tested. The basic idea behind the program was that it provided financial support and other forms of assistance for individuals or families of individuals that had COVID-19. With the

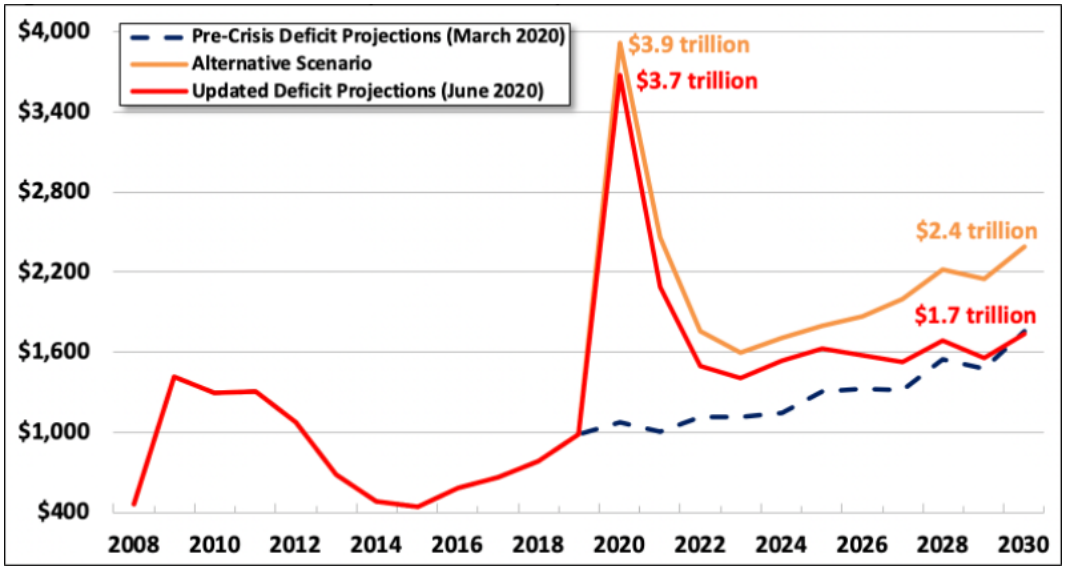
financial support, sick individuals and their families could effectively socially distance themselves and not be as concerned about some of the resulting potential financial losses.

On March 24th, the Coronavirus Aid, Relief and Economic Security (CARES) Act was passed. The Cares act added $1,721 billion to the deficit. The CARES provided direct payments of $1,200 for every adult and $500 per child for most households. The CARES Act also increased unemployment compensation, provided additional financial support for state and local governments, and created additional support for health care and research. On April 24th, the Government passed the Paycheck Protection Program and the Health Care Enhancement Act. The paycheck protection program, along with the Main Street lending program, were targeted loans to small businesses that would help businesses stay open. Moreover, firms were given favorable terms on the loan if they maintained their payroll. In many instances, they were given complete loan forgiveness. The paycheck protection program was targeted at small firms, and the Main Street lending program was targeted at medium-sized firms. The Act contributed about another $500 billion to the deficit.

The response by the federal government increased the projected deficit to GDP ratio from nearly 5% of GDP to almost 20 percent of GDP this year. It is also anticipated that the deficit will be nearly 10% of GDP next year. The increase has pushed the debt held by public-to-GDP ratio from an expected 80 percent of GDP to over 100 percent of GDP. The pandemic has also increased total projected deficits for 2020–2030 from 16.9 trillion dollars to 23.9 trillion dollars (Committee for a Responsible Federal Budget, 2020). Figure 24 and Figure 25 are taken directly from the Committee for a Responsible Federal Budget and shows how big of an impact COVID-19 has had on federal deficits and the debt based on their models (Committee for a Responsible Federal Budget, 2020).

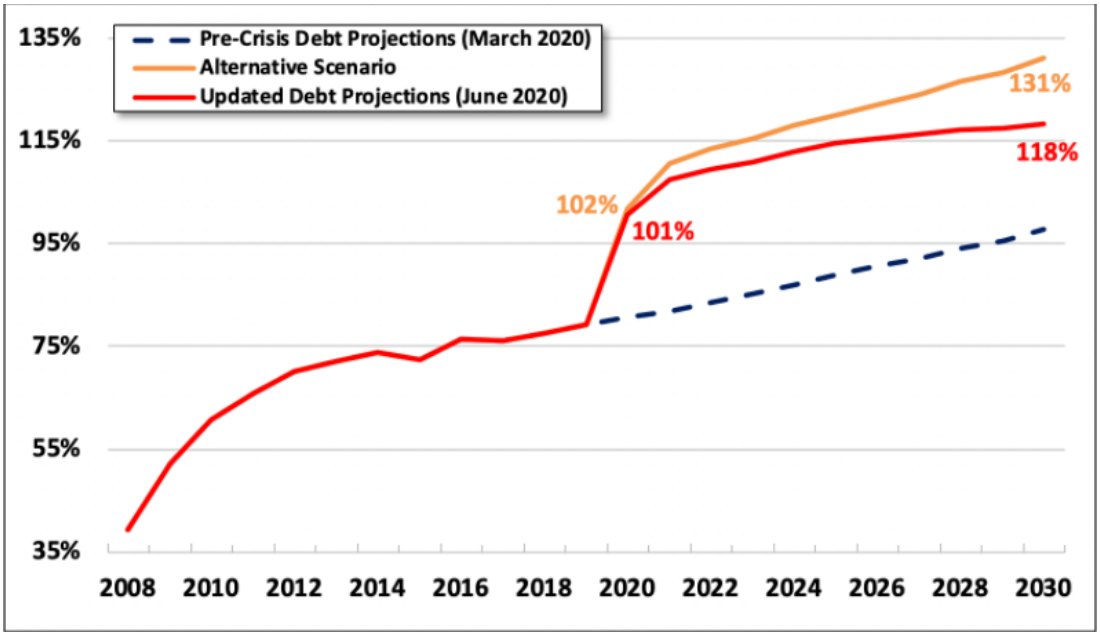
Most economists believe that a large response to the pandemic was necessary, and many have made the analogy to this being the equivalent of fighting a war. Therefore, it would not be surprising to see the deficits and debt to GDP ratios increase as was the case during World War II. It is our opinion that is probably the right approach realizing that this response is likely to be temporary, and the faster we can address the health issues, the quicker the economy can rebound. Therefore, it makes some sense to address the health issues and economic issues now and address the problems associated with a larger debt when the economy recovers.

**Figure 24: Projected Impact of COVID-19 on Federal Deficits**




Source: Committee for a Responsible Federal Budget

**Figure 25: Projected Impact of COVID-19 on the Federal Debt**




Source: Committee for a Responsible Federal Budget

**Section 10: Conclusion**

The United States currently holds a historic amount of debt (roughly 80% worth of GDP is held by the public). The trend over the period 1962–2019 has been for the debt to increase. With increases in mandatory spending projected as Baby Boomers continue to retire, the national debt is projected to continue its rise through 2030. The increases in the debt will be driven by deficits caused by increases in mandatory spending on programs such as Social Security and Medicare. Moreover, there are calls to increase the size and scope of some mandatory programs, such as Medicare for All and the Medicaid expansion due to the Affordable Care Act (also known as "Obamacare").

To finance the debt, the United States government will either need to continue to borrow money at higher interest rates, increase tax revenues, or print money in order to pay down the debt, known as "monetizing the debt." Each of these solutions comes with heavy costs for the United States' economy. Higher interest rates on government debt may lead to lower private investment, stifling growth. Higher tax rates may lead to less innovation and production as workers substitute away from work and towards leisure. Finally, printing money could trigger high levels of inflation, which can destabilize the economy. Regardless of how the United States deals with its debt, the next ten years will be important for the country, its economy, and the well-being of its citizens.

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**Appendix A: State and Local Finances and International Comparisons**

To make comparisons across countries and to provide a more complete picture of government finances, we briefly discuss state and local expenditures as well as state and local finances. In 2019, state and local government expenditures were a little over $3,600 billion, so that the combined spending by the federal, state, and local government was about $8,000 billion. Figure A1 depicts expenditures by the state and local governments. State government expenditures were $1,763.5, and you can see a large portion of state spending went to social insurance and income maintenance (52%). These expenditures include unemployment benefits as well as contributions to Medicaid and pensions for state employees. The next largest category includes expenditures on education (18%). Another 14 percent of state expenditures went to health and transportation, split evenly between these two categories. In 2017, local government expenditures totaled $1,896.5 billion. Education accounted for 36% of local government expenditures in 2017. Public utilities accounted for 11% of expenditures, and public safety, which includes police and fire protection, accounted for 10% of expenditures. The local governments also provided additional health support (9%), housing (6%), and social insurance (6%). Revenues from tax collection for state and local governments in 2018 are depicted in Figure A3. Approximately 85% of the $946 million in state tax collections is from sales (48%) and income (37%). Local government collected over $706 million in taxes where 72% of their tax revenues were from property taxes, 17% from sales taxes, 5% from income taxes, 1% from corporate, 5% from other categories. In addition to the over $1.6 billion collected in tax revenues, state and local government collected over $0.75 billion in charges and miscellaneous fees that include things like water, and sewerage, parking and highway tolls to name a few.

Every state in the United States, except for Vermont, has some type of balanced-budget provision. Therefore, when we look at state budgets over time, we are not likely to see large budget deficits. Figure A4 depicts revenues and expenditures for state and local governments over time, and we can see the deficits are small relative to the size of the federal deficits. One financing issue that the state and local government's face is that many have made promises to state and local employees that the government would provide pensions and health care when certain workers retire. These obligations do not show current deficits. Still, many economists and politicians will factor in these unfunded liabilities to get a better measure of the fiscal health of state and local governments.

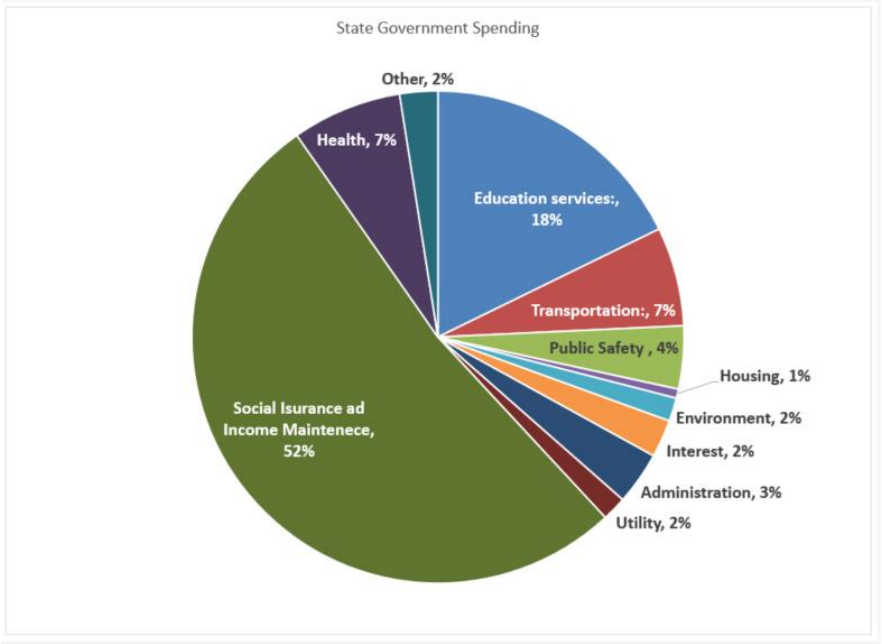
Once we add in state and local spending, we can compare the size of the government to other economies. Figure A5 depicts total government spending for countries in the Organization of Economic Cooperation and

Development (OECD). Compared to other countries in the OECD, total government spending in the US is on the lower end of the government-spending spectrum. Government expenditures in Norway, Denmark, Belgium, Finland, and France exceed 50 percent. What accounts for these differences? These countries spend more on health care and other forms of social insurance, as well as providing lower-cost higher education and more support for low-income families. The provision of these goods may sound appealing; they do not come without a cost. The higher tax rates in these countries may contribute to lower overall per capita GDP. With the exception of Norway, the countries with larger governments tend to have lower per capita GDP.

When we compare the debt across countries, we see that, according to the OECD, the United States has a higher debt to GDP ratio than most OECD countries. A couple of important things to note about the debt to GDP ratio depicted in the OECD figure. First, it is overall debt, not the debt held by the public; earlier in the article, we argued that debt held by the public is the more relevant measure. Also, the United States' tolerance for debt may be higher than in other countries because of the importance of the U.S. dollar in financial markets. Some commodities are traded primarily using dollars, and this gives the United States a little more latitude when it comes to its debt; some countries, like Greece, do not have their own currency, and this limits their flexibility in dealing with issues associated with the debt and deficit.

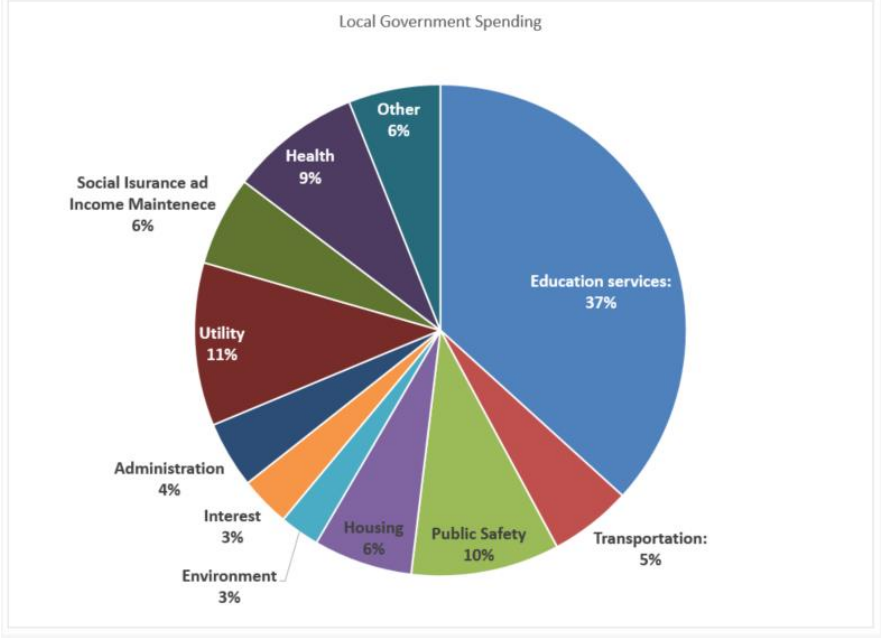
**Appendix** **Figures**

**Figure A1: State Expenditures**



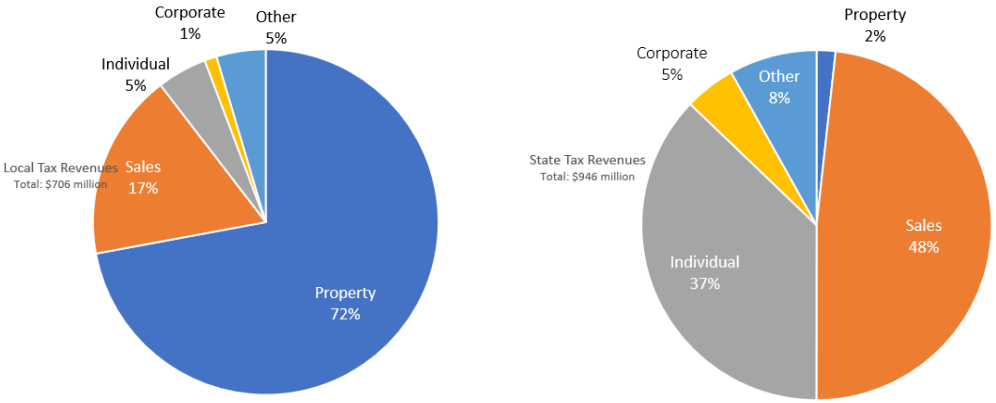

Source: U.S. Census Bureau

**Figure A2: Local Expenditures**



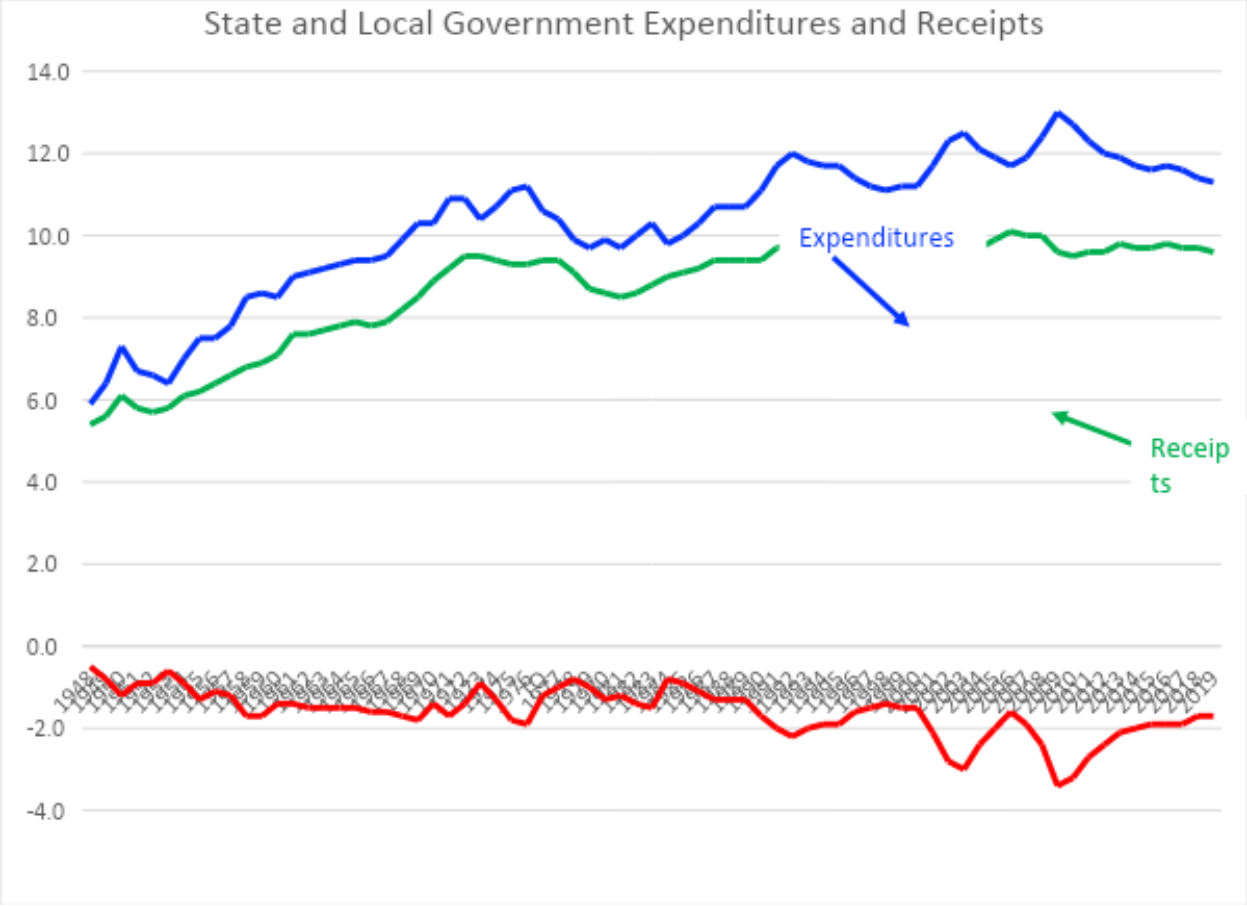

Source: U.S. Census Bureau

**Figure A3: State and Local Revenues**



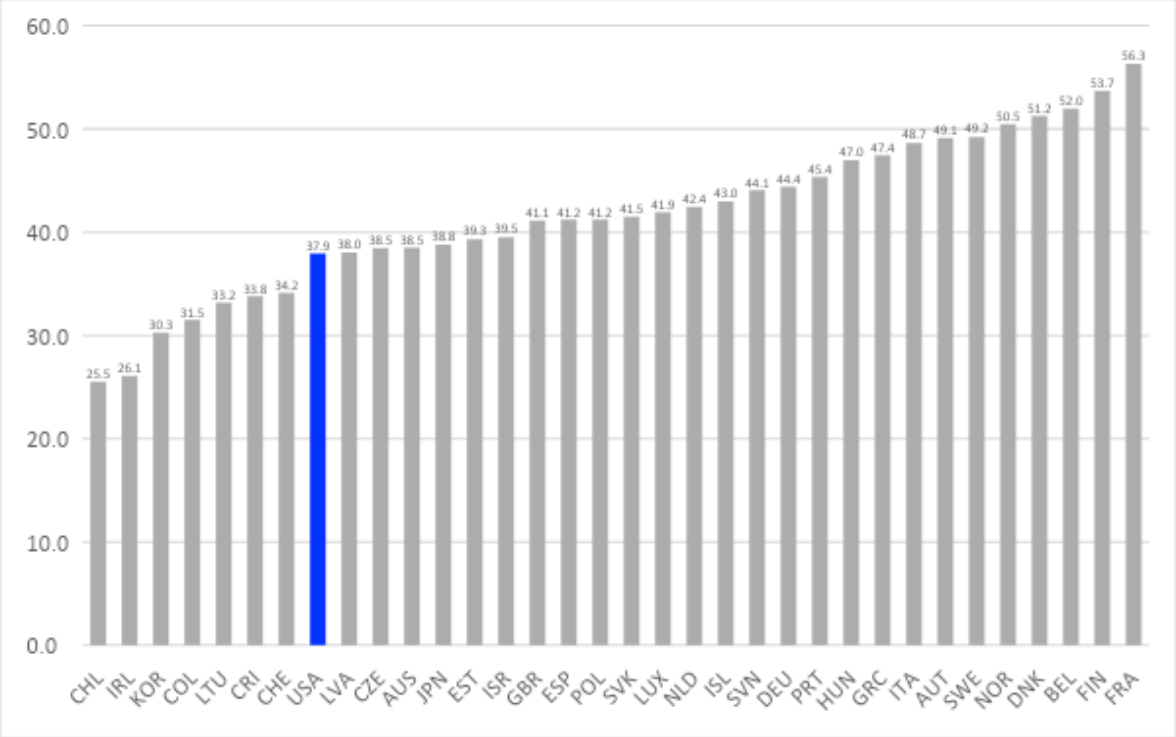

Source: U.S. Census Bureau

**Figure A4: State and Local Revenues (1948–2019)**



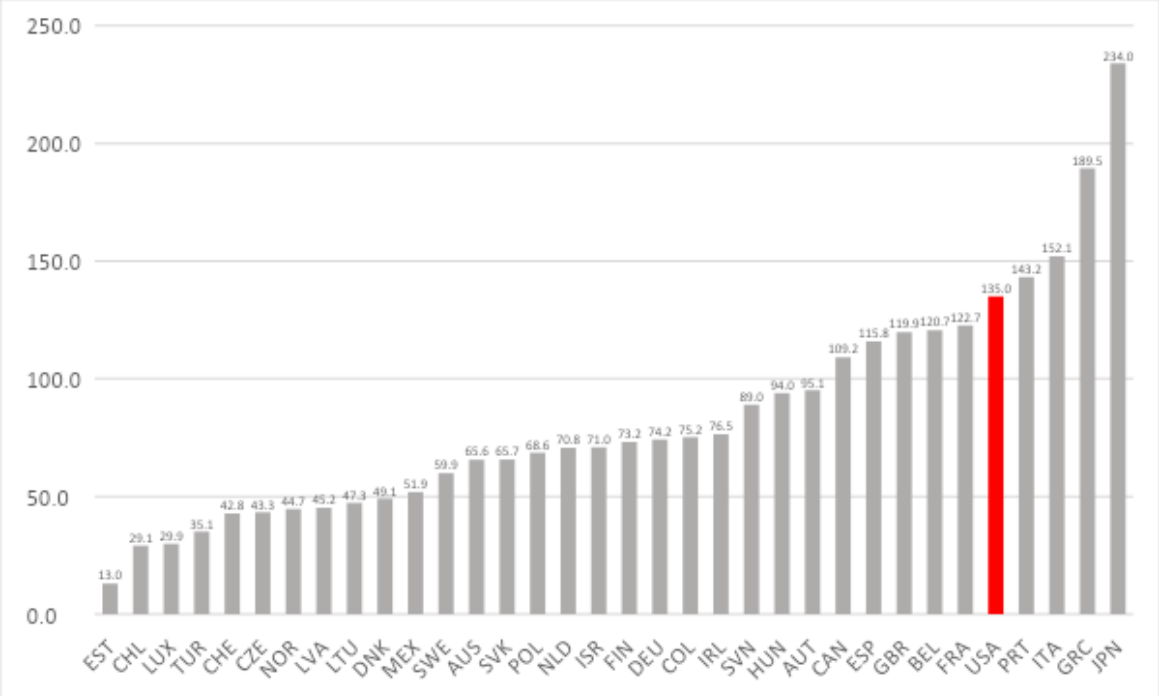

Source: Office of Management and Budget

**Figure A5: Government Expenditures by Country for OECD Countries**




Source: Organisation for Economic Co-operation and Development (b)

**Figure A6: Government Debt by Country for OECD Countries**




Source: Organisation for Co-Operation and Economic Development (a)