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The Macroeconomic Implications of Replacing the U.S. Federal Tax System With a Value-Added Tax

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The Macroeconomic Implications of Replacing the U.S. Federal Tax System With a Value-Added Tax

Abstract

This paper analyzes the potential implications of instituting a value-added tax (VAT) as the sole source of revenue for the United States Federal Government. A credit-invoice, broad-based VAT would fundamentally tax consumption, whereas the current system employed by the U.S. taxes production. A VAT system would allow firms to make decisions based on the most efficient allocation of capital and labor inputs, leading to a greater level of efficiency and productivity for U.S. firms in the long run. While the VAT would initially reduce the amount of consumption spending within the United States due to it raising the price of consumable goods, workers have the potential to earn higher after-tax income as a result of eliminating the payroll and individual income tax. This shift would provide incentives toward savings, investment, and work that would augment the nation's capital stock and lead to higher levels of real gross domestic product (GDP) in the long run. This paper concludes that the macroeconomic effects of replacing the current tax system with a broad-based VAT are positive despite the drawbacks of such a mechanism. A flat, broad-based VAT is a simple, efficient tax mechanism that could provide a better revenue source for achieving higher levels of economic growth in the United States.

Keywords

value-added tax, consumption, capital stock, labor, real GDP, firm decision-making

Disciplines

Business | Economics | Finance | Macroeconomics | Public Economics | Public Policy | Social Welfare | Taxation

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This paper analyzes the potential implications of instituting a value-added tax (VAT) as the sole source of revenue for the United States Federal Government. A credit-invoice, broad-based VAT would fundamentally tax consumption, whereas the current system employed by the U.S. taxes production. A VAT system would allow firms to make decisions based on the most efficient allocation of capital and labor inputs, leading to a greater level of efficiency and productivity for U.S. firms in the long run. While the VAT would initially reduce the amount of consumption spending within the United States due to it raising the price of consumable goods, workers have the potential to earn higher after-tax income as a result of eliminating the payroll and individual income tax. This shift would provide incentives toward savings, investment, and work that would augment the nation's capital stock and lead to higher levels of real gross domestic product (GDP) in the long run. This paper concludes that the macroeconomic effects of replacing the current tax system with a broad-based VAT are positive despite the drawbacks of such a mechanism. A flat, broad-based VAT is a simple, efficient tax mechanism that could provide a better revenue source for achieving higher levels of economic growth in the United States.

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1 Introduction

This paper seeks to understand the consequences of a hypothetical proposal: to replace the current United States tax system with a broad based, credit-invoice value-added tax on all consumable goods. This would be a uniform VAT to ensure a neutral effect that does not discriminate among the type of consumption. This mechanism would effectively shift the tax base from U.S. production to U.S. consumption.

Value-added taxation has emerged as a bedrock aspect of the collection of revenue since the end of the second world war. The Organization for Economic Cooperation and Development (OECD) finds that nearly 20 percent of the total tax revenue worldwide and among OECD nations is generated by a VAT.¹ Out of the 193 full United Nations member nations, 166 of them employ some form of VAT. Across this global landscape, the United States is the only OECD country to not administer some type of VAT.²

This paper is solely focused on the direct effects of implementing a VAT mechanism. The macroeconomic responses discussed further on would surely be affected by additional factors that would accompany a shift to a VAT, such as the precise rate of taxation, potential social programs enacted to stabilize the economy in the short run of this transition, trade relations with other nations, and other decisions made by lawmakers regarding fiscal policy. However, this paper isolates the effect of simply changing the type of taxation and holds these other factors constant.

This paper will begin by providing an overview of the current tax system employed within the United States federal government. Then it will dissect the precise nature and reasonable effects of

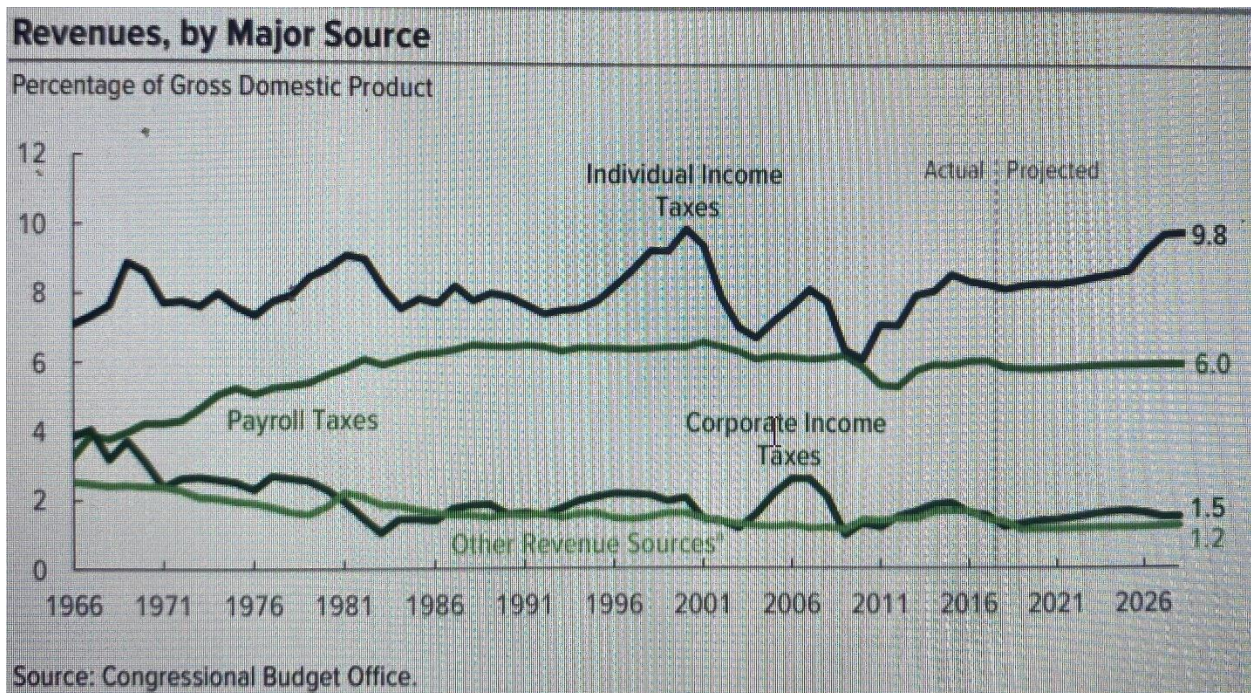
¹ OECD (2018), Consumption Tax Trends 2018: VAT/GST and Excise Rates, Trends, and Policy Issues.

² While no U.S. entity administers a VAT, many states utilize some form of sales tax system to raise a significant degree of their revenue. A sales tax is not a VAT, and only taxes value added at the final stage of production.

a uniform, broad based value-added tax. Finally, it will assess macroeconomic conditions to determine the implications of replacing the federal tax system with a VAT.

2 The Current Tax System

The United States employs a variety of taxes that utilize income, wages, and capital income as their respective tax base. The main sources of revenue for the United States are generated through an individual income tax, a corporate income tax, a payroll tax, and other sources of revenue including capital gains, custom duties, and excise taxes. Figure 1 illustrates the level of taxation each source of revenue provides relative to gross domestic product (GDP).



[Figure 1]
Revenues, by Major Source
Source: Congressional Budget Office

The individual income tax applies to the gross income of individuals, and is levied on salaries, interest, dividends, wages, and any other form of income a person earns. As Figure 1 illustrates, it is the largest source of revenue for the U.S. government and amounted to nearly 8 percent of GDP in the year 2018. It is worth noting that the individual income tax is what is levied against both

owners of firms that operate under a sole-proprietorship, S-corporation, or limited liability company, and partners in a limited partnership or limited liability company.

The corporate income tax applies to the profits of U.S. resident firms organized under a C-corporation, amounting to nearly 1.5 percent of GDP in 2018. As of 2020, corporations are subject to a uniform 21 percent rate on taxable profits. Taxable profits include a corporation's receipts less deductions such as wages and other employee compensation, depreciation, cost of goods sold, advertising, and interest. As Hooper and Smith³ point out, this system negatively impacts capital-intensive firms who require higher incomes to generate returns that are attractive to investors because the more income they generate the more they are liable for taxation. In addition, capital purchases are not allowed to be deducted immediately, which increases the cost of the additional investment through the decrease in the real value from the depreciation deduction taking place over time and being subject to inflation. While the Tax Cuts and Jobs Act of 2017 does solve this problem in the near term by allowing first-year bonus depreciation, where certain business assets can be fully expensed, this change to the tax code is temporary and only applies to property acquired and placed in service between Sept. 27, 2017 and Jan. 1, 2023.⁴ Hall and Rabushka,⁵ as well as Hooper and Smith, also observe that the double taxation of dividends through the corporate income tax on the firm and the individual income tax on shareholders creates a distortion that favors debt over equity.⁶

The payroll tax is a direct tax on the wage of workers, deducted from a worker's salary, wage, or tips by their employer so that it can be remitted to the government. In 2018, the payroll tax,

³ Hooper, P., & Smith, K. A. (1997). A value-added tax in the U.S.: An argument in favor.

⁴ Internal Revenue Service. (2018). New rules and limitations for depreciation and expensing under the tax cuts and jobs act.

⁵ Hall, R., & Rabushka, A. (2007). The flat tax and the economy. The flat tax (pg. 131).

⁶ The tax advantage of debt lies in interest only being subject to the individual income tax rate of the lender.

officially the Federal Insurance Compliance Act (FICA) tax, amounted to nearly 6 percent of the nation's GDP. The U.S. established this mechanism in order to fund its Social Security and Medicare programs; the revenue generated from the FICA tax goes directly into the trust funds that support these program.⁷ However, there is no reason why this tax is essential for the funding of these programs, as the government could raise revenue through other means to cover the necessary expenditures demanded by these two programs through the general fund where all revenue from a VAT would be collected.

Capital gains taxes are a form of taxing capital income, but only when an investment is realized. If one were to acquire a stock at \$20 and later sell the security at \$26 in two years, then the tax base for the capital gains tax would be the realized gain (\$6), not the total value of the security. The tax is levied on the year that the security is sold, and the gain is realized, so in this example the seller of the security would pay the tax in two years. Losses in capital act as a buffer that subtract from the tax base. Another tax that does not represent a large portion of federal revenue is the excise tax, which is a tax levied on a supplier or manufacturer at the moment of manufacture rather than once it is sold. Certain goods and services in the U.S. are subject to this type of taxation at the federal level, such as coal and sports wagering.

Despite these diverse tax bases, the one trait they all share is that the tax is ultimately levied on a factor of production. The payroll tax is a direct tax on labor through its tax base representing the value of an individual's work: their wage. The capital gains tax is a tax on the appreciation of capital. The corporate tax, by taxing a firm's profit, is a tax on production as a result of utilizing some combination of capital and labor. Finally, the income tax can be considered both a tax on

⁷ Social Security Administration. Social security history: Myths and misinformation about social security.

labor and a tax on capital: it taxes net income, whether it stems from salary and wages as well as the interest and dividends from investments. This paper will analyze the hypothetical transition from a system that taxes production to one that taxes consumption. The vehicle for this shift will be a uniform, broad-based value-added tax.

3 Value-Added Tax

A value-added tax is a tax on consumption that has a tax base of the value added to a good or service at each stage of production. It is important to note that while businesses are the entities that pay the tax nominally, firms and consumers are the effective payers of the tax. This is due to the increased price that the buyer has to pay for a good or service with a VAT. The significant price increase will reduce consumption spending and GDP in the short run. However, the current system encourages firms to produce using the most tax advantaged inputs (i.e. capital expenditures vs additional labor), rather than what would be the most efficient inputs with no tax to distort production decisions. This incentivizes firms to engage in counterproductive efforts to reduce their reportable taxable income, such as shifting income abroad or choosing to hire additional workers instead of purchasing useful capital assets. The recent Tax Cuts and Jobs Act of 2017 alleviates this dilemma by allowing for bonus depreciation, thereby removing the need to limit a firm's capital purchases. However, since this change is not permanent and will expire at the beginning of 2023, it is not a permanent solution to this problem. The neutrality of a VAT with respect to tradeoffs between additional labor and capital purchases means that firms will be incentivized to make decisions that achieve the most efficient combination of production inputs and thus realize greater productivity in the long run.

3.1 Methodology

If the U.S. were to levy a broad-based VAT at a uniform rate, businesses would pay the tax on their purchases from other businesses and collect the tax on their own sales. This essentially provides a tax base of firms' gross margin, or the value added at each stage of production. The characteristic of this proposal is a VAT rate that is both uniform and broad-based in its application towards all consumption spending. To achieve the greatest level of simplicity while pragmatically raising revenue for the government, all value added will be taxed at the business level with no deduction in wages. Certain proposals, such as the Hall-Rabushka flat tax,⁸ institute a two part VAT that allows businesses to deduct wages from the business level VAT, thus allowing a distinction between value added at the business level and taxing the wage at the individual level.⁹ The VAT of this paper would be uniform with no exception to specific industries or exemptions based on income level, and thus could be considered regressive in nature.

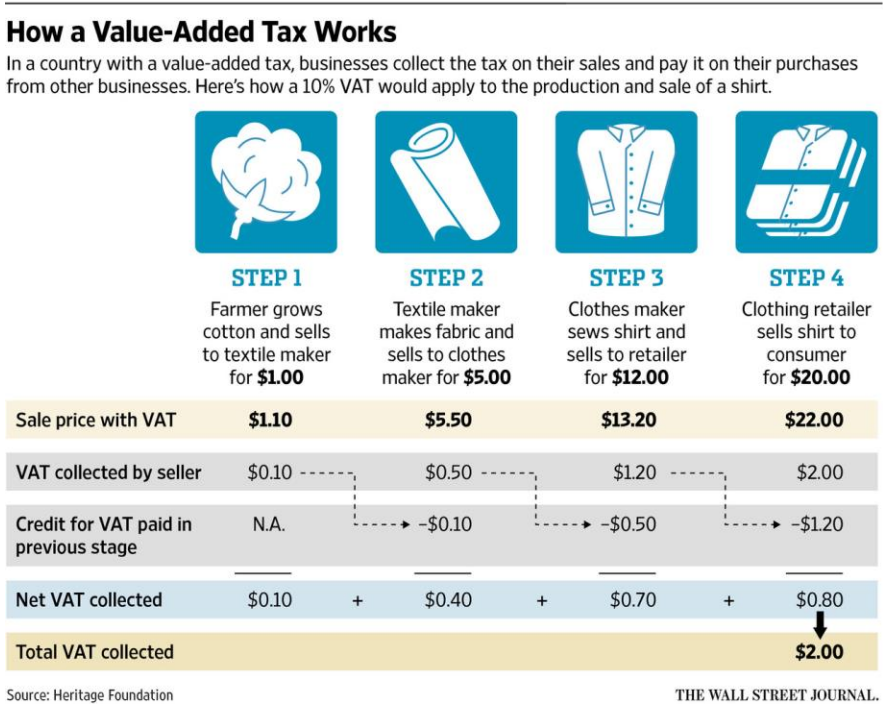
This proposal considers the tax mechanism as a credit-invoice VAT, which can best be depicted through the chain of production for a good or a service. This is the method employed by every nation that levies a VAT, with the exception of Japan, which employs an accounts-based method of collection.¹⁰ Figure 2 shows the process for collecting and paying a VAT through the production of a shirt from its initial phases. Under the credit-invoice method of collecting a VAT, sales are taxed with the customer having been informed of the VAT on the transaction and businesses are

⁸ Hall, Robert E., and Alvin Rabushka. 1985. *The Flat Tax*. Stanford, CA: Hoover Institution Press.

⁹ The purpose behind the decision to have an individual flat tax along with the business level flat tax is to incentivize economically active individuals to work more. The Hall-Rabushka proposal includes exemptions in which individuals would only pay a tax on wages in excess of that exemption level. This minimizes the potential contraction in labor supply that a VAT could pose, by providing a large part of the population greater encouragement to work more.

¹⁰ The accounts-based method involves the tax being collected via calculating the difference between revenues and allowable purchases and paying the VAT rate based off of this.

credited with the tax paid on purchases.¹¹ The textile maker shown in Figure 2 collects \$.50 in VAT from each unit sold of their fabric at a 10 percent VAT rate. However, they also pay \$.10 in VAT to the farmer on each unit of their cotton. Under the credit method, the payment of the tax to the farmer acts as a credit on the taxes collected from cloth makers. This is critical because the crediting of taxes paid on purchases is what allow the tax base to be the value added at each stage of production. The total VAT remitted to the government consists of $$(.5-.1) = $.4$ per unit of good sold which would imply a tax base of $$(.4/.10) = 4 , which is the precise value added by the textile maker from the farmer; the textile maker purchases cotton at \$1 per unit and sells their fabric at \$5



[Figure 2]
 Invoice-based VAT Diagram
 Source: The Wall Street Journal, Heritage Foundation

per unit, meaning \$4 is the value added at this stage of production. It is worth noting that the only link in the production chain that does not receive a credit is the initial producer, whose initial

¹¹ Bodin, Jean-Paul; Ebril, Liam P.; Keen, Michael; Summers, Victoria P. The Modern VAT. International Monetary Fund.

creation of the fundamental product used in later stages of production is the value that they add. In this case, the farmer adds a value of \$1 because they sell their cotton for that much while requiring no purchase of prior materials.

3.2 Effect on Consumer Spending and Inflation

Perhaps the most immediate effect of a VAT is a sharp increase in the price of goods and services. Consumption is far more expensive under a VAT, and so it would be reasonable to conclude that there will be a decrease in the aggregate demand for goods and services as the VAT is instituted as the sole source of revenue for the federal government.¹² Even the simple example in Figure 2 demonstrates that the first result of a VAT is a rise in price for each good or service because firms must now charge their price plus a VAT to their buyer. While firms pay the tax to the government, both businesses and consumers pay the VAT in the form of the new, higher price for each consumable good.

In 1992, the Congressional Budget Office estimated that a 5 percent VAT would cause the Consumer Price Index to jump by 3 percent.¹³ Inflation would occur in the period between the announcement of the tax and the institution of it. Demand for consumer goods would cause a spike in price and output, but the price level would remain higher than before the spike due to a VAT making consumption more expensive. This would mean inflation is likely to rise in the near term but will not continue to rise after the shift to a VAT has occurred, since prices will have adjusted to the new tax system.

The effect on consumer spending is more nuanced. Since the current system taxes production, consumption is currently less expensive than production and represents a greater component of the

¹² Appendix A provides greater detail on this point.

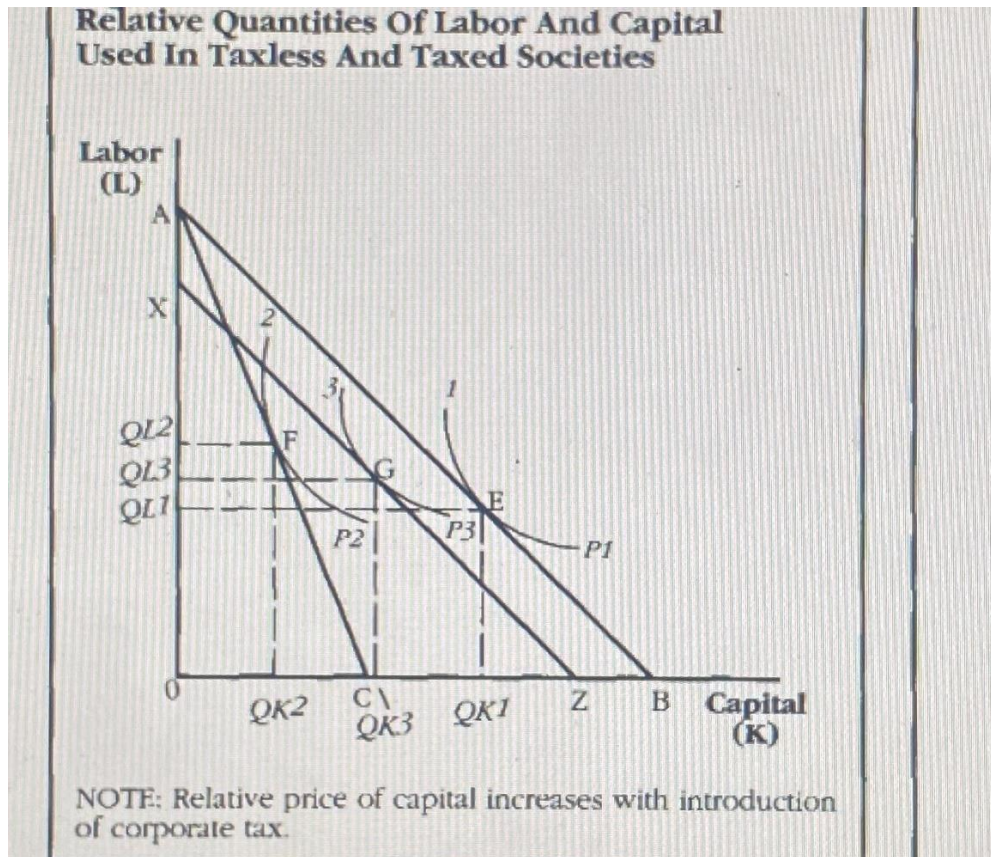
¹³ Congressional Budget Office (1992). Effects of Adopting a Value Added Tax, p. 51.

U.S economy. This is reflected in GDP, as consumption spending accounted for 68 percent of gross domestic product even at one month into the coronavirus pandemic.¹⁴ If a VAT is introduced as a replacement for the income, payroll, corporate, capital gains, and other forms of taxes on production, there will likely be a greater level of income for many workers and firms. However, that will not necessarily increase consumer spending because consumption will become comparatively more expensive than saving or investing. This means that a VAT would reduce consumer spending in the United States due to consumption becoming more expensive than before the shift. This also indicates that the current component of GDP that is made up of consumption spending would likely be greater than the VAT tax base because the propensity to consume would decrease as a result of consumption becoming more expensive, relative to saving, under a VAT. Thus, the propensity to consumer for individuals will decrease, and the propensity to save will increase.

¹⁴ Council of Economic Advisors. (2020). An in-depth look at COVID-19's early effects on consumer spending and GDP.

3.3 Effect on Firm Decision-Making

A VAT system offers a major benefit to firms in their decision-making process: the ability to make the most productive decision with the most efficient combination of inputs. Hooper and Smith provide two excellent figures that illustrate this. Figure 3 shows the effect of tax schemes on the



[Figure 3]

Relative Quantities of Labor and Capital Use in Tax-less and Taxed Societies

Source: *A Value-Added Tax In The U.S.: An Argument In Favor* (Hooper & Smith, Figure A)

relative quantity of capital and labor used, and Figure 4 draws the production-possibilities frontier between corporate output and non-corporate output. Both demonstrate the benefit that firms can experience through the transition to a VAT. In Figure 3, the relative price of Capital (K) is represented on the horizontal axis, while the relative price of Labor (L) is represented on the vertical axis. Isocosts such as AB represent a corporation's cost restriction between these two inputs; in the case of isocost AB, it represents a corporation's cost restriction in a tax-less society.

For each line, an isoquant¹⁵ defines the combination of capital and labor needed to produce a given output (e.g. isoquant 1 gives the tradeoff between capital and labor needed to produce P1 units of output). The interception between each isoquant and its corresponding isocost (e.g. point E on isoquant 1 and line AB) gives the most efficient combination of K and L.

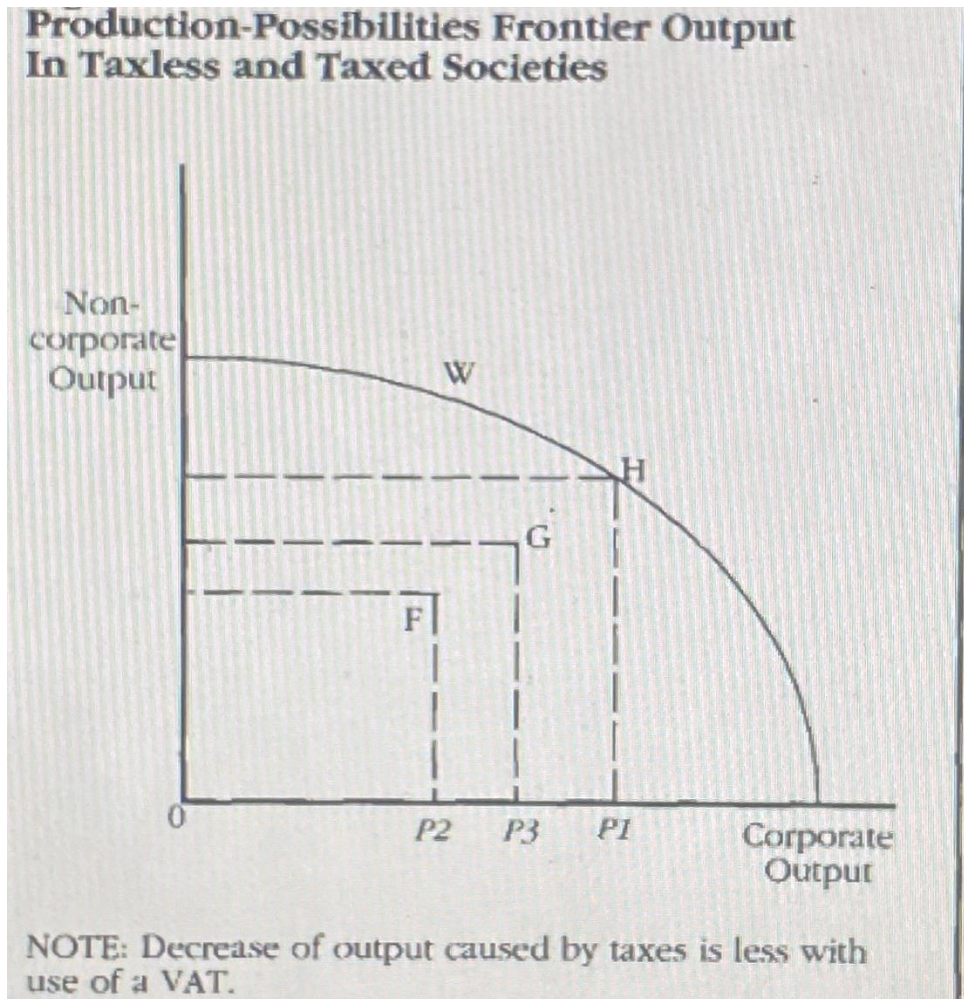
Focusing on Figure 3, the isocost AB represents a corporation's cost restriction with no tax. The isocost AC represents the cost restriction with a corporate income tax, the current system.¹⁶ Because wages and salaries are able to be deducted from the current corporate income tax, capital purchases become more expensive than additional labor, with the isocost showing that labor is tax advantaged: the quantity of capital decreases from QK1 to QK2. This is still an efficient level of production, but less output is produced as before, making it an undesirable position. Line XZ represents the introduction of a VAT, which causes only a parallel shift from AB due to it not affecting the relative price of capital and labor. The efficient combination at G produces more goods using a greater quantity of capital but slightly less labor than the efficient combination under a corporate income tax.

The inefficient use of capital and labor inputs from the corporate tax causes the total production of outputs to be within the production possibilities curve in Figure 4. Producing at a point on the production possibilities frontier would only be possible in a tax-less society, with the most efficient combination being represented by point H. With a corporate tax, Point F represents the most efficient output combination. This is because capital not employed in the corporate sector is employed in the non-corporate sector or unused, since all corporations face a tax advantage for

¹⁵ An isoquant is a contour line drawn through the set of points at which the same quantity of outputs is produced while changing the quantities of two or more inputs (Varian, Hal R. (1992). *Microeconomic Analysis* (Third ed.)).

¹⁶ This represents the current permanent system; a referenced in Section 2 the Tax Cuts and Jobs Act of 2017 allows for bonus depreciation until 2023.

labor inputs. Thus, the decrease in corporate output is not supplemented by an equivalent increase in non-corporate goods since capital used in the corporate sector is employed more efficiently. Point G represents the efficient combination of outputs with a VAT. Because it is neutral in determining the relative prices of capital and labor, the ratio of quantity of capital and labor are unchanged from a tax-less state and less capital is forced out of the corporate sector into the non-



[Figure 4]
 Production-Possibilities Frontier Output of Tax-less and Taxed Societies
 Source: *A Value-Added Tax In The U.S.: An Argument In Favor* (Hooper & Smith, Figure A)

corporate sector. This causes a greater amount of goods and services to be produced overall than would be the case under a corporate tax. Thus, the result of a VAT is an improved state of efficiency and productivity in the long term.¹⁷

The final key feature in promoting economic efficiency does not emerge from the nature of a VAT as a consumption tax, but from the specification of this paper in applying a uniform VAT. This is so critical that the Congressional Budget Office, when considering the effects of adopting a value-added tax, found that applying a broad-based uniform VAT would reduce economic waste by .4 percent of GDP.¹⁸ The ultimate advantage for firms is that they would be able to focus on the most efficient combination of inputs rather than the most tax advantaged set of inputs.

4 Capital and Labor

A VAT system creates consistent incentives to save and invest. This would expand the nation's available capital and significantly augment the capital stock and long term growth. The announcement of the VAT also presents a critical factor in effecting the growth of capital stock. The effects on labor are mixed, as the removal of the income and payroll tax undoubtedly create an incentive to work and engage in productive activity, but the institution of the VAT could potentially depress real wages and tighten the labor supply.

4.1 Accumulated Capital and Capital Stock

A greater propensity to save resulting from the increased cost of consumption creates a natural incentive to either save or invest money as an individual or engage in capital purchases as a firm. If the savings rate increases, this produces a cascade of benefits to the economy by increasing the

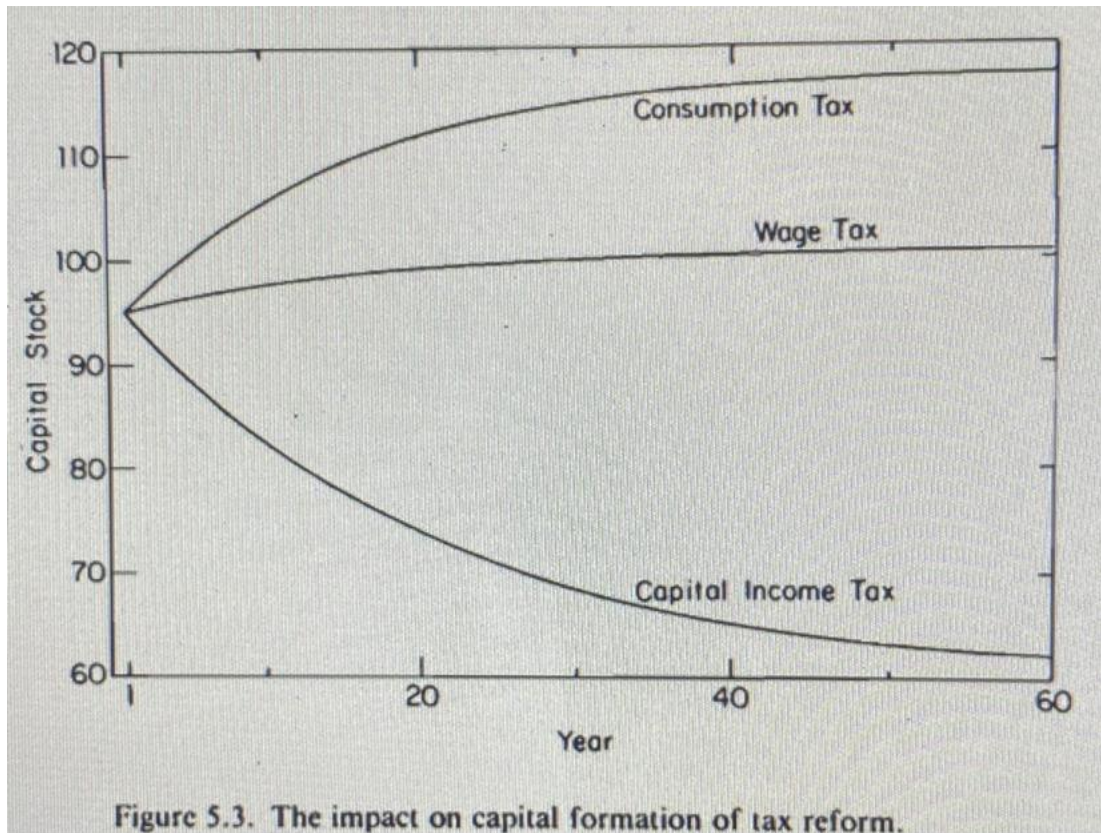
¹⁷ Hooper, P., & Smith, K. A. (1997). A value-added tax in the U.S.: An argument in favor.

¹⁸ Congressional Budget Office. (1992). Effects of Adopting a Value Added Tax, p. 51.

supply of loanable funds and lowering interest rates as a result of the decreased cost of capital. Since interest, capital gains, and dividends are not only exempt from double taxation but all forms of taxation all-together, there is a clear encouragement of investing. This not only contributes to the formation of greater capital in the country but also creates the bedrock for a long term increase in wealth per capita.

Section 3.3 detailed the process of a firm's decision-making under a VAT and demonstrated how a VAT removes the advantage of labor and fosters a neutral environment between choosing capital or labor inputs. This means that relative to the current system, the amount of capital purchases would increase as a result of this shift. Since purchases of capital equipment and buildings would be treated as an expense, they would immediately be written off and thus provide the ideal incentive for investment.¹⁹

¹⁹ Hall, R., & Rabushka, A. (2007). The flat tax. Pg. 132.

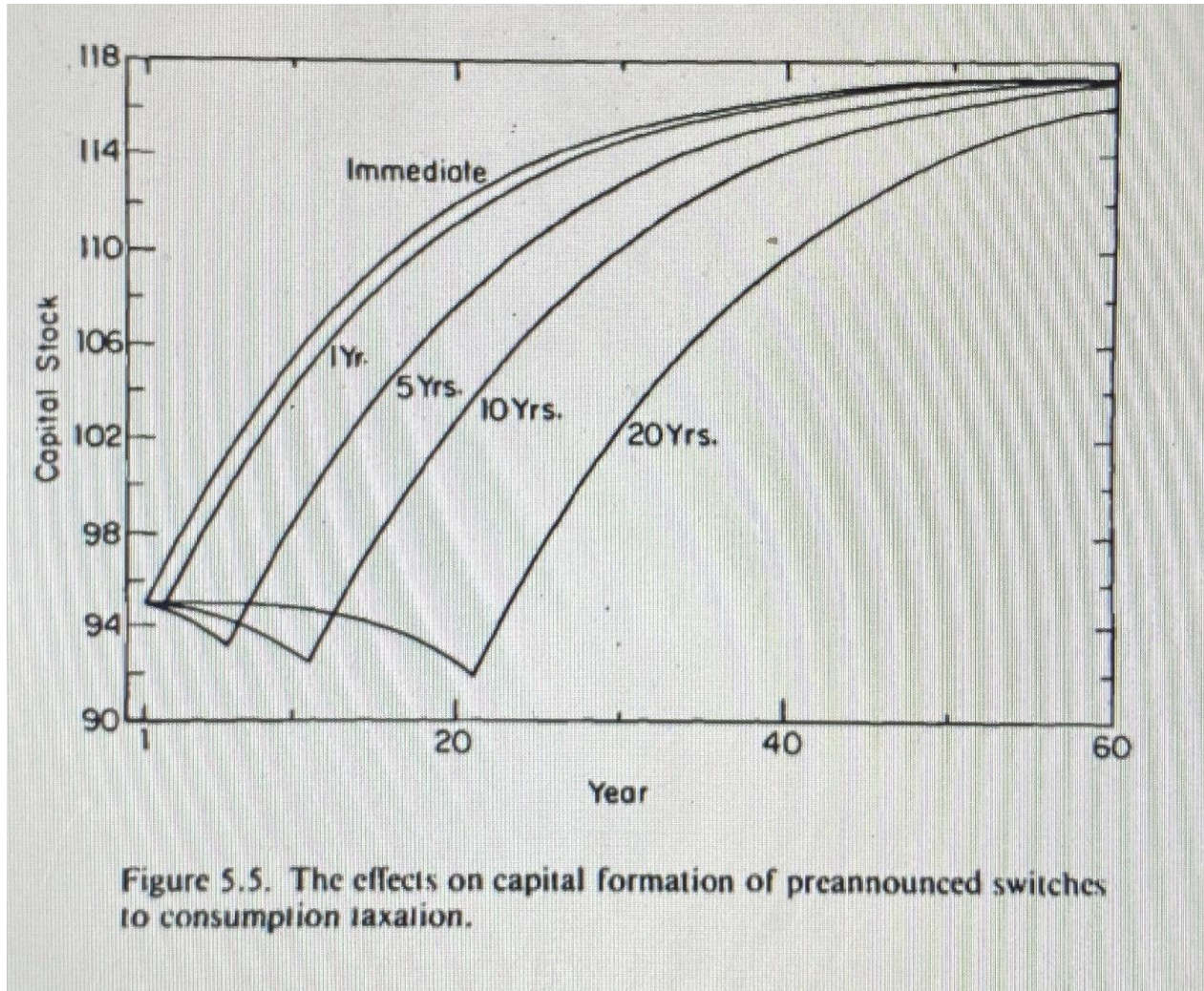


[Figure 5]
 The impact on capital formation of tax returns
 Source: *Dynamic Fiscal Policy* (Auerbach & Kotlikoff, Pg. 67)

Auerbach and Kotlikoff estimate that a replacement of the income tax with a flat consumption tax would raise the ratio of capital stock to GDP from 5.0 to 6.2,²⁰ which would have amounted to a 5.9 trillion increase in the capital stock in 1987 dollars. The precision of that estimate may not be applicable in 2020, but a consumption tax provides the best tax base for growth in capital stock, as illustrated by Figure 5. Auerbach and Kotlikoff demonstrate that a consumption tax provides superior capital formation compared to other tax bases. This is because of several factors provided by a consumption tax that are superior when compared to other tax bases, including 1) the highest ratio of capital to labor 2) the highest wage-rate over the long-term 3) the lowest long term interest

²⁰ Alan J., & Kotlikoff, L. J. (1987). *Dynamic fiscal policy*. Cambridge University Press.

rates (pre-tax) and 4) the highest national savings rate throughout all periods of time.



[Figure 6]

The effects of preannounced switched to consumption taxation
Source: *Dynamic Fiscal Policy* (Auerbach & Kotlikoff, Pg. 83)

It is worth noting that the timing of announcement is critical when making a transition to a consumption tax. Figure 6 depicts the consequence of announcing a switch to a consumption tax base. This proposed VAT would best generate the highest degree of capital stock if it were announced in the year immediately before it were to take effect, in order to reduce the initial loss incurred due to the expected spike in consumption between the announcement of the tax and its institution. This VAT effectively isolates consumption as its tax base while removing the income,

wage, and capital income tax bases. It would better position the U.S. capital stock to experience higher levels of growth over the short-run and long term horizon. In addition, the expanded degree of capital available for production would grow the U.S. economy over the long term.


4.2 Wages and Labor

The repeal of the income and payroll tax would at first seem to indicate a massive increase in disposable income for individual workers. However, since wages constitute the principal component of the value added to goods at each stage of production, it would be erroneous to deduct wages from a VAT as is presently the situation under the corporate income tax. The VAT system proposed here does not have a component for individual filing. Rather, the business absorbs the VAT and is the sole provider of revenue to the government. However, while businesses fund the government, individuals and firms pay the tax through purchasing consumable goods, and workers are automatically taxed through a VAT on their wage to account for the value added. This mechanism differs from the Hall-Rabushka tax referenced throughout this paper, which has an individual filing component but only imposes the VAT on wages exceeding an exemption for individual filers. While both plans tax consumption, the VAT of this paper chooses to keep the VAT at the business level to simplify the collection and reporting of the VAT and to save workers a significant degree of time. The benefit of the Hall-Rabushka plan is that it incentivizes work for most economically active individuals²¹ by ensuring both the VAT and individual rate are low. The consequence of having only one uniform VAT is that there are no opportunities for exemptions. This means that whether or not there is an incentive to work depends on the rate of the VAT; if it is low enough to where the individual has more after tax income due to the removal of the income and payroll tax than before, then the individual has an incentive to work. If the VAT rate depresses

²¹ Hall, R., & Rabushka, A. (2007). The flat tax (Pg. 128).

wages to an extent where after tax income is not higher than under the current system, then the individual will not be incentivized to work that particular salaried occupation. This is the major concern: that a VAT will adversely tighten the labor supply. However, this would only occur if the VAT were set at a high enough rate. The actual shift to a VAT system does not inherently cause labor supply to tighten.

TABLE B1
Compensation in the Cruz Plan



	Middle-income		High-income	
	Current law (\$)	Cruz plan (\$)	Current law (\$)	Cruz plan (\$)
1. Total compensation	43,060	43,060	210,247	210,247
2. Employer payroll tax	3,060	0	10,247	0
3. Value-added tax	0	6,890	0	33,640
4. Cash wage	40,000	36,170	200,000	176,607
5. Employee payroll tax	3,060	0	10,247	0
6. Take home pay (before income tax)	36,940	36,170	189,753	176,607
7. Income tax	3,993	2,217	46,207	16,261
8. After-tax income	32,947	33,953	143,546	160,347

Source: Urban-Brookings Tax Policy Center calculations.
Note: Calculations are based on 2015 tax law for a single taxpayer with only wage income that takes the standard deduction. After-tax income is total compensation less payroll taxes, value-added tax, and individual income tax.

[Figure 7]
Compensation in the Cruz Plan
Source: Urban-Brookings Tax Policy Center

This discussion is best illustrated by the analysis of Senator Ted Cruz’s 2016 Tax Plan, which proposed a 16 percent business flat tax that functioned as a VAT.²² However, the plan did not repeal the current tax system. Whereas the Hall-Rabushka proposal effectively levied a two part value-added tax that would replace the current tax system, the Cruz proposal keeps the current individual income tax and applies a VAT at the firm level while eliminating the payroll tax and corporate income tax (with the exception of a 10 percent repatriation tax on foreign subsidiaries).

²² Rosenberg, J. R., Burman, L. B., Nunns, J. N., & Berger, D. B. (2016, February). AN ANALYSIS OF TED CRUZ’S TAX PLAN. Urban-Brookings Tax Policy Center.

The VAT proposal of this paper replaces the current tax system with a singular broad-based VAT applied at a flat rate on the firm level. Analyzing Figure 7, it is apparent that the profit of the worker is merely due to the cuts in payroll and individual income being greater than the additional VAT.

It is tough to make a prediction of the definite effect on wages and labor supply, because the most important factor is the actual level of taxation. The action of eliminating the payroll tax could be offset by a VAT affecting wages. However, the repeal of the individual income tax does encourage work because gross income from all sources is now eliminated from the tax base, so even if a salaried position is less profitable due to a high VAT rate, productive endeavors are still encouraged because no income tax is levied on that labor and income not relating to salaried positions.

5 Drawbacks of a VAT and Potential Solutions

While a VAT tax mechanism would provide an efficient, simple method of raising revenue, there are some clear drawbacks in instituting a value added tax. There is the issue of aggregate demand initially declining, the distributional effect of such a consumption tax with no exemptions for necessities, and the potential for increasing government revenue with greater ease; these have all been cited as arguments against a VAT system. However, there are reasonable measures that could satisfy these concerns and avoid the adverse ramifications that these arguments propose would occur.

5.1 Decline in Aggregate Demand and Tax Distribution

The most striking negative consequence of a VAT is the initial drop in consumption spending that reduces demand for goods and services. This is a fair rebuttal of a VAT, since the stated intent of a VAT is to increase GDP in the long run by taxing consumption, yet there is a short-run decrease

in potential GDP. Even if the VAT is rational due to the long run position of the economy being far better, the short term adjustment will cause a visible shift in economic activity. Greater amounts of savings and less consumption initially means that there is the potential for a brief economic contraction resulting from the initial dip in aggregate demand.

Another key consideration is that lower income individuals would not stand to benefit initially, as many pay either zero or low rates on income taxes. In addition, the uniform, regressive nature of the VAT causes these lower income individuals to be disadvantaged due to their propensity to consume being higher than individuals with more disposable income. Long-run benefits such as greater wealth due to high saving rates might fall disproportionately toward higher-income individuals since the price of necessities such as food, medicine, and apparel will increase. Lower income populations, constrained by less disposable income, have to consume these items out of necessity, so the positive effects of a higher propensity to save encouraging more investment will not be as salient as it would in populations with higher levels of disposable income.

5.2 Universal Basic Income

A solution to both issues is provided by William Gale²³ who argues for a universal basic income (UBI) to assist low income families in his proposal for a progressive VAT. However, there is no reason this plan would be ineffective in a regressive uniform VAT like the one proposed in this paper. In addition, the greater level of government expenditure would boost aggregate demand, and in the most effective way too. Since every individual would be receiving the government expenditure it is unlikely certain industries or communities would be neglected in the stabilization of aggregate demand. Another benefit of this approach is that it allows the markets to function efficiently and not be distorted by varying degrees of taxation on specific products (e.g. zero VAT

²³ Gale, W. G. (2019). Raising Revenue with a Progressive Value-Added Tax (Pg. 43-87).

on food or produce) and seeks to solve the issue through a universal social program. However, the U.S. already has a gigantic welfare system in place, with Social Security being the largest expenditure of the U.S. government. To be clear, this proposal is only considering universal basic income in the context of this specific challenge in implementing a VAT, not as a standalone policy proposal to add or replace the current U.S. welfare system.

One way in which a UBI could work to correct the initial hike in aggregate demand is to instill a temporary payment program, similar to the Economic Impact Payments administered under the CARES Act of 2020.²⁴ This would boost aggregate demand by stimulating the economy and thus counter the initial decline in aggregate demand caused by the decrease in consumption spending. However, this likely would result in a high deficit since this plan adds these payments on top of the current entitlement expenditures. The marginal benefit of receiving a universal basic income is greater for an individual with an annual salary of \$20,000 than it is for a person making \$100,000 per year. Even if the set amount of payments is equivalent for every citizen, the utility is greater for lower income populations and thus would counteract the regressive nature of the VAT. The benefit of this solution is that it would provide a one-time payment to cover the adjustment to the new tax system, but prices would still be higher after the shift has occurred and lower income individuals would still not benefit from the reduced incentive to consume.

Another method is a permanent UBI, structured in a manner that gives individuals the choice to enter the universal basic income program but forego their entitlement towards social security. This system would give a universal basic income to anyone 18-65 years old, and those who choose to opt into it would forego their right to social security. This would ideally phase out social security and have the UBI structure replace the social security structure of deferred payments. The time

²⁴ CARES Act, Division B, Title I; Division C, Title I, 116th Congress Cong.

value of money principle²⁵ makes UBI more attractive since it provides immediate disposable income to individuals. The social security trust fund and current revenue sources would sustain social security while its unfunded obligations decrease over time. As unfunded obligations for social security decrease, the expenditures for UBI would increase, effectively shifting any increase in cost from the addition of a new social program out over time until UBI replaces social security in the long term. The benefit of this approach is that if many people chose to enroll in the UBI, they would effectively counter the initial decrease in aggregate demand as in the former example. However, a continuous UBI would ensure that lower income individuals are able to benefit from a new tax system that places a higher expense on goods that are basic necessities, by allowing them to have a consistently greater stream of disposable income than before this shift.

It is worth noting that none of these solutions imply that there will be a deficit, as the government could set taxes, expenditures, and entitlement benefits at a level that ensures budget neutrality. Furthermore, a common practice in value-added taxation is exempting food and necessities from being taxed.²⁶ However, this creates a major artificial incentive towards a particular sector, which would limit the efficient flow of capital.²⁷ This also presents a severe limitation on government revenue in the U.S., since agriculture and food accounted for roughly 5.4 percent of GDP in 2017, amounting to \$1.053 trillion.²⁸

²⁵ Time Value of Money is the idea that the benefit is greater when one receives a certain amount of money immediately rather than the same amount of money at a later time.

²⁶ OECD (2018), Consumption Tax Trends 2018: VAT/GST and Excise Rates, Trends, and Policy.

²⁷ Smith, A., & Cannan, E. (1994). An inquiry into the nature and causes of the wealth of nations. New York: Modern Libr.

²⁸ USDA. (2020). Ag and food sectors and the economy.

5.3 Government Revenue

The VAT is an efficient tax that allows policymakers ease in raising or lowering revenue. However, David Henderson notes that every European nation that established a VAT with a goal of revenue neutrality has ended up increasing the percent of government spending as a part of GDP.²⁹ He offers that a VAT would need to be highly visible so as to minimize the risk of government increasing revenue substantially. However, if the tax is promoted to be highly visible, it could disincentivize policymakers from passing the tax (Canada's government was ousted after they introduced a national consumption tax in 1991 by making it highly visible).

The best solution that would ensure a VAT does not raise excess revenue and grow the size of government to an unreasonable level would be to enact a balanced budget amendment, but provide flexibility in times of recession, pandemic, national emergency, or other scenarios where the government would need to finance their endeavors with a sudden increase in the tax.

²⁹ Should the U.S. adopt a value-added tax? Wall Street Journal (2016).

6 Conclusion

Value-added taxation would provide a powerful incentive for individuals and firms in the U.S. to work, save, and invest. This would manifest into an increase in both the capital stock and the available capital for businesses to deploy. The repeal of the individual income and payroll tax should ensure American workers take home a greater after-tax income, however the reduction in real wages could cause labor supply to decrease; the higher the VAT rate, the greater the reduction in wages and labor supply. Nonetheless, if the VAT rate is low enough to ensure a greater after-tax income for U.S. workers than the current system, then the incentive to work will remain and could boost labor productivity in the long run.

The effect on real GDP growth is positive regardless of the VAT level, even in a situation with capital growing and labor supply shrinking. This is because firms would be able to utilize the most efficient combination of capital and labor due to the VAT not affecting the relative price of each. Shifting the tax base from production to consumption in this manner both provides more resources for production and has the potential to increase the amount of work being conducted on those resources, but also critically allows firms to determine the optimal balance of those two factors to realize their maximum efficiency.

This new system would greatly simplify the tax code and ensure the government has a greater degree of flexibility in its execution of fiscal policy. Since there would be only one tax rate and one type of tax, the act of raising or decreasing revenue would be easier for lawmakers. A VAT will also better contribute to a stabilized economy by ensuring a more consistent revenue stream less dependent on the business conditions of the time.

A flat, broad-based VAT is a simple, efficient tax mechanism that could provide a better revenue source for achieving higher levels of economic growth³⁰ in the United States.

³⁰ Appendix B elaborates on this paper's interpretation of economic growth.

7 Recommendations for Future Research

This paper has focused primarily on the mechanism of a VAT and the implications of introducing the tax system as a replacement for the current taxes employed by the U.S. It did not focus on such issues as the VAT rate levied on the population or the particular response from lawmakers to this change in the tax base.

Perhaps the most critical factor for determining the effect of tax policy on economic growth is the level of taxation. Further research should identify the precise rate that this VAT would need to be set at to match current federal revenue projections. It would also be beneficial to take this several steps further and determine the rate required to (1) achieve enough revenue to be budget neutral and (2) collect a sufficient surplus of revenue to pay down a set portion of the national debt (e.g. determine the VAT rate needed to stabilize debt as a percentage of GDP to 100% by 2030).

Another area for future scholarship is the determination of best practices in making the VAT visible to consumers and businesses so that individuals are better informed of the price they pay for their consumer goods. As economist David Henderson notes, ensuring a VAT is highly visible is crucial so that the buyer can be aware of how big the tax is, but a government that adopts a transparent VAT is likely to be defeated.³¹ Determining a manner in which the efficiency and integrity of a VAT system are ensured while making the tax highly visible would be an excellent progression in this area of scholarship.

A consistent trend noted among nations that adopt some type of VAT are that their revenue and spending rise as a percent of their GDP. However, none of these countries rely solely on a VAT. Assessing whether or not it is likely for this situation to be replicated in the U.S. would shed light

³¹ Should the U.S. adopt a value-added tax? Wall Street Journal (2016).

on circumstances beyond the transition of the tax base from production to consumption. The level of revenue is determined by the policymakers of a given country, but if this effect were to just as likely occur in the U.S. if it adopted a VAT as its sole revenue provider then it would better inform the discussion on whether to move forward with the proposal considered in this paper.

Finally, a key area of scholarship that would contribute toward the future of VAT implementation is the optimal way to actually administer a VAT to ensure efficient collection of revenue and adequate compliance among firms. The timing of VAT collection could create issues within firm decision-making regarding the time value of money, particularly if the U.S. were to allow deferment on payments for particular circumstances. In addition, the actual collection of revenue could be done voluntarily through businesses determining how much they owe or the government determining the required amount for firms. The former puts less strain on administrative costs at the expense of firms' spending time or resources to determine how much they ought to pay, and the latter would alleviate concerns over compliance. Determining the optimal time and frequency of collection as well as the best way to ensure firm compliance would bring useful insights into how the U.S. could establish a VAT if it decides to transition to this new system.

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Appendix A: Value Added Tax Diagram and Aggregate Demand

Table 1
Production Of A Textbook With The Application Of A 10% VAT Rate

ENTITY	(1) Purchase Cost	(2) VAT Paid $(1) \times 10\%$	(3) Sale (Transfer) Price	(4) VAT Collected $(3) \times 10\%$	(5) Value Added $(3) - (1)$	Tax Remitted to Government $(4) - (2)$, or $(5) \times 10\%$
Timber Producer	—	—	\$ 5.00	\$ 0.50	\$ 5.00	\$ 0.50
Paper Producer	\$ 5.00	\$ 0.50	8.00	0.80	3.00	0.30
Printer	8.00	0.80	15.00	1.50	7.00	0.70
Binder	15.00	1.50	20.00	2.00	5.00	0.50
Publisher/Distributor	20.00	2.00	24.00	2.40	4.00	0.40
Bookstore	24.00	2.40	30.00	3.00	6.00	0.60
Student	30.00	3.00	—	—	—	—
TOTAL					<u>\$30.00</u>	<u>\$ 3.00</u>

→ The consumer (student) pays a total of \$33.00 for the textbook.

Production of a Textbook with The Application of a 10% VAT Rate
Source: A Value-Added Tax In The U.S.: An Argument In Favor (Hooper & Smith, Table 1)

This diagram provides a more thorough numerical depiction of a value added tax. As illustrated, a VAT isolates the value-added at each stage of production and collects a rate off of that base. The net result is a tax that is levied purely on consumption. The real price of each item is automatically increased by the VAT rate. The textbook which was \$30 is now \$33 with a 10 percent VAT.

Aggregate demand can be defined as the total demand for final goods and services in an economy at a given time. Since this change is sudden, there will likely be a brief hike in aggregate demand due to a spike in consumption between the announcement of the switch to a consumption tax and its actual implementation. The rise in price level throughout this period will lead to a higher degree of inflation in the short run. However, once the tax goes into effect the price level of goods and services will remain fixed. This is because all firms in all markets are experiencing a VAT tax, and so all consumption will be more expensive which means that all firms will experience a near term rise in the real price of their products. This will reduce the quantity of output in aggregate demand

and lower real gross domestic product as the quantity demanded is reduced in the near term. However, this rise in inflation will only occur once and prices will not continue to rise after the transition has been made. Efforts to boost consumption through non-tax means, such as a universal basic income, would contribute positively to negating the reduced aggregate demand in the near term.

Appendix B: Economic Growth and Key Terminology.

Economic Growth can be defined as an economy possessing a greater capacity to produce goods and services. This paper views economic growth as being measured by the rate of growth in real gross domestic product. Nobel Prize winning economist Paul Romer illustrates economic growth through the following metaphor from the *Concise Encyclopedia of Economics*:

“A useful metaphor for production in an economy comes from the kitchen. To create valuable final products, we mix inexpensive ingredients together according to a recipe. The cooking one can do is limited by the supply of ingredients, and most cooking in the economy produces undesirable side effects. If economic growth could be achieved only by doing more and more of the same kind of cooking, we would eventually run out of raw materials and suffer from unacceptable levels of pollution and nuisance. Human history teaches us, however, that economic growth springs from better recipes, not just from more cooking”

This paper determines that a VAT system of taxation would allow the U.S. to achieve higher levels of economic growth by augmenting the amount of resources through greater capital formation (providing more ingredients) and allowing individuals and firms to make better decisions regarding capital and labor (better combinations of ingredients that allow for new recipes or more of the desired combinations to be produced efficiently).

Capital was first given an economic meaning in Adam Smith’s *The Wealth of Nations*, which referred to capital as “stock”, from which improvements could be made to that stock to realize revenue. Capital has similar meanings in different business settings, but for the purpose of this paper, capital refers to privately owned resources or funds which owners can deploy in order to

earn income or generate profit. **Capital Stock** refers to durable goods or any non-financial asset that works for the production of goods and services.

Gross domestic product (GDP) refers to the market value of all final goods and services produced in an economy. **Real GDP** is adjusted for inflation.

Inflation is a rise in price level relative to available goods that leads to a substantial and continuing drop in purchasing power in an economy.