*Robert F. van Brederode**

VAT's Regressivity: Empirical Truth or Political Correctness

The assumption that VAT is a regressive tax has had an immediate effect on the design of the tax in many countries and dominates policy debate when its introduction is under discussion. This article's starting point is the requirement that taxes must be fair. Since moral values change over time, the concept of fairness is not set in stone. Rejection of a VAT on the ground of its presumed regressive nature (unfairness) is merely a statement of political correctness, the validity of which can be empirically tested. In this article, the author examines the arguments for and against VAT's regressivity and, from a combination of perspectives, concludes that it is in fact a proportional tax.

1. Introduction

The assumption that VAT is a regressive tax has had an immediate effect on the design of the tax in many countries and dominates policy debate when its introduction is under discussion. This article's starting point is the requirement that taxes must be fair, and it investigates the evolution of that concept from its birth in natural law to today's application. Since moral values change over time, the concept of fairness is not set in stone. The statement that a progressive income tax is fair and just is merely a statement of political correctness; it is not a statement of fact. In the same sense is the rejection of a VAT on the ground of its presumed regressive nature a statement of political correctness. However, whether or not VAT is indeed regressive can be empirically tested. This article examines the arguments for and against VAT's regressivity and, from a combination of perspectives, concludes that it is in fact a proportional tax.

2. Terminology

2.1. Progressive taxes

Generally, a tax is called progressive where, as a percentage of income, the tax rises as income rises. For income taxes this means that the tax rate increases as the amount to which that rate is applied increases and, as a result, people with a higher disposable income pay a higher percentage of that income in tax than those with a lower income.

Consumption taxes, such as a VAT, do not apply the rate directly to income, but to consumptive expenditure. To my knowledge, there exists no VAT system in the world designed to be progressive. The only way to make a VAT progressive is by rate variation. Theoretically, a VAT would be progressive where the tax rate on a certain good or service would vary with the customer's income. In other words, higher income groups would pay a higher tax rate than lower income groups on the purchase of the same goods or services. Clearly, from a practical perspective, the implementation of such a system would be extremely difficult, if not, in fact, impossible. To some extent, progression can be built into a VAT system through rate variation, by applying reduced rates to categories of goods and services predominantly procured by lower-income groups, and by applying increased rates to categories of goods and services presumably favoured by the better off (see, however, my remarks in 6.3.).

Progressive taxes reduce the tax incidence for people with lower incomes, as they shift it disproportionately to those with higher incomes.

2.2. Proportional taxes

A tax is called proportional where, as a percentage of income, the tax rate is constant at all income levels. However, as Jeremiah Bentham has pointed out, even under those circumstances, there is still progression in the sense that those who earn twice as much as others pay twice as much in taxes, etc.

Proportional or flat taxes were commonly levied during the 19th century and are recently making a strong comeback. Flat taxes have been adopted in Estonia, Lithuania, Latvia, Russia, Serbia, Ukraine, the Slovak Republic, Georgia, and Romania. In the United States, whilst the federal income tax is progressive, five states (Illinois, Indiana, Massachusetts, Michigan and Pennsylvania) apply a single-rate tax to household incomes.

2.3. Regressive taxes

A tax is called regressive where, as a percentage of income, the tax falls as income rises. For income taxes, this means that the tax rate decreases as the amount to which that rate is applied increases. In relation to consumption taxes, regression means that the ratio of consumption to income falls when moving up the income scale, as does the ratio of tax burden to income. The tax incidence rests disproportionately on those with lower incomes.

* **Retired professor of Tax Law at Erasmus University Rotterdam and (former) partner of PricewaterhouseCoopers.**

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3. Philosophical Perspective: Progressive v. Regressive Taxes

As to the justification of taxation, there exists general consensus that every member of society must somehow contribute to its common costs. There also exists general consensus that taxation should be fair. The definition of "fair" is less clear and the interpretation of that concept probably varies from person to person and from time to time. Nevertheless, it seems correct to state that fairness must be interpreted relative to the extent a person derives benefits from society, relative to his wealth, and relative to what others contribute. By writing this down, I am already making a moral statement, and it is important to realize that moral statements are not absolute but, indeed, relative, and that morality and concepts of justice and equality are conceived differently between cultures and over time.

When absolute power of the ruler was the norm in Europe, the idea that taxation should be based on fairness was considered absurd. In those days, the king, at his discretion, would tax whenever, whatever and whomever he pleased. Only in the 18th century, during the Age of Enlightenment, were ideas of fairness in taxation postulated. In England, Adam Smith laid down his concept of fairness in four canons, the first of which stated that taxes are fair when the tax burden is universal and applies equally to all in society.[1] Smith's ideas on fairness, including the notion that the equal must be treated equally and, as a consequence, the unequal must be treated unequally in proportion to their individual inequality, became an ethical guideline for the next century.[2] Based on the idea of a contract between the individuals and the state[3], all subjects ought to contribute in proportion to the revenue they respectively enjoyed under the protection of the state. In France, Montesquieu and, later, Rousseau came to similar conclusions, but they were opposed to proportional taxation arguing that income should be exempt from taxation insofar as it is needed to cover the minimum cost of living, and that excess income should be taxed higher.[4]

John Stuart Mill and, later, Edwin Seligman argued strongly that the quid pro quo approach of Smith is indefensible because it is impossible to accurately measure the benefits individual members of society derive from the activities of the government.[5]

In the 19th century, taxation was no longer seen as payment for state protection, but as a personal sacrifice for the totality of benefits the state generated for society as a whole and, therefore, was unrelated to, by whatever measure, the personal advantages individuals derived from the same governmental activity. Where, under the social contract theory, a proportional tax seems to be adequate, this more abstract view ultimately leads to taxation based on the ability to pay. Since the latter will depend on many factors, such as income, savings, family size, cost for health care, etc., it is basically impossible to exactly measure the ability to pay in individual cases. Another problem is to determine a fair rate of taxation. A progressive tax rate seemed acceptable on the basis of the economic theory of diminishing marginal utility.[6] This means that, in relation to income, additional monetary units offer the receiver reduced utility. In simple words, the more money you earn, the less value it has. An extra 50,000 means a lot when you earn 100,000 a year (person A) but, where you earn 5 million (person B), an additional 50,000 does not really make much difference. From that perspective, a tax dollar paid has a different impact on persons whose incomes are significantly different. Under the diminishing marginal utility approach, a fair distribution of the common cost of society means that individuals should make a financial sacrifice that is comparatively the same at different income levels. In terms of utility, every subject contributes the same to the common cost, which principle will then have to be translated into monetary units at the individual level. Since for person B a dollar has less utility than for person A, B should pay in accordance with a rate of progression which corresponds to the diminishing utility of his earnings. The concept of the ability to pay, in this sense, also serves the objective of ensuring economic neutrality in taxation.

However, economics are not an exact science, and where the ability to pay cannot be measured at the individual level, the same is true for the concept of utility. Everybody's situation is different and, therefore, individual utility curves[7] will be divergent as well. Even where two individuals have the same income and their circumstances are otherwise identical, i.e. under ceteris paribus conditions, their utility curves may be different because utility is not just an economic, but also a psychological phenomenon. For example, someone who employs his wealth for charitable purposes may gain the psychological satisfaction of doing good, which, clearly, cannot be measured, neither in terms of utility nor in monetary units.

Where the concepts of ability to pay and marginal utility, in abstracto, seem to have a sound theoretical foundation, as indicated before, they do not have much practical value.[8] Therefore, these concepts are, in essence, use-

1. Adam Smith, *Inquiry into the Nature and Causes of the Wealth of Nations*, (first published 1776; The Modern Library, New York: 1937), p. 777.
2. It should however be noted that Smith based his conclusions on an economic approach to taxation and never spoke of "Equity" or "Justice".
3. A legal theory supported by the leading philosophers of the 17th and 18th centuries, including Thomas Hobbes (1588-1679), Hugo Grotius (1553-1645), John Locke (1632-1704) and Jean Jacques Rousseau (1712-1778).
4. Montesquieu, *De l'Esprit des Lois* (1748) and Jean Jacques Rousseau, *Discours sur l'Economie Politique* (1755).
5. John Stuart Mill, *Principles of Political Economy* (1848), p. 485 and Edwin R. A. Seligman, *Progressive Taxation in Theory and Practice* (1908), p. 717.
6. Hermann Heinrich Gossen, *Die Entwicklung der Gesetze des menschlichen Verkehrs und der daraus fließenden Regeln für menschliches Handeln* (The Development of the Laws of Human Intercourse and the Consequent Rules of Human Action) (1854) was the first to elaborate on this theory. His work was largely ignored, but rediscovered in the year 1870 by William Stanley Jevons, who, together with Leon Walras and Carl Menger, reintroduced and built on this theory.
7. A graph expressing the relationship between income and utility of the last-earned monetary unit.
8. Also: J.F Due, *Government Finance* (1977), p. 372: "the concept of ability has no clearly defined universally accepted meaning or measure".

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less to us. That gives rise to the question of why we still have progressive income taxes in the Western world, and why they have such a strong support.

At the end of the 19th century, Adolph Wagner was the founding father of an approach, which is still applied today, that included the use of taxation for social policy, including redistribution of income and wealth.[9] With John Keynes, a strong and influential interest emerged in using taxation as an instrument of economic cyclical policy,[10] which meant that tax revenue and tax rates must depend on the economic conditions. Today's income tax structure is based on a combination of the aforementioned approaches; in effect, taxation exists to serve a myriad of conflicting and contradicting functions. Redistribution of income conflicts directly and essentially with the tax neutrality of the utilitarian model. Under the (post-)Keynesian theory, taxation is primarily an instrument in realizing economic policy goals; on the other hand, the principles of fair tax distribution approach taxation from the perspective of the individual contributor.

Nevertheless, in public opinion and political debate, the argument is still made that a progressive income tax is fair because it is based on the ability-to-pay principle. In my view, that argument is partly based on the apparent misconception that a progressive tax, whose objective it is to realize redistribution of income, is in fact a tax based on the ability to pay; for another part, I am afraid, the argument must be attributed to the short-term benefit of simplistic rhetoric. The misconception has proved to be persistent. In 1999, the Dutch Labour Party held a conference on a new tax system for the 21st century based on the premises of ability-to-pay[11] and redistribution of income, unaware that those two objectives are in essence irreconcilable. The notion that a progressive income tax is fair because it is presumably based on the ability-to-pay principle has become part of the public domain. Everybody seems to accept this as an unalienable truth to the extent that it has become an almost religious dogma, not open to discussion or challenge. Where a progressive tax is considered to be fair, a regressive tax is consequently perceived to be unfair. This has become a generally accepted idea, as demonstrated by an episode of the television drama series "The West Wing", in which the character of Deputy Chief of Staff makes the angry remark that a VAT is wrong because it is regressive, which means that poor people pay more than rich people.

Simplicity creates powerful rhetoric but should not be confused with empirical truth. However, perceived truth is what really matters. A certain degree of social acceptance of a tax is essential for its successful implementation. With fairness being a requirement for acceptable taxation, an element of morality has been introduced into the political and public debate. Where progressive taxes are perceived as being morally correct, regressive taxes are seen as unacceptable, even as immoral. Naturally, politicians are sensitive to the sentiments of their constituents. Obviously, from a political perspective, it is difficult to propose the introduction of a tax that in the public mindset is morally inferior: all the more reason to offer nuances and new perspectives, and to test empirically what is perceived as truth, in order to develop an environment in which tax reforms can be discussed properly, i.e. on the basis of facts, not emotions and political correctness.

4. Regressivity in the Political Debate

It is essential to establish whether or not and, if so, to what extent, a VAT is regressive because it determines the validity of the arguments for and against in policy debates on the introduction of that tax. The presumed regressivity of a VAT is used as a supporting argument by those who are opposed to its introduction, for example, in the United States. Because of its regressivity, a VAT is conceived to be unfair and its introduction is even seen as a roadblock on the way to social justice. In fact, the VAT's regressivity has become an axiom elevated beyond proper discussion, at least in policy circles, and probably also in the public's mind.

In countries that already apply a VAT, reduced rates applicable to essential goods and/or increased rates on luxury items have been introduced as measures to reduce or neutralize the regressive effect of the tax. Several authors and politicians even suggest that introduction of a VAT should be accompanied by an increase of the progressivity in personal income tax in order to offset the regressive effects of the VAT.[12] In the preceding section, I have discussed the element of political correctness in qualifying taxes as "progressive" or "regressive", and the effect of such qualifications on the public's acceptance of a tax as fair, or rejection as unfair. A serious debate on the introduction of VAT should however be based on facts, not myths, and for that reason it is important to establish whether or not, and if so, to what extent, the VAT is regressive. It does not seem to make any sense to reject a VAT for the wrong reasons, nor can it be wise to make a VAT unnecessarily complicated and more costly in terms of administrative and compliance costs on the basis of an incorrect premise.

5. The Argument for VAT Being Regressive

In economic studies, the impact of a tax, or the tax burden, is generally measured relative to income. Where low-income groups spend a relatively larger part of their income on consumption than higher-income groups, they consequently pay more consumption tax (VAT) relative to their income.

When a tax is levied on specific goods or services, the regressivity of the tax would depend on the taxpayers'

9. Adolph D. Wagner, *Finanzwißenschaft*, Volume 2 (Leipzig/Neurenberg: 1880), p. 288.
10. John Maynard Keynes, *The general Theory of Employment, Interest and Money* (London: 1936).
11. "*De sterkste schouders moeten de zwaarste lasten dragen*" (The heaviest loads should rest on the strongest shoulders).
12. Not only by applying higher top rates, but also by applying higher rates to low-income brackets.

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propensity to engage in the taxed activity or transactions relative to their income. In other words, where goods and services subject to the tax are predominantly purchased by the poor and to a lesser extent by the rich, the tax would be labelled as "regressive".

A VAT on food and other essentials can be regressive. Since the income elasticity of food is usually less than 1,[13] expenditure on food tends to take up a higher percentage of the budget of persons or families with a lower income as compared to persons or families with a higher income.

To determine whether or not a consumption tax is regressive, the income elasticity of the goods and services[14] being taxed, as well as possible income substitution[15] effects must be considered.

The regressive nature of VAT can be illustrated by means of the following highly simplified example. Person A earns an income of 10,000 and person B's income is 5,000. Both A and B pay a tax of 1,000 on their purchases. Consequently, the effective tax rate is 20% for B and 10% for A. Thus, a tax that is fixed to the value of the good/service (disregarding exemptions or rebates) would be likely to result in a higher rate of taxation on people with less purchasing power. Hence, a VAT is in effect regressive. In this simple model, regressivity is measured on an annual basis and, as a result, an economic unit is supposed to be captured within a certain income category; the level of consumption is assumed to be stable irrespective of income, and savings are not subject to the tax.

6. Preliminary Remarks

Before taking a closer look at, and making an analysis of the validity of, the argument presented above in what I will refer to as the regressive model, the following should be borne in mind before VAT is rejected as being a regressive and unfair tax.

6.1. The effect of regressivity is relative

A regressive tax system does not mean that low-income earners pay more taxes than the wealthy, and that will probably not be the case. It only means that the effective tax rate relative to income constitutes a heavier tax burden on low-income earners as compared to high-income earners. For VAT, regressivity means that low-income groups pay a larger percentage of their income in VAT. In absolute terms, they may pay less tax. For example, a low-income family earns 30,000 (after income tax) per annum and spends 8,000 on the home mortgage, leaving the family a disposable income of 22,000. With two children, a cat and a dog, they spend it all on consumptive expenditure. At a tax rate of 6%, the family pays 1,320 in tax. A middle-income family of a similar size earning 60,000, paying 20,000 on the mortgage, and saving 5,000 pays a total of 2,100 in tax, which is 5.25% of its disposable income. Finally, a third family earning 150,000, paying 40,000 on its mortgage and saving 30,000, pays 4,800 in taxes, which is 4.36% of its disposable income.

Although the two families with the higher income pay less as a percentage of their respective disposable incomes, in absolute terms, they pay a higher amount of tax than the low-income family.

6.2. VAT is just one tax in a tax system

Even if VAT were a regressive tax, that would not necessarily lead to the conclusion that the tax is unfair. It would only be unfair if it were the only tax levied in a country. In reality, however, every country levies multiple taxes, some of which are progressive, others proportional, and a third category possibly regressive, and those characteristics may even vary in respect of individual taxes. For the purpose of assessing the fairness of a tax, its effects should not be considered in isolation. Instead, the total effect of the entire tax system should determine whether or not the tax burden is distributed equally amongst all members of society. To make the matter more complicated, grants and subsidies, child support and other payment individuals receive from the state and which, in effect, offset part of the tax burden, should also be taken into account.

6.3. Counter measures

Proponents of VAT often point out that the regressive effect of VAT can be mitigated by applying exemptions and reduced rates to goods and services primarily procured by low-income families, and by applying increased rates to luxury items supposedly favoured by high-income consumers. Theoretically, this proposition is correct. However, in practice, the situation is more complex.

Multiple rates lead to classification problems as regards goods and services on the dividing line of definition, they violate the principle of economic neutrality in that final consumers may substitute standard-rated goods and services for those subject to a reduced rate, and they may result in a significant increase of the compliance costs for businesses and administrative costs for the government. Moreover, it is not so simple to determine which goods and services are predominantly acquired by the relative poor and which by the better off. Consumption patterns of high and low-income categories tend to converge and, as a result, the impact of rate variations is much less than expected. Apart from that, it should be borne in mind that reduced rates aimed at benefiting low-income groups also benefit high-income groups and, sometimes even to a greater extent. In many countries, public transportation is exempt from tax or subject to a reduced tax rate under the apparent assumption that low-income households make regularly use of

13. An income elasticity of less than 1 means that, where income increases by 10%, expenditure on the goods or services in question increases by less than 10%.
14. The percentage change of demand for specific goods or services (δC) relative to a percentage change of income (δY), i.e. the income elasticity of the goods and services is $\delta C/\delta Y$.
15. The extent to which demand for specific goods and services is substituted by demand for other goods and services as income changes.

it. However, commuters from the suburbs taking the train or subway to the city or financial centre derive the same benefit from that reduced rate. In addition, research shows that expenditure on certain reduced-rated goods and services, as a percentage of total expenditure, increases as family income increases.[16] Irish research shows that, in absolute terms, the rich spend twice as much on food as compared to the poor because they purchase more expensive varieties, go to restaurants more frequently, and are more likely to throw away food.[17] As a result, zero rating food in Ireland provides the better off with twice as much tax relief as compared to low-income groups.

In conclusion, VAT's regression can theoretically be reduced or mitigated by exemptions and rate variances but, in practice, it is impossible to apply those measures efficiently due to many factors that are unknown or cannot be sufficiently quantified, qualified, or defined; moreover, the counter measures themselves add to the complexity of the VAT system and reduce its transparency.

7. Empirical Verification of VAT's Regressivity

Let's take a closer look at the methodology and findings of the regressive model.

7.1. Level of expenditure is constant

In its most basic model, the pro-regressive argument distinguishes between, on the one hand, a low-income category, whose representatives spend their entire income (Y) on consumption (C), i.e. Y = C and, on the other hand, middle-income and high-income categories spending the same amount of money on consumptive expenditure and saving the remainder (Y = C + S; C being constant). If we take the families used as the example in 6.1. and assume that they all spend the same absolute amount on consumption, their tax burden, as a percentage of their income, is as follows.

Table 1: Tax = 6%, C = constant

Income group	Disposable income	Consumption	Saving	Taxes	Tax burden (%)
low	22,000	22,000	0	1,320	6
middle	40,000	22,000	18,000	1,320	3.3
high	110,000	22,000	88,000	1,320	1.2

The tax burden as a percentage of disposable income is by far the highest for the low-income group, and regression is rather steep: as income increases, the tax burden diminishes from 6% to 1.2%.

However, the assumption of the regressive model that consumption is a constant, can be falsified by simple observation. The fact is, that people who earn a higher income spend more money, but not necessarily all of it. Consumption is not a constant but a variable determined by long-term income perspectives. This is relevant because increased consumption is accompanied by increased taxation.

If we assume that the families in the middle and high-income groups spend an increasing amount on consumption, the regression becomes rather moderate.

Table 2: Tax = 6%, C = variable

Income group	Disposable income	Consumption	Saving	Taxes	Tax burden (%)
low	22,000	22,000	0	1,320	6
middle	40,000	35,000	5,000	2,100	5.25
high	110,000	80,000	30,000	4,800	4.36

On the basis of a more realistic assumption that consumptive expenditure varies with income, in the sense that expenditure will increase when income increases, albeit not at the same rate, a VAT remains regressive in nature, but a more nuanced picture appears, showing that VAT has a moderate regression rate.

Under an income tax, the savings in these examples would have been taxed as earned income. Under a VAT, savings remain untaxed since they are not used for consumptive expenditure. The exclusion of savings in the model has a direct influence on the degree of VAT's regressivity. A VAT is regressive to the extent that the saving ratio increases with income.

Where T is the tax rate, this is demonstrated by the following equation.[18]

16. Third Report of the Irish Commission on Taxation: Indirect Taxation (Dublin: June 1984), p. 71, regarding footwear and children's clothing.
17. Id., Appendix 9.
18. Since income (Y) is consumed (C) or saved (S), Y = C + S or C = Y – S. The total amount of consumption tax is TC, which means that $TC = T(Y - S)$. The amount of consumption tax relative to income is TC/Y. Consequently, $TC/Y = T(Y/Y - S/Y) = T(1 - S/Y)$.

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$$\frac{TC}{Y} = T\left(1 - \frac{S}{Y}\right)$$

Therefore, the aspect of savings needs further attention in order to assess the validity of the assumption that savings remain untaxed and are correctly excluded for the purpose of determining VAT's regressivity.

7.2. Savings remain untaxed

Under the regressive model, it is assumed that savings are not taxed in the present (which is true) and also remain untaxed in the future, which would imply that savings serve no purpose at all. They are deposited in a bank account and remain there merely generating interest. Clearly, that is generally not the case. People generally save money for two reasons. Firstly, they make reservations for foreseeable costs of repair or replacement of durable goods in the near or semi-distant future (automobiles, washing machines, lawnmowers, refrigerators, etc. must be replaced every so many years; homes must regularly be maintained, repaired or renovated). Secondly, savings serve the purpose of a retirement fund aimed at covering the cost of living during the retirement period. In both cases, the savings are postponed expenditures and, consequently, will be subject to the tax in the future. With the exception of top income earners, households generally consume all their savings over the lifetime.[19] That conclusion has a direct impact on the regressivity of VAT as demonstrated in Table 3 in 7.3.

7.3. Individual income levels are constant

In the regressive model, a comparison is made between income categories, regardless of the fact that their constituents may change. The basic assumption is not necessarily that the composition of income categories is static and rigid, as if – by divine predestination – people are imprisoned for life in a certain income category, but social mobility is simply ignored. By doing so, the model presents a distorted picture of reality because people generally do not remain in the same financial position all their lives and, for that reason, it seems more appropriate to assess the fairness of an individual's tax burden over his whole life span and not over an isolated period of time. Generally, people earn their highest income during middle age and a lower income in their youth and old age. In a cross-sectional annual analysis, low-income categories will include young and elderly people. The latter people's income may be low but they may not have had a low income during their active period and they may even be wealthy. On the other hand, people in high-income categories include persons, who are at the peak of their income; their incidental high income may not be an appropriate criterion for determining their propensity to consume.

In Table 3, the development of a family's income is followed over lifetime, under the assumption that the household's income begins when the breadwinner is 20 and ends when he reaches the age of 80, that the retirement period begins at the age of 60, and that the flow of income is not interrupted due to unemployment. In the first ten years, the family's annual disposable income is 22,000, which is entirely spent on consumptive expenditure; from age 30 to 39, annual disposable income is 40,000, of which 5,000 per year is saved; from age 40 to 49, annual disposable income is 70,000 and savings are 6,000 per year; and from age 50 to 59, annual disposable income is 110,000 and savings are 30,000 per year. At retirement, the household receives an annual income 60,000, which it supplements by withdrawing 20,000 per year from savings. The tax rate remains at 6% over the years.

Table 3: Tax = 6%

Age	Income	Consumption	Saving		Taxes	Tax burden (%)
20-29	220,000	220,000	0	0	13,200	6
30-39	400,000	350,000	50,000	0	21,000	5.25
40-49	700,000	640,000	60,000	0	38,400	5.49
50-59	1,100,000	800,000	300,000	0	48,000	4.36
60-80	1,200,000	1,600,000	0	– 400,000	96,000	8.00
total	**3,620,000**	**3,610,000**	**410,000**	**– 400,000**	**216,600**	**5.98**

Measured over ten-year periods, as income increases, the family's tax burden decreases, except for the third decennium in which savings are comparatively low. On the other hand, during retirement, the tax burden, as a percentage of disposable income, shows a sharp increase, due to the appropriation of savings for consumptive purposes. However, measured over lifetime, the tax is unmistakably proportional, if (almost) all savings are used for consumptive purposes. Since we concluded in 7.1. that, on an annual basis, a VAT's regressivity correlates with the saving ratio, this should not come as a surprise. Where all savings are eventually consumed, lifetime income (Y_t) will equal the value of lifetime consumption (C_t); in equation: $Y_t = C_t$. At a single and fixed tax rate, the lifetime tax payments, TC_t, would equal TY_t, and the average tax rate would be the same as the statutory rate T, which means that the VAT in this model is proportional.

19. Franco Modigliani, "The Role of Intergenerational Transfer and Life Cycle Saving in the Accumulation of Wealth", 2 *Journal of Economic Perspectives* 2 (1988), pp. 15-23.

Studies in the United States confirm that, measured over a lifetime, indirect taxes are only slightly regressive or even proportional.[20]

In Table 3, the very high-income groups have purposely been ignored. People in this category will have no, or very little, need to withdraw funds from their savings, and will bequeath most of their funds to their heirs.

8. The Very Poor and the Very Rich

In the examples, people close to the subsistence level as well as the extremely rich have been ignored because the fairness of a tax should not be measured by its effects on groups whose income is peripheral.

The very poor are unlikely to be able to improve their position and their social mobility is negligible. As a group, they pose to society a challenging question of justice. However, it is indeed their lack of social mobility, not the tax system, which causes the problem. That problem could be addressed through the provision of direct income support, additional education, etc. As shown in 6.3., application of reduced rates, zero rates or exemptions in VAT are not effective remedies.

The regressivity of VAT for the very poor could be mitigated by allowing them a tax credit for income tax purposes. The credit would be applied against their tax liability, if any, and where the credit exceeds the liability, the excess could be refunded ("negative" income tax). The credit could take the form of a fixed amount or, more effective in reducing regressivity, a credit that decreases as income increases. Alternatively, low-income families could be granted a stand-alone credit, which would avoid the need for filing income tax returns. Eligible households would only need to file a simple refund application form.[21] In its preferred form, this rebate would be equal to the tax rate times the poverty threshold for a given family size in a particular country.

The very rich should remain outside the assessment of the fairness of VAT for the same reason, i.e. extremes distort the overall picture. Households in the top-income category do not need their savings to help finance their retirement period. A study by Menchik and David suggests that ignoring bequests only has the effect that the regressivity of a VAT is underestimated for the very top of the income pyramid.[22] As we have concluded earlier, under those circumstances, VAT will be regressive to the extent of the saving ratio. This article does not aim to examine the fairness of taxation in general; the analysis is limited to an assessment of the fairness of consumption taxes, such as VAT, and other taxes only play a role in providing a framework (see 3.) in which VAT's fairness is analysed. As a category, the very rich constitute less than 1% of all income earners and, therefore, their atypical situation and consumption pattern are of marginal importance for an overall assessment of the regressivity or fairness of VAT.

9. Conclusions

The regressive model, which analyses the burden of VAT for different income groups on an annual basis, presents a simplification of reality. It disregards saving and social mobility. A life cycle approach is more appropriate to test the VAT's presumed regressivity and that approach produces the result that VAT is proportional for low and middle-income groups, and mildly regressive where the top-income groups are included. In my opinion, the very poor and very rich should not be included in an assessment of the fairness of a consumption tax by reason of their extreme positions in the income pyramid. In my opinion, a society may afford the rich to be rich, but not the poor to remain poor. Poverty is a problem not caused by taxation. It should be solved by means of social measures, which may include financial support granted through the tax system.

20. For example, James M. Poterba, "Lifetime Incidence and the Distributional Burden of Excise Taxes", *American Economic Review* 79 (2) (1989), pp. 325-330; James M. Poterba, "Is the Gasoline Tax Regressive?", *Tax Policy and the Economy* 5 (1991), pp. 145-164; Donald Fullerton and Diane L. Rogers, "Lifetime versus Annual Perspectives on Tax Incidence", *National Tax Journal* 44 (1991), pp. 277-287; and Donald Fullerton and Diane L. Rogers, *Who Bears the Income Tax Burden?* (Brookings Institute, Washington DC: 1993); Erik Caspersen and Gilbert Metcalf, "Is a Value Added Tax Regressive? Annual versus Lifetime Incidence Measures", 47 *National Tax Journal* 4 (1994), pp. 731-746.

21. James M. Bickley, *Value-Added Tax: A New U.S. Revenue Source?*, (CRS report, 22 August 2006), pp. 11-12.

22. Paul Menchik and Martin David, "The Incidence of a Lifetime Consumption Tax", *National Tax Journal* 35 (1982), pp. 189-203.

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