

KIGALI INDEPENDENT UNIVERSITY (ULK)

P.O BOX : 2280 KIGALI

Tel.:(+250) 0788304081, 0788303667,

0788308792, 0788304086

Website : [http:// www.ulk.ac.rw](http://www.ulk.ac.rw)

e-mail: ulk@rwanda1.com



ULK SCIENTIFIC JOURNAL

Vol. 30

EDITIONS OF THE KIGALI INDEPENDENT UNIVERSITY

December 2013



Disclaimer



The views expressed in this publication are purely personal judgment of the article authors and do not necessarily reflect the views of ULK.

Table of Contents

- ❖ Tax, a double edged knife”: an economic discussion

By

Lecturer NGABOYISONGA Roch.....7

- ❖ The State of Formal Environmental Education (EE) in Rwandan Secondary Schools Case Study of Kigali City's schools

By

B. KAGABIKA, F.L. ORACH-MEZA and E. EDROMA.....39

- ❖ Evaluating the effects of tariff restructuring on clothing imports in South Africa: a Computable General Equilibrium Model

By

**Ndahiriwe Kasai, Eric Humbulani Nevondo,
Denis Chiekweiro Uzoigwe :63**

Editorial

In line with its mission of serving the Community through research, the Kigali Independent University ULK presents its 30th Issue. The issue comprises three quality research articles.

The first article put to light the contribution of the tax revenues in enabling the Government to fulfill its mission of covering expenditures linked to its role as traditional State and Providence State. Lecturer NGABOYISONGA Roch stipulates that tax revenue is even crucial in countries with other means such as natural resources. However, tax withdrawal requires some sacrifices for the community. Indeed, most of taxes are levied either on income of people (direct taxes) and activities (indirect taxes). Direct taxes reduce disposable income of people while indirect taxes disrupt economic activities. They entail a reduction of demand since they affect prices. When price increases, demand decreases. That is why we say taxes present some disadvantages. Thus, this paper has analyzed the advantages and disadvantages of taxes. Tax can rescue or spoil the economy.

In the second paper, Lecturer KAGABIKA Boaz has examined how Environmental Education (EE) is presently practiced in Rwandan secondary schools especially in schools of Kigali City. The findings reveal that EE is not an independent subject and the curriculum content is still limited to enable students for strengthening their ability and skills in order to promote environmental ethical values for sustainable development. In concluding, the author cites Bodzin *et al* (2010) who believe that in the coming decades, EE will be the science for the future and the general public will be required ever more often to understand complex environmental issues, evaluate proposed environmental plans, and understand how individual decisions affect the environment at local and global level.

Finally the paper, "Evaluating the effects of tariff restructuring on clothing imports in South Africa: a Computable General Equilibrium Model" by Dr Kasai Ndahiriwe *et al* simulates 32 sectors of the South African economy with the aim to gain understanding on how the 1999's 16% tariff reduction affected them. The authors

find that the consumer has gained tremendously while the local producer has lost. The producer welfare loss has led to 0.3% decrease in the real GDP. Nevertheless, the statistics have shown a consumer's welfare gain which is significantly greater than the producer's welfare loss.

ULK expresses its deep appreciation to the authors of the papers and to the referees. To the reader, we wish you a good reception of the 30th issue of the ULK Scientific Journal.

Dr SEKIBIBI Ezechiel

Rector of Kigali Independent University ULK

**Topic of the article “TAX, A DOUBLE EDGED KNIFE”:
AN ECONOMIC DISCUSSION**

By

Lecturer NGABOYISONGA Roch¹

1. Master of sciences in economics, lecturer at the Faculty of economics and business studies at the Kigali Independent University

Abstract

Though Government has many other sources of income tax is the main source of revenue for it. Even in other countries in which there exist other means to mobilize resources, notably thanks to its participation to capitals of companies and despite the availability of natural resources likely to provide Government revenue tax is unavoidable. Indeed it constitutes the main source of financing for the Stat It helps it to cover expenditures linked to public need such as road, security, health services to mention the few. Hence it presents advantages for the Government.

However, tax collection requires some sacrifices for the community. Indeed, most of taxes are levied either on income of people (direct taxes) and activities (indirect taxes). Direct taxes reduce disposable income of people while indirect taxes disrupt economic activities. They entail a reduction of demand since they affect prices. When price increases, demand decreases. That is why we say taxes present some disadvantages. Thus, the purpose of this paper is to analyze these advantages and disadvantages of taxes vis-à-vis boosting the economy. In brief, thanks to this article, whoever one can easily understand that public finances are at the heart of the whole economic activities.

1. INTRODUCTION

Public finances can be considered as a pillar for the development of a country. Indeed, government always has some compulsory expenses to meet which are connected to its mandate. Government always has many expenditures that need enough money to be able to meet public expenditures such as health and education, army and police, justice, diplomacy, salaries of public administrative staff, purchases of Government, etc.).

Thus, like private individuals, government needs money to finance its expenditures. However, private individuals aim at maximizing their own utility while Government spends its revenues for the interest of the whole society, a portion of taxes go also to pay debts and interests of debts.

Therefore taxes are compulsory to be deducted in all societies. For State to exist, taxes must be levied in order to cover financial needs of Government.

Nevertheless, taxes are not neutral. They influence in a way or another social and economic activities. For instance indirect taxes directly have an impact on prices. They entail prices escalation. Indirect taxes reduce income of economic agent. So the objective of this article is to show that tax always maintain Government in a dilemma since its deduction present some advantages and disadvantages. Reason why is a "double edged knife".

I believe that this research will help future researcher to have common understanding on the problems caused by taxes deduction and the reason why Government is obliged to levy them despite the disruption they cause in the society at both economic and social level.

Hence the main question to be answered in this research is to know the reason why we can consider taxes as “a double edged knife”

The research is based on economic arguments drawn from theories of Public Finances and Macro economics. So, it is based mainly on documentary technique and other arguments drawn from my general knowledge.

The paper starts by a chapter related to the literature review on taxes and its economic role. The second chapter is devoted to advantages of taxes while the third chapter is devoted to the disadvantages of taxes.

2. LITERATURE REVIEW

In this literature review I am going first to define tax. Second I will make a brief view on taxation. The other purpose of this chapter is to demonstrate that there are economic theories emphasizing on the economic role of government budget. Whenever we talk about the government budget we mean taxes as chief sponsor. As tax is the basic concern of this paper I will present also some theories on their action on the economic situation

This chapter reviews the literature available in the areas of the study. It reflects a number of studies or aims at familiarizing the researcher with the work done by the previous researchers, scholars and authors on the specific topic under study. This literature may be found in textbooks, on internet and in other published documents. This was intended to help the researcher to access to others' ideas, arguments and observations on the topic under study, which in fact was a cornerstone to the researcher's study.

2.1. General considerations on tax

2.1.1. Definition of tax

A **tax** (from the Latin *taxo*; «rate») is a financial charge or other levy imposed upon a taxpayer (an individual or legal entity) by a state or the functional equivalent of a state such that failure to pay is punishable by law. Taxes are also imposed by many administrative divisions. Taxes consist of direct or indirect taxes and may be paid in money or as its labor equivalent (ZODROW: 2008).

According to WENDELL HOLMES: 2004, a tax is a “pecuniary burden laid upon individuals or property owners to support the government. It “is not a voluntary payment or donation, but an enforced contribution, exacted pursuant to legislative authority” and is “any contribution imposed by government.

2.1.2. Optimal tax

Most governments take revenue which exceeds that which can be provided by non-distortionary taxes or through taxes which give a double dividend. Optimal taxation theory is the branch of economics that considers how taxes can be structured to give the least deadweight costs, or to give the best outcomes in terms of social welfare. The Ramsey problem deals with minimizing deadweight costs. Because deadweight costs are related to the elasticity of supply and demand for a good, it follows that putting the highest tax rates on the goods for which there is most inelastic supply and demand will result in the least overall deadweight costs. Some economists sought to integrate optimal tax theory with the social welfare function, which is the economic expression of the idea that equality is valuable to a greater or lesser extent. If individuals experience diminishing returns from income, then the

optimum distribution of income for society involves a progressive income tax. Mirrlees optimal income tax is a detailed theoretical model of the optimum progressive income tax along these lines. Over the last years the validity of the theory of optimal taxation was discussed by many political economists (**ZODROW: 2008**).

2.1.3. Tax incidence

According to (**ZODROW: 2008**) in economics, **tax incidence** is the analysis of the effect of a particular tax on the distribution of economic welfare. Tax incidence is said to «fall» upon the group that ultimately bears the burden of, or ultimately has to pay, the tax. The key concept is that the tax incidence or tax burden does not depend on where the revenue is collected, but on the price elasticity of demand and price elasticity of supply. The concept was brought to attention by the French Physiocrats and in particular François Quesnay who argued that the incidence of all taxation falls ultimately on landowners and is at the expense of land rent. For this reason they advocated the replacement of the multiplicity of contemporary taxes by the Single Tax. In the first instance, however, the incidence of the tax falls elsewhere. For example, a tax on apple farmers might actually be paid by owners of agricultural land but the incidence may initially fall on consumers of apples.

The theory of tax incidence has a number of practical results. For example, United States Social Security payroll taxes are paid half by the employee and half by the employer. However, some economists think that the worker is bearing almost the entire burden of the tax because the employer passes the tax on in the form of lower wages. The tax incidence is thus said to fall on the employee.

2.2. Views on taxation

2.2.1. View supporting taxation

According to most of political philosophies, taxes are justified as they fund activities that are necessary and beneficial to the society. Additionally, progressive taxes can be used to reduce economic inequalities in a society. According to **WENDELL HOLMES (2004)**, taxation in modern nation-States benefits the majority of the population and social development. It can be also argued that in a democracy, because the government is the party performing the act of imposing taxes, society as a whole decides how the tax system should be organized. For traditional conservatives, the payment of taxes is justified as part of the general obligation of citizens to obey the law and support established institutions.

2.2.2. Views opposed to taxation

Because payment of taxes is compulsory and enforced by the legal system, some political philosophies view taxation as violation of property rights, accusing the government of levying taxes via force and coercive means.

Taxation has also been opposed by communists. Karl Marx assumed that taxation would be unnecessary after the advent of communism and looked forward to the “withering away of State”.

Nowadays, as government has shifted from a Policeman State to a Providence State, the role of taxes has been increased (**WENDELL HOLMES: 2004**).

2.2.3. Action of tax on the economic situation

Taxes techniques can be used to mitigate if not eliminate the effects of expensive economic cycles Keynes and automatically stabilize the economy (J.F. PICARD, 1989: 323).

2.2.3.1. The boosting of the economy

It can operate at the level of demand and supply.

The idea is to reach through taxation an increase of the real demand.

The reduction of taxes direct causes an increase of income of the households prices remaining unchanged, induces an increase in consumption. However, this effect occurs with some delay which is the complexity. This reliance by the direct tax has been used to Crown United in 1964 as part of the Keynesian theory.

The decrease of tax direct causes lowering of the price of the property and services and indirectly an increase in real income. Regarding taxes on the turnover including VAT, the effect is almost immediate, but still need that there is integral repercussion on the direct tax drop prices. In fact, this impact varies according to products, hence the distortions.

2.2.4. The action of the tax system on competitiveness of enterprises

Tax techniques can facilitate the creation of new businesses: the traditional method consists of temporary exemptions of direct taxes which may be total or partial: for example of new businesses created in the country (J.F. PICARD, 1989: 323). Also less there are indirect taxes, more prices increase.

2.2.5. WAGNER's laws and the continuous increase public spending

It is the German Economist Adolph WAGNER, making for the first time at the end of the nineteenth century in its 'treat science finance' continuous increase Act of public expenditure. The examples of the budget of the France which increased from 1 billion francs in 1822 was about 2 trillion in 1999, seems to confirm the analysis of Wagner (**LASCOMBE Michel and VANDENDRIESSCHE Xavier, 2001: 5**).

2.2.6. The economic role of the State Budget

The economic role of the budget of the state is the materialization of the economic functions of the government (**PARCEBOIS J: 1991: 67**).

SAMUELSON and NORDHAUSS recognize that the executive power has four important functions:

- Economic stabilization and research of the full employment by adequate policies;
- Improvement of the economic efficiency (optimal allowance of resources and factors of production)
- Improvement of the distribution of income ;
- Management of the international economic policies (research of the balance of payment equilibrium)

Thus, one distinguishes three main economic role of the government:

a. To search for the economic stability and the full employment

The generally accepted idea is that the economic cycles translate fluctuations in the activity. Since the movements are oriented either toward the rise, or toward the decrease, the Government's effort will be done in order to maintain cycles globally positive.

b. To search for an optimal allowance of resources and factors of production

The governmental action must permit to eliminate the pockets of inefficiency within the economy and to proceed, if necessary, to a redistribution of resources and to allocate them where they are more efficient.

c. To search for the fairness in the distribution of the national income

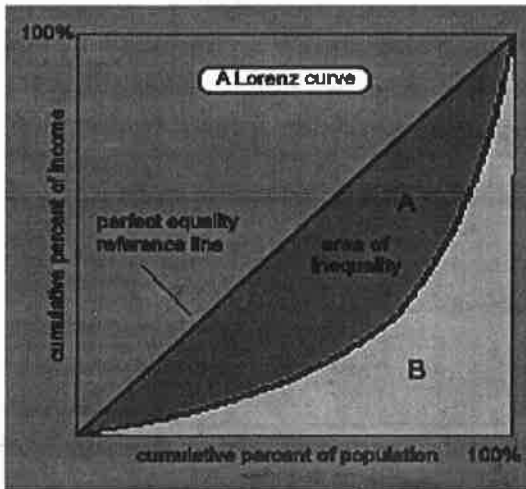
The Government must permit thanks to adequate policies a minimum of fairness in the distribution of income.

For that it must ensure a minimum income that guarantees to all citizens a comfortable spending power.

LORENZ was the first to formulate a quantifiable analysis of the distribution of the income within the population.

Thanks to G budget, Lorenz curve can come closer to the 45 degree line.

The curve that he drew puts in relation the concentration of wealth and the proportion of people who share it to themselves.



The 45° bisector indicates the optimal distribution of income.

Indeed, all points on the right line means there is perfect equality in distribution of wealth between people.

LORENZ'S curve shows, on the other hand, the reality of the situation: more it distant of the bisector of 45° more the inequality is deep within the economy. The space represented by A on the following graphic is big while the one represented by the space B is small.

The Government's mission will consist therefore in making its action brings back LORENZ'S curve more and more close to the right to 45°. For this the Government could use its budget.

3. ECONOMIC ADVANTAGES OF TAXES

3.1. Reduction of the public debts and the reduction of inflation

The tax collection helps Government to avoid some economic disruptions notably indebtedness and inflation due to the banknote plate in the case State faces a budget deficit.

3.1.1. Reduction of debt

Government must avoid too much debt to avoid financial eviction and snow ball effect

3.1.1.1. Eviction effect

Each year, these public administrations perceive resources (taxes and fees, and other non-tax revenues) and pay public (expenses salaries, supplies, services...)

When these expenses are greater than revenues, a deficit is found. To finance this deficit, public administrations must go into debt. Specifically, they are in this case in the same situation a household that would be forced to borrow, its resources being less than its expenses. However, the difference of a household, public administrations generally not borrow from a Bank, but issue securities, mainly bonds, on the market. They undertake to repay these bonds, paying interest at a future date. If Governments are in deficit for several years, their debts increase Debt poses a danger to the economy (**ARTUS Patrick:1996**)

In General, the increase of the public debt increases the debt burden and thus reduces the margins of maneuvers of future fiscal policy and its ability to influence contra cyclical in the short term.

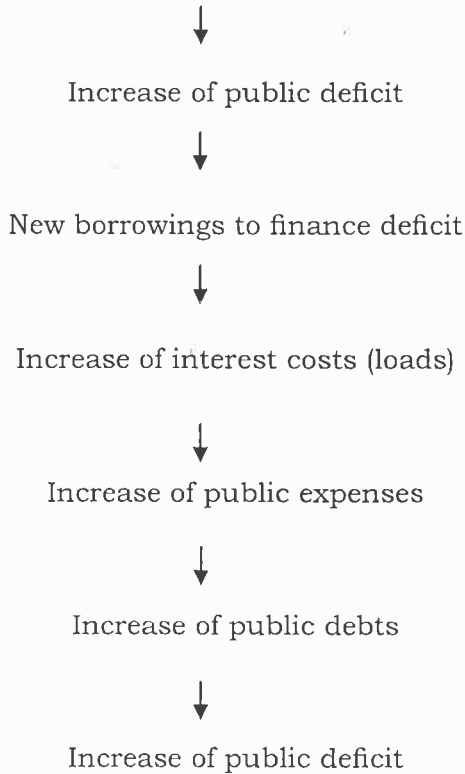
The increase in deficits led to an increase of interest rates because increasing the supply of Government securities elicits lower prices and obliges the State to offer higher rates. This increase in rates can lead to crowding out private investment, public investment pay becoming more attractive. Hence, tax helps Government to avoid the eviction effect due to debt. Indeed when there are less taxes ending by deficit, if Government appeals to internal debt it increases interest rate on bonds and public obligations, interest rate increases, private investments decrease, then income decreases.

3.1.1.2. The “snow ball effect”

The snow ball effect is a situation in which the debt usually the public debt increases mechanically, the rate of interest paid on debt is higher than the growth rate of the resources that are used to reimburse it.

In the long run, the interest rate is roughly equal to the rate of growth of the economy. It should therefore not be effect “snow ball”. However, it may also intervene when the fragile situation of the State generates risk premiums (lenders require higher compensation to offset the risk of default), when an unexpected slowdown in inflation increases the real rate of interest paid on the debt or when economic growth collapses. The effect “snow ball” requires achieving a primary budget surplus (before payment of interest on the debt). Without quick action, it can lead to an uncontrolled skid of the debt (**ARTUS Patrick: 1996**).

The snow ball effect can be described as following:



3.1.2. The decrease of inflation

According to the bulletin of the Bank of France (2007), the first formulation of the quantitative theory of money goes back to the work of Jean BODIN in 1568. Its work focused on the inflationary effects of the massive influx of gold from Latin America; This influx causing a rise in prices in Spain and on the European continent. However, it is very common to attribute the origins of the quantitative theory of money to David Ricardo (disciple of Smith).

Classics (John Hicks in particular) have formalized the quantity theory from an equation of conservation of the quantity of money exchanged in all of the transactions:

According to the monetarists, the velocity of circulation of money is constant. Same for the level of production which is assumed constant because of the situation of employment factors of production in the economy. Based on these two assumptions, any increase in the quantity of money increases the price. This brings the monetarists suggests that inflation is only a purely monetary phenomenon. There is inflation in an economy; it may be due to an excessive monetary creation from the level of production of the country. Nowadays, the quantity theory of money is generally accepted in the long term, which is not the case in the short or medium term.

3.2. Administrative loads covering

Government has many expenses to do. Among those expenses we can quote general public services, defense, education, health, social security and welfare, housing and community amenities, recreation and culture, agriculture, transport and communication, etc. To cover these public expenditures government needs financial means it gets mainly from taxes. Indeed, according to WAGNER law there is a trend to the increase of public expenditures, then Government should deduct more taxes. Indeed, we notice that in most of countries taxes are the main way helping Government to cover public expenses.

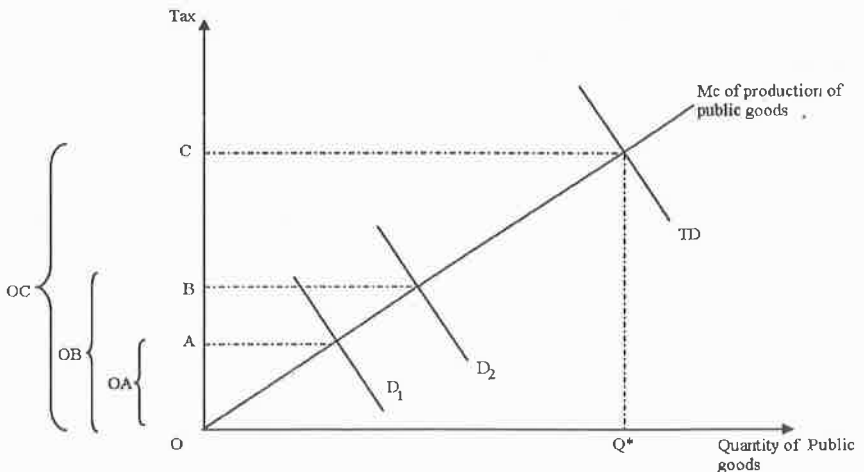
3.3. Increase of the investments of the government and production of the public property or goods

Thanks to tax, Government produces public goods.

The theorem of BOWEN-LINDHALL – SAMUELSON leads at the conclusion that in order to allow State producing public goods people must be ready to sacrifice a part of the consumption of private goods paying taxes. It means that in principle everybody should pay taxes because they are inevitable increase investments of State which i.e. public goods which provides the same level of satisfaction like private goods (PARCEBOIS J.1991:87).

Bowen developed the idea that individuals have, with regard to goods provided by the State, preferences of the same nature of those relative to private properties (PARCEBOIS J.1991:87).

Also, the required quantity of collective goods will be weak if the tax that must be paid to get it is high and inversely this quantity will increase when the tax paid per unit of goods decreases. This is the theory of taxation - price of the public services.



In principle the presence of an additional consumer increases the amount of tax that the sectors agree to pay. Suppose a collectivity made up of two individuals, the reasoning likely to be extrapolated to n individuals whose demands of collective properties are respectively D_1 and D_2 .

The total demand of the collective properties is obtained by the sum of the D_1 and D_2 curves.

Suppose C_m (marginal cost), the curve of offer of these public properties.

The optimum is obtained at point when Q^* quantity of the collective properties is put at the disposal of the two individuals. The total tax that will be levied is equal to OC and every individuals will only pay for the part corresponding to the amount of money that he had to pay in order to get the Q^* quantity of public goods.

The individual 1 will pay for OA and the individuals 2 will pay for OB . Thus, by 0 construction, $AO + BO = OC$.

Therefore important difference results between the market and the public economy. Whereas in merchant economy, there is balance between a single price and the consumed variable quantities from an individual to another, in public economy or non-commercial, there is equilibrium of the variable price, but a unique quantity consumed by all the individuals.

We also note that the availability to pay is not the same for everybody.

All, by the opposite, consume the quantity Q^* of the public goods. There is no rivalry among agent

One makes the hypothesis that everybody search his personal interest and one supposes at the same time that the individuals

will be sufficiently altruistic and honest to indicate to the State the amount of the taxes they are ready to pay. The same result can be obtained by using an algebraic approach.

Suppose an economy made up of n consumers. The function of utility of a consumer i is supposed to have the form $(U_i(x, Y_i))$ where X represents the quantity of pure collective properties (non rivalry and non exclusion) and where i represents the available income of i likely to be affected to the purchase of the private goods (**PARCEBOIS J. ¶1991:87**).

This Y_d is by construction equal to the total income reduced of the fiscal levies ($Y_d = Y \text{ Primary} + \text{transfer-taxes}$).

Suppose Z_i , the total income and t_i the fiscal levy

$$Y_i = Z_i - t_i$$

We suppose that the function of collective goods is a combination of the individual functions of well being $W = \sum_{i=1}^n \mu_i(x, Z_i - t_i)$

Suppose $C(x)$, the total cost of production of collective goods x . The objective of the State will consist to maximize the function of the collective utility (W) under a budgetary constraint (because the State must be able to recover taxes superior or equal to the production costs of public property).

Soit :

$$\begin{aligned} \text{Max } W &= \sum_{i=1}^n \alpha_i \mu_i(x, Z_i - t_i) \\ C(x) &\leq \sum_{i=1}^n t_i \\ U/C: & \end{aligned}$$

It means that the state must be able to maximize collective welfare taking into account the fact that the total cost of production of collective goods must be lower or equal to the sum of the taxes collected from the overall individuals living in the collectivity.

Formulas:

$$L(\chi, \gamma, \lambda) = \sum_{i=1}^n \mu_i(x, z_i, -t_i) + \lambda \left(\sum_{i=1}^n t_i - C(x) \right)$$

$$\frac{\partial L}{\partial x} = \sum_{i=1}^n \frac{\partial \mu_i}{\partial x} - \lambda(c(x))' = 0$$

$$0 = \sum_{i=1}^n \frac{\partial \mu_i}{\partial x} - \lambda(c(x))' = 0$$

$$\sum_{i=1}^n \frac{\partial \mu_i}{\partial x} = \lambda(c(x))'$$

$$\sum_{i=1}^n \frac{\partial \mu_i}{\partial x} = \lambda cm(x)$$

$$Cm(x) = \sum_{i=1}^n \frac{\partial \mu_i}{\partial x} / \lambda$$

$$L = \sum_{i=1}^n \alpha_i \mu_i(x, z_i, t_i) + \lambda \left(\sum_{i=1}^n t_i - C(x) \right)$$

$$\frac{\partial L}{\partial t_i} = 0$$

$$\Leftrightarrow - \sum_{i=1}^n \frac{\partial \mu_i}{\partial y_i} + \lambda = 0$$

$$\Leftrightarrow - \sum_{i=1}^n \frac{\partial \mu_i}{\partial y_i} = -\lambda$$

$$\lambda = \sum_{i=1}^n \frac{\partial \mu_i}{\partial y_i}$$

$$Cm(x) = \frac{\sum_{i=1}^n \alpha_i \frac{\partial \mu_i}{\partial x}}{\sum_{i=1}^n \alpha_i \frac{\partial \mu_i}{\partial y_i}} \Leftrightarrow$$

$$Cm(x) = \sum_{i=1}^n \frac{\frac{\partial \mu_i}{\partial x}}{\frac{\partial \mu_i}{\partial y_i}}$$

This equation represents the condition that we know under the name of BOWEN-LINDHAL – SAMUELSON theorem. To the optimum, the marginal cost of production of pure collective goods is equal to the sum of marginal cash to pay of various taxpayers.

Represent the marginal rate of substitution of the private property to the public property. It informs us on the quantities of private goods that is necessary to give up in order to consume more public goods.

In other words it is the supplementary tax that consumer i would accept to pay to the State in order to benefit from an additional unit x of the collective goods.

In practice, it is demonstrated that in an economy where each actor brings some voluntary contribution to permit the financing of collective properties (Balance with subscription); this leads to an infra-optimal (sub-optimal) situation.

This sub-optimality results from the non cooperative character of the procedure. Consumers don't take into account the fact that their contribution improves the situation of other agents and hence they choose to subscribe for an amount lower to the one that would be socially acceptable.

The higher number consumers, the more every one each more will tend to conceal his preferences to contribute the lesser to financing (the logic of the stowaway).

So, the marginal cost of production of public goods depends on the availability of people to pay tax. Tax being the price of public goods, people should pay it to take benefit of public goods since they are compulsory for their life. They provide the same level of satisfaction like private goods. In brief the BOWEN-LINDHALL-SAMUELSON theorem shows that tax is unavoidable even considering a micro economic reasoning.

3.4. Positive external effects of production

Governments can intervene in order to increase demand or to increase supply, depending on the market. For example, by providing grants and scholarships, the government increases the demand for education. On the other hand, tax revenue can be used to fund goods such as roads and bridges, which also create positive externalities.

Education is used as an example of a positive externality. The benefit of education affects the private consumer of the education as well as having many positive impacts on society as a whole.

The private demand for a good with a positive externality is less than socially optimal because the social value of the activity is not felt by the private market. Adding the external benefit to the private value leads to an upward shift in demand and leads to a greater optimum quantity. The government could subsidize the production or consumption of a good to attempt to achieve the socially optimal level. Again, this subsidy is forcing the internalizing of an externality.

So, government can create externalities in the following ways: Increased funding for education and training programs within the public sector, Tax credits for businesses that spend in vocational training programs, State funded and operated vocational training, for example modern apprenticeships and expansion of vocational exams **(SAEZ Emmanuel: 2007)**.

3.5. Subsidies to companies

In many countries, governments grant different capital subsidies to the business sector in order to promote growth. Also the EU, provides this type of subsidies. As De Long and Summers (1991)

suggest there might be market failure justifications for public subsidization of firms. However, because the use of subsidies is not unproblematic, it is far from clear how they affect long-run economic growth. Subsidization can influence growth, but there seems to be little evidence that the subsidies have affected productivity.

To soften this development the government can grant different types of support (e.g. direct subsidies and subsidized loans) and/or reduce taxes to firms located in the backward regions or to firms that decide to relocate in the backward regions.

Although subsidization of the business sector in the backward regions can lead to an increase of employment and capital investments, the main question is whether it can affect productivity. First, if the subsidies help to advance the technological development of the recipient firms then productivity increases. Second, if the subsidies can help the firms to better utilize economies of scale, productivity might increase as well.

(BERGSTROM F, 1998: 4)

4. ECONOMIC DISADVANTAGES OF TAXES

Tax represents a weight for taxpayers. We talk about tax burden. Indeed, tax reduces income of taxpayers. In this chapter, it will be about to show that tax present negative consequence on economic activities. It negatively acts on the income of economic agents (producers and consumers). It can even entail the reduction of private investment, the relocation of production; hence it ends at unemployment. In the case of indirect tax, the impact on price is direct.

4.1. Reduction of the income of the economic agents

4.1.1. For Producer: reduction of the benefit

The income of company is his result. The latter is calculated at the end of each account exercise after deduction of all loads in the income statement. This result belongs to the owners of the company that is the shareholders. Before the distribution of the final result to shareholders we deduct a tax which is called corporate income tax which is a percentage of profit or result deducted by government before dividend distribution. It is worth to indicate that before the corporate income tax deduction there are other taxes a company must pay which are linked to its daily activities. It is about taxes linked to its functioning, notably the value added tax. Some of those taxes are considered as burden for the company. They can reduce the benefit of the company. So, for the company, tax is a burden. It reduces the income of shareholders.

4.1.2. For consumers: reduction of income

Basing on the psychological equation of Keynes ($C=C+c(Y-T)$), we can say that a part of consumption depends on the income. The income it is about is the disposable income that is the disposable income which is the primary income from that we deduct taxes. Thus, when taxes increase, the disposable income decrease, then we face a decrease of private consumption. This decrease of private consumption negatively impact on national demand since the private investment is one of the components of national demand. Indeed, the equation of national demand is the following:

$$ND= C+c (Y-T) +I+G+X-M$$

$$C+c(Y-T)= \text{Consumption}$$

I= Investment

G= Public expenditures

X-M= Net exports

So, as tax reduces consumption, it reduces national demand because consumption is a component of national demand.

4.2. Reduction of Investment and the financial eviction

The tax on profits of corporations decreases the profitability of investments. This tax pushes investors to look elsewhere when the time to invest their funds comes. An increase in taxes for businesses can become a factor of discouragement for potential foreign investors as well as local investors.

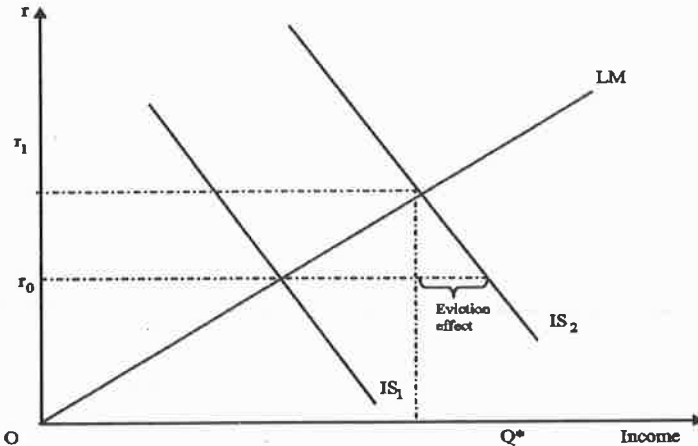
Literature about the effect of taxes on foreign direct investment supports the conclusion that the effective tax rate of companies has a statistical impact-ING significant on the investment, even if it remains uncertainty about the magnitude of its impact

Heavy taxation of enterprises also pushes individuals to be less enterprising. A 2010 study published in the American Economic Journal has reconfirmed the conclusions mentioned above, but adding that an increase in the effective tax rate of between-harvest reduces the investment of those already present on the market, that entrepreneurship (GELOSO Vincent and GUENETTE Jasmine, 2010:1)

Budgetary expenditures are often at the basis of the rise of interest rate that can reduce the private i. We can notice it through the IS-LM model (in closed economy).

In fact, the budgetary policy displaces the IS curve and it is therefore at the basis of the rise of interest rate.

If this interest rate increases up to become more elevated than the interest rate expected from investments, then it is obvious that the level of investment is going to decrease sensibly.



The graphic above shows that an expansionary fiscal policy ends to a shifting of IS curve from IS_1 to IS_2 . This shifting is followed by an increase of interest rate (because government intervenes on the financial market). As the private investment is negatively correlated to investment, there is a decrease of investment; hence the income cannot increase following the rhythm of fiscal policy. We talk about financial eviction.

4.3. Possible relocation of the production

It concerns especially multinational societies. This relocation can increase the number of unemployed person.

Indeed according to many studies, tax is among causes of companies' relocation. For instance, an investigation led in France showed that 42% of enterprises relocations are due to the taxes increase MOUHOUD el M., (2006:37). The direct consequence of relocation is unemployment.

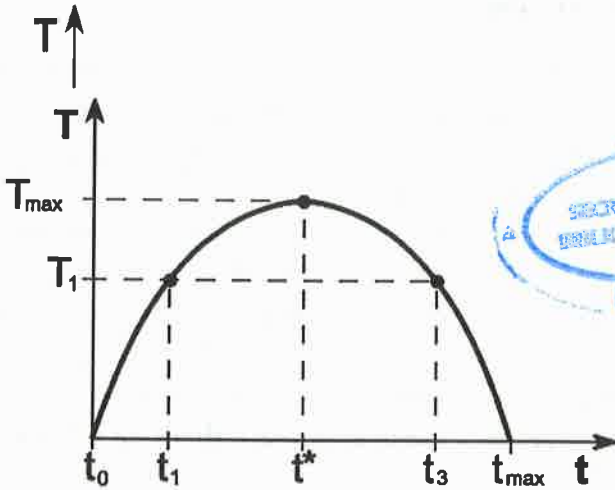
4.4. Possible rise of prices especially for indirect taxes

Indirect taxes are imposed by the government on producers - but the burden of tax can be passed on to consumers depending on the price elasticity of demand and elasticity of supply for the product. Therefore in most of cases, consumers end up paying some or all of any indirect tax introduced into a market.

4.5. Reduction of the incomes from taxes: the Thesis of Arthur LAFFER

According to LAFFER Arthur quoted by HAYRAULT Jean Olivier (2008) all the burden of the fiscal and special taxes pressure beyond a certain threshold provokes proportionately more important reduction of the taxes bases and therefore of the public income «too many taxes kill the tax» and « too much rate kills the rates».

Intuitively the thesis of LAFFER presupposes that an optimal rate of fiscal pressure would exist and should not be exceeded.



On the graphic above t^* is the threshold of tax rate State should not go beyond. If it goes beyond (t_3) we face a decrease of tax revenue. Indeed, too much tax discourages taxpayers. It pushes them stopping investing or shifting for investing elsewhere. Also when tax rates are too high, taxpayers are encouraged to practice fiscal fraud. On the graphic above at the level t_{max} tax revenues become equal to zero.

4.6. The implications in terms of transfer between generations and inequality

The drift of public debt allows facilities to current generations by making the burden of repayments on future generations. It also increases social inequalities in a period of rising real interest rates, because the burden of debt corresponds to a transfer to the benefit of the wealthier classes, holders of government bonds, at the expense of the least-favored categories.

5. GENERAL CONCLUSION

The objective of this article was to demonstrate that economically tax is a double edged tax because it presents some advantages and disadvantages. To reach this objective I have based my arguments on economic analyses. Indeed it was about to draw knowledge from economic theory in order to show that tax can suffocate the economy. However, if Government doesn't deduct them, there are some consequences on economic activities. In this chapter, we have presented some theories on taxation. After presentation of theory, some of the theories opposes of taxation while others supported it. I discovered that some economic theories advocate that tax can boost the economy. At the same time it can hinder it. Also I have talked in that chapter about the economic role of Government budget because tax is its main component.

In the second chapter I have presented some advantages of tax I mean some arguments supporting that for Government it is indispensable to deduct taxes. Thanks to analyses done in that chapter we notice that tax help Government to avoid debts whose economic consequence is the eviction effect. Also tax helps Government appealing to bank note plate in order to finance deficit. In fact when Government appeals too much to bank note plates it creates inflation. Furthermore, thanks to tax Government covers administrative expenditures (expenses) related to its traditional role. It creates positives externalities for producers credited applauds to public goods financed. Also, tax helps Government to support productive sector providing subsidies to enterprises whose product or services are vital for the population. Hence, if we base on the BOWEN-LINDHALL-SAMUELSON theorem each individual should pay tax reducing his disposable income in order to allow Government producing public goods because its marginal cost of production is equal to

the marginal rate of substitution of private goods to public goods.

In the chapter III, it was about to discuss disadvantages of taxes. On that subject the economic theory shows that taxation can have negative consequences on:

- The producer since it reduces benefit
- The consumer because it reduces disposable income.
Hence, it ends at the decrease of national demand

Basing on the IS-LM model, I have shown also that taxation entails an eviction effect i.e. when Government asks for too much taxes (e.g. through an increase of tax rate), we notice a relocation of production likely to increase the number of jobless, I mean unemployment. Another negative consequence of taxes, especially indirect tax is understood through its impact on prices. Whenever there is an increase of indirect taxes, there is inflation because the latter are paid by the last consumer. Last but not least, the thesis of Arthur LAFFER says that "too much tax kills tax" There do exist a threshold of tax rate Government must not exceed. Beyond that threshold fiscal revenues start decreasing.

The previous analyses push us to conclude that though taxes have some disadvantages their deduction is vital for State in order to maintain social equilibrium. Hence, comparing advantages to disadvantages, advantages overtake disadvantages.

REFERENCES

I. BOOKS

1. ARTUS Patrick (1996), *Public deficit, Theories and practice*, Economica edition, Paris
2. BERGSTRÖM FREDRIK, *Capital subsidies and the performance of Firms*, Stockholm School of Economics, Dept. of Economics, SSE/EFI Working Paper Series in Economics and Finance No. 285
3. LASCOMBE Michel et VANDENDRIESSCHE Xavier (2001), **Public Finances**, Ed. Dalloz, Paris
4. PARCEBOIS J. (1991:72) **Economy of public finance**, Armand Colin edition Paris
5. PICARD J.F.(1989), **Public Finances**, Ed. Litec, Paris

II. WEB-LINK REFERENCES

1. Bank of France Magazine, (2007), www.wikipedia.org consulted on 21th May 21, 2013
2. COURTOIS Arnaud, **Advantages and disadvantages of direct taxes** www.privatefinance-i.com article retrieved on 21th May 21, 2013
3. GELOSO Vincent and GUENETTE Jasmine, **The negative consequences tax on investments and workers**, Montreal Economic Institute, article retrieved on Internet on www.iedm.org/files/point_1210.fr.pdf on 22th May 2013

4. GRANER B., **Black's Law Dictionary**, www.google.com retrieved on June 18, 2013
5. MOUHOUD el M., 2006, **Globalization and relocation of companies**, retrieved on [www.lyc-arsonval-brive.ac-limoges.fr/jp.../ pdf/ deloc](http://www.lyc-arsonval-brive.ac-limoges.fr/jp.../pdf/deloc) on 22th May 2013
6. SAEZ Emmanuel (2007), **Externalities: Problems and Solutions**, 131 Undergraduate PublicEconomics,UCBerkeley,www.elsa.berkeley.edu/~saez/course131/externalities1_ch05.pdf retrieved on 21th May 21, 2013
7. WENDELL Holmes O. (2004) **Taxes are the price of civilization**, www.investorwords.com retrieved on June 18, 2013
8. ZODROW(2008), **The Property Tax Incidence Debate and the Mix of State and Local Finance of Local Public Expenditures**, citing Fischel, Regulatory Takings: Law, Economics, and Politics, www.google.com retrieved on June 18, 2013
9. HAYRAULT Jean Olivier, LANGOT François and THEPTHIDA SOPRASEUTH, **quantifying the LAFFER curve on the continued activity tax in a dynamic framework**, www.google.com retrieved on June 18, 2013

The State of Formal Environmental Education (EE) in Rwandan Secondary Schools Case Study of Kigali City's schools

By

B. KAGABIKA¹, F.L. ORACH-MEZA and E. EDROMA²

1 B. KAGABIKA, Lecturer at Kigali Independent University, E-mail: kagabikab@yahoo.fr

2 F.L.ORACH-MEZA, Professor and Dean of School of Sciences at Nkumba University, E-mail: seida_meza4@yahoo.com and E. EDROMA, Professor at Nkumba and Vice Chancellor at International University of East Africa.

Abstract

The purpose of the present publication is to examine if Environmental Education (EE) is taught as an independent discipline in Rwandan Secondary Schools. Key informants were 48 headmasters from 25 schools of 3 districts of Kigali City. The main instrument used to collect data was a questionnaire based on curriculum content assessment. The data were processed, using the Statistical Package for the Social Sciences (SPSS 16 for windows 7).

The findings have revealed that EE is not an independent subject but it is mainly taught through Geography and Biology and the curriculum content is still limited in such way it cannot enable students to strengthen their ability and skills in order to promote environmental ethical values for sustainable development. So, the researcher suggested that if EE is considered as the future science by many scholars, it should be taught compulsory as an independent discipline in all combinations (all subject areas of secondary schools).

Keywords: Formal Environmental Education, Rwandan School, Curriculum, Sustainable Development

1. Introduction

This paper focuses on the state of the Environmental Education as it is currently practiced in Rwandan secondary schools.

As Ramesh and Rao (2006) emphasise, man is part and parcel of the environment, so he must recognise the role and the importance of the environment in order to protect it and get protection from it. Thus, man needs EE which is the process of recognising values and classifying concepts in order to develop knowledge, skills, attitudes, abilities and behaviour to understand and appreciate the interrelatedness of man, his culture and his biophysical surrounding. This will entail practice in decision making and self formulation of a code of behaviour regarding issues of environmental quality.

For Uma and Adinarayana (2007), due to lack of knowledge or negligence, man is creating environmental problems. So, EE should be part of students' education in order to disclose the global problems to the people and help them to protect their environment.

2. Background

In Rwanda, EE seems to be a minor subject for impacting the future of secondary school students instead of being independent subject. Secondary schools are concerned in this publication because at this level, the students should develop skills and ability which can allow them to know more about the functions of ecosystems and the relationships between environment and development and to get behavioural change towards environment. UNESCO-UNEP (1985) argue that students enter secondary schools between the ages of 11 and 14 and leave between 16 and 19 years. They thus belong to one of the most sensitive groups of population who may be initiated, involved and prepared for

understanding and tackling the environmental problems to the extent possible. In the same context Nath (2011) stresses that the future adults today's children are more likely to make adverse impacts on the natural environmental and earth's life-support systems through their behaviour, life-styles and attitudes. Besides, a Chinese saying quoted in Ramesh (2006) stipulates: *"If you plan for a year, plant rice; if you plan for years, plant trees; but if you plan for a century, educate the people"* (p.4).

The United Nations Conferences on Human Environment and Development organised in Stockholm in 1972, the Brundland Commission in 1987, and the World Summit of Rio de Janeiro in 1992 and the World Summit on Sustainable Development in Johannesburg in 2002 are the global efforts for protecting the environment. These conferences have drawn the attention of people around the globe to the deteriorating conditions of our environment and this posed the first milestones of environmental education. But the environmental education took its roots from Belgrade in 1975 and Tbilisi conferences in 1977 (UNESCO, 2002).

The Belgrade Charter (UNESCO, 1975) was the outcome of the International Workshop on Environmental Education held in Belgrade (in former Yugoslavia). The Charter was built upon the Stockholm Declaration and added goals, objectives, and guiding principles of environmental education programs. It defines an audience for environmental education, which includes the general public. On the other hand, the Tbilisi Declaration (UNESCO, 1977) noted the "unanimous accord in the important role of environmental education in the preservation and improvement of the world's environment, as well as in the sound and balanced development of the world's communities." The Tbilisi Declaration updated and clarified the Stockholm Declaration and the Belgrade Charter by including new goals, objectives, characteristics, and guiding principles regarding environmental education.

3. Problem statement

The protection and management of environment in Rwanda are among the pillars of Vision 2020 (the strategic plan of Rwanda that should be achieved by 2020). According to MINITERE (2005), the objective of the Government is that by 2020, it will have built a nation in which pressure on natural resources, particularly land, water, biomass and biodiversity, has significantly been reduced and the process of environmental pollution and degradation has been reversed. In addition, it aims to build a nation in which the management and protection of these resources and environment are more rational and well regulated in order to preserve and bequeath to future generations the basic wealth necessary for sustainable development.

In the same line, MINITERE (2007) and REMA (2010) argue that in order to fulfill this objective, a particular attention must be drawn to the integration of the environmental dimension in educational programmes at all levels. The reason is that there are shortcomings that are noticed in this field at all the stages of education (primary, secondary and tertiary) and mostly there is lack of specialized teachers in Environmental Education.

Notwithstanding, whether MINEDUC (2007) recognises that the issue of relevant programmes is a priority issue which needs to be addressed, the challenges it faces are in producing a sufficient number of teachers who are qualified, motivated, engaged and opting to remain in the profession. The lack of teacher management and development policy has exacerbated the problem of teacher shortages. Particularly, there is lack of specialized teachers in environmental education at all levels of education in the country. Thus, environmental content in the curriculum is issue-based rather than being linked to an interdisciplinary education for sustainable development context. In addition, there is shortage

of environmental materials and guidelines for the various public sector organizations which makes difficult to efficiently address environmental issues with stakeholders.

Research questions

Given that all the finalists of secondary school do not all have the opportunity to attend universities, do they have enough environmental knowledge and ability to analyze and interpret environmental problems when introduced into the workforce?

Are the curricula contents relevant for fostering Environmental Education for sustainability?

4. Purpose and Objectives

The purpose of this research is to assess the state of formal environmental education through scrutinising the curricula contents of secondary schools in Rwanda in relation to environmental issues while the objectives for the study are to:

- examine whether the current materials used in secondary school can foster students' knowledge on environmental concepts;
- examine whether the materials used can develop students' ability and skills to analyse environmental consequences ;
- examine whether the materials used can raise awareness of a wide variety of environmental issues and needs for various solutions ;
- analyse if the content of materials could help to understand the ethics of development, to participate in community development and to understand that environmental education is vital part of all efforts to foster environment respect for sustainable development.

5. Methods

This study adopted a survey research design to conduct the research. The population of the study is the staff of headmasters and deans of studies (511) (MINEDUC, 2012) of schools selected purposively from 3 urban districts (Nyarugenege, Gasabo and Kicukiro) in Kigali City. The criterion was that school should have upper secondary level and the research tool was a questionnaire supplemented by curricula scrutinizing and literature texts as check and balance. So, 50 forms of questionnaire have been launched to 25 schools but 48 only returned. As shown in table 2, a four-point scale (0 = not all 1 = limited, 2 = fairly well 3 = Very well) was used in assessment of curriculum content whether it can increase environmental knowledge, raise awareness, develop ability and skills of students for understanding, analysing and solving environmental issues. The data were processed, using the Statistical Package for the Social Science (SPSS 16).

6. Presentation of findings and discussions

6.1. Presentation

The research findings are divided into three sections. Demographic information regarding respondents is included in the first section. The second section includes results regarding the kinds of materials used. The third section is about the headmasters' perception on content of environmental education curriculum.

6.1.1. Demographic information

Information was received from 48 headmasters and deans of studies. The respondents were asked to provide basic demographic information, including age, education level, and gender. The mean age category for the respondents was 39 years of age and the majority of them (87.5%) had a bachelor's degree and 12.5% had

masters' degree. This highlights that the respondents are mature and have enough knowledge to give reliable answers. Regarding the data on the gender it is shown that 75% of respondents were male and 25% were female. Heading schools is a hard work which requires being available and permanent. This could justify the imbalance between genders observed of headmasters in the formal educational sector.

6.1.2. Educational materials

The curriculum documents content vary in nature and quality. The usefulness of the way in which they explain and exemplify Environmental Education principles also varies. Therefore, they are important indicators of quality of education.

Table 1: Distribution of materials used by respondents in their schools

Materials	Used (%)	None used (%)
Textbook	100	0
Modular unit	2.1	97.9
Basic case	2.1	97.9
Extended case study	2.1	97.9
Manual activity	22.9	77.1

Source: Data from the field

The findings from table 1 reveal that the materials most used in secondary schools are textbooks (100%) and some schools (22.9%) initiate their students to manual activities. But extended case studies including outdoor class are few (2.1%) while they should be organised frequently. Learning by doing as highlighted by John Dewey quoted in Rather (2007) increases experience and put student in contact with reality of field. Even Jean Jacques quoted in McCrea (2006) emphasized that the nature was the child's greatest teacher and "his knowledge of the natural world

serves as a foundation for his later learning”.

Table 2: Assessing of headmasters’ perception on content of environmental education curriculum

Items	Frequencies (in %)				Total
	Not all	Limited	Fairly well	Very well	
Materials used can foster the students’ knowledge of major concepts about individuals, species population, communities, ecosystems	6.2	62.8	25	6.2	100
Materials can develop the ability and skills to apply environmental knowledge	10.4	56.2	29.2	4.2	100
Materials can develop the ability and skills to predict environmental consequences	20.8	52.1	22.9	4.2	100
Materials can develop ability and skills to identify and investigate environmental issues using both secondary and primary sources	16.7	62.5	20.8	0	100
Materials can develop students’ ability and skills to analyse environmental issues and associated value perspectives	22.9	60.4	16.7	0	100
Materials can develop students’ ability to evaluate environmental alternative solutions for crucial environmental issues	20.8	62.5	16.7	0	100
Materials can raise awareness of the way cultural activities influence natural environment	16.7	45.8	33.3	4.2	100

Materials can raise awareness of wide of variety of environmental issues	14.6	66.7	18.8	0	100
Materials can develop awareness of needs for various solutions of environmental issues	16.7	62.5	20.8		100
The content of materials can help students to develop actions plans using various citizenships strategies	6.2	62.5	27.1	4.2	100
The content of materials could help to evaluate action plans in light of their ecological and cultural implications	12.5	62.5	22.9	2.1	100
The content of materials could help students to implement plans and apply actions skills for solving environmental issues	8.3	62.5	25	4.2	100
The content of materials could help students to understand the ethics of development	12.5	70.8	12.5	4.2	100
The content of materials could help students to participate in community development	6.2	72.9	18.8	2.1	100
The content of materials could help learners to assess environmental impact	12.5	68.8	14.5	4.2	100
The content of materials could help learners to understand that environmental education is vital part of all efforts to foster environment respect	6.2	75.2	14.6	4.0	100

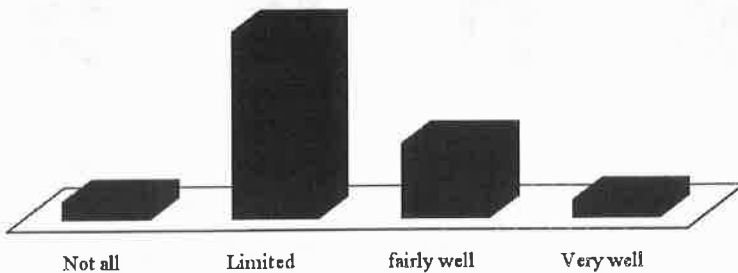
Source: Data from the field

The table above can be grouped into the four following sections.

6.1.3. Role of educational materials for fostering students' knowledge on environmental concepts

The knowledge of environmental concepts and principles is considered as necessary in secondary level because it is invariably called into play an important role when interpreting the ecological dimension of complex environmental issues. To Hattab (1989), the solution of environmental problems in the long term must pass through an education that enables individuals and communities to understand first the concepts of environment and then to understand the relationships united to it.

Figure 1. Headmasters' perception on the role of education materials for fostering environmental knowledge's concepts

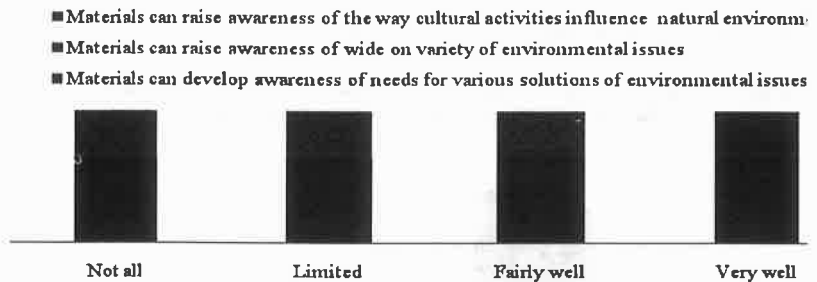


The findings in figure 1 show that a majority of respondents (62.5%) stated that the educational materials used for fostering environmental concepts are limited. The headmasters who recognize that the materials can help students fairly well (25%) and very well (6.2%) to foster knowledge of environmental concepts, are those who organise within their combinations, Geography and Biology and courses in which some features of can be found such as general paper, entrepreneurship and political education.

6.1.4. Role of educational materials to raise awareness on wide variety and needs for various environmental solutions

To be environmentally aware, is to recognise all facts, concepts, and relationships concerning the natural environment (atmosphere, hydrosphere, lithosphere and biosphere) and manmade activities (socio-technosphere) that influence the latter and to have the skills to assess environmental risk and social impact assessment, necessary to apply this knowledge for the environment management.

Figure 2. Headmasters' perception on the role of education materials to raise students' awareness for environmental issues



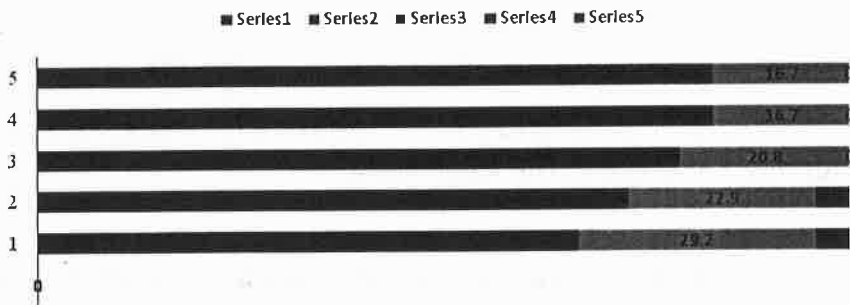
Headmasters were also asked to rank their viewpoints on three items characterizing the educational materials. As shown in figure2, the greatest percentages of respondents on each item emphasized that the educational materials are limited to raise awareness of learners on environmental issues while the category of other respondents rated respectively to 33.3, 18.8 and 20.8) reported that curriculum used can fairly well help students to be environmentally aware. A proportion of 4.2% highly appreciated the materials used. It is evident that schools which have geography, biology, general paper, entrepreneurship in their combinations, could have led the above positive reactions.

Although the appreciation of materials highlighted above, some of respondents are still pessimist on materials' capacity to arouse the awareness of learners about environmental issues. The latter represent respectively percentages of 14.6 and 16.7.

6.1.5. Role of educational materials for developing students'ability and skills for analyzing environmental consequences

To have ability and skills for analyzing environmental consequences, it requires that people understand the interrelationships between environmental components (lithosphere, hydrosphere, atmosphere, biosphere, socio-technosphere), the way they function and the fact that interaction between the biophysical and socio-cultural components of the environment could cause environmental problems.

Figure 3. Headmasters' perception on the role of education materials to develop students'ability and skills for analysing environmental consequences



As detailed in table 3, the figure above comprises five items addressed to headmasters for testing their perception on reliability's education materials to develop students'ability and skills to analyse environmental consequences as follows:

- Most of respondents (52.2%), pointed out that those materials are limited to develop the students' ability and skills to

apply environmental knowledge while a proportion of 29.2% indicated that the materials can fairly well lead to success.

- In the same line, majority of surveyed (52.1%) emphasized that those materials are limited to predict environmental consequences. In contrast, 22.9% believe that those materials can enable students to predict environmental consequences. A few proportion of respondents (4.2%) exceptionally pointed out that the materials are very well to make students able to understand environmental problems.
- Regarding how education materials used can develop students' ability and skills for identifying and investigating environmental issues using both secondary and primary sources, the scenario almost the same because majority (62.5%) pointed out limited the ability and skills of materials of learners to use primary and secondary sources for perceiving environmental problems while a proportion of 20.8% believe to enable them fairly well. A number of respondents (10.8%) are pessimist that cannot in any way help learners.
- Actually, for remaining items, the spectrum of responses from surveyed, is going in the same sense.

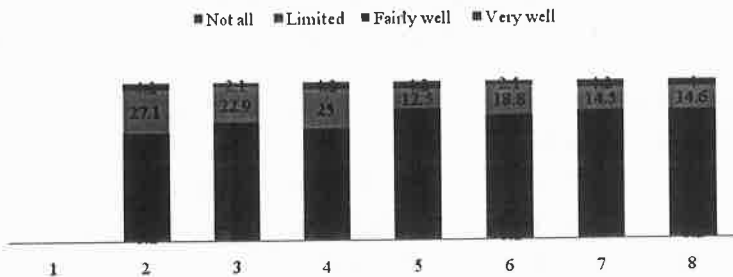
6.1.6. Educational materials content in fostering of students' community participation for sustainable development

In this section, an important consideration was to analyse whether the education material used encompass the notion of Sustainable development within curriculum in line with the definition given by World commission on environment and Development (WCED) also called Brundtland Commission, stipulates : "Sustainable development is that which meets the needs of the present without compromising the ability of future generations to meet their own

needs”(Brundtland Commission,1987). This definition incarnates the environmental ethics which requires people to limit their socio-economic needs for protecting environment.

As shown surveyed results in figure 4, the greatest percentage of headmasters surveyed, ranked the educational materials used as limited to increase students’ knowledge and skills to participate in the sustainable development rated in the order of following percentages 62.5, 68.8, 70.8, 72.9, 75.2. Another category of respondents consider the materials content is fairly well for enabling students to have ability of involvement in sustainable development by planning environmental actions using various citizenships strategies (27.1%), by evaluating plans in light of their ecological and cultural implications (22.9%), by implementing plans and apply actions skills for solving environmental issues (25%), for understanding the ethics of development (12.5%), by participating in community development (18.8%); for assessing environmental impact (14.5%) and for understanding environmental education as vital part of all effort to foster environment respect (14.6%). A small proportion of surveyed, ranked from 2.1 to 4.2%, believes that the educational materials used are very well to fulfill all requirements defined by seven items concerning sustainable development.

Figure 4. Headmasters' viewpoints of education materials for promoting sustainable development



6.2. Findings discussions

Based on all evidence raised above, the level of formal EE in Rwanda is still low since there is no specified content or curriculum related to the field. In secondary schools it is offered from Senior 1 to Senior 6 through Geography and Biology. But the analysing of the curriculum developed by Curricula and materials production and Distribution Department (CPMD) former National Curriculum development Centre (NCDC, 2010) reveals that in upper secondary level, Geography and Biology are not compulsory to all subject areas and EE is taught through some chapters. Where they are taught their respective contents are the following:

Physical Geography: Definition of environment and its components (abiotic and biotic elements); interactions between the environment and the living things (the influence of environment upon living things; impact of fauna and flora upon the environment interactions); interaction of living things among themselves (positive and negative); Man's positive and negative influence on his physical environment.

Human and Economic Geography: Population (diversities, structure, factors of distribution and population growth, etc.); urbanisation and rural settlement, agriculture, mining, industrialisation, transport and communication, trade and commerce; pollution (types, causes, effects of pollution and solutions) and catastrophes (types, causes, effects and solutions).

Biology: Here the stress is placed to Ecology (its definition and components, habitat, biocenosis, biomas, biome, ecosystem, population, community, biosphere, niche, environment); Ecological factors (abiotic, biotic); explanation of different ecosystems; relations between living organisms in the same

biological community (Relations: autotrophy, heterotrophy, food chain, food web, ecological pyramid, energy flow, biocenosis, productivity, competition, saprophytism, parasitism, predation, commensalism, symbiosis; relations between producers and consumers; biogeochemical cycles (water, carbon, nitrogen); degradation of ecosystem (deforestation, bush-fire, pollution, global warming, demographic explosion; nature conservation (reforestation, soil conservation, protection of endangered species as gorillas, crocodiles, etc).

A workshop organised on Nile Transboundary Environmental Action Project (2004), has recognised that Formal EE in schools, is mainly taught through carrier subjects. Rubagumya, former Director of Primary and Secondary Education, participant to the workshop, has emphasised the state of environmental education through questions that she has wondered herself if what is offered is sufficient, if the mode of delivery is appropriate, if message reaches everybody and if it positively impacts their behaviours.

Actually, as can be seen, those modules are more descriptive than analytic because they do not link the environmental knowledge to psychosocial and cultural aspects of students that can impact their behaviour, arouse and reinforce their interest in the sense of responsibility towards environmental issues. In addition to the broad areas of knowledge outlined above, there is a missing of transversal themes in other words, the multidisciplinary approach (holistic approach) that should at this level, develop ethics, values, attitudes and behaviour of students towards environment.

Similarly, Were, senior lecturer at Kigali Institute of Education and participant to the workshop, showed that Environmental Education at Tertiary Level is characterised by the fragmented curriculum, the compartmentalisation of environmental themes, the lacks base in secondary school curriculum, the faculty inertia, the teaching based on lecture and disempowering.

So, the workshop has recommended to set up a curriculum review committee that can determine what is missing in the curricula and identify topics to be included; it can also train teachers and provide teaching materials; develop a national environmental education policy for schools; encourage other initiative geared to improve provision of environmental education; establish and strengthen partnership with local and regional environmental bodies and to adhere to the UN decade of Education for Sustainable Development.

Given that Rwanda depends more than 90% on natural resources, the government has defined a legal framework and policies in place on environment in order to protect environment especially learning institutions have the missions to fulfill this objective. The articles 43 of Official Gazette of Republic of Rwanda (OGR) regarding environmental protection stipules that Public institutions and projects or those of private individuals which have in their attributions training, research and information are obliged, through concrete sensitisation programmes to publicise environmental problems and integrate in their activity plan environmental campaign programmes (OGR, 2005, Art. 43). In this way, EE is one of the main pillars of the policies and strategies put in place by the Government. But as Perikleous (2004) has remarked about the state of EE in Cyprus, in Rwanda the same state of EE prevails until now as a process of “environmental studies” rather than the implementation of “environmental education” as such.

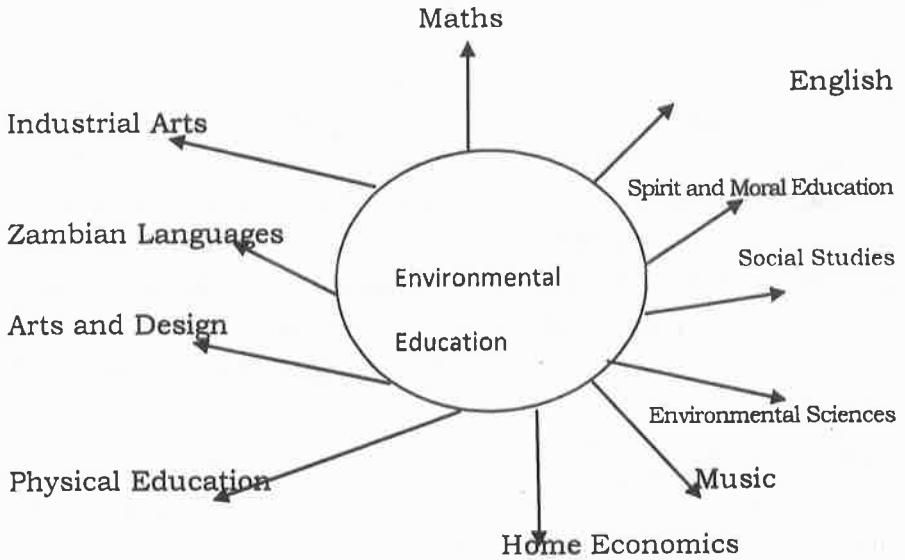
As shown, this state of EE whose approach is still incomplete in Rwanda presents the same features with one developed in other african countries and as illustrated by the discussion of literature, the state of EE is still so poor that cannot change behaviour of students.

Mucunguzi (1995) notes that EE in the formal sector in Uganda, during its pre-colonial period has been largely marginalised by changes in society and land use associated with colonial and post-colonial developments. To him, the formal curriculum has been inadequate in many ways for meeting local needs because it was largely disciplinary, factual, descriptive and academic, without being dialectical and analytical. He argues that a better approach to formal environmental education should be based on a multidisciplinary foundation that embraces the biophysical environment, people, culture, politics and socio-economic systems. It should occur as a holistic approach to education, as well as the environment.

In Tunisia, Smati (2004) reports that environment classes are taught as a subject in the different educational institutions. Moreover, there exist environmental clubs in primary and secondary schools. The teachers in charge of EE are not necessarily formed but they are generally sensible to the subject as they enjoy teaching it. They can find documents at the different national agencies that are concerned with the environment, in particular at the service in charge of the environment at the Ministry of Agriculture, at NAPE (National Agency for the Protection of the Environment) but also at NGOs that always provide opportunities to discuss with younger generations.

But in South Africa, Rosenberg (2009) notes that, the Environmental Education is considered as a basis for other disciplines. Besides, Ischool.zm presents EE in Zambia as core of the other disciplines. But its approach is interdisciplinary as it is illustrated in the Figure below.

Figure 5: Status of EE in the school curriculum in Zambia



Source: Ischool.zm, The nature of environmental education retrieved from http://www.ischool.zm/media/ptddl_m5_part1.pdf, 07/01/2013

The above figure would express that environmental education is a crossroads discipline and recalls the popular roman saying: "all roads lead to Rome" i.e. that all educational disciplines lead to Environmental Education. Otherwise, EE is the starting point of other education disciplines. This seems to be correct because all kind of teaching should take examples from environmental for good understanding. This meets viewpoint of Orr (1992) who reports: "all education is environmental education" (p.90). This offers an opportunity to see education as relevant to the challenge of building a sustainable and environmental society.

7. Conclusion and recommendations

The paper has examined how EE is presently practiced in Rwandan secondary schools especially in schools of Kigali City. The survey results from headmasters and analysis of curriculum supported by literature discussion, reveal that EE is not an independent subject and the curriculum content is still limited to enable students for strengthening their ability and skills in order to promote environmental ethical values for sustainable development whereas Bodzin et al (2010) believe that in the coming decades, EE will be the science for the future and the general public will be required ever more often to understand complex environmental issues, evaluate proposed environmental plans, and understand how individual decisions affect the environment at local and global level.

As matter of fact, if we accept that EE has its purpose, objectives, methodology and principles to it, EE must be an independent discipline while being a crossroads of other disciplines using holistic approach and should be taught compulsory in all combinations (all subject areas of secondary schools).

The development of environmental curriculum requires the consultation on a wide scale of all Environmental Education stakeholders (Government, relevant professional organisation of civil society, teachers, parents committee, etc).

It should be better to introduce aspects of Environmental Education that at present are overlooked or very poorly treated in the curriculum, for instance, environmental ethics which is a component of education for sustainability. The educational materials may include units of manual activities, extended case study, and outdoor classes.

REFERENCES

1. Bodzin et al (2010). *The inclusion of Environment Education in Science Teachers Education*, 2010 retrieved from <http://www.springer.com>, on 08/08/2013
2. Brundtland, World Commission on Environment and Development (1987): *Our Common Future*, Overview: From One Earth to One World , which includes the definition of sustainable development retrieved from <http://www.un-documents.net/ocf-ov.htm>, 24/12/2012 NCDC. (2010). *Advanced level Biology curriculum (Principal subject, 4, 5&6)*, Kigali, NCDC.
3. NCDC. (2010). *Geography programme for advanced level, Humanities Section*, Kigali, NCDC.
4. Hattab, A. (1989). "La problématique environnement-développement ». *Actes du Séminaire sur l'environnement et le développement durable tenu à Brazzaville du 5 au 8 Juillet 1989. In UNESCO: 115-122, Paris, 1990.*
5. Ischool.zm, The nature of environmental education retrieved from http://www.ischool.zm/media/ptddl_m5_part1.pdf,07/01/2013
6. Maushe, K (ed) (2004). Nile Transboundary Environmental Action Project. Networking of Environmental Education and awareness practitioners in Rwanda, Kigali, REMA.
7. MCcrea, E.J. (2006). "The roots of environmental education: How the past supports the future". In *Environmental Education and Training partnership (EETAP)*
8. MINEDUC (2007). *Teacher development and management policy in Rwanda*, Kigali.
9. MINEDUC (2010). *Education Sector Strategic Plan 2006–2010*, Kigali, MINEDUC.
10. MINEDUC (2012). *Education statistics year book*, Kigali, MINEDUC.

11. MINITERE (2000). National strategy and Action plan for Biodiversity Conservation in Rwanda, Kigali, MINITERE.
12. MINITERE (2005). *National Environmental Policy*, MINITERE, Kigali.
13. Mucunguzi, P. (1995). "Article usage statistics combine cumulative total PDF downloads and full-text HTML views from publication date (but no earlier than 25 Jun 2011, launch date of this website) to 15 May 2013. Article views are only counted from this site. Although these data are updated every 24 hours, there may be a 48-hour delay before the most recent numbers are available. Environmental Education in the Formal Sector of Education in Uganda". Volume 1, Issue, 1995 pp 233-240
DOI: 10.1080/1350462950010208 Retrieved from <http://www.tandfonline.com/action/doSearch?q=12/07/2013>.
14. Nath, B. (2011). "Formal Environmental Education at preschool, primary, and secondary level". *Environmental Education and Awareness*. Vol.1. European Centre for pollution research.
15. London OGR (2005). Organic Law determining the modalities of protection, conservation and promotion of environment in Rwanda, Official Gazette N° 04/2005 of 08/04/2005.
16. Orr, D. (1992). *Ecological literacy. Education and the transition to a postmodern world*. Albany, NY: State University of New York Press.
17. Perikleous, E. "The Status of Environmental Education in Cyprus Today. The status of Environmental Education in the Mediterranean countries within the formal & non-formal educational systems". In *MIO-ECSDE*, Issue no 34: pp 10-12, December, 2004.
18. Ramesh, G. and Rao, B. D. (2006). *Environmental education, Problems and Prospects*, New Delhi, Discovery.
19. Rather, A. R. (2007). *Theory and Principles of Education*, New Delhi,

20. DPH REMA, (2010). *Rwanda Environmental Education for Sustainable Development Strategy A Strategy and Action Plan for 2010-2015*, Kigali.
21. Rosenberg, E. (2009). *Teacher Education Workbook for Environment and Sustainability Education*. Rhodes University Environmental Education and Sustainability Unit, Grahamstown. Distributed through Share-Net, Howick.
22. Smati, B. (2004). "Environmental Education in Tunisia". The status of Environmental Education in the Mediterranean countries within the formal & non-formal educational systems In *MIO-ECSDE*. Issue no 34: pp 7-8.
23. Uma, D. and Adinarayana, P. R. (2007). *Environmental education for rural population*. New Delhi, Discovery.
24. UNESCO (2003). "L'UNESCO et la Décennie internationale pour l'éducation en vue du développement durable (2005-2015) " in *connexion*, Vol. XXVIII, n°1-2, Paris, UNESCO.
25. UNESCO (2002). *Education for Sustainability. From Rio to Johannesburg: Lessons learnt from a decade of commitment*. Paris, UNESCO.
26. UNESCO-UNEP (1985). "Environmental Education: Module for Pre-Service Training of Social Science Teachers and Supervisors for Secondary Schools" in *International Programme, Environmental Education series 9*. Paris, UNESCO.
27. UNESCO (1978). *Tbilisi Declaration (Final report of the Intergovernmental Conference of EE: Tbilisi (Georgia- URSS), 11-26 October 1977)*. Paris, UNESCO.
28. UNESCO (1975). *International Workshop on environmental Education*, Belgrade. UNESCO

Evaluating the effects of tariff restructuring on clothing imports in South Africa: a Computable General Equilibrium Model

By

*Ndahiriwe Kasai*¹, *Eric Humbulani Nevondo*² and *Denis Chiekweiro Uzoigwe*³

1. Senior lecturer, Department of economics, Kigali Independent University, Rwanda,

E-mail: dr.kasai.ndahiriwe@ulk.ac.rw, Phone: +250 (0) 788309917

2. Chief Surveyor General, South Africa, Pretoria,

E-mail: msinthumule@csg.pwv.gov.za

3. Centre for Management Development, Lagos, Nigeria

E-mail: denis_uzoigwe@yahoo.co.uk, Phone: +234 (0) 8061562479

Abstract

This paper analyses the effects of tariff restructuring on clothing imports in South Africa using a Computable General Equilibrium (CGE) model. A simulation on 32 sectors of the economy has been done with the aim to gain understanding on how the 1999's 16% tariff reduction affected them. On one hand, simulation results reveal that the South African consumer has gained tremendously. However, on the other hand, the effect on the local producing industry shows a disadvantage resulting from free trade. Cheaper imports have stimulated the domestic consumer to forego some domestic products. This scenario has led to 0.3% decrease in the real GDP. Indeed, the decrease in the real GDP has resulted from both the decrease of domestic production and the increase of the imported products of the clothing and textile industry. Nevertheless, the statistics have shown a consumer welfare gain which is significantly greater than the producer welfare loss.

Key words : General equilibrium, Tax reduction, clothing industry.

JEL classification : C68

1. Introduction

While free trade maximizes world welfare, practically all nations impose some restrictions on the free flow of international trade (Salvatore, 2004: 235). Invariably, most trade restrictions are on the tariff and this results in the form of tax or duty levied on traded goods and services as they cross a national boundary. It is important to mention that import tariffs rarely depend on the increase of tax revenue but they mostly aim at protecting domestic industries.

As far as South Africa is concerned, the Customs and Excise Act of 1964 acknowledged that custom duties on imports were levied since the mid 1920's. This position was effective in protecting import-competing domestic industries. It is through this that the country survived economic sanctions imposed by the international community between 1980 and 1994, since the industries were more or less well established. As a weapon to dismantle the apartheid racial regime in the country, the sanctions nonetheless covered trading with the rest of the world. It was not surprising that when South Africa democratized in 1994, it was to be reintegrated into the International economic and social groups including the multilateral banks and trade agencies like the World Bank, International Monetary Fund and World Trade Organization (WTO). As a precondition to join the WTO, the country had to adopt liberal or free trade policies.

This being the case, the broad objective of this paper is to explore and evaluate the policy implication of the 16% import tariff cut embarked on by South Africa in 1999 as a precondition for the country's admittance into WTO. Clearly, there are about 32 sectors affected by the tariff cut, but special attention is focused on textile and clothing industry.

This paper is structured into five sections. Section one is the introduction; section two is devoted to the literature review, while section three is the general analytical model. Section four presents the results, and section five concludes.

2. Literature review

By principle, WTO member are permitted to protect human beings, animals and to conserve natural resources, but they are not permitted to deny people access to commodities of good quality (see Gupta, 1997). Advocates of free trade include Victor *et al.* (1986), Gerhard (1990), Earle and Harbison (1993), Olbeter (1994), and Santos-Paulino and Thirwall (2004).

For instance, Olbeter (1994) stipulates that the free movement of telecommunication services in the US has forced firms to continually innovate, improve efficiency and provide high quality services as opposed to the Asian countries which generally do not welcome competition. Indeed, protection is simply seen as a defense of the interests of specific industries and classes of workers (see Earle and Harbison, 1993). On his side, Victor *et al.* (1986) has provided empirical evidences that protection policy has negative impact on standard of living of the poor, employment and balance of trade.

With reservations, Santos-Paulino and Thirwall (2004) view trade liberalization as a good policy for better overall economic performance leading to economic growth and improved welfare of the people. When foreign cheaper goods enter the domestic market, consumers will go for them against the domestic expensive goods. On the other hand local industries will try hard to improve the quality of their products which has a positive impact on the welfare of the country. Hypothetically, for developing nations,

free trade leads to improved performance of local industries. Free trade results into a flow of skills and technology acquired by developing countries from developed countries. On this note, Gerhard (1990) sees free trade as a stimulant for Research and Development as compared to autarky.

However, while free trade maximizes world welfare, the views expressed on the subject are controversial. One fear the opponents of free trade are always having is the concept of dumping which involves importing goods that are in excess in the foreign country at very low prices and so, impacting negatively the domestic industry. In addition, if industries within two different liberalized countries are not at the same level of development, the advantage seems to be one sided. Experience of liberalizing countries as shown by Thomas *et al.* (1990) indicates that the result is more than a theoretical curiosity. Indeed, despite the fact that comparative advantage is the desire of international trade as per Ricardian theory, in a world of many countries it is quite possible for a country not to enjoy comparative advantage in the production of any commodity. Such a country is obviously standing to oppose any attempt to have trade liberalized.

For example, when Germany was to enter into bilateral trade agreement with Great Britain which was industrially leading at the time, critics of the idea argued reasonably against free trade. Great Britain was seen as a country which would benefit at the expense of Germany on the supply side of the industries. Another example is provided by Taplin (2003) who assessed the effects of the North American Free Trade Agreement (NAFTA) on the US and Mexican textile and apparel companies. He found that free trade will move low wage, low skilled and labor intensive jobs to Mexico since it has a comparative advantage over the products. The process was expected to increase **employment**

in Mexico but to the disadvantage of the other members at the expense of employment in the importing nations. Therefore, for the other members, consumer welfare would increase as a result of imported less expensive goods but should be weighed against the job losses.

On another perspective, Shilling (2003) makes a remark on the inefficient Mexican agricultural industry which could not compete with the United States and had to be protected by imposition of 20% tax on all imports from the US. Among many others, authors like Sodersten and Reed (1980), Hanson and Song (1988), Harriott *et al.* (1997), Agénor and Monttiel (1999), Shilling (2003), Hurreram and Little (2004), Keenan *et al.* (2004) show their concern about unequal advantages resulting from free trade. Indeed, global competition between countries which are not on the same economic and technological level lead to imbalances since the country with better technology will always prey on the competitor.

However, most authors generally look at the impact of restricted trade on domestic producers without any consideration of redistribution effect. Exceptions include a study on the Australian automotive industry by Tcha and Kuriyama (2003) who reported a substantial redistribution effect of the tariffs but very small on the deadweight loss.

3. General analytical Model

The study uses the University of Pretoria General equilibrium Model (UPGEM)³ to analyze the effect of tariff reduction on the South African economy. The model consists of 32 sectors. Data input within the model represent some form of equilibrium;

³ Developed by the University of Pretoria, UPGEM is a flexible recursive-dynamic computable general equilibrium model of the South African Economy.

therefore, shocking variables result into changes that disturb the equilibrium position. Findings result from the effects of policy shocks in terms of changes from initial equilibrium. This study concentrates on two sectors namely clothing and textiles only because of their relatedness. The imports have been shocked by 16% reduction of tariffs in the clothing industry. This is a short run simulation. The following variables are exogenous in the model: all tax rates; real investment expenditure; government expenditure on goods; capital (by sector); agricultural land; technological change; real wage shift and government demand. The rest of other variables are endogenous and explained within the model.

4. Results and Discussion

The simulation results are given in the output tables and discussion thereof is based on the results. Only two sectors are considered for discussion because the rest is beyond the scope of this study. Most of the results are presented in percentage changes some others in millions of rand (South African currency). Aspects of the results that are important for the discussion are arranged as follow: (1) price effects; (2) quantity effects; (3) ordinary changes.

4.1. Price effects of the tariff reduction policy

A reduction on import tariff of clothing basically implies a drop in the price of imports in the local market. This will stage up the state of competition now that foreign goods are less expensive than before in the domestic market. The basic price of domestically produced goods consequently drops by 1% for clothing and 0.25% for textiles resulting from the simulation. The less priced imports stimulate the domestic demand for imported commodities and consequently the demand for domestic product drops. It is well

known that textiles are used in the production of clothes. Therefore, a reduced demand for the domestic product affects demand for textiles negatively. This translates into the same effect that tariff cut has on the price of domestic clothing. The consumer price index fell by more than 0.25% in the domestic economy. Relatively speaking, the fall in the price of import commodities is higher than that for the domestically produced goods. The consumer prices for clothing fell by 0.92% for domestic commodity and 14.13% for imported goods. The textile industry reports a 0.25% decrease in domestic good price and 0.03% for the imported textiles. As far as the consumer is concerned, it is observed that the tariff was preventing domestic consumers from buying cheaper clothing manufactured outside the country; hence they were forced to buy expensive domestic goods. Consumers were therefore denied welfare gains by protecting domestic industry against foreign competition.

Table 1: Price effect in percentage changes

Prices	Clothing	Textiles
Panel A: Supply side		
Domestic producer price	-1.00	-0.25
Cost of capital per unit	-0.10	-0.10
Rental price of capital	-10.85	-1.72
Panel B: Demand side		
Consumer price	Domestic	-0.92
	Import	-14.13
		-0.25
		-0.03

On the other hand, the effect on the local producing industry shows a disadvantage resulting from free trade. Local producers forfeit the privilege of being sole suppliers of clothing in the local market when tariffs on imports are reduced, and therefore, resorting to cut down local production as a consequence of being

less competitive. This behavior may lead to reduced demand for capital goods, thus reducing the cost of capital per unit by 0.1% for both textiles and clothing. The output of the competing domestic commodity falls by 11.2% from the pre-simulation figures. As a consequence, the output of textiles falls by 1.51% since the demand for local clothing for which intermediate textiles are produced has decreased significantly. The reason is simply that the South African textile industry could not successfully compete with countries like China. Accordingly, Hurreram and Little (2004) suggest that Sub-Saharan countries have to group themselves in order to compete globally in the textile industry. But these authors agree that with free trade the biggest share of the market for the product will belong to a country which has comparative advantage in terms of cost, product quality, manufacturing flexibility and responsiveness to market. This will be disadvantageous to a country that does not have the raw materials, skills and adequate infrastructure.

As opposed to free trade, restrictions would have benefited domestic producers. For example, Stennes and Wilson (2003) provided empirical evidences with regard to restrictions that the US imposed on imports of softwood lumber from Canada. They found that the US imposition of 27.2% tariff and quota resulted in the US producers gaining at the expense of the consumers. A heavy restriction against imports of a particular commodity leads to imported goods sold at higher prices than domestic goods which will discourage consumers. The domestic producer therefore stands to gain from the policy as foreign goods will not be affordable to the local users.

4.2. Quantity effects

The reduction of the tariff by 16% attracted an inflow of import goods from the international producers. The total supply of clothing rises by 56.5% with that of textile for intermediate consumption declining by 3.9%. The reason for this is that domestic consumers become better-off with relatively cheaper commodities.

Table 2: Quantity effect in percentage changes

Quantities	Clothing	Textiles	
Panel A: Supply side			
Supplies of imports	56.47	-3.96	
Local investment	-7.17	-1.11	
Value added (activity level)	-11.57	-1.45	
Local output	-14.93	-2.35	
Labor input	-13.15	-1.80	
Panel B: Demand side			
Household demand	Domestic	-14.58	0.10
	Import	60.34	-0.38

As regards the supply side, results reveal that local production is decreased by 14.9% in response to the tariff cut. Consequently, a negative impact is observed on the demand for labor as labor inputs for domestic clothing and textile industries shrink by 13.2% and 1.8% respectively. Investments within the industry would also decline when investors are less confident of the returns in the industry. With the tariff cut, investments in the domestic industry have fallen by 7.17% which led the activity level to fall by 11.6% as well. Same consequences resulted from liberalization of the European Union clothing and textile sectors which left a lot of people jobless. Global competition led the EU to lose the market to China which is currently the cheaper producer of clothing and textiles (see Keenan *et al.*, 2004).

4.3. Other changes

Tariff reduction has more economic effects than could be expected. The following are the ordinary changes brought about by the policy on tariff cut and all the values are measured in millions of rand.

Table 3: Tariff and costs (Ordinary changes in millions of Rand)

Definition	Clothing	Textiles
Tariff revenue	-693.85	0.00
Cost of primary factors	-509.49	-59.06
Cost of production	-1370.54	-178.88

The most significant change in Table 3 is on the cost of production which has decreased by more than a billion Rand. Indeed, 16% tariff cut in the clothing sector reduces the production costs by 1370.54 and 178.88 in the clothing and textile sector respectively. Primary factors also get cheaper with a decrease of 507.19 and 59.06 for the clothing and textile sector respectively. Since cheaper clothes are coming into the South African market from abroad, lower demand for domestic goods will lead into lower demand for the respective capital goods. The cheaper these goods will be, the lower the costs of producing clothes shall become. In fact, the cheaper imports compel the domestic producer to sell at lower prices as well.

As seen in Annex 2, aggregate revenue from all indirect taxes reduced by 927.04 in millions of Rand. Similarly, Table 3 shows that the government revenue has negatively been affected by the shock. With the ad valorem tariff reduced by 16 percent, the government loses tariff revenue by 693.85 in millions of Rand. This can be interpreted as a trade off to the deadweight loss caused by the tariff when foreign firms were restricted within the local market.

Table 4: Aggregate sales (Ordinary changes in millions of Rand)

Definition	Domestic	Import
Intermediate	-88.33	63.86
Household	-1225.31	1364.25

The aggregate sales (see Table 4) in the market reflects a decrease in domestic sale of intermediate clothing by 88.33 and sales for household use of the domestic good decreased by 1225.31. With the imported clothes for intermediate use there is an increase of 63.86 and for household use an increase of 1364.25. The decomposition of sales above clearly shows that users have shifted from purchasing the domestically produced goods to imports. As a result, the total real GDP and import ratio (WOGDPEXP) within the period showed a decrease of about 0.3%. This result signifies that cheap imported foreign clothing led to a fall in domestic productions in the textile industry, labor cut and low income affected real GDP negatively.

5. Conclusion

This paper analyses the effects of tariff restructuring on clothing imports in South Africa using a Computable General Equilibrium (CGE) model. A simulation on 32 sectors of the economy has been done with the aim to gain understanding on how the 1999's 16% tariff reduction affected them. By principle, the objective of the policy was to improve the welfare of the inhabitants of the country under free trade. Consumers have access to foreign cheaper goods traded in the domestic market as the world is free to be part of it. However, as stipulated by the theory, the trade policy pursued by South Africa has both the gains and losses.

Simulation results reveal that the 16% tariff cut led to 0.3% decrease in the real GDP. The decrease in the real GDP has resulted from both the decrease of the domestic production and the increase of the imported products of the clothing and textile industry. In fact, the decomposition of sales has clearly shown that users have shifted from purchasing the domestically produced goods to imports. The less priced imports stimulate the domestic demand for imported commodities and consequently the demand for domestic product drops. Therefore, the effect on the local producing industry shows a disadvantage resulting from free trade. Local producers forfeit the privilege of being sole suppliers of clothing in the local market when tariffs on imports are reduced, and therefore, resorting to cut down local production as a consequence of being less competitive. This constraint has led to reduce the demand for capital goods for both textiles and clothing.

The above is justified by the fact that the South African textile industry could not successfully compete with countries like China. However, as far as the South African consumer is concerned, a tremendous positive effect has been recorded. It is observed that the tariff was preventing domestic consumers from buying cheaper clothing manufactured outside the country; hence they were forced to buy expensive domestic goods. Consumers were therefore denied welfare gains by protecting domestic industry against foreign competition. All in all, the good news is that, the statistics have shown a consumer welfare gain which is significantly greater than the producer welfare loss.

References

1. Agénor, P.R and Monttiel, J.P. (1999), *Macroeconomics Development*, 2nd edition, UK, Princeton University Press.
2. Anonymous, (1994), Companies unsure of GATT, NAFTA impact on US business, *Journal of Accountancy*, Vol. 178, No. 3, pp. 20 – 21.
3. Banks, H. (1995), Protection hurts the economy, *Forbes*, Vol. 156, No. 7, p. 37.
4. Baron, J and Kemp, S. (2004), Support for Trade Restrictions, Attitudes and Understanding of Comparative Advantage, *Journal of Economic Psychology*, Vol. 25, No. 5, pp. 565 – 580.
5. Board on Tariff and Trade, (1996), Review of Customs Tariff Policy, South Africa.
6. Clothing Federation of South Africa, (1997), The South African Clothing Industry: *Executive Handbook*.
7. Du Plessis, S.P.J. (1994), *International Economics*, 2nd edition. Butterworth: Johannesburg, South Africa
8. Earle H. and Harbison J.R. (1993), Protection or Protectionism?, *Issues in Science and Technology*, Vol. 26, No. 4, pp. 26 – 29.
9. Gerhad, C. (1990), International R & D competition and trade policy, *Journal for International Economics*, Vol. 28, No. 1-2, pp. 93 – 113.
10. Gupta R.K. (1997), Non-Tariff Barriers or Disguised Protectionism, *CUTS: Briefing Paper*, No 2.
11. Hanson R.C. and Song H. (1998), Shareholders wealth effects of free trade: US and Mexican Stock market response to

NAFTA, *International Review of Economics and Finance*, Vol. 7, No.2, pp. 209 – 224.

12. Harriott J., Hatfield G. and Walker, M.M. (1997), The effect of the US – Canada free trade agreement on the banking market, *Journal of Multinational Financial Management*, Vol. 7, No. 2, pp. 145 – 157.
13. Hurreram, D.K. and Little D, (2004), International Apparel Trade and Developing Economies in Africa, *International Journal of social Economics*, Vol. 31, No 1/2, pp. 131 – 142.
14. Keenan, M., Saritas, O. and Kroener, I. (2004), A dying industry or not? The future of the European textiles and clothing industry, *Foresight*, Vol. 6, No. 5, pp. 313 – 322.
15. Olbeter, E.R. (1994), Opening the global market for telecommunications, *Issues in Science and Technology*, Vol. 11, No. 2, pp. 57 – 64.
16. Salvatore, D. (2004), *International Economics*, 8th edition, USA, John Willey & Sons.
17. Santos-Paulino, A. and Thirlwall, A.P. (2004), Trade Liberalization and Economic Performance in Developing Countries, *The Economic Journal*, Vol.114. No. 493, pp. F4 – F21.
18. Shilling, A.G. (2003), The Protection threat, *Forbes*, Vol. 172,
19. Sodersen, B. and Reed G. (1994), *International Economics*, 3rd edition, St. Martin's Press, New York.
20. Stennes, B. and Wilson, B. (2003), An analysis of lumber trade restriction in North America: Application of a Spatial equilibrium model, *Forestry Policy and Economics*, Vol. 7, pp.

21. Taplin, I.M. (2003), The politics of industrial restructuring: NAFTA and Beyond, *Journal of Fashion Marketing and Management*, Vol. 7, No. 2, pp. 111 – 118.
22. Tcha, J. and Kuriyama, T. (2003) Protection policy under economies of scale- the welfare effects of tariffs on the Australian automotive industry, *Journal for Policy modeling*, Vol. 25, No. 6 – 7, pp. 655 – 672.
23. Thomas, V., Matin, K.M and Nash, J. (1990), Lessons of Trade Policy Reform, *The World Bank* (July).
24. Victor A. Canto, J. Kimball Dietrich, Adish Jain and Vishwa Mudaliar (1986), Protectionism and Stock Market: The determinants and consequences of Trade Restrictions, *Financial Analysis Journal*, Vol. 42, No. 5, pp. 32 - 42.

ANNEXURE 1

[UPGEM02 MODEL]

INPUT DATA (SOUTH AFRICA)

Header	Dimension	Coef	Total	Name
1	HPUR COM*HOU*POP	HOU*PUR	553072.1	Household purchases: D10 is richest
2	P2*IX HOU*POP	FRISCHX	43.68	Frisch Parameter
3	XPLX COM*HOU*POP	EPSX	754.35	Expenditure elasticities
4	CHK3 COM	CHK3	0.01	check HOU*PUR adds to V3BAS+V3TAX+V3MAR: should = zero
5	COM 32 length 12			Set COM Commodities
6	IND 32 length 12			Set IND Industries
7	OCC 3 length 12			Set OCC
8	MAR 2 length 12			Set MAR Margin coms
9	1BAS COM*SRC*IND	V1BAS	539830	Intermediate Basic
10	2BAS COM*SRC*IND	V2BAS	128548.6	Investment Basic
11	3BAS COM*SRC	V3BAS	436782.8	Households Basic
12	4BAS COM	V4BAS	240194.4	Exports Basic
13	5BAS COM*SRC	V5BAS	42341.79	Government Basic
14	6BAS COM*SRC	V6BAS	0	Inventory Changes
15	1-Mar COM*SRC*IND*MAR	V1MAR	124944.3	Intermediate Margins
16	2-Mar COM*SRC*IND*MAR	V2MAR	1850.73	Investment Margins
17	3-Mar COM*SRC*MAR	V3MAR	68557.48	Households Margins
18	4-Mar COM*MAR	V4MAR	9352.46	Exports Margins
19	5-Mar COM*SRC*MAR	V5MAR	1424.16	Government Margins
20	1TAX COM*SRC*IND	V1TAX	21307.4	Intermediate Tax
21	2TAX COM*SRC*IND	V2TAX	5191.68	Investment Tax
22	3TAX COM*SRC	V3TAX	47731.86	Households Tax
23	4TAX COM	V4TAX	4257.18	Exports Tax
24	5TAX COM*SRC	V5TAX	1156.48	Government Tax
25	1CAP IND	V1CAP	342336.9	Capital
26	1LAB IND*OCC	V1LAB	309543.6	Labour
27	1LBE IND*OCC*POP	Wages	309543.6	Wage matrix
28	1LND IND	V1LND	14291.46	Land
29	1PTX IND	V1PTX	-2367	Production Tax
30	1-Oct IND	V1OCT	16022.36	Other Costs
31	MAKE COM*IND	MAKE	1365908	MAKE

32 0TAR	COM	V0TAR	0	Tariff Revenue
33 SLAB	IND	SIGMA1LAB	11.2	Labour Sigma
34 P028	IND	SIGMA1PRIM	37.88	Primary Factor Sigma
35 1ARM	COM	SIGMA1	83.7	intermediate Armington
36 SCET	IND	SIGMA1OUT	16	Output Sigma
37 TAU	COM	TAU	0	1/Elast. of transformation, exportable/locally used
38 2ARM	COM	SIGMA2	83.7	Investment Armington
39 3ARM	COM	SIGMA3	83.7	Households Armington
40 P021		1 FRISCH	-1.82	Frisch Parameter
41 XPEL	COM	EPS	31.14	Household Expenditure Elasticities
42 ENGL	COM	MARSHR3	1	Marginal budget shares
43 P018	COM	EXP ELAST	-128	Individual Export Elasticities
44 EXNT		1 EXP ELAST_NT	-4	Collective Export Elasticity
45 ITEX	COM	IsIndivExp	32	Flag, >0.5 for individual export commodities, else collective export

**MODEL UPGEM02.
OUTPUT**

ANNEXURE 2

Defination	Symbol		Simulation tariff(-16%) cut on clothing	
QUANTITIES				
Value added(activity level)	x1tot			
# Clothing			-11.57	
# Textiles			-1.45	
Labour Inputs	x1lab_op			
# Clothing			-13.15	
# Textiles			-1.8	
Total suplies of import goods	x0imp			
# Clothing			56.47	
# Textiles			-3.96	
Output of commodity local	x0dom			
# Clothing			-14.93	
# Textiles			-2.35	
Investment by industry	x2tot			
# Clothing			-7.17	
# Textiles			-1.11	
Real Hosehold consumption	x3tot_h			
Household basic demand	x3		domestic	import
# Clothing			-14.58	60.34
# Textiles			0.1	-0.38
PRICES				
Producer Basic price of dome	p0dom			
# Clothing			-1	
# Textiles			-0.25	
Cost of Capital per unit	p2tot			
# Clothing			-0.1	
# Textiles			-0.1	
Consumer Prices (Household)	p3			
			domestic	import
# Clothing			-0.92	-14.13
# Textiles			-0.25	-0.03
Output price of locally produced goods	p0com			
# Clothing			-1	
# Textiles			-0.25	
Rental price of capital	p1cap			
# Clothing			-10.85	
# Textiles			-1.72	

Defination	Symbol		Simulation tariff(-16%) cut on clothing	
OTHER CHANGES				
Aggregate Revenue from all				
Indirect taxes (ordinary)	delv0tax_csi		-927.04	
Tariff Revenue (ordinary)	delv0tar			
# Clothing			-693.85	
# Textiles			0	
Cost of primary factors(ordinary)	delv1prim			
Cost of primary factors(ordinary)	delv1prim			
# Clothing			-509.49	
# Textiles			-59.06	
Costs of production(ordinary)	delv1cst			
# Clothing			-1370.54	
# Textiles			-178.88	
Gross Capital growth (%)				
# Clothing			-7.17	
# Textiles			-1.11	
Gross rate of return on capital(%)	gret			
# Clothing			-10.76	
# Textiles			-1.11	
Sales Aggregates	delsale		domestic	import
	intermediate		-88.33	63.86
	Households		-1225.31	1364.25

ANNEXURE 2

MODEL UPGEN02

OUTPUT(

Macros

contBOT	-0.02	w1cap_I	-0.14
delB	0	w1lab_lop	-0.3
delV0tar_c	-693.85	w1Ind_I	0.41
delV0tax_csl	-927.04	w1oct_I	-0.31
delV1PTX_i	5.5	w2tot_I	-0.1
delV1tax_csi	-35.09	w3tot	-0.29
delV2tax_csl	-4.99	w4tot	0.32
delV3tax_cs	-166.16	w5tot	-0.18
delV4tax_c	16.93	w6tot	0
delV5tax_cs	-1.69	x0cif_c	0.54
employ_lop	0	x0gdpexp	-0.02
f1lab_lop	0	x0gdpinc	-0.02
f1tax_csl	0	x0imp_c	0.48
f2tax_csl	0	x1cap_I	0
f2tot	0	x1Ind_I	0
f3labinc	0	x1prim_I	0
f3tax_cs	0	x2tot_I	0
f3tot	0	x3tot	0
f4p_ntrad	0	x4_ntrad	0
f4q_ntrad	0	x4tot	0.43
f4tax_ntrad	0	x5tot	0
f4tax_trad	0	x6tot	0
f5tax_cs	0		
f5tot	0		
f5tot2	0		
invsIack	0.11		
p0cif_c	0		
p0gdpexp	-0.28		
p0imp_c	-0.24		
p0realdev	0.28		
p0toft	-0.11		
p1cap_I	-0.14		
p1lab_lop	-0.29		
p1Ind_I	0.41		
p2tot_I	-0.1		
p3tot	-0.29		
p4_ntrad	0		
p4tot	-0.11		
p5tot	-0.18		
p6tot	0		
phi	0		
realwage	0		
w0cif_c	0.54		
w0gdpexp	-0.3		
w0gdpinc	-0.3		
w0imp_c	0.23		
w0tax_csl	-0.99		

Design & Printing by NIKA Printers Ltd Kigali
Tel: +250 788301554
E-mail: nikaprinters@yahoo.fr