

Macroeconomic Impact of Tax Reform in Ethiopia

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Abstract

This study analyzes the economy wide impact of tax reform on Ethiopian economy using Dynamic Computable General Equilibrium (DCGE) model. It utilized the updated 2009/10 Ethiopian Social Accounting Matrix (SAM) from 2005/06 developed by Ethiopian Development Research Institute (EDRI). In order to investigate the impact of tax reform on Ethiopian economy different simulations were made turn by turn. First, a reduction in direct tax by 30% is introduced to see its impacts on economy. Consequently, GDP and all other macroeconomic variables such as: absorption, private consumption, government expenditure, import, export, government income, investment, and aggregate output show a considerable improvement. On the second simulation sale tax increased by 66.27% to look the impact of sales tax on economy. As a result, sale tax improve the overall economic performance by improving the government revenue compared to direct tax reduction. Under the third scenario reduction of import tariff by 24% deteriorated the overall economic performance by boosting import and discouraging domestic output. Based on the finding, inspiring direct tax reform and consumption tax reform, protecting the home country from external sector influence to encourage domestic production are the major policy option recommended to bring a good economic performance with lower distortion since it is difficult to abolish distortion when tax reform is conducted.

Keywords: Ethiopia, Tax Reform, Tax Revenue, Macroeconomics performance, Dynamic Computable General Equilibrium.

1. Introduction

Economic development is the principal and overall objective of all country in the world especially the issue of improving the living standard of society is still blistering and need immense struggle to tackle it. In developing countries apart from the accessibility of resources developing country is yet to use the resource in efficient and effective manner and so far taxation is the most important tools of resource mobilization and social development comes through the implementation of an effective tax policy (Workineh, 2016; Chaudhry and Munir, 2010; and Wawire, 2011).

Taxation in developing countries is a challenging topic and has attracted increasing attention in the last two decades (Tanzi *et al*, 2000). These challenges are serious in low income countries, where the pressing need to raise revenue for increased investment in public services and infrastructure (David *et al.*, 2016). As empirical literature reveal, the tax revenue performance of developing countries where very poor and far less than developed countries. For example, Ghirmai (2016), the average taxation ratio of developed countries as a proportion of GDP fall between 29 and 32%, whereas the corresponding range for developing countries in the medium-income category was from 17 to 22%. The average taxation ratio in the poorest countries falls between 13 and 16%. Tax revenue (% of GDP) in Ethiopia was last measured as 13.5% according to the NBE report of 2015/16, which is even less than the average value of sub Saharan country that has 16% of GDP and currently tax revenue can finance only around 70% of government expenditure on average and 30% of government expenditure is financed through the grant and borrowing. To overcome this problem Ethiopia, like other countries in Africa, has been making extensive efforts in recent years to reform its tax system with a view to increase tax revenue as well as reduce distortions in the economy and as a result country subjected to numerous tax reform at different time starting from 1940s where the modern taxation started in Ethiopia (Wogene, 1994; Alemayehu and Abebe, 2005; Fantahun, 2013). However, basic question is whether the tax reform can bring the required result or not is basic question. Some empirical investigation are also accustomed to these issue in Ethiopia. For instance (Endeg and Wendaferahu, 2016, Delesa, 2014, Tegegn, 2008, and Alemayehu and Abebe, 2005) they give special focus for optimal tax theory and adopted partial equilibrium approaches that have failed to estimate the full impacts of taxation policy. Therefore, there is the need for a more comprehensive approach that takes into consideration the various interrelationships between all actors in the economy, in order to more realistically estimate the economic effects of any tax policy changes. As a result the aim of current study is to look economy wide impact of tax reform on Ethiopian economy by using the dynamic CGE model to fill the gap identified in the previous literature and to capture the economy wide impact of tax reform.

2. Review of Literature

2.1. Definition and Concepts:-

Tax is defined as a financial charge or levy imposed upon an individual or legal entity by a state, to support

government expenditure or defined tax as a monetary charge imposed by the Government on persons, entities, transactions or properties to yield revenue and can be collected without any direct benefits attached with¹ (William, and Andrew, 2014). Tax policy is defined as all the sets and main instructions that determine the structures of a tax system and make it possible to finance public spending and support economic activity whereas, tax reform is the process of changing the existing tax system or the current situation to a new level of tax system so that the tax system can serve the main objective of financing government expenditure and meet other objective in short run and long run economic policies both in developed and developing country (Delesa, 2014; Desalegn, 2014; Cliche, 2012). The basic idea which should be raised when we talk about tax is principle of taxation. One of the principle of taxation is fairness principle and according to this principle, tax system of a given country expected to be fair in a sense that each tax payer should contribute his/her fair share to the tax revenue basket. Furthermore the ability to pay principle consider the horizontal and vertical equity when horizontal equity refers to equal taxation of person with equal ability to pay and vertical equity implies that ability to pay principles call for reasonable differences in taxation of individual with unequal ability to pay and everybody is subjected to pay in accordance with his/her income (Fantahun, 2013). The third principle of taxation is administrative ease and according to this principle one of the factors determining capacity of a country to generate adequate revenue from taxation is the tax administration competence and efficiency (Bird, 2015).

2.2. Empirical Literature Review

All countries face challenges in designing and operating such an effective system of taxation but, these challenges are particularly acute in low and middle income countries, where the pressing need to raise revenue for increased investment in public services to enhance business environments, such as mobilization of resource for investment, increasing employment opportunities, price stability, and minimization of the inequalities of income and wealth for rapid and sustainable economic growth. Whereas, in developed country fiscal policy is mainly used to maintain full employment and stabilize economic infrastructure (David *et al.*, 2016, WB, 1990). Many empirical literature also support this argument. For example, Willi *et al* (1997), showed that the effects of taxation on economic performance in OECD countries. The result reveal, in open OECD economies, taxes may have affected economic performance via their effects on capital and labor markets, and on human capital formation.

Sigtas and Igor (2008), on the economic impact of the 2006–2008 personal income tax (PIT) reform in Lithuania and analyzed applying CGE model-based simulations. They find that the undertaken PIT reform is unsustainable as it leads to permanent government budget deficits and ever increasing public debt.

Gerali and Pisano, (2015) evaluate the macroeconomic effects of simultaneously implementing fiscal consolidation and competition-friendly reforms in a country of the euro area by simulating a large-scale dynamic general equilibrium model. They find that the joint implementation of reforms had additional expansionary effects on long-run economic activity. James and Asmaa (2012) estimate the impact of value-added tax (VAT), on the aggregate consumption of fifteen European Union countries over the period 1961-2005). They found across a one percent increase in the VAT rate leads to roughly a one percent reduction in the level of aggregate consumption in the short run and to a somewhat larger reduction in the long run. Cecelia *et al* (2016), Assessing the Impacts of a Major Tax Reform in Uruguay by using CGE-microsimulation analysis and assessed the joint effects of tax changes on macroeconomic and labor outcomes, poverty and inequality using a top-down static CGE micro simulation approach. They find substantial general equilibrium effects of the full implementation of the reform that tend to reinforce the reduction of poverty indicators, exclusively due to the modifications of the direct personal income tax without considering behavioral responses. Regarding poverty, the general equilibrium effects are significantly greater than the direct effects. Overall, they estimate a one-point reduction of the Gini coefficient due to the reform.

Duarte (2001), study on the implementation of Brazilian tax reform, under two restriction which are (a) fiscal adjustment restriction (public sector debt cannot increase), (b) fiscal federalist restriction (revenues from individual states and municipalities cannot decrease).

By giving special focuses on a specific reform that overcomes in principle the fiscal federalist restriction. The reform presented positive macroeconomic effects both in the short and long run. Despite a substantial increase in the average VAT rate in the first years after the reform, a majority of cohorts experienced an increase in their lifetime welfare, being potentially in favor of the reform.

Amir *et al.* (2013) studied the effects of the latest tax reforms on key macroeconomic variables and distribution of assets and incomes in Indonesia. They found that, under the assumption of the balanced budget, reductions in the income tax of individuals and that of companies might affect economic growth, slight decrease

¹ There is no quid pro quo among the tax collected and benefit to be provided as government services are delivered to society without concurrent payments.

in the tax incidence of the assets, and increase income inequality. Sajadifar *et al.*, (2012), quantified impact of tax reform of Iranian economy by using a CGE model calibrating data of various sources such as input-output data, national accounts etc. Existing literature was also used for data. They simulated results for three VAT rates i.e.3%, 45 and 10%. They found that government revenue was increased and household welfare and GDP declined due to implementing of VAT. Blessing and Ronald (2015) used computable general equilibrium (CGE) model to analyze and quantify the economy-wide equity and distributional impacts of Namibia's tax policy reforms introduced in 2013. The result show that reductions in personal and corporate taxes varied across institutions and markets. For households, a decrease in the effective tax rate directly resulted in higher disposable incomes, especially for urban households that participate in the labor market and tax cut enhanced inequality between skilled and unskilled labor. The tax reforms also resulted in exchange rate depreciation, thus increasing export competitiveness.

Bhasin and Kobina (2005), used the CGE model and examine the impact of alternative fiscal reforms in Ghana; in which lost tariff revenue is compensated by a lump-sum tax, on the poverty and income distributions of households. The study tests the hypothesis that elimination of trade related import taxes accompanied by an increase in VAT reduce the incidence, depth and severity of household poverty and improve the income distributions of households. On the other hand, the study tests the hypothesis that the elimination of export taxes accompanied by an increase in VAT increase the incidence, depth, severity of household poverty and worsens the income distributions of households.

Omer *et al.*, (2012), evaluates the effects of agricultural taxes changes on Sudan economy by using the computable general equilibrium model as analytical tool; with Sudan Social Accounting Matrix for year 2004. The model results show that reduction of wheat import tariff increases wheat imports, output and export of cotton, sesame, industrial and services sectors. The overall effect of this policy is improvement of GDP, balance of trade and investment. The results reveal that reduction of production tax or value added tax for each crop would increase its domestic output and exports and reduce those of the other crops, except for sorghum. The overall effect of reducing these taxes improves the GDP and private consumption despite the mixed effect on investment and balance of trade.

Ghirmai, (2009) examining the main tax reforms of Ethiopia; Kenya, Uganda and Ghana. He views tax policy from variety viewpoints, which focuses on broad based of tax revenues and on designing certain selected major taxes. Highlighting tax revenue profile and composition; and discussing major problems that could prevent by implementing effective tax policies in those countries. Tadele (2015) Tax revenue in Ethiopia has been low throughout the period (1974 to 2010). Double logarithmic functions relating tax receipts to GDP were estimated. The results reveal that gross, direct and domestic indirect tax revenues were non-buoyant both in short run and in the long run and as a percentage of GDP it was below the average sub Saharan African countries. Even though, foreign trade tax revenue was found non buoyant in the short run, it was buoyant in the long run. His finding indicated that the share of service sector value added, import and over all government budget deficits to GDP affects positively, whereas the share of official development assistance to GDP affects it negatively. Tegegn (2008) evaluates the productivity of the tax system in Ethiopia for the period 1961-2005 and examines the role played by elasticity and discretionary tax measures in the government's efforts to reduce the budget deficit, and measures the income elasticity of the tax system by decomposing elasticity into tax-to-base and base-to-income elasticities. The analysis shows that tax revenue tend to be inelastic with respect to changes in tax base. The relatively low tax-to-base elasticity may be explained by inefficient and poor tax administration and the existence of exemptions.

3. Methodology

This study uses the recursive dynamic CGE model based on the 2010 SAM in order to examine macroeconomic impact of tax reform. We can also draw the main justifications of using dynamic CGE model. Firstly, the model enables us to run various experiments of change in tax reform at the same time and simultaneously compare their effects at benchmark and counterfactual policy scenarios. Secondly, it considers entire economy in the sense of general equilibrium. Thirdly, it incorporates the dynamic nature of structural change and market interactions and feedbacks. Finally, it incorporates adaptive expectation behavior of economic agents instead of forward looking expectations, helps to reflect the economic nature of developing countries. The specification of CGE model in the study follows the manual developed by Sherman Robinson and his colleagues in 2002 in the context of neoclassical-structuralist tradition and enabled to address the structural features of Ethiopian economy:

The dynamic CGE model is calibrated to 2009/10 SAM prepared by Ethiopian Development Research Institute. It comprises database that shows the flow of economic resources and transactions among economic agents. The SAM is disaggregated into 113 activities (with 77 agricultural activities by agro ecological zones, AEZs), 64 commodities, 16 factors (by AEZs except capital), and 13 institutions including 12 households. The SAM also has 17 different taxes, saving-investment, and rest of the world account show the interaction of different economic agents. It integrates regionally disaggregated agricultural production and income generation

for the four main agro-ecological zones of Ethiopia (Humid, high land cereals, drought prone and pastoralist zones). Furthermore, for the completion this study further aggregated to seventeenth activities and commodities, four factors of production, four type of household, enterprise, government, three tax category, saving-investment balance and rest of the world.

Having CGE model specification and SAM 2009/10, the study calibrates dynamic variables based on the actual performance and forecast of Ethiopian economy. Following dynamic natural growth of the population overtime, labor as the factor of production grows accordingly or probably with different rates. The CGE model assumes that such labor growth pushes up the other factors of production-cultivated land and capital- to grow in order to enhance output growth. The changes in factors in one year have effects on the next year's performance. In effect, investment (capital formation) dynamically soars up in order to accompany the growth of factors of production. The dynamic CGE model, therefore, considers these factor adjustments overtime which enables the model to reflect the dynamic feedbacks via change in factors of production. It also accounts for the cost of adjustment and the time taken to full adjustment process. Linking one period to the next period, the dynamic part of the model is captured by updating variables that grow at a constant rate per period and by controlling the accumulation of capital. The study, therefore, takes the dynamic CGE model that considers and works on the following closure: Firstly it assumes flexible foreign saving and fixed real exchange rate. Secondly government saving is held fixed while Public receipts are adjusted endogenously to achieve the predetermined net government, and lastly investment is saving-driven are selected for the completion of the study.

4. Simulation Results and Discussions

Public resources are part of development resources mobilized from the general public through taxation and then administered by the government. Conducting tax reform has its own implication for achieving perpetual growth and rapid pace of economic transformation. In the CGE modeling framework, it is essential to establish a baseline scenario that is counterfactual for comparing against the outcome of a policy shock. The base case scenario is established to serve as a reference in an absence of any policy shock and serves as a benchmark for policy evaluation. Additionally, apart from base case scenario we look for alternative policy option where the policy option are: reduction in direct tax by 30%(simulation1), increase in sales tax by 66.27%(Simulation2), and reduction in import tariffs by 24%(Simulation3) and they are simulated turn by turn to examine the impact of all policy scenarios on the macroeconomic performance.

4.1 Impact of Alternative policy reform on Macroeconomic Performance

The effect of tax reform on macro economy is intensively and extensively examined, but there are inconclusive results in literature. The dynamic CGE model in this regard contributes some facts to the literature of developing country. Table 1 presents the macroeconomic effect of tax reform for the three simulations on absorption, Government expenditure, private consumption, output, fixed investment, export, and import, gross domestic product at market price, net indirect tax, and real GDP at factor cost (GDPFC), government income and CPI.

Table 1 Summary of Effect of Tax reform on Macroeconomic variables (%change from base line simulation

	INITIAL	BASE	DTAX DE	STAX IN	IMPOR DE
ABSORP	0.58713	13.5189	0.294054	0.261379	-1.11601
Government Expenditure	0.02342	4.07772	0.147264	0.099212	0.627477
Private Consumption	0.400199	11.7960	0.141819	0.124718	-1.27489
Output	0.66	11.82	0.22	0.19	-1.13
Fixed Investment	0.143253	18.3474	0.508234	0.453879	-0.96953
EXPORTS	0.08636	7.8489	0.255122	0.231153	-0.65153
IMPORTS	-0.1632	17.336	0.433622	0.40614	-0.74358
GDP at Market price	0.51024	10.939	0.197454	0.162078	-1.32287
Net indirect Tax	0.03959	8.8395	0.225264	0.068579	-5.81136
GDPFC2	0.470657	11.095	0.195694	0.168097	-1.10425
Government Income	0.10017	17.532	0.817928	0.549384	3.59181
Consumer price index	0.612639	-2.1921	-1.1933	-0.30472	-0.81486

Source: Own computation From Simulation Result, June, 2017

According to above all macroeconomic variables shows some improvement compared to base case scenario except for third simulation and the consumer price index for which we can observe the negative value for all simulation scenarios. As we can observe from the table 6 in all simulations, the macroeconomic variables have shown positive changes.

Absorption, which is the total demand for all final marketed goods and services by all economic agents resident in an economy, regardless of the origin of the goods and services themselves, indicates that there is a 0.29%, 0.26% and -1.11 % increases in scenario 1, in scenario 2 and decrease in scenario 3 as compared to the

base line scenario. Absorption increased due to increase in investment, private consumption and government expenditure. In simulation 1, private consumption reveals a 0.14% increase from base line simulation because of decrease in direct tax increase the disposable income which boosted private consumption. In simulation 2 private consumption reveal 0.12% increase from base line simulation but increment is less than in the simulation1. This is because of when the government increase the sales tax the price of product increase results in reduction in purchasing power parity of consumer then failed to consume more additional goods as before. But in simulation three apart from the reduction in import tariffs private consumption show a massive reduction and it is also unexpected result for us. When we come to the aggregate output there is overall improvements in output in simulation 1 and 2 and reduction in third simulation because reduction import tariffs result increase in import and hurt domestic production.

Gross fixed investment shows a relatively good improvement in in simulation 1 and 2 which is 0.50, 0.45 and huge reduction in simulation 3 which is -0.92. This may be because of Ethiopia is an emerging economy which private sector is not well developed, reduction in direct tax increase the real income of the society then private investment. But for simulation three reduction in import tariffs result in increase in import and discourage the investment for unknown reason. On other hand government expenditure show positive change in the all simulations which is 0.14, 0.09 and 0.62 in simulation 1, 2 and 3 respectively. These imply that on simulation1 increase in tax free threshold is expenditure for government and then increase government expenditure. On simulation 2 increase in VAT is increase in revenue of government to finance increase in tax free threshold and government expenditure is reduced compared to simulation1 as a result of VAT is used to recovery budget loss in reduction of direct tax. On simulation 3 government expenditure shows merely increase in government expenditure due to reduction import tariffs opens of the country to the rest of the world increase and government expenditure increase to make domestic producer competitive.

Even though there is increase in export still External balance is deteriorated in all scenarios compared to the baseline simulation due to further increase in import. In simulation 1 and 2 the growth rate of import is double of growth rate in export which worsen the negativity of trade balance. Both GDP at factor cost and GDP at market price show increment as result of decrease in direct tax and increase in sales tax but reduced in simulation three due to reduction in import tariffs. In simulation one reduction direct tax encourage production and consumption as well as saving then GDP. Moreover reduction in tariffs encourages import and hampered domestic production by lowers the price of imported goods, and affects the domestic relative price structure, supply of goods and demand for goods then at end the day also GDP. Net indirect tax shows some improvement in the first two simulations and huge reduction on the third simulation. Simulation 1 indirect tax increase since production increased and in simulation 2 increase in VAT tax by 66.27 improves the level of indirect tax because of increase in consumption also increase the VAT. However, on the third simulation the impact on the net indirect tax is very critical which are -5.81 due to reduction in tariffs which account lion share for indirect taxes.

Government income show huge improvement when compared to baseline simulation as result of tax reform. The value of government saving from baseline is 0.81, 0.54, and 3.59 respectively for simulation 1, 2, and 3. In simulation1 reduction in direct tax by 30% improved the government income by creating voluntary tax compliances. In simulation2 government income showed some improvement compared to simulation1 due to increase in sales tax by 66.27%. Overall the result from the third simulation which is reduction import tariffs reveals implausible result apart from researcher expectation and for which we don't any justification because it's against from basic economic theory. Lastly the other important issue is the concept of price effect. From the simulation price show reduction on the three simulation but the decrement is less than baseline simulation which is -2.19 and among the three simulation reduction indirect tax is more successful in reducing the price of goods and service.

4.2. Sectoral Impact

When we observe the sectoral impact of tax reform all sectors shows an improvement in simulation 1 and 2 but show huge reduction in simulation for unknown cases. GDP increase by 0.28, and 0.25 in simulation 1 and 2 show 1.1 reduction in simulation 3. Agricultural sector improved by 0.12 and 0.13 in simulation 1 and 2 and service sector show good improvement in simulation 1 and 2 followed by service sector. Below table 7 show the summary of sectoral impact

TABLE 2: SECTORAL IMPACT OF TAX REFORM PERCENTAGE CHANGE FROM BASELINE

	BASE	DTAX_DEC	STAX_INC	IMPOR_DEC
Growth rate in agriculture	9.64	0.12	0.13	-1.76
Growth rate in Industry	16.93	0.4	0.36	-0.91
Growth rate in Service	9.94	0.23	0.21	-1.01

Source: Own Computation from Simulation Result

5. Conclusion and Policy Implication

The purpose of this paper is to examine economy wide impact of tax reform using a recursive dynamic CGE model. The study used an updated version of the 2009/010 EDRI Social Accounting Matrix2005/6. We used different scenarios to evaluate economy wide impact such as reduction direct tax, increase in sales tax and reduction in import tariffs. The simulations result shows that following the tax reform there is overall improvement in economic activity in simulation 1 and 2 but not for simulation 3 and there is no any justification than can support the result of simulation three. On other hand factor supply remain constant apart from change in tax policies though there is improvement in factor income as result of overall increase in economic performance which is witnessed by increase in GDP at factor cost. Based on the finding the researcher forwarded the following policy implication. Since tax one element macroeconomic variable that can link micro and macro aspect of the economy a little beat modification on tax to change some macro and micro economic variable results in overall disturbance of the economy. Deep and careful investigation should intensively and extensively conducted on immediate and long run effect before conducting tax reform since, the intervention of the government has both positive and negative implications on the economic activities. In our analysis reduction in direct tax and increase in sales tax improved overall economic performance and reduction in import tariffs were not successful deed. Therefore the best way to improve economic performance would be conducting a comprehensive direct tax reform and general tax on consumption which would eliminate tax distortions on inter temporal decisions, labor supply decision, savings and investment. Additionally the economic importance of customs tariff for a developing country is very crucial for public revenue generation, infant industry protection, balance of payment protection and attraction of investors are the major benefits of imposing customs tariff. As a result tariff reduction in Ethiopia where infant industry is abundant is not recommended rather than protecting the country from external sector influence to encourage domestic production

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