

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

**THE IMPACT OF ETHIOPIAN TRADE IN SERVICE
LIBERALIZATION ON WELFARE: CGE ANALYSIS**

BY

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Abstract

The contribution of Service sector to the development of both developed and developing economies is increasing from time to time. However, many developing countries, including that of Ethiopia, are blamed for delivering high-cost and unproductive input services, thereby limiting economic efficiency gains from trade reforms. This, calls for liberalization of the sector so that it improves welfare and enhance economic growth. Ethiopia has also requested to access World Trade Organization in 2003 and the country is still underway to access the institution.

Thus, this study has focused on the impact of the service sector liberalization on welfare of the country. To meet its objective the study has undertaken qualitative assessment and quantitative assessments. The qualitative assessment compares the Ethiopian service sector policy to GATS principles and concludes that the liberalization will have positive impact on sectors like construction and transport service sub-sector which are relatively strong enough to compete with competitors.

The quantitative assessment has tried to quantify the net welfare impact of the liberalization with different scenarios at macro level using CGE model. The result of the simulations shows that the country derives higher welfare gain from liberalizing its service sector. Moreover, the comparison of service sector liberalization and goods trade liberalization shows that there is higher welfare gain in case of goods trade liberalization than service trade liberalization due to the relatively low protection in service sector than goods sector. Finally, simultaneous liberalization of the service and goods trade also shows higher welfare gain even though the welfare is less than the additive welfare of the separate liberalization of the tow sectors.

1. Introduction

Most traditional international economics textbooks tend to assume that services are largely non-tradable. However, this belief was changed since the late 1980s and the 1990s when the service trade has emerged to become a dynamic sector whose importance continued to rise in most economies (Konan and Maskus, 2006). They indicated that in high-income countries, on average, services constitute nearly two thirds of total Gross Domestic Product (GDP) and among low-and middle income countries they account for smaller share -54%- but still the majority of output. The Ethiopian service sector is not much far from this average. According to the report of National Bank of Ethiopia(NBE), the share of the service sector in GDP has been growing up steadily in recent years reaching 40.8 % in 2006/07 from its level of 36% in 1996/97(NBE, 2006/07).

However, the domestic service sector in many developing countries, including that of Ethiopia, are blamed for delivering high-cost and unproductive input services, thereby limiting economic efficiency gains from trade reforms. This, calls for liberalization of the sector so that it improves welfare and enhance economic growth.

Accordingly, the Ethiopian government requested for WTO accession on 13 January 2003 and the General Council established a working Party on 10 February 2003 (Fortune, 2007). Since then different studies have tried to assess the potential outcome of the accession. Regarding the goods trade liberalization in the Ethiopian case, few studies have attempted to evaluate the ex-ante of the country's accession. Such studies include Dejene et al 2007, Cordella and Esemalem 2005, Phillip and Tadele, 2005, and Stasinopoulos and Wendwesson 2005. The findings of the researches are mixed regarding the effect of goods tariff dismantling on the welfare, government

revenue, poverty and inequality of the country. For instance, Phillip and Tadele (2005) have found out that the goods trade liberalization will result in loss in government revenue and increased economic growth. The study also indicates that the gain from economic growth doesn't offset the loss from government revenue and hence welfare loss to the country.

Similarly, there are some studies like Self et al 2007, Kiyota et al 2007, Stern et al 2007, Dorel and Mengesha 2005, and Alemayehu and Daniel 2003 who have tried to assess the impact of the accession on service sectors. Many of these studies employ partial analysis of the financial service sector liberalization except Alemayehu and Daniel (2003)¹, who have also considered the airline service liberalization and Self et al (2007), which is limited to the telecom sector liberalization assessment. Moreover, only some of the studies, only Kiyota et al and Bienen et al -for the financial sector, have undertaken the quantitative impact assessment using econometrics. Thus, there are limited studies, if any, which have quantified the potential impact of the service sector liberalization using economy wide models such as computable general equilibrium models. This is an important lacuna given the increasing importance of the service sector to conduct this research.

The main objective of this study is, thus, to identify the impact of trade in service liberalization on the welfare of the country by undertaking the liberalization policy simulations with CGE model. The study will review theoretical and empirical literatures on the service sector liberalization, assess extents of compatibility of Ethiopian service sector policy with GATS principles and quantify the welfare impact of the service sector liberalization using CGE model. The study used secondary data from different publications of National Bank of Ethiopia (NBE),

¹ Alemayehu and Daniel (2003) is currently published in Oyejid and Lyakura,eds(2008)

Ethiopian Investment Authority, International Monetary Fund (IMF) Balance of Payments Statistical Yearbook, Ministry of Finance and Economic Development (MOFED) and UNCTAD data base. The main data to be used for the Computable General Equilibrium (CGE) model simulation is the 1999/2000 Social Accounting Matrix (SAM) constructed by Alemayehu and Tadele (1999/2000).

The rest of the paper is organized as follows. The next section presents the literature, section three and four will undertake the qualitative and quantitative assessment of the liberalization of the service sector respectively, results are presented in section five and section six concludes with some policy recommendations.

2. The Literature

The literatures on service sector liberalization are very limited due to the fact that there is lack of comprehensive data on cross-border services trade, and FDI and the associated barriers, together with the difficult conceptual problems of modeling that are encountered. As a result, most CGE or sectoral modeling literatures to date have been focused on barriers to international trade in goods rather than trade in services and FDI (Hoekman, 2006). Despite this fact, there are various literatures, both theoretical and empirical, explaining the impact of service sector liberalization on welfare of an economy. Some argue that it has a positive effect on welfare while others argue the other way round.

Theoretically, service sector liberalization will have an advantage from both the supply and demand side. The supply side benefit are of two types. The first type is that domestic services

market liberalization and the opening of the services sector to external competition are expected to encourage quality improvement and product and process innovation, reduce the scope for waste and rent-seeking, as well as impose significant limitations on the economic power of any individual producer (UNCTAD, 2008). The second type is that service trade liberalization reduces the capacities and tendencies for actual and potential government regulation and control thus leading directly to a more dynamic development process steered by the private sector (Oyejide and Bankole, 2001).

Similarly, from the perspectives of consumers of services (demand side), increased quantity and enhanced quality of services from alternative sources of supply will give rise to substantial reduction in prices and economic distortions. Services market liberalization has the potential to increase the number of services providers, thus engendering competition, quality improvement, product and process innovation, and investment, and reduce government anti-competition regulation, as well as to enhance efficiency of consumer choice and certainty in the market (Hoekman and Matto, 2008). These effects lead both directly and indirectly to increased supply, lower prices, and gains in consumer surplus.

However, there are also costs associated with the service sector liberalization that are expected to reduce the welfare increase argued above. The social Adjustment cost involved in establishing reforms to improve the conditions for investment and growth in the services sector is potentially significant in terms of the employment implications of job losses, skills and professional obsolescence, and adverse effects on social services and culture (Oyejide and Bankole, 2001; Khor, 2006).

The latter argument seems to be critical issue for Ethiopia. Many of Ethiopian service sectors like banking and insurance are intensively using labor relative to capital, compared to foreign banks or insurance companies. Hence, if the sector is liberalized, foreign firms will have opportunity to participate in the domestic banking and insurance service provision. This will change the production function of these services from labor intensive to capital intensive which results in job loses to majority. It might take long period of time for the country until the economy absorbs these displaced employees.

Similarly, the liberalization may also adversely affect culture of the country. i.e., Ethiopia is characterized being home to diversified ethnic groups that have their own culture. Currently, medias like Television and Radios, which are government owned are used to reflect these cultures. But once the service sector, like TV and Radio are liberalized ,foreign companies could take the job of transmission since the sate have no more exclusive right to transmit. This gives a chance to the foreign firms to affect, could be positively or negatively, the culture of the country by diverting the content towards their own culture.

There are also arguments from the environmental perspective. The perception that the services economy has no significant impact on the environment is increasingly called into question as high income services based economies still account for most of the world natural resources consumption, polluting emissions and impacts on biodiversity (OECD, 2006 ; Tewolde Berhan , 2005; Andrew, 2000). The argument is that the service sector liberalization will result in lose of jobs for some people. This people might degrade the environment while running for alternative

job for survival. However, due to the complexity of the topic and its recent development as a field of research, the understanding of the services sector's environmental impacts remains incomplete and fragmentary at best, with the notable exception of certain sub-sectors that are better documented due to their close relationship with the environment and natural resources. This is the case for the tourism and transportation industries (Mayrand and Paquin, 2007).

The empirical literatures also show a mixed effect. Some come out with the positive association between service trade liberalization and welfare while others argue that they have an inverse relationship. One of the studies on the first category is the one undertaken by Konan and Maskus (2006). They build a CGE model to investigate the potential effects of removing barriers to trade in services in Tunisia. They argue that increasing international competition on service markets will reduce the cartel effect—the markup of price over marginal cost—that incumbents are able to charge due to restricted entry; and attenuate what they term the “cost inefficiency effect”—the fact that in an environment with limited competition marginal costs of incumbents are likely to be higher than if entry were allowed. They concluded that removing policies that increase costs can have much greater positive effects on national welfare than the removal of merchandise trade barriers, by up to a factor of seven or eight.

On the other hand, the assessment of the impact of service liberalization on employment and output for China, by Li et al (2003), shows a mixed outcome. They have employed a CGE model designed specifically for this issue and simulated the potential impact of service sector liberalization on employment and output in China. Their analysis suggests that service sector liberalization could produce substantial benefits for China in terms of economic growth and

consumer welfare. However, along with the service liberalization, some labor force would move from a narrowly defined service sector to other sectors such as automobile, construction and water. This results in adjustment cost, and they concluded that implementing complementary policy measures to reduce strains in labor market during the process of liberalization is necessary.

Fink, Mattoo, and Rathindran (2003), have also analyzed the impact of policy reform on sectoral performance in basic telecommunications. Their data cover 86 developing countries globally for the period, 1985-1999. They address three questions, covering the impact of: (1) policy changes relating to ownership, competition, and regulation; (2) any one policy reform coupled with the implementation of complementary reforms; and (3) the sequencing of reforms. Their findings are: (1) privatization and the introduction of competition significantly increase labor productivity and the density of telecommunication mainlines; (2) privatization and competition work best through their interactions; and (3) there are more favorable effects from introducing competition before privatization. They further conclude that autonomous technological progress outweighs the effects of policy reforms in increasing the growth of teledensity.

Finally, there are some empirical literatures specific to the Ethiopian case as discussed in section one. One of the pioneering works was by Alemayehu and Daniel (2003), currently published in Oyejid and Lyakurwa, 2008. They have tried to see the impact of service sector liberalization on two sectors-Financial and Airline service sectors. In order to assess the impact of the liberalization on these sectors, they have undertaken the thorough analysis of the performance and regulatory framework of the sectors. Their finding regarding the financial sector is that

multilateral trade rules may result in myriad of problems such as making domestic banks vulnerable and hence force them out of market in a very short time, foreign domination of the banking sector and failure of the central bank to endure prudence band performance². However, regarding the airlines liberalization, the researchers are optimist in the sense that since Ethiopian air lines is relatively competitive enough to deal with its competitors, the liberalization will not have a remarkable negative impact on the sector.

The other study by Kiyota et al (2007) seems to confirm the recommendations by Alemayehu and Daniel (2003) regarding the financial sector. Kiyota et al (2007) have assessed whether Ethiopia would benefit from allowing foreign participation in the financial sector or not. In order to accomplish their objective the authors have run a regression to compare the performance of the state-owned and private owned banks. They used different proxy variables for the performance like cost divided by asset, return on assets and interest rate spread. The regression output has shown that the state owned financial sectors performed lower and have high cost while the reverse is the case for the private ones. They also noted main reasons why the Ethiopian government opposes the financial sector liberalization based on infant industry protection, argument that led to credit allocation towards large scale industrial and service sector

² As a result, the authors recommends: 1)to invest in building the institutions required to adequately regulated and supervise both the existing and incoming new banks by investing on the human resource of the central bank's supervision and regulation department, which is badly staffed,2)the country may need to explore joint venture in the banking sector so as to exploit both learning new technology and also ensure the survival of its indigenous banks,3) protecting domestic banks need not be done for eternity. There should be a clear and transparent procedure which inform the banks when they are expected to graduate from such protection, 4) liberalizing the sector need to be done on gradual and sequential manner with an eye to 'learning by doing', and 5) Since the airline is relatively competent, it can be strategically liberalized with little impact.

which oppose the Agricultural Development Led Industrialization (ADLI) policy of the economy and it might lead to less saving mobilization to liquidity problem.

Kiyota et al (2007) still recommend many advantages that the country will derive from liberalizing the financial sector gradually. Such advantages include increased efficiency due to high competition, increased employment from high foreign direct investment (FDI) and increased access to credit for the poor. However, the study didn't quantitatively show these benefits. Moreover, the regression didn't seem to address the impact of the inflow of the foreign financial firms on the domestic firms. What it shows is only the comparison of the performance of the state-owned and private held banks. Since the private banks included in the regression are the one owned by the nationals of the country, it might not address issues like infant industry protection, and saving mobilization which could be a consequence of foreign firm inflow and concern of Ethiopian government.

On the other hand, Stern et al (2007) have assessed the impact of the Ethiopian financial sector liberalization both quantitatively and qualitatively. The quantitative assessment tried to assess the impact of the liberalization on financial intermediation, economic growth and income inequality using econometric model. The finding is that the liberalization increases the financial intermediation index by 1.35, the economic growth by 0.5 and the result also suggests that the gains from the development of financial intermediation are equal for both poor and wealthy people. The regression result also shows similar findings to the one by Kiyota et al 2007, discussed above, regarding the performance of the government and private owned banks. But it quantifies that the costs of public banks are 1.6 percentage points significantly higher than those

of private banks. Second, the returns on asset of public banks are 1.7 percentage points significantly lower than private banks. These findings imply that public banks are more inefficient than private banks. Third, the interest spread is 1.5 percentage points smaller for public banks than private banks. The qualitative assessment, on the other hand, identifies the potential impact considering the four modes of supply identified by GATS. It considers different scenarios for mode 3 (FDI) supply. In general, the conclusion of the qualitative method is also with recommendation of the liberalization of the financial sector.

In conclusion, there is no consensus on the relationship between service trade liberalization and welfare improvement both theoretically and empirically. The next section tries to assess the impact of the Ethiopian service sector liberalization on welfare qualitatively.

3. Qualitative Assessment of the Welfare Impact of Ethiopian Service Sector Liberalization

The qualitative impact assessment is undertaken by highlighting the GATS principles and Ethiopian service sector policy and assessing the compatibility of the two.

3.1. GATS Principle and the Ethiopian Service Sector

The General Agreement on Trade in Services (GATS) is a pioneering agreement evolved under a multilateral framework that focuses on international transactions related to services. It seeks primarily to secure access into the domestic market of countries by facilitating the progressive negotiation of “offer and acceptance” of conditions among trading countries in order to liberalize all trade in services. Literatures note that there is no single international standard for defining the

services sector and there is no precise definition of services in WTO's GATS as well. Instead the GATS uses an informal classification scheme based on the UN Central Product Classification that is structured around 12 service sectors and 155 sub-sectors (Mayrand and Paquin, 2007).

The GATS defines trade in services as the supply of services through four modes:

- Mode 1: cross-border supply of services – from the territory of one Member into the territory of any other Member;
- Mode 2: consumption abroad – in the territory of one Member to the service consumer of any other Member;
- Mode 3: commercial presence – by a service supplier of one Member, through commercial presence in the territory of any other Member;
- Mode 4: movement of people – by a service supplier of one Member, through presence of natural persons of a Member in the territory of any other Member.

Mode 1, cross-border supply of services, is essentially similar to trade in goods: only the service itself crosses national frontiers. Mode 2, consumption abroad, refers to the supply of a service in the territory of one country to a consumer located in another country. The consumer travels to the supplying country (e.g. tourism, educational establishment, ship or aircraft repair, etc) and do not require the service supplier to be admitted to the consuming country. Mode 3, commercial presence, involves the presence in a country's territory of a foreign supplier through foreign direct investment (FDI). Example, establishment of branch offices or agencies to deliver banking, legal advice or communications services. According to Bisset et al (2003), this is the most important mode of supply and probably the most problematic too in terms of policy implications for host governments. The fourth and last mode of supply is the presence of natural

persons, which refers to the admission of foreign citizens to provide services. It may be used alone or in conjunction with other modes of supply. This mode of supply does not cover seeking employment, citizenship, residence or employment requirements in another country. Members may still regulate the entry and stay of natural persons by requiring visas but such regulations should not prevent the fulfillment of member countries commitments. This is probably the most controversial mode of supply in the GATS due to its implications for labor and immigration policies (Dabee, 2000).

GATS have three fundamental principles. Namely: national treatment, most favored nation (MFN) treatment, and progressive liberalization. The first principle established a standard for a non-discriminatory market-structure relationship between foreign and domestic suppliers. It thus states that foreign services and services suppliers should be accorded similar treatment provided to nationals in a domestic services market. The second, which is the MFN treatment, concerns a stipulation that prohibits discrimination between other Members of the Agreement in terms of the treatment accorded to their service suppliers, whether nationals or foreign. In this respect, member countries are required to publish all discriminatory restrictions and barriers to market access to ensure transparency. The principle of progressive liberalization is couched on the possibility of using current binding commitments on market access of member countries to provide the basis for future rounds of negotiation. It therefore allows member countries to continue negotiating with a view to achieving a progressively higher level of liberalization in services trade, with the first of such negotiation beginning within five years of entry into force of the agreement(Oyejide and Bankole, 2001).

Size of the Ethiopian Service Sector

The Ethiopian services sector comprises of electricity, water, construction, road, rail, ocean, and air transport, communication, tourism, hotel and restaurants, financial services, real estate, health, education and other services. Extensive government intervention has been the usual practice in the majority of the service sector especially, in the financial and telecommunication services sub-sectors due to their perceived strategic importance in the economy. The contribution of the service sector to GDP of the country is, however, increasing from time to time (See table 1).

Table 1: Sectoral Contribution to GDP (in Millions of Birr, otherwise indicated)

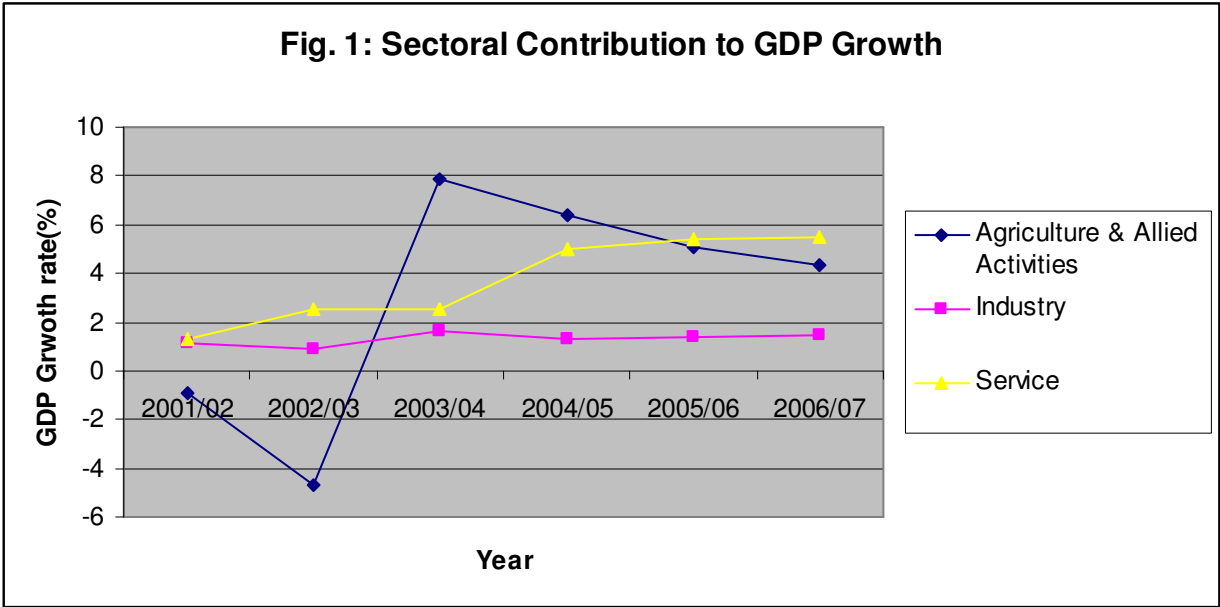
Sector	2002/03		2003/04		2004/05		2005/06		2006/07	
	Contribution to GDP	Share in GDP(%)	Contribution to GDP	Share in GDP(%)	Contribution to GDP	Share in GDP(%)	Contribution to GDP	Share in GDP(%)	Contribution to GDP	Share in GDP(%)
Agriculture & Allied Activities	29920	44.6	34990	46.7	39729	47	44063	46.7	48226	45.9
Industry	9331	13.9	10420	13.9	11402	13.5	12561	13.3	13944	13.3
Service	27799	41.5	29536	39.4	33312	39.4	37770	40	42877	40.8

Source: National Bank of Ethiopia, Annual Bulletin, 2006/07, P.5

Note: Sectoral Contribution will not add-up to overall GDP growth (100%) because of FISIM (Financial Intermediary Service Indirect Measurement)

As can be seen from table 1, in terms of sectoral contribution, agriculture has remained the major constituent of the economy having about 46 percent share in the GDP during 2006/07. The

service sector is the second dominant sector in contributing to the GDP of the country. Its contribution to GDP has grown from 2.5 percent in 2002/03 to 5.5 percent in 2006/07 while the growth in the contribution of the agriculture and allied activities for the same period is -1.9 and 9.4 percents respectively (See Fig. 1). This shows more or less that there is relatively high growth stability in the service sector than the agricultural and allied activities (see also Fig.1 below). This could be attributed to the high dependency of the latter sector on natural phenomenon like rain fall.



Source: Ministry of Finance and Economic Development

Regarding the trade in services of Ethiopia, according to the Balance of Payment Statistical Year Book of IMF, there are three main categories of the components of trade in services for the country (IMF, 2007). These include transportation, travel and other services. The first is further broken down into passenger, freight and other transport carried through air and sea routes, the second has two subcategories namely business and personal travels. ‘Other services’ comprise

many services areas including communications, construction, insurance, financial, computer and information, royalties and license fees, other business services, personal, cultural and Recreational, as well as government services.

3.2 Service Sector Related Policies

The review of the policies related to each service sub-sector enables us to assess the compatibility of the policy to rules of GATS discussed under section 3.1 above. It is obvious that there are many service sub-sectors. But due to lack of information on some of the sub-sectors and their relative low contribution to service export, only communication, construction, financial and transport services are discussed regarding their policy and compatibility to GATS principles³. According to UNCTAD data, these service sectors share on average about 58% from the total service export (UNCTAD, 2008).

To begin with, Communications service sub-sector includes the telecommunication and postal services. Under the communication sector, telecommunication services investment is reserved for the government or a joint venture (domestic or foreign) with the government (Proclamation No. 280/2002). However, down-stream activities of telecommunication (resale and tele-centre services, installation and maintenance of cables, wireless local loop, and virtual Internet Service Providers (ISPs) are open for domestic investors. Global Mobile Personal Communication by Satellite (GMPCS) is allowed for both domestic and foreign investors. Postal services are under a government monopoly except courier services which is open for both domestic and foreign investors.

³ The service sector policies discussed here are mainly based on the MOIT Memorandum, 2006

On the other hand, relative to the other service sectors considered here, the construction service sector is the most liberal one. In this sector, more than 90% of the market is handled by the private sector (MOTI, 2006). In this sector, foreign investors are allowed to engage only in Grade 1 Category of construction works (Construction cost above 20 million Birr or above USD 2.3 million) and consulting offices (project value above 30 million Birr or above USD 3.5 million).

The financial Service Sector is however characterized by state monopoly. Only Ethiopian nationals can engage in the banking, micro-financing and insurance businesses (except reinsurers) in the country. On the other hand, the transport service which includes road and sea transport, Passenger air transport and Air cargo is another state dominated service sector. Passenger air transport service rendered using aircrafts more than 20 seats is exclusively reserved for the State, while services using an aircraft less than 20 seats are allowed for Ethiopian nationals only. Air cargo is open for private participation. Aviation services provided by different carriers are based on Bilateral Air service Agreement (MOTI,2006).

Freight Forwarding and Shipping Agency activities are only open to Ethiopian nationals pursuant to Investment Proclamation No. 280/2002 and Regulations No.84/2003. Likewise, Commission Agency and Travel Agency are reserved for Ethiopian nationals only. Shipping of export products and import of liquid cargo are open for domestic and foreign companies. Ethiopian Shipping Lines is given the privilege of transporting dry cargo imports. Passenger and goods transport service by road is open for competition, but is reserved for Ethiopian nationals. In the case of road transport, there are bilateral agreements between Ethiopia and neighboring countries such as Djibouti, Kenya and the Sudan. Regarding sea transport, the flag state is the one

responsible for qualification, procedures, technical standards and certification and registration of those involved in the provision of shipping services.

3.1.4 Compatibility by Modes of Supply of Ethiopian Service Sector

Mode 1 – Cross-Border Supply

This mode of supply is either subject to restrictions or is prohibited to foreign suppliers. In the communications service sector, the telecommunication service is supplied by the state alone except the downstream services and Global Mobile Personal Communication by Satellite. Thus, foreigners are hindered from supplying the international telecom services to any country and it is only the state who can do so. Similarly, except the courier services that are currently supplied by the foreign companies, the postal service is also government owned and hence it is only government who supply this type of services internationally. In the financial services sector, we also find that oversea insurers and banks are not allowed. However, there is one exception in the insurance service that transport insurance, and reinsurance are provided in Ethiopia by foreign reinsurance. The transport sector is also relatively state owned while the construction service sector is the most liberal relative to the rest.

Thus, mode 1 liberalization will be riskier for the telecommunication services which are currently fully closed to foreigners on the backbone network. The reason is that the incumbent corporation might not be able to compete with the international telecom providers that are relatively with high technological advancement. However, this doesn't mean that there is no consumer surplus to be driven from the low cost of telecom services due to competition. Thus, the net effect is indeterminate unless quantitative measures are taken. Similar risk will encounter

the banking service sector since capital inflow might kick out the domestic banks overnight and the transport sector which is with lack of competition on main services⁴. However, the risk looks less for the postal and insurance services since part of services are currently in line with the GATS principles and it is even less costly for the construction sector where the foreigners are already involved.

Mode 2 – Consumption Abroad

Consumption abroad of financial and communication services is virtually impossible to observe or monitor. However, they might not cause that much capital inflow to the country in the case of financial service sector and competition on the domestic telecommunication or postal service in the case of communication service sector. This mode of supply is also not common feature of construction and transport sectors. Hence, the impact might not be significant. In general, because there is little potential impact of Mode 2 liberalization on the Ethiopian service sector or the economy at large, it can be fully bound for all the sectors with little cost⁵.

Mode 3 – Commercial Presence

This mode of supply is currently in existent for sectors like communications (except the courier service and satellite telephone) and the financial sector (except reinsurance) and transport services since foreigners are not allowed to undertake foreign direct investments. Thus, the question of commercial presence does not arise for these sectors under the persisting policy. However, it might be for construction services. Thus, there might be pros and cons of the liberalization of this mode of service. The pros of the liberalization include increase in competition in the service sector due to entrance of foreign firms. This in turn reduce price for

⁴ However, Alemayehu and Daniel (2003) have argued for high competency of the air transport service in providing the maintenance service

⁵ This is why this mode of supply is not considered in the scenarios of the quantitative assessment

the consumer resulting in consumer surplus. The cons of the liberalization, on the other hand include, allowing foreign firms to the infant Ethiopian service sector might result in replacement of the domestic infant sectors by the foreign companies. Such problems, however, can be reduced by allowing partial ownership upon accession, with gradually increasing limits on foreign firms and allowing conditional entry of branches upon accession.

Mode 4 – Presence of Natural Persons

There are no sector specific commitments for mode 4. All sectors are subject to horizontal commitments that make provision for the temporary stay of highly qualified personnel. No generally agreed definitions or precise descriptions exist of the types of natural persons to which access is granted. Common types are based on functional or hierarchical criteria, related either to the type of person involved (e.g. executive, manager, specialist) or to the purpose of their movement (e.g. to establish business contacts, negotiate sales, set up a commercial presence, provide services as a contractual service supplier). Thus, the cost of mode 4 liberalization looks relatively low for all sectors as far as care is taken in bounding the commitment in line with mode 3 commitments.

One can also look at the compatibility of the Ethiopian service sector policy as a whole with the three principles of GATS- national treatment, MFN and progressive liberalization. Concerning the first principle of GATS-national treatment-the investment proclamation No.280/2002 and Regulations No.84/2003, for instance, provides tax holidays and duty free privileges for domestic and foreign investors. This is inline with the GATS rule that the national and foreign firms should be treated similarly. Regarding the second principle-MFN- there is no distinction

among the services and service suppliers from various countries except in financial and telecom sectors where foreigners are treated differently. However, there are exemptions for sub-regional and regional trade agreements for which Ethiopia is a member. The exemptions to MFN are the regional agreements signed on Economic Integration with the Inter-governmental Authority on Development (IGAD) and Common Market for Eastern and Southern Africa (COMESA). It is also a party to the ACP-EU (Africa-Caribbean-Pacific-European Union) negotiation for the establishment of Economic Partnership Agreement. The third principle is a matter of negotiation and once the country signs GATS, it will undertake the progressive liberalization. Thus, the main problem regarding the compatibility is the limit to market access in most of the service sectors.

In general, the compatibility assessment made so far could help to distinguish the costs and benefits associated with liberalizing each mode for the respective service sectors considered. However, one can't precisely tell ex-ante the net potential consequence of the service sector liberalization. This calls for quantitative method of estimating the potential outcome(s). The next section, tries to discuss the models used to undertake such assessments and followed by simulation of the liberalization policy.

4. Quantitative Assessment of the Welfare Impact of Ethiopian Service Sector Liberalization

4.1 The Benchmark Data

As indicated in the introduction, this study uses the 1999/2000 SAM as a benchmark data. The original SAM is a 40x40 matrix and contains an account each for fifteen production activities, four

factors of production, eight commodities, transactions costs, eight institutions, public investment, savings/investments of institutions other than the government, food aid, and the rest of the world (net of food aid). As such it captures the diverse production activities and the interdependencies among the various sectors and institutions that characterize the Ethiopian economy⁶. However, due to two major reasons aggregation of the data is necessary. The first reason is that the management of the results becomes very difficult since many variables are to be included. The second reason is that the scope of this research is limited to be at macro level due to lack of barriers to service at sectoral level for Ethiopia. Hence, it is not relevant to deal with detailed activities.

Thus, for this study, the SAM is aggregated in to three production activities, two factors of production, three commodities, three institutions, saving investment account, three tax accounts and the rest of the world account. The structure of the Ethiopian economy in the benchmark year revealed that the service sector's share in the GDP is about 38%. This puts the sector on the second rank next to agriculture sector, which contributes half of the GDP during the year. The service sector contribution to GDP growth has also grown by 1.3 % while it was negative figure for the agricultural sector during the same year.

4.2. Alternative Modeling Approaches

Models have paramount importance for trade policy analysis. They provide a theoretically consistent, rigorous and quantitative way to evaluate different economic policies (McDaniel et al, 2004). There are three alternative models or methodologies that are commonly used to quantitatively assess the impact of trade liberalization: Applied general equilibrium (AGE)

⁶ For more detailed description on the SAM see Alemayehu and Tadele,2004

modeling, partial equilibrium modeling, and econometric analysis such as gravity modeling (McDaniel et al, 2004). The most important question is which of the available models best fit for this research? To answer the question the clear description of the alternative models is presented and the most suitable model is selected and discussed in detail.

AGE models are useful tools to estimate economy-wide effects of trade policy changes. These models are ex-ante tools, used to forecast the economic effects of a policy change (Piermartini and Teh, 2005). Regardless of the great importance of the outputs of such models to policy makers, they are not free of limitations. The critiques include incorporating *ad hoc* assumptions about the price responsiveness of supply and demand, assumption of a representative agent (while individuals reflect different behaviors), the key elements that drive the results of a scenario are not always transparent, and the models and their associated databases are costly to build and maintain (Scricciu, 2006). CGE models like Global Trade Analysis Project (GTAP) Global Trade and Environment Model (GTEM), and others are some examples of such models.

Partial equilibrium models are also used to evaluate the economic effects of trade liberalization, but within narrowly defined product categories. That is, the model would ignore linkages to other sectors through input-output relationships and do not provide economy-wide effects or broad welfare calculations. However, they are appropriate when the goal is to provide relatively rapid and transparent analysis of the direct effects of a wide range of commercial policy issues (Piermartini and Teh, 2005). Such partial equilibrium models include the Agricultural Trade Policy Simulation Model (ATPSM) developed by UNCTAD, and the Static World Policy

Simulation Model (SWOPSIM) of the US Department of Agriculture (Piermartini and Teh, 2005).

Similarly, econometric modeling can be useful in providing a retrospective look at the economic effects of a policy change such as tariff cuts. This type of ex- post analysis is also useful as an input into applied general equilibrium and applied partial equilibrium analysis. Gravity model is an example of such modeling. It was proposed by Jan Tinbergen in 1962 and since then, it is used to analyze the effects of trade liberalization that has already occurred by relating trade growth to tariff cuts, and estimate the trade effects of non-tariff barriers that lack an obvious ad valorem tariff equivalent (Keith, 2003).

Even though the above discussed models are not mutually exclusive, a researcher can choose one of the models based on the suitability of the model for a particular policy analysis in question. The partial modeling system doesn't enable us to see the economy wide effect of the service trade liberalization. But services are linked to the goods trade (Arnold et al, 2006; Li et al, 2003). Thus, the partial models are not capable of addressing this linkage. On the other hand, the econometric modeling is mainly used for ex-post impact assessments. However, the impact assessment to be made here is ex-ante, since Ethiopia is yet to access WTO (GATS). Moreover, econometric estimations such as gravity model need data inputs like Service Trade Restrictiveness Index which are not available for the Ethiopian service sector.

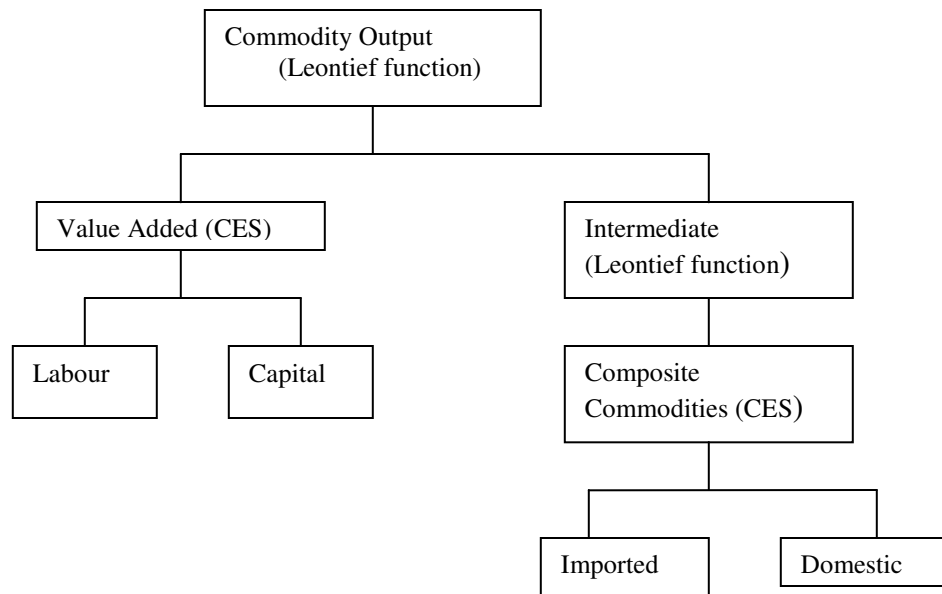
Thus, Applied General Equilibrium model seems to be the most suitable model relative to the rest of the models. A comparative static standard neoclassical-structuralist CGE model specified

by Lofgren et al (2001) is employed here with some adjustments. The model is called mixed type of neoclassical and structuralist models since its specification is partially based on neoclassical assumptions about prices (relative prices), and others, and partially based on the structuralist CGE modeling, mainly due to its assumption about macro closures and consideration of mark-up prices for the service sector. The model includes a number of features designed to reflect the characteristics of developing countries (Lofgren et al, 2001). These features, of particular importance in developing countries, include household consumption of non-marketed commodities, explicit treatment of transaction costs for commodities that enter the market sphere, and a separation between production activities and commodities that permits any activity to produce multiple commodities and any commodity to be produced by multiple activities (Lofgren et al, 2001 ; Thurlow and Sevens, 2002⁷). The model can also be used with the Keynesian closure in which aggregate employment is linked to macro variables through a Keynesian multiplier and real investment is fixed (Lofgren 2001). The detailed basic characteristic of the Ethiopian CGE model specified for this research is as discussed below and the equations are found under Appendix A.

The technology at the top level is specified by a Leontief function of the quantities of value-added and aggregate intermediate input. Value-added is itself a constant elasticity of substitution (CES) function of primary factors where as the aggregate intermediate input is a Leontief function of disaggregated intermediate inputs (see Fig 2.).

Fig. 2: Production Technology

⁷ They have used the neoclassical-structuralist model specified by Lofgren et al (2001) to develop a standard computable general equilibrium model for South Africa.



Source: Author's own construction based on Lofgren et al, 2001

The mechanism used for equilibrating supplies and demands in factor markets is that the quantity supplied of each factor is fixed at the observed level. Each activity pays an activity specific wage that is the product of the economy wide wage and activity specific wage (distortion) term and the later terms are fixed.

In this CGE model, institutions are represented by households, firms, the government and the rest of the world. Households receive income from the factors of production (directly or indirectly via the firms) and transfers from other institutions. The households use their income to pay direct taxes, save, consume and make transfers to other institutions. Their consumption is allocated across different commodities (both market and home commodities) according to linear

expenditure system (LES) demand functions, derived from maximizations of Stone-Geary utility function.⁸

The Ethiopian government collects taxes and receives transfers from other institutions. The government uses this income to purchase commodities for its consumption and for transfers to other institutions. Government consumption is fixed in real (quantity) terms where as government transfer to domestic institutions (households and firms) are CPI-indexed. Government savings (the difference between government income and spending) is a flexible residual.

The final institution is the rest of the world. Transfer payments between the rest of the world and domestic institution and factor are all fixed in foreign currency. Foreign saving or the current account deficit is the difference between foreign currency spending and receipts.

Both domestic output and imports, except the home consumed output, enter the market. Domestic output may be sold in the market or consumed at home. CES function is used to aggregate the marketed output from the different activities of a given commodity. The aggregated domestic output is allocated between exports and domestic sales on the assumption that supplier maximize sales revenue for any given aggregate output level subject to imperfect transformability between exports and domestic sales ,expressed by a constant elasticity of transformation(CET) function. The world prices of imports and exports are exogenous invoking the small country assumption for Ethiopia.

⁸ The Stone-Geary function also known as the linear expenditure system(LES), does not assume unit income elasticity(See Annabi et al,2006)

The domestic demand is made up of the sum of demands for households, government consumptions, investment, intermediate inputs, and transactions (trade and transportation inputs).

Regarding the macro closures, there are different macro closures used in CGE models (Lofgren et al, 2001): the Johansen, and the neoclassical closures. The Johanson closure refers to investment-driven closure where investment determines saving or saving adjusts while the latter assumes saving-driven closure where saving determines investment or investment is flexible. The choice between these macro closures depends on the context of the analysis. According to the Lofgren et al (2001), the appropriate closure for the Ethiopian CGE model looks the first type. It recommends that given the analysis is a single period model, a closure combining fixed foreign savings, fixed real investment and fixed government consumption may be preferable for simulations that explore the equilibrium welfare changes for alternative policies(Lofgren et al, 2001).

The CGE model includes three macroeconomic balances. In the government account the level of direct and indirect tax rates, as well as real government consumption, are held constant. As such the balance on the government budget is assumed to adjust to ensure that public expenditures equal receipts. This closure is chosen since it is assumed that changes in direct and indirect tax rates are politically motivated and thus are adopted in isolation of changes in other policies or the economic environment. For the current account, it is assumed that a flexible exchange rate adjusts in order to maintain a fixed level of foreign borrowing (or negative savings). In other

words, the external balance is held fixed in foreign currency. This closure is appropriate given Ethiopia's commitment to a flexible exchange rate system.

The savings-investment balance, closures are either investment-driven (the value of savings adjusts) or savings-driven (the value of investment adjusts). The closure is investment-driven. Real investment quantities are fixed. This means that in the case of trade liberalization, a reduction in tariff revenue requires savings to increase through increase in domestic saving to maintain the level of the fixed investment. In such a case, the level of disposable income is reduced with crowding-out effects on private consumption. Finally, the consumer price index is chosen as the numeraire such that all prices in the model are relative to the weighted unit price of households' initial consumption bundle.

4.3 Simulation Design for the Liberalization

The simulation is structured based on the fact that the service production decisions in the benchmark equilibrium is distorted by imperfect market structure that limit the rights of domestic and foreign enterprises to establish service facilitates in Ethiopia. The liberalization considered mode 1 and mode 3 only since mode 2 is not a problem for any country and mode 4 can be considered in mode 3 for developing countries (Konan and Maskus, 2006)⁹. Thus, the simulation mainly needs cross border tariffs on mode 1 and the quantification of barriers to FDI(mode 3). The latter parameter is not available for Ethiopia. Where such estimations are not available for the countries concerned, assumptions derived from literature on elasticities estimated for a

⁹ As a result, mode 4 is not separately considered in the simulation.

country with similar characteristics can be applied (Annabi et al, 2006). Accordingly, the parameter is taken from Konan and Maskus (2006).

There are different motives for FDI such as natural resource seeking, market-seeking and efficiency-seeking (Alemayehu, 2006). Here, the motive is assumed to be market seeking and this creates a stiff competition in the service sector. This is assumed to eliminate the price mark ups or rents of the existing firms. FDI in the benchmark equilibrium is also assumed to be null in all the service sectors. This is in fact the case for most of the sectors. However, sectors like construction involve FDI in the benchmark equilibrium (see Annex 2). The marginal analysis for such sectors in the service sector of the country is very difficult, if not impossible, due to data limitation. Thus, this might understate the impact of the liberalization on welfare. Moreover, data limitation on sectoral service sectors confines the simulation to be at macro level. Generally, the simulation scenarios are:

Base Case Scenario

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. Thus, in this scenario welfare, measured as equivalent variation in the representative agent's real income, and other macroeconomic variables show their value without any shock to the economy.

Scenario 1: Removal of Barriers to Mode 1

Mode 1 supply of service refers to services which are traded internationally across borders in a manner similar to cross-border trade in goods. A trade barrier in this case might consist of domestic restriction on the cross border service, discriminatory taxes on its operation or regulation on the way consumers consume the service domestically. That is, the rate of tax

(tm) on service sector is equated to zero. The initial value to the parameter is assigned from the SAM.

Scenario 2: Removal of Barriers to Mode 3

Mode 3 of international services provision is arguably the most general and the most important: provision through a commercial presence that is the result of FDI (Deardorff and Stern, 2004). In this mode of service supply, foreign service providers may well face impediments, both to their establishment and to their ongoing operations. But Ethiopia lack quantified estimations for such barriers on service trade. As mentioned before, this parameter (mp_c) is benchmarked from the Tunisian case of 2002(Konan and Maskus, 2006) where the service sector of the country was having similar features to that of Ethiopia's today. The scenario is , thus, equating this value to zero.

Scenario 3: Simultaneous Removal of Barriers to Mode 1 and Mode 3

The effect of removal of both mode 1 and mode 3 at a time is considered. Here, unlike the cases under scenario 1 and 2, the tax rate and the barrier to FDI are simultaneously removed from service trade. This scenario also crosses ponds to the full liberalization of the service sector which will be compared with the full liberalization of goods trade later.

Scenario 4: Full Liberalization of Trade in Goods

Here the extreme case is considered for the goods trade where the tariff on goods trade is assumed to be cut by 100%. Similar to the service sector, the initial value for the goods border tariffs rate (tm) is taken from SAM. Thus, the scenario is equating this value to zero for goods trade liberalization for comparison.

Scenario 5: Simultaneous Liberalization of the Service and Goods Trade

The impact of liberalization of both services and goods trade is simulated. Under this scenario, the simultaneous simulation of scenarios 4 and 5 above are undertaken.

Scenario 6: Simultaneous Removal of Barriers to Mode 1 and Goods Trade

Under this scenario, partial liberalization of services trade is simultaneously undertaken with goods trade full liberalization. The liberalization of cross-border service supply (mode 1) and the goods trade are simultaneously undertaken. That is, (tm) on services and goods is removed while barriers on service FDI (mode 3) are still persistent.

Scenario 7: Simultaneous Removal of Barriers to Mode 3 and Goods Trade

Similar to scenario 6, goods trade liberalization and partial service trade liberalization are simulated simultaneously. However, here the barriers to mode 3, other than mode 1, and barriers to goods trade are removed simultaneously. i.e., mp_c on service FDI and (tm) on goods trade are equated to zero.

One can also undertake other forms of simulation to derive even more robust results for the service trade liberalization impacts. Such scenarios include categorization of the service sectors in to three as: those which can relatively compete with foreign firms like airline and construction sub-sectors, those monopolized by the state like financial and telecom sub-sectors and others. However, such simulation needs sub-sectoral level barriers to FDI, which is lacking for Ethiopia. As a result, the above scenarios become important.

The simulation results are presented and discussed in the next section.

5. Results and Interpretations

Under this section the simulation results of the different scenarios considered in section four above are presented and the results are discussed in detail. Before directly moving to the discussion of the result, however, it is worth discussing how the model was adopted to Ethiopia. To begin with, the original CGE model by Lofgren, 2002 was specified with different options of macro closures so that the modeler will adopt one or more among the alternatives. As mentioned before, this model has employed investment-driven, the balance on the government budget is assumed to adjust to ensure that public expenditures equal receipts, for the current account - flexible exchange rate adjusts in order to maintain a fixed level of foreign borrowing (or negative savings). Moreover, the price equation is modified to incorporate the price distortions by the service sectors due to their cartel effect in the benchmark scenario

Table 2: Impact of Mode 1 and Mode 3 Liberalization on Macro Variables (% change from base year Value)

Variable	Scenario 1 (border lib.)	Scenario 2 (FDI lib)	Scenario 3 (border + FDI lib.)
Welfare(EV) ¹⁰	20.13	29.16	24.75
Consumer price Index	-1.32	-2.63	-2.23
Labor turnover	0.55	0.02	1.37
Capital turnover	0.28	1.33	0.55
Real return to labor	0.54	0.02	1.44
Real return to capital	2.01	5.24	13.12
Government Revenue	-0.77	-1.83	-1.81

Source: Simulation of the Model

Three of the scenarios considered in table 2 refer to the service sector liberalization. As discussed in section four, scenario 1 refers to the cross border liberalization (mode 1) and scenario 2 refers

¹⁰ Welfare measured as equivalent variation (EV) in the representative agent's real income.

to the removal of barriers to FDI (mode 3).The last scenario of the table is the combination of removal of cross border tariffs and barriers to FDI simultaneously.

The result exhibits that welfare of the representative agent, measured as equivalent variation in the representative agent's real income, dramatically increases in the three of the scenarios considered here. The welfare increase is higher in the case of removal of barrier to FDI (about 29%) than removal of cross border tariffs (about 20%) and simultaneous removal of both which is about 25%. This result is in line with the qualitative assessment which argued that since many of the service sub sectors are mainly state dominated, the admission of foreign firms might increase domestic competition and increase consumers welfare by removing mark ups and increasing scope of choice. However, the joint liberalization of both mode one and mode three doesn't imply the additive of the separate welfare gain, which indicates that there is a slightly offsetting interaction between the two scenarios. The consumer price index also shows a significant decline. The cross border liberalization (mode 1) has resulted in the minimum reduction of the CPI-1.32%.

In terms of factor adjustment, about 0.55%, 0.02%, and 1.37% of the labor force would turn over industry of employment under the first, second and third scenarios respectively. Similarly, the turnover for capital is maximum (1.33%) under the mode 3 liberalization. This could be attributed to the fact that FDI in developing countries also results in technology transfer that might result in replacement of outdated technologies available in developing countries like Ethiopia by the modern ones.

The liberalization also shows a decrease in government revenue in the three of the scenarios. In the case of the border liberalization, the reason for the government revenue losses is straightforward. Because the government loses the tariff revenue levied on imported services. But under mode 3, government implicitly earns from the protected incumbent firms like telecommunications and financial institutions. It loses such earnings if other firms are allowed to operate in the respective service sub-sectors. Thus, in all the cases, the liberalization leads to government revenue losses, even though the magnitude is different for the different scenarios considered.

Table 3, on the other hand, evaluates four additional simulations. The goods trade alone liberalization (scenario 4), the simultaneous liberalization of goods and service trade (scenario 5), simultaneous liberalization of mode 1 and goods trade (scenario 6) and simultaneous liberalization of mode 3 and goods trade (scenario 7). Scenarios 1, 2 and 3 are also part of this table and are as discussed in table 2. Scenario 4 considers a 100% import tariff cut on goods trade while the service sector continues being protected, opposite of scenario 3. Under scenario 4, one observes that the welfare has increased by about 32%. This is larger than both the individual liberalization of the two modes of service trade supply or the joint liberalization of the two considered in table 2 above. There might be many candidate reasons explaining the larger increase in welfare under full liberalization of goods trade than service. The first of such reasons is that there might be lower protection on service trade than goods trade and hence lower welfare gain from liberalization of service sector. The second could be due to the common problems

Table 3: Impact of Service and Goods trade Liberalization on Macro Variables

Variable	Scenario 1 (Border Only)	Scenario 2 (FDI Only)	Scenario 3 (Border +FDI=Service lib)	Scenario 4 (Goods)	Scenario 5 (Goods +Service)	Scenario 6 (Border+ Goods)	Scenario 7 (FDI+ Goods)
Welfare(EV)	20.13	29.16	24.75	31.77	41.61	16.72	18.85
Consumer price Index	-1.32	-2.63	-2.23	-5.07	-16.31	-8.11	-5.88
Labor turnover	0.55	0.02	1.37	3.19	8.47	10.85	1.39
Capital turnover	0.28	1.33	0.55	3.18	15.24	4.69	0.18
Real return to labor	0.54	0.02	1.44	3.13	9.38	10.83	1.34
Real return to capital	2.01	5.24	13.12	0.71	2.74	2.99	21.23
Government Revenue	-0.77	-1.83	-1.81	-6.05	-19.25	-23.44	-5.07

Source: Simulation of the Model

encountered in measuring the tariff equivalents of non-tariff barriers on services trade (Hoekman, 2006). In the case of the Ethiopian service sectors both reasons look acceptable. From the calibration, the import tariff rate on the agricultural and industrial, and service sectors is on average 0.205 % and 0.127 % respectively. This indicates that there is high protection on agricultural and industrial goods trade than service trade. This results in lower welfare gain in the case of service trade liberalization relative to that of the other sectors. Similarly, surveys assessing the Ethiopian service sector are also very limited. In sum, the result is robust in the sense that the welfare is larger in the case of goods liberalization than service liberalization.

Moreover, the goods liberalization is in favor of the dominant factor of the country (labor) than capital. The change in real return to labor and capital under the service liberalization(scenario

3) is about 1.44% and 13.12% respectively. However, the change in real returns to labor and capital under goods trade liberalization (scenario 4) is 3.13% and 0.71% respectively. This shows that service sector liberalization favors capital while goods trade liberalization favors labor which is abundant factor production for the country in general.

The fifth scenario of table 3 is the simultaneous liberalization of goods and services trade. The result shows that the simultaneous liberalization of the two sectors doesn't result in additive welfare change of the individual liberalization of the sectors. The welfare of the representative agent increases by about 42%, which is larger than the separate liberalization of goods and service trade liberalization. However, the gain is below the additive welfare change of the two under isolated liberalization, which is about 57%. This indicates that there is a slightly offsetting interaction between the two commitments. The impact of the blended liberalization of the two sectors on CPI is also significant, it decreases by about 16%.

The six and seventh scenarios of the same table are simulations on partial liberalization of service trade and full goods trade liberalization. The results show that whether goods trade is simultaneously liberalized with mode 1 or mode 3 of service trade, the welfare gain is minimum relative to the rest scenarios. However, it reduces the CPI significantly (see table 3).

The sectoral price and production effect of the different scenarios considered is also indicated in annexes 2 and 3 respectively. The service sector liberalization scenarios (scenario 1-3) resulted in decrease in import price of the service outputs. The removal of barriers to mode 1 decreases only import price of service trade while mode 3 decreases the import price of agricultural and

industrial goods in addition to that of services. The fourth scenario also shows a result similar to scenario 1 with regard to the import price effect. Scenarios 4, 5 and 6 are in line with scenario 2 while scenario 7 decreases only agricultural and service import prices.

The production effect (annex 3) also shows that Ethiopia will shift to exporting service outputs. The service export increase by 0.24%, 0.44%, 6.3% , 3.6% and 1.32% under scenarios 1,2 ,3 ,5 and 6 respectively. While it decreases by 2.14% and 0.29% under scenarios 4 and 7. In contrary, liberalization of service sector leads to decrease in import of service outputs except for scenarios 6 and 7, due to import substitution effect (see annex 3).

Moreover, according the Rbyszynski theorem of international trade, the inflow of capital in case of mode 3 liberalization would result in increased output of the sector that uses the capital input intensively(service and industry sector) and reduces that of the labor intensive sector (agriculture).The result here also seems to confirm this theory (see annex 3). Due to mode 3 liberalization, the out put of agriculture decreases by about 0.37% since more labor will be employed in industrial or service sector leaving agricultural sector. The out put of industrial sector increases by about 0.72% due to the admission of the capital inflow as FDI even though it is not the case in the service sector (annex 3).

6. Conclusions and Recommendations

6.1 Conclusions

The paper tried to assess both qualitatively and quantitatively the impact of liberalizing the Ethiopian service sector on the welfare. The Quantitative assessment has shown that liberalizing the different service sub sector will have varying impacts on welfare. The welfare gain in relatively open service sub sectors like construction is less compared to closed sectors like financial and telecommunication sub sectors. In the latter sectors, the welfare is high since the liberalization drive out the mark-up prices on service and reduces the scope for resource use inefficiency. This results in higher consumer's surplus relative to the former sectors. At the same time, with out prudent policies in place, liberalization of the closed service sector results in factor adjustment costs.

However, the qualitative assessment is with the limitation of showing the quantitative net welfare impact of the liberalization. To fill this gap, the quantitative assessment is undertaken. Due to lack of measurement of ad valorem tariff equivalents of non-tariff barriers on services at sectoral level, the quantitative assessment is made at macro level. The macro level assessment shows that service sector liberalization increases household welfare significantly. Especially the liberalization of the sector to foreign and domestic firms results in maximum welfare increase to the representative household.

The comparison of full liberalization of service trade with that of goods trade also shows that welfare increases more dramatically in liberalization of the latter sector. Moreover, the goods trade liberalization favors labor relative to capital and vice versa for the service sector liberalization, which seems to support the current service sector protection reasoning of the Ethiopian government indicated in the literature. The simultaneous liberalization of service and goods trade also shows the modest welfare increase. The welfare increase under the simultaneous liberalization is less than the additive of the separate liberalization of the two sectors.

Generally, one can conclude that both service and goods liberalization increases welfare. However, the country needs to build prudent policies, especially on the service sector to derive these welfare and other benefits from liberalization.

6.2 Recommendations

For liberalization to proceed successfully, complementary policies are needed to help domestic firms to compete, to promote competition and minimize the costs to local people whose assets and jobs are displaced. Given the literatures reviewed, qualitative assessments and qualitative simulation undertaken on the service sector liberalization of Ethiopia, the following such policies are recommended to supplement the liberalization:

- ☞ The quantitative assessment has shown that the service liberalization increases capital inflow which is intensively used by the service sector. This favors capital at cost of labor which is abundant resource of the country. On the contrary, goods liberalization favors labor. Thus, Ethiopia should have concert policies on labor employment of the newly established foreign firms on liberalization. This could be done by upgrading her labor

force through capacity building and give due consideration to goods liberalization than service liberalization.

- ☞ Today countries are suffering from the global financial crisis. Some indicate that Africa appeared insulated from the financial crisis due to the fact that its financial systems are not well developed and are weakly intergraded to global financial systems (Alemayehu et al, 2009). Even though this system is not able to completely block the transmission of the crisis to Africa, it helped the countries like Ethiopia from being infected by the crises largely. Thus, rushing in to liberalization of the financial service sector might open a door for such problems, since such sub-sector simulation is not undertaken here to see such impacts due to lack of sub-sector level barriers to service trade.
- ☞ It is important to undertake the service sector liberalization step by step even though the case considered here is a general one. The welfare gain would be larger and sustainable if the country allows foreign firm after empowering the domestic ones on competition. i.e., it would be better if the country undertake domestic liberalization before the international one in sectors like telecom and financial.
- ☞ If the country decides to liberalize the service sector, it is advisable to liberalize the sector with the goods sector to minimize the labor turnover.
- ☞ While GATS provides for successive rounds of negotiations aimed at achieving higher levels of liberalization, it also clearly states that due consideration must be given to national objectives and to the level of development of a country. In particular, developing countries have the flexibility of opening fewer sectors and of a more gradual increase in

market access (Dabee, 2000). Thus, Ethiopia can liberalize those sectors which are relatively open now even though the specific list of such sectors needs further assessment at sectoral level.

- ☞ The country should have well trained professionals who can provide technical helps during the negotiation and undertake assessment impacts as well.

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Appendix A. Model Equations and Notations

I. Production and Trade Block

1. Activity production $QA_a = \text{Min} \left\{ \frac{QINTA_a}{intaa}, \frac{QVA_a}{ivaa} \right\}$

2. Demand for aggregate value add $QVA_a = ivaa \cdot QA_a$

3. Demand for intermediate input $QINTA_a = INTaa \cdot QA_a$

4. Value add function $QVA_a = \alpha_a^{va} \left[\sum \delta_{fa}^{va} QF_{fa}^{\rho_a^{va}} \right]^{\frac{-1}{\rho_a^{va}}}$

5. Factor demand

$$WF_{fa} \overline{WFDIST}_{fa} = PV_a (1 - tva_a) \cdot QVA_a \left(\sum_{j \in F} \delta_{fa}^{va} \cdot QF_{fa}^{-\rho_a^{va}} \right)^{-1}$$

6. Output aggregation $QX_c = \alpha_c^{ac} \left[\sum_{a \in A} \delta_{ac}^{ac} QXAC_{ac}^{-\rho_c^{ac}} \right]^{\frac{-1}{\rho_c^{ac}}}$

7. Disaggregated intermediate

Input demand

$$QINT_{ca} = ica_{ca} \cdot QINTA_a$$

8. Output transformation $QX_c = \alpha_c^t \left[\delta_c^t QE_c^{\rho_c^t} + (1 - \delta_c^t) QD_c^{\rho_c^t} \right]^{\frac{1}{\rho_c^t}}$

9. Commodity Production and

Allocation

$$QXAC_{ac} + \sum_{h \in H} QH_{ach} = \theta_{ac} \cdot QA_a$$

10. Export to domestic supply ratio $\frac{QE_c}{QD_c} = \left[\frac{PE_c}{PDS_c} \cdot \frac{1 - \delta_c^t}{\delta_c^t} \right]^{\frac{1}{\rho_c^t}}$

11. Import to domestic demand ratio $\frac{QM_c}{QD_c} = \left[\frac{PDD_c}{PM_c} \cdot \frac{1 - \delta_c^q}{\delta_c^q} \right]^{\frac{1}{1 + \rho_c^q}}$

12. Composite Supply

/Armington /Function

$$QQ_c = \alpha_c^q \left[\delta_c^q QM_c^{-\rho_c^q} + (1 - \delta_c^q) QD_c^{-\rho_c^q} \right]^{\frac{1}{\rho_c^q}}$$

II. Price Relationships and Identities

13. Activity price

$$PA_a = \sum_{a \in A} PXAC_{ac} \cdot \theta_{ac} + mp_{ac}$$

14. Aggregate intermediate input price $PINTA_a = \sum_{c \in C} PQ_c \cdot ica_{ca}$

15. Consumer price index $\overline{CPI} = \sum_{a \in A} PQ_c \cdot cwts_c$

16. Import price $PM_c = pwm_c \cdot (1 + tm_c) \cdot EXR + \sum_{c' \in CT} PQ_{c'} \cdot icm_{c'c}$ 17.

Export price $PE_c = pwe_c \cdot (1 - te_c) \cdot EXR - \sum_{c' \in CT} PQ_{c'} \cdot ice_{c'c}$

18. Domestic spending

/absorption / $PQ_c (1 - tq_c) QQ_c = PDD_c QDc + PMcQM_c$

19. Marketed output value $PX_c \cdot QX_c = PDS_c \cdot QD_c + PE_c \cdot QE_c$

III. Institution Block

20. Factor income $YF_f = \sum_{a \in A} WF_{fa} \cdot \overline{WFDIST}_{fa} \cdot QF_{fa}$

21. Institutional factor income $YIF_{if} = shft_{if} \cdot [(1 - tf_f) YF_f - trnsfr_{rowf} \cdot EXR]$

22. Income of Domestic Non-government

institution $YI_i = \sum_{j \in F} YIF_{if} + \sum_{i' \in INSDNG} TRII_{ii'} + trnsfr_{igov} \cdot \overline{CPI} + trnsfr_{irow} \cdot EXR$

23. Household consumption

Expenditure $TRII_{ii'} = shii_{ii'} \cdot (1 - MPS_{i'}) \cdot (1 - TINS_{i'}) \cdot YI_{i'}$

24. Disposable income of the agent $YDH_h = (1 - \sum_{i \in INSDNG} shii_{ih}) \cdot (1 - mps_h) \cdot YI_h$

25. Household savings $SH_h = srh_h \cdot YDH_h$

26. Firm Savings $SF_f = YF_f - tyf_f \cdot YF_f - \sum_{h,f} TFH_{hf}$

27. Government Revenue

$$YG = \sum_{i \in INSDNG} TINS_{i'} \cdot YI_{i'} + \sum_{j \in F} tf_j \cdot YF_j + \sum_{a \in A} tva_a \cdot PVA_a \cdot QVA_a + \sum_{a \in A} ta_a \cdot PA_a \cdot QA_a + \sum_{c \in CM} tmc_c \cdot pwm_c \cdot QM_c \cdot EXR + \sum_{c \in CE} te_c \cdot pwe_c \cdot QE_c \cdot EXR + \sum_{c \in C} tq_c \cdot PQ_c \cdot QQ_c + \sum_{c \in CM} YIF_{govf} + trnsfr_{govrow} \cdot EXR$$

28. Government expenditure $EG = \sum_{c \in C} PQ_c \cdot QG_c + \sum_{c \in C} trnsfr_{igov} \cdot \overline{CPI}$

29. Investment Demand $QINV_c = \overline{IADJ} \cdot \overline{qinv}_c$

V. Macro economic Balance /System Constraints Block

30. Composite commodity

$$\text{Market } QQ_c = \sum_{a \in A} QINT_{ca} + \sum_{h \in H} QH_{ch} + QG_c + QINV_c + qdst_c + QT_c$$

31. Factor markets

$$\sum_{a \in A} QF_{fa} = QFS_f$$

32. Government Balance

$$YG = EG + GSAV$$

33. Direct institutional tax

$$TINS_i = \overline{tins}_i (1 + \overline{TINSADJ}_{tins}) + \overline{DTINS}_t$$

34. Equivalent Variation

$$EV_h = \left((YI_h - SH_h) - \left(\sum_{c \in C} PQ_c \cdot CON_{(c,h)} \right) \right) \cdot \left[\frac{PQO_c}{PQ_c} \right] - \left((YIO_h - SHO_h) - \left(\sum_{c \in C} PQO_c \cdot CON_{(c,h)} \right) \right)$$

35. Saving -investment balance

$$\sum_{i \in INSDNG} mps_i (1 - TINS_i) \cdot YI_i + GSAV + EXR \cdot \overline{FSAV} = \sum_{i \in C} PQ_c \cdot QINV_c + \sum_{c \in C} PQ_c \cdot qdst_c$$

36. Current account balance for the Rest of the World

$$\sum_{c \in CM} pwm_c \cdot QM_c + \sum_{f \in F} trnsfr_{rowf} = \sum_{c \in CM} pwe_c \cdot QE_c + \sum_{i \in INSD} trnsfr_{irow} + \overline{FSAV}$$

37. Total Absorption

$$TABS = \sum_{h \in H} \sum_{c \in C} PQ_c \cdot QH_{ch} + \sum_{a \in A} \sum_{c \in C} \sum_{h \in H} PXAC_{ach} \cdot QHA_{ach} + \sum_{c \in C} PQ_c \cdot QG_c + \sum_{c \in C} PQ_c \cdot QINV_c$$

Set Definition

Set	Set Definition
$a \in A$	Activities
$\alpha \in ALEO$	Activities with a Leontief function at the top of the technology nest
$c \in C$	Commodities
$c \in CE$	exported commodities
$c \in CM$	Imported commodities
$c \in CT$	transactions service commodities
$f \in F$	Factors
$h \in H$	Households
$i \in INSDNG$	Domestic institutions

List of variables

Symbol	Variable Definition
$CON_{(c,h)}$	Consumption of good c by household h
EG	total current government expenditure
EV_h	Equivalent variation for household h
EXR	exchange rate
$GSAV$	Government savings
PA_a	output price of activity a
PDD_c	demand price for com c produced & sold domestically
PDS_c	supply price for commodity produced and sold domestically
PE_c	price of exports
$PINTA_a$	price of intermediate aggregate
PM_c	price of imports
PQ_c	price of composite good c
PVA_a	value added price
PX_c	aggregate producer price for commodity
$PXAC_{ac}$	price of commodity c from activity a
QAa	level of domestic activity
QD_c	quantity sold domestically of domestic output
QE_c	quantity of exports
QF_{fa}	quantity demanded of factor f from activity a
QG_c	quantity of government consumption
QH_{ch}	quantity consumed of marketed commodity c by household h
$QINTAa$	quantity of aggregate intermediate input
$QINT_{ca}$	quantity of intermediate demand for c from activity a
$QINV_c$	quantity of fixed investment demand
QM_c	quantity of imports
QQ_c	quantity of composite goods supply
QT_c	quantity of trade and transport demand for commodity c
$QVAa$	quantity of aggregate value added

QX_c	aggregated marketed quantity of domestic output of commodity c
$QXAC_{ac}$	quantity of marketed output of commodity c from activity a
SF_f	Firm saving from factor f
SH_h	House hold h saving
$TABS$	total absorption
TFH_{hf}	Transfer from firm h to households f
$TINS_i$	rate of direct tax on domestic institutions i
$TRII_{ii'}$	transfer from institution i to i'
WF_f	average price of factor f
YF_f	income of factor f
YG	Government income
YI_h	income of household h
YI_i	income of (domestic non-governmental) institution i
YIF_{if}	income to domestic institution i from factor f

List of Exogenous Variables

Symbol	Variable Definition
\overline{CPI}	consumer price index (PQ-based)
\overline{DTINS}	Change in domestic institution tax share
\overline{FSAV}	Foreign savings
pwe_c	World price of exports c
pwm_c	World price of imports c
\overline{QFS}_f	quantity of factor supply f
$\overline{TINSADJ}$	direct tax scaling factor
\overline{WFDIST}_f	a wage distortion factor for factor f in activity a

List of Parameters

Symbol	Parameter Definition
$cwts_c$	weight of commodity c in the CPI
ica_{ca}	quantity of c as intermediate input per unit of

	activity a
$ice_{c'e}$	quantity of commodity c as trade input per exported unit of c .
$icm_{c'e}$	quantity of commodity c as trade input per imported unit of c .
$intaa$	quantity of aggregate intermediate input per activity unit
$ivaa$	quantity of value-added per activity unit
mp_{ac}	Mark-up price on good c
mps_i	base savings rate for domestic institution i
$qdst_c$	quantity of stock change
$shft_{if}$	share for domestic institution i in income of factor f
$shii_{ih}$	share of institution i in income of household
srh_a	the saving rate of house hold h
ta_a	rate of tax on producer gross output value
te_c	rate of tax on exports
tf_f	direct tax rate for factor f
$tins_i$	exogenous direct tax rate for domestic institution i
tm_c	rate of import tariff
tq_c	rate of sales tax
$trnsfr_{i,f}$	transfer from factor f to institution i
tva_a	rate of value-added tax
tyf_f	Rate of consumption of firm from factor f income
α_a^{ac}	shift parameter for domestic commodity aggregation function
α_c^q	Armington function shift parameter
α_c^t	CET function shift parameter
δ_a^{ac}	share parameter for domestic commodity aggregation function
δ_a^{fa}	CES value-added function share parameter for factor f in activity a ,
δ_c^q	Armington function share parameter
δ_c^t	CET function share parameter

θ_{ac}	yield of commodity c per unit of activity a
ρ_a^{va}	CES value-added function exponent
ρ_c^t	CET function exponent
ρ_c^a	Armington function exponent
ρ_a^{dc}	domestic commodity aggregation function exponent

Annex 1: Foreign Direct Investment Capital Flow (in thousands of Birr)

Sector/Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Agriculture	318761	344289	99478	1399308	2757474	6542055	25912172	11354753	33666161
Manufacturing	266289	1518072	273312	1214625	2091496	7023190	32935643	11711628	47132295
Service									
Construction	293720	6367	198032	78204	1123072	304935	2518383	456546	1229108
Education	34298	200000	4200	9512	59731	42974	149711	422171	195252
Electricity,gas,steam and Water Supply					391800	59467		1582	
Health and Social works			843238	15460	30219	1099449	114701	1254627	692713
Hotels and restaurants	23893			67526	144479	439051	1781085	5497036	6686344
Real estate,renting and business activities	493938	610716	179793	557589	661247	1137886	5359372	7303778	11936801
Transport,storage and communication	3370			4390	28653	49135	16228	80934	244408
Whole,retail trade and repair service	77480		30388	72955	324835	94543	48254	379072	57035
Other community, social and personal service activities					49750	1700	20900	28000	74385

Source: Ethiopian Investment Authority, 2009

Annex 2: Impact of the Liberalizations on Sectoral Prices

Indicators	% change from Benchmark Value						
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7
1. price of exported commodity							
Agriculture	4.39	-3.62	2.85	-5.48	-36.18	5.81	-3.07
Industry	5.93	-1.98	4.94	-5.16	-47.42	5.93	-2.09
Service	4.24	-4.35	1.78	-4.46	-44.48	7.58	-2.68
2. price of activity							
Agriculture	-2.52	-2.72	-3.42	-4.73	-35.21	-8.25	-5.33
Industry	-6.86	-3.24	-7.88	-5.10	-27.34	-19.00	-7.97
Service	-0.85	-1.39	-1.92	-3.30	-32.94	0.43	-5.33
3. price of composite commodity							
Agriculture	-1.23	-2.36	-2.15	-4.82	-38.52	-6.35	-5.23
Industry	-2.75	-3.93	-3.93	-5.40	-40.63	-15.41	-6.28
Service	-0.54	-0.11	-1.41	-3.24	-39.03	2.05	-4.97
4. price of value added							
Agriculture	-8.92	-2.67	-10.54	-2.67	-24.80	-8.11	1.04
Industry	-17.60	-3.47	-19.08	-5.70	-6.32	-22.06	-13.14
Service	9.75	-2.49	10.17	-3.53	-9.13	3.32	-11.62
5. price of imported commodity							
Agriculture	9.09	-3.40	8.32	-19.39	-65.39	-2.63	-19.93
Industry	12.79	-2.84	12.02	-5.03	-75.08	-6.99	1.20
Service	-10.93	-2.76	-13.13	-4.53	-66.56	-0.44	-0.33
6. producer price for commodity c							
Agriculture	-1.34	-2.36	-2.16	-4.42	-39.88	-5.55	-4.32
Industry	-9.97	-4.01	-11.46	-5.13	-24.70	-18.73	-9.51
Service	0.76	-0.65	-0.11	-3.46	-34.96	3.03	-5.41
7. Domestic price of good c							
Agriculture	-2.25	-2.66	-3.17	-4.29	-39.26	-6.44	-4.70
Industry	-10.40	-4.09	-11.98	-5.48	-24.61	-19.31	-9.84
Service	0.65	0.11	0.00	-3.24	-36.89	2.48	-5.50

Annex 3 : The Impact of the liberalizations on Sectoral Output

Indicators	% Change from Benchmark Value						
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7
1. Quantity of domestic output for com							
Agriculture	-0.30	-0.37	-0.29	-0.27	3.58	-2.22	-0.34
Industry	0.33	0.72	0.53	1.70	-34.94	-1.08	0.53
Service	-0.52	-0.47	-0.36	0.82	2.53	-0.57	0.05
2. Quantity of composite commodity							
Agriculture	-0.01	-0.09	-0.01	0.33	-7.42	-1.06	-0.17
Industry	-0.14	0.39	-0.03	1.98	56.60	-1.46	0.37
Service	-0.03	0.11	-0.03	0.27	-9.01	-0.54	0.08
3. Exported commodity							
Agriculture	5.35	3.93	10.04	4.08	10.32	-13.69	1.75
Industry	-35.91	-22.87	42.06	-67.56	-99.17	-65.90	-91.67
Service	0.24	0.44	6.30	-2.14	3.63	1.32	-0.29
4. Imported commodity							
Agriculture	1.23	-0.95	2.00	-0.46	-92.89	-97.33	-0.34
Industry	-1.12	-0.19	-1.90	-3.00	-5.95	-2.61	-4.86
Service	-1.05	-1.77	-0.01	3.92	-58.75	1.67	1.94

