

A Quest for Structural Transformation of Uganda by 2020

By John Mary Matovu

Draft: October 31st 2012-10-31

Abstract

This paper had three objectives. The first objective was to take stock of the progress Uganda has achieved and compare this with other countries that have gone through structural transformation. The second objective was to identify the key sectors that can be able to deliver structural transformation within the Ugandan context. The third objective focuses on the current export strategy pursued in Uganda and whether this will be able to deliver the desired objective of turning Uganda into a MIC. In general all countries that have achieved structural transformation and joined MIC status have pursued aggressive export strategies by switching into manufactured exports and moving away from exportation of primary commodities. This paper finds that the current export strategy of focusing on primary traditional commodities with limited value addition will not deliver the desired structural transformation by 2020. It would require a holistic approach to export diversification and also putting more focus on sectors within services (including ICT, financial services and tourism) which are exportable to achieve structural transformation and MIC status in 2022. Oil revenues would significantly contribute towards this goal however being an enclave sector with limited backward and forward linkages within the economy; this would require using oil resources in productive activities like infrastructure and human capital development which would have positive spillovers on other tradable sectors like agriculture and manufacturing.

1. Introduction

Uganda has sustained growth at a high level for the past 20 years. Between 1990 and 2007, real GDP growth averaged close to 8 percent, compared with 3 percent in the rest of Sub-Saharan Africa (SSA). The early years of the growth episode was largely driven by significant capital accumulation as the country was recovering from civil strife. More recently growth has decelerated during 2009-2011 due to external shocks including the volatile commodity prices and global recession which has greatly put pressure on the current account and the domestic exchange rate. The growth that has been witnessed in the past years has been accompanied by some significant changes in the composition of GDP where services are the largest contributor to GDP, agriculture continues to shrink and the industrial sector has remained stagnant. In addition, there have been some improvements in social indicators. For example, poverty has been halved before the targeted date of 2015 set for the MDGs. Other MDGs like access to water and sanitation are also on course to being met. Notwithstanding, the rest of the MDGs would require substantial resources to be met.

While these developments can be related to other countries which have gone through structural transformation, Uganda's structural changes have not been associated with significant improvement in income levels and social transformation. This is partly because the structural transformation taking place in Uganda is through the expansion of services at the expense of the contracting agriculture sector. Economic transformation has been defined as a combination of accelerated growth, rapid growth of exports, economic diversification, and structural change. It also involves the evolution of labor productivity (Pieper 2003). It's synonymous with transformation from a traditional to a modern one through high capital accumulation, technological change and productivity growth. Non-agriculture sectors also grow very fast in this process (Chenery 1980; Kuznets 1971; Syrquin 1988). These common characteristics notwithstanding, countries could also take various paths in their structural transformation process depending on various factors like natural endowments or geographical location. For the reference countries in this paper including Brazil, Thailand, Malaysia and India structural transformation took place by at least two sectors moving in tandem. For the case of Brazil which used to be agriculture based country, despite the expansion of the manufacturing and services sector, agriculture was transformed into a more sophisticated sector characterized by large scale farming and value addition. The slow growth of the agriculture sector in Uganda and being replaced by services partly explains why per capita GDP has stagnated at US\$ 500 dollars. Coupled with the high population

growth rate estimated at 3.2 percent and the unstable depreciating exchange rate, the objective of joining Middle Income Status Country (MIC) by 2017 as suggested under the National Development Plan remains a huge challenge.

In recognition of these challenges, the government has put several initiatives to address the bottlenecks that constrain growth in Uganda. These interventions are enshrined within the NDP which is being implemented for the period 2010-2015. A draft National Vision is also under way with its major objective of structural transformation of the economy and joining the MIC status. At the core of these policy documents is the drive to make Uganda an export led economy especially in sectors like agriculture and tourism where it's considered to have a comparative advantage. There are several initiatives that have been attempted to boost exports. Between 1960 to date, Uganda has largely depended on traditional exports including coffee, tea, cotton and tobacco. Even though their composition to total exports has been decreasing due to new emerging export commodities and trading partners, these commodities still contribute significantly to our total export receipts. For the countries that have structurally transformed their economies, they all have one characteristic where they have pursued an aggressive export strategy and moved away from exporting primary unprocessed commodities. In that effort, Uganda has also attempted to diversify its exports. More recently, the non-traditional exports have become important and they comprise of commodities like fish and horticulture commodities. Trade within the region especially Southern Sudan has also led to increased demand for Uganda's exports especially food items like maize and beans and manufactured commodities especially for the construction sector. This to an extent has cushioned Uganda from the recent external global shocks which were characterized by fluctuating commodity prices and a decline in remittances.

Albeit all these developments, the export receipts generated from the traditional exports and more recently from non-traditional exports are not enough to close gaps within the current account imbalances and later on deliver the structural transformation that has been witnessed in other countries. In that vein, there is a drive to add value especially to primary commodities in the agriculture sector. The arguments for value addition are two pronged. By value addition, Uganda would be able to get more in export revenues but also this would generate employment especially for the semi-skilled and skilled labor categories. All these proposals are enshrined within the NDP being implemented despite its slow implementation. In addition, the country has also identified exportable service sectors. Key among them is tourism and ICT with an objective of tapping the outsourcing industry.

The objective of this study is to assess the extent to which all these export promotion strategies will be able to deliver the structural transformation and make Uganda achieve the MIC status. First we assess how far the country can go with continued exportation of primary commodities that are not processed. Second, we analyze whether structural transformation can be achieved through further diversification or value addition to the primary commodities being exported. Given the experience of other countries which have achieved structural transformation through growth of services in tandem with other sectors, we also assess the potential gains that will be achieved by targeting especially export oriented service activities. As such, this paper will attempt to quantify these effects and thereby provide the policy makers the opportunity costs associated with each export strategy and whether they will be able to deliver the desired structural transformation.

To analyze these objectives we use a dynamic CGE model which can capture the inter-sectoral linkages and spillover effects of intervening in one sector. Several studies have used CGEs to do similar analysis on structural transformation. We adopt a similar model that was used by Breinsinger et. al (2008) which was done for Ghana. The key finding for this study suggested that Ghana's rapid growth to achieve structural transformation is limited to the nature of its industrial sector which is largely agro-based and dependent on the growth of the agriculture sector. They also find that Ghana has potential of developing an export services sector similar to that of India. More importantly, the services sector could be a source of rapid growth in Ghana given its linkages with other sectors. Other general equilibrium models which have investigated this area are by Irz and Roe (2005). Their major finding suggests that agricultural productivity can be a bottleneck to growth as it results in high food prices and low savings rate. For the most part most of these models used have been highly aggregated (see Irz and Roe (2005), Echevarria (1997) and Diao et.al. (2005)). This could hide country specific unique features that can only be captured using a more disaggregated model.

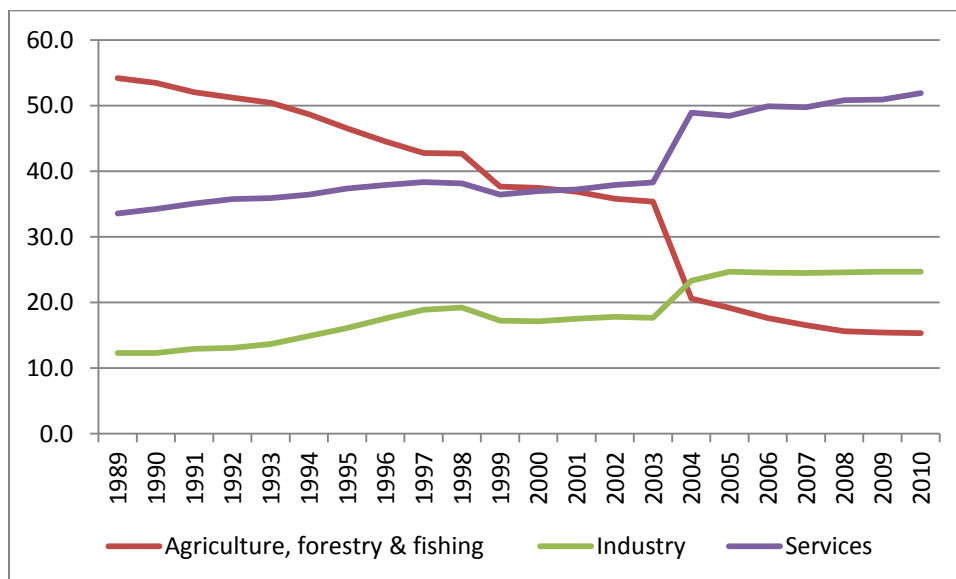
The rest of the paper is organized as follows: Section 2 discusses countries that have gone through structural transformation by identifying the sectors that were focused on and the years it took these countries to achieve this objective. Section 3 discusses the potential growth drivers of Uganda and assesses the inter-sectoral linkages between sectors using the multiplier analysis. Section 4 outlines the model used for the analysis. Section 5 reports the results of the simulations. Lastly is the policy implications and conclusion.

2. Growth and Transformation: Lessons from Successful Countries

Uganda like all other middle-income countries (MICs) face peculiar development challenges that requires an ability to compete in a global marketplace without protection from trade preferences. To do so, Uganda like the MICs must continually enhance economic competitiveness, increase productivity, especially by improving infrastructure, broadening their knowledge base and developing human capital.

Uganda's strong economic growth since 1992 has been driven mainly by the services, manufacturing and construction sectors (Figure 1). In [2008/09], the share of value added contributed by the services sector was almost half of total gross domestic product (GDP) from about 32 per cent in 1990 and that of agriculture diminished steadily from 50.3 per cent to about 15.2 per cent in the same period. The recent decline in agriculture partly reflected the fall in productivity of the sector, deterioration in farming methods synonymous with poor technologies and resources especially in form of labor being reallocated to services. Other structural problems, including the use of inferior inputs and lack of value addition to raw materials that have limited productivity and profitability of the sector have contributed to the low growth of the sector.

Figure 1 – Sector Composition of GDP (Percentage)



Source: UBOS, 2010

In order to undertake a comparative analysis of Uganda with other countries, this study compares Uganda with five other countries which have managed to achieve structural transformation and also attained MIC status. The countries chosen in this case include Brazil, China, Malaysia, Thailand, India, and Vietnam. The path to structural transformation on average took a period of 8-12 years. All the reference countries suggest that there has been a structural shift away from agriculture to other sectors especially manufacturing and services (Table 1). All these countries witnessed low growth rate for the agriculture sector relative to the growth of other sectors. However, while the shares of agriculture declined, these countries never completely abandoned the sector where on average its share to GDP only declined by 5-10 percent relative to the period before the transformation process.

Table 1: Structural change in economic transformation for selected countries

Country	Year when GDP per capita was around \$400	Year when GDP per capita current US	Annual growth rate during transformation (%)			Share of total GDP in the initial and ending years (%)			
			GDP	GDP per capita	Agriculture GDP	Agriculture	Industry	Manufacturing	Services
Brazil	1965	258	9.9	7.2	3.2	19.0	34.0	26.0	48.0
Malaysia	1965	335	7.1	4.5	5.9	29.0	27.0	9.0	44.0
Thailand	1976	401	6.1	4.1	3.6	27.0	28.0	20.0	46.0
China	1993	374	9.2	8.1	3.5	19.0	47.0		34.0
India	1992	406	6.0	4.2	2.3	31.0	27.0	16.0	42.0
Vietnam	1997	356	6.6	5.3	4.0	27.0	29.0	15.0	44.0
Uganda	1990	406	-0.6	2.8	5.4	56.6	11.1	5.6	32.6
	Year when GDP per capita was around \$1000	Year when GDP per capita current US \$)	Number of years needed			Agriculture	Industry	Manufacturing	Services
Brazil	1974	996	9			13	40	31	47
Malaysia	1977	1,089	12			27	36	19	37
Thailand	1987	967	11			16	33	24	51
China	2001	1,042	8			14	45		41
India	2004	640				21	27	16	52
Vietnam	2004	550				22	40	20	38
Norh Korea	1960	1109	8						
Singapore	1971	1071	10						

Source: World Bank Development Indicators <http://www.worldbank.org>

High growth was also accompanied by a rapid expansion of export growth during the transformation period. It's also the case that agricultural exports as a share of total exports declined in all six countries, while the share of manufacturing exports increased substantially. Brazil had a similar export structure in

1965 as Uganda in 2005, which was comparable to the Asian countries like Indonesia. However, nine years later, in 1974, the share of manufactured exports in Brazil reached 24%, up from 8% in 1965. Growth in exports was typically faster than economic growth, even for the big countries with larger domestic markets. This reflects the importance of external demand in growth accelerations and structural change, because it allows production growth to exceed growth in the domestic demand. Table 2 shows the changes in the export structure of the selected countries. At the time when GDP per capita for these individual countries was around US\$ 400 dollars, total export per capita for most countries ranged from as low as US\$ 19 dollars to US\$ 130 dollars. However, what differentiates Uganda from other countries is the rate at which exports grew thereafter. While all the countries witnessed double digit growth in export volumes, Uganda on the contrary its exports contracted in real terms. In addition, the key difference between Uganda and other countries is the share of merchandise exports by sectors. For all the countries in the reference group, their shares of manufactured exports increased significantly. For instance for a country like Thailand the share of manufactured exports have increased from 17 to 52 percent. For the case of Uganda, a modest increase of 2.4 to 21 percent has been achieved since 1990.

Table 2: Change in export structure of selected countries

Country	GDP per capita was around \$400	per capita in that year (US\$)	growth rate in export during	Share of Merchandise export (%)			
				Food	Agriculture raw	Mining	Manufacturing
Brazil	1965	19.0	19.4	67.0	15.0	9.0	8.0
Malaysia	1965	130.0	15.4	11.0	49.0	28.0	5.0
Thailand	1976	70.0	10.6	60.0	13.0	7.0	17.0
China	1993	78.0	12.7	11.0	2.0	2.0	81.0
India	1992	22.0	9.9	16.0	2.0	4.0	73.0
Vietnam	1997	122.0	15.6	30.0	3.0	0.0	44.0
Uganda	1990	...	-2.2	0.0	14.0	...	2.4

Country	GDP per capita was around \$1000	Total export per capita in that year (US\$)	growth rate in export during	Share of Merchandise export (%)			
				Food	Agriculture raw Materials	Mining	Manufacturing
Brazil	1974	75.0		58.0	6.0	9.0	24.0
Malaysia	1977	474.0		19.0	39.0	12.0	15.0
Thailand	1987	223.0		37.0	8.0	2.0	52.0
China	2001	209.0		5.0	1.0	2.0	89.0
India	2004	70.0		10.0	1.0	7.0	73.0
Vietnam	2004	312.0		23.0	2.0	1.0	53.0
Uganda	2006	50.8	24.6	66.0	8.9	1.0	21.3

Source: World Bank Development Indicators <http://www.worldbank.org>

Coffee in 1965 used to contribute 72 percent of the total agricultural exports. Overtime when structural transformation was attained, the share of coffee exports in Brazil's agriculture exports had declined to 31 percent. This also applies to all the other reference countries where the share of cash crop exports has been on the decline. For the case of Uganda, a similar trend has been observed as well. However, this has to be interpreted with caution. This decline is partly explained by several factors. First is the introduction of new non-traditional agriculture exports like horticulture sector. Second, the value derived from coffee exports could also have declined owing to the volatility of international commodity prices.

Table 3: Change in export structure of selected countries

Country	Agricultural exports in total exports (%)				Selected commodities in total agricultural exports (%)				
	Year	Share	Year	Share	Commodity	Year	Share	Year	Share
Brazil	1965	66.1	1974	55.1	Coffee	1965	72.4	1974	31.0
Malaysia	1965	46.0	1977	28.6	Rubber	1965	84.3	1977	79.1
Thailand	1976	69.2	1987	43.8	Rice	1976	35.3	1987	21.4
China	1993	37.9	2001	30.7	Fruits vegetables	1993	25.6	2001	20.9
India	1992	15.9	2005	8.7	Fruits vegetables	1992	14.8	2005	17.6
Vietnam	1997	32.1	2003	24.7	Rice	1997	30.2	2003	16.2
Norh Kore	1961	13.4	1971	5.8	Silk raw	1961	76.8	1971	29.6
Singapole	1961	34.4	1971	21.0	Pepper	1961	16.2	1971	13.6
Uganda	1990	17.6	2006	8.9	Cofeee	1990	62.8	2006	24.0

Source: Data from the United Nations Statistical Division, <http://www.unstats.un.org/unsd/default.htm>

Several conclusions can be drawn from this comparative analysis. First, all countries that have successfully transformed experienced significant structural changes and declining shares of their agricultural sectors. For the case of Uganda, a similar, path has been observed where the agriculture sector GDP contribution has declined to about 24% in 2010 from over 70% in the 1990s. This development notwithstanding, agriculture has remained a dominant sector employing about 82% of the population, a major export earner and a source of government revenue. Therefore, as Uganda undergoes structural change like other MIC countries, the question is how long will it take to attain MIC status? Can Uganda afford to ignore the role of the agriculture sector in its quest for transformation? Another important observation is the fact that the growth of manufactured exports increased significantly. While there is some positive increase in manufactured exports for the case of Uganda, these exports are growing from a very low base to have any meaningful impact on the structural

transformation process. This raises questions on what should be the new export drivers for the country to achieve a structural transformation and MIC status.

3. Sources of growth and Sectors Are Most Important: Multiplier Analysis

Economic development has historically been associated with structural changes in the national economies. That is, economic development is a process combining economic growth with changing share of different sectors in the national product and labor force. The most common structural changes that have been observed in Uganda and historically in other countries have followed a sequence of shift from agriculture to industry and then to services. Uganda has been characterized by a predominant share of agriculture, but as the economy develops further, the share of industry has increased and that of agriculture declined, and subsequently a reasonably high level of development, the services sector has also increased in importance, becoming a major component of the economy.

To assess the importance of the individual sectors, we use the multiplier analysis based on two SAMS of which one was derived in 1999 and compare this to the most recent SAM of 2009. While this is a short period to expect and structural changes within the economy, this still provides us with a sense of what is the most important sectors within the economy and where should government concentrate in terms of interventions. As shown in Table 4, we disaggregate the economy into Agriculture, Industry and Services and assess the impact of these sectors on the various components of the economy including all the activities/sectors, demand for commodities, factors of production and household income.

The analysis shows that agriculture has remained a dominant sector with huge multiplier effects on the rest of the economy. The key drivers for the multipliers in the agriculture sector include food crops as shown in Table 4. Crop production affected all other activities by a factor of 60 in 1999 compared to 17 times in 2009. Currently an increase in crop production by one unit multiplies the income of rural households by 3 times. Cash crops also still play an important role in Uganda's economy. Increasing production of cash crops by one unit results into an increase of rural farming households by 2.5 times. Not surprising is the role of non-traditional exports of which some tend to be more capital intensive. Indeed, increasing non-traditional exports by one unit leads to increased demand of capital by 2.3 percent. Enterprises and rural households are the larger beneficiaries of non-traditional cash crops. The dominance of agriculture multipliers has considerably declined over the past ten years. Crop production

along the way has now become less important and other new activities like non-traditional crops have emerged as important for the economy within the agriculture sector.

In addition, over the past ten years the role of industry related to other sectors has also changed significantly. For instance, while the multiplier for agriculture on all activities was 45 times in 2009, more recently this has increased to 58 times. The bulk of this increase is in other industry rather than agro-processing. Other industries include sectors like utilities and construction sector which has been growing at a very high rate. Increased manufacturing has also been accompanied by higher commodity demand. The multipliers for services in 2009 compared to 1999 have also considerably increased an indication of the importance of this sector. Services which used to impact all other activities by only a factor of 19 now affect them by more than 40 times. The same trend has been observed also for the private sector. In summary what can be drawn from this analysis is that the importance of agriculture over the past years has dwindled and this has been replaced by other sectors in industry and services. The decline in the multipliers for agriculture is partly explained by the low productivity of the sector due to climate changes, low use of fertilizers and poor farming methods. While the importance of industry and services has grown overtime, due to the limited backward linkages with the agriculture sector this has not resulted into positive spillovers to stimulate growth in agricultures sector.

Table 4: Multiplier Analysis using 1999 and 2009 Social Accounting Matrices

A: Social Accounting Multipliers for 1999

	Agriculture				Industry		Services	
	Food Crops	Traditional	Non-Trad	Livestock	Agroprocessing	Other	Private	Public
		Cash-crops	Cachcrops			Manufacturing		
Activities	167.18	60.20	33.43	33.33	27.42	17.82	14.68	4.93
Agriculture	82.24	29.48	16.45	16.35	9.27	4.60	4.04	1.34
Industry	44.39	15.81	8.88	8.87	11.61	8.85	3.91	1.28
Services	40.54	14.91	8.11	8.11	6.55	4.37	6.74	2.31
Commodities	157.23	57.27	31.44	31.34	26.52	17.14	14.00	4.73
Agriculture	44.73	14.97	8.95	8.81	8.65	4.18	3.58	1.24
Industry	67.51	25.73	13.50	13.52	10.60	8.12	6.26	2.03
Services	44.99	16.56	9.00	9.01	7.26	4.85	4.16	1.46
Labour	68.87	20.47	13.74	11.96	9.06	5.71	5.41	1.71
Capital	20.27	7.37	4.05	4.05	3.74	3.51	2.63	0.81
land	34.76	13.83	6.98	8.61	4.27	2.08	1.80	0.60
Rural Farming Households	76.91	25.65	15.38	15.44	9.91	5.47	5.27	1.55
Rural Non-Farming Households	22.83	7.55	4.56	4.47	3.11	1.95	1.78	0.53
Urban Households	24.16	8.48	4.83	4.72	4.04	3.89	2.78	1.04

B: Social Accounting Multipliers for 2009

	Agriculture				Industry			Services		
	Food Crops	Traditional	Non-Trad	Livestock	Mining	Agroprocessing	Other		Private	Public
		Cash-crops	Cachcrops				Manufacturing			
Activities	36.32	16.84	6.33	11.58	3.39	23.05	31.77	27.11	13.80	
Agriculture	17.18	7.82	2.92	5.07	0.51	5.39	4.50	3.91	1.91	
Industry	5.32	2.49	0.91	2.23	1.51	9.54	13.25	3.88	1.97	
Services	13.92	6.53	2.50	4.28	1.37	8.12	14.01	19.31	9.92	
Commodities	38.25	17.71	6.60	12.11	3.49	24.42	33.43	27.93	14.27	
Agriculture	9.19	3.61	1.18	2.71	0.65	7.03	5.72	4.99	2.44	
Industry	15.48	7.71	2.90	5.24	1.52	9.33	15.79	11.87	6.12	
Services	24.79	6.39	2.53	4.16	1.32	8.06	11.92	11.07	5.71	
Labour	5.90	2.86	1.08	1.99	0.54	3.18	4.49	4.74	3.47	
Capital	2.96	1.98	2.37	0.96	1.55	6.60	12.00	11.14	4.45	
land	2.87	1.19	0.58	0.27	0.19	1.74	1.54	1.47	0.72	
Enterprises	2.96	1.98	2.37	0.96	1.55	6.60	12.00	11.14	4.45	
Rural Farming Households	5.09	2.59	2.09	1.51	1.08	6.48	8.56	8.11	3.81	
Rural Non-Farming Households	0.68	0.44	0.54	0.23	0.34	1.51	2.66	2.58	1.31	
Kampala Households	0.87	0.56	0.70	0.29	0.43	1.93	3.40	3.29	1.68	
Urban Farming Households	0.48	0.28	0.29	0.18	0.17	0.88	1.38	1.41	0.85	
Urban Non-Farming Households	0.47	0.30	0.37	0.16	0.23	1.04	1.82	1.77	0.93	
Government	0.03	0.02	0.02	0.01	0.02	0.06	0.12	0.11	0.04	

4. Methodology and Data

The analysis is based on the MAMS (Maquette for MDG – Millennium Development Goal – Simulations) which is a dynamic-recursive computable general equilibrium (CGE) model. The model is also linked to a micro-simulation module which is used to generate poverty estimates under the various scenarios. The MAMS model is integrated also with an additional MDG module which links all the MDG indicators to its determinants. The MDGs that MAMS focus on include MDG1, MDG2, MDG4, MDG5 and MDG 7a and 7b. For MAMS TO adequately address all these MDGs, it provides a rich framework differentiating between government activities and private sectors activities in education and health.

The CGE model used in the present study is based on a standard CGE model developed by Lofgren, Harris, and Robinson (2002) and adopted to Uganda by EPRC. This is a real model without the financial or banking system (See Table A1). GAMS software is used to calibrate the model and perform the simulations. This has since been simplified for country teams and it now has an excel interface. This framework is based on various data sources. The key data source is the Social Accounting Matrix. The first disaggregated Ugandan Social Accounting Matrix was derived in 2002 which was later modified in 2007 by IFPRI. The SAM on which the MAMS model is based was modified based on the 2007 SAM in order to take into account the more elaborate public sector. Table 5 shows the various accounts in the SAM on which the disaggregation of the model is based.

Table 5: Social Accounting Matrix

Activities/Commodities	Factors of Production	Investment Accounts
Agriculture	Labor - less than secondary education	private investments
Industry	Labor - completed secondary education	Government investment in primary education
Transport	Labor completed tertiary education	Government investment in secondary education
Private services	Private capital	Government investment in tertiary education
Primary education nongovernment	Capital for primary education	Government investment in health
Secondary education nongovernment	Capital for secondary education	Government investment in water and sanitation
Tertiary education nongovernment	Capital for tertiary education	Government investment in agriculture
Health - non-government	Capital for Health	Government investment in roads
Primary education government	Capital for water and sanitation	Government other government
Secondary education government	Capital for agriculture	
Tertiary education government	Capital for roads	Other Accounts
Health - government	Capital for other government	interest payments on domestic debt
Water and Sanitation	Land	interest payments on foreign debt
Agriculture-government		
Roads	Institutions	Tax Accounts
Other government	Households	Direct taxes
	Government	Indirect taxes
	Rest of the World	Import taxes

The 2007 SAM was built in several steps. The initial task in building a SAM involves compiling data from various sources into the SAM framework. This information is drawn from national accounts, household surveys, foreign trade statistics, government budgets, balance of payments, and various other publications. This information often uses (i) different disaggregation of sectors, production factors, and socio-economic household groups, (ii) different years and/or base-year prices, and (iii) different data collection and compilation techniques. Consequently, the initial or prior SAM inevitably includes imbalances between row and column account totals. The cross entropy method is used to balance the SAM.

We draw on a number of strengths from the CGE modeling framework in our analysis. Firstly, the model simulates the functioning of the economy as a whole and track how changes in economic conditions are transmitted through price and quantity adjustments on a range of markets. Secondly, since the basis of the CGE model is a Social Accounting Matrix we are able to discern the effects of the changes in infrastructure spending on individual sectors of the economy. Thirdly, the link of the model to household survey data enables an assessment of the impacts on the welfare of households due to the changes in infrastructure expenditure, which is particularly interesting since this is where the most important policy implications are likely to be found.

The recursive dynamic nature of our model implies that the behavior of its agents is based on adaptive expectations, rather than on the forward looking expectations that underlie inter-temporal optimization models. Since a recursive model is solved one period at a time, it is possible to separate the *within-period* component from the *between-period* component, where the latter governs the dynamics of the model

For all activities, producers maximize profits given their technology and the prices of inputs and outputs. The production technology is a two-step nested structure. At the bottom level, primary inputs are combined to produce value-added output using a CES (constant elasticity of substitution) function. At the top level, aggregated value added is then combined with intermediate input within a fixed coefficient (Leontief) function to give the output. The profit maximization gives the demand for intermediate goods, labor and capital demand. The detailed disaggregation of production activities captures the changing structure of growth due to the pandemic.

Consumption for each household type is defined by a constant elasticity of substitution linear expenditure system, which allows for the income elasticity of demand for different goods to deviate from unity. The CGE model endogenously estimates the impact of alternative growth paths on the incomes of various household groups. These household groups include farm and nonfarm households and are disaggregated across rural areas, the major city of Kampala, and other smaller urban centers.

The allocation of domestic output between exports and domestic sales is determined using the assumption that domestic producers maximize profits subject to imperfect transformability between these two alternatives. The production possibility frontier of the economy is defined by a constant elasticity of transformation (CET) function between domestic supply and export. On the demand side, a composite commodity is made up of domestic demand and final imports and it is consumed by households, enterprises, and government. The Armington assumption is used here to distinguish between domestically produced goods and imports. For each good, the model assumes imperfect substitutability (CES function) between imports and the corresponding composite domestic goods. The parameter for CET and CES elasticity used to calibrate the functions used in the CGE model are exogenously determined.

There are three institutions in the model: households, enterprises and government. Households receive their income from primary factor payments. They also receive transfers from government and the rest of the world. Households pay income taxes and these are proportional to their incomes. Savings and total consumption are assumed to be a fixed proportion of household's disposable income (income after income taxes). Consumption demand is determined by a Linear Expenditure System (LES) function. Firms receive their income from remuneration of capital; transfers from government and the rest of the world; and net capital transfers from households. Firms pay corporate tax to government and these are proportional to their incomes. Government revenue is composed of direct taxes collected from households and firms, indirect taxes on domestic activities, domestic value added tax, tariff revenue on imports, factor income to the government, and transfers from the rest of the world. The government also saves and consumes.

Equilibrium in a CGE model is captured by a set of macro closures in a model. Aside from the supply-demand balances in product and factor markets, three macroeconomic balances are specified in the model: (i) fiscal balance, (ii) the external trade balance, and (iii) savings-investment balance. For fiscal balance, government savings is assumed to adjust to equate the different between government revenue and spending supported by foreign borrowing. For external balance, foreign savings are fixed with exchange rate adjustment to clear foreign exchange markets. For savings-investment balance, the model assumes that savings are investment driven and adjust through flexible saving rate for firms.

5. Simulation Results

The basis of the analysis in this paper is motivated by these four strategies and we attempt to identify which one will deliver structural transformation earlier. To do this we use a dynamic general equilibrium model which is summarized in section 4. In the first scenario, we examine whether continuing with the exportation of traditional crops will deliver the structural transformation. The second simulation focuses on the recent diversification efforts into non-traditional exports like fish and horticulture and exportation of food crops and manufactured goods within the region. The third simulation examines the gains in value addition to the raw material especially for the agriculture sector. The fourth simulation looks at the impact of increasing other types of manufacturing rather than agro processing. The fifth simulation explores the impact of growth in services and its impact on the production sectors like

agriculture and industry. Lastly, we run a simulation which is considered to be holistic with all these interventions being done simultaneously.

Baseline Scenario

The period of analysis is 2010-2020 and this is chosen on the basis that the countries we are comparing with some took on average 6-12 years to undergo structural transformation. In this scenario it is assumed that there are no specific additional policy interventions made to achieve structural transformation. In essence the business as usual scenario results into a GDP per capita that is not targeted by policy makers. This scenario, total factor productivity for agriculture varies from 0.1-0.5 percent of the period 2012-2020 an indication that there are no specific interventions like increased use of fertilizers or commercialization of farming to enhance productivity in the sector. The productivity of the other sectors is between 0.5 and 1 percent. In addition, we do not assume any increased use of factors of production (including land, labor and capital) in any of the sectors. As a result of these assumptions, the growth generated during the period 2012-2020 is about 6.5 percent (Table 6). The average growth rate which was envisaged under the National Development Plan of 2010-15 was about 7.2 percent. However, this was on the basis that the plan would be fully implemented which has not taken place. The slow implementation of the National Development Plan and the recent global recession have resulted into growth of between 5-6 percent during the past two years and this justifies the rationale to use a lower growth rate under the baseline compared to the NDP projection.

To generate the baseline several closure rules have to be adopted as well. The first rule relates to the fiscal balance as a result of government operations in revenue collection and expenditure. We assume that this is flexible and financed domestically and foreign borrowing. Since this study is about export led growth and structural transformation, we do not go into the details of various financing options of the fiscal deficit. The baseline also assumes that revenue collection is going to remain at its current level of 12-13 percent of GDP. Albeit all the efforts to boost domestic resource mobilization, this has not been reflected in increased revenue collection and it is rational to assume that it's going to remain the same for the baseline. For spending, we build on the recent developments where the government has accelerated spending on energy and transport infrastructure. In this regard, we assume that the shares of spending on this vital infrastructure will remain the same. The next key closure rule is the savings and investment balance where we assume that household savings adjust endogenously to investments. For the closure of the external balance, we assume that Uganda uses a flexible exchange rate. This has

various implications for this study as changes in exchange rates have varied impact on exported goods and imports. For the factor markets, we calibrate the model with the objective of reproducing the current unemployment rate.

Under this baseline, the GDP per capita would only increase by US 100 dollars to a level of about US 520 dollars in 2020 which is way below the objective set by under the National Development Plan of reaching middle income status by 2017 (Table 7). This result is based on the assumption that the population grows at 3.2 percent and by 2020 the country would have reached about 44 million people. Under this baseline, the largest contributor to GDP is services as has been witnessed during the past decade where services have overtaken both agriculture and industry contributing more than half. As a result, the contribution of services to total GDP will increase to 57 percent while agriculture will continue to shrink to 16 percent and industry will contribute about 25 percent of GDP (Table 9). This scenario depicts what has been observed in the past where services have continued to be the main driver of growth compared to other sectors despite its limitations in absorbing the unskilled labor involved in agriculture. The overall export growth under the baseline scenario would be about 9 percent and this would largely be driven by the traditional exports and recent diversification efforts in fish and horticulture industry (Table9).

The dismal contribution in raising per capita income under the baseline is also consistent with the lower generation of employment opportunities especially among the unskilled. As shown in figure 2, while there is reduction in the level of unemployment, the rate at which it is reduced compared to alternative scenarios is much slower and thereby limiting opportunities for income growth. Unemployment under the baseline remains consistently higher at an average of 6 percent during the simulation period. This is also consistent with the lower reduction in poverty levels which only reduce to 13 percent in 2020 under the baseline (Table 11). Similarly, as shown in figure 3-7, the MDG attainment by 2015 and also beyond the targeted period by 2020 would be low compared to the simulations presented below.

Figure 2: Unemployment Rate

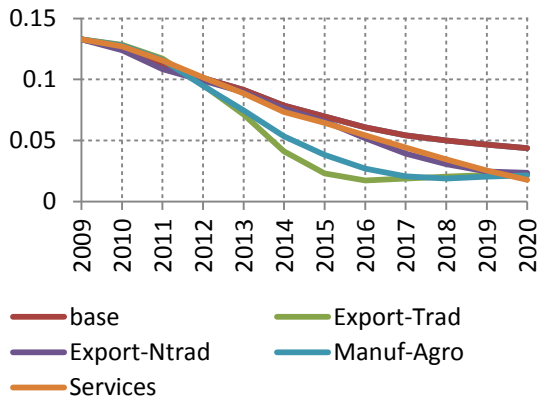


Figure 3: MDG 2

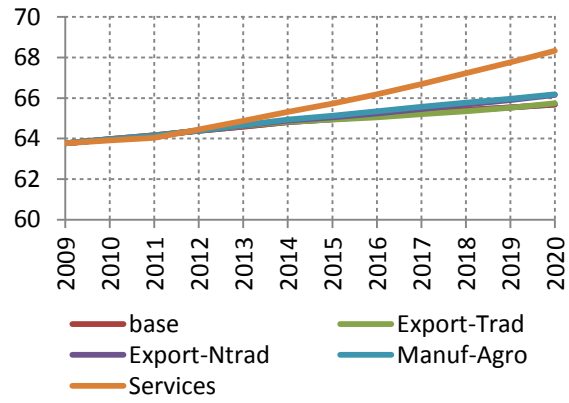


Figure 4: MDG4

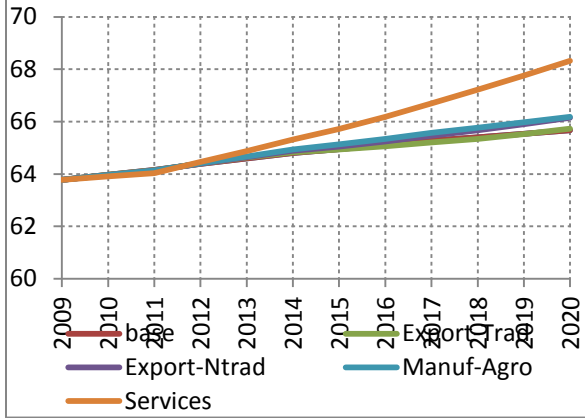


Figure 5: MDG5

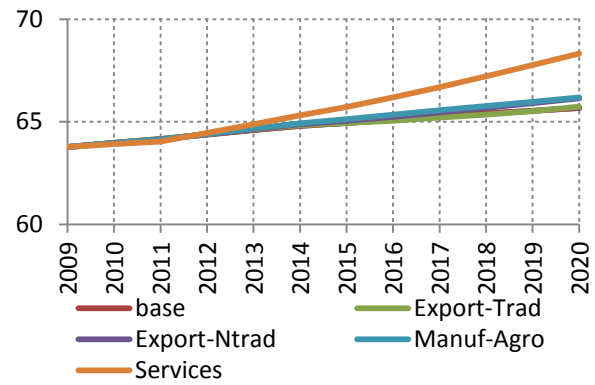


Figure 6: MDG 7W

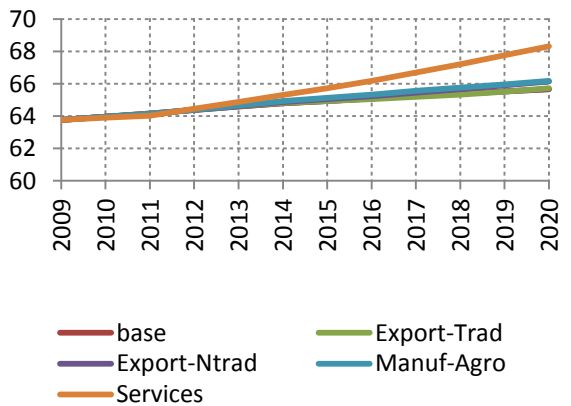
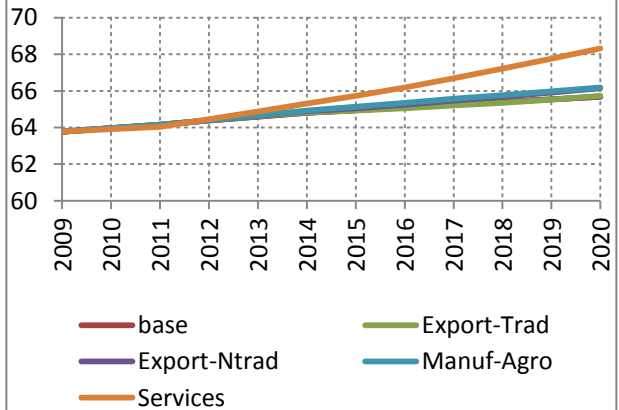


Figure 7: MDG 7S



Simulation 1: Increased production of traditional exports

From the background it's very clear that structural transformation can be achieved through different path. Notwithstanding the path followed by each individual country, it's also the case that all countries reviewed have to a certain extent pursued export led growth an indication that external demand for Uganda's exports could be critical to achieve its middle income status. The question is whether the export strategy that Uganda has adopted would be able to deliver. For the past 50 years, Uganda's exports have largely been dominated by the so called "traditional exports" which are cash crops. These cash crops include coffee, cotton, tea and tobacco crops and they are mainly exported without much value addition to the foreign markets. These crops have been susceptible also to frequent price fluctuations and at times leading to poor performance in export revenues and thereby creating further external pressure imbalances which sometimes feed into the exchange rate fluctuations and increasing domestic prices. The other challenge with these cash crops is that with the challenges of climatic changes, yields of these crops have reduced considerably due to inadequate investment in better technologies and low use of fertilizers. This simulation therefore focuses on whether continued exporting of cash crops with no value addition will deliver the structural transformation.

The first simulation increases productivity among the traditional exports. In addition to increased productivity which would result into increased yields, we also assume that there would be higher use of factors of production especially land and capital in this case. The basis for increasing land usage is consistent with the notion that agriculture should be commercialized where farmers interested in agriculture engage at a larger scale. Resorting to commercial farming of these traditional exports would also require intensive use of capital in form of machinery. The increase in land productivity is equivalent to 1 percent additional annual growth, while the additional land expansion is equivalent to 0.5 percent additional annual growth (compared with the base-run scenario). The objective of this simulation is to ascertain whether Uganda should stay the course by continuing to grow these cash crops which include coffee, cotton, tea and tobacco albeit at a large scale.

Table 6: Average GDP Growth 2012-2020

	BASE	Export-Trad	Export-Ntrad	Export-Vadd	Export-Othman	Services	Combined	Comb-Oil
Overall-GDP	5.92	6.46	6.63	6.44	6.64	9.49	11.98	13.37
Agriculture	3.64	4.69	6.42	3.79	3.73	3.44	6.07	6.24
Cereals	1.84	1.30	5.36	2.00	1.69	-1.27	2.70	2.08
Rootcrops	3.73	3.77	3.67	3.71	3.79	4.44	4.27	4.36
Bananas	3.97	4.04	3.96	3.96	4.17	5.02	5.12	5.36
Pulses	2.99	2.93	8.19	3.04	3.00	3.32	7.67	7.74
Horticulture	4.35	4.42	8.38	4.37	4.48	5.98	10.68	11.07
Exportcrops	2.38	11.16	3.02	2.15	2.27	-1.08	8.43	7.66
Livestock	3.43	4.46	4.89	3.42	3.46	3.22	5.75	5.86
Otheragriculture	4.63	4.91	9.32	5.05	4.85	4.59	7.21	7.31
Industry	5.48	6.52	6.51	6.59	7.55	6.42	11.29	13.93
Mining	5.65	6.64	6.34	6.53	7.99	4.65	7.89	9.70
Manufacturing	5.39	5.94	6.12	6.35	9.26	5.55	10.30	11.80
Agroprocessing	5.49	5.80	6.56	6.68	6.44	8.18	11.09	12.38
Other Manufacturing	5.30	6.08	5.66	6.02	11.61	2.27	9.46	11.18
Other Industry	5.51	6.74	6.67	6.68	6.80	6.78	11.71	14.75
Services	6.92	7.06	6.77	7.28	7.17	12.49	14.06	15.16
Private	7.80	7.96	7.61	8.23	8.10	14.32	16.08	17.32
Public	3.48	3.58	3.53	3.57	3.53	3.83	3.97	4.08

Table 7: GDP Per Capita During Period 2012-2020

GDP Per Capita During Period 2012-2020								
	BASE	Export-Trad	Export-Ntrad	Export-Vadd	Export-Othman	Services	Combinec	Comb-Oil
2012	423	426	426	426	426	426	426	426
2013	435	439	440	439	440	451	461	461
2014	447	453	454	454	455	479	500	501
2015	459	468	469	468	470	509	543	544
2016	471	483	484	483	486	541	592	601
2017	483	498	499	498	502	577	647	669
2018	495	513	515	513	519	615	709	749
2019	508	529	531	529	536	657	779	844
2020	520	546	548	545	554	702	859	959
2021	532	563	565	562	573	752	950	1099
2022	544	580	583	579	593	806	1053	1268
2023	557	598	601	596	613	865	1172	1471
2024	569	617	620	614	635	929	1308	1719
2025	582	636	640	632	658	999	1466	2022

Table 8: Contributions to GDP Growth by Sectors in 2012-2020

	BASE	Export-Tr	Export-Nt	Export-Va	Export-Ot	Services	Combined	Comb-Oil
Overall-GDP	5.92	6.46	6.63	6.44	6.64	9.49	11.98	13.37
Agriculture	0.69	0.89	1.27	0.70	0.69	0.58	1.02	1.05
Cereals	0.03	0.02	0.11	0.04	0.03	-0.02	0.04	0.04
Rootcrops	0.13	0.13	0.12	0.12	0.13	0.14	0.12	0.12
Bananas	0.08	0.08	0.08	0.08	0.08	0.10	0.09	0.09
Pulses	0.06	0.06	0.20	0.06	0.06	0.06	0.16	0.16
Horticulture	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.02
Exportcrops	0.04	0.25	0.05	0.04	0.04	-0.01	0.14	0.13
Livestock	0.07	0.09	0.09	0.06	0.06	0.06	0.09	0.09
Otheragriculture	0.29	0.30	0.65	0.31	0.29	0.25	0.40	0.40
Industry	1.44	1.79	1.77	1.81	2.12	1.59	3.02	3.82
Mining	0.02	0.02	0.02	0.02	0.03	0.01	0.02	0.03
Manufacturing	0.40	0.45	0.46	0.49	0.77	0.37	0.75	0.86
Agroprocessing	0.21	0.22	0.25	0.26	0.24	0.30	0.42	0.47
Other Manufacturing	0.20	0.23	0.21	0.23	0.53	0.07	0.33	0.39
Other Industry	1.02	1.32	1.30	1.31	1.33	1.21	2.25	2.93
Services	3.80	3.78	3.58	3.93	3.83	7.32	7.94	8.50
Private	3.41	3.39	3.20	3.54	3.45	6.93	7.56	8.12
Public	0.39	0.39	0.38	0.39	0.38	0.39	0.38	0.38

Table 9: Average GDP Contribution by Sectors

		BASE	Export-Tr	Export-Nt	Export-Va	Export-Ot	Services	Combined	Comb-Oil
Overall-GDP	Share-2008	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Share-2020	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Agriculture	Share-2008	22.65	22.65	22.65	22.65	22.65	22.65	22.65	22.65
	Share-2020	16.88	17.58	20.08	16.30	15.93	12.26	12.56	11.50
Cereals	Share-2008	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
	Share-2020	1.50	1.36	1.91	1.45	1.38	0.84	0.98	0.83
Rootcrops	Share-2008	3.98	3.98	3.98	3.98	3.98	3.98	3.98	3.98
	Share-2020	3.04	2.91	2.84	2.89	2.86	2.39	1.93	1.74
Bananas	Share-2008	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37
	Share-2020	1.87	1.79	1.75	1.78	1.78	1.51	1.25	1.14
Pulses	Share-2008	2.88	2.88	2.88	2.88	2.88	2.88	2.88	2.88
	Share-2020	1.89	1.79	2.76	1.81	1.77	1.44	1.70	1.53
Horticulture	Share-2008	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Share-2020	0.21	0.20	0.27	0.20	0.20	0.18	0.21	0.20
Exportcrops	Share-2008	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23
	Share-2020	1.41	2.80	1.40	1.32	1.31	0.76	1.43	1.20
Livestock	Share-2008	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62
	Share-2020	1.17	1.09	1.09	1.13	1.09	0.87	0.71	0.94
Otheragriculture	Share-2008	6.76	6.76	6.76	6.76	6.76	6.76	6.76	6.76
	Share-2020	5.81	5.65	8.06	5.72	5.53	4.27	4.36	3.93
Industry	Share-2008	27.25	27.25	27.25	27.25	27.25	27.25	27.25	27.25
	Share-2020	25.73	27.50	27.09	27.69	29.52	21.19	25.88	28.50
Mining	Share-2008	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
	Share-2020	0.29	0.31	0.30	0.31	0.34	0.20	0.22	0.23
Manufacturing	Share-2008	7.68	7.68	7.68	7.68	7.68	7.68	7.68	7.68
	Share-2020	7.29	7.33	7.33	7.60	9.52	5.51	6.69	6.77
Agroprocessing	Share-2008	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88
	Share-2020	3.70	3.62	3.81	3.91	3.77	3.44	3.57	3.57
Other Manufacturing	Share-2008	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
	Share-2020	3.58	3.70	3.52	3.69	5.75	2.07	3.12	3.20
Other Industry	Share-2008	19.27	19.27	19.27	19.27	19.27	19.27	19.27	19.27
	Share-2020	18.16	19.86	19.46	19.78	19.66	15.48	18.98	21.51
Services	Share-2008	50.10	50.10	50.10	50.10	50.10	50.10	50.10	50.10
	Share-2020	57.38	54.92	52.82	56.01	54.55	66.55	61.55	59.99
Private	Share-2008	36.52	36.52	36.52	36.52	36.52	36.52	36.52	36.52
	Share-2020	47.50	45.42	43.50	46.51	45.23	59.00	55.31	54.35
Public	Share-2008	13.58	13.58	13.58	13.58	13.58	13.58	13.58	13.58
	Share-2020	9.88	9.50	9.32	9.50	9.31	7.55	6.24	5.64

Table 10: Average Export Growth Rate for Key Commodities 2012-2020

	BASE	Export-Trad	Export-Ntrad	Export-Vadd	Export-Othman	Services	Combined	Comb-Oil
Total Export Growth	9.14	9.67	8.99	9.42	9.02	17.06	19.08	19.78
Traditional Exports								
Coffee	2.58	11.84	2.33	2.40	2.48	-0.84	8.75	8.03
Cotton	2.16	11.54	1.78	1.87	2.06	-1.68	8.10	7.24
Tobacco	2.00	12.10	1.60	1.67	1.58	-2.97	7.98	6.88
Tea	1.48	11.07	0.94	1.03	1.19	-2.84	6.99	5.92
Non-traditional Exports								
Fish	3.77	3.78	16.39	4.16	3.40	-4.54	3.95	2.41
Horticulture	2.49	2.10	11.79	2.28	2.47	-1.40	8.60	7.84
Manufactured Exports								
Agro-Manufacturing								
Fish Processing	3.77	3.78	16.39	4.16	3.40	-4.54	3.95	2.41
Grain processing	1.87	1.37	1.51	5.75	1.78	-2.94	1.63	2.64
Beverages and tobacco	5.41	5.77	5.63	5.88	9.08	5.48	10.85	11.79
Other Manufacturing								
Textiles	3.52	3.61	2.07	3.32	23.71	-8.76	9.52	10.32
Chemicals	5.10	5.14	4.42	5.03	13.67	-0.48	7.36	7.93
Machinery and Equipmer	3.85	4.56	3.44	4.44	5.04	-12.60	-10.05	-11.24
Other Manufacturing	5.45	6.32	5.25	6.17	27.62	-11.51	10.46	12.57
Utilities	7.18	7.80	7.45	7.70	7.77	-6.74	15.23	16.90
Service Exports								
Communications	4.00	4.10	3.84	4.17	4.20	9.15	9.99	11.13
Transport	6.06	6.58	6.11	6.45	6.76	11.52	13.03	14.54
Banking	-1.64	-2.51	-3.05	-2.07	-1.76	1.74	1.58	1.75

As shown in Table 6, despite the significant increase in use of factors of production and productivity targeted to traditional exports, the additional growth that is generated for the agriculture sector is 1 percent on average during the period 2012-20. This is as a result of the significant growth for the exportable crops. However, the overall growth rate generated under this scenario is not very different from the baseline where on average growth would be about 6 percent. The overall additional growth is estimated at 1.5 percent. This is due to the fact that there would be a reallocation of factors of production from services to the agriculture sector leading to the services limited expansion. Services under this scenario would grow by 7 percent compared to 6.9 percent under the baseline. The average contribution of agriculture to GDP would only increase by 0.2 percent relative to the baseline (Table 8).

As a result of the limited growth under this scenario, the share of traditional exports in total GDP would also increase to 2.8 percent by 2020 compared to 1.4 percent under the baseline (Table 9). This would partly explain the lower reduction in agricultures contribution to GDP where in 2020 it would be about 17.6 percent compared to 16.8 percent. The share of services in total GDP would in this case slightly

reduce from 57 percent to 55 percent due to the limited expansion of the sector. The average export growth under this scenario is 9.7 percent higher than the baseline which is registered at 9.1 percent during the period 2012-20 (Table 10). This increase is largely driven by the targeted traditional export growths.

With these marginal changes, the per capita GDP would only be marginally higher than the baseline by US\$ 26 dollars in 2020 at a level of US \$ 546 dollars. Similarly, poverty reduction under this scenario would go down to 10.7 percent compared to 12.5 percent in the baseline by 2020. While the increase in per capita GDP and reduction in poverty are limited, this masks other positive developments under this simulation. As shown in Figure 2, it's clear that this scenario would quickly generate employment especially among the unskilled. The unemployment level is rapidly reduced from the current 12 percent to about 2 percent in 2015 and it stabilizes at that level. To a large extent this scenario partly addresses the challenge of very high unemployment amongst the unskilled workers.

Table 11: Population Below Poverty Level Between 2007-2020

	BASE	Export-Tr	Export-Nt	Export-Va	Export-Ot	Services	Combinec	Comb-Oil
<u>National</u>								
2007	32.32	32.32	32.32	32.32	32.32	32.32	32.32	32.32
2008	30.43	30.43	30.43	30.43	30.43	30.43	30.43	30.31
2009	27.99	27.98	27.98	27.98	27.98	27.98	27.98	27.87
2010	26.23	26.12	26.12	26.12	26.12	26.12	26.12	26.05
2015	18.84	17.54	17.15	17.55	17.53	13.14	11.12	10.95
2020	12.47	10.68	10.22	10.92	10.64	4.58	2.13	1.41
<u>Rural</u>								
2007	34.29	34.29	34.29	34.29	34.29	34.29	34.29	34.29
2008	32.51	32.51	32.51	32.51	32.51	32.51	32.51	32.40
2009	30.11	30.10	30.10	30.10	30.10	30.10	30.10	29.99
2010	28.33	28.18	28.18	28.18	28.18	28.18	28.18	28.12
2015	20.77	19.49	19.10	19.50	19.45	14.97	12.93	12.73
2020	14.33	12.52	12.02	12.70	12.44	5.43	2.65	1.85
<u>Urban</u>								
2007	13.77	13.77	13.77	13.77	13.77	13.77	13.77	13.77
2008	12.38	12.38	12.38	12.38	12.38	12.38	12.38	12.38
2009	11.73	11.73	11.73	11.73	11.73	11.73	11.73	11.73
2010	10.99	10.99	10.99	10.99	10.99	10.99	10.99	10.99
2015	6.83	6.54	6.44	6.54	6.47	4.56	3.72	3.64
2020	4.38	3.60	3.26	3.54	3.26	1.13	0.55	0.47

From this simulation, we can conclude that by only targeting traditional exports, this would generate limited growth resulting into low per capita GDP growth and poverty reduction. While under this simulation there would be significant job creation for the unskilled, these are largely low paying jobs which would not be translated into significant income growth or poverty reduction. This scenario has not considered the external shocks especially with the volatility associated with these crops which could sometimes further dampen efforts to expand these sectors. Besides, also the structure of the economy would not change significantly and therefore this would call for much more radical export diversification beyond the traditional exports.

Simulation 2: Non-Traditional Export Diversification

As a way to diversify its exports, Uganda has attempted to start exporting non-traditional commodities which include food crops, fish, flowers and manufactured goods especially within the region. The export revenues from these commodities has also been increasing notwithstanding the recent slump due to the global recession which led to reduced demand for luxury goods like flowers. In addition to these non-traditional commodities especially in the horticulture sector which are largely destined for Europe, Uganda started exporting a diversity of commodities within the region especially to neighboring countries including Southern Sudan, Rwanda and Congo. Products exported to these countries include food crops (maize and beans) and manufactured products like building materials. To an extent, this has cushioned the country from the global recession as export demand to the neighbors has remained strong. While this is a positive development, the high export demand especially for food crops and building materials has put considerable pressure on these items partly explaining the recent inflationary pressures the country has witnessed.

The share of traditional cash crops in total exports has declined from 96 percent in 1985 to 38.3 percent in 2001, 37 percent in 2003 and to 30 percent in 2007. This fall is mainly attributed to the collapse of world coffee prices and failure to add value to the cash crops as well as the high dependence on a few export commodities. The contribution to export earnings of non-traditional export products that include fish, maize, hides and skins has increased because of trade liberalization and an aggressive export promotion campaign by government. Non-traditional exports have, for the period 2003 to 2007

superseded traditional exports increasing from 63 percent in 2003 to 70 percent in 2007 and the trend is expected to continue, with growth in the fish and horticulture sub-sectors expected to be particularly strong. Manufactured products such as soap, beer and plastics are also slowly increasing their share, especially in the regional markets of EAC and COMESA.

The objective of this simulation is to assess the benefits of further expansion of the new commodities being exported and the extent to which this would lead to structural transformation. This is implemented by intensifying the use of factors of production in these sectors especially capital. In addition, for newly identified commodities that compose nontraditional exports we assume that factor productivity improves by 1-2 percent.

The implications for such an export strategy are not very different from the earlier simulation where Uganda focuses on traditional exports. The overall average GDP growth would be higher by 0.7 percent compared to the baseline (Table 6). This growth is largely driven by the agriculture industry which would contribute 1.27 percent to total GDP compared to the baseline where it contributes 0.69 percent (Table 8). Horticulture in this case would grow at 8 percent compared to 4.3 percent under the baseline. The increase in the contribution of agriculture would sustain the sectors contribution to total GDP at 20 percent compared to the 17 percent under the baseline by the year 2020. This would come at the expense of the expansion of the services sector which remains at 52 percent compared to 57 percent under the baseline in 2020 (Table 9).

Despite this modest increase in GDP, this does not transcend into higher income growth where GDP per capita only increases to US\$ 554 dollars higher than the baseline by only US\$ 34 dollars (Table 7). This is consistent with the stagnated per capita GDP growth that has been witnessed in the past despite the recent drive to diversify Uganda's exports. The low GDP per capita generated is also consistent with the poverty level modest reduction which is 10.2 percent compared to 12.6 percent under the baseline by 2020 (Table 11).

The key difference between this simulation and where more effort is devoted on increasing traditional exports is on employment generation. In this case where focus is put on non-traditional exports unemployment is not reduced as fast compared to the traditional exports scenario. Unemployment especially for unskilled labor force remains high during the period 2012 through 2015 averaging at 8

percent. This could be partly explained by the fact that some activities under this category like horticulture are a lot more capital intensive and use less labor compared to agricultural activities for traditional exports.

In summary, this simulation clearly suggests that it would not be enough to venture into non-traditional exports and expect a significant turnaround in growth or structural transformation that would lead Uganda to change into MIC status. This is partly due to the limited multiplier effects some of these sectors have on the rest of the economy. A sector like horticulture while it is important, it could also be considered an enclave sector with limited sectoral linkages with the rest of the economy. This therefore suggests that Uganda would have to do more than diversification of exports to realize its dream of achieving structural transformation by 2017.

Simulation 3: Export Value Addition

Given that traditional exports have not been able to deliver the structural transformation, the emphasis within the National Development Plan is to start adding value to the exports especially those that are exported in raw form. The objective is to get higher value for the exports and higher growth and also create employment especially in the manufacturing sector. While this is a well intended objective, there are still binding constraints explaining why the manufacturing sector has failed to take off. Key constraints include poor infrastructure facilities like roads, high transportation costs, inadequate energy and the high cost of financing small businesses like in the agro-processing area which is considered to be a risky sector. Despite the challenges which are being addressed within the NDP, there could be considerable potential of achieving growth through value addition of commodities that are currently exported to be processed in other countries. In addition, this creates employment opportunities in urban areas and stimulating migration away from the rural areas which would free up the land in rural areas for large scale commercial farming. The argument for value addition is at the core explaining why Uganda has resorted to processing of its newly found oil rather than exporting crude. Albeit the arguments that setting up a refinery would require large economies of scale to remain profitable in the refining business, it is argued that there is enough export demand within the region for processed oil and Uganda would also benefit by creating new jobs in a new lucrative petroleum industry.

For this simulation we focus on the opportunities of value addition especially for agro-processing of commodities that are currently exported in raw form. The commodities include coffee, tea, cotton,

tobacco, as well as the non-traditional exports like fruits and vegetables, grains and fish. The growth in value addition is mainly driven by significant capital accumulation within the manufacturing sector for agro-processing industries as well as the improvement in factor efficiency. This scenario results into significant growth of agro-processing industries which improve by an additional 1.2 percent growth relative to the baseline. This is also reflected in the overall growth of manufacturing which increases by 1 percent compared to the growth rate under the baseline. Growth of exports for agro-processed commodities also increases especially for fish processing, grain processing and beverages and tobacco (Table 6).

However, the backward linkages of agro-processing with other sectors are not as significant. For instance for agriculture the average growth rate would only be higher by 0.1 percent relative to baseline. The minimal lack of backward multiplier effects should be a concern to policy makers. The argument has always been that increased value addition would also stimulate production for example for the agriculture sector. However, this could also partly be explained by the fact that the current agro-processing industry in Uganda (based on the SAM) is still small and at its infant stage. For some of the factories that for example produce juice, they import their raw materials in form of concentrate from other countries, and therefore they have limited linkages to domestic fruit growers.

In summary, this strategy alone in itself would not be able to deliver the desired structural transformation. The GDP per capita generated is not very different from the baseline at US\$ 545 dollars in 2020. The structure of the economy in terms of composition to GDP marginally changes. Also there would be marginal changes in poverty reduction and MDG attainment.

Simulation 4: Growth in Services

For the countries that are reviewed in the background, there is one common pattern that cannot be overlooked by any country in the quest to attain MIC status. All these countries have had significant contributions from the services sector and this was mirrored by a decline in the contribution of agriculture. In addition, growth of the industry was moving in tandem with services during the transformation period. The fourth strategy being pursued by Uganda to achieve middle income status is to promote services. The key fundamentals for transformation identified include a well trained human resource, improved transport infrastructure, higher energy generation, improved ICT infrastructure and

promoting science and technology. Indeed a country like India has managed to achieve considerable growth which was led by the services sector. Uganda's aspiration is to create a globally competitive human resource by largely promoting sciences and allocating substantial resources to BTVET. Under the NDP, Uganda would also like to invest considerable resources in transport infrastructure by increasing the number of paved roads and improving the rail system to carry 80 percent of the cargo. By targeting such services, this could have considerable spillovers on other sectors involved in production (especially agriculture and manufacturing).

The argument usually fronted is that agriculture employs more than 70 percent of the population and therefore by having a dominant services sector this may not necessarily deliver the social transformation where poverty would be significantly reduced and MDGs improved. For the case of Uganda, the services sector contributes more than 50 percent of total GDP. This increase like in other countries has also come about at the cost of agriculture declining to 22 percent. The bulk of the services sector is private which comprises 36 percent in total GDP and the public sector is 13 percent of GDP. In addition, export oriented services like tourism and hotels, transport and communications comprise of 10 percent in total GDP.

This simulation focused on increasing the productivity of private sector services especially the ones that are export and domestic oriented which are being targeted under the NDP. These private sectors are both labor and capital intensive. We exclude public services in this simulation since this has been done exhaustively in a paper by Matovu et. al. (2011). Like in the previous scenarios we assume that there is capital accumulation and within the sectors being targeted which is financed by foreign inflows. Under these assumptions, we find that overall growth under this scenario would be 9.5 percent compared to 5.9 percent under the baseline. This growth would come at significant cost, where agriculture would grow at 3.4 percent compared to 3.6 under the baseline. Some activities like cereals and export crops would indeed contract as resources are shifted away from agriculture to the services sector. This partly reflects what has been happening in Uganda where significant labor has migrated away from rural areas to provide services (especially in form of transport-the "bodaboda phenomenon") in urban areas. The agriculture sector in this scenario would continue to shrink to about 11.5 percent of GDP in 2020 while services would contribute 60 percent of total GDP. The contribution of private services to total GDP growth would be 6.84 percent relative to 3.4 percent under the baseline.

GDP per capita would increase to US\$ 700 dollars compared to US\$520 dollars under the baseline by 2020. Likewise, poverty would be halved compared to the baseline by 2020. While these are desirable outcomes, such a strategy would be realized at significant costs for other sectors. For instance, this scenario results into significant reduction in traditional and non-traditional exports. The contraction for traditional exports range between 0.1 to 3 percent. Given the reduction in agriculture activities, we also observe a reduction in agro-processing activities. For the case of unemployment, this scenario also generates the least jobs especially for the unskilled compared to all the other scenarios. On the other hand, growth of the services sector is only favorable in the creation of jobs for the highly skilled especially in the short-term period.

Therefore, while a focus on growth of services would significantly boost the structural transformation process, it also comes with some undesirable outcomes where exports would shrink and this scenario does not generate many jobs especially for the unskilled labor market in the agriculture market.

Simulation 5: Combined Interventions

For all the interventions described above, none of them will be able to deliver the structural transformation desired by the country. This suggests that it would require a more holistic approach in the combination of the various strategies outlined above to achieve the objective of structural transformation. In this case we combine the growth in use of factors of production and their productivity in one single simulation. It's important to note that growth in services is critical as intervention in this sector lowers relative prices for other sectors and thereby making them more productive and profitable.

This scenario results into significantly higher growth path of 12 percent compared to 5.9 percent under the baseline. The growth is balanced from all sectors where agriculture grows at 6 percent compared to 3.6 percent under the baseline. Industry grows at 11 percent compared to 5.5 percent under the baseline. Services also grow at 14 percent compared to 6.9 percent in the baseline. Despite the fact that the same assumptions are used for each sector, the observed growth in this scenario for each sector is much higher because of the possible synergies between the sectors owing to the sectoral inter-linkages.

To a large extent, similar structural transformation that has been observed in other countries would be realized in this simulation would be achieved where despite the fact that agriculture sector would be growing at a high rate, its composition to GDP would decline to 13 percent while services and industry would comprise the 87 percent. The contribution of private services to total GDP would be 56 percent compared to 47 percent under the baseline.

This simulation is closest to getting Uganda into a MIC status country. The GDP per capita increases to US\$ 859 dollars short of the required US\$ 1000 to qualify for this category. An extension of the simulation period to 2025 shows that under this holistic strategy, structural transformation would be realized in 2022. Likewise poverty would also be significantly reduced to 2 percent at the national level.

Simulation 6: Combined Interventions and Oil Revenues

Finally we attempt to combine all the interventions discussed in the previous scenarios with the fact that oil exploration is taking place with the expectations that this will be consumed domestically and therefore reduce on Uganda's import bill while at the same time exported especially within the region. This simulation is based on the assumptions provided in Table 12.

Table 12: Projections of Oil Production and Revenues

	2015	2020	2025	2030	2035	2040
Barrels per day (1000)	200	250	300	350	300	280
Barrels per year (365 days)	73,000	91,250	109,500	127,750	109,500	102,200
Oil Value (per day ,1000)						
US 80 dollars per barrel	16,000	20,000	24,000	28,000	24,000	22,400
US 60 dollars per barrel	12,000	15,000	18,000	21,000	18,000	16,800
Oil Value (per year, 1000)						
US 80 dollars per barrel	5,840,000	7,300,000	8,760,000	10,220,000	8,760,000	8,176,000
US 60 dollars per barrel	4,380,000	5,475,000	6,570,000	7,665,000	6,570,000	6,132,000
Government Revenue (per day,1000)						
US 80 dollars per barrel	6,400	8,000	9,600	11,200	9,600	8,960
US 60 dollars per barrel	4,800	6,000	7,200	8,400	7,200	6,720
Government Revenue (per year,1000)						
US 80 dollars per barrel	2,336,000	2,920,000	3,504,000	4,088,000	3,504,000	3,270,400
US 60 dollars per barrel	1,752,000	2,190,000	2,628,000	3,066,000	2,628,000	2,452,800

Notes: Government revenues are based on the assumption that the production sharing agreement is based on 40 percent for government and 60 percent for the companies extracting oil. Total value of the industry for the extraction period is estimated at US 50 billion dollars.

As expected this simulation results into a higher growth path compared to all the other simulations. The additional average growth rate generated as a result of oil is 1.4 percent on top of the combined interventions. The oil simulation is associated with a further reallocation of resources from tradable sectors like agriculture to non-tradable sectors especially services. Contribution of agriculture under the oil scenario becomes smaller as resources are shifted to the more profitable oil processing sector. Growth is also partly driven by the higher export demand especially under industry and exportable services. This scenario provides the closest level where Uganda might be able to reach the MIC status. The addition of the oil sector could deliver an extra US\$ 100 dollars per capita income by 2020 on top of the combined export interventions.

Conclusion and Policy Implications

This paper had three specific objectives. The first objective was to take stock of the progress Uganda has achieved and compare this with other countries that have undergone through structural transformation. The second objective was to identify the key sectors that can be able to deliver structural transformation within the Ugandan context. Given the importance of growth of export for all the countries that have been successful in structural transformation, the third objective focuses on the

current export strategy pursued in Uganda and whether this will be able to deliver the desired objective of turning Uganda into a MIC.

The paper demonstrates that countries which successfully transformed experienced significant structural changes. They can all be characterized by declining shares of the agriculture sector and increasing role of both industry and services. It is also the case that for the past 20 years, Uganda has followed a similar path where the share of services has increased tremendously to more than half of total GDP. However, this has been realized at the expense of the declining growth for the agriculture sector. In addition, we may also conclude from this study that countries which have structurally transformed their economies, this process were driven by strong export demand especially for manufactured products. They also moved away from exporting of primary commodities by switching to value addition of their primary commodities. For the case of Uganda, even though some progress has been observed in diversification of exports to non-traditional commodities, exports are still dominated by the traditional cash crops. Limited progress has been achieved in boosting highly sophisticated manufactured products.

Given the importance of export growth in the structural transformation process, this study attempts to answer the question as to whether the current export strategy will deliver the desired dream of structural transformation and Uganda joining the MIC status. It can be concluded from the analysis that even with increased productivity and increased intensive use of factors of production on traditional cash crops, this will never yield the desired structural transformation. It's also clear that even with the recent diversification of exports into non-traditional commodities like food, fish and horticulture; this will not turn this country into a MIC status for the next 8 years. In addition, value addition may also not yield the desired objective. Structural transformation would be realized in 2022 with a combination of developing all the sectors in tandem.

First, for Uganda to achieve its MIC status by 2020, this would require more holistic approach for its export strategy by intensifying its use of factors of production for non-traditional exports and value addition for the traditional exports and this would require to be done simultaneously. This strategy would be able to deliver the desired structural transformation by 2022. This would therefore require policy makers to focus on exportable services which have great potential to generate growth and create high income jobs especially for the skilled labor force. This would particularly be in sectors like ICT and

tourism as correctly identified under the current NDP. The focus on services sector however, should not be realized by abandoning the agriculture sector. The current significant unskilled labor force involved in the agriculture sector is not that mobile to be absorbed within the sophisticated services sector.

While oil revenues are highly anticipated by 2016, this is an enclave sector with limited backward and forward linkages to the rest of the economy. Therefore, whether as joining the oil producers would quickly make Uganda join MIC status by raising its per capita GDP, the limited inter-sectoral linkages of this sector to the rest of the economy may not necessarily deliver the desired social outcomes of lowering unemployment levels especially in the tradable sector like agriculture. Therefore on realization of oil resources, it would be important to invest these resources in productive sectors like infrastructure and human capital development which would result into stimulating production in other sectors like agriculture, manufacturing and private sector services.

References

- Breisinger C., Diao X., Thurlow J., Yu B. and Kolavalli S. 2008. Accelerating Growth and Structural Transformation Ghana's Options for Reaching Middle-Income Country Status, Washington, DC: International Food Policy Research Institute.
- Chenery, H.B. 1980. Interactions between industrialization and exports. *American Economic Review* 70(2): 281–287.
- Diao, X., J. Rattso, and H.E. Stokke. 2005. International spillovers, productivity growth and openness in Thailand: An intertemporal general equilibrium analysis. *Journal of Development Economics* 76: 429–450.
- Diao, X., J. Rattso, and H.E. Stokke. 2006. Learning by exporting and structural change: A Ramsey growth model of Thailand. *Journal of Policy Modeling* 28: 293–306.
- Echevarria, C. 1997. Changes in sectoral composition associated with economic growth. *International Economic Review* 38(2): 431–452.
- Irz, X., and T. Roe. 2005. Seeds of growth? Agricultural productivity and the transitional dynamics of the Ramsey model. *European Review of Agricultural Economics* 32(2): 143–165.
- Kuznets, S. 1971 (December 11). Modern economic growth: Findings and reflections. Nobel Memorial Lecture. *American Economic Review* 63(3): 247–258.
- Löfgren, H., R.L. Harris, S. Robinson, M. Thomas, and M. El-Said. 2002. A standard computable general equilibrium (CGE) model in GAMS. *Microcomputers in Policy Research* 5. Washington, DC: International Food Policy Research Institute.
- Syrquin, M. 1988. *Patterns of structural change*. In H. Chenery and T.N. Srinivasan (eds.), *Handbook of development economics*, vol. 1. New York: Elsevier.