Sources of Economic Growth in Kenya: A Redux

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Abstract

Achieving and sustaining high levels of economic growth has been a primary focus for policy makers in post-independent Kenya. However, economic growth has been episodic, and achieving sustainable growth remains elusive. Agriculture and manufacturing have remained the key priority areas for growth, with limited focus on services (trade, tourism, transport, communication and financial services). This study used two Social Accounting Matrices (SAM) at two different points in time (1976 and 2003) to analyse structural change and sources of growth for the Kenyan economy. It was found that the economy has undergone structural transformation from a labour-intensive economy to a capital intensive one. This has had implications on the ability to generate employment, which is one of the pillars of economic recovery. Also, incremental capital output ratio has been increasing implying increased inefficiency. Even though the economy has become more open, there has been increased import dependency and declining export share, which does not support a growth strategy predicted on exports. It was also shown that domestic final demand accounted for about 58.6 per cent of output growth between 1976 and 2003, while intermediate consumption accounted for 49.4 per cent. The large contribution by intermediate consumption indicated the importance of inter-industry linkages for growth in the Kenyan economy. Analysis of linkages reveals that the level of inter-sectoral linkages increased between 1976 and 2003, and demand for inputs was more dispersed. However, priority areas (agriculture and manufacturing) had weak and below average backward linkages, but above average forward linkages. In general, it was shown that these sectors have not played their role in the growth and development of the economy. It was also shown that Kenya has not followed the hypothesized development path, since the service sector is the leading sector in terms of contribution to value added. For the economy to achieve more sustainable growth, there is need to ensure increased value addition in agriculture and manufacturing increased efficiency in use of factors of production (labour and capital) and enhanced intersectoral linkages for stimulation of growth.

Abbreviations and Acronyms

EAC	East Africa Community
GDP	Gross Domestic Product
GoK	Government of Kenya
ICOR	Incremental Capital Output Ratio
IFPRI	International Food Policy Research Institute
ILO	International Labour Organization
KIPPRA	Kenya Institute for Public Policy Research and Analysis
SAM	Social Accounting Matrix
SAPs	Structural Adjustment Programmes
TFP	Total Factor Productivity

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The Sources of Growth project is a collaborative effort between KIPPRA, Ministry of Planning and National Development, IFPRI, and World Bank. We are grateful to FAO for providing the research funds.

1. Introduction

Achieving and sustaining high levels of economic growth has been a primary focus for policy makers in post-independent Kenya. Several government Sessional papers and development plans have emphasized the crucial role of economic growth in achieving development goals. At the advent of major economic reforms as outlined in Sessional Paper No. 1 of 1986 on *Economic Management for Renewed Growth,* it was acknowledged that rapid economic growth would be achieved through job creation, increased productivity in agriculture, widespread rural non-farm activity, a dynamic informal sector and a restructured industry. This was expected to have widespread impact on incomes. Indeed, a review of the economic policy priorities for achieving economic growth reveals that there has not been a significant shift in the areas of focus over time. Despite these attempts, achievement of sustainable economic growth in Kenya continues to be elusive. The gains that had accrued during the first two decades after independence have been reversed.

The reforms the country initiated since the 1980s were intended to eliminate the structural constraints to growth, appropriately dubbed Structural Adjustment Programmes (SAPs). In the mid 1980s, Kenya reached a 'dead end' after exhausting cultivation of the high potential agricultural land and the pursuit of self defeating import substitution strategy. The collapse of the East African Community (EAC) did not augur well for Kenyan industries, which were not efficient to compete in the international market. Furthermore, a rising incremental capital output ratio (ICOR) signaled declining efficiency productivity (O'Brien and Ryan, 1999). The only option for Kenya was a structural transformation in both the pattern and process of growth to a path with potential for employment generation and a more efficient structure of production (World Bank, 1975).

However, after two decades of reforms, growth has stagnated and employment opportunities decreased. The dual nature of the economy has become more pronounced. The informal sector has been the main source of minimal growth in employment. Between 2004 and 2005, for instance, employment growth in the informal sector was 6.9 per cent compared to 2.5 per cent in the formal sector (Government of Kenya, 2006). Manufacturing has not emerged as the leading sector as envisaged in the various development strategies. Indeed, the share of

manufacturing value added has remained below 15 per cent over the last four decades and the services sector has emerged as the leading sector in the economy, contributing the largest share of value added in the economy. It is evident from the figure that from early 1990s, there has been a gradual change in the sectoral shares in value added.

This paper uses a simple and analytically tractable methodology, the Social Accounting Matrix (SAM) multiplier analysis, to analyse the sectoral structure of production of the Kenyan economy before and after economic and structural reforms undertaken in the 1980s and 1990s. The multipliers are computed from two SAMs for Kenya (1976 and 2003) representing the pre and post-reform structure of the Kenyan economy.[1] The two SAMs provide two snapshots of the Kenyan economy at different points in time of Kenya's development. The analysis will illuminate the change in the underlying structure of the Kenyan economy between 1976 and 2003. Using the change in structure, or lack of it, the paper explains the poor performance of the Kenyan economy over the last three decades. Besides the hindsight, results will provide useful insights on the potential of the Kenyan economy. Analyzing the change (if any) in the structure of production, two broad questions are asked: what went wrong in the economy's quest for economic growth and, looking at sectoral priorities, which sectors have the capacity to contribute significantly to Kenya's economic growth process and poverty reduction?

Section two of the paper outlines the sectoral priorities of the Kenyan government over time while section three reviews literature on determinants of economic growth and the role of total factor productivity growth, with particular emphasis on Africa's growth experience. The fourth section looks at the structural transformation of the Kenyan economy while the fifth section examines the sectoral linkages within the economy. Section six concludes the paper.

[1] We note that the two SAMs are not directly comparable due to differences in construction methodology and the level of disaggregation of different sectors. Nevertheless ,the analysis provides insights into the changes in the structure of Kenya's economy that has taken place over the last three decades.

2. Economic Growth Performance and Sectoral Priorities

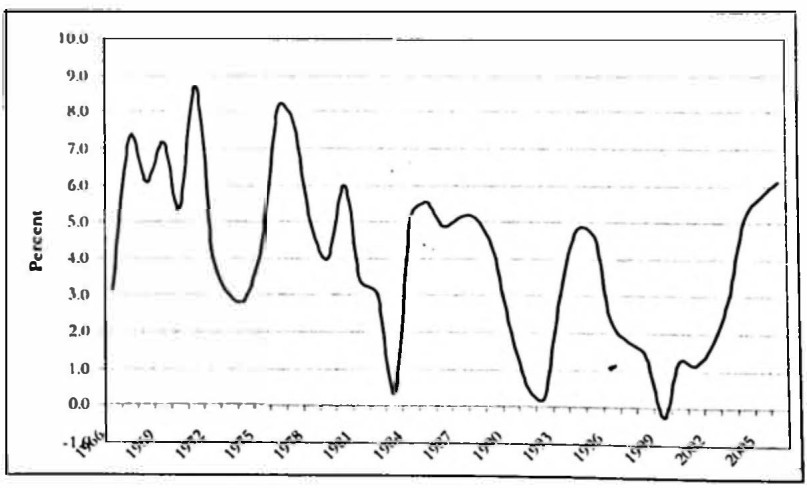
2.1 Economic Growth Performance

Kenya, just like many African economies, has had a history of declining or stagnated economic growth over the past three decades. The country's growth performance can be sub-divided into three major phases: a rapid growth phase (1964 to 73); an era of external shocks dominated by oil price shocks (1974 to 1989), a coffee boom and a period of stabilization and structural adjustment and; an era of liberalization, inconsistent donor inflows and economic stagnation (1990 to 2002) leading to recovery from 2003 (Figure 2.1).

Rapid growth phase (1964 to 1973)

After independence, rapid economic growth was mainly promoted through public investment, smallholder agricultural production, and private (often foreign) industrial investment. Gross Domestic Product grew at an annual average growth rate of 6.6 per cent from 1963 to 1973. The economy was mainly agriculture-based, contributing 37 per cent of GDP at independence as compared to 16 per cent from trade, restaurants and hotels, 8 per cent government services and 7 per cent manufacturing. Over the 1960s, overall marketed agricultural

Figure 2.1: Overall GDP growth rates



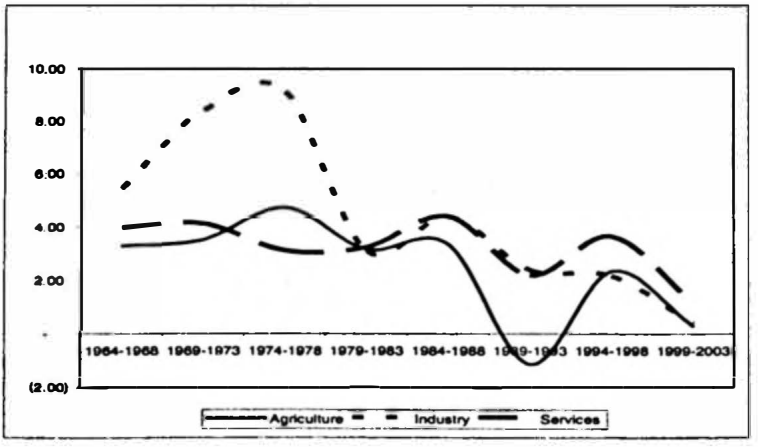
Source: Economic Survey (various)

production remained high even though dry weather conditions in some areas, affected food production, an effect that was felt more in the non-monetary sector. In the monetary sector, improved agricultural production was as a result of the recovery of coffee following the worst effects of the coffee berry disease. Increased agricultural production was also stimulated by redistribution of estates, diffusion of new crop strains, and opening up of new areas to cultivation. Rising tea production also contributed substantially to the growth of marketed output. The growth in manufacturing was highest for several years (reaping the initial benefits resulting from protectionism under the import substitution strategy), while transport, storage and communications grew at a slower pace because of the stagnation in tourism, which slowed down the services sector. Wholesale and retail trade expanded more slowly because of the relative stagnation of imports.

Era of external shocks, stabilization and adjustment (1974 to 1979)

Between 1974 and 1979, Kenya's economic performance declined hitting a period low in 1979. Growth in agriculture also declined, even though the most notable decline was experienced in the manufacturing sector (Figure 2.2). This was the advent of manufacturing sector's poor growth performance, which has persisted to date. The coffee boom of 1977 led to a temporary increase in growth rates, but there was an eventual

Figure 2.2: Sectoral growth rates (%)



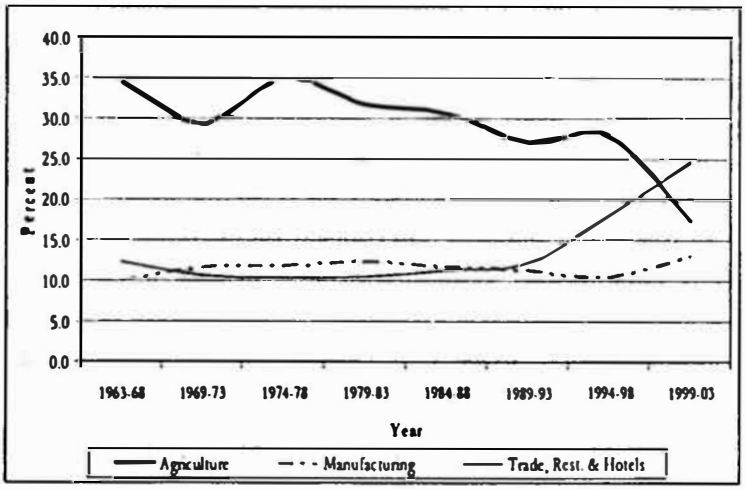
Source: Economic Surveys, various issues

decline in 1978, which was mainly occasioned by a decline in the agricultural sector. The decline in agriculture was due to a cumulative effect of the drop in world prices of coffee and tea, and the bad weather that adversely affected production of some crops. Inappropriate agricultural policies, inadequate credit, and poor international terms of trade also contributed to the decline in agriculture. The government's policy of increasing producer prices ensured less decline in the growth of the agricultural sector. Building and construction performed poorly mainly due to shortages of bank credit and also the reduction in government spending on roads and other construction activities.

Kenya's inward-looking policy of import substitution amidst rising oil prices made Kenya's manufacturing sector uncompetitive. The decline in the growth of the manufacturing sector was mainly attributed to a weak incentive system, which favoured production for the domestic market over production for export, and also to diminishing opportunities for efficient import substitution (Government of Kenya, 1997). The situation was further exacerbated by the collapse of the EAC in 1977, which served as the traditional market outlet for Kenya's industry, and also the growing inefficiency of public industrial investments. An industrial sector adjustment programme was mounted in 1988 as one of the measures to raise the growth of investment and exports from the industrial sector. Lack of export incentives, tight import controls, and foreign exchange controls made the domestic environment for investment even less attractive.

The economic performance in mid 1980s was satisfactory, with average real GDP growth rate of 5.1 per cent between 1984 and 1988. Value added in agriculture grew by 4.4 per cent, and manufacturing value added grew by 6.0 per cent over the same period (Figure 2.3). However, growth in agriculture was partly hampered by the 1984 drought. Impressive performance in the manufacturing sector was attributed to: steady growth in agricultural output; the rise in international coffee and tea prices; and decline in oil prices in 1986, which ensured greater availability of foreign exchange for the purchase of imported industrial inputs and capital goods; trade liberalization policy that removed selective restrictions on imports of raw materials; export promotion measures, which encouraged export of manufactured goods; and higher domestic demand for manufactured goods owing to higher incomes from agricultural production. Trade, restaurants and hotels also experienced boom mainly due to backward and forward

Figure 2.3: Sectoral shares of value added



Source: Economic Survey (various)

linkages resulting from the impressive performance in manufacturing and agriculture, even though they grew at a slower rate than agriculture and manufacturing.

Economic stagnation and eventual recovery (1990s)

The economy slowed down in 1990, with an annual growth rate of 4.5 per cent compared to 5.0 per cent in 1989. The slowdown was attributed to the deceleration in the agricultural sector, which was due to unfavourable weather, low world coffee prices, and a decline in manufacturing output. From 1991 to 1993, Kenya had its worst economic performance since independence. Growth in GDP stagnated, and agricultural production shrank at an annual rate of 3.9 per cent. Inflation reached a record 100 percent in August 1993, and the government's budget deficit was over 10 percent of GDP. As a result of these combined problems, bilateral and multilateral donors suspended their aid programme to Kenya in 1991. This worsening of economic performance was also attributed to the 1991/92 drought, increase in oil prices resulting from the Gulf War, and the 1992 ethnic clashes. The poor performance after liberalization has been attributed to, among other factors, inappropriate sequencing of reforms.

In 1993, the Government of Kenya began a major program of economic reform and liberalization. Under this program, price controls

and import licensing were eliminated, foreign exchange controls were removed, a range of publicly-owned companies were privatized, the number of civil servants was reduced, and conservative fiscal and monetary policies were introduced. From 1994 to 1996, Kenya's real GDP growth rate averaged 4 per cent a year.

Economic growth stagnated in 1997 partly due to adverse weather conditions and reduced economic activity prior to the general elections held in December 1997. The economy recorded negative GDP growth rate in 2000, but improved slightly in 2001 as weather patterns became more favourable. Slight improvements were made in 2002, reaching 2.8 per cent in 2003 and 4.3 per cent in 2004. Economic growth in 2004 was boosted by the expansion in private consumption through increased credit to private sector that was attractive due to low interest rates. The major constraints to growth were the poor state of infrastructure, decline in net foreign direct investment, high cost of production, low domestic demand and high oil prices.

Some analysts have partly attributed the worsening growth in the 1980s and 1990s to changes in political balance in the context of regions and ethnic groups in Kenya, alongside escalating urbanization leading to a distortion of government policies and widened macroeconomic imbalances (Takahashi, 1997 as quoted by Mwega and Ndung'u, 2002). There was a shift in focus from growth towards regional and ethnic redistribution during President Moi's era (Mwega and Ndung'u, 2002). Attempts were made to address the imbalances in the society, which marked a significant and fundamental change in policy that involved a trade-off between equity and productivity. It seemed that the distribution policies did not trickle down to smallholders, who were the driving force of Kenya's agricultural growth.

Although the agricultural sector continues to dominate the country's GDP, the economy has been undergoing an appreciable process of diversification. Whereas the share of agricultural sector declined from 31.6 per cent in 1982 to 29.0 per cent in 1987 and further to 28.2 per cent in 1990 and 24 per cent in 2003, manufacturing sector's share rose from 12.2 per cent to 12.9 per cent, 13.3 per cent and 13.0 per cent, respectively. The share of contribution from trade, restaurants and hotels, on the other hand, increased from 10.6 percent in 1982 to 11.25 per cent in 1987, before slightly declining to 11.03 per cent in 1990, but increasing to 12.7 per cent in 2003. The financial sector increased its

share from 7.5 per cent in 1988 to 7.9 per cent in 1990 and 10.5 per cent in 2003. The non-monetary sector has continued to decline over time.

A look at the contribution of sectoral valued added to GDP reveals that the agricultural sector has over time been the dominant contributor to overall value added. The sector accounted for about 38 per cent of value added to GDP in 1963, which peaked to 41 per cent in 1977, an increase mainly occasioned by the coffee boom. As earlier alluded to, the effects of the boom were temporary, as the economy recorded reduced growth in all the sectors in subsequent years. Agricultural value added has continuously declined since the boom in 1977, while value added in trade, restaurants and hotels has continued to increase, becoming the dominant contributor to value added in 2000. Value added in manufacturing and government services as a percentage of GDP has remained fairly stable over the entire period.

Despite the declining value added and share in GDP, the agriculture sector remains the dominant sector, hence the backbone of Kenya's economy. It is recognized that favourable growth in agriculture over the years could have had widespread effects. It provided significant stimulus for the marked increase in the overall growth of the economy.

2.2 Sectoral Priorities since Independence

Kenya's development agenda immediately after independence emphasized stimulation of demand for goods and services as a way of generating economic growth. The desired production mix was to be determined, while considering the exploitation of available markets and conservation of scarce resources (mainly capital, high-level manpower and foreign exchange) as they made use of abundant ones (unskilled labour and land). Major emphasis was on manufacturing, agriculture, trade and services. Increased production from manufacturing depended on domestic demand and import substitution growth given that the industries were not internationally competitive at that time. Agriculture, on the other hand, depended not only on increased fertile land use through irrigation and reclamation, but also increased productivity. Increases in agricultural output were intended primarily for export markets, while increases in manufacturing were more heavily directed towards satisfying domestic demand, largely through import substitution. Industrial priorities were evaluated according to a set of

criteria that included significant export or import substitution potential, greatest contribution of value added within Kenya, high labour-capital ratio (given the labour surplus and scarcity of capital), production of investment goods for self-sustaining growth and, contribution to the diversification of the economy to reduce risk due to fluctuations. Industries that appeared to meet the above criteria at that time were: food processing; timber; minerals; textiles, assembly of agricultural machinery, vehicles and bicycles; chemical industries including insecticides, plastics and pharmaceuticals; light metals; and building and construction (Development Plan, 1964 to 1970).

Despite these priorities, the agriculture sector continued to be the main engine for Kenya's economic growth. It accounted for about 39 per cent of GDP and 89 per cent of exports in the 1980s (Government of Kenya, 1989). This dependence on agriculture was envisaged to continue till early 1990s, implying that rapid economic growth was only to be achieved through agricultural growth. Agricultural development and its supporting infrastructure were, therefore, accorded the highest priority in resource allocation.

The World Bank in early 1970s also tried to formulate sectoral priorities that were to ensure efficient operation of the economy for growth, employment creation and increased generation and distribution of incomes (World Bank, 1975). The proposed strategy was to increase the flow of resources towards productive sectors and reduce the growth of infrastructure and social services. The priority sectors were agriculture and manufacturing, with the agriculture sector having the most immediate priority. This is because agriculture was already considered an efficient user of resources, which implied that increased agricultural investment would yield substantial results without fundamental reforms to restructure production. Secondly, given that majority of Kenyans heavily relied on agriculture for their livelihood, increasing agricultural productivity was considered an effective way of tackling poverty.

Manufacturing sector was expected to contribute to growth, but with substantial reforms in efficiency. This required a policy change from import-substitution to resource-based export industries, given that the scope for further import substitution for final consumption goods was limited, and the industries required high levels of protection, but had very low value-added. Another policy shift was promotion of small-

scale industries, which would expand opportunities for entrepreneurship and employment.

Despite the continued emphasis on agriculture, the country's vision has always been to become an industrial nation, with the emergence of import substitution policies in the 1960s. Renewed emphasis on manufacturing in the 1990s was because experience had shown that the sector had a higher potential for stimulating economic growth. As a supplier of essential inputs to other sectors, and the industrial sector itself, and as a user of output from other sectors, the industrial sector represented an effective stimulant to the economic system. During this period, agriculture continued to be the primary foundation of rapid and sustained growth, while manufacturing was considered more dynamic in accelerating growth. This explains why agriculture and manufacturing are seen as twin engines of economic growth.

There is empirical evidence and theoretical underpinning that as a country develops, the contribution of manufacturing to GDP expands considerably and at some stage surpasses that of agriculture and other primary industries. Sachs (2004) posits that economies go through different transformations that involve re-structuring of the economy, which can be summarized in three main stages: the commercial stage, the industrial stage and, knowledge-based stage.

A commercial economy is one that has a basic division of labour between urban and rural activities, where the urban sector produces manufactured goods and services, and the rural sector produces food and other agricultural products. Most African economies are pre-commercial. After the commercial stage, economies move to the industrial stage. Here they shift from the primary commodity and small urban sector to manufactured goods. Typical examples are some of the economies in Latin America (Chile, Mexico), even though they never went beyond manufacturing of primary commodities and therefore did not industrialize successfully. The final transition is from an industrial economy to a knowledge-based economy, for example China and India. However, Kenya's growth path demonstrates a departure from this path.

The manufacturing sector has over time developed into an inefficient and uncompetitive sector dominated by traditional, light and low-technology industries, which relied on imported intermediate inputs. The sector has, therefore, not created strong domestic linkages, and

has remained predominantly an enclave sector, which has lacked dynamic deepening effects on the economy (Development Plan, 1997-2001). It was in light of this recognition that deliberate efforts were made in the 1990s to promote linkages among industries and sectors to enhance the spread effects of industrial growth and to facilitate the transfer of technology, skills and growth. There was further need to adopt an industrial culture and an export mentality, which implied attitudinal, organizational and operational changes, with a certain level of neo-mercantilism. But such outward orientation called for the need for efficiency in use of resources, competitiveness, right price, quality, timeliness and reliability of delivery. Thus, emphasis between 1997 and 2001 was on expansion and modernization of existing industries and attraction of new investments in light manufacturing and resource-based industries. This choice of industries followed the approach by the East and South-East Asian Newly Industrialized countries' initial industrialization path, which focused on agro-processing, food processing and light manufacturing such as textiles and clothing, leather and leather goods, food, beverages and tobacco. It was believed that Kenya had the potential to produce and export these products. After three decades of trying to industrialize, the manufacturing sector still remains uncompetitive, and value added has remained constant. As for the services sector, value added has continued to rise. The services sector had been envisaged to remain more or less constant, even though its significant contribution to GDP and modern wage employment is important for the future prosperity of the economy.

There was a shift in emphasis beyond 2000 as the economy embarked on growth policy options that would move the economy out of recession. The 2002-2008 plan period underscored the need for sound macroeconomic policies to achieve faster economic growth. Emphasis was on ensuring a stable exchange rate and fiscal stability, in addition to reducing risks and inefficiency in the financial sector, encouraging long-term financial instruments, and reducing domestic debt. On sectoral priorities, the government's blue print for economic recovery, the Economic Recovery Strategy for Wealth and Employment Creation (2003), recognizes productive sectors as agriculture, industry and tourism. In general, sectoral emphasis has been on agriculture and manufacturing, but manufacturing has under-performed and has, therefore, not played a leading role in Kenya's growth process.

3. Explaining Economic Growth: The Role of Total Factor Productivity Growth

Economic growth is an important aspect of the development process. However, it has not been uniform all over the world as some countries have grown faster than others. That is why economic growth in East Asian countries such as Hong Kong, Korea, Singapore, and Taiwan has been termed as miraculous. There has been a lot of debate with little consensus on the most important determinants/sources of economic growth (Limam and Miller, 2004). Theoretically, there are three elements that contribute to the production of goods and services: labour, capital, and technology, which must be present for an economy to grow. What is subject to debate is the contribution of the factors of production relative to that of technology. While some think that physical capital is more important, others think that growth in total factor productivity is the dominant source of economic growth.

Several models have been developed over time to explain sources of growth. The broad consensus of most studies is that growth is determined by mainly three factors: the efficient utilization of existing stock of resources, accumulation of productive resources such as human capital and technological progress (Dewan and Hussein, 2001). Similarly, Harberger (1998) identifies five pillars of growth as Total Factor Productivity (TFP), which he equates to real cost reduction, rate of increase in the labour force (population growth), rate of increase in the stock of human capital (skills development), increase in the capital stock and increase in the rate of return to capital. The standard view about the success of the East Asian countries emphasizes the role of technology in their high growth rates and focuses on the fast technological catch-up in these economies.

Sources of economic growth can be identified through growth accounting by use of economic growth models. One of the early growth models is the Solow (1956) model, which is a neoclassical production function, whereby physical capital, labour and technology determine growth, and factors of production are assumed to be substitutable. Emphasis of the model is on factor accumulation, with productivity growth and technological change playing no distinct role. The model also implies that a country's real GDP per capita growth negatively correlates with its initial level of income, which is the convergence hypothesis. The Solow residual is assumed to capture total factor

productivity growth. Most economists have found this residual to be large, implying that capital and labour accumulation do not fully explain economic growth. This growth model has been criticized that it does not explain cross-country differences in growth, given that other factors other than physical capital, labour and human capital explain the differences in cross-country growth.

Consequently, the endogenous growth models that were developed mainly explain the Solow residual, with emphasis on the sources of TFP. Proponents of the endogenous growth models argue that the large Solow residual responds to variables that are endogenous to the model, such as endogenous technology and human capital. The two major components of TFP growth are innovation and technical change. Given the importance of technology and its diffusion mechanisms in the endogenous growth models, TFP varies between developed and developing countries. Easterly and Levine (2001) as quoted by Limam and Miller (2004) argued that with increasing returns to technology, TFP is more important than factor accumulation. They further noted that there is increasing divergence, not convergence, in per capita incomes. Given that physical capital tends to remain constant over time and growth in most countries is volatile, the Solow model cannot explain growth in the less developed countries.

The African growth experience has been the centre of focus of the growth debate, given the long stagnation periods for most African states. O'Connell and Ndulu (2000) in an attempt to explain Africa's slow growth argued that it could be explained by relatively slow capital accumulation, low productivity growth and high population growth rate pressures. However, differences between Africa and other developing countries can mainly be explained by the productivity residual. In her contribution to Africa's growth debate, Hoeffler (2000) found that the augmented Solow model explained Africa's growth experience only when observed country-specific effects were considered, and when investment was endogenized. She observed that the slow African growth could be explained by low investment ratios and high population growth rates. In an attempt to understand the growth of total factor productivity in sub-Saharan African countries, Njikam *et al* (2006) found lack of convergence in growth rates, implying that poorer countries did not grow faster than rich countries as hypothesized under the neoclassical growth theory. Outward orientation was found to negatively affect TFP, which implied that African sectors were not

competitive. Lack of competitiveness was mainly attributed to supply constraints such as poor transport and communication, high utility costs, lack of skilled labour force, government bureaucracies, corruption and bad governance. Physical capital accumulation was also found to be important for growth of TFP. Growth accounting for economies with high growth experience revealed that early growth episodes were mainly determined by capital accumulation (Berthelemy and Soderling, 1999). Kenya relied on a very high investment ratio (36.6% on average) which was not sustainable. The distinctive feature between earlier growth episodes and more recent ones is that capital accumulation played a bigger role in determining growth in earlier episodes than in recent growth experiences.

The role played by different sectors of an economy in its development process has also formed a central part of the growth debate. From development theory, it is argued that industrialization is an essential component of any long-run development strategy given that countries that have had sustained growth have also had structural transformation from primary production towards industry (Stewart *et al*, 1992). In most economies, manufacturing industry has been the critical agent of the structural transformation that marks the transition from a primitive, low productivity and low income state to a dynamic, sustained and diversified one (Lall, 1992). Industrial expansion is necessary to raise incomes and employment, diversify exports to avoid excessive dependence on few commodities, pursue import substitution policies, and make use of economies of scale accruing from industrialization (World Bank, 1981 as quoted by Lall, 1992).

The focus on agriculture, on the other hand, is necessary to provide the food supplies that are essential to raise nutritional standards and to achieve food self-sufficiency, extend the benefits of economic growth to the whole population, achieve regional balance in development, generate opportunities via rural linkages for rural non-agriculture, which already constitutes an important source of incomes and employment in the rural areas and, provide essential foreign exchange especially in the short run since agricultural imports constitute a large proportion of exports from developing countries (Stewart *et al*, 1992). However, the shift in focus between these sectors depends on the level of total factor productivity. Lewis (1954) as quoted by O'Connell and Ndulu (2000) argued that reallocation of resources from sectors with low TFP to high TFP is central in modern development theory.

Agriculture continues to be the dominant contributor to economic growth in Africa, with very little evidence of structural transformation within these economies.

An economy's structure can change in terms of the composition of output, and contributions of different sectors to the economy's growth. According to Berthelemy and Soderling (1999), such structural change is one of the ways through which TFP can be enhanced. It requires re-allocation of factors towards more-productive activities. As earlier alluded to, a largely accepted theory of structural change is that economies that rely on primary sectors (agriculture and mining) graduate to a structure where manufacturing and service sectors dominate as they develop. Through structural transformation, an economy shifts production from comparative advantage basis to created comparative advantage thorough efficiency gains (TFP). Eyakuze (2003) argues that there is inherited comparative advantage based on endowment and created comparative advantage, which comes from innovation, technical change and human capital development. Since national output is an aggregation of output at the firm level, TFP can be broken down at the firm level and translate to total costs reduction at the firm level per unit of output (Harberger, 1998). The African experience shows a declining share of agriculture in GDP, but this has not been accompanied by a significant increase in the growth and performance of the manufacturing sector. African economies have not benefited from the positive effects of sectoral dynamism, or efficiency at firm level.

A look at the growth of total factor productivity of African countries when these economies experienced high growth rates also shows that human capital accumulation played a significant role in TFP growth (Table 3.1). For instance, human capital contributed 1.1 per cent of TFP growth in Kenya between 1961 and 1979, as compared to 2.9 per cent for Cote d'Ivoire (1960 to 1978), 1.5 per cent for Cameroon (1972 to 1986) and 1.4 per cent for Tunisia (1970 to 1981). Reallocation of labour from agriculture sector to more productive sectors of the economy contributed significantly to growth, both in current and earlier episodes. The most significant contribution is the case of Botswana, whereby labour reallocation contributed 2 per cent TFP growth for the period 1970 to 1996.

In Kenya Gerdin (1997) as cited in Eyakuze (2003) estimated that productivity growth contributed marginally to output growth. Between 1984 and 1994 (labour 10.05, capital 30.65, intermediate inputs 50.25), technical change and TFP were declining at -0.18 per cent and -0.12 per cent, respectively. The ICORs increased from 5.3 between 1984 and 1989 to 13.9 between 1989 and 1994, reflecting declining productivity of capital (more capital was required to produce 1 unit of output). Kimuyu (1998) estimates an overall decline of TFP of -0.198 between 1961 and 1996. In the following section, we use multipliers to analyse changes in the underlying structure of production to which we can attribute to the poor performance of the economy over time.[2]

Table 3.1: Sources of factor productivity growth in selected African countries (annual averages in %)

Country	Period	GDP growth (%)	TFP growth	Human capital contribution	Labour reallocation contribution
Failed take-offs					
Kenya	1961-79	6.9	2.4	1.1	0.6
Cameroon	1972-86	7.7	2.3	1.5	1.3
South Africa	1960-74	5.1	0.8	0.5	0.5
Tunisia	1970-81	7.0	1.1	1.4	0.2
Egypt	1964-85	7.1	1.8	0.6	0.3
Cote d'Ivoire	1960-78	9.5	2.8	2.9	1.2
Recent performers					
Botswana	1970-96	10.1	3.4	1	2
Mauritius	1980-96	5.5	2.8	0.5	0.2
Uganda	1987-96	6.9	4.6	0.8	0.3

Source: Berthelemy and Soderling (1999)

[2] This analysis is complemented by further analysis using a dynamic general equilibrium model, under the sources of growth project.

4. Structural Transformation in Kenya: A Social Accounting Matrix Approach

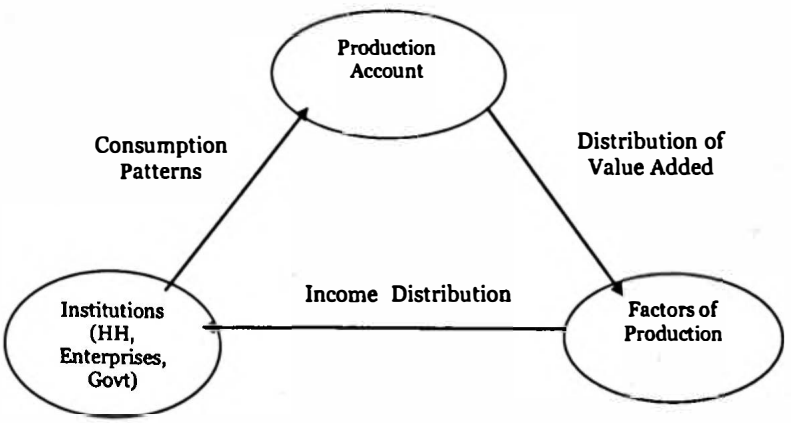
4.1 Social Accounting Matrix

The Social Accounting Matrix (SAM) is an important database that represents a consistent framework for analyzing income and expenditure flows in an economy. It gives details on the direct linkages among the sectors, in this case, the production activities, commodities, factors of production, households, the government and the rest of the world. It, therefore, provides a consistent framework of economic processes, which can be used to establish socio-economic relationships. Because of these reasons, SAMs have been used for socio-economic policy formulation especially in the analysis of employment, poverty, growth and income distribution.

Below is a simplified relationship among the principal SAM accounts - production activities, factors and institutions (Figure 4.1). From the structure, production accounts buy raw materials and intermediate goods and hire factor services to produce output (commodities). Their expenditures, therefore, are intermediate inputs and value added, which is distributed between factors of production, and their receipts are sales.

Commodity accounts represent domestic product markets, which include domestic production and import purchases. Their receipts accrue from domestic sales of intermediate goods to activities, final goods to households and the government, and also investment goods to the capital account. Commodities also pay indirect taxes.

Figure 4: Simplified SAM accounts representation

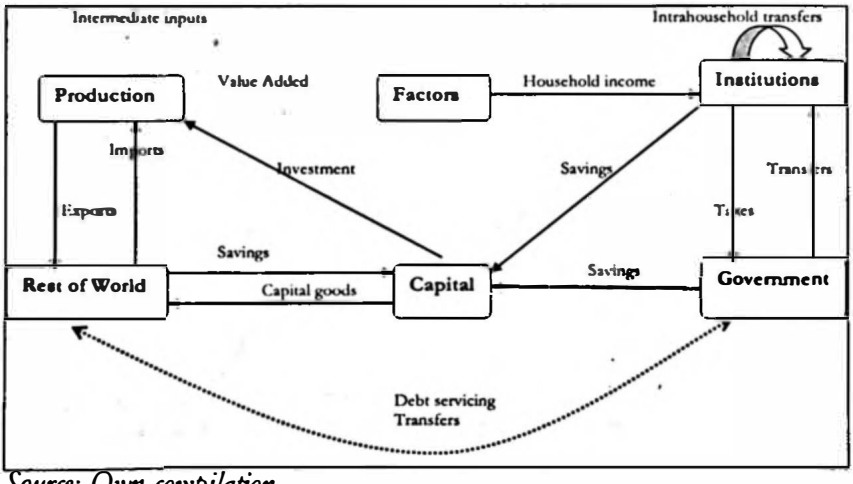


Factor accounts include labour and capital accounts. They receive receipts from sale of their services in form of wages, rent, income from abroad as remittances and other capital income, and distribute these receipts to households in terms of wage incomes and distributed profits and to firms as non-distributed profits. Institutions include households, enterprises and government. Sources of household incomes include factor incomes, transfers from other households, firms, government and abroad. They spend on consumption and income taxes, and the balance is savings. Firms receive profits and transfers, spend on taxes and transfers, and also save. The government receives income from taxation and transfers from abroad, and spends on purchasing of services, transfers resources to households and enterprises and also saves.

The other SAM accounts are the capital and the rest of the world accounts. The capital account collects savings (domestic and foreign) and investments. The rest of the world account includes transactions between the domestic economy and the rest of the world, with receipts from exports and factor payments from abroad and expenditures on imports and factor payments to abroad. The current account deficit is covered by net foreign capital transfer, which appear as foreign savings.

Below is a flow diagram showing a summary of interactions among SAM accounts (Figure 4.2).

Figure 4.2: Flow diagram of SAM transactions



Source: Own compilation

4.2 Structure of the Kenyan Economy: A SAM Perspective

4.2.1 Macro-level analysis

The SAM represents a snapshot of an economy. Analysing different SAMs over time can give an indication of the changing structure of the economy. The SAM 1976 by Vandermoortele (ILO) and the SAM 2003 by KIPPRA/IFPRI were used for this analysis.

The 1976 Macro SAM indicates that the aggregate demand for the economy was K£ 2,673.2 million in 1976 (Table 4.1). The GDP at factor cost was K£ 1,296.1 million. Intermediate consumption was about K£ 932.3 million. About 74 per cent of factor incomes accrued to households, and 26 per cent to enterprises. Exports amounted to K£ 471.7 million, while imports were K£ 335.8 million, representing a trade surplus of K£ 135.9 million. Looking at composition of government revenue, personal income taxes accounted for about 24.4 per cent, corporate taxes 23.6 per cent, and indirect taxes 52 per cent. Intra-household transfers were K£ 76.8 million, transfers from enterprises to households were K£163.9million, and government transfers to households about K£ 142.7million.

Table 4.1: Macro SAM 1976 (K£ million)

	Activities	Factors	Households	Enterprises	Government	Indirect taxes	Savings-investment account	Rest of the world	Total
Activities	932.3		950.5		120.0		198.7	471.7	2,673.2
Factors	1,296.1							14.3	1310.0
House holds		905.1	76.8	163.9	142.7			5.3	1294.0
Enterprises		320.9	6.8	16.4	12.3			8.0	364.4
Government recurrent		2.0	82.2	79.5		175.5		16.5	355.7
Indirect taxes	109.0							66.5	175.5
Savings-investment account			67.5	97.3	77.5			51.9	294.2
Rest of the world	335.8	82.4	110.0	7.3	3.2		95.5		634.2
Total	2,673.2	1310.4	1293.8	364.4	355.7	175.5	294.2	634.2	

Source: Reconstructed by the author from SAM 1976 by Vandermoortele (ILO)

Table 4.2: The 2003 Macro SAM (Ksh million)

	Activities	Commodities	Factors	Enterprises	Households	Taxes	Government	Investment	Rest of the World	Total
Activities		1,783,049			95,043					1,878,092
Commodities	867,692	117,117			772,972		202,913	196,723	281,387	2,438,804
Factors	1,010,400									1,010,400
Enterprises			544,860				41,297		4,909	591,066
Households			461,261	335,194			17,898		91,014	905,367
Taxes		131,756		37,053	33,603					202,412
Government			4,279	7,332	6,298	202,412			5,677	225,998
Savings				204,248	-2,549		-36,286	17,498	31,310	214,221
Rest of the world		406,882		7,239			176			414,297
Total	1,878,092	2,438,804	1,010,400	591,066	905,367	202,412	225,998	214,221	414,297	

Source: 2003 KIPPRA/IFPRI SAM

The 2003 Macro SAM indicates that total aggregate demand for the economy was Ksh 1,878,092 million in 2003, while value added was Ksh 1,010,400 million. About 46 per cent of factor incomes went to households, 53.9 per cent to enterprises and the remaining 0.4 per cent to government (Table 4.2). On government revenue, about 54.8 per cent was from commodity taxes (excise and Value Added Tax), 34.9 per cent from direct taxes (personal income and corporate taxes) and 10.3 per cent from trade taxes. Exports amounted to about Ksh 281,387 million, and imports Ksh 406,882 million, indicating a trade deficit of about Ksh 125,495 million. Enterprises contributed about Ksh 204,248 million to the savings pool, while households and government had dissavings. Investment, on the other hand, originated from commodities (Ksh 179,225 million) and changes in stocks (Ksh 17,498 million). Government transfers to enterprises amounted to about Ksh 41,297 million and Ksh 17,898 million for households. Foreign capital inflows were about Ksh 31,310 million, while foreign transfers to households were Ksh 91,014 million.

Below is a summary of indicators of structural change (Table 4.3). The table shows there has been a significant change in some of the indicators.

Factors of production: There are three factors of production: capital, land and labour, which constitute value added. The theory of comparative advantage stipulates that a country should derive comparative advantage from the more abundant factor of production, which is labour, for Kenya. Labour share in value added declined from 69 per cent to 45 per cent, reflecting a shift to more capital intensive production. The decline in the labour share translates to a decline in

Table 4.3: Indicators of structural change

	1976 %	*2003* %
Household share in factor incomes	69.07	45.65
Labour share in value added	69.52	42.84
Export share in gross output	21.17	14.98
Import share in gross supply	15.07	21.66
Share of household consumption in total demand	35.56	31.69
Share of investment demand in total demand	11.01	8.07
Share of intermediate inputs in total demand	34.88	35.58
Trade ratio	62.30	68.12

Source: Authors computation from SAM 1976 and SAM 2003

household share in factor incomes from 69 per cent in 1976 to 46 per cent in 2003. This shows that the little growth experienced in the economy has not generated sufficient employment. The structure of production does not utilize the most abundant factor, labour and, therefore, not exploiting the comparative advantage.

Openness: The trade ratio (exports + imports as a share of GDP) is a commonly used indicator of openness. The trade ratio shows that Kenya has become more open over the last three decades from 62 per cent in 1976 to 68 per cent in 2003. This is not surprising since liberalization was a central element of the reforms. However, further analysis show that the share of exports in gross output declined from 21 per cent to 15 per cent, while the share of imports increased from 15 per cent to 22 per cent. Kenya's development strategy has been predicated on export led growth, but exports have not emerged as the key driver for growth, an outcome of both external and internal factors.

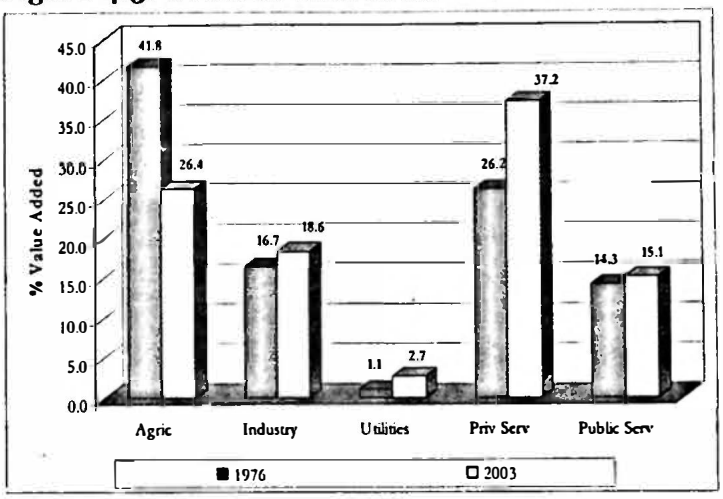
Composition of demand: An interesting result is the overall decline in the share of investment in final demand. Household consumption share also declined, which could be linked to the decline in household share of factor incomes. Intermediate inputs take a larger share but as observed above, the import intensity in production has increased. The combination of larger share of intermediate demand and increasing import intensity weakens inter-sectoral linkages in the economy which are crucial for growth, unless the share of exports increase to compensate for the decline in domestic demand.

4.2.2 Sectoral level analysis

One way of analyzing structural change over time is through an analysis of sectoral composition of value added to GDP. As earlier indicated, the Kenyan economy was mainly agriculture-based in the 1960s, 1970s, 1980s and partly 1990s. Using the SAM approach,[3] it shows that agriculture contributed about 41.8 per cent of value added to GDP in 1976, but this proportion declined to about 24.2 per cent in 2003 (Figure 4.3). As explained in section 2, the decline in the performance of the agriculture sector has mainly been attributed to climatic changes (drought), decline in world prices and lack of access to credit facilities. The share of industrial valued added increased from 16.7 per cent to

[3] See Appendix B1 for SAM sectors.

Figure 4.3: Sectoral contribution of value added



Source: Authors computation from SAM 1976 and SAM 2003

19.1 per cent, while the share for public services increased marginally from 14.3 per cent to 15.6 per cent in 1976 and 2003, respectively. The relative shares of manufacturing, building and construction and mining in industrial sector remained fairly constant. The share of private services in value added increased significantly from 26.2 percent in 1976 to 38.3 per cent in 2003, which shows that services gained importance in terms of contribution to value added as agriculture became less important. This represents structural transformation in terms of the sources of economic growth.

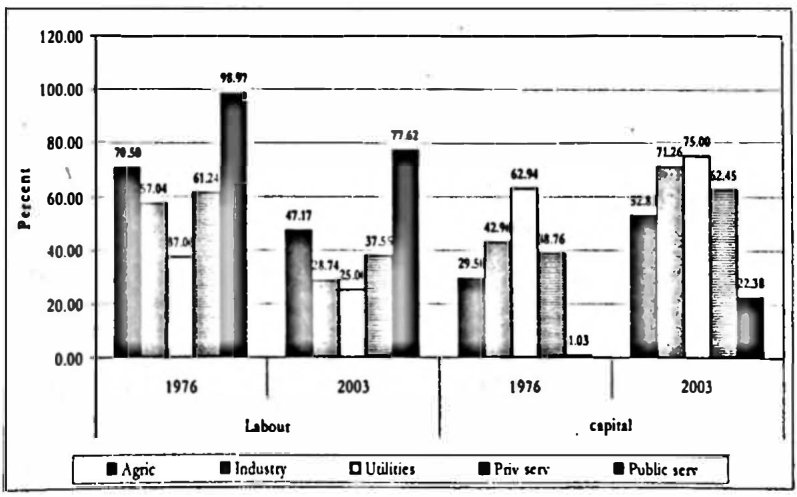
In 1976, the composition of value added from private services was: trade, hotels and restaurants 42.6 per cent; transport and communication 20.4 per cent; financial services 13.01 per cent and; other services 24 per cent. Comparing with 2003, the composition was: trade, hotels and restaurants 35.6 per cent; transport and communication 27.3 per cent; financial services 17.6 per cent and; other services 19.5 per cent (SAM, 1976 & 2003). This indicates that the increase in services value added has mainly been in two sectors—financial services and transport and communication. The positive performance of financial services is due to the policies that have been pursued over time, mainly in the area of liberalization, which has ensured increased access to credit/finance for investment. Growth in the transport and communication sector was mainly because of increased internet use, and wider telecommunication coverage, among others. The private sector played a big role in this sector, with the public

sector's contribution being hampered by inadequate budgetary allocations, especially in the 1990s after the suspension of donor funding.

The question that arises is whether this service-led growth strategy (in financial services, tourism, transport and communication and trade) is sustainable. Kenya's growth and development targets (pro-poor growth and employment creation) can only be met if the sectors driving the economy can make use of available and abundant factors of production (in this case labour, mainly for employment creation), and also if the growth levels can be sustained. The success of the service sector mainly depends on other sectors of the economy as shown in the next section. A thriving financial services sector depends on the demand for services, which will be high if activities in the economy are booming. The services sector can therefore be volatile depending on the prevailing economic conditions (internal and external).

An analysis of the composition of factors of production also reveals a changing production structure, with the share of labour across all sectors declining over time. For instance, labour in agricultural sector accounted for about 70.5 per cent of factors of production in 1976, but the proportion declined to about 47.2 per cent in 2003 (Figure 4.4). Consequently, the share of capital increased from 29.5 per cent to 52.8 per cent, respectively. The agriculture sector was predominantly large-scale after independence, but there has been land fragmentation and

Figure 4.4: Factors of production (shares in 1976 and 2003)



Source: Own computation from SAM 1976 and SAM 2003

increased small-scale production over time. The sector is expectedly labour intensive, but the low labour ratios in the sector have mainly been attributed to the low wages prevailing in the sector, and also the abundance of self-employment and unpaid family workers (Economic Survey, 1996). The labour shares are highest for public services, whereby labour accounted for 98.97 per cent of factors of production in 1976, but declined to 77.62 per cent in 2003. This structural change could be attributed to technological advancement over time, whereby production has become more capital intensive.

Given the high share of services value added in GDP, a look at the distribution of sectoral factors of production reveals a shift towards more capital intensive production.[4] For instance, labour contributed 75 per cent of financial services value added in 1976, but only accounted for about 37 per cent in 2003. Shares of other services include: trade, restaurants and hotels—70 per cent in 1796 and 39 per cent in 2003; transport and communication—68 per cent in 1976 and 38.5 per cent in 2003; other services —82 per cent in 1976 and 33.6 per cent in 2003. Given that the sector leading the economy is becoming more capital intensive, the question is whether this is the appropriate production mix for the economy. It explains why the economy is growing; yet, the employment creation in the formal sector has been minimal. Consequently, the pro-poor effects of such a strategy are bound to be minimal given that these sectors could directly benefit a few (given their capital intensive nature). Also, there is growing evidence that indicates capital efficiency has been declining, which implies that more capital is needed to produce a unit of output.

Using movements in incremental capital output ratio (ICOR) as an indicator of efficiency of resource use, it shows that capital efficiency has been declining. A look at the ICOR trends reveals a steady increase in the ratios—overall, ICOR in Kenya was 2.4 in 1966, which compared favourably with the world's most efficient economies at that time, but increased to 3.2 in 1970, which raised concerns about the country's ability to promote growth, given the existing resource constraints (World Bank, 1975). These ICOR trends were attributed to existence of excess capacity, redirection of production towards more capital-intensive activities resulting from distortions in factor pricing and also

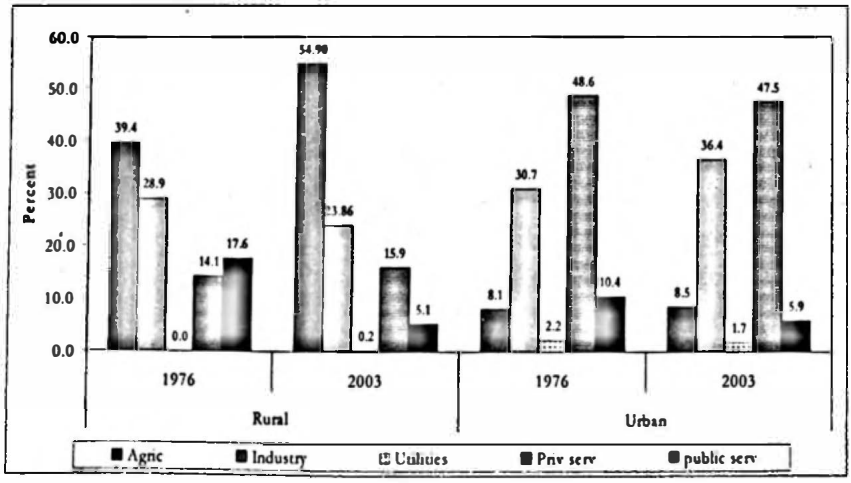
[4] The use of automated teller machines is a good example that provides useful insight to the capital labour—labour input in production.

a likely possibility that 'easier' opportunities had already been taken up. These trends had not been reversed until the 1990s, as ICOR increased to about 5.3 between 1984 and 1989, and 13.9 between 1989 and 1994 (Mwega and Ndung'u, 2002; Kimuyu, 1998 as quoted by Eyakuze, 2003). Sectors have become more capital-intensive (despite scarcity of this resource), and less labour intensive (despite abundance). Labour is an important source of growth for the Kenyan economy, but intensity in its use has been declining in favour of scarce capital.

Looking at household consumption, the analysis shows that agricultural output accounted for about 39.4 per cent of rural and 8.1 per cent of urban households' consumption in 1976 (Figure 4.5). This share increased to 54:9 per cent for rural households and 8.5 per cent for urban households in 2003. These trends are as expected because rural households consume more of unmarketted agricultural output than urban households. Also, agricultural output is expected to have the largest share in total rural household consumption basket as compared to urban households.

The share of public services in total household consumption declined for both rural (17.6% to 5.1%) and urban (10.4% to 5.9%) households This can be attributed to policy measures that were aimed at cost sharing, and increased private sector participation in the provision of private services, mainly education and health. Private services, on the other hand, accounted for the largest share of urban households'

Figure 4.5: Composition of household consumption (1976 and 2003)



Source: Own computation from SAM, 1976 and SAM, 2003

consumption, accounting for 48.6 per cent in 1796 and 47.5 per cent in 2003. Looking at utilities, rural households consumed minimal amounts (almost zero in both years), but there was some increase, which could mainly be attributed to policy measures aimed at increasing access to water and electricity (rural electrification project).

The structure of exports and imports has not changed between the two periods. In 1976, imports into industry accounted for 78 per cent of total imports and 32 per cent of total exports, compared to 75 per cent of total imports and 47 per cent of total exports in 2003. Agriculture accounted for 5 per cent of total imports and 33 per cent of total exports in 1976, compared to 7 per cent of total imports and 36 per cent of total exports in 2003. These trends show that the industrial sector is more import dependent. As a result, this sector is expected to have weaker backward linkages (except for its linkages with agriculture) as will be shown in section 5.

4.3 Structural Decomposition of Output Growth: An Input-Output Framework

Structural change can be analyzed using an input-output framework. Following from Zakariah and Ahmad (1999), major shifts within the economy can be analysed by using a comparative static examination of the key parameters. This is a useful tool in providing a framework for examining structural change, mainly because it provides the links that transmit changes among industries through technological changes (Forssell, 1988 as quoted by Zakariah and Ahmad, 1999).

The material balance identity can be used to decompose gross output changes into changes in the different demand categories: domestic demand, export demand (export expansion), import substitution (an increase in the ratio of domestic to total supply) and the input structure of production (intermediate consumption).

Using the macroeconomic identitY:

> Gross Domestic Income @ market prices = Gross Domestic Product @ market prices

From national accounting;

> Gross Output @ market prices + Imports (M) = Private Consumption (C) + Investment (I) + Government Expenditure (G) + Exports (X)

Where:

Gross Output (GO) @ factor cost = Production = Value Added + Intermediate Consumption (IC)

Private Consumption = Intermediate Consumption (C_i) + Household Consumption (C_h)

Investment = Investment by commodity type + change in stocks

As shown by Beaulieu (1990), the change in gross output for the economy between two years can be written as:

$$\Delta GO = \Delta D_d + \Delta X + \Delta M + \Delta C_i$$

Where ΔD_d is the change in domestic demand

ΔX is export expansion

ΔM is import substitution (which can be approximated by an increase in the ratio of domestic to total supply)

ΔC_i is the change in the input structure of production (intermediate consumption), which represents a change in the production and use of inputs.

For comparison between the two years, the 2003 figures were deflated using different deflators (GDP deflator, consumer price index, export price index, import price index), with 1976 as the base year. Looking at the macro level, output decomposition reveals that in 1976, domestic final demand accounted for about 54.3 per cent of total aggregate demand, compared to 58.52 per cent in 2003 (Appendix B2). This increase was mainly in manufacturing, electricity and water, building and construction, transport and communication, and financial services. Proportions of intermediate demand increased from 39.89 per cent in 1976 to 49.15 per cent in 2003, which could imply movement to a higher production frontier or increased input costs. The major drivers of this change were manufacturing, trade, hotels and restaurants, and other private services. In addition, the economy was a net exporter in 1976, with export demand accounting for 20.18 per cent while import demand was 14.37 per cent. However, in 2003, export demand accounted for only 14.38 per cent in total demand, as compared to 22.05 per cent import demand. Agriculture remained a net exporter, while manufacturing sector's trade deficit widened.

Sectoral output growth decomposition is shown in Table 4.4. The analysis reveals that domestic final demand was the major source of

output growth between 1976 and 2003, contributing 58.6 per cent of total output growth. The second largest contributor to growth was intermediate demand (49.4%). This expansion in intermediate demand is a positive sign of technological change. Export demand contributed 14.23 per cent of output growth. Import substitution did not contribute to output growth during the two periods, even though a look at trade policy clearly reveals that the government pursued import substitution policies which were aimed at encouraging domestic production over the 1970s and 1980s.

Decomposition of output growth at sectoral level reveals that the manufacturing sector contributed the largest percentage of output growth (29%) of total output growth, followed by agriculture (13.6%), trade, hotels and restaurants (13.0%) and transport and communication (12%). Of the 29 per cent contribution by manufacturing, 23.85 per cent was growth in intermediate demand, while 15.54 per cent was growth in final demand. The sector was also characterized by increased import dependency and, therefore, the least contribution of import substitution to growth. Increased demand in agriculture was mainly in terms of final demand (6.85% of total output growth) and exports (5.13%). For trade, hotels and restaurants, the major contribution was from increased intermediate demand (9.27% of total output growth) and increased final domestic demand (4.04%). Increased domestic final demand (7.19% of total output growth) and intermediate consumption (5.12% of total output growth) contributed to output growth in transport and communication.

Looking at sources of output growth by sector, agriculture was mainly final demand-driven, with final demand contributing 50.4 per cent of total agricultural output growth, export demand contributing 37.7 per cent, and intermediate demand 23.3 per cent. Manufacturing, trade, hotels and restaurants and, financial services were intermediate demand driven, contributing 82.3 per cent, 71.5 per cent and 72.1 per cent, respectively, of total sectoral output growth. Public services (education, health and public administration) were final demand driven. Overall, this analysis shows that stimulating domestic final demand and intermediate consumption is important for output growth in the economy.

Table 4.4: Sources of output growth in Kenya (1976-2003)

	Domestic Final Demand (D)	Intermediate Demand (W)	Export Demand (X)	Imports (M)	Total
Agriculture, Fishing and Forestry	50.40	23.34	37.71	(11.44)	**100.00**
	6.85	*3.17*	*5.13*	*(1.56)*	***13.60***
Mining and Quarrying	(1.58)	19.79	90.79	(8.99)	**100.00**
	(0.01)	*0.10*	*0.44*	*(0.04)*	***0.49***
Manufacturing	53.60	82.28	21.69	(57.56)	**100.00**
	15.54	*23.85*	*6.29*	*(16.69)*	***28.99***
Electricity and Water	30.97	69.33	(0.04)	(0.27)	**100.00**
	0.57	*1.28*	*(0.00)*	*(0.00)*	***1.85***
Building and Construction	94.57	5.23	0.00	0.20	**100.00**
	7.89	*0.44*	*0.00*	*0.02*	***8.35***
Trade, Hotels and Restaurants	31.15	71.53	(0.03)	(2.65)	**100.00**
	4.04	*9.27*	*(0.00)*	*(0.34)*	***12.96***
Transport and Communication	60.53	43.15	19.60	(23.28)	**100.00**
	7.19	*5.12*	*2.33*	*(2.76)*	***11.87***
Financial Services	34.60	72.11	1.34	(8.05)	**100.00**
	1.70	*3.54*	*0.07*	*(0.39)*	***4.90***
Other Services	56.77	43.72	(0.27)	(0.22)	**100.00**
	3.06	*2.36*	*(0.01)*	*(0.01)*	***5.39***
Education	99.59	0.47	(0.06)	0.00	**100.00**
	1.98	*0.01*	*(0.00)*	*0.00*	***1.98***
Health	99.98	0.00	(0.00)	0.03	**100.00**
	5.26	*0.00*	*(0.00)*	*0.00*	***5.26***
Public Administration	104.85	5.72	0.00	(10.57)	**100.00**
	4.57	*0.25*	*0.00*	*(0.46)*	***4.36***
Total	**58.63**	**49.39**	**14.23**	**(22.25)**	**100.00**

Source: Own computation from SAM 1976 and SAM 2003

5. Sectoral Linkages within the Kenyan Economy

One of the ways of stimulating growth in the economy is by strengthening inter-dependencies between sectors. This implies stimulating demand both for intermediate inputs (backward linkages) and final products (which can be demanded as inputs into other sectors—forward linkages). Backward linkages measure the degree of dependence of sectors on the supply of inputs from other sectors while forward linkages relate to interdependence secured through the sale of one sector's output to other sectors as inputs. The policy significance of identifying the key or most important backward and forward linkages is that policy makers can determine the impact flowing from the stimulation of a key sector on other sectors of the economy. Thus, identifying the key industry linkages emphasizes the role that each sector plays in the development of the domestic economy and, therefore, informs domestic policy directed towards economic development in the economy. Analysis of absolute backward and forward linkages will also indicate how the outputs of the key industries are distributed backward and forward to others in the domestic economy. So development policies focusing on one of the key industry sectors will have impacts on the remaining industries, which can be observed by the policy maker.

Looking at the growth experience, productivity growth was the least significant source of output growth between 1964 and 1994, accounting for about 9.3 per cent, with 10.05 per cent by labour, 30.65 per cent by capital and 50.25 per cent by intermediate consumption (Kimuyu, 1998 as quoted by Eyakuze, 2003). Therefore, inter-industry linkages are important for growth of the Kenyan economy.

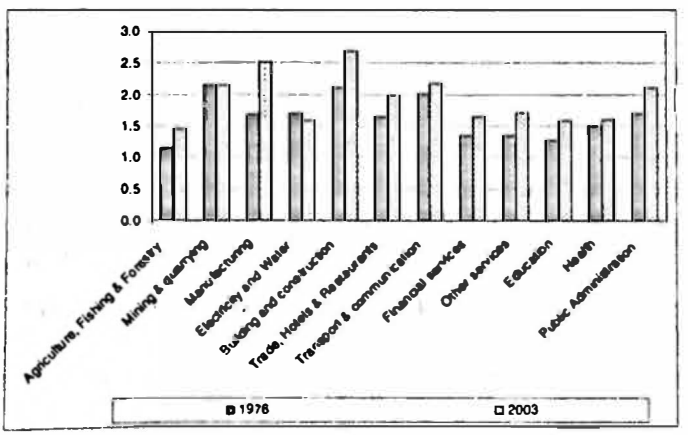
Multiplier analysis was carried out to determine the level of inter-sectoral linkages within the economy (Appendix A). Since the SAM comprises five major accounts (production, factors of production, institutions, capital and rest of the world), it is usually important to determine which accounts are endogenous before carrying out multiplier analysis. It has been customary to consider the production account, the factors of production and institutions (households and enterprises) as endogenous, and the government account, the capital account and the rest of the world as exogenous. To assess the level of inter-sectoral linkages, only the production account was endogenized.

5.1 Level of Backward and Forward Linkages

The summary of backward linkages is shown in Figure 5.1. An analysis of the backward linkages shows that, in general, all sectors recorded an increase in the level of linkages between 1976 and 2003. Mining and quarrying, building and construction and transport and communication had the highest level of backward linkages (2.1, 2.1 and 2.0, respectively) in 1976, while building and construction and manufacturing had the highest backward linkages (2.7 and 2.5, respectively) in 2003. These two sectors also recorded the largest increments in backward linkages between the periods.

Building and construction is the major recipient of investment funds in Kenya and it is, therefore, important for the sector to have high backward linkages so that it generates growth synergies in other sectors. The manufacturing sector has over time been seen as an engine of growth, mainly through stimulation of domestic demand (both intermediate and final demand). A high backward linkage implies that the sector stimulates a lot of demand in sectors where it sources its inputs, especially agriculture (for food processing industries), which is expected. Agriculture had relatively lower backward linkages mainly because the sector generates larger forward than backward linkages given its input mix. In addition to agriculture, financial services, education and other private services had the least backward linkages between the two periods. This implies that these sectors cannot qualify as priority areas for growth given that their ability to generate synergies in other sectors is lower as compared to sectors with higher linkages.

Figure 5.1: Backward linkages (1976 and 2003)



Source: Own computation from SAM 1976 and SAM 2003

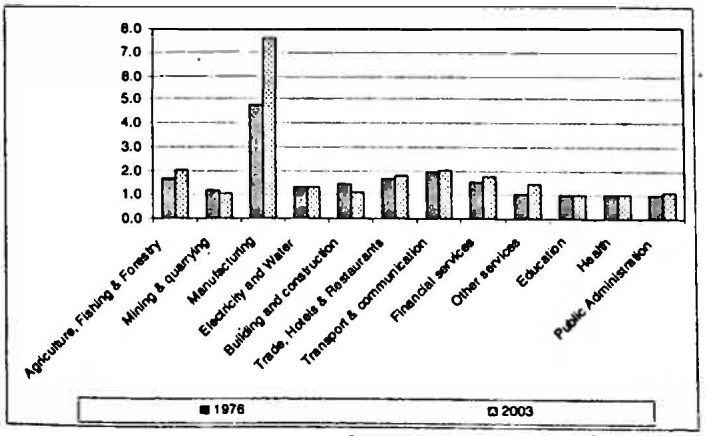
A look at forward linkages reveals that, in addition to strong backward linkages, the manufacturing sector also had the highest forward linkages between the two periods; 4.8 in 1976 and 7.6 in 2003 (Figure 5.2) Other sectors with relatively higher backward linkages were: transport and communication (1.9 in 1976 and 2.0 in 2003); agriculture (1.7 in 1976 and 2.0 in 2003); trade, hotels and restaurants (1.7 in 1976 and 1.8 in 2003); and financial services (1.6 in 1976 and 1.8 in 2003). Public service sectors (education, health and public administration) had relatively low forward linkages.

5.2 Dispersion Indices

The inter-dependence of each sector can be compared by computing the ratio of the linkages in each sector to the average of linkages in all sectors, with the index for backward linkages being refered to as the 'power of dispersion index', while the index for forward linkages being the 'sensitivity of dispersion index' (Appendix A). Sectors with an index above unity have above average backward and forward linkages, implying a higher relative inter-dependence of the sector, even though the increase could be a result of increased linkages with only one or two sectors.

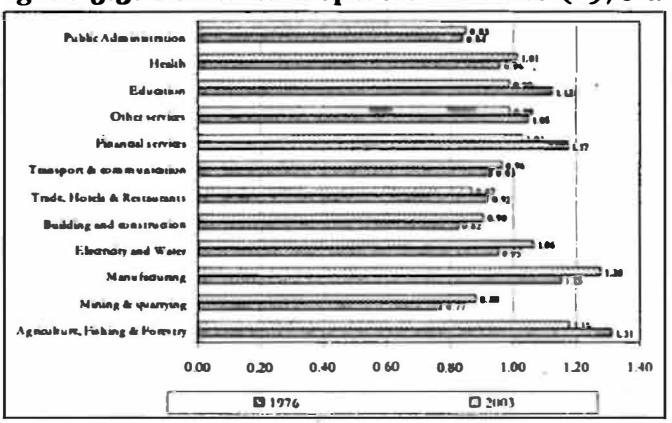
Figure 5.3 shows a summary of the power of dispersion indices. The analysis shows that only agriculture, manufacturing, financial services, other private services and education had above average backward linkages in 1976 (1.31, 1.15, 1.17, 1.05 and 1.12, respectively). Mining

Figure 5.2: Forward linkages (1976 and 2003)



Source: Own computation from SAM 1976 and SAM 2003

Figure 5.3: Power of dispersion indices (1976 and 2003)



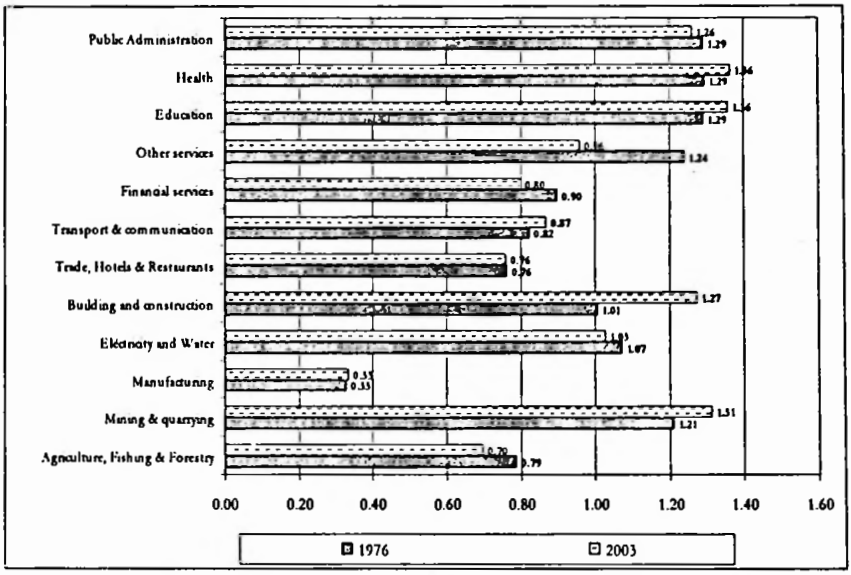
Source: Own computation from SAM 1976 and SAM 2003

and quarrying, electricity and water, building and construction, trade, hotels & restaurants, transport & communication, health and public administration had below average backward linkages. This shows that agriculture had the highest level of inter-dependence with other sectors in terms of backward stream (where they source their inputs), followed by manufacturing.

Agriculture, manufacturing, electricity and water and financial services had above average backward linkages in 2003 (1.18, 1.28, 1.06 and 1.03, respectively). Only three sectors (agriculture, manufacturing and financial services) maintained above average backward linkages between the two periods. It is, therefore, not surprising that these sectors have been the major drivers of growth in Kenya since independence. Agriculture was more inter-dependent than manufacturing in 1976, but this situation was reversed in 2003.

Analysis of forward linkages shows that all the key sectors (agriculture, manufacturing and private services – trade, hotels and restaurants, transport and communication and financial services) had below average forward linkages both in 1976 and 2003 (Figure 5.4). Manufacturing recorded the least forward linkages averaging 0.33 for both 1976 and 2003, implying a very low level of inter-dependence with other sectors. This could partly be attributed to the high level of import dependency in terms of sourcing of intermediate consumption. The second lowest linkages were from agriculture, with an average of about 0.7 in both periods. This record of low inter-dependence among the sectors that have been seen as the major drivers of growth has great implications on the ability of the economy to generate and sustain high

Figure 5.4: Sensitivity of dispersion indices (1976 and 2003)



Source: Own computation from SAM, 1976 and SAM, 2003

levels of economic growth. Despite these low levels of inter-dependencies, these two sectors still play a major role in terms of their contribution to output and employment in the Kenyan economy. Public services (education, health and public administration) had above average forward linkages. These findings corroborate with earlier findings by Beaulieu (1990).

Further analysis of coefficients of variation was carried out to determine the degree of dispersion of the increased inter-dependence between the above sectors; that is increased inter-dependence could be on only few sectors.

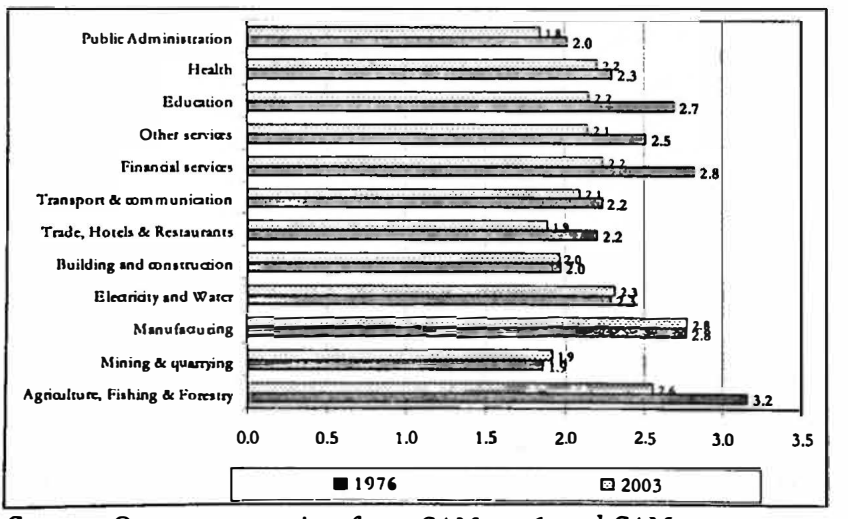
5.3 Coefficient of Variation

The coefficient of variation provides the degree of integration of an economy (see Appendix A for details on the computation of the coefficient of variation). A relatively low coefficient of variation indicates that a sector's demand is dispersed widely across all sectors while a relatively higher coefficient implies that the sector draws heavily on only a few sectors. Results indicate that, on average, the coefficients of variation (both backward and forward) decreased between 1976 and 2003 (Figure 5.5). This implies that, overall, sectors became more inter-dependent, with more dispersed demand in 2003 as compared to 1976.

Agriculture had the highest level of backward coefficient of variation, averaging 3.2 in 1976 and 2.6 in 2003. This indicates that demand for agricultural inputs was not widely dispersed. Coupled with the low dispersion indices, this implies that agriculture has not participated fully in the modernization of the economy. However, Beaulieu (1990) contends that substantial gain can be made by increasing the use of farm inputs.

The level of backward linkages for manufacturing remained fairly stable between 1976 and 2003, averaging about 2.8. This high coefficient of variation also indicated that the demand for the sector's inputs,such as agriculture, was not widely dispersed. As earlier stated, this has mainly been due to increased import dependency. In addition to the low dispersion indices, manufacturing has also not played its role in the growth and development of the economy. Increased use of domestic intermediate inputs would improve the synergies from manufacturing. However, it should be noted that this does not necessarily mean shifting back to import substitution. Financial services also recorded a notable decline in the backward coefficient of variation between 1976 and 2003, which implied that the sector's demand for inputs became more dispersed. The sectors with the least coefficients of variation (and therefore more interdependent) were mining & quarrying, building and construction and public administration.

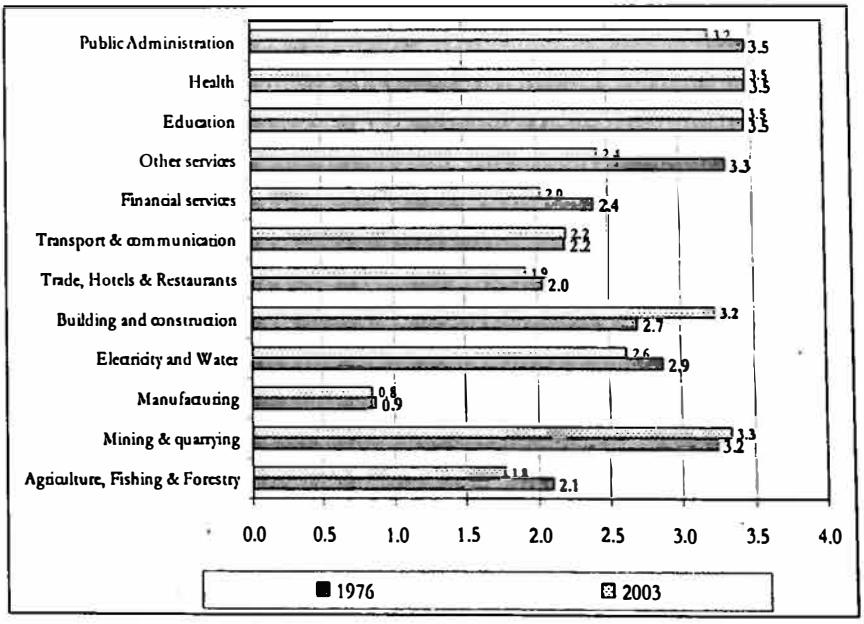
Figure 5.5: Backward coefficients of variation



Source: Own computation from SAM 1976 and SAM 2003

Looking at the forward coefficients of variation, most sectors recorded a decline in the coefficients between 1976 and 2003, except for mining and quarrying, and building & construction (Figure 5.6). This implied that demand for these sectors' output, as inputs into other sectors, was more widely dispersed in 2003 as compared to 1976. Manufacturing had the least forward coefficient of variation, which was 0.9 in 1976 and 0.8 in 2003. This shows that manufacturing's output, as an input into other sectors, was the most widely dispersed across many sectors as compared to the rest of the sectors. The sector, therefore, has very weak backward linkages but strong forward linkages. The same case applies to agriculture, which had the second least forward coefficient of variation of 2.1 in 1976 and 1.8 in 2003. Services (trade, hotels and restaurants; transport and communication; and financial services) also recorded high backward coefficients of variation, but lower forward coefficients of variation. The fact that sectors that are major drivers of the economy recorded higher forward coefficients of variation than backward coefficients has great implications on the stimulation of growth, especially downstream. For the inter-sectoral synergies to be beneficial, there is need to strengthen the backward linkages so that backstream synergies are realized.

Figure 5.6: Forward coefficients of variation



Source: Own computation from SAM 1976 and SAM 2003

6. Conclusion

After the economy recorded its lowest growth rate in the past two decades in 2000, there was renewed concern on how this trend could be reversed. The Economic Recovery Strategy paper outlined various policy options for restoration of economic growth and poverty reduction, among them achieving a high GDP growth rate of 7 per cent by 2006, and also a reduction in the level of poverty by at least 5 per cent. In addition, the government believes that recovery can be spearheaded primarily by improvements in the main productive sectors of the economy, that is agriculture, tourism, trade and industry. The economy has made remarkable progress in restoration of economic growth, but higher growth targets are required to meet the development challenges, more importantly reduction in poverty levels, which are increasing over time. Several facts have emerged from the analysis of the past sources of growth:

The policy strategies pursued by the government have placed great emphasis on agriculture and manufacturing as the key sectors that would lead to the growth and development of the economy. However, the analysis reveals that these sectors are yet to play their role in Kenya's development process. The value added from manufacturing has been fairly stable, while that of agriculture has declined over time. For these sectors to fully play their role in growth and development of the economy, there is need to increase their value addition.

Kenya has not followed the hypothesized development path of moving from agriculture to industry and finally knowledge-based economy. Although the country has a strong agricultural base, services are driving the economy. The main limitation of such a development path is that the service industry is considered volatile, and requires to be underpinned by vibrant agriculture and industry sectors.

Looking at the indicators of structural change, it has been shown that the economy has become more capital intensive and is, therefore, not making use of the abundant labour resources. A look at the sectoral priorities reveals that capital-labour ratio was an important criterion for choosing priority areas, with emphasis on a higher labour ratio. But experience has shown that the labour share has declined over time. Incremental Capital Output Ratio has been increasing implying that efficiency of capital has declined (more units of capital are required to produce the same level of output). These trends partly explain why the

economy has been experiencing growth with minimal employment synergies, especially in the formal sector. There is need for more efficient resource allocation, which calls for more efficient use of capital and taking advantage of the abundant labour resources.

Although, the economy has become more open, exports share in gross output has been declining while the share of imports has increased. The increased import dependency (which mainly constitutes intermediate inputs into manufacturing) undermines the effectiveness of inter-sectoral linkages. For the economy to pursue an export-led growth as envisaged in the various development agenda, there is need to increase the export share by encouraging export orientation. This also includes increasing value addition, especially in agriculture.

The analysis of inter-sectoral linkages reveals that sectors had relatively stronger and more widely dispersed forward linkages as compared to backward linkages, especially manufacturing, agriculture and private services (trade, hotels and restaurants; transport and communication; and, financial services). There is need to generate stronger and more widely dispersed backward linkages, which are also crucial for stimulation of demand and therefore growth.

Looking at the sources of growth decomposition, aggregate domestic demand (final household and intermediate demand) was the most important source of output growth. This implies that policies aimed at increasing household demand and also intermediate consumption can spur growth in output. However, the decline in the labour share and consequently a decline in factor incomes undermines the contribution of final household demand to output growth. Also, the contribution of inter-sectoral linkages is undermined by increased import dependency.

In general, it can be concluded that agriculture and manufacturing still have a vital role to play in Kenya's growth and development process. A service-led growth is viable, but its sustainability is debatable.

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Appendix A: Multiplier Analysis

If the amount of sector *i*'s output required for the production of sector *j*'s output X_{ij} is assumed to be proportional to sector *j*'s output X_j, then the input-output coefficients can be given as $a_{ij} => X_{ij} = a_{ij} X_j$. Thus, the domestic input output technology can be expressed as $i^d = (i\text{-}m_i) = AX$, and the value added generation relation as $y = BX$

The direct backward linkage of sector j is measured by the amount that sector j's output uses as inputs from other sectors. Thus, the direct backward linkage of sector j is the sum of the elements of the j^{th} column of the direct-input coefficient

$$BL_j = \sum a_{ij} \text{ where } a_{ij} = X_{ij}/X_j$$

A comprehensive measure of backward linkages includes both direct and indirect effects. The total backward linkage of sector j is measured by the sum of the jth column of the Leontief input-inverse matrix – $(I\text{-}A)^{-1} = Ma$.

Thus, total backward linkages are given as:

$$BLT_j = \sum z_{ij} \text{ where } z_{ij} \text{ is the i,jth element of Ma.}$$

Forward linkages for sector i is the share of its output used by other sectors, weighted by each sector's share in final demand. The direct forward linkage of each sector i is the sum of the elements of the ith row of the direct output coefficient matrix

$$FL_i = \sum a^*_{ij} \text{ where } a^*_{ij} = X_{ij}/X_i$$

Total forward linkages for sector i is the row sum of the ith row of Leontief output-inverse matrix Ma

$$FLT_i = \sum z^*_{ij} \text{ where } z_{ij} \text{ is the i,jth element of Ma.}$$

The power of dispersion or the normalized backward linkage of sector j is the average of the jth column of the Leontief matrix over the overall average

$$B_j = (\sum_i z_{ij}/n)/ (\sum_i \sum_j z_{ij}/n^2)$$

The sensitivity of dispersion or the normalized forward linkage of sector i is the average of the ith row of the Leontief output-inverse matrix over the overall average

$$F_i = (\sum_i z^*_{ij}/n)/ (\sum_i \sum_j z^*_{ij}/n^2)$$

The coefficient of variation gives an indication of how integrated a sector is and, therefore, measures how dispersed a sector's linkages are with all the sectors.

The coefficient of variation for backward linkages is computed as:

$$V_j = \text{square root of } \{\sum (Z_{ij} - \sum Z_{ij}/n)^2 / (n-1)\}/\sum z_{ij}/n$$

A low backward coefficient of variation suggests that a sector's demand is dispersed widely across all sectors, while a high coefficient suggests that the sector draws heavily on only a few sectors.

The coefficient of variation for forward linkages is computed as:

$$V_i = \text{square root of } \{\sum (Z^*_{ij} - \sum Z^*_{ij}/n)^2 / (n-1)\}/\sum z^*_{ij}/n$$

A low forward coefficient of variation suggests that a sector's output that is sold as intermediate consumption is purchased widely across all sectors, while a high coefficient suggests that the sector sells to only a few sectors.

Appendix B

Appendix B1: SAM 2003 sectors

Agriculture	Staples	Maize, wheat, rice, barley, cotton, other grains, roots and tubers, pulses and oils, fruits, vegetables and other crops
	Export crops	Sugar, coffee, tea, cut flower
	Livestock	Beef, dairy, poultry, goats, sheep, other livestock
	Other agriculture	Fishing, forestry
Industry	Food processing	Meat and dairy, bakery and confectionary, beverages and tobacco, other food manufactures
	Light industry	Milling, textiles, footwear, wood processing, printing and publishing
	Heavy industry	Petroleum, chemicals, machinery, non-metallic manufactures
	Other Industry	Mining, other non-food manufactures, building and construction
Utilities	Water, electricity	
Private Services	Hotels, restaurants, trade, transport, communication, financial services, other services	
Public Services	Public administration, health, education	

Source: SAM 2003

Appendix B2: Contribution to output (constant prices – 1976=100)

	Inter mediate Demand (W)	Domestic Final Demand (D)	Export Demand (X)	Imports (M)	Total
1976					
Agriculture, Fishing & Forestry	53.93	23.49	25.12	2.53	100.00
Mining & quarrying	7.14	79.46	22.32	8.93	100.00
Manufacturing	47.13	69.80	21.80	38.73	100.00
Electricity and Water	11.99	92.51	2.25	6.74	100.00
Building and construction	77.56	32.75	0.00	10.31	100.00
Trade, hotels & restaurants	38.74	34.09	30.18	3.01	100.00
Transport & communication	22.46	50.40	37.37	10.23	100.00
Financial services	12.05	85.02	12.38	9.45	100.00
Other services	83.32	6.07	13.51	2.90	100.00
Education	98.49	0.40	1.11	0.00	100.00
Health	104.80	0.00	0.40	5.20	100.00
Public Administration	103.90	0.29	0.00	4.19	100.00
Total	**54.30**	**39.89**	**20.18**	**14.37**	**100.00**
2003					
Agriculture, Fishing & Forestry	50.57	23.34	37.12	11.02	100.00
Mining & quarrying	(1.37)	21.25	89.11	8.99	100.00
Manufacturing	53.44	81.97	21.69	57.10	100.00
Electricity and Water	30.67	69.69	0.00	0.37	100.00
Building and construction	94.25	5.75	0.00	0.00	100.00
Trade, hotels & restaurants	31.30	70.77	0.59	2.66	100.00
Transport & communication	59.88	43.27	19.91	23.06	100.00
Financial services	34.29	72.29	1.49	8.07	100.00
Other services	57.35	42.89	0.03	0.27	100.00
Education	99.53	0.47	0.00	0.00	100.00
Health	100.00	0.00	0.00	0.00	100.00
Public Administration	104.82	5.54	0.00	10.36	100.00
Total	**58.52**	**49.15**	**14.38**	**22.05**	**100.00**

* Total = D + W + X - M

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Njuguna, E. N., Karingi S. N. and Kimenyi M. S. (2003), *Alternative methodologies for measuring Kenya's potential output and output gap.* KIPPRA Discussion Paper No. 28, Nairobi: Kenya Institute for Public Policy Research and Analysis.

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