

A Theoretical Perspective of Structural Change and Economic Development

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Abstract

The process of economic development has been associated with structural change in every economy, following a sequence of shift from agriculture to industry and then to services. The investigation of the models of structural analysis and of theories of structural changes allows to understand the pattern of structural change and the growth of service sector in the national economies. The present paper is a brief review of the various economic theories and empirical studies concerning the relation between economic development/growth and structural change. A large number of studies have been analysed and a synoptic review of some of the research studies/theories are discussed here. The first part of the paper discusses the economic theories and structural change theories. The second part analyses the empirical studies regarding the process of growth and structural change.

Key Words: *Economic development, Structural change, Structural Change Theories,*

Introduction

Structural change means a qualitative transformation of the economy along with evolution of the economic systems. The key contributing factors are technological developments & innovations, intellect and knowledge, organizational set up and institutions etc. which accelerate the process of structural change. Schumpeter (1912, 1939) analyzed and explained the process of development and at the same time took into consideration the mechanisms of transformation of the production system and focused on the models of structural analysis, the methods and principles adopted therein. Structural change and growth of services sector becomes the dominant theme of all the research work. The examination of structural analysis models and structural changes theories clarifies the pattern of structural change and the growth of service sector in the national economies. The striking fact found in the economic growth of the nations is significant difference between rates of growth of productivity and output. Some economies have achieved sustained growth in productivity, while others have shown little or no improvement.

Most of the empirical and theoretical work on growth and structural change has considered aggregate output and productivity as determinants. The process of economic development has been associated with structural change in every economy, following a sequence of shift from agriculture to industry and then to services. The structural change is a process of combining economic growth with changing share of different sectors in gross domestic product (GDP) and labour force. Overtime, countries undergo the process of transforming their structure, away from agriculture with low productivity of labour towards industrial activity with high productivity of labour. Every underdeveloped economy is characterized by larger share of agriculture in domestic income, with development, the share of industrial sector increases and that of agriculture falls and as the level of development rises, the share of services sector increases. The structural shift and changing sectoral shares happen not only in domestic product but also in the shares of employment. Historically, industrial development was considered to be the driving force of modernization but demand for

services continue to rise with economic development and the share of services sector in domestic income started increasing. There is disagreement among economists regarding the causes of structural change in the economies. The demand side and supply side arguments have been put forth. Fisher opines that there is saturation of demand for manufactured goods but high income elasticity of demand for services. Basing his argument on the so-called "hierarchy of needs", Clark argued that demand for services rise with rising income and more employment and output is allocated to the service sector. Income elasticity of demand is the primary reason for changes in economic structure. Chenery argues that as income level rises, the tertiary sector grows at the cost of secondary sector, because the primary sector has already developed up to a minimum level. But Baumol argues that employment shift result from differential productivity growth. Since services sector productivity rises slower than manufacturing activity, employment share of the services sector tends to grow faster. Fuchs opines that demand shifts play a minor role; the shift to services is mainly due to productivity differentials. Kuznets found that the driving force for changes in sectoral composition of output lies in the differences in income elasticity of demand for products of different sectors but caused by differential growth of productivity in different sectors. However, according to Kaldor, growth of services was induced both by requirements of expanding industrial sector and rising levels of income. In short, structural change is associated with faster economic growth and development. Every economy experiences a rise in the share of services in GDP and employment and this is happening at a faster pace.

Objectives: The present paper is a theoretical review of the theory and empirics on structural change.

- 1) Exploring the pattern of structural change.
- 2) Finding theoretical and empirical link between structural change and economic growth.
- 3) To identify the basic issues for further research.

Part-1

Large number of studies have been undertaken to understand the structural change in the national economies. Following is the synoptic review of such studies.

Materials and Methods: A large number of theories and empirical studies have been selected and examined. The paper attempts to understand their methodology of the analysis of structural change.

Classical theories of economic development The literature on economic development can be divided into four major competing lines of thinking.

- 1) The linear stages of growth models (1950s & 1960s)
- 2) Theories and patterns of structural change (1970s)
- 3) The international dependence revolution (1970s)
- 4) The neo-classical, free market counter revolution (1980s&1990s).

The classical economists differentiated between goods and services for the purpose of defining productive labour. Adam Smith's concept of increasing returns based on division of labour, establishes the economic progress as a self -generating process. Increasing returns are experiences by industrial activities found in developed nations and diminishing returns characterize land based activities such as agriculture and mining found in underdeveloped nations. This difference highlights the gaps in levels of development and rich-poor nation divide. Therefore balanced growth is required for proper growth and development. To Smith, exports are significant in development process. The neo-classicals like Alfred Marshall (1890) treated growth and development as a natural phenomenon. The linear stage growth models considered the development process as a series of successive stages of growth through which all countries must pass. The major determinants of development process considered were savings, investment and foreign aid for faster economic growth. The international dependence revolution was more radical

and political. The neoclassical counterrevolution emphasized the beneficial role of free market open economies leading to privatization of inefficient public enterprises. Structural change models highlighted the mechanism by which underdeveloped economies transform their domestic structures from a heavy emphasis on traditional agriculture into more industrially diverse manufacturing and service economies.

Fisher (1935) suggested that economic progress would lead to the emergence of a large services sector which followed the development of a primary and secondary sector. Colin Clark (1940) reformulated this in the form of Clark-Fisher development theory. The Clark-Fisher model comprised of some elements of linear stage models and structural change models. The idea that in capitalist economies, structural change must occur for increasing the rate of economic progress, has served as the basis of modern explanations of development. The Clark-Fisher hypothesis states that development will lead to shifting of labour force to services sector. The main reasons explained for the service sector growth as follows: (1) There is generally a high income elasticity of demand for services, especially leisure, tourism and financial services. More employment and national output are allocated to services production. (2) Productivity in the services sector is lower than in the manufacturing sector because it is harder to apply new technology to improve productivity in services. This means that, over time prices of services rise relative to primary and secondary goods. As a result of high income elasticity of demand and low productivity a rising proportion of national income and consumption is allocated to the services sector

Lewis (1955) expressed his views by developing a two sector and surplus labour model. According to him, the countries need to transform their structures away from agriculture, with low productivity of labour, towards industrial activity, with a high productivity of labour. He assumed two sectors in the economy, rural agricultural sector and an urban industrial sector. The marginal productivity of agricultural labour is zero. Therefore, transferring workers out of agriculture does not reduce productivity in the whole economy. Workers are transferred/employed in the highly productive industrial sector/construction. The Capital accumulation process starts. The capitalist sector/industrial sector enjoys more profits due to increased productivity and reduced cost. These profits are re-invested to accelerate the process of industrialization along with rising capital accumulation. As soon capital accumulates, further economic development can sustain itself. This results in changes in the sectoral composition of output and employment.

Nurkse (1959) & Hirschman (1958) are the propounders of balanced and unbalanced growth theories. according to balanced growth theory as an economy grows, it requires all sectors to grow simultaneously to support each other and become each other's customers. the inter connectedness of different sectors implied that growth was required across the economy simultaneously. It has a strong implication for the government to develop those sectors that might not naturally develop. Big push theories focus on the need for the growth of the economy in a balanced way. Proper balance between the growth of consumer goods and capital goods and between agriculture and manufacturing sector is essentially required.

In contrast, unbalanced growth theory of Hirschman, focused on deliberate imbalancing the economy to provide jerks and jumps to accelerate the rate of overall growth of the economy. If growth is unbalanced, resource prices will rise in slow output growth sectors. This will act as a signal for investors to allocate funds, leading to high levels of investments and growth through more efficient allocation of resources. Finding the industry/sector with largest linkages effect can be done by the government.

Rostow (1960) gave the stages of economic growth which specified five steps through which all countries must pass to become developed. 1) The stage of traditional society. 2) The stage of Preconditions to take-off. 3) Take-off. 4) Drive to maturity and 5) Age of high mass consumption. Each nation is somewhere on this linear spectrum and with the passage of time, move through each

stage in the development process. Traditional society: this stage is characterized by a subsistent, agricultural based economy, with intensive labor and low levels of trading, and more population which is less progressive. Preconditions to take-off: The manufacturing sector starts to develop leading to rise in income levels and changes in birth and death rates. Take-off: a short period of intensive growth, in which industrialization process begins leading to shifting of workers and institutions around a new industry. Drive to maturity: Over long period of time, standards of living rise, use of technology increases, and the national economy grows and diversifies. Age of high mass consumption: This is the last but developed stage. Here, the national economy flourishes in a capitalist system, characterized by mass production and high level of mass consumption. Rostow's stages clearly indicate the changing structure of the economy.

Kuznets (1966) characterize differences in the industrial structure of rich and poor nations find out the long-term changes in the industrial structure of twenty-eight countries, using cross sectional and time-series data. Kuznets based his analysis on twelve sectors divisions(sometimes three sectors-named as A (agriculture, forestry, and fishing), M (manufacturing including mining and construction), and S (transportation, communications, commerce, public utilities, government and other services).) of the economy. His research shows that as countries develop, the agricultural share of the labor force declined. The growth of population exceeded the growth of output of agriculture over time. Therefore, the share of the labor force in agriculture declined but the labor shares of the other two sectors rose. During the early nineties, growth rate of labor-productivity in the developed nations was much higher in the manufacturing and services sector. The shift in the structure of the labor force from agriculture to higher- productivity sectors by itself accounted for about one-fifth of the overall growth in labor productivity, and the remainder was due to productivity growth within each sector. Six characteristics of modern economic growth have emerged. 1) high rates of growth of per capita product and of population in the developed countries. 2) High rate of growth in productivity. 3) Fast pace of structural transformation of the economy. 4) Fast changes in important structures of society and its ideology like urbanization and modernization. 5) Technologically and economically developed countries, is able to connect to other nations in terms of investment. 6) The spread of modern economic growth, is limited in the sense that three-quarters of world population still falls far short of the minimum levels feasible with the potential of modern technology.

Fuchs,V.(1968) developed a general theory of economic development analyzing changes occurring in American economy during that period to understand the changing patterns of employment due to fast growth of service sector. All western economies were experiencing fast growth of employment in service sector. As the Clark-Fisher model find out that productivity growth in the service sector would tend to be much slower than for the manufacturing sector. Therefore, sustainable growth of the services sector itself would need to go through an industrialisation process. A special finding of the study was increasing participation of females in the labour force which led to service sector development.

Daniele Schiliro' (2012) analyses the various models of structural change and tries to find out the methods and principles adopted. It investigates those features of structural analysis of economic systems which were discussed in the works of Leontief, von Neumann, Sarraffa and Pasinetti. There are some common variables like production, growth and structural change which were found, by examining these models regarding the economic structure. The notion of 'relative structural invariance' was found during the analysis, especially used by Leontief and it was also prevalent in classical line of thinking for the structural change. The findings: 1) Economic structure comprises of fixed elements as well as those which may change overtime. 2) Relative structural makes the study of structural change through a 'time differentiated' description of the interrelationships among elements of the economic system and peeps into the complexity of economic structure. 3) It helps in the decomposition of the economic system into sub-units such as industries or single productive processes to reduce the degree of complexity of the analysis. Leontief's input-output method is

consistent with this goal, as it concentrates on a finite variety of characteristics and activities of the economic system, but the structure is determined by the state of technology and not by the assumptions concerning economic agents' or social classes' behaviour, as in Quesnay. Sarraffa works with inter -industry framework and a circular approach, and attempts to decompose the system in sub-units but distinct from Leontief in the sense of given state of technology the price system open analytical system. Von Neumann hypotheses about constant technology and constant non-decomposability of the system. He does not divide the economic system into sub systems as he thinks that decomposability is not essential to reduce complexity in a balanced-growth model .This is due to the fact that there is no structural change in his model. Therefore, his model becomes rigid. Structural analysis implies that the degree of diversity of the economic environment is reduced by the assumption of limited heterogeneity. Hence, a) relative structural invariance. b) the adoption of methods of decomposition. c) the identification of normative conditions of equilibrium are core to the study of structural analysis. This can be found in the works of Quesnay. But he did not use the last condition. Von Neumann did not make use of methods of decomposition. Sarraffa made an important use of methods of decomposition for his analysis. He also adopted an equilibrium concept which was related with possible different solution about income distribution among social classes. In short, the analysis of structural change must involve both qualitative and quantitative transformation. It is therefore essential to develop a proper theory of structural analysis keeping in view the composition of economic structure, institutional social patterns etc. Indeed, Leontief's, Von Neumann's and Sarraffa's models can help to sort out this complex task.

Part 2

Chenery and Syrquin (1975) undertook the study to find out the development patterns across countries and across time within countries with the objective to measure the growth processes accompanying structural change during the period (1950-1970). It redefined the development pattern as follows: "As a systematic variation in any significant aspect of the economic or social structure associated with a rising level of income or other index of development." Development is a multi-dimensional process involving the re-orientation and re-organization of entire economic and social systems. The levels of income, and output change, involving changes in the institutional, structural and social setup., Many of the countries with different institutional features have chosen different economic policies to achieve development and growth, but the significant role of structural differences is important to understand the development process. With the emergence of endogenous growth theory, the focus and interest in structural analysis has reduced. It linked economic growth to production functions with either increasing returns to scale or non-diminishing returns to reproducible capital. At the same time, factors like income distribution, political instability, influencing the effectiveness of physical and human capital, are getting attention. Considering economic structure, the growth literature has limited the analysis to investment shares, trade shares and trade intensities, and financial market development. The above analysis has shown that many more structural features exist that can explain why growth and development succeeds or stagnates. Although, economic structure cannot be changed in the short run, it is endogenous in the long run.

Branson, W.H., Isabel, Bernhard G (1998) study the patterns of development for 93 countries over 25 years(1970-1994). The study considered 45 macro-economic variables like sectoral shares of GDP, trade intensity, or financial market development to define economic structure. The four country groups are based on the 1996 World Development Report's classification of low-income, lower-middle-income, upper-middle-income, and high-income countries. The study shows that a systematic relationship exist between the level of GDP per capita and macro-economic indicators. These variables are: sectoral composition of output, shares of investment and savings and consumption to GDP, Shares of govt. expenditures and revenues , inflation and money supply, overall trade and import related variables, export related variables, export product concentration, market power in the world export markets and financial market development. These relationships are confirmed by

statistical tools like scatter diagrams, group averages, regressions etc. The findings show that the share of agriculture in GDP falls and of industry, manufacturing, and services increase as development proceeds. The coefficients of determination vary between 0.81 and 0.83 for the regressions related to the share of agriculture and between 0.33–0.43, 0.25–0.45, and 0.47–0.52 for the shares of industry, manufacturing, and services, respectively. The results are strong enough because they provide always significant β s (income parameters) at the 99% level. Given the robustness of these relationships and the fact that the analysis is based on the actual experience of ninety-three countries from the period of 1970–94, these relationships can be set as stylized facts of development patterns for 1970–941). As GDP per capita rises, the share of agriculture in GDP falls and the shares of industry, manufacturing, and services to GDP rise. 2) The shares of gross domestic investment, domestic fixed investment, and fixed private investment in GDP increase as development proceeds. 3) The savings ratio rises with rise in GDP per capita as a result, the shares of total and private consumption in GDP fall. 4) Higher GDP is associated with higher government- revenues and expenditures. 5) As development proceeds, there is a decline in current account deficits and capital account surpluses due to rise in trade intensity. 6) The shares of total exports and merchandise exports in GDP increase as GDP per capita rises. As GDP per capita rises, the share of machinery exports in GDP as well as in total exports increases and the share of primary exports in total exports decreases. 7) A country's export product concentration is higher, the poorer the country is. 8) A country's market power in world exports is higher, the more developed it is. 9) A positive relationship is found between GDP per capita development and financial market development. Finally, the development patterns show that structural differences are significant understanding the development process.

Pieper (2000) evaluates 30 developing countries over two periods, 1975–84 and 1985–93, based on a four-sector breakdown: agriculture, industry (mining, manufacturing and construction), industry services (public utilities, transport, storage and communication, and finance, insurance, real estate and business services) and other services. The study provides evidence that industry's contribution to aggregate labour productivity growth rises in both the time periods, followed by other services. The contribution of these two sectors was stable between the two periods, but there was a big shift away from agriculture towards industry services, illustrating the increased importance of the latter in contributing to aggregate labour productivity growth. Looking at individual countries, Pieper observes that the more rapidly growing countries in Asia had large and often increasing contributions of industry to aggregate labour productivity growth, whereas many countries in Latin America and sub-Saharan Africa had low or declining contributions of industry.

Timmer, Marcel P., Vries, G.J. (2008) developed modified shift share analysis to measure the growth accelerations and decelerations trends in long-term. It measures the rise in productivity due to sectoral contributions so as to measure the contribution to growth from expanding sectors. It is applied to the GGDC 10-sector database, with annual time series of value added and persons employed. The study is done for the 19 countries in Asia and Latin America for the period from 1950 to 2005. The findings: 1) Reallocation of employment to more productive sectors fail to explain the growth accelerations rather it is better explained by productivity increases within the sectors. 2) The productivity improvement in market services occupies more significant place than manufacturing. 3) The factor markets disequilibrium due to gaps between average and marginal productivity remained unexplained by the standard shift share analysis. Therefore the modified shift share analysis is superior in the sense that it decomposes GDP per worker to know the growth accelerations and decelerations in developing nations. 4) Shadow prices of labour has been used to measure it. Therefore, growth accelerations are measure by productivity increases within sectors.

Nobuya Haraguchi (2010) examined the relation between structural change and manufacturing sector in the economy by estimating the patterns of structural change across income levels based on the panel data of 100 countries. With the rising levels of nations' incomes, the share of agriculture tends

to decline while the share of services gradually increases. But the manufacturing sector continue to maintain its significance/share in GDP throughout the course of development and remain as an engine of growth. At low and lower middle income levels, at a relatively early stage of development, the manufacturing sector contributes at a fast rate but in a disproportionate manner. As the economy approaches the upper middle levels of incomes, the rise in the share of manufacturing sector slows down and reaches its peak before the country moves into a high income level.

Dale W. Jorgenson and Marcel P. Timmer (2011) tried to give evidence on the patterns of structural change in advanced economies, reconsidering the stylised facts put forward by reknowned economists like Kaldor (1963), Kuznets (1971), and Maddison (1980). Since 1980, the services sector has grown in the European Union, Japan, and the US, but there is substantial heterogeneity among the growth rates of various activities of the services sector. The activities with low productivity growth but rising shares in employment are- Personal, finance, and business services .The activities like distribution services occupy constant shares with rapid productivity growth. in all sectors across all regions, there is intensive use of ICT capital and skilled labour, resulting in declining share of labour in value-added. Nicholas Kaldor(1963), Simon Kuznets(1971), and Angus Maddison (1980) found many empirical regularities in the structural transformation of advanced economies . Kuznets and Maddison described the canonical shifts of output and labour first from agriculture to industry, and later from industry to services. The study confirmed the cost-disease of services hypothesis of Baumol (1967) that productivity growth in the services sector remained lower than in the rest of the economy, but services output prices tended to increase more rapidly. The remarkable feature is that the stability of the share of labour in GDP over time was found. This study aims to find out whether these stylised facts are able to explain the modern development process and structural changes. The data have been taken from EU KLEMS for Austria, Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Spain, and the United Kingdom. Output and inputs have been aggregated on the basis of relative prices of output. The study investigates the long-run growth patterns since 1980 across three major regions—Europe, Japan, and the US. It stresses that a radical shift of emphasis from goods production to the production of services is needed. Dividing the economy into three sectors is not significant as agricultural sector has become small and services sector comprise about three-quarters of GDP. The services sector itself is heterogeneous. The trend of growth in personal, finance, and business services is in tune with the classical pattern of low productivity growth, rising relative prices, and increasing shares in employment and GDP. The rising trend is depicted by non-market services both in GDP and employment. On the other hand, the shares of distribution services have been stable, and productivity growth has been rapid. These findings are dissimilar to Kaldor's findings in the sense that the labour share in value-added has been declining in all sectors and regions over the period 1980-2005, except in US finance and business services..

Cortuk, O. and Singh, N. (2011) prepares indices of structural change on the basis of time series analysis to find the links between structural change and growth in India. It has been found that those economies which experience structural change, has faster economic growth. This study has been able to establish linkage between economic growth and structural change in India. The results locate the year 1988 as a break year for economic growth and structural change in India as no evidence for this linkage before 1988 but one-way causality from structural change to growth in the period 1988-2007. National Accounts gross domestic product (GDP) data from 1951 to 2007 at 1999- 2000 prices have been used to calculate Growth rates following Dietrich (2009) methodology .The results show that Indian economy has only one structural break, which is at 1988, for the period from 1951to 2007. This structural break allows us to identify a significant positive impact from structural change to growth, but only in the latter period. Furthermore, there we find Granger Causality from structural change to growth for this period, 1988 to 2007. However, there is no such relationship for the period 1951-1988. Therefore, one of the sources for increasing growth rates observed in the last two decades is the structural change of the Indian economy.

Singaryia (2015) used panel data collected from the CSO for thirty two states and UTs of India for the recent period of 2004-05 to 2013-14(the constant prices 2004-05).The study highlights the effect of structural change on economic growth. It examines these relationships in an augmented Chenery-Syrquin Model, and test whether the high income states, EAG (Empowered Action Group) States and high densely states have had any structural impact. It finds the type of structural trends adopted by the economy in such a high growth period. Results of random effect model show that any increases in the shares of manufacturing sector and industrial sectors have significant positive effect on economic growth. The patterns of industrial sector has significant positive effects on population density. These relationships suggest that most densely populated states can achieve economies of scale, resource endowments and scale of domestic demand easily and hence population density plays an important role in the patterns of industrial and manufacturing development. The time trend seems to have significant negative association with industrial orientation and dummy for high income states has significant positive association with service sector and significant negative association with agriculture and manufacturing sectors.

Results and discussions: The review of studies on structural change highlight the following results.

- 1) The sustained growth and development are associated with structural transformation which involves a reallocation of resources from low to high productive sectors.
- 2) All national economies, developed or underdeveloped experience the process of structural change.
- 3) There is significant difference between the pattern of structural change and economic development process of different economies.
- 4) There is difference of opinion among economists regarding the causes of structural change. Some economists consider the demand side more important while others the supply side. Many economists consider productivity changes a major factor of structural change.
- 5) Most agree to develop a proper theory of structural analysis keeping in view the composition of economic structure , institutions and social patterns.
- 6) Some empirical studies focus also on factors like, income distribution, political instability, influencing the effectiveness of physical and human capital and size of population.
- 7) The above studies show that a systematic relationship exist between the level of GDP per capita and macro-economic indicators like sectoral composition of output, investment, savings and consumption ,govt. expenditures and revenues etc.

Conclusions:

- 1) The most significant fact concluded from the above studies is that the nations undergoing faster structural changes experience faster economic growth rate as compared to those which are slow in their structural transformation.
- 2) The changes in structure of the economy brings changes not only in the domestic product but also in the employment structure.
- 3) Developed and underdeveloped economies are experiencing a faster growth of service sector. The underdeveloped economies of Asia, Africa and Latin America are also striving hard to bring structural changes to accelerate the rate of their economic development and faster service sector growth to compete with the developed economies.

Issues for further research:

More and more studies can be explored for to understand the structural change patterns. The emerging trends of different countries can be examined and compared and determine the development strategy.

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