Development Journal of the South

Volume 1 | Issue 1   Article 3

1-1-2015

Agriculture, Labor Intensive Growth, and Structural Change: East Asia, Southeast Asia, and Africa

Richard Grabowski

Follow this and additional works at: https://digitalrepository.unm.edu/djs

This Article is brought to you for free and open access by UNM Digital Repository. It has been accepted for inclusion in Development Journal of the South by an authorized editor of UNM Digital Repository. For more information, please contact disc@unm.edu.

Agriculture, Labor Intensive Growth, and Structural Change: East Asia, Southeast Asia, and Africa

Richard Grabowski

ABSTRACT

In this paper, it is argued that physically abundant labor is not necessarily cheap labor. The latter depends upon the cost of food staples. Given the non-tradability of the latter, rapid growth without rapid agricultural productivity growth will make labor increasingly costly. This will make the transition to labor intensive manufacturing and the exportation of such products very difficult. More importantly, it results in a structural change process in which the economy skips manufacturing and instead shifts in to capital intensive services. The experiences of Taiwan, Indonesia, and Uganda are used to illustrate these ideas.

Keywords: Agriculture, Staple Foods, cheap labor, Structural Change.

I. INTRODUCTION

In the postwar period, rapid economic development has occurred first in East Asia, then in parts of Southeast Asia, and most recently in China. A common element in the successful growth of these countries has been rapid export growth focused on labor intensive manufacturing. This type of growth has allowed many of these countries to utilize abundant labor existing in the countryside to fuel rapid economic growth. The result has been rapid structural change in both production and employment. That is, the share of Gross Domestic Product (GDP) produced by agriculture declined and the share produced in manufacturing has increased. Similarly, the share of employment in agriculture declined while the share of employment in manufacturing increased.

Many economists argue that Africa and parts of Asia have a great opportunity to rapidly develop. Specifically, East Asia has progressed to the point at which these countries are now becoming capital abundant (physical as well as human capital). Thus government policy there has aimed at expanding capital intensive firms and industries. Southeast Asia and China are also finding their underlying factor proportions changing, with various forms of capital becoming increasingly abundant relative to labor thus requiring a shift in resources and a change in economic policy.

At the same time, rapid population growth in many parts of Africa is making this region increasingly labor abundant. Thus with a change in strategy, rapid growth in labor intensive manufacturing could offer an opportunity to dramatically transform the structure of African economies (Lin, 2012). Traditionally, policy in Africa has been driven by import substitution goals which tended to promote capital intensive sectors of the economy. This involved a number of different policies. Tariffs were often used to protect capital intensive domestic production, foreign exchange rate controls were used to allocate foreign exchange to these firms, and

financial suppression sought to direct domestic savings to these same firms. The emphasis of these policies was to promote economic activities in which these nations did not currently have a comparative advantage and thus were comparative advantage defying (CAD) (Lin, 2003). Recently, reforms have swept away many of the policies promoting infant industry (capital intensive) development. Tariffs have been reduced while exchange rates have been deregulated. In addition, credit reforms have aimed at allowing saving and investment to be more efficiently allocated. Growth has accelerated in many parts of Africa. However, transformative development awaits a government driven policy to promote labor intensive manufacturing.

There are a number of criticisms that can be made of the idea that liberalization can unleash long-run growth in Africa and regions of Asia. This sort of approach ignores the role which colonization has often played in the development of these regions. It also ignores the fact that institutions are critical to successful overall development. In addition, the switch to more labor intensive strategies of development will also require significant subsidies, since markets are subject to significant failure in these regions. The subsidies required to promote labor intensive development would likely be less than those required for an import substitution strategy of development, since the former is in greater conformity with existing relative factor proportions (labor abundance), but government led investment co-ordination is still likely to be necessary. These are important problems, but this paper will focus on another difficulty. The assumption underlying the above thinking is that if labor is physically abundant, it must be relatively cheap and therefore it will be relatively easy to promote labor intensive manufacturing. But this may not be true. Labor which is physically abundant may not be relatively cheap.

The argument is fairly straight forward. Staple food products make up a large share of the budget for populations in poor countries (47%) compared with richer countries (13%) (Regmi, Deepak, Seale, and Bernstein, 2001). Thus rising prices of staple foods will drive up the wage rate that must be paid for labor (classical argument). In fact, according to the World Food Organization (FAO), world food prices have been rising since 2000. Thus comparing two countries, one where food staples are relatively cheap and one where they are expensive, labor in the former will be relatively cheap relative to the latter.

The above argument raises the question of why surplus food in the country where it is cheap is not exported to the country where it is expensive. It will be argued in this paper that for many of the poorest countries in the world (particularly those in Africa), staple grains are non-tradable goods. Furthermore, markets for staple foods are often very thin. That is, the trade in such goods makes up a small share of the total production. Thus small changes in the demand for a food staple by a large country can have dramatic effects on the price of food (price of the food staple is endogenous).

The model utilized in this paper is dualistic in nature. The traditional sector produces non-tradable food staples and services (McArthur & Sachs, 2013). The modern sector produces tradable manufactured goods and non-tradable modern services and possibly a commercialized primary export product. It is presumed that modern sector services are more capital intensive than manufacturing (primary product exports may be more capital or labor intensive than manufacturing).

Saving and capital accumulation in the modern sector will cause the modern sector to expand, drawing labor from the traditional sector. If this accumulation occurs at a rate faster than the growth of staple goods production in the traditional sector, food prices will rise and labor will become increasingly expensive. Production processes in the modern sector will in turn become increasingly capital intensive. The result will be that the share of GDP devoted to labor intensive

manufacturing will decline, the share of such production devoted to modern sector services will rise, and the competitiveness of primary product exports will decline (especially if it is labor intensive). Thus there will be economic growth, but not structural change (transformation) as economists have generally thought of. Specifically, production will shift from agriculture to services, skipping manufacturing and a large proportion of the labor force will remain in the traditional sector. Growth will generate slow modern sector employment growth.

The paper is organized as follows. Section I will more fully develop the theory (closed economy) which underlies the paper while Section II will develop the semi-open version of the model. Section III will use the theory to examine the experience of three countries: Taiwan, Indonesia, and Uganda. The first two represent the experiences of an East and a Southeast Asian country where rapid growth in food staples kept the price of food from rising, thus keeping labor cheap. Uganda will represent an African nation that has experienced rapid growth without economic transformation. These countries are chosen for examination for several reasons. First they represent East and Southeast Asia and Africa. These are regions within which rapid growth has occurred. They also allow one to contrast areas where rapid growth in agricultural staples has succeeded with that in which such growth has failed to occur and this permits a comparison of structural change patterns. The main contribution of the analysis is to show how structural change without growth in staple food productivity leads to a very different form with growth in capital intensive services replacing growth in labor intensive manufacturing. Finally, Section IV will summarize the paper and discuss policy implications.

II. SOME THEORY (CLOSED ECONOMY)

The models which will be developed here are dualistic in nature. The first model to be examined is that of Lewis (1954). He divided a developing country's economy into two parts, a modern and traditional sector. The distinction between the two sectors was based on how decisions were made. The modern sector maximizes profits and engages in all the types of activities associated with that. The traditional sector makes decisions utilizing tradition, usually represented by paying labor its average product (sharing mechanism).

The modern sector utilizes capital and labor, saves, and accumulates capital. The traditional sector uses only labor and land, does not save, and accumulates no capital. This sector involves the production of food staples and traditional services. The modern sector involves manufacturing, modern services, etc.

Assuming that the model is closed to international trade, the growth process unfolds relatively simply. Saving and capital accumulation in the modern sector results in economic growth. Lewis presumed that the traditional sector was characterized by surplus labor (the marginal product of such labor is zero). As expansion occurs the production of food staples in the traditional sector does not decline as the modern sector expands, thus growth occurs with structural change (the share of agricultural employment in total employment declines and the share of agricultural production in total production also declines).

However, difficulties arise when the surplus labor in the traditional sector is exhausted. Then capital accumulation and growth in this sector will draw productive labor from the modern sector, staple food production will decline, food prices rise, wages to the modern sector increase,

profits and investment in this sector will decline. Growth, in a sense, is strangled by increasing wages driven by scarce food. Growth and structural transformation would be halted.

One can further extend the Lewis model by allowing the modern sector to adjust to the rising costs of labor. As the cost of labor rises (due to the increasing cost of food staples), production processes in the modern sector will become increasingly capital intensive. As a result, economic growth could occur via saving and capital accumulation, but the growth in the demand for labor by the modern sector will be slow or non-existent. Thus growth would occur and structural transformation in terms of production would occur, but not structural transformation in terms of employment.

Many economists have criticized the Lewis' model for its assumptions concerning decision making in the traditional sector and the concept of surplus labor. However, one can drop these aspects and still have a model in which dualism is related to consumption patterns. Assume that participants in both the traditional sector and modern sector maximize profits and that there is no surplus labor. However, the traditional sector produces outputs (staple foods and services necessary to provide local access to such foods) that are necessary to provide some level of subsistence for each family. Eswaran and Kotwal (2004) have developed dualistic models in which it is presumed that preferences are non-homothetic in nature. That is, as long as a family's income is below a specific level, all income must be spent on staple goods and services produced in the traditional sector. However, once income rises above that level, the proportion of income spent on food and food related services declines continuously. One can think of this level of income as the subsistence requirement for consumption and the specific income at which the switch takes place can vary from family to family.

In this context, at very low levels of income all spending is devoted to agricultural food staples and thus there is no opportunity for modern sector production to succeed. As productivity rises in agriculture, income per person will begin to rise and some families will begin spending a portion of their income on modern sector goods. The modern sector will begin to grow and draw labor out of the traditional sector. This labor can be released from the traditional sector without causing a rise in the relative price of food staples. The rate at which labor can be drawn out (without increasing food costs) will be dependent upon the rate of growth of agricultural productivity. Thus structural change occurs via demand and supply factors. For the demand for non-agricultural modern goods to grow, income among rural producers must rise above subsistence levels. For the labor to be able to exit the traditional sector it must be possible for that labor to be fed cheaply.

Thus the character of the growth process will be the result of the interaction of two forces, saving and capital accumulation in the modern sector and agricultural productivity growth in the traditional sector. If savings and investment in the modern sector occurs at a faster rate than productivity growth in agriculture, then wages to the manufacturing sector will rise, growth will become more capital intensive, and structural change in terms of employment will lag.

One further extension to the above analysis can be made. One can think of the modern sector as composed of manufacturing and modern services and the traditional sector as composed of agriculture (food production) and traditional services. Modern sector services are highly capital intensive in nature, especially human capital intensive. Alternatively, traditional sector services are labor intensive in nature (utilizing unskilled labor). Now if one includes human capital in the category of capital and if modern sector services are more capital intensive than manufacturing, then an interesting result emerges. Slow agricultural growth will imply that savings and capital accumulation in the modern sector will cause the costs of labor to rise. This will cause

manufacturing and modern sector services to become increasingly capital intensive. In addition, resources will tend to shift out of manufacturing and into modern sector services (since the latter is less reliant on labor which is becoming increasingly expensive). Those unable to find work in the modern sector would join the traditional service sector.

The analysis in the previous paragraph is partly based on the notion that the modern service sector is less labor and more capital intensive (including human capital) than manufacturing. Evidence on the factor intensity of services is somewhat limited. However, the experience of India indicates that much modern sector growth there since the 1990s has been driven by a capital intensive services sector (Kochar, Kumar, Rajan, and Subramanian, 2006). If one includes human capital within the concept of capital, then it is very apparent that modern service firms have been much more capital intensive than manufacturing. This is supported by the work of Ramaswamy, et al., (2012). They utilize National Sample Survey data 1999-2000 and 2009-2010 to examine human capital levels for modern sector service relative to modern sector manufacturing and find that the former is much more human capital intensive than the latter. One last point needs to be made, even if modern sector services are not more capital intensive than manufacturing, the fundamental results of the model remain unchanged. Lagging growth in food production will cause modern sector production to become increasingly capital intensive thus slowing or preventing structural change in terms of employment.

III. SOME THEORY (SEMI-OPEN ECONOMY)

Up till now the assumption has been that the economy is closed in nature. Opening the model to trade implies that slow agricultural growth would no longer have the structural implications discussed above. The availability of cheap food staples via trade would keep labor cheap. Physically abundant labor would be economically cheap labor. Modern sector, labor intensive growth could occur without fears of rising food prices. However, no economy is completely open. Most developing economics are, as Myint (1975) has pointed out, semi-open in nature. By this he meant that a significant part of the domestic economy remains insulated from the impact of foreign trade and comparative costs so that the agricultural sector's contribution to domestic food supply can be treated as though it was still in a closed-economy model.

It is argued here that staple foods represent non-tradable goods and sectors. Few developing countries rely upon trade to meet their critical food needs. In most developing countries the proportion of the population of labor employed in agriculture significantly exceeds the proportion of output produced in agriculture which in turn implies very low agricultural productivity. Much of the labor employed in agriculture is focused on the production of staple foods. The FAO reports that in 2000 almost 70% of the arable land in 159 developing countries was devoted to food staples (grains, pulses roots, and tubers). Of this production, almost all of it was devoted to domestic consumption. As an example, only a few developing countries are net exporters of grain and of them only one, Argentina, exported more than one quarter of its grain production. A similar story can be told with respect to the production of roots and tubers. FAO data shows that most poor countries meet their food demands for these goods via domestic production. In summary, in developing countries most of the resources are used to produce food, the labor resources required to do this are large, and "it is reasonable to view most economies as closed from the perspective of trade in food" (Gollin, Parente, and Rogerson, 2007).

A further implication of the above is that when markets for food staples do exist, they are often quite thin. That is, of the total production of a food staple (worldwide), the percent that is actually traded is very small. As a result, changes in purchases on the international market by any fairly large economy will have dramatic impacts on the price of a particular food staple. Thus when countries participate in the market it is not a small country case (price of food staple is exogenous), but instead a large country case (price of food staples is endogenous).

Thus the last model to be developed here will be a semi-open economy in which staple food production and services, both traditional and modern sector services, are assumed to be non-tradable. Both manufacturing and a primary product modern sector export good are assumed to be tradable. It will be assumed that the modern sector primary product export and the manufacturing sector are initially labor intensive, while the modern service sector is assumed to be capital intensive. The country is assumed to be large with respect to international trade in food staples.

Saving and investment in the modern sector will initially cause the labor intensive primary product export crop and labor intensive manufacturing to grow relative to the capital intensive modern sector services. However, if agricultural staple food production remains stagnant or grows sluggishly, then the relative cost of food to the modern sector will rise. Labor that may be physically abundant will become increasingly expensive (wages will arise). As a result, both primary product exports and manufacturing will become increasingly capital intensive. Since these two sectors are tradable, they will find it increasingly difficult to compete. Thus their share in GDP is likely to decline. Growth will occur, but structural change in terms of employment is not likely to occur and exports will likely fall.

A similar type of scenario has been developed in the work of Delgado, Minot, and Tiongco (2004). They have argued that for a number of countries in Africa food staples are, to a great extent, non-tradable goods. This is due to the fact that many parts of African nations are isolated due to a lack of adequate transportation and communication infrastructure. Thus the costs of transporting goods to market in effect isolate these production processes from international markets. Also, markets for staple food products are very thin, as discussed above. As a result, rapid primary product export (coffee, sugar, etc.) growth may be constrained because of rising food costs. This would be especially so if the production of this export product was labor intensive. Thus rapid export growth combined with stagnant or slow growth in food productivity would raise wage costs to the export sector. These rising costs might very likely inhibit further growth. The analysis of this paper adds labor intensive manufacturing to the modern sector and argues that rapid expansion of labor intensive manufacturing is also likely to be constrained in those situations in which labor may be physically abundant, yet increasingly expensive.

Contrast the situation above with an alternative scenario. Savings and capital accumulation in the modern sector will increase the demand for labor. Rapid productivity growth in staple foods (non-tradable) keeps the price of food low. The result is that labor which is physically abundant will also be economically cheap. As a result, the labor intensive primary product export product and labor intensive manufacturing will both expand as share of GDP and as shares of total employment. Structural change in terms of both output and employment will occur.

If one assumes that learning by doing occurs in the modern sector (labor intensive manufacturing) then it is possible that this sector will begin to evolve a comparative advantage. Thus exporting such manufactured goods may become possible. Of course, making the shift from

manufacturing for the local market and producing for international markets always proves to be difficult. Because of externalities and market failures it is difficult for labor intensive firms to export even if labor is economically cheap. This opens the possibility for some sort of industrial policy aimed at promoting comparative advantage following exports (CAF). This type of policy in this scenario can succeed. This is contrasted with a situation in which labor, though physically abundant, is not economically cheap as staple food crops become more expensive. In this situation, government policy aimed at a CAF strategy will fail.

One final point needs to be made before the end of this discussion. In the first scenario in which growth in the modern sector is not matched by agricultural productivity growth, the ensuing growth process is likely to be very unequal. The structure of the economy shifts in a capital intensive direction, slowing employment growth. Such an increase in inequality is likely to create significant problems for further growth and development. The political legitimacy of the state is likely to be brought into question and institutional quality is likely to decline. Alternatively, in the second scenario in which productivity growth in staple food is rapid, the structure of the economy will shift in the labor intensive direction. Thus employment opportunities are likely to grow rapidly leading to a more equal dispersion of the benefits of growth. The state's legitimacy is likely to be enhanced resulting in an improvement in institutional quality.

The following section will try to illustrate these ideas by drawing on the experience of Taiwan, Indonesia, and Uganda. These represent three countries which have experienced rapid growth. Taiwan's take off began in the 1960s and early 1970s, Indonesia in the 1980s and 1990s, and Uganda in the 1990s. These countries represent three broad geographical areas. Taiwan is in East Asia and industrialized beginning in the 1960s. Indonesia is in Southeast Asia and is still undergoing the process of industrialization. Uganda is in the beginning stages of economic development. All three countries experienced periods of exploitation under colonial rulers. All three pursued periods of import substitution policies aimed at promoting industrialization. They all began as exporters of primary products with economies fundamentally rural based. Obviously the geographies and institutional structures are different. However, all three faced the same fundamental agricultural problems. If manufacturing was to grow and employment in non-agriculture expand relative to agriculture, then the food problem would have to be solved. This would be true whether rapid growth occurred in the 1960s and 1970s (Taiwan), 1980s and 1990s (Indonesia), or 1990s and 2000s (Uganda).

Before closing, it must be pointed out that wages in the modern sectors of developing nations are determined by a number of factors others than just food availability and cost. New technologies which raise labor productivity will generally cause real wages in the modern sector to increase. However, food scarcity and food costs are likely to limit any wage increases due to increased labor productivity in the modern sector. What becomes crucial is increasing labor productivity in food production.

IV. RESULTS

Country Experiences: Taiwan, Indonesia, and Uganda

One cannot understand the role of agriculture in Taiwanese growth without first looking at how it fit into the Japanese Empire before World War II. Taiwan became a colony of Japan in 1894, but did not play an important economic role in the Japanese Empire until early in the 20th century.

Japan's modern period of economic growth began in 1868 with the Meiji restoration. The Japanese feared colonization by the West and thus began to promote rapid expansion of labor intensive manufacturing, given the relative physical abundance of labor. However, the government recognized the important role that rice played as a wage good for industrial workers. Specifically, rice was the source of 60% of the total calorie intake of the Japanese prior to World War II. Thus agricultural policy was aimed at expanding productivity in rice production via the establishment of research and extension institutions as well as the investment in agrarian infrastructure (Hayami, 1972).

The agrarian aspect of the Japanese development strategy was required given the fact that a substantial part of rice production remained subsistence oriented (non-tradable) and the international market for rice was very thin, meaning a small proportion of world production was actually sold in international markets. Thus Japan was a large country with respect to the rice market. The strategy worked fairly well with agricultural productivity growing at approximately 1.2% per year for the period 1876 to 1904 (Yamada & Hayami, 1979).

However, the technological potential for agriculture was slowly exhausted and the research necessary to create new technological potential would take years to bear fruit. As a result, Japan became a net importer of rice and thus became subject to potential spikes in the price of rice. The rapid growth of labor intensive manufacturing intensified this problem and in 1918 a dramatic rise in rice prices precipitated rice riots in many of the urban areas of Japan. This threatened to derail the rapid growth of labor intensive manufacturing and also threatened the growth of an important labor intensive export, silk. These developments led to the government of Japan organizing an imperial self-sufficiency program. The aim of this program was to develop the rice production capacity of its colonial empire (most importantly Korea and Taiwan). It sought to invest in irrigation and water control and research and extension in order to adapt high yielding Japanese seed varieties to the circumstances existing in Korea and Taiwan.

The efforts were quite successful. Productivity rose rapidly in Taiwan, less so in Korea, and much of this output was then sold to the Japanese mainland. Rice prices were dramatically reduced and most importantly stabilized (Hayami, 1972). Rapid expansion of labor intensive manufacturing and exports was sustained.

With the end of World War II, Taiwan ceased to be a colony of Japan. It now faced its own development problem, exacerbated by the arrival of the Nationalists from the mainland. Labor was physically abundant in Taiwan, but it was not going to be necessarily cheap. However, Taiwan inherited the agrarian infrastructure created by the Japanese in their drive to enhance rice production for the Japanese homeland. In addition, in the late 1940s and in the 1950s, Taiwan received significant aid from the U.S., but this effectively ended in the early 1960s.

The Taiwanese government sought to build upon this existing infrastructure and technology by initially expanding investment into irrigation, agricultural research, and extension. As a result agricultural output grew at 4.7% from 1951 to 1960 and at 4.2% from 1960 to 1970 (Lee & Chen, 1979). However, this paper is mainly concerned with the production of food

staples in particular. Table 1 provides data concerning production of these food commodities per capita and as can be seen food production per capita increased from 1973 to 1996.

Table 1: Food production Per Capita (index): Taiwan

Year	Food Production Index	Year	Food Production Index
1973	95.84	1985	110.39
1974	96.44	1986	106.87
1975	90.61	1987	111.4
1976	100.5	1988	111.37
1977	106.43	1989	112.47
1978	104.96	1990	111.15
1979	111.69	1991	115.34
1980	107.36	1992	114.31
1981	103.64	1993	119.31
1982	103.62	1994	119.11
1983	106.05	1995	121.94
1984	106.85	1996	124.39

Source: Food and Agriculture Organization

Given the analysis of the previous section, the hypothesis would be that food would have remained relatively cheap. The only reliable data on food prices concerns rice. Table 2 presents data on the real price of rice. As one can see, other than the mid-1970s, the entire period is characterized by stability in the real retail price of food. Rice remained cheap.

The final implication of the theory discussed above is that where food is cheap, labor will be economically cheap and economic growth will be labor intensive. Wage data for the 1970s and early 1980s is not available for a broad enough spectrum of manufacturing. However, if the theory is correct one should find production characterized by labor intensity and, most importantly, exports should be labor intensive in nature. The work of Ho (1978) is particularly useful here. He ranks the labor intensity of sectors by value added per employee and total assets in operation per employee. He finds that there is a shift in export composition with agricultural and processed agricultural products dominating before the mid-1960s and labor intensive manufacturing, in particular textiles, dominating after that date. For this to have occurred, labor must have been relatively cheap.

Table 2 Real Price of Rice: Taiwan

Year	Retail Price ($/ton)	CPI	Real Price
1952	201	0.105	1,914
1953	210	0.125	1,680
1954	187	0.127	1,472
1955	127	0.139	914
1956	136	0.154	883
1957	147	0.166	886
1958	101	0.168	601
1959	109	0.186	586
1960	138	0.22	627
1961	147	0.237	620
1962	146	0.243	601
1963	148	0.248	597
1964	149	0.248	601
1965	151	0.248	609
1966	153	0.252	607
1967	160	0.261	613
1968	171	0.281	609
1969	176	0.295	597
1970	183	0.306	598
1971	190	0.315	603
1972	203	0.324	627
1973	239	0.351	681
1974	448	0.517	867
1975	474	0.545	870
1976	471	0.558	844
1977	426	0.597	714
1978	451	0.632	714
1979	544	0.825	659
1980	656	0.968	678
1981	674	0.988	682
1982	705	1.002	704
1983	636	1.002	635
1984	682	1.002	681
1985	603	1	603
1986	659	1.007	654

Source: International Rice Research Institute (1991)

This sort of rapid labor intensive growth based upon abundant and, most importantly, cheap labor was not limited to East Asia. One can also find an outstanding example of these

processes in Southeast Asia as well. Specifically, Indonesia represents a country in which rapid growth in agricultural production was the key to labor intensive manufacturing.

During the Sukarno era the performance of the economy was bleak. From 1950 to 1965, GDP grew at 3% per year whereas population growth was approximately 2% a year (Linblad, 2010). In the latter part of this period economic performance significantly deteriorated. Budget deficits became endemic, domestic savings were low, and little new foreign investment was taking place. Increasingly the government under Sukarno relied upon policies aimed at expanding the money supply to finance government deficits combined with export and import taxes and significant regulation of foreign exchange activities. The result was falling incomes and hyperinflation. It is estimated that 80% of the population was absolutely poor in late 1966 and early 1967, with average food intake less than 1600 kilocalories per day. Hunger was widespread and rice was scarce (Timmer, 2004). High food prices and food riots were common during Sukarno's last years in power. In terms of the analysis of this paper, labor was certainly physically abundant, but it was not cheap.

Indonesia has historically been a net importer of rice, relying on the international rice market for about 4-5% of total supply. Given the large size of the Indonesian population, it is evident that in terms of rice Indonesia is a large country. In addition, in the late 1960s much rice production was for subsistence. Thus the rice price in Indonesia was endogenously determined and the scarcities of the late 1960s and 1970s made it impossible to expand labor intensive manufacturing.

With the emergence of a new ruling elite led by Suharto (and the fall of Sukarno) an emphasis on agriculture and, in particular, rice production evolved. Hence in the first five year plan priority was given to agricultural development (Elson, 2001). Earlier, in 1967, Badan Urasan Logistic (BULOG) was established as the main institution responsible for stabilizing the price of rice. This was done in order to provide adequate incentives conducive to investment as well as to reduce price spikes for rice.

In addition to providing price stability conducive to agriculture, the new regime also invested significant amounts of resources into rural infrastructure. Between 1939 and 1960 the average annual increase in kilometers of road was .3 percent and for 1960 to 1970 .4 percent. However, from 1970 to 1998 this rate of expansion rose to 8.3% per year. A similar story can be told with respect to communication (Timmer, 2004). Also investment in irrigation and extension systems increased and a national system for agricultural research was established.

However, drought in 1972 exacerbated the problems faced by Indonesia. Weather problems created havoc in the world market for rice and BULOG was unable to keep the price of rice stabilized. Efforts at increasing imports failed with the world price jumping from US $125/ton in 1971 to US $630/ton in 1973 when the crisis finally ended. This became a major political issue as Jakarta's students engaged in large demonstrations against inflation, the high price of rice, and other issues. It was at this point that crisis "galvanized the Indonesian government to a full scale commitment to rice self-sufficiency" (Bresnan, 1993, p. 118).

The above situation led to programs aimed at subsidizing fertilizer usage and credit to the agricultural sector. Indonesia was fortunate in that it was at this time that it became a beneficiary of the Green Revolution. This was an institutionalized process for creating new crop varieties, especially wheat and rice. The wheat varieties were the result of the crossing of Mexican varieties with other strains with much of the activity coordinated by the Rockefeller Foundations Mexican agricultural program. Similarly, new rice varieties arose from crossing different genetic

lines that had evolved throughout various areas of Asia through the centuries. This breeding program was carried out at the International Rice Research Institute in the Philippines and this was a part of the Consultative Group for International Research, a donor funded international research program.

The impact of these policies on agricultural growth in Indonesia was significant. From 1967 to 1981 food producing agriculture grew at an average rate of 5%. This growth was broadly based leading to significant reductions in poverty. The proportion of the population classified as poor fell from 60% to 11.3% during this same time period (Thee, 2002). The main cause of this surge in food production was a massive application of new technology and new inputs to the agricultural production process. By the first half of the 1980s Indonesia achieved food self-sufficiency. Data on food production per capita is presented in Table 3.

Table 3: Food Production Per Capita (Index): Indonesia

Year	Food Index	Production Year	Food Production
1967	46.16	1984	68.85
1968	51.8	1985	68.95
1969	51.13	1986	77.65
1970	53.26	1987	77.34
1971	53.59	1988	74.00
1972	52.16	1989	76.97
1973	55.33	1990	78.24
1974	56.69	1991	77.45
1975	54.22	1992	83.31
1976	52.36	1993	83.10
1977	53.43	1994	83.22
1978	55.56	1995	89.47
1979	56.63	1996	84.49
1980	60.16	1997	88.90
1981	63.03	1998	83.11
1982	61.39	1999	82.38
1983	64.56	2000	84.16

Source: Food and Agriculture Organization

As a result of this process, it became easier for BULOG to stabilize rice prices in Indonesia. Other than a price spike in 1973 and 1968, the real price of rice remained stable from 1969 to 1995. The result of this was that labor which was physically abundant was also economically cheap. Data on the real price of rice is presented in Table 4.

Table 4 Real Price of Rice: Indonesia

Year	Retail price ($/ton)	CPI (Base Year = 2005)	Real Price
1964	202,000	0.01	20,200,000
1965	726,000	0.02	36,300,000
1966	6,000	0.27	22,222
1967	17,000	0.57	29,825
1968	48,000	1.29	37,209
1969	43,000	1.5	28,667
1970	47,000	1.68	27,976
1971	45,000	1.75	25,714
1972	49,000	1.87	26,203
1973	83,000	2.45	33,878
1974	100,000	3.44	29,070
1975	111,000	4.1	27,073
1976	128,000	4.41	29,025
1977	133,000	5.45	24,404
1978	140,000	5.89	23,769
1979	170,000	6.85	24,818
1980	199,000	8.09	24,598
1981	229,000	9.08	25,220
1982	255,000	9.94	25,654
1983	304,000	11.11	27,363
1984	330,000	12.27	26,895
1985	323,000	12.85	25,136
1986	346,000	13.6	25,441
1987	388,000	14.86	26,110
1988	469,000	16.06	29,203
1989	500,000	17.09	29,257
1990	519,000	18.42	28,176
1991	557,000	20.16	27,629
1992	604,000	21.67	27,873

Source: International Rice Research Institute (ricestatirri.org)

The implication of the above is that labor in Indonesia should have remained cheap. The work of Stuivenwold and Timmer (2003) indicates that throughout the 1980s and 1990s labor costs per unit of output were lower than those in South Korea and Taiwan, especially in manufacturing which was labor intensive in nature. Rapid growth, especially in labor intensive export commodities, began in the early 1980s. This in turn generated employment growth of about 7% a year after 1985. This brought about a rapid reduction in poverty (Henley, 2012). Thus rapid agricultural growth, especially in rice production, preceded the rapid growth of labor intensive manufacturing. It provided the cheap wage goods that were necessary to make labor economically cheap (as well as being physically abundant).

The rapid growth in agricultural production also had a more direct effect on the growth of manufacturing in rural areas of Indonesia. Suryahadi Suryadarma, Sumato, and Mdyneaux (2006) estimated agricultural demand linkages via the calculation of growth multipliers for rural Indonesia. In 1984, they estimated that a 1% increase in the growth of the agricultural sector induced a 1.4% growth in the non-agricultural sector in rural areas. The growth in agricultural production stimulated the demand for locally produced goods and services in rural areas, in particular those produced by the non-tradable sector.

In the end, real wages in Indonesia rose dramatically with economic development. However, much of this rise was driven by the fall in the cost of basic foodstuffs especially early on in the development process. Daily agricultural wages measured in terms of the amount of rice afforded rose more than six-fold between 1961-1965 and 2001-2005 (Fuglie, 2010). Thus labor was economically cheap.

Uganda provides an African example of a very different kind of experience. It is an example of Sub-Saharan nation that has experienced a sort of economic renaissance. Uganda has experienced nearly two decades of relatively rapid economic growth. From 1990 to 2001, this growth averages 6% per year while from 2001 to 2011 the growth rate rose to an average of 7.8% per year. In 2010 and 2011, the growth rate dipped to 5.9% and 6.7% respectively. The share of agricultural production in total GDP declined from 52.2% in 1991 to 23.4% in 2011. Uganda also became increasingly involved with trade with the share of exports in GDP rising from 7.5% in 1991 to 23.8% in 2011 (World Bank, 2013). As a result, poverty in Uganda declined from 56% in 1991 to 25% in 2010 (Kjaer and Katusiimah, 2012).

This indeed represents a dramatic change in economic performance, especially compared with that of the 1980s. There are, however, some glaring anomalies in this performance. The most striking anomaly involves the process of structural change. Generally, rapid growth is accompanied by a decline in the share of agricultural production and an increase in the share of manufacturing in GDP. Agriculture's share has indeed fallen, but the manufacturing share has only increased from 5.7% in 1990 to 8.7% in 1999 while remaining stagnant since then. This is not a dramatic change from what it was in 1960 (8.5%). The sector that has expanded is the service sector.

Structural change in employment also generally accompanies rapid economic growth with the employment share of agriculture declining while that of manufacturing increases. The surprising fact is that "73% of the population is estimated still to be working in low productivity agriculture …" (Kjaer & Katusiimah, 2012). This has actually increased since 2002/2003 when the proportion was approximately 63% (Mukwaya Banutaze, Magarura, and Branson, 2012). With such a large proportion of the population still in the rural areas while the proportion of GDP

produced in agriculture declining, this implies that productivity in the agricultural sector is very low. This is borne out by the fact that the agricultural sector is dominated by small farms utilizing very low levels of fertilizer and planting very little of their land in high yielding seed varieties. These characteristics are consistent with a population characterized by a high rate of population growth. In fact, population growth is quite high at 3.2% on average per year. Thus even a growth rate of 7% per year in terms of GDP will have much of this growth offset via population growth (World Bank, 2012).

The peculiarities of structural change in Uganda are accompanied by several other anomalies. Not only does manufacturing make up a small share of the economy, it also makes up a small share of exports. Primary production continues to dominate exports. Foreign aid still makes up approximately 12% of GDP and in the past this share has been even higher (Kjaer & Katusiimah, 2012). Finally, the distribution of income seems to be worsening through time. The Gini coefficient for 1992-1993 was 0.365 and rose to 0.426 by 2009-2010.

Economic growth in Uganda has been very rapid, but the usual characteristics of structural transformation are lacking. How does one explain this? The model developed in the previous section provides an outline of an explanation. The necessary assumption is that food staple production with its affiliated labor intensive service sector (food processing) make up a large non-tradable goods sector. Gollin (2009) has argued that indeed much of the agricultural sector in Sub-Saharan Africa in general and Uganda in particular is non-tradable. Most of Sub-Saharan's food is produced within the continent. For example, for the region as a whole 90% of all calories consumed are produced within the region. Imports of food are negligible for most countries in the region. More specifically, Uganda imports less than 2% of its total calorie consumption.

For Uganda large fractions of the population live far away from transportation systems and, in addition, Uganda is landlocked. This in itself implies high costs of transporting imported food to various parts of Uganda. For example, 30% of communities surveyed in the national household survey of 2005/2006 did not have roads that were passable even in the dry season. Two-thirds of the communities lacked any bus or taxi connections. Related to the above, the country's paved road density in 2003was approximately 16,300 km in a land area of 200,000 km². Thus the state of transportation in Uganda is quite limited (Gollin, 2009).

The implication of this assumption of non-tradability is that Uganda can be seen as a semi-open economy. The traditional sector is made up of food staple agriculture and the food processing activities connected with food staples, both non-tradable in nature and labor intensive. The modern sector is made up of a labor intensive export commodity (coffee), potentially labor intensive manufacturing, and a modern service industry.

In this context, the restoration of political stability as well as the inflow of foreign aid, etc. resulted in an expansion of the modern sector. Food aid was initially important, but has declined in the late 2000s (Harvey, Proudlock, Clay, Riley, and Jaspers 2010). However, the outcome of this expansion is dependent upon what happens in the food staples sector. Although the government has placed agriculture at the top of its policy agenda, the sector has never received a significant share of the public budget. More importantly, the share of the budget going to agriculture has actually declined from 8% in 2001-2002 to 3.1% in 2009-2010 (Joughin & Kjaer, 2010).

The utilization of modern agricultural technology in Uganda is also quite low. Data from 2005/2006 indicate that only 7.3% of farmers in Uganda were visited by an extension agent

during the past 12 months. There was also a bias in the activities of these agents in that richer farmers were likelier to be visited than poorer ones. This seems to be especially important since evidence suggests that connections between extension agents and farmers tend to significantly increase productivity (Mukuwayaet al., 2012).

Evidence for the same time period indicates that few farmers utilize any kind of modern input such as improved seed varieties, organic or inorganic fertilizers, and pesticides. Although modern input usage varies from region to region in Uganda, in all regions the usage is quite low. This is due to the fact that modern inputs, including chemical fertilizers, are quite expensive in Uganda. Given the conditions that exist in the rural sector it is not surprising that few farm households utilize outside labor in the production process (Mukuwaya et al., 2012).

Table 5 Food Production Per Capita (Index): Uganda

Year	Food Production Index	Year	Food Production Index
1970	171.11	1989	108.66
1971	168.18	1990	110.68
1972	160.69	1991	108.87
1973	156.29	1992	104.88
1974	162.27	1993	107.04
1975	170.68	1994	100.93
1976	158.26	1995	102.47
1977	153.43	1996	93.73
1978	151.23	1997	93.14
1979	109.42	1998	99.2
1980	103.13	1999	101.63
1981	110.93	2000	101.84
1982	114.51	2001	104.29
1983	117.77	2002	105.45
1984	107.05	2003	106.93
1985	105.9	2004	103.29
1986	101.3	2005	100.07
1987	102.57	2006	96.7
1988	104.84		

Source: Food and Agriculture Organization

The problems faced in trying to modernize Ugandan agriculture are illustrated by the experience with NERICA rice varieties. These varieties were developed via research undertaken

in Africa. These were higher yielding varieties that could be self-produced by farmers. Using panel data for the period 2004 to 2006 for Uganda, Kijma, Otsuka, and Sserunkuuma (2011) found that 50% of the initial adopters of these rice varieties had abandoned use of the seeds. The main reason this occurred seems to be that farm extension activities were often focused on farms which were ill equipped to profitably use the new technology. Often complementary inputs were not available or rainfall patterns proved inhospitable to the effective utilization of the seeds.

As a result of the above, agricultural growth has stagnated and food production per capita has declined. Examining Table 5 one can see that food production per capita declined rapidly during the 1970s, stabilized in the 1980s, declined in the 1990s, and then stabilized. The implication is that food costs would increase. Data for food costs for Uganda is quite limited, specifically to the years from 2000.

The data for Uganda are presented in Table 6. The third column shows that food prices rose faster than prices in general. Although this data corresponds to only a small part of the time period discussed, it does indicate that food is becoming relatively more expensive.

Table 6 Food Price Indices: Uganda

Year	Food Price Index	CPI	Food Price Index/CPI
2001	96.6	101.9	0.95
2002	92.5	101.6	0.91
2003	106.7	110.5	0.97
2004	111.4	114.5	0.97
2005	126.1	124.1	1.02
2006	139.3	133.3	1.05
2007	142.8	141.4	1.01
2008	171.1	158.5	1.08
2009	213.9	179.2	1.19
2010	218.4	186.3	1.17
2011	289.0	221.1	1.31
2012	313.7	252.0	1.24
2013	324.7	265.8	1.22

Source: Food and Agriculture Organization

The hypothesis of this paper is that in a country in which labor is physically abundant, but agricultural growth is slow, one would find that labor is not economically cheap. Evidence to support this conclusion is provided in the work of Gelb Meyer, and Ramachandran (2013). They focus on comparing labor costs in 12 Sub-Saharan African countries with those in 13 comparison countries drawn from four regions. The data is taken from the World Bank's Enterprise Surveys

of 10,502 manufacturing firms. It is generally thought that in poor countries labor is cheap, but is that true for Africa?

The results are quite interesting. After accounting for income, they find that labor costs in Sub-Saharan Africa are substantially higher than in the comparison nations (regions), with the wage premium on average approaching 50%. One of the countries included in the study was Uganda and although the labor cost premium was less than 50%, it was still substantial. This is further supported by estimations for unit labor costs (median ratio of wages to value added) in Cotton, Habyarimana, Leechor, Marchat, Patton, Ramachandran, Shaw, and Wong (2004). They estimate unit labor costs to be 0.39 in 2002/2003 for Uganda as compared to 0.27 and 0.32 for India and China respectively. Also Taiwan had unit labor costs of 0.16 in 1961 and Indonesia's unit labor cost in 1981 was 0.21. Thus although Uganda is poor and labor is physically abundant, it is not cheap.

Gelb et al. (2013) hypothesize that the higher labor costs are the result of cost of living differences. Utilizing data from 188 countries, they found that, "relative to low income comparators like Bangladesh, Vietnam, and also India, African countries are considerably more costly" (p.16). Including South Africa, the average PPP for African countries is about 20% higher than for Bangladesh, Indonesia, and Vietnam and this was true for Uganda too.

Gelb et al., (2013) hypothesizes that Sub-Saharan cost differences with other low income countries in other regions likely reflects large differences in food costs which are in turn related to agricultural productivity. Thus labor costs in Africa are high because food productivity is very low. The link between low food productivity and high costs holds when food staples are non-tradable or the international market for food is thin. The previous paragraphs have shown that the agricultural sector lacks the foundation for rapid productivity growth. This is further borne out by data concerning yields in food products from 1995 to 2005. This data indicates improvement for four crops, while the rest (including rice, maize, beans, and sorghum) all declined. Annual agricultural growth from 1991 to 2001 was a respectable 3.5%, but from 2001 to 2011 this fell to 1.7% (Joughin & Kjaer, 2010).

Thus Uganda is a country in which slow agricultural growth, particularly in food staples, has made labor relatively expensive. Thus modern sector growth has occurred mainly as a result of the rapid growth of the service sector, not labor intensive manufacturing. Thus although growth has been rapid, structural change in terms of employment has yet to occur.

One might think this is nothing to worry about as long as rapid growth continues. However, inequality is likely to continue to worsen without rapid growth in labor intensive manufactured exports. In addition, it is hard to see how rapid growth could be sustainable based on service sector expansion. Thus Uganda represents a case of growth without structural change (in terms of employment), growth without transformation.

V. SUMMARY AND CONCLUSION

This paper has argued that physical abundance of labor does not imply that labor is cheap. Specifically, rapid growth of the modern sector without rapid growth in the production of food staples results in high food costs and relatively expensive labor. This makes growth in labor intensive manufactured goods for export extremely difficult. The dependence of labor costs on

food productivity is the result of two factors: (a) much staple food production in poor countries is non-tradable and (b) even where tradable the international markets are so thin that most countries are large, meaning food prices are endogenous.

In this situation a successful shift to labor intensive manufacturing and the exporting of these goods requires rapid growth in agricultural productivity. A comparison of the experiences of three countries was presented to illustrate these ideas. Taiwan represents an East Asian country in which the foundations for rapid productivity growth (particularly in rice) were constructed during the Japanese colonial period. This allowed Taiwan to keep labor costs low, first in mainland Japan during the colonial period, and then in Taiwan itself as labor intensive industrialization occurred. A similar story can be told with respect to Indonesia. Uganda illustrates a growth process in which agricultural productivity has not risen rapidly. Thus labor is relatively expensive and labor intensive manufacturing has failed to develop. Instead, rapid growth has involved the expansion of the service sector. Thus the typical pattern of structural change has not occurred. As a result, labor remains bottled up in the traditional sector even while economic growth has been high.

Several policy implications emerge. First, given the non-tradability of food, productivity in food production must be enhanced. This would require significant investment in the development of agricultural technology, rural infrastructure, and rural transportation systems. A complementary approach would be to increase the tradability of food. This too would involve significant investment in rural transportation systems. Also liberalization in agricultural trade among developing nations would be required so that the markets for food staples could deepen and expand.

Richard Grabowski: Professor of Economics, Southern Illinois University, Carbondale, Illinois 62901, e-mail: ricardo@siu.edu.

REFERENCES:

Bresnan, J. (1993). *Managing Indonesia: The Modern Political Economy* (New York: Columbia University Press.

Cotton, L., Habyarimana, J. P., Leechor, C., Marchat, J. M., Patton J., Ramachandran, V., Shaw, M. K. & Wong M. (2004). "Competing in a Global Economy," World Bank, Washington D.C., pp.1-140.

David, C. (1991) "The World Rice Economy: Challenges Ahead," in *Rice Biotechnology*, edited by G.S. Khush and G.H. Tocnniessen (Manila, Philippines: IRRI), pp. 1-18.

Delgado, C., Minot, N. & Tiongco, M. (2004). "Evidence and Implications of Non-Tradability of Food Staples in Tanzania 1983-1998," MTID Discussion Paper No. 72, International Food Policy Research Institute, Washington, D.C.

Dodge, E. & Gemessa, S. (2012). "Food Security and Rice Price Stabilization in Indonesia: Analysis of Policy responses," Masters Thesis, Harvard Kennedy School of Government, pp. 1-68.

Elson, R. (2001). *Suharto: A Political Biography* (Cambridge: Cambridge University Press).

Eswaran, M. & Kotwal, A. (2004). "The Role of Agriculture in Development," in *Understanding Poverty*, edited by A.V. Banerjee, R. Bènabou, and D. Mookherjee (New York: Oxford University Press), pp. 111-123.

FAO, www.fao.org/home/en/.

Fuglie, K.O. (2010). "Indonesia: From Food Security to Market-Led Agricultural Growth," in *The Shifting Patterns of Agricultural Production and Productivity Worldwide*, eds. J.M. Alston, B.A. Babcock, and P. G. Parday, The Midwest Agribusiness Trade Research and Information Center, Iowa State University, Ames, Iowa.

Gelb, A., Meyer, C. & Ramachandran, V. (2013). "Does Poor Mean Cheap? A Comparative Look at Africa's Industrial Costs," Center for Global Development, Working Paper 325, Washington, D.C.

Gollin, D. (2009). "Agriculture as an Engine of Growth and Poverty Reduction: What We Know and What We Need to Know,' Williams College.

Gollin, D. Parente, S. L. & Rogerson, R. (2007). "The Food Problem and the Evolution of International Income Levels," *Journal of Monetary Economics* 54, pp. 1230-1255.

Harvey, P., Proudlock, K., Clay, E., Riley B., & Jaspars S.(2010). "Food Aid and Food Assistance in Emergency and Transitional Contexts," Humanitarian Policy Group, ODI, United Kingdom.

Hayami, Y. (1972). "Rice Policy in Japan's Economic Development," *American Journal of Agricultural Economics* 54, pp. 19-31

Henley, D. (2012). "The Agrarian Roots of Industrial Growth: Rural Developments in South-East Asia and Sub-Saharan Africa," *Development Policy Review* 30, pp. 525-547.

Ho, S.P.S. (1978). Economic Development of Taiwan, 1860-1970 (New Haven: Yale University Press).

International Rice Research Institute. (1991). World Rice Statistics (Los Banos, Laguna: Philippines).

Joughin, J. & Kjaer, A. M. (2010). "The Politics of Agricultural Policy Reforms: The Case of Uganda," *Forum for Development Studies* 37, pp. 61-78.

Kijma, Y., Otsuka K. & Sserunkuuma, D. (2011). "An Inquiry Into Constraints on a Green Resolution in Sub-Saharan Africa: The Case of NERICA Rice in Uganda," *World Development* 39, pp.79-86.

Kjaer, A.M. & Katusiimah, M. (2012). "Growing But Not Transforming: Fragmental Ruling Coalitions and Economic Development in Uganda," DIIS Working Paper 2012:07, Danish Institute for International Studies, Copenhagen, Denmark.

Kochar, K., Kumar, U., Rajan, R. G. & Subramanian, A. (2006). "India's Pattern of Development: What happened, What Follows?" *Journal of Monetary Economics* 53, pp. 981-1019.

Lee, T. & Chen, Y. (1979). "Agricultural Growth in Taiwan, 1911-1972," in Agricultural Growth in *Japan, Taiwan, Korea, and the Philippines*, edited by Y. Hayami, V. Ruttan, and H. Southworth (Honolulu, Hawaii: University Press of Hawaii), pp. 59-89.

Lewis, W.A. (1954). "Economic Development with Unlimited Supplies of Labor," *Manchester School of Economic and Social Studies* 22, pp. 139-191.

Lin, J.Y. (2003). "Development Strategy, Viability, and Economic Convergence," *Economic Development and Cultural Change* 51(2), pp. 277-308.

_____ (2012). "From Flying Geese to leading Dragons: New Opportunities and Strategies for Structural Transformation in Developing Countries," *Global Policy* 3(4), pp. 397-409.

Linblad, T. J. (2010). Economic Growth and Decolonization in Indonesia," *Itinerario* 34(1), pp. 97-112

McArthur, J.W. & Sachs J. D. (2013). "A General Equilibrium Model for Analyzing African Rural Subsistence Economic and an African Green Revolution," Africa Growth Initiative, Working Paper 12, Brookings Institutions, pp. 1-72.

Mukuwaya, P., Banutaze, Y., Magarura, S. & Branson, T. (2012). "Rural Urban Transformation in Uganda," Uganda Strategy Support Program, International Food Policy Research Institute.

Myint, H. (1975). "Agriculture and Economic Development in the Open Economy," in *Agriculture in Development Theory*, edited by Lloyd G. Reynolds (New Haven, Connecticut: Yale University Press), pp. 327-372.

Ramaswamy, K.V. & Agrawal, T. (2012). "Service-led Growth, Employment and Job Quality: A Study of Manufacturing and Service Sector in Urban India," Indira Gandhi Institute of Development Research, Mumbai, March.

Regmi, A., Deepak, M. S., Seale, J. L. & Bernstein, J. (2001). "Cross Country Analysis of Food Consumption Patterns," Economic Research Services (USDA), pp. 14-22.

Stuvenwold, E. & Timmer, M. P. (2003) "Manufacturing Performance in Indonesia, South Korea, and Taiwan Before and After the Crisis," Research Memorandum GD-63, Gronigen Growth and Development Center.

Suryahadi, A., Suryadarma, D., Sumato, S. & Mdyneaux, J. (2006). "Agricultural Demand Linkages and Growth Multiplier in Rural Indonesia," SMERU Research Institute, Jakarta, pp. 1-24.

Thee, K.W. (2002). "The Soeharto Era and After: Stability, Development and Crisis, 1966-2000," in H. Dick, et. al., *The Emergence of a National Economy: An Economic History of Indonesia, 1800-2000* (Honolulu, Hawaii: Allen and Unwin and University of Hawaii Press), pp. 194-243.

Timmer, C.P. (2004). "How Indonesia Connected the Poor to Rapid Economic Growth," in *Delivering on the Promise of Pro-Poor Growth: Insights and Lessons from Country*

Experiences, edited by T. Besky and L.J. Cond (Washington, D.C.: World Bank), pp. 29-58.

World Bank. (2013). "Uganda at a Glance," The World Bank, Washington, D.C.

Yamada, S. &Hayami, Y. (1979). "Agricultural Growth in Japan 1880-1970," in *Agricultural Growth in Japan, Taiwan, Korea, and the Philippines*, edited by Y. Hayami, V.W. Ruttan, and H.M. Southworth (Honolulu, Hawaii: University Press of Hawaii), pp. 33-58.