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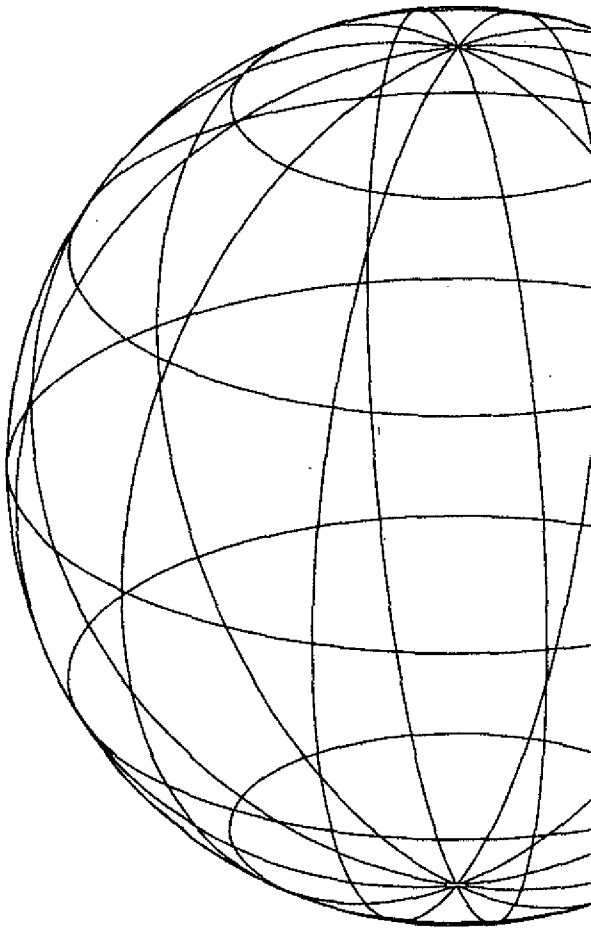
UNIDO RESEARCH PROGRAMME

Productivity Performance in Developing Countries

Country Case Studies

Indonesia



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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
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Executive summary

The Indonesian economy is now quite different to what it was nine years ago. The economic crisis that exploded in mid-1997 transformed the country from a miracle economy to a debacle economy. The rapid economic growth, which was achieved at an average rate of over 7 per cent between 1968 and 1996, declined significantly to less than 5 percent between 2000 and 2003. In fact, in 1998 the growth rate contracted to –10.14 percent which led to a surge in unemployment and the incidence of poverty. The crisis also nearly put an end to investment, business confidence, exports and the financial sector, not to speak of the problems of high inflation and the lack of government funding to develop the country. As this report is being written, the government is still struggling to formulate an economic strategy with measures to mobilize financial and human resources. While the economy was much better in 2004 when a growth rate of 5.2 per cent was achieved, much remains to be done by the government and the people of Indonesia.

This main objective of this is to examine the productivity performance in Indonesia from 1962 to 2004. In order to achieve this, the study starts with an outline of Indonesia's growth experiences in general and in manufacturing sector in particular during between 1962 and 2004 and goes on to examine the sources of this growth. The analysis of the overall productivity performance of Indonesia is largely based on the growth estimates provided by the UNIDO (1962-2000) and the productivity performance of the manufacturing sector is analyzed on the basis of previous estimates undertaken by Sigit (2001) and Timmer (1999). Next, it analyses the major determinants of productivity trends in the economy and the manufacturing sector, followed by a discussion of the policies affecting productivity and, finally, by policy recommendations towards productivity growth,

Overall and manufacturing growth performance

Indonesia experienced a rapid economic growth between 1968 and 1996 in particular. During this period the average growth rate was over 7 per cent per annum. Prior to this, the overall growth performance had very poor, ranging from -1.96 per cent in 1963 to 4.80 per cent in 1966. In 1967 the growth rate was extremely low at about 0.66 per cent. Since 1997, due to the economic crisis, economic growth fell again to less than 5 per cent on average per annum, except in 2004 when it reached a level of 5.2 per cent.

The poor productivity performance before 1966 was associated with high inflation rates. In 1966, in particular, the inflation rate reached 1,136 per cent which led to the stagnation (or even decline) of production and investments. This situation was linked to the government's economic and political policies under Soekarno which constrained the inflow of foreign aid and foreign direct investment. Consequently, the GDP grew by only 3.94 percent per annum and levels of poverty and unemployment were very high. Booth and Mc Cawley (1981) estimated that about two-thirds of the total population lived below the poverty line before 1966.

The economic situation, however, has changed significantly since 1968. Under Soeharto, there was macroeconomic stability and the capital account policies were liberalized. The government also sought foreign aid as a significant source of economic development, complemented by tax revenue. A shift from the oil export policy to the non-oil export policy was also in place from since the 1980s onwards. The impact of these economic policies, supported by the oil windfall gains, made it possible for Indonesia to reduce the inflation rate to a two digit level as had existed during the period from 1974 to 1977 and, since then, to single-digit level. The country was also able to achieve an average growth rate of over 7 percent per annum from 1968 to 1996. The World Bank (1993) classified Indonesia as a miracle economy together with other newly industrialized countries such as the Republic of Korea, Taiwan, Singapore, Thailand and Malaysia.

However, the rapid growth that was achieved between 1968 and 1996 came to an end when the Asian financial crisis exploded in mid-1997. In fact, in 1998, the growth rate contracted to – 10.14 per cent and the inflation rate was above 50 percent. This brought the economy into a recession and a period of overall negative growth. The manufacturing sector that used to be the main source of growth contracted by 11 per cent, while the construction sector declined by 36 per cent in the same year. This low growth in the manufacturing sector continued until 2004. The financial crisis also reduced the investment flows by around 50 percent gave rise to further unemployment and poverty

Sources of economic growth

The main sources of the rapid economic growth were capital and labor inputs, while the contribution of TFP was very low (or even negative). The low TFP during the period 1962-2000 was also confirmed by the data on technical change and technical efficiency. Between 1964 and 1966, for instance, low TFP growth was associated more with technical change than with technical efficiency. Between 1969 and 1972, 1975 and 1976, and 1978 and 1982, low TFP was related to low technical change. Conversely, from 1983 to 1988 and 1993 to 1999, low or negative TFP was associated more with technical efficiency. The reason for the correlation between low (negative) TFP and low (negative) technical change in the early years may be the fact that, in these years, economic development in the country was still at a transitional stage. In other words, any large foreign investments and foreign aid inflows were used for the purpose of capital investment rather than for technological development. It must also be noted that, during these years, there were windfall gains from oil so that there was not much development in the manufacturing sector. This resulted in low (negative) TFP and technical change.

Unlike in the period between 1983 and 1988, technical change was positive as a result of the decreasing revenue from oil and the government policy towards the manufacturing for export sector. This further increased technical efficiency, although it had almost no effect on the growth in TFP. This may be due to the fact that manufactured goods for export are largely dependent on imported inputs so that the gains from the former exports have to be used to finance the latter. This

led to the low contribution of TFP to the overall and the manufacturing sector growth.

This assessment of TFP trends was also confirmed by other studies. Aswicahyono et.al. (1996), for instance, found that the TFP growth in the manufacturing sector was only positive for the periods 1976-1981, 1982-1985, and 1986-1991, findings which were also confirmed by Abimanyu and Xie (1994) and Osada (1994). However, it should be noted here that the contribution of TFP to manufacturing growth was less than 4 per cent and that there were differences in the calculation of TFP for the same period between one study and another. For example, Aswicahyono et.al. (1996) estimated that the TFP growth in the manufacturing sector for the period 1986-1991 was 2.1 per cent, while Abimanyu and Xie (1994) arrived at a figure of 1 per cent for 1985-1990. Osada (1994) provides two estimates for the same period, 2.1 per cent and 3.6 per cent.

In terms of the TFP by industry, Timmer (1999) estimated that TFP performance varied greatly across industries. During the period 1975-1981, TFP growth rates ranged from very high (12 %) in the wood industry to low (-5%) for chemicals. In 1982-1985, the basic metals industry performed best (14%), while TFP in non-metallic minerals slumped (-8%). The log export ban seems to have had an adverse impact on efficiency in the wood industry, with TFP growth becoming negative (-2%). The period 1986-90 showed annual TFP growth rates of over 5 per cent for all industries except chemicals. Furthermore, between 1991 and 1995, TFP levels appeared to be rising very rapidly particularly for food, beverages, tobacco and the metal product and machinery industries, while there was a marked slump in the basic metal industry. Therefore, all industries - except chemicals and non-metallic minerals - experienced a TFP growth of at least 2 per cent between 1975 and 1995. The low level of TFP growth in the area of non-metallic minerals (especially cement manufacturing) was perhaps due to government regulations aimed at improving efficiency levels in this industry.

Determinants of productivity performance

Many factors can be pointed out as determinants of productivity performance in Indonesia. In terms of institutional factors, it seems difficult to ascertain whether there is linear correlation between institutional development and long-term socio-economic growth. The reason for this is simply because there are many facts and much evidence which show that a good institutional structure does not necessarily result in better economic growth. This, for example, can be seen from the economic policy reforms after the fall of Soeharto in May 1998 when the good institutional structure put in place by the government, with advice from the IMF, failed to resolve the negative impacts of the crisis. This is quite contrary to the situation before the crisis in which rapid economic growth could be achieved with the poor and corrupt institutional structure. In fact, the World Bank (1990), in a comparative study on the performance of a number of developing countries in alleviating absolute poverty, concluded that Indonesia – between 1970 and 1987 - had been considered the most successful among the developing countries in reducing poverty.

The situation is quite different in the case of corruption and poor quality governance. These two factors seem to be crucial in affecting the productivity performance of the Indonesian economy because they prevent the country from implementing sound macroeconomic management practices. They also make the government lose credibility and confidence in the eyes of both domestic and foreign investors. Corruption can also create bottlenecks in the delivery of infrastructural and other publicly provided commercial services, to name but a few problems. Good governance is therefore central to creating and sustaining an environment which fosters strong and equitable development and essential to complement sound economic policies favoring economic growth.

In terms of domestic competition policies, extensive regulations and restrictions adversely affected the competitive business environment in Indonesia, as they unnecessarily increased the cost of doing business (high-cost economy). They also reduced efficiency and limited economic opportunities, often for the less privileged small businesses, which tended to lack political and administrative connections. Thus, the number of regulations and restrictions should be reduced, if not abolished outright. By improving the competitive business environment for both private and state-owned manufacturing firms, with the removal of price distortions caused by import protection and restrictions on domestic competition, Indonesia's scarce resources could be deployed more efficiently, and the competitiveness of the corporate sector would be enhanced.

In addition to the above factors, there are also problems associated with technological information and support services as linkages between the public R&D infrastructure and manufacturing firms have been very weak, if not non-existent. This is reflected in the fact that managers of some firms have expressed their dissatisfaction, particularly with researchers, who, in their view, had little understanding of the technological needs of the firms they were supposed to advise, and were often not even aware of the most recent technological developments in their fields of expertise. In addition, many firms themselves are unaware of the R&D capabilities of the country's science and technology institutes or skeptical of the relevance of their activities for their own specific technological needs. In fact, there have been arguments put forward that neither the government nor the private sector have an interest in promoting research and development, particularly for the middle and high technologies. As a result, industrial technological development in Indonesia has fallen behind in comparison to other ASEAN countries. This is reflected in the large number of industries which are still engaged in low-tech, traditional, small-scale manufacturing activities with and low levels of productivity. It also suggests that the quality of workers affect the productivity performance of Indonesian economy.

The lack of infrastructure development is another important factor determining productivity growth. There have been many complaints about the infrastructure, especially with regard to the difficulties experienced in the areas of communications and transport systems and the availability of electricity and water. The electricity supply is perhaps the most obvious problem with firms reporting production revenue losses of up to 4 per cent due to supply problems. Indonesia's ratio of fixed and mobile phone connections in terms of the size of the population is also a fraction of that found in most of Southeast Asia. The standard

of the infrastructure in Indonesia is, in all respects, below that of other ASEAN countries (especially Thailand, Malaysia, and the Philippines). It has a lower proportion of paved roads, less electricity-generation capacity and fewer main telephone lines per 1,000 inhabitants. This severely limits Indonesia's ability to achieve a good geographic distribution of economic activities and industrialization and reap the benefits of information technology. The situation is even more serious if one considers the poor quality of the existing infrastructure. Priority should therefore be given to infrastructure investments both for future growth needs and because of the potential of a good infrastructure for job creation and to increased export activity. Emphasis should be placed on bridges and roads, particularly in rural areas, and on communications networks for a broadly based economic growth.

Finally, country-specific factors and the investment climate played significant roles in determining productivity performance. Country-specific factors include natural endowments, of which oil in particular has been the major determinant for the rapid growth before 1982. However, a large proportion of Indonesia's exports consist of products derived from natural resources (e.g. oil) and this has retarded industrialization as it created the Dutch disease problem. This indicates that country-specific factors, in the form of oil resources, for instance, are necessary, but it is not sufficient in themselves to determine productivity growth. It is clear that comparative advantage in natural resources has to be accompanied by appropriate policies which govern the actual use of the resources. Similarly, there are still many problems related to the investment climate, including lengthy and confusing bureaucratic procedures, the overlap of central and regional development policies on investment and among sectors and a great variation in regional investment programs.

Future policies towards productivity

Economic policies played a significant role in determining the productivity performance of the country from 1962 to 2004. However, as the economic policies cannot address all issues and given with the current declining trends in average capital productivity, future productivity growth must come from technological progress and upgraded skills. There is therefore a need to re-examine policies with regard to education, training and technology development, also addressing the area of foreign direct investment as a vehicle for technology transfer. It is most important to establish a balance between activities based on natural resources, labor-intensive mass-production and high valued added and technology-intensive, differentiated manufacturing operations, given the fact that manufacturing production has been highly concentrated, heavily dependent on imported inputs and lacking in backward linkages.

It is important too for Indonesia to find a balance between production for the domestic economy and the world economy, and a balance in regional economic activities. Reconstituting the conglomerates may not be a desirable option, given the implications that it might have on domestic competition, asset inequality and the regional disparity in economic activity. Breaking them down into smaller and medium-sized enterprises may be more beneficial in terms of their job creation

potential and regional dispersion. They offer strong potential for equitable and broadly based growth in the future. Similarly and in terms of low technological capability, private-sector participation in the provision of training could in fact be more efficient because of its close association with manufacturing activities.

Finally, there is a need to boost labor market flexibility in the manufacturing sector. This could be done, for instance, by implementing production-sharing activities or production networks in which Indonesia would produce manufacturing parts, while other countries produced components or different accessories. Production-sharing activities are important due to the increasing global competition, especially in East Asian region. Manufacturing industries suited to this approach include the electronics, automotive, footwear, telecommunications, information technology and computer sectors. In terms of internal policies, there is a need for the government to adopt a more activity-centered rather than product or sector oriented industrial strategy. For instance, in order to develop the tourism industry, the government needs to give incentives for training, instead of protectionist measures. Similarly, fiscal incentives need to be given to companies that are going to engage in R&D activities. I Incentives should also be made available for infrastructure improvements and the acquisition of foreign technology. In short, the strategy adopted for the manufacturing sector should integrate both internal and external markets needs.

I. Productivity performance in Indonesia (1962-2004): Introduction

Indonesia's rapid economic growth during the period 1968-1996 and its dramatic downturn since 1997 have raised many questions. One of the fundamental questions raised is why the rapid economic growth that had been achieved for almost thirty years was unable to withstand the economic crisis. What had gone wrong with the growth process leading to the crisis? Was it connected with some of the subtle imbalances in macroeconomic management, or with the lack of sound technological advances in the right direction? Could it be flaws in the design and operation of some of the political/economic/social systems or institutions, rendering the overall economic system vulnerable to major economic shocks?

It is, of course, undoubtedly difficult to get the right answers or find consensus on these questions. However, it is possible to seek these answers by first trying to understand the historical aspects of the growth process of the Indonesian economy and analyze the sources of growth, the major determinants of productivity in the periods when the growth rate was rapidly increasing and/or decreasing, and why these sources of growth were unable to protect the economy from the crisis.

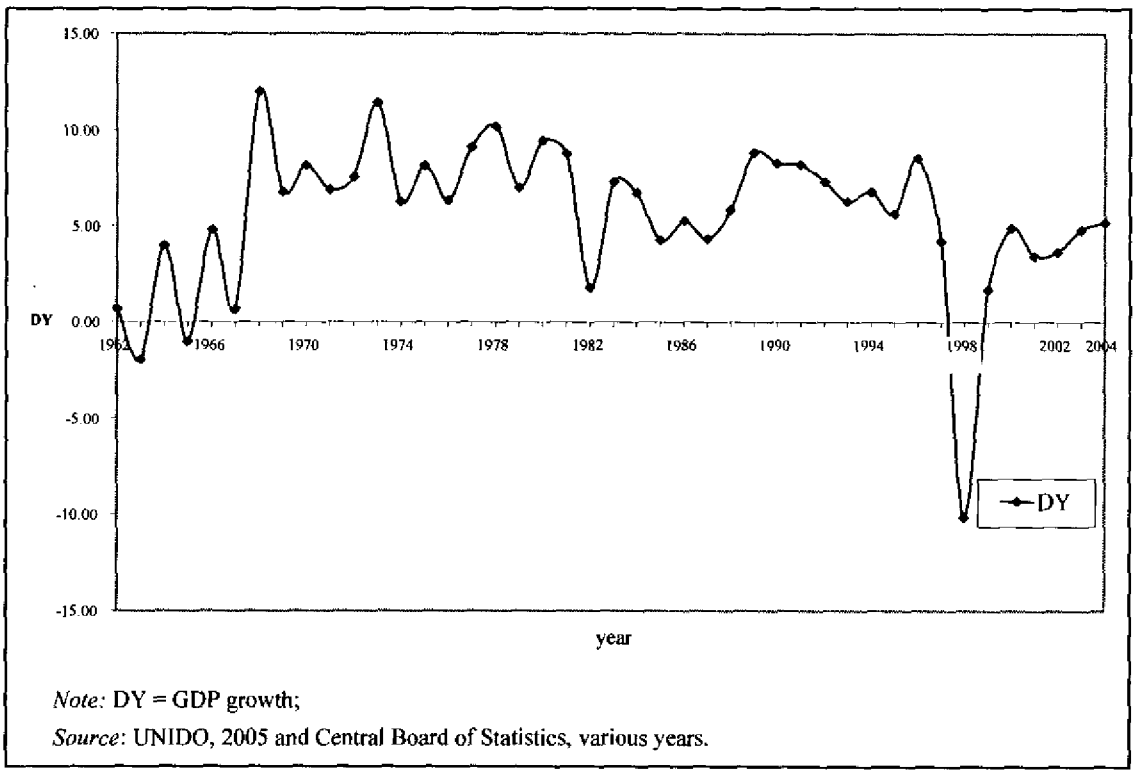
This study aims at answering these questions and is structured as follows: Section 2 deals with Indonesia's growth trends in general and in the manufacturing sector in particular in the period 1962-2004. Section 3 examines the sources of growth in the overall economy and the manufacturing sector. The interpretation of the overall productivity performance of Indonesia is largely based on the growth estimates provided by the UNIDO (1962-2000), while the interpretation of the productivity performance of the manufacturing sector is based on previous estimates undertaken by Sigit (2001) and Timmer (1999). Section 4 deals with the assessment of the major determinants of productivity in the economy and the manufacturing sector. Section 5 discusses policies affecting productivity and is followed by policy recommendations to achieve productivity growth in Section 6. Finally, concluding remarks are made in Section 7.

II. Overall and manufacturing growth trends

Indonesia is one of the developing countries which have experienced high overall and manufacturing growth. These rapid growth rates have brought the country into the group of miracle economies in East Asia (World Bank, 1993). The main period of rapid economic growth was between 1968 and 1996. During this period, the average growth rate was about 7 per cent per annum, compared with the previous very much lower overall growth performance which ranged from -1.96 per cent in 1963 to 4.80 per cent in 1966. In 1967 there was a further decline in economic growth to about 0.66 per cent.

Similarly, after 1997, the economic growth was also low and averaged less than 5 per cent per annum, due to the Asian economic crisis which had a severe impact on the economy. In less than a year the rapid economic growth rates that had been achieved from 1968 to 1996 dropped significantly. The crisis caused the growth rate to fall sharply to – 10.14 per cent in 1998. Fortunately, this negative growth rate could be turned around gradually from 1999 onwards when it reached 1.69 per cent and it increased further to 4.89 per cent in 2000. Between 2001 and 2002, however, the growth rates declined slightly to 3.42 percent and 3.66 respectively and rates picked up again in 2003 and 2004 when they reached levels of about 4.8 per cent and 5.2 per cent respectively (Figure 2.1).

Figure 2.1 The overall growth rate in Indonesia, 1962-2004



Note: DY = GDP growth;

Source: UNIDO, 2005 and Central Board of Statistics, various years.

The fluctuations in economic growth from 1962 to 2004 can be explained by three particular episodes in the development of the Indonesian economy, namely, a period high inflation period, a phase of low inflation period and the Asian financial crisis.

2.1 Period of high inflation

High inflation rates were the major cause of the low growth rates before 1967. In 1966, in particular, there was hyperinflation of 1,136 per cent (Mc Cawley 1981) which led to the stagnation (or even decline) of production and investments. This situation was associated with the government's economic and political policies under Soekarno which constrained the inflow of the foreign and foreign direct investment. President Soekarno believed that the inflow of foreign aid and foreign investment could only give benefit to the countries of origin at the expense of the host country's economy. For Soekarno, policies oriented towards political cooperation with international partners (especially Russia and China) were more important than foreign aid and foreign investment policies for the promotion of Indonesian development after independence.

On account of this highly political approach, the Indonesian economy was unable to expand significantly and, during this period GDP increased by only 3.94 percent per annum. Mining activity, utilities and construction accounted for over 6 percent of growth per annum. Generally, growth probably came from a low economic base stimulated by domestic savings. In terms of per capita income, Indonesia was only able to reach an annual level of less than US$ 100. Furthermore, high incidence of poverty and unemployment constituted the major problems facing the country during this period. Booth and Mc Cawley (1981) estimated that about two-thirds of the total population lived at poverty level during these years. Because of these poor economic conditions, there was political instability which led President Soekarno to cede his presidential chair to Soeharto in 1968.

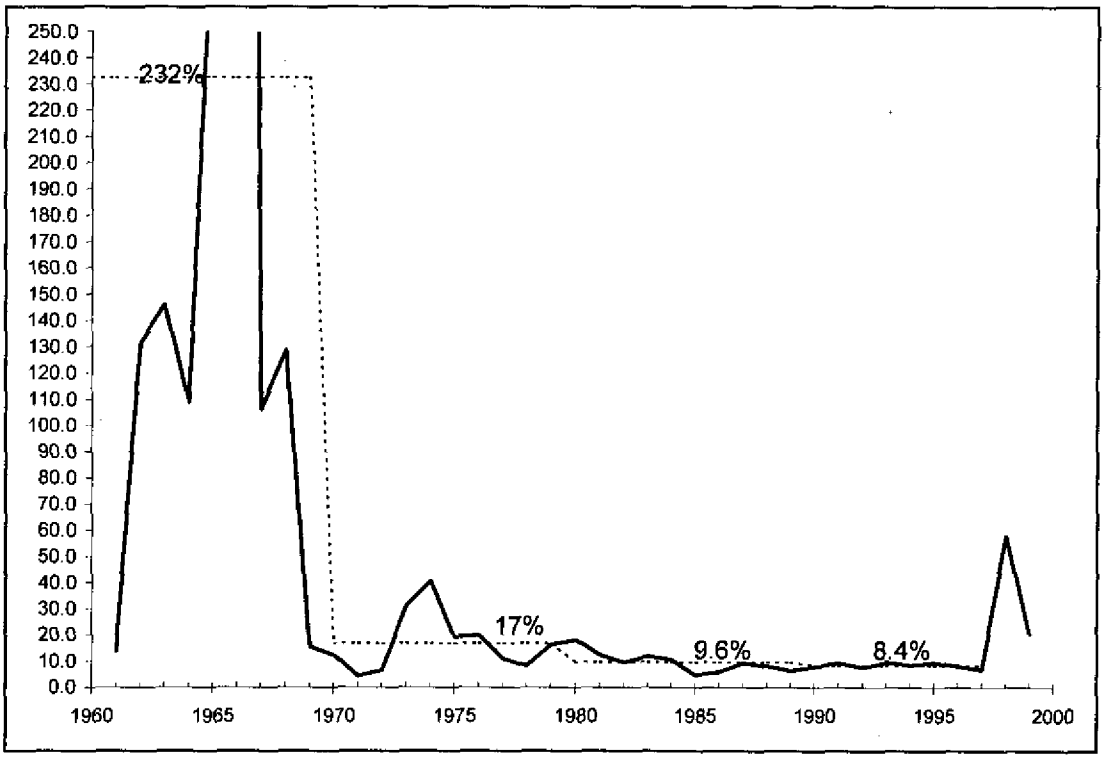
2.2 Period of low inflation

President Soeharto had a completely different style of government to President Soekarno. With the help of "Mafia Berkeley advisers' under the leadership of Prof. Wijoyo Nitisastro, the government introduced policies to introduce macroeconomic stability and liberalize the capital account policies and more favorable investment legislation in 1967. It also sought foreign aid as a significant source of economic development, complemented by tax revenue. A shift from the oil-exporting policy to a regime of no oil exports was also introduced in the 1980s (Thee Kian Wie, 2002).

The results of these economic policies supported by oil windfall gains enabled the country to reduce the inflation rate by around two digits to levels prevailing during the period 1974 to 1977 and, from then on, to single-digit levels (Figure 2.2).The economic growth rate could be maintained at the average of 7 percent per annum between during 1968 and 1996. On the supply side, growth came from manufacturing, construction and the utilities sectors – which had double-digit

expansion rates, and, on the demand side, mainly from investment and exports. The growth rate of investment was over 20 percent per year. This rapid economic growth with a low inflation rate have encouraged the World Bank (1993) to classify Indonesia as a miracle economy together with other newly industrialized countries such as the Republic of Korea, Taiwan, Singapore, Thailand and Malaysia.

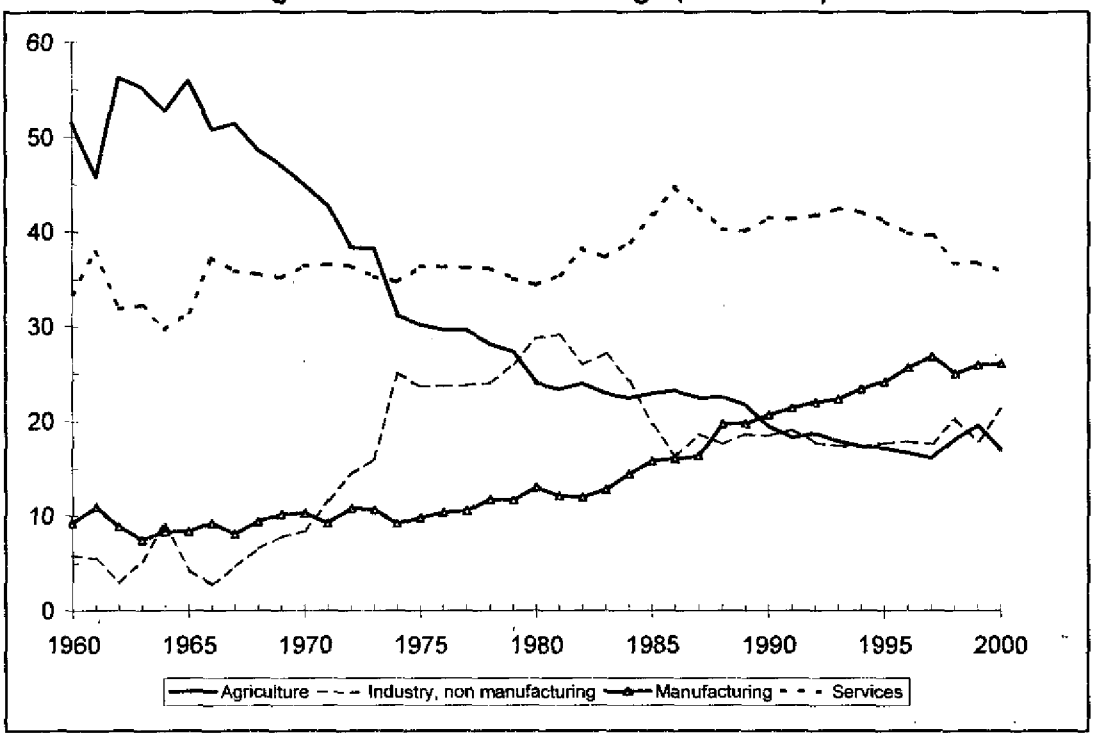
Figure 2.2 Inflation, consumer prices (annual %), 1960-2000



In addition, the aforementioned successful policies resulted in an economy more resilient to external shocks for much of the period between 1968 and 1996. The per capita income, for instance, increased by a factor of 15 from US$ 70 in 1968 to US $1100 in 1996 (current prices). The high growth also cut back the number of people living below poverty level from 70 million in 1968 to 22 million in 1996, an almost six-fold reduction in percentage terms from 60 per cent in 1968 to 11 per cent in 1996.

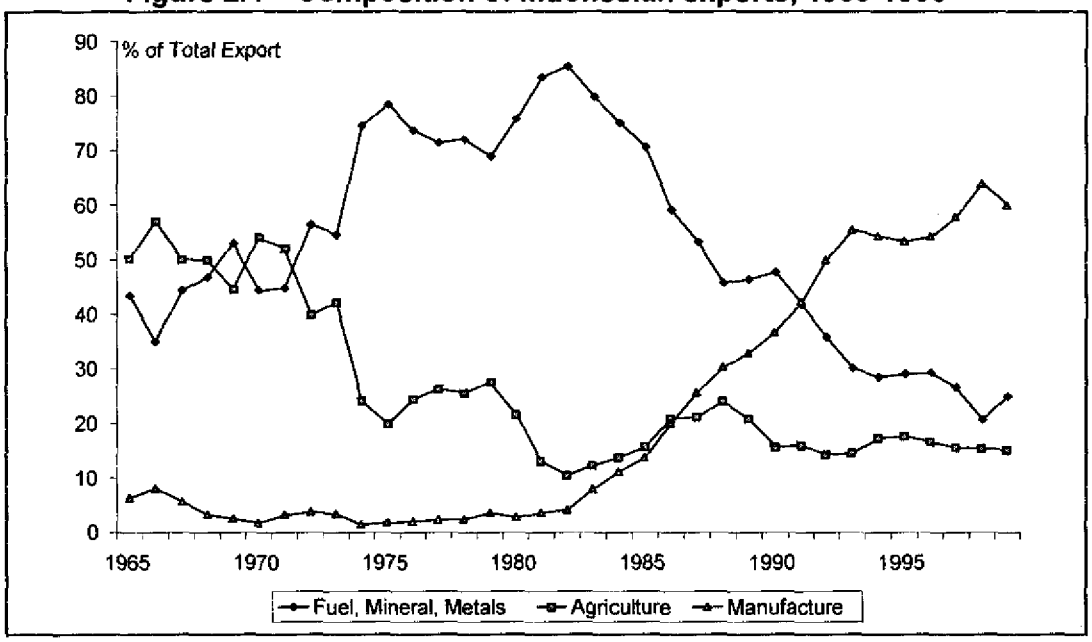
Apart from the improvement in the per capita income and the poverty level, rapid economic growth between 1968 and 1996 accelerated manufacturing development. Prior to 1968, there was almost no industrial growth. Its rapid industrial growth placed Indonesia among the leading economies in the East Asian region and was considered to be the landmark of Indonesia's New Order (Thee, 1998; Hill, 2000). This is simply because the agricultural sector, which once dominated the economy, declined from 56 per cent in 1965 to 16 per cent in 1997 (Figure 2.3).

Figure 2.3 Structural change (% of GDP)



The share of manufacturing exports surpassed that of agricultural exports and, in 1992 even overtook the share of oil, minerals and basic metal exports (Figure 2.4). The period from 1968-1996 not only witnessed rapid economic growth, but more importantly was marked by a structural shift in the country's dependency on the agricultural to the manufacturing sector.

Figure 2.4 Composition of Indonesian exports, 1965-1999



2.3 The Asian financial crisis

The great economic success that had been achieved between 1968 and 1996 came to an end when the Asian financial crisis exploded in mid-1997. In just less than a year, the economy reversed from miracle proportions to a debacle. In 1998 the growth rate contracted to – 10.14 per cent and the inflation rate was over 50 percent, followed by an economic slump leading to a recession. There was negative growth throughout the economy. The manufacturing sector, previously the main source of growth, contracted by 11 per cent, while the construction sector declined by 36 per cent in the same year. The low level of growth in the manufacturing sector continued until 2004. The financial crisis also reduced the investment flows by around 50 percent, which led to increased unemployment and poverty.

The crisis badly affected the export manufacturing companies, both in the labor-intensive sectors, such as textiles and footwear (ISIC Code 32), and in the transport equipment and machinery (ISIC 38) and the basic metal industries (ISIC 37). Only the food and beverage and tobacco industries (ISIC 31) succeeded in coping with the crisis. Many attempts have been made to explain the inability of the economy (including the manufacturing sector) to withstand the crisis. The main reason, however, appears to lie in financial sector difficulties. These difficulties were the result of institutional problems, namely, asset price bubbles and poor regulation which contributed to lax lending criteria and unwise investment by borrowing firms. The consequence was that many firms could not repay large portions of borrowed funds. Financial institutions were also subsequently faced with the need to address a large amount of Non-Performing Loans (NPLs). In turn, these problems were exacerbated by large external debts which forced the government to seek help from the International Monetary Fund (IMF).

These financial sector difficulties were to blame for a low level of private investment. During the boom period (1988-1996) when the economy grew between 5.81 percent (1988) and 8.52 percent (1996) annually, fixed investment accounted for 26-30 percent of nominal GDP and 26-31 percent of real GDP. However, since 1998, due to financial difficulties and a lack of confidence among investors to purchase fixed assets, the ratio of fixed investment has fallen to 20-22 per cent of nominal GDP and 20-23 per cent of real GDP through 1999 and up to 2003 (World Bank, 2005).

In addition to financial difficulties, the low level of physical investment has been associated with factors related to competitiveness, political instability, inappropriate government regulations, ineffective implementation of existing regulations (including decentralization), legal uncertainty, and outright corruption (Bird, 1999; World Bank 2005). It was also adversely affected by of external shocks, including the war in Iraq, the outbreak of Severe Acute Respiratory Syndrome (SARS) in East Asia and the bombing of the Marriot Hotel in August 2002. As a result of these problems, some foreign-owned firms closed their Indonesian operations or relocated them elsewhere.

All in all, these factors prolonged the relative slow growth rate of the economy at an average of less than 5 per cent during the period 1998-2002.

Due, however to continued efforts by the government to stabilize macroeconomic conditions, the economy finally became more stable in 2003. The growth in the consumer price index slowed down to 6.6 per cent in 2003, having exceeded 20 per cent annually between 1998 and 1999 and 10 per cent annually in 2001 and 2002. The exchange rate also strengthened to about 8,500 per US dollar, a further advance on a 16 percent appreciation in 2002. Under these favorable conditions, the interest rate on key 3-month bonds (SBI or Sertifikat Bank Indonesia) fell from 13 per cent in December 2002 to 8.3 per cent in December 2003. Despite the continued appreciation of the Rupiah, the current account recorded another substantial surplus at about 3.0 per cent of GDP in 2003. Correspondingly, the ratio of external debt to GDP continued to decline to 65 per cent in 2003 and international reserves increased to US$ 34 billion by the end of 2003.

The improved economic situation yielded an enhanced growth rate of about 5.2 per cent and a sharp rise in business confidence and investment demand in 2004. The government debt to GDP ratio continued its rapid decline, reaching 53 per cent in the end of 2004. The financial sector strengthened with an improvement in both Capital Adequacy Ratios (CAR) and non-performing loans. Consumer demand, especially for durables, remained strong and was boosted by a long awaited turnaround in investment growth by over 10 percent in 2004 coupled with a marked upsurge in exports (World Bank, 2005).

However, several serious problems remain, largely relating to massive unemployment and poverty. About 11 million persons were registered as unemployed in 2004, while about 40 million were underemployed (National Planning Board, 2005). In terms of the incidence of poverty, about 19.6 percent of the total population in 2004 were considered living below the official (BPS) poverty line, whilst, using the US$ 1 Purchasing Power Parity (PPP), the World Bank (2005) estimated the number of the poor to be over 36 percent.

In summing up, the success of Indonesian economic growth has been associated with the ability of the government to implement the appropriate policies in terms of openness to foreign investment and export promotion. However, as a result of lacking financial discipline, the large level of debt and other economic and non-economic problems, the rapid growth that had been achieved for a period of over thirty years slowed down to an average of less than five percent per annum during the period 1998-2004. This low economic growth, in turn, triggered off the decline in the manufacturing sector, raising unemployment and poverty levels in the country.

III. Sources of growth of the economy and manufacturing sector

3.1 Sources of growth

The inability of the economy to withstand the economic crisis was undoubtedly associated with a number of its structural weaknesses which existed long before the crisis hit the country. One weakness was the relatively insignificant contribution of productivity growth to the overall growth of GDP (Young, 1995; Bannerjee, 2002). As presented at Table 3.1, except for the period 1991-1995, the contribution of TFP growth was less than 4 per cent, and almost consistently below the aggregate contributions of labor and capital. It was negative during the period 1981-1985 when there was some move towards import substitution industrialization with capital-intensive projects. This partly suggests that the orientation towards capital- intensive projects was not effective enough to speed the growth of the economy in those years.

Table 3.1 Contribution to GDP growth (1971-2001)

Time period	GDP growth	Contribution of labor	Contribution of capital	Contribution of TFP
1971-1975	0.0798	0.017	0.028	0.035
1976-1980	0.0762	0.021	0.029	0.026
1981-1985	0.0522	0.027	0.037	-0.012
1986-1990	0.0685	0.028	0.023	0.018
1991-1995	0.0754	0.008	0.027	0.041
1996-2000	0.0071	0.018	-0.033	0.022
2001	0.0332	0.021	-0.030	0.042
Overall	0.0583	0.020	0.017	0.022

Source: UNSFIR, 2002.

Negative TFP growth did not only occur in the period 1981-1985 - other studies undertaken by Thomas and Wang (1993) using a long period of data (1975-1990) found that negative TFP growth had also occurred between 1975 and 1990. Osada (1994) also estimated that the TFP growth was negative in the periods 1985-1990 and 1980-1990 respectively (Table 3.2).

Table 3.2 Estimates of TFP growth in Indonesia

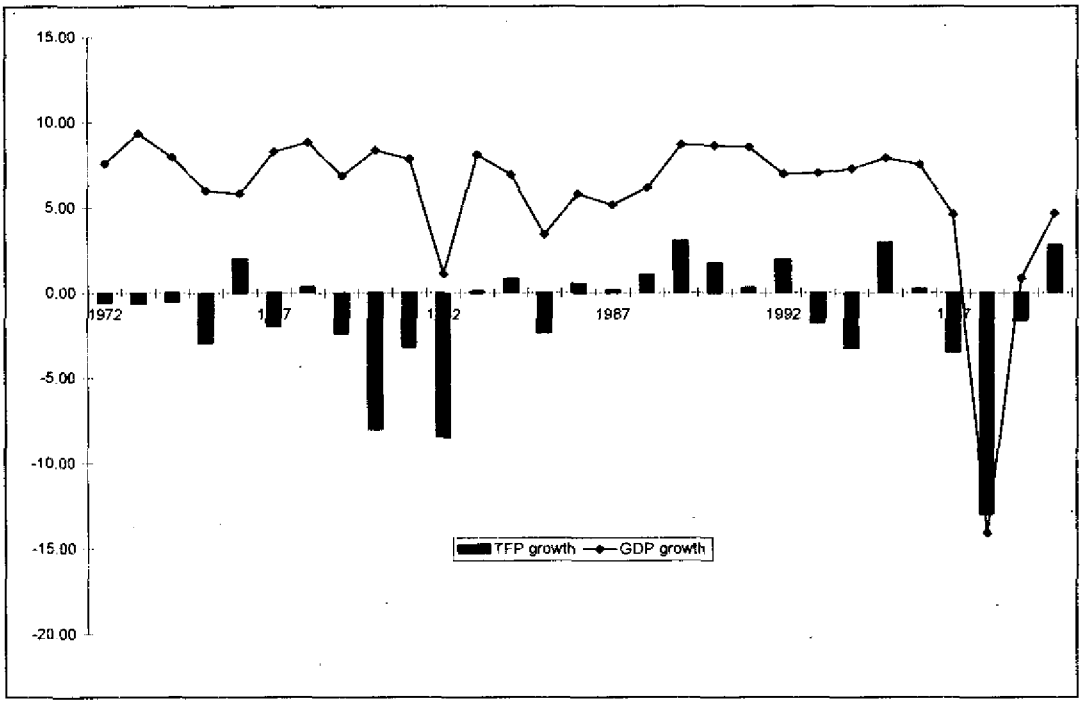
Period	Average TFP growth	Source
1975-90	-0.90%	Thomas and Wang (1993)
1978-85	0.00%	Dasgupta, Hanson and Hulu (1995)
1985-92	1.10%	Dasgupta, Hanson and Hulu (1995)
1985-90	-2.70%	Osada (1994)
1970-80	3.10%	Kawai (1994)
1980-90	-0.10%	Kawai (1994)

Note: Osada uses two different capital stock estimates: a preliminary estimate by the BPS and his own calculated stock.

Source: Timmer, 1999.

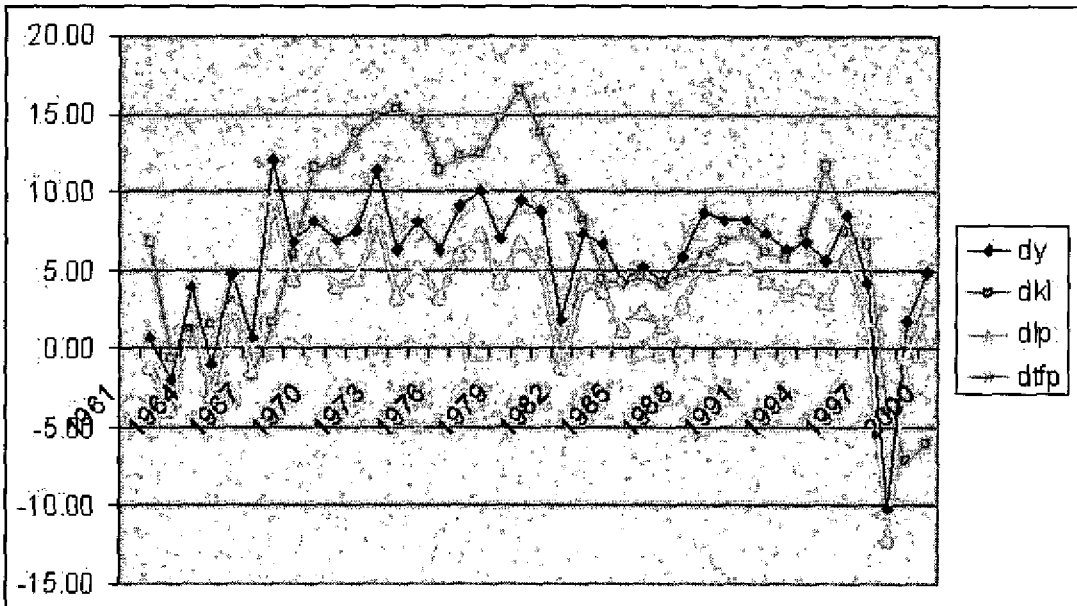
A similar observation was provided by Firdausy, et. al.(2002). By using the growth accounting method, they found that, from the period 1972-1996, when the real GDP grew by 7.02 percent per annum, the TFP growth was negative (–0.83 percent). This indicates that a large proportion of aggregate output growth was derived from input growth, but not from the TFP. These findings reconfirmed other' studies which found that the growth of inputs was more important than TFP (Figure 3.1).

Figure 3.1 Estimated TFP growth, 1971-2000



Looking at year by year estimates, UNIDO (2005) – based on constant 1996 purchasing power parity (PPP) - also confirms the above findings in that the role of TFP growth was negligible for almost all the years between 1962 and 2000, except in 1968 and 2000 (Figure 3.3 and Table 3.3). Also, it can be noted that there is a big range within the productivity, from a decreasing to an increasing level. This indication indicates that the Indonesian economy was highly instable with changing levels of productivity in each period. When there was a shock, the productivity directly affected showed a negative change. The instability may be due to several influences, ranging from the external impact of economic factors to non-economic factors. Economic factors, for instance, may be related to bank mismanagement, low foreign direct investment, and lacking technological development, while the non-economic factors could perhaps be associated with the problems of corruption, collusion and nepotism which resulted in a high-cost economy.

Figure 3.2 Sources of growth 1962-2000



Source: UNIDO, 2005.

Table 3.3 GDP growth, capital growth, labor growth, and TFP growth, 1962-2000

Year	DY	DKL	DLP	DTFP
1962	0.67	6.73	-1.16	-6.3
1963	-1.96	-0.60	-3.79	-3.3
1964	3.98	1.28	1.99	1.0
1965	-1.01	1.47	-2.95	-4.0
1966	4.80	2.93	2.71	0.6
1967	0.66	-1.78	-1.38	-0.1
1968	11.99	1.56	9.68	8.6
1969	6.75	5.96	4.53	0.7
1970	8.16	11.44	5.90	-1.8
1971	6.85	11.78	3.91	-3.8
1972	7.54	13.75	4.51	-3.6
1973	11.38	14.86	8.27	-0.6
1974	6.27	15.28	3.31	-6.4
1975	8.11	14.61	5.19	-5.1
1976	6.32	11.40	3.32	-4.6
1977	9.08	12.31	6.14	-2.5
1978	10.17	12.34	7.35	1.1
1979	6.99	14.78	4.31	-3.7
1980	9.42	16.54	6.77	-2.3
1981	8.76	13.67	5.42	-2.0
1982	1.77	10.69	-1.25	-6.7
1983	7.29	8.24	4.14	-0.7
1984	6.69	4.39	3.63	0.8
1985	4.25	4.15	1.28	-1.1
1986	5.23	4.57	2.26	0.2
1987	4.33	4.05	1.44	-0.5
1988	5.81	4.72	2.88	0.6
1989	8.82	5.82	5.83	2.9
1990	8.23	6.88	5.24	1.6
1991	8.19	7.47	5.22	0.3
1992	7.28	6.13	4.45	-0.4
1993	6.27	5.76	3.54	-1.0
1994	6.76	7.40	4.12	-1.5
1995	5.65	11.53	3.11	-5.4
1996	8.52	7.48	6.03	-0.4
1997	4.22	6.68	1.85	-2.8
1998	-10.14	-3.96	-12.17	-11.4
1999	1.69	-7.20	-0.55	0.5
2000	4.89	-6.18	2.60	3.5

Note: DY=GDP growth; DKL= capital growth; DLP=labor productivity growth; DTFP= TFP growth. *Source*: UNIDO, 2005.

In relation to capital and labor inputs, it was found that the role of the latter was less than the former input in terms of contribution to GDP growth (Figure 6). As can be seen in Table 3.4, the role of capital input relative to GDP growth was, on average, 7.0 percent, while the role of labor input was only 3.3 percent for the period 1962-2004. This is not surprising as foreign debt, foreign investment and the oil windfall gain were been the major contributors to economic development between 1962 and 2004. With regard to labor input, although Indonesia has a significant labor force, labor resources, the quality of the labor is low (Manning, 2000). As a result of these problems, it is clear that the rapid economic growth in Indonesia was not sustainable in the face of the crisis.

Table 3.4 Annual GDP growth and productivity

Periods	Average GDP Growth	Average GDP's adjusted Growth	Change Total Factor Productivity	Capital Deepening	Change in Labor Productivity
1961 – 1970	3.94	3.78	-0.500	3.22	1.73
1971 – 1997	6.60	7.32	-0.183	9.90	4.32
1999 – 2004	3.96	3.29[a]	2.000[a]	-6.69[a]	1.02[a]
1961 – 2004	5.19	5.66	-1.530	6.90	3.02
1961 – 2004*	5.49	5.92	-1.240	7.00	3.33

Note: *) Excluding 1998 during a financial crisis in the economy
Column (3) using PPP method of 1996. [a)] Covers only 1999 to 2000.
Source: UNIDO, except column (2) from BPS (reprocessed)

When the situation is observed more closely in relation to the individual economic sectors (Table 3.5), the electricity, gas and water sector had the highest growth of 11.7 percent between 1962 and 2004, over twice the national GDP average of 5.2 percent. This sector is characterized as capital-intensive, but its share is quite small relative to other sectors in terms of GDP contribution. Nevertheless, it is a sign that the national economy may be boosted by capital deepening or by technological changes (infrastructure utilities). Other sectors which showed a better level of growth were construction: 8.75 percent, manufacturing sector: 8.26 percent, transport and financial services: 7.45 percent and communications: 7.26 percent. These four sectors are relatively capital-intensive compared to others. The labor-intensive sectors such as agriculture and services grew below the national average. Similarly, there was a lower growth evident in the trade sector when it is taken separately from the hotel and restaurant sector. This once again confirmed that capital rather than labor input and TFP had a greater role than in contributing to the rapid growth in Indonesia.

Table 3.5 GDP annual growth by economic sectors

Economic sector	Total				
	Avr 61-04	Avr 61-70	Avr 71-97	Avr 99-04	Avr 61-04 (excl.1998)
Agriculture	2.97	2.62	3.20	3.26	3.00
Mining	4.36	8.98	4.01	-0.58	4.42
Manufacturing	8.26	4.75	11.01	5.04	8.52
Electricity,gas and water	11.68	10.85	13.24	7.53	11.62
Construction	8.75	8.64	11.31	4.96	9.58
Trade,hotel and restaurants	6.40	6.24	7.86	4.17	6.81
Transport and communication	7.23	1.86	9.82	8.23	7.57
Financial	7.45	5.93	10.00	4.20	8.05
Services and government	4.88	3.90	5.91	3.32	4.97
Gross domestic product	5.19	3.94	6.60	3.96	5.49

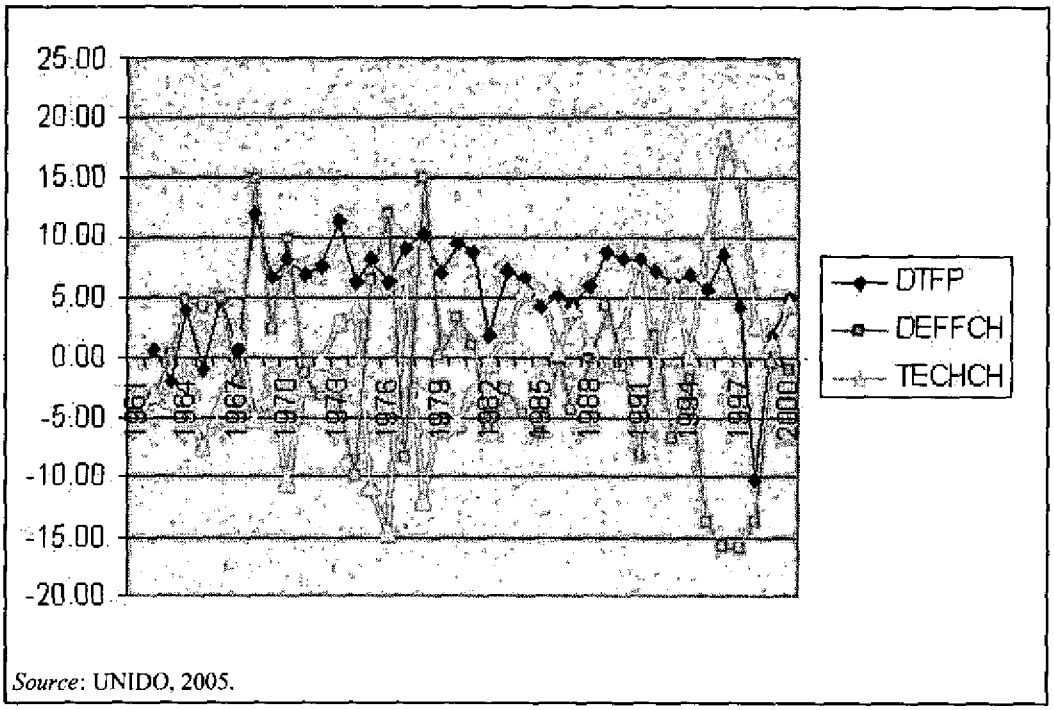
Note: avr = average

Source: Central Board Statistics (CBS) data reprocessing.

The explanation for the low TFP during the period 1962-2000 was also confirmed by the data on technical change and technical efficiency. As can be seen in Figure 3.3 and Table 3.6, both technical change and technical efficiency are relatively low. In the years between 1964 and 1966, for instance, low TFP growth was associated with technical change rather than with the technical efficiency. The same was the case in the years between 1969 and 1972, 1975 and 1976 and 1978 and 1982. However, in the periods 1983 to 1988 and 1993 to 1999, low (or negative) TFP was associated more with movements in technical efficiency rather than with technical change. The reason behind the correlation between low (negative) TFP and low (negative) technical change in the early years may be that economic development in the country at the time was still in a transitional stage. In other words, any large foreign investments and foreign aid inflows had been used for the purpose of capital investment development rather than for technological development. Also, it must be noted that, during these years, there was a windfall gain from oil, not much development in the manufacturing sector and – as a result - TFP and technical change become low (negative).

Unlike in the period from 1983 to 1988, technical change was positive as the result of the decreasing oil revenue and the government policy towards the export manufacturing sector. Technical efficiency further increased, but had almost no effect on the TFP growth. This was possibly because inputs used to promote exports of manufactured products are largely dependent on imported components, so that the export gains goods have to be used to offset the cost of the imports.

Figure 3.3 TFP, Change in technical efficiency and technical change, 1962-2000.



Source: UNIDO, 2005.

Table 3.6 TFP Growth, change in technical efficiency, and technical change, 1962-2000

Year	DTFP	DEFFCH	TECHCH
1962	-6.3	-3.3	-3.1
1963	-3.3	0.2	-3.5
1964	1.0	4.7	-3.5
1965	-4.0	4.0	-7.6
1966	0.6	5.0	-4.2
1967	-0.1	-2.1	2.0
1968	8.6	14.7	-5.3
1969	0.7	2.4	-1.6
1970	-1.8	9.8	-10.6
1971	-3.8	-1.4	-2.4
1972	-3.6	-3.3	-0.3
1973	-0.6	-3.4	2.9
1974	-6.4	-9.9	3.9
1975	-5.1	6.5	-10.9
1976	-4.6	11.9	-14.8
1977	-2.5	-8.5	6.7
1978	1.1	15.0	-12.1
1979	-3.7	0.0	-3.7
1980	-2.3	3.3	-5.4
1981	-2.0	0.9	-2.9
1982	-6.7	-6.1	-0.6
1983	-0.7	-2.8	2.2
1984	0.8	-4.6	5.6
1985	-1.1	-6.3	5.5
1986	0.2	-0.3	0.5
1987	-0.5	-4.5	4.1
1988	0.6	-0.2	0.9
1989	2.9	4.2	-1.2
1990	1.6	-0.7	2.3
1991	0.3	-8.3	9.4
1992	-0.4	1.7	-.02
1993	-1.0	-6.8	6.3
1994	-1.5	-1.8	0.3
1995	-5.4	-13.8	9.7
1996	-0.4	-15.8	18.3
1997	-2.8	-16.1	15.8
1998	-11.4	-13.7	2.7
1999	0.5	-0.6	1.1
2000	3.5	-1.0	4.5

Note: DTFP=Total factor Productivity; DEFFCH=change in technical efficiency; TECHCH=technical change. All data are in constant 1996 PPP.

Source: UNIDO, 2005.

However, the UNIDO estimates were quite different to those arrived at by the Sigit study (2001). Sigit (2001) estimated that long-term productivity was quite positive and found, during the period 1975 to 1997, that the average productivity was positive at 0.50 percent as were t the majority of changes. He recorded a decreasing trend in TPF only in four-years: 1982, 1983, 1986 and 1988. These differing results may be due to the method used in the Sigit study (2001) which was based on constant GDP prices. UNIDO worked with an adjusted GDP by using the Purchasing Power Parity (PPP) method. Sigit's study also split productivity into two factors, while UNIDO data is based on more than two factors.

Rapid economic growth in Indonesia has therefore been driven almost entirely by factor augmentation (especially capital input), rather than by labor and total factor productivity (TFP). This is in line with the findings in studies by Timmer (1999), Chen (1997), Drysdale and Huang (1995) and UNIDO (2005), but deviates considerably from Sigit's estimates due to differences in the method of calculation. This suggests that the main driving force of rapid economic growth over the past three decades might be due high foreign investment and foreign aid. The growth has, however, also been a result of various government initiatives to promote export strategies and the use of modern production facilities which boosted the performance of companies. However, as the country is largely dependent on imports to produce goods for export, the large flows of capital inputs did not, as previously indicated, have positive impacts on either technical efficiency or TFP growth.

3.2 Sources of manufacturing growth

It has already been mentioned that rapid economic growth in the period 1968-1996 was associated with the structural changes. As can be seen in Table 3.7, the TFP growth in the manufacturing sector was positive at about 3.62 per cent during the period 1972-1996, while agricultural sectors and services were negative during the same period. However, in the period between 1997 and 2000, all three sectors had negative TFP growth. This is not surprising since the Indonesian economy was still suffering the effects of the crisis during these years and the growth in the manufacturing sector was mainly contributed by capital and labor inputs, rather than TFP.

Table 3.7 GDP Growth, Capital Growth, and TFP growth by sector, 1972-1996 and 1997-2000

			TFP growth (%)					
Period	GDP growth (%)	Capital Growth (%)	Agriculture	Non-Manufacturing Industry	Manufacturing	Services	Weighted Average TFPG (%)	Contribution to growth (%)
1972-1981	7.68	12.08	-1.56	-4.65	2.74	-1.11	-1.78	-23.22
1982-1985	4.89	10.71	-2.28	-9.25	6.95	-2.60	-2.47	-50.56
1986-1992	7.14	8.80	-0.80	0.40	3.45	1.63	1.25	17.54
1993-1996	7.42	9.80	-0.82	0.22	3.15	0.94	-0.46	-6.20
1997-2000	-0.99	4.20	-1.81	-2.36	-1.71	-6.55	-3.82	-384.25
1972-1996	7.04	10.58	-1.53	-2.82	3.62	-0.88	-0.83	-11.81

Source: Firdausy, et.al, 2000.

The TFP estimates above were also confirmed by other studies. Aswicahyono et.al. (1996), for instance, found that the TFP growth in the manufacturing sector was positive only for the periods 1976-1981, 1982-1985, and 1986-1991, as did. Abimanyu and Xie (1994) and Osada (1994). However, it should be noted here that the TFP contribution to manufacturing growth was less than 4 per cent (Table 3.8) and that the studies are based on different methods of calculation of TFP for the same period. For example, Aswicahyono et.al. (1996) estimated that the TFP growth in the manufacturing sector for the period 1986-1991 was 2.1 per cent, while Abimanyu and Xie (1994) arrived at a figure of 1 per cent for 1985-1990. Osada (1994) provides two estimates of 2.1 per cent and 3.6 per cent respectively for the same periods.

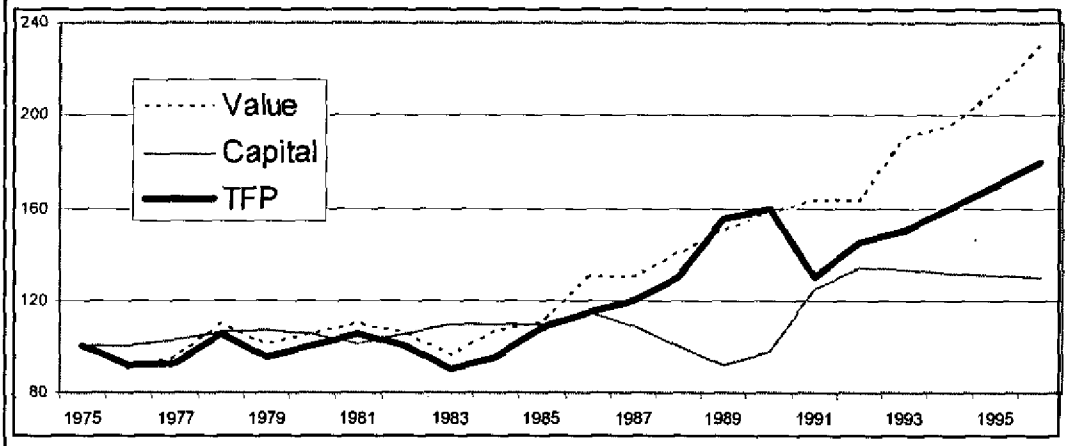
Table 3.8 Estimates of TFP growth in manufacturing sector by different authors

Period	TFP growth	Author
1976-81	0.70%	Aswicahyono, Bird and Hill (1996)
1982-85	1.10%	Aswicahyono, Bird and Hill (1996)
1986-91	2.10%	Aswicahyono, Bird and Hill (1996)
1985-90	1.00%	Abimanyu and Xie (1994) (Cited Abimanyu 1995)
1985-90	2.10%	Osada (1994)[a]
1985-90	3.60%	Osada (1994)[a]

Source : Timmer, 1999.

Furthermore, Timmer (1999), using the Tornqvist indices based on a translog value added production function with two inputs (labor and capital), found that the rapid increase in capital input in manufacturing sector has not been completely matched by increases in the labor input for the period 1975-1995 (Figure 3.4). By 1983, capital intensity had increased to 108 per cent of the 1975 level, while in 1989 it dropped below the 1975 level. Again, in 1995 capital intensity rose quickly to reach 134 percent of the 1975 level.. With regard to TFP, the levels show an almost opposite trend to that of capital, while labor productivity - which had lagged behind until the mid-1980s – showed strong growth in 1995. Timmer (1999) argued that these changes were partly due to the consequences of the government policy shifts towards financial deregulation from 1983 onwards and ultimately encouraged the investment booms.

Figure 3.4 Labor productivity, capital intensity and TFP growth in manufacturing, 1975-95[a] (1975 = 100)



[a] Manufacturing, refers to all manufacturing establishments with 20 or more employees, except oil and gas-refining operations.

Sources: Gross value added at market prices and number of workers from BPS (1997); capital input from Table 2, column D; TFP computed with Tornqvist indices using labor shares in value added from SI (various issues).

In terms of the TFP by industry, Timmer (1999) estimated that the performance varied greatly across industries (Table 3.9). During the period 1975-1981, TFP growth rates ranged from very high (12 %) in the wood industry to low (-5%) for chemicals. From 1982to 1985, the basic metals industry performed best (14 %), while TFP in non-metallic minerals slumped (- 8 %). The log export ban seems to have had an adverse impact on efficiency in the wood industry, with TFP growth becoming negative (-2 %). The period 1986-90 showed annual TFP growth rates of over 5 per cent for all industries except chemicals. Furthermore, the 1991-1995 TFP levels appeared to rise very rapidly in the food, beverages and tobacco and metal product and machinery industries, while for the basic metal industry showed a marked slump. All industries, with the exception of chemicals and non-metallic minerals experienced a TFP growth of at least 2 per cent between 1975 and 1985.

Table 3.9 Average annual TFP Growth in Manufacturing by Industry, 1975-95 (percent)

Industries	1975-81	1982-85	1986-90	1991-95	1975-95
Food, Beverages & tobacco	3.7	3.8	5.6	5.7	4.7
Textiles, garments &leather	0.8	3.5	12.4	3.6	4.9
Wood Products	12.0	-2.4	7.9	-1.8	4.7
Paper, printing & publishing	-1.8	2.5	7.5	3.2	2.6
Chemical, rubber & plastic [a]	-4.9	-2.1	1.7	-0.3	-1.6
Non-metallic minerals	-1.7	-8.3	7.1	-0.5	-0.5
Basic metals	3.6	13.6	8.9	-3.6	5.1
Metal products & Machinery	5.6	-7.8	9.9	6.9	4.3
Other manufacturing	2.4	8.9	5.6	-2.3	3.3
Aggregate TFP growth [b]	*1.0*	*0.1*	*7.9*	*2.1*	*2.8*

Note [a] Excluding oil and gas refining.

[b] The labor input has not been corrected for quality changes.

Source: Timmer, 1999.

In terms of the productivity performance in each industry, Denison (1997) - using the growth accounting method - found that, of the three sources of growth (labor, capital and TFP), TFP was the major contributor in the food industry. However, industry-wide it was found that capital was by far the most important source of growth, accounting for at least 50 per cent of output growth, compared with 30 per cent or less from TFP. The contribution of labor input was relatively high for the chemical, rubber and plastics, wood products, paper, printing and publishing industries, but not in the case of the basic metals food, beverages and tobacco industries (Table 3.10).

Table 3.10 Contribution of labor, capital and TFP to average annual growth in manufacturing value added by industry, 1975-95 (percent)

Industries	Growth in gross value added	Contribution labor [a]	Capital	TFP
Food, Beverages & tobacco	7.4	11	27	63
Textiles, garments &leather	16.4	16	54	30
Wood Products	17.9	21	53	26
Paper, printing & publishing	11.9	21	57	22
Chemical, rubber & plastic [b]	8.1	23	96	-19
Non-metallic minerals	14.0	13	91	-4
Basic metals	22.2	11	66	23
Metal products & Machinery	14.8	15	56	29
Other manufacturing	22.4	23	62	15

[a]. The labor input has not been adjusted for quality changes.

[b] *Excluding oil and gas-refining operations*

Source: Timmer, 1999.

Of the three sources of growth, capital makes the major contribution towards the average annual growth in manufacturing value added, followed by TFP and labor for the years 1975-1995. Looking at the sub-period, the contribution of capital input to the manufacturing sector value added was high for almost all the period, except the years between 1986 and 1990 when manufacturing growth was dominated by the TFP contribution. The contribution of change in the quality of labor is low (2 %) for the period 1975-1995, due to the low share of wages in value added (around 0.23) and the rapid growth of the capital input and TFP (Table 3.11). This indicates that an improvement in labor quality is a prerequisite for workers to cope with the continual demands made on them to operate sophisticated new machinery (Timmer, 1999).

Table 3.11 Contribution of labor input, capital input and TFP growth to average annual growth in manufacturing value added, 1975-95 [a] (percent)

	1975-81	1982-85	1986-90	1991-95	1975-95
Growth in gross value added	8.9	8.5	15.2	13.2	11.5
Labor input	22	29	13	13	18
Employment	21	21	12	11	15
Education	2	8	1	2	2
Capital Input	68	78	36	74	60
Capital Stock	63	73	35	70	57
Capital quality	5	5	1	4	3
TFP	10	-7	51	13	22
of which total relocation effect [b]	6	-6	-2	1	0
of labor input	2	0	0	0	1
of capital input	4	-6	-2	1	0

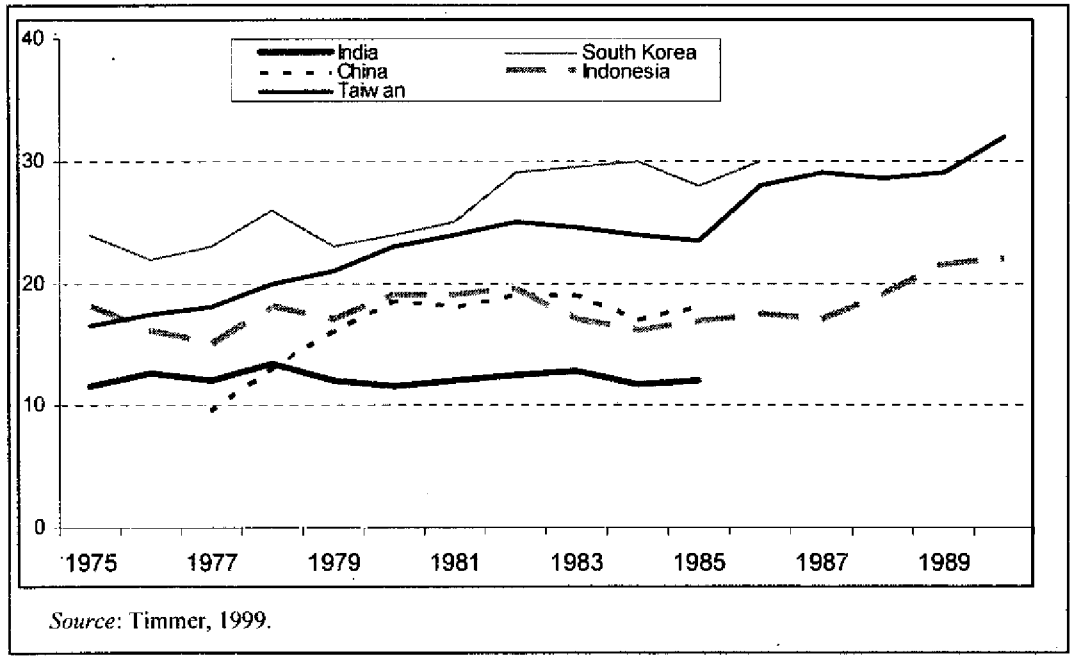
[a] Contribution' is defined as the growth rate of the input multiplied by its share in value added. Figures may not add up due to rounding off.

[b] Calculated according to equation (5) (see text).

Source: Timmer, 1999.

In terms of international comparisons, Timmer (1999) - using currency converters derived from the industry of origin and by assuming a Cobb-Douglas production function - estimated that Indonesia's level of TFP in 1975 was only 18 per cent that of the US. This level of TFP growth stagnated until 1988 and improved somewhat in the period 1989-1990. In contrast, South Korea and Taiwan had much higher levels of TFP and show prolonged catch up with the USA while India experienced relative stagnant TFP below that of Indonesia throughout the period and China's TFP level was only slightly higher in 1985 (Figure 3.5).

Figure 3.5 Relative TFP levels in manufacturing in five Asian economies, 1975-90 (US = 100)



Source: Timmer, 1999.

After 1989, the Indonesian manufacturing sector was steadily climbing the technology ladder (Timmer, 1999). This followed the increasing accumulation of physical capital and human capital, and the diffusion of technology. However, of the three sources of growth, growth in capital input accounted for most of the rapid expansion of manufacturing output, followed by TFP and labor input. By comparison, capital intensity is still below 30 per cent that of the USA, with relative total factor productivities not exceeding the 25 per cent level. In terms of labor productivity in the manufacturing sector, Indonesia has little or no catching up to do by comparison with the US. This suggests that all three sources of growth in Indonesia have been at very much lower levels than in the US.

In summary, the manufacturing growth has been mainly driven by capital input, followed by TFP and labor input. This is in line with the overall picture of the economy in that capital input is also the main source of growth in the country. Perhaps this is the main reason why the economy could not be sustained when the crisis hit Indonesia. For this reason, it is critical that the government increase the quality of labor and technology I in order to maintain the growth rate of the economy in general and the manufacturing sector in particular.

IV Determinants of productivity performance

4.1 Institutions

It has become accepted wisdom that a country cannot have sustained growth without good governance and that governance is highly dependent on the institutional structure of the country. However, it is clear that countries with very different types of institutions, both formal and informal, have managed to achieve long-term growth. Consequently, while most cross-country studies point to the importance of good institutions for growth, it is not always clear what a good institution is, other than one that is working well. In addition, it seems highly likely that the institutions necessary for growth change within a country as it moves up the income ladder. There is also an ongoing debate on whether good institutions are necessary for good policies or vice versa.

In the case of Indonesia, it seems difficult to justify that there is a linear correlation between institutional development and long-term socio-economic growth because there is simply enough established evidence to show that one is automatically associated with the other. This, for example, can be seen from the economic policy reforms after the fall of Soeharto in May 1998. Even then, the good institutional infrastructure introduced by the government following IMF guidelines was unable to resolve the negative impacts of the crisis. This is quiet contrary to the situation before the crisis in which rapid economic growth could be achieved under the poor and corrupt institutional infrastructure. In fact, the World Bank (1990) - in a comparative study on the performance of a number of developing countries in alleviating absolute poverty - concluded that Indonesia was considered to be the most successful of these countries in reducing poverty during the period 1970-1987.

It is argued that reason behind the failure IMF intervention to resolve the crisis was the government's is reluctance to rigorously implement the agreed reforms. While this argument may be justified, there is no disagreement on the fact that the fall of Soeharto on May 21, 1998 was associated with the intervention of the IMF with their reform agenda for institutional development. Institutional development policies, though crucial for productivity improvement, must clearly address many other social and political needs to actually sustain growth in productivity.

4.2 Corruption and poor quality governance

In addition to the institutional problems, corruption and poor quality governance were two other critical factors that contributed to the unsustainability of economic growth between 1962 and 2004. Corruption was not only extremely widespread in Soeharto era, but also, more importantly, in the reform era after the crisis period. In fact many argued that, in the reform era, both corruption and poor quality governance were more dominant than in previous periods. In one widely quoted assessment of corruption, prepared annually by Transparency International, Indonesia was ranked t 80 out of 85 countries in 2000. Most other surveys also clearly placed it towards the top of the corruption scale (Bardhan, 1997). The

Political Economic Risk Consultant (PERC, 2005) even ranked Indonesia as the most corrupt country in 2005. While these evaluations lack a solid scientific basis and are obviously highly subjective, they nonetheless give a reasonably sound and probably quite accurate picture of the situation in Indonesia. Moreover, there was very clearly an extraordinary concentration of power and privilege around Soeharto and a dramatic expansion in his family's business empire. The expansion of his children's business interests after the mid-1980s was particularly remarkable (Time, 24 May 1999)

While the centralization of privilege and resources around Soeharto cannot be denied, it is virtually impossible to reach any conclusion about aggregate trends in corruption over the past number of decades and relative to the size of the economy. One might even make a case – though it could never be proven -that the country was no more corrupt in 1997 than around 1980. In 1980, for example, the petroleum sector, state enterprises and command lending at highly subsidized interest rates through the state banks all constituted a far more sizeable share of GDP and these were massive sources of corruption (Mc Cawley, 1978). In addition, Indonesia's trade regime had become far more open and less distorted by the mid-1990s following the major reforms which were initiated in the mid-1980s. There were fewer non-tariff barriers and a lower dispersion of tariff rates (Fane and Condon, 1996).

Although these arguments do not conclusively demonstrate that corruption was a major causal variable of low productivity growth and the crisis, it does, however, ultimately have has negative implications for the sustainability of sound macroeconomic management. It can make the government lose its credibility in the eyes of both domestic and foreign investors and can also create other problems, such as bottlenecks in the supply of infrastructural and other public commercial services. Therefore, good governance is central to creating and sustaining an environment which fosters strong and equitable development and is essential to complement sound, growth-oriented economic policies.

4.3 Lack of industrial technology development

It can be argued that there were many different factors behind the low contribution of labor and TFP to the growth of the economy in general and the manufacturing sector in particular. Apart from the lack of concern to increase the quality of labor, there was not enough focus on developing more technology and skill-intensive industries. Lall (1993), for instance, argued that there are five major sets of factors that have favorably or adversely affected such developments. These are the incentives system (macroeconomic policies, trade regime, and domestic competition policies), human skills, technological information and support services, finance, and science and technology policies. However, of these five factors it appears only the incentives system in Indonesia (especially macroeconomic policies and trade regime) has been relatively functional, while the other areas urgently need improvements.

In the area of domestic competition policies, for instance, many are still subject to extensive regulations and restrictions. These regulations adversely affect the

competitive business environment in Indonesia, as they unnecessarily increase the costs of doing business (high-cost economy). They also reduce efficiency and limit economic opportunities, often affecting particularly for the less privileged small businesses, which tend to lack political and administrative connections. Restraints on domestic competition include marketing controls, pricing, industrial licensing, public sector dominance in certain industries, and controls and taxes (including illegal levies) on intra-country trade (World Bank, 2005; Thee Kian Wie, 1998). These various regulations and restrictions should be reduced, if not abolished outright. By improving the competitive business environment for manufacturing firms, private and state-owned alike, through the removal of price distortions caused by import protection and restrictions on domestic competition, Indonesia's scarce resources could be deployed more efficiently, and firms' competitiveness would be enhanced.

In terms of human skills, it was true that the government has made rapid strides in education. The primary schools gross enrolment rate, which was just 62 per cent in 1973 rose quickly to 115 percent and 100 in 1996 as a result of the introduction of compulsory primary education. The rapid spread of primary education has reduced the adult illiteracy rate from 43 per cent in the early 1970s to 16 per cent in 1996. However, due to the crisis in 1997, the education system faced many financial difficulties which consequently brought the HDI (Human Development Index) ranking for Indonesia down significantly from 92 in 1996 to 112 in 2003 (UNDP, 2003) and it is now below the HDI for Vietnam.

The rapid expansion of primary education has, however, not been sufficient to produce an adequate number of skilled workers at all levels to sustain Indonesia's rapid industrial growth and modernization. As a result, the educational standard of the Indonesian workforce remains low, with 68.6 per cent of the total workforce having completed or dropped out of primary schools, 28.6 per cent having completed either junior or senior secondary school, and only 2.6 per cent having benefited from tertiary education (CBS, 2004; Thee, 1998).

Another matter of concern is the imbalance between the number of graduates of social sciences and that of natural sciences and engineering in both state and private universities. This has led the government to promote university studies abroad in natural sciences and engineering, by providing scholarships under the Overseas Fellowship Program to talented senior high school and university graduates. However, this program has also been too limited to accommodate the large demand from universities and senior high schools. All in all the quality of human skills in Indonesia remains quite low, despite efforts to improve this situation. Therefore, there can be no doubt the labor input has played a minor role in the growth process of the economy since 1962.

Apart from the lack of human skills, there are also problems associated with technological information and support services as linkages between the public R&D infrastructure and manufacturing firms have been very weak or non-existent (Thee and Pangestu, 1994). Managers of some firms expressed their dissatisfaction, particularly with the researchers who, in their view, had little understanding of the technological needs of the firms they were supposed to advise, and often were not even aware of the most recent technological

developments in their fields of expertise. In addition, many firms themselves are unaware of the R&D capabilities of the country's science and technology institutes or skeptical of the relevance of their activities for their own specific technological needs. In fact, there have been suggestions that neither the government nor the private sector have any interest in promoting research and development, particularly for the medium and high technologies. It has been argued that it was cheaper to imitate the existing product produced by foreign technology rather than to conduct research to develop new products. As a result, industrial technological development in Indonesia lags behind or is off course in comparison to other ASEAN countries. This is reflected in the large number of industries still engaged in low-tech, traditional, small-scale and low-productivity activities.

In terms of the technological achievement index, Indonesia was ranked 60 out of 72 countries in 2001 and 69 out of 104 countries in the growth competitive index in 2004. This confirms what the statement by Lall (1998) that technological activity in Indonesia is still at the bottom of the technology ladder. Much of its exports of high tech products emanate from fairly low-level assembly activities, many relocated from Taiwan, Singapore and Malaysia. Given this situation, it is quiet clear why TFP accounts for only a small contribution to Indonesia's economic growth.

All of the aforementioned problems are of course related to the financial limitations of the country. The ratio of R&D expenditures as a percentage of GDP in Indonesia has been the lowest among the ASEAN countries. It was recorded that in 2000, for instance, Indonesia invested around 0.052 per cent of GDP in R&D, with the government providing 80 per cent of the funds. This performance is comparable with that of its lower income ASEAN neighbors, the Philippines and Thailand, less than half of the Malaysian and the Chinese levels, and about one-fifth of India's. It is of course well below the figure for Singapore, which is similar to the lower OECD norm of around 1.5 per cent. On a per capita basis, Indonesia spent only US$ 1.5 on R&D, compared to US$ 271 in Korea, US$ 180 in Taiwan and US$ 154 in Singapore. Although there is now growing emphasis on R&D (3 % of GDP in 2005), the results of current initiatives remain to be seen.

Apart from the low ratio of R&D expenditure, Indonesia also lacks an effective productivity centre to provide technological support and training in generic technologies relevant to large subsets of firms (for example, quality control systems, just-in-time management and flexible manufacturing). Also, there has been little attention given to improving the technology information services (TIS) offered by the Ministry of Trade and industry. These TIS are vital to improve the access of smaller firms to the international technology markets.

Although there have been many problems associated with technological activity, it should be noted that there is some dynamism in areas of manufacturing activity and exports. Some large conglomerates in particular have accumulated good technological capabilities in complex activities, though their lack of exposure to export markets has held back the development of skills in product development and cost reduction. Similarly, the MNCs (Multinational Corporations), while they have the best operating capabilities in Indonesia, are reluctant to deepen their local

technological activities. The public sector also has a wide range of technological capabilities, but again a lack of competitive pressures. This situation serves to hold back the intense technological initiatives needed to establish a sustainable export presence (Hill and Thee, 2004).

In summary, industrial technological development in Indonesia is still weak, at least in the large manufacturing sector and this may be one reason behind the country's low and even negative productivity growth. The government, therefore, needs to do a great deal to promote industrial technology development. This could be done, for instance, by harmonizing the openness towards trade and investments in the country.

4.4 Low manufacturing skill base and lopsided industrial structure

It was mentioned that the successful rapid economic growth was associated with extensive structural change in the economy which is reflected in the increasing share of the manufacturing sector in GDP - from around 10 per cent to nearly 25 per cent. However, this actually occurred before the onset of the 1997 crisis (Dhanani, 2000). Between 1993 and 1997 growth slowed down in almost all sub-sectors, with the exception of basic metals. The average annual growth rate of manufacturing value added (MVA) declined from 22 per cent in between 1989 and 1992 to 12 percent during from 1993 to 1997. The manufacturing sector was also suffering from a number of structural weaknesses. Firstly, the level of technology employed in manufacturing did not rise over the period 1985-1998. Dhanani(2000) estimated that the share of low-technology activities in the period 1985-1998 rose from 44 to 48 per cent of total MVA, while that of middle-technology industries declined from 38 % to 34 % and the high-technology industries' share stagnated at around 17-18 %. Excluding the large oil and gas sub-sector, the share of low-technology industries ranged from 50 % to 60 per cent. Thus these findings are broadly consistent with slow TFP growth and its marginal contributions to GDP growth.

Secondly, the Indonesian manufacturing sector was heavily dependent on imported inputs, indicating weak backward linkages. The value of imported raw materials, intermediate inputs and components rose from 28 % to 33 % between 1993 and 1996. Higher-technology industries had the highest import content of intermediate inputs, ranging from 61% (drugs and medicines) to 97% (communications equipment), indicating the relatively insignificant role of local technological capabilities. Even the low-technology activities had imported contents as high as 53 % (footwear).

Finally, manufacturing production was highly concentrated. For example, four leading establishments accounted for over 75 per cent of the total output in more than half of the 300 industrial sectors. The simple average four- firm concentration ratio (CR4) was 71-72 % between 1990 and 1996 (Dhanani, 2000). The ownership structure was also highly concentrated. For example, one study found that, in the pre-crisis period, 71.5 % of Indonesia's publicly traded corporations were family-controlled, the highest proportion in East Asia. Almost 17 per cent of the total market capitalization was under the ultimate control of a

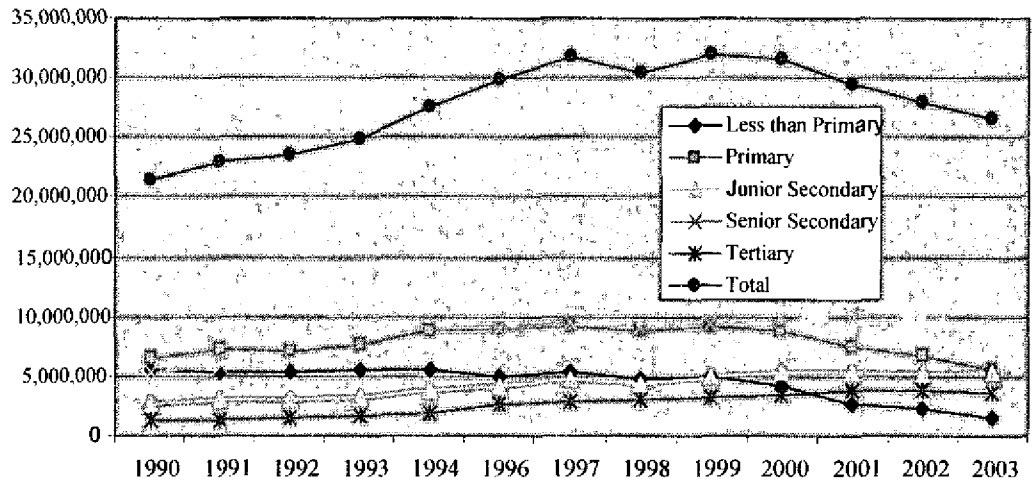
single family. Top 10 families controlled close to 60 per cent of commercial assets. Only 5.1 % of Indonesia's corporations were in wider ownership and most commercial banks were dominated by a handful of families with strong connections to the local and international business community Claessens, et.al, (1999). All these factors may have contributed to the failure to upgrade the skill/technology base in the manufacturing sector and hence adversely affected Indonesia's international competitiveness.

4.5 Low quality of workers and high capital input

The low contribution of labor input to the Indonesian growth performance from 1962 to 2004 was undoubtedly caused by the poor quality of workers. This is reflected in the small number of the workers engaged in formal sector activities. . Figure 4.1 shows that, from 1990 to 2003, there was a trend of decreasing employment in the formal sector. This decreasing trend was due to the economic crisis that left many formal without employment. However, this situation changed slightly in 2004 when the number of formal sector workers increased by 1.19 million in rural areas. These workers are spread evenly over the manufacturing, trade, transportation and services sectors.

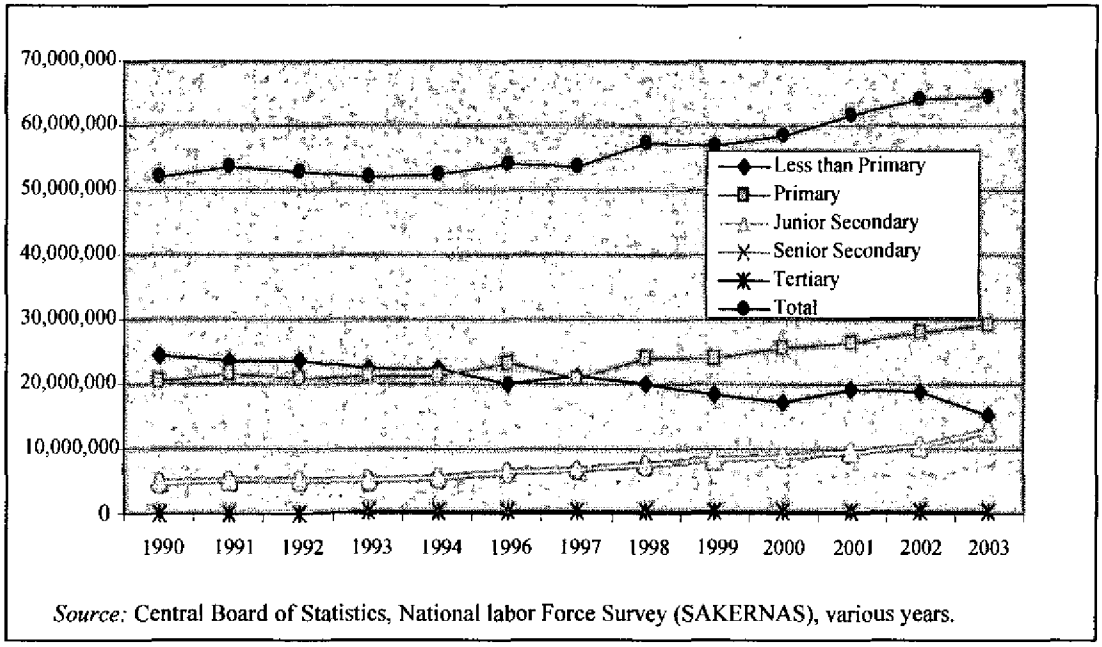
The increasing level of unemployment in the formal sector activities has led to a surge in the number of workers in the informal sector. Figure 4.2 shows that the proportion of workers in the informal sector is on the increase and is always over 60 per cent. In 2004, for instance, the percentage of workers in this sector was about 69.7 per cent. Of these workers, almost 72 per cent worked in rural areas (CBS, 2004).

Figure 4.1 Formal sector employment by educational attainment, 1990-2003 (in thousands)



Source: Central Board of Statistics, National Labor Force Survey (SAKERNAS), various years.

Figure 4.2 Informal sector employment by educational attainment, 1990-2003 (in thousands)



Source: Central Board of Statistics, National labor Force Survey (SAKERNAS), various years.

The low quality of workers in both the formal and informal sectors is also reflected in their educational attainment. As indicated in Table 4.1, about 78 per cent of the total workforce in 2002 had educational attainment below senior high school. This included the workers with educational attainment up to primary school level (35.5 %), followed by junior high school (20.4%) and senior high school (18.1 %). The remaining 22 percent had educational attainment up to tertiary level.

Table 4.1 Percentage of workforce by age and educational attainment, 2002

Age Group	Educational attainment (percent)										
	1	2	3	4a	4b	5a	5b	6	7	8	Total
15 –24	0.25	1.37	8.27	8.86	0.67	4.18	1.85	0.14	0.14	0.11	25.84
25 –39	0.87	3.66	13.60	6.44	0.57	5.74	2.68	0.34	0.54	1.30	35.72
40 –59	3.00	6.45	11.20	2.98	0.33	1.94	1.32	0.26	0.30	0.58	28.31
60+	3.58	2.97	2.53	0.43	0.10	0.21	0.20	0.02	0.04	0.06	10.13
Total	7.71	14.50	35.50	18.70	1.67	12.07	6.04	0.75	1.02	2.04	100

Note: Educational level : 1. No schooling; 2. Complete/Primary schooling in progress; 3. Primary school; 4. Junior high school (4a general, 4b. vocational); 5. Senior high school (5a general, 5b vocational); 6. Diploma I/II; 7. Academy/Diploma III; 8. University.
Source: Labor Force situation in Indonesia, CBS, 2003.

One consequence of the large proportion of the workforce with a low educational level is that they have to depend on the agricultural and trade sectors as their source of earnings (Table 4.2). This suggests that jobs in economic sectors such

as manufacturing, mining and quarrying, financing and other services sectors are almost impossible to fill with a low-quality workforce as they sectors need a higher qualifications. For this reason, it is clear why labor input made no significant contribution to the growth in Indonesia from 1962-2004.

Table 4.2 Percentage of workforce by main industry and educational attainment, 2002

Main industry	*Educational attainment (percent)*										
	1	2	3	4a	4b	5a	5b	6	7	8	Total
1	5.33	10.2	20.4	5.39	0.45	1.65	0.76	0.02	0.03	0.08	44.30
2	0.05	0.13	0.25	0.10	0.01	0.07	0.05	0.00	0.01	0.02	0.69
3	0.54	1.35	4.50	2.65	0.22	2.18	1.33	0.06	0.15	0.24	13.20
4	-	0.00	0.01	0.03	0.00	0.06	0.07	0.00	0.00	0.01	0.19
5	0.11	0.55	2.11	0.90	0.09	0.42	0.35	0.01	0.03	0.09	4.66
6	0.89	2.48	6.62	3.60	0.33	3.30	1.52	0.10	0.19	0.38	19.40
7	0.08	0.48	1.87	1.28	0.09	0.76	0.37	0.02	0.06	0.08	5.10
8	0.00	0.01	0.05	0.10	0.01	0.36	0.18	0.03	0.10	0.24	1.08
9	0.23	0.69	1.93	1.32	0.16	2.19	1.95	0.72	0.60	1.50	11.30
Total	7.24	15.9	37.8	15.4	1.37	11.00	6.56	0.97	1.18	2.64	100

Note: Main industry: 1. Agriculture, forestry, hunting and fishery; 2. Mining and quarrying; 3. Manufacturing Industry; 4. Electricity, gas and water; 5. Construction; 6. Wholesale trade, retail trade, restaurant and hotels; 7. Transportation, storage and communications; 8. Financing, insurance, real estate and business services; 9. Community, social and personal services.
Educational level : 1. No schooling; 2. Primary schooling in progress; 3. Primary school; 4. Junior high school (4a general, 4b. vocational); 5. Senior high school (5a general, 5b vocational); 6. Diploma; 7. Academy; 8. University.
Source: Workforce Situation in Indonesia, Central Board of Statistics, 2003.

Unlike labor input, capital can be considered as the significant source of economic growth, simply because t capital inflows to the country increased during the period 1967- (Table 4.3 and Figure 12). The sources of the capital inputs can be broken down among private savings, government savings, the net flow of foreign development aid, net private foreign borrowing, net foreign direct investment, and net portfolio investment. In terms of the gross domestic fixed capital formation both in nominal and constant terms, for instance, there was a significant increase between 1996 and 1969. There was a similar situation from 1997 to 2000 when the nominal gross domestic fixed capital formation at current market prices still showed sharp increases from, respectively, Rp. 177,686 million to Rp. 313,915 million, consisting of nominal gross domestic savings which increased from Rp. 197,573 million to Rp. 331,907 million minus net savings which declined from Rp. 19,887 million to Rp. 17,992 million. The sharp increases in nominal values were caused by the high inflation rate during 1998 at the peak of the crisis. Hence in real terms, gross domestic fixed capital formation at constant 1993 market prices declined significantly from Rp. 139,726 million in 1997 to Rp. 88,985

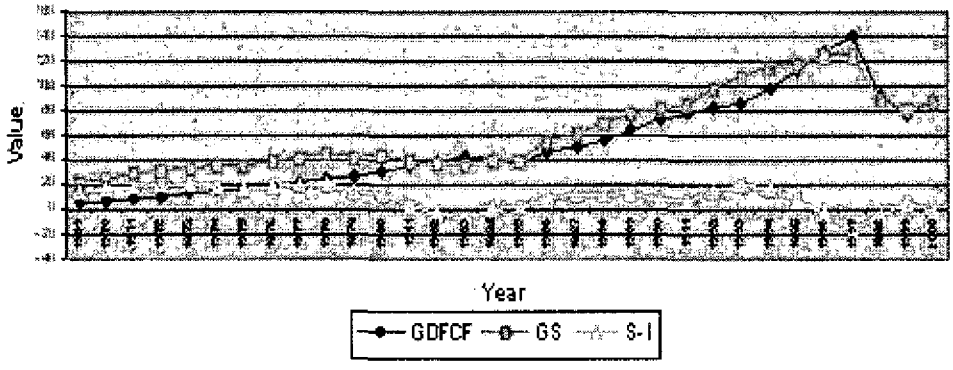
million in 2000, with real gross domestic savings declining from Rp.124,429 million to Rp.86,941 million in 2000 and real net savings falling from -Rp. 15,297 million to -Rp. 2,043 million over the same period (Table 4.3 and Figure 4.3).

Table 4.3 Trends in gross domestic fixed capital formation, gross domestic savings and savings - investment gap, 1969 – 2000 (In million Rupiah)

Year	Gross Dom. Fixed Capital Formation		Gross Domestic Saving		Savings – Investment	
	Current price	Constant price	Current price	Constant price	Current price	Constant price
1969	317	5,822	159	21,812	-158	15,989
1970	455	7,726	355	25,049	-100	17,324
1971	580	9,401	498	28,139	-82	18,738
1972	857	11,191	748	31,885	-109	20,694
1973	1,208	13,100	1,247	34,217	39	21,117
1974	1,797	15,616	2,608	35,088	811	19,472
1975	2,572	17,895	2,644	35,623	73	17,728
1976	3,205	18,969	3,412	38,438	208	19,469
1977	3,826	21,987	4,475	42,405	649	20,419
1978	4,671	25,299	4,903	45,276	232	19,977
1979	6,704	26,417	8,778	41,910	2,074	15,494
1980	9,485	31,405	13,255	43,592	3,769	12,187
1981	11,553	34,902	12,679	38,602	1,126	3,699
1982	13,467	39,438	11,131	37,246	-2,337	-2,191
1983	18,974	42,523	20,881	36,069	1,907	-6,454
1984	19,625	39,999	26,534	40,209	6,909	211
1985	19,618	37,580	26,970	40,222	7,352	2,643
1986	24,782	48,009	27,862	56,425	3,080	8,417
1987	30,980	50,642	41,063	62,737	10,082	12,095
1988	36,803	56,479	48,219	68,417	11,417	11,939
1989	45,650	64,025	61,880	77,256	16,230	13,231
1990	55,633	73,356	71,712	80,414	16,079	7,058
1991	63,894	78,142	81,630	85,411	17,736	7,269
1992	70,820	82,001	99,273	97,393	28,453	15,392
1993	86,667	86,667	107,061	107,061	20,393	20,393
1994	105,381	98,589	123,086	116,136	17,706	17,547
1995	129,218	112,386	139,054	118,696	9,836	6,310
1996	157,653	128,699	160,174	125,100	2,522	-3,598
1997	177,686	139,726	197,573	124,429	19,887	-15,297
1998	243,043	93,605	253,514	89,522	10,471	-4,082
1999	240,322	75,468	224,165	80,473	-16,157	5,005
2000	313,915	88,985	331,907	86,941	17,992	-2,043

Source: CBS and Bank Indonesia (various years)

Figure 4.3 Trend of gross domestic fixed capital formation, gross domestic savings and saving investment gap, 1969-2000 (In real billion Rupiah)



Source: Bank of Indonesia, various years.

Apart from the increasing trends in gross fixed capital formation, investment also played a critical role in capital productivity (Figure 12), particularly between 1967 and 1973 and 1986 and 1997. In the period 1974-1985, the level of investment decreased sharply due to government policy to restrict foreign direct investment, and also declined in the period between 1998-2000 as a result of the economic crisis (Table 15). In addition to the investment flows, foreign debt also played a significant role in increasing the capital growth. The importance of foreign debt for Indonesia dates back to 1950. By the end of 1988, Indonesia's total outstanding public foreign debt had reached US$ 52.8 billion, over half its GNP and almost twice as its goods and services' export value (Table 4.4). This capital input accelerated economic growth between 1968 and 1997.

Table 4.4 Trends in Investment Credits, Capital Flows, Rates of Inflation and Foreign Debt, 1968 – 2000

Year	Investment Credit (Billion Rp)[1]	Foreign Direct Investment (Million US$)	Approved FDI Projects (Billion Rp)	Approved Domestic Investment Projects (Billion Rp)	Portfolio Investment (Million US$)	Inflation Rate (Monthly Cumulative, '88-'89=100, percent)	Foreign Debt (Million US$)
1968	..	..	264	38	..	125.2	..
1969	9	..	128	34	..	17.9	..
1970	40	..	167	113	..	12.4	..
1971	73	139	287	186	..	4.0	..
1972	92	207	163	186	..	6.7	..
1973	111	15	324	469	..	30.6	..
1974	137	-49	542	170	..	41.0	..
1975	178	476	1,145	159	..	18.8	..
1976	246	344	221	409	..	20.0	..
1977	273	235	167	484	..	11.0	..
1978	332	279	207	679	103	8.2	..
1979	397	226	249	655	60	20.6	..
1980	1,296	183	1,074	2,817	46	18.5	20,944
1981	1,781	133	707	2,292	47	12.2	26,305
1982	2,541	225	2,417	3,616	315	9.6	..
1983	3,402	292	2,471	6,476	368	11.7	29,978
1984	4,140	222	1,097	2,109	-10	10.5	31,861
1985	5,207	310	853	3,736	-35	4.7	34,265
1986	6,167	258	848	4,412	268	5.9	40,071
1987	7,635	385	1,520	10,450	-88	9.2	49,738
1988	10,422	576	4,411	14,202	-98	8.1	51,415
1989	14,292	682	4,714	19,594	-173	6.0	53,494
1990	20,734	1,093	8,751	56,511	-93	9.5	67,011
1991	25,748	1,482	8,778	41,078	-12	9.5	76,110
1992	35,223	1,777	10,323	29,342	-88	4.9	84,385
1993	42,713	2,004	8,143	39,450	1,805	9.8	80,592
1994	47,136	2,109	27,353	53,289	3,877	9.2	96,500
1995	59,274	4,346	39,945	69,853	4,100	8.6	107,832
1996	70,443	6,194	29,929	100,715	5,005	6.5	110,171
1997	100,735	4,677	33,833	119,873	-2,632	9.9	136,089
1998	141,464	-356	13,563	60,949	-1,878	59.5	150,886
1999	57,691	-2,745	6,142	36,804	-1,792	2.1	148,097
2000	65,276	-3,924	-	-	-1,910	9.0	141,685

Note: [1] Until 1985 investment credit was grouped by debtor and prior to 1979 was not specified by currency
Sources: Bank of Indonesia, Indonesian Financial Statistics, various figures; IMF, International Financial Statistics, various figures; Investment Coordinating Board.

Capital inputs therefore play a more important role than labor input sin determining the Indonesia's economic growth and as a source of growth. This is simply due to the fact that the quality of labor inputs have been relatively low, as indicated by the small number of workers in the formal sector and the large proportion of the workforce with educational attainment below senior high school. For this reason, efforts to improve the education and skills of the workers are very

much needed. The low level of in-house training in industrial enterprises has to be raised, and SMEs need to be assisted in human resources development by specialized training institutes. Given the constraints on the government capabilities and resources, it should encourage the private educational and training services, with appropriate accreditation, certification and control measures to monitor the quality of the training provided.

4.6 Environmental concerns

Environmental concerns are another important aspect of growth on account of the problems created by past rapid economic growth and unsustainable urbanization. In 1980, for example, the deforestation rate was around one million hectares per annum and had doubled to 2 million hectares by 1996 (World Bank, 2001). The World Bank (1998) estimates that the lowland forest in Sumatra will disappear in 2005 and that the same resources at in Kalimantan will be gone by 2010. Illegal logging constitutes about 65 per cent of the total supply to the wood-processing industry. The annual production of forestry products exceeds 40 million m3, although the estimated sustainable harvest is 22 m3. Forestry and land use change contribute account for as much as 75 per cent of greenhouse gasses and CO2 emissions. El Nino and increased incidences of other extreme weather patterns are clear indications of a looming massive environmental disaster.

Furthermore, with the current crisis in which the Rupiah is depreciated in line with the US dollar there will be increased temptation to export natural resource-based products without restriction. Also, with the current decentralization programs, the governments in each district will be tempted to exploit these natural resources in order to sustain their revenue. Considerable attention should therefore be given to reducing environmental degradation in order to sustain the growth performance of Indonesia.

4.7 Infrastructure

Infrastructure is a crucial factor in determining growth potential. However, there have been many complaints regarding the infrastructure in Indonesia, especially with regard to the difficulties experienced in the areas of communications and transport systems and the availability of electricity and water. The inadequate electricity supply is perhaps the most obvious problem, with firms reporting production revenue losses of up to 4 per cent due to supply problems. Indonesia's ratio of fixed and mobile telephone connections in terms of size of population is a fraction of that found in most of Southeast Asia.

The infrastructure in Indonesia lags behind that of selected ASEAN countries (especially Thailand, Malaysia, and the Philippines) in all respects. It has a smaller percentage of paved roads, lower electricity-generation capacity and fewer main telephone lines per 1,000 inhabitants. This of course severely limits Indonesia's ability to achieve even distribution of economic activities and industrialization, and prevents the country from reaping the benefits of information technology. The situation is even more serious, given the poor quality

of the existing infrastructure and investment in this area should therefore be given priority both for future growth needs and because of its importance for job creation and to boost export activity. Priorities should be given to bridges and roads, particularly in rural areas, and to information communications network to ensure broadly based economic growth.

4.8 Country-specific factors and the investment climate

Country-specific factors played significant roles in transforming Indonesian economic growth. These factors include factor endowments, particularly oil resources, and the fact that a large proportion of Indonesia's exports consists of products based on natural resources (e.g. oil) has also retarded industrialization as it created the problem of Dutch disease. This indicates that country-specific factors, while necessary, are not sufficient in themselves to determine rapid economic growth. This comparative advantage in terms of natural resources has to be accompanied by the policies which ensure the efficient management and use of available resources.

In addition, there have been problems associated with the investment climate. Some of the impediments to inflows of investment are still in need of improvement. Among these, are firstly, the lengthy and confusing procedures. For example, no fewer than 46 permits are required from various government agencies in order to start a business. These procedures take longer and are more expensive in Indonesia than in other countries in the same region. It apparently takes 151 days to establish a company in Indonesia, over 2.5 times longer than in any other Southeast Asian country (Jakarta Post, June 24, 2005). These cumbersome procedures lead to a high-cost economy and to the loss of business opportunities both for companies and for the national economy –in areas such as employment creation.

Secondly, there is an overlap of central and regional development policies on investment and among sectors and widely differing investment policies among the regions. All these have resulted in conflicting national investment policies which deter investors. Thirdly, there is a lack of legal certainty, on account of the lengthy formulation process of the draft investment law and the weak enforcement of the law pertaining to the commercial court. The fourth set of problems is related to the labor market. The decline in employment per unit of economic growth rate indicates the reluctance of companies to employ workers. There are basically two manpower problems that affect the investment climate, namely (a) the tendency for minimum wages to rise, accompanied by the high costs of non-provincial minimum wage components, and (b) uncertainty in industrial relations between employers and employees. These two problems have resulted in increased and unpredictable manpower costs. Finally, the investment incentives on offer, including tax incentives, fail to attract direct investment in Indonesia. Compared with other countries, the tax incentives in Indonesia have lagged behind, although its progressive tax rates are similar. The Indonesian tax system does not provide for tax holidays and has relatively limited tax allowances.

V Policies affecting productivity

Government policies played important roles in shaping Indonesian productivity growth between 1966 and 2004. In order to facilitate a better understanding of the issues involved, the sections which follow are devoted to a brief outline of the evolution of economic policy in Indonesia since the mid-1960s.

Stabilisation period (1966-1970)

As mentioned earlier, between the 1966 and 1970, the government's focus was on economic stabilization – i.e. controlling inflation – and fiscal discipline and a tight monetary policy were adopted in pursuit of this objective. In addition, ties with the international donor community were re-established and the physical infrastructure that had been neglected for years was upgraded. All these factors resulted in strong interest on the part of investors which further improved the economic growth, particularly in the period between 1968 and 1970, when it averaged over 8 per cent. Total factor productivity was high at 8.6%, but decreased sharply to =1.8% in 1970. During these years, capital and labor played constant role in contributing to the overall growth performance.

Petroleum boom years (1971-1981)

In this period, the growth rates were extremely high, due to the oil boom and the ongoing open trade and investment policies. It should also be noted that, by the late 1970s, the government had embarked on a more interventionist path, especially in the area of industrial policy. There were at least four major channels through which government intervened during this period: firstly, through domination of state-owned banks, which provided subsidized credit to favored clients; secondly, through direct involvement in production of state-owned enterprises, mainly in heavy industry; thirdly, through increasing import barriers and, finally, through a complex set of regulations aimed at promoting various industrial policy objectives, such as, regional dispersion of investment, small industry and indigenous business development. All these encouraged the contribution of capital and labor inputs as well as TFP which ensured a relatively high growth rate in these periods. Again during these periods, capital and labor inputs were the dominant factors contributing to the overall growth performance.

The adjustment to the lower oil prices (1982-1985)

Due to the lower oil prices in 1982 and their sharp decline between 1985 and 1986, the government attempted to address the macroeconomic problems through tight fiscal and monetary policies and two large devaluations in 1983 and in 1986. It also followed a microeconomic reform policy at a slower pace. This microeconomic reform policy became effective and wide-ranging in the mid-1980s and included the removal of entry barriers to the banking sector and credit

subsidies, the replacement of the corrupt customs service in 1985 by a Swiss company, SGS, the introduction of an efficient and clean duty draw-back system in 1986, the liberalization of foreign investment, and the reduction of trade barriers. These initiatives saved the economy from a recession and growth rates in these periods ranged from 7.3 per cent in 1983 and 4.3 per cent in 1985, having previously declining significantly to 1.8 percent in 1982. During these years, capital input was a major source of economic growth, followed by labor input.

Swift and effective liberalization (1986-1991)

This period was one of further liberalization and recovery from oil crises, during which the private sector played a greater role and there was an emphasis on non-oil exports. The government devalued the Rupiah in September 1986 and this was followed by a series of substantive trade reforms in October 1986, January 1987, November 1988, and May 1990. The devaluation, combined with tight macroeconomic management, maintained the competitiveness of the real effective exchange rates, while the substantive deregulation tackled the 'high cost economy'.

It should also be noted that, in May 1986, the old export certificate scheme that was subject to abuse was replaced with a duty drawback system which was more precise and less vulnerable for to corruption. The approved importers system, which had become a non-tariff instrument, was abolished and converted into tariff equivalents in the October 1986 and subsequent deregulation packages. In addition, the government announced the introduction of financial reform in October 1988. The reform boosted competition among banks, resulting in an increased mobilization of public monetary assets and reduced interest rates. Foreign and domestic investment was gradually deregulated during the period 1986-94, especially for export- oriented FDI. These policies increased the growth rate from 5.23 per cent in 1986 to 8.2 percent in 1991. They were fuelled mainly by capital input, while TFP made only an insignificant contribution to growth.

Deregulation fatigue (1992-1997)

During these periods, deregulation and reforms in trade and investment were the main policy determinant behind the growth rate. Deregulation policies introduced included reduction in NTBs (Non-tariff Barriers), which were replaced them with tariff and export taxes, and reduced general tariff levels. Several areas of business which had previously been included closed to foreign investors were reopened for new domestic and foreign investment. The removal of NTBs included the abolition of import bans on cold-rolled steel sheets and tin plates.

In terms of trade and investment reforms, the government abolished export bans on copra and palm oil as well as the exclusive rights of several companies to export palm-oil based products. In addition, there were a series of trade and investment reforms in July 1992, June and October 1993, June 1994, May 1995, and June 1996. The main elements of these reforms were a range of tariff reductions, changes in trading arrangements for certain commodities (the removal

of NTBs), improved trade facilitation measures such as a duty draw back scheme and revised procedures for bonded zones, and a reduction of the lists of activities closed to domestic and/or foreign investment.

Although these policies helped sustain the growth rates between 1992 and 1997, there were problems in the implementation process. Apart from the slow pace of implementation, it is also argued that the policies were not comprehensive enough as they did not include various sensitive agricultural commodities, and several important manufacturing commodities. Moreover, there were specific problems related to certain controversial cases such as the clove monopoly and the restrictions on inter-island trade in oranges from West Kalimantan in 1991, the increase in the tariff surcharge on propylene and ethylene imports in 1993, and exemptions from the35 percent luxury taxes on the national car, Timor. There were also a number of problems associated with rampant corruption and the rapid rise in the short-term external debt which threatened to undo the gains from the expected objectives of the reforms. This was perhaps the main reason behind the vulnerability of the Indonesian economy that led to the economic crisis in mid-1997. See Thee Kian Wie (2002) and Jackson (1999) for the details of the reasons behind the economic crisis.

Economic crisis and transition period (1998-2004)

Due to the aforementioned problems, economic growth had contracted to -10.1 per cent in 1998 over a period of less than one year. The initial response to the crisis by the government was the introduction, in cooperation with the IMF and the World Bank, of a tighter monetary policy involving an exorbitant rise in interest rates. This measure was successful in mitigating the Rupiah depreciation, but created problems associated with the banks' inability to pay the high interest rates and encouraged more capital flight (Montes and Abdulsalamov, 1998).

Only since 2000 has the economy made a stronger recovery from the crisis. The policies undertaken to facilitate the economic recovery included a restructuring of the banking sector and of corporate debt, fiscal sustainability measures and debt management, promotion of foreign direct investment, SME (small and medium-sized enterprises) development and the introduction of good governance practices. These policies resulted in an expansion in the growth rate from 1.69 in 1999 to 5.2 percent in 2004 (World Bank, 2005; Alisyahbana, 2005; Thee Kian Wie, 2002).

Economic policies clearly played a significant role in the successful rapid economic growth during the period 1968 to 1997. Of these economic policies, the opening up of trade and investment, high rates of physical investment (including private investments and human capital), and foreign debt were among the most important. These policies encouraged the increase in capital flows created employment opportunities and facilitated the diffusion of technology. They also had a positive impact on productivity growth and capital and labor inputs. As there was, however, much evidence of corruption, collusion, nepotism and a lack of fiscal discipline, these policies have since 1997, been ineffective and unable to sustain rapid economic growth in Indonesia The erosion in financial discipline was evident from the increase in off-budget public expenditures on various costly

investment projects of questionable economic value. On the microeconomic level, a number of regulations and restrictions on domestic competition which were introduced had an adverse impact on the investment climate and the economic efficiency in various sectors of the economy and only encouraged unproductive rent- seeking activities. For these reasons, the rapid economic growth which was achieved between 1966and 997 deteriorated significantly to a negative growth of 10.1 percent in 1998.

VI. Policy recommendations towards productivity

There has been considerable discussion above which has shown that the contribution of productivity growth to the overall growth of GDP was not very significant during the period 1962-2004. Of the three sources of growth, it was shown that, from 1962to 2000, the contribution of TFP was very low and even negative. The years in which TFP made an important contribution were 1968 (8.6 %), 1989 (2.9 %), and 2000 (3.5 %). These findings are consistent with other studies. Also Indonesia's TFP growth was also consistently lower than most southeast and East Asian countries (Chen, 1997) which means that economic growth in Indonesia has been primarily driven by factor accumulation, in particular investment.

However, with the current trend of a decline of the average productivity of capital since 1983, it would be increasingly difficult to regenerate and sustain the investment-driven growth of the past. Future growth must come from an increase in productivity or technological progress and the upgrading of skills. This means that there is a need to re-examine policies with regard to education, training and technology development, including the question of foreign direct investment as a vehicle for technology transfer.

Furthermore, as manufacturing production has been highly concentrated and heavily dependent on imported inputs with weak backward linkages, it is clear that Indonesia is facing critical choices. It has to find an appropriate balance between activities strongly focused on natural resources, labor-intensive mass production, and high value added, technology-intensive differentiated manufacturing. It also has to find a balance between production for the domestic economy and the world economy, and a balance in regional economic activities. Reconstituting the conglomerates may not be a desirable option, given the implications it might have for domestic competition, asset inequality and regional disparity in economic activity. Breaking down these conglomerates into smaller and medium-sized enterprises may be more beneficial in terms of their job creation potential and regional dispersion. They offer strong potential for equitable and broadly based growth in the future.

There is evidence that advancing agricultural technology alone cannot increase production. It has been claimed that over extensive agriculture led to environmental degradation in Indonesia. A more effective measure to increase agricultural production is to fill the yield gaps across farming areas (Bustanul Arifin, 2004). This requires an appropriate rural economic infrastructure acceptable and suitable for the outer islands in particular. A further important measure to be taken is the investment in rural human resources both to improve the quality of the rural workforce and to prepare rural entrepreneurs for the not so distant future. However, given the debt burden of the government, measures should be taken to encourage the private sector to invest in the rural infrastructure and human resource development.

Similarly and in terms of low technological capability, private-sector participation in the provision of training could in fact be more effective because of the close association of the private sector with manufacturing activities. As a matter of fact, enterprise-level case studies found widespread dissatisfaction with publicly provided training facilities (Tan and Batra, 1995). Indonesian firms have not been able to draw on the technical and other support services provided by the country's public vocational and training institutes. The training programs of these institutions are basically supply-driven and have little relevance for manufacturing problems. Hence, the private sector should be encouraged to establish and operate demand-driven technical and vocational training centers, under carefully structured industry initiatives. Their programs should be accredited for quality control, possibly by a joint government and industry association body.

In addition, there is a need to boost labor market flexibility in the manufacturing sector. This could be done, for instance, by implementing production- sharing activities or production networks in which Indonesia would produce certain manufacturing parts, while other countries produced components or different accessories. Production-sharing activities are of particular importance in an environment of increasing global competition, especially in the East Asian region. Manufacturing industries which could adopt this approach include the electronics, automotive, footwear, telecommunications, information technology and computer sectors. In terms of internal policies, there is a need for the government to adopt a more activity-oriented, rather than a product or sector-centered industrial strategy. For instance, in order to develop the tourism industry, the government needs to give incentives for training initiatives, instead of protectionist measures.. Similarly, fiscal incentives need to be given to companies which will engage in research and development activities. There is also a need to give incentives towards infrastructural improvements and technology acquisition from abroad. In short, the manufacturing strategy introduced should integrate both internal and external markets needs.

In sum, the main structural weakness of the Indonesian economy seems to be low productivity of both labor and capital. The contribution of TFP to GDP growth is also extremely low. This is consistent with the low technology and skills base of the manufacturing sector. There also seems to be a disjoint between Indonesia's skilled human resource endowment and skill and technology intensity in manufacturing. Thus, the challenge now lies not only in enhancing the endowment skills, but also to in finding ways to better utilize the available skilled manpower in order to advance on the technology scale. One possible approach could be an effective private public partnership, given the huge debt of the government and the complexity of a growing economy.

VII. Concluding remarks

The sources of growth fin Indonesia between 1962 and 2000 were dominated by the factor inputs, while TFP only played a negligible role in the overall growth process. In terms of the economic sectors, however, TFP played a significant role in the manufacturing, compared with agriculture and services. This suggests that industrial technological development (ITD) is necessary pre-condition to improve the TFP growth. In addition, it was also found that a policy to improve the quality of human resources is very important in order to increase labor productivity. To achieve this, it appears that educational and training opportunities in the field of natural sciences and engineering in particular need to be expanded in the near future.

Furthermore, although the government has taken several steps to upgrade the capabilities of the public science and technology infrastructure, linkages with the private sector are still weak, mainly because of bureaucratic constraints. To improve this situation, the government should facilitate collaboration between the R&D institutes and the private sector. This is possibly an area that would benefit from the involvement of the UNIDO.

An open-door government policy for technology imports and investment needs to be pursued. However, the government should proceed with greater caution to avoid a negative impact on the economy and the environment. There is also a need for the government to increase R&D and technological activities which are economically viable in the foreseeable future.

Moreover, while the policies of openness towards trade and investment and institutions might indeed be the most important factors contributing to the productivity performance, the relationship between the two still needs to be examined critically in a further study. The reason for this is simply because policies of openness have adverse effects on the large number of economic activities (e.g. SMEs). Therefore, institutional policies are vital to improve the competitiveness of SMEs in an open environment of trade and investment.

In summary: future growth should be rooted in the domestic economy from both supply and demand sides. While this study pointed out the importance of the government policies towards productivity growth, strategic public-private sector partnerships seems crucial, given the huge burden on the government and the complexity of the economy, especially in the context of increased globalization. Furthermore, there should be no room for complacency in the area of reforms and institutional restructuring. This is particularly important in the light of the somewhat bleak prospect for a large-scale inflow of foreign capital. Thus, much remains to be done by the government of Indonesia to promote productivity growth in the economy.

Bibliography

Abimanyu, A., 1995. 'The Indonesian Economy and Total factor Productivity', *Singapore Economic Review*, Vol 40, no. 1, pp.25-40.

Abramovitz, M., 1956. 'Resource and output trends in the United States since 1870' *American Economic Review*, vol. 46, no.2.

Arndt, H.W. and H. Hill, 1988. *The Indonesian Economy: Structural Adjustment After the Oil Boom,* ISEAS, Singapore.

Asra, A., 1988. 'Indonesia Economic Growth, 1970-1980', *Bulletin of Indonesian Economic Studies*, vol 10, non 1, ANU, Australia.

Aswicahyono, H., K. Bird, and H. Hill, 1996. 'What happens to industrial structure when countries liberalize, *Journal of Development Studies*, vol 32, no. 3.

Bannerjee, S., 2002. 'Recovery and Growth in Indonesian Industry', *Working Paper* Series no. 02/08, UNSFIR, Jakarta.

Bird, K., 1999. 'Concentration in Indonesian Manufacturing, 1975-1993', *Bulletin of Indonesian Economic Studies*, vol. 35, no.1, pp.43-73.

Booth, A. and P. Mc Cawley, 1981. The Indonesian Economy Since the Mid Sixties, in Booth and P. Mc Cawley (eds) *The Indonesian Economy During the Soeharto Era*, Oxford University Press.

Booth, A., 1989. *Indonesian Economic Development under Soeharto Era*, Oxford University Press.

Central Board of Statistics, Population Census, 1970, 1980, 1990 and 2000, BPS, Jakarta.

Central Board of Statistics, 1978. The Labor Force in Indonesia, Jakarta.

Central Board of Statistics,1984. The Labor Force Situation in Indonesia, Jakarta.

Central Board of Statistics, 2000. Statistics During 50 Years Indonesian Independence, Jakarta.

Central Board of Statistics, various years. Statistical Year Book of Indonesia, Jakarta.

Central Board of Statistics, various years, Statistical Yearbook of Indonesia, Jakarta.

Chen, E.K.Y., 1997. 'The total factor productivity debate : Determinants of economic growth in East Asia', *Asia Pacific Economic Literature*, vol. 11, no. 1, Australia, ANU.

Dhanani, S., 2000. Indonesia : Strategy for Manufacturing Competitive, Jakarta, UNIDO/UNDP.

Denison, E., 1967. *Why Growth rates Differ: Post War experience in nine western countries*, Brookings Institution, Washington DC.

Drysdale, P. and Huang Yiping, 1995. *Technological catch up and productivity growth in East Asia*, The Australian National University, Australia, mimeo.

Elias, V.J, 1992. *Sources of Growth: A Study of Seven Latin American Economies*, International Centre for Economic Growth, ICS Press, San Fransisco, California.

Elias, V.J, 2000. 'Indonesia's Labor Market During the Crisis : Empirical Evidence from the Sakernas, 1997-1999'. *The Indonesian Quarterly*, vol 28, no. 3., Jakarta.

Firdausy, C.M., 1999. *Sources of Growth in East Java and North Sumatra*, Puslitbang Ekonomi dan Pembangunan, Jakarta.

Goeltom, M.S. 1999. "Financial Market and Macroeconomic Policies", paper for the Conference on "The Economic Issues Facing the New Government", Jakarta, August 18-19.

Hall, R. E..and C. I. Jones (1999), 'Why do some countries produce so much more output per worker than others?', *Quarterly Journal of Economics*, 114, 83-116.

Han, C.H. and J. I. Kim, 2000. *Sources of East Asian Growth : Some Evidence from Cross Country Studies*, Paper prepared for the Global Research Project, World Bank and ISEAS, Singapore.

Hill, H. 1996. *The Indonesian Economy since 1966: Southeast Asia's Emerging Giant*, Cambridge University Press.

Hill, H. 2000. 'Indonesia: the strange and sudden death of a tiger economy', *Oxford Development Studies*, vol. 28, no. 2, pp. 117-139.

Hill, H. and Thee Kian Wie, 1998. *Indonesia's technological Challenge*, ANU and ISEAS, Canberra-Singapore.

Kanamori, H., 1972. 'What accounts for Japan's high rate of growth', *Review of Income and Wealth*, vol. 18, no. 2.

Kendrick , J.W., 1956. 'Productivity trends Capital and labor', *Review of Economics and Statistics*, vol. 38, no. 3.

Lall, S., 1998. Technology Policies in Indonesia in Hill, H. and Thee Kian Wie (ed), *Indonesia's technological Challenge*, ANU and ISEAS, Canberra-Singapore.

Lall, S., 2001. *Competitiveness, Technology and Skills,* Cheltenham : Edward Elgar.

Liem, K.L. 1956. "Some Recent Developments in Banking and Credit under Provisions of the Indonesian Bank Act", in: *Economics and Finance in Indonesia*, Jakarta: LPEM-FEUI, Vol. IX No. 7, July, pp. 418-421.

Mahmud, S. 1976. "Perkembangan dan Kebijaksanaan Moneter di Indonesia Sesudah Perang Dunia II", in: *Economics and Finance in Indonesia*, Jakarta: LPEM-FEUI, Vol. XXIV No. 4, December, pp. 327-336.

Mangkusuwondo, S. 1973. "Proyeksi Makro Perekonomian Indonesia 1973", in: S. Mangusuwondo, S,B. Joedono, D. Kuntjoro Jakti (eds.), *Prospek Perekonomian Indonesia 1973*, Jakarta: LPEM-FEUI, pp. 17-28.

Manning, C., 1999. Indonesian Labor in Transition: An East Asian Success Story, Cambridge University Press.

Nasution, A. 1984. "Kebijaksanaan Fiskal – Moneter & peranan Perbankan", in: *Business News*, No. 4028, Jakarta, March 5, pp. 1C-8C.

Osada, H., 1994. 'Trade Liberalization and FDI Incentives in Indonesia: The Impact on Industrial Productivity' *The Developing Economies*, vol. 32, no. 4, pp. 479-491.

Radelet, S. ,1999. *Indonesia : Long Road to Recovery*, Paper presented at CIER/Brooking Conference, April, 5, 1999.

Rodrik, D., A. Subramanian and F. Trebbi (2002), 'Institutions rule: the primacy of institutions over integration and geography in economic development', *IMF Working Paper WP/02/189.* International Monetary Fund (Washington, D.C.)

Rodrik, D. (ed., 2003), *In Search of Prosperity: Analytic Narratives on Economic Growth* (Princeton University Press, Princeton).

Sabirin, S. 1999. "Central Bank Independence and Monetary Policy: The Case of Indonesia", dinner speech at the Seminar on "The Economic Issues Facing the New Government", organized by LPEM-FEUI, USAID and PED, Jakarta August 18.

Sigit, H., 2001. "Measurement of Total Factor Productivity in Indonesia", Infomet, Central Board of Statistics, vol.1 no. 1. pp. 1-19.

Schmookler, J., 1952. 'The Changing efficiency of the American Economy 1869-1938', *Review of Economic and Statistics,* vol. 34, no. 3, pp. 214-312.

Solow, R. M. (1994), 'Perspectives on growth theory', *Journal of Economic Perspectives*, 8/1, 45-54.
Solow, R. M. (1999), 'Neoclassical growth theory', in: Taylor, J. B. and M. Woodford (eds.), *Handbook of Macroeconomics, Volume 1* (North-Holland, Amsterdam), 637-667.

Solow, R. M. (2001), 'Applying growth theory across countries', *World Bank Economic Review*, 15/2, 283-88.

Stigler, G.J., 1947. *Trends in Output and Employment*, National Bureau of Economic and Statistics, New York.

Szirmai, A., 1994. 'Real Output and Labor Productivity in Indonesian manufacturing', *Bulletin of Indonesian Economic Studies*, vol. 30, no. 2, pp. 49-90.

Szirmai, A., 1993. Comparative Performance in Indonesian Manufacturing, 1975-1990. Research Memorandum 538 (GD-3).

Tan, H. W. and Batra, G., 1995. 'Enterprise training in developing countries: Overview of Incidence, determinants and productivity outcomes', World Bank, Private Sector Development Department.

Thee, K.W.; K. Yoshihara. 1989. "Modal Asing dan Domestik dalam Industrialisasi Indonesia", in: S. Ichimura, Pembangunan Ekonomi Indonesia.

Thee Kian Wie, 2002 The Impact of the Economic Crisis on Indonesia's Manufacturing Sector, mimeo.

Thee Kian Wie, 2002. The Indonesian Economic Crisis and the long road to recovery, mimeo.

Timmer, M.P., 1999. 'Indonesia Ascent on the technology Ladder: Capital Stock and Total factor productivity in Indonesian Manufacturing, 1975-1995', *Bulletin of Indonesian Economic Studies*, vol. 35. no. 1, ANU, Australia.

Timmer, P. and A. Szirmai, 1997. Growth and Divergence in Manufacturing Performance in South and East Asia, Research Memorandum GD-37.

Tinbergen, J., 1942. 'Zur Theorie der Langfirstigen Wirtschafsenwicklung', Welwirts Archiv, no. 1, pp. 511-549.

World Bank, 2005. Indonesia : New Directions, Paper presented at The World Bank Brief for the Consultative Group on Indonesia, 19-20 January, 2005, Jakarta.

World Bank,1993. *The East Asian Miracle: Economic Growth and Public Policy*, Oxford University Press, New York.

World Bank,1998. Indonesia in Crisis: A Macroeconomic Update, Washington DC.

Young, A., 1995. 'The Tyranny of Numbers:Confronting the statistical realities of the East Asian Growth Experience', *Quarterly Journal of Economics*

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