Reconstruction of the Service Sector
in the National Accounts of Indonesia 1900-2000:
Concepts and Methods

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September 2005

Technology and Long-run Economic Growth in Asia

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[DRAFT. PLEASE DO NOT CITE]

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1. Introduction

> "National economies cannot be observed directly, but can only be observed via the national accounts. National accounts statistics make the size, development and composition of these national economies visible by translating them in monetary terms indicating their economic importance. The national accounts is therefore often referred to as the barometer of the national economy (Bos, 2003, p. 41)."

The most intriguing question about the economic development of Indonesia during the twentieth century is why the country's growth performance has been so erratic and displayed such a high degree of discontinuity. Why was Indonesia at independence so poor after having experienced a comparatively impressive export-led economic expansion during several decades prior to the worldwide economic depression? Why did the economic growth performance improve so much during the New Order Government of Suharto after the dismal experiences of the Old Order Government of Sukarno? Does this erratic performance convey a fundamental structural weakness in the Indonesian economy that in turn may even help us in understanding why the country plunged into such a deep economic crisis since 1997, the worst one in the region and the worst in several decades? These questions are all connected with the fundamental question of the nature of long-run economic development in Indonesia.

The study of the modern economic history of Indonesia, covering the period from the beginning of the twentieth century until the present day, has so far been less systematic than what the available source material would permit. Indonesia is exceptionally well endowed with rich statistical sources, especially with regard to the late-colonial period, which carry the potential of supporting a rigorous and systematic quantitative approach to vital questions concerning the economic growth performance in the long run. The gap between current historiography and available sources needs to be bridged by the appropriate methodological framework and a rigorous analysis.

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[1] This project is a part of a wider research project entitled 'Strategies of Economic Development in the Twentieth Century: Europe and Asia' of the N.W. Posthumus Institute for Economic and Social History. The reconstruction of the national accounts of Indonesia is supervised by dr. Pierre van der Eng (Australian National University) and Prof. dr. Jan-Luiten van Zanden (International Institute of Social History)

Such a methodological framework is provided by the reconstruction of the national accounts of Indonesia. This paper will discuss the case of the service sector in the reconstruction of the national accounts of Indonesia, 1900-2000. Its aim is to explore the methodological opportunities and threats to reconstruct this important economic sector in both current and constant prices. Schumpeter (1954) already stressed the importance to study in detail how statistics are compiled:

> "We need statistics not only for explaining things, but also in order to know precisely what there is to explain. […] It is impossible to understand statistical figures without understanding how they have been compiled. It is equally impossible to extract information from them or to understand the information that specialists extract for the rest of us without understanding the methods by which this is done- and the epistemological backgrounds of these methods. Thus, an adequate command of modern statistical methods is a necessary (but not sufficient) condition for preventing the modern economist from producing nonsense (p. 14)."

Moreover one should realize that historical national accounts is a useful tool for *measuring* economic growth, but cannot be more than a starting point for the *analysis* of economic development process. But as Krantz (1983) concludes 'processing national accounts data along methodologically proper lines can create new analytical purposes (p.131).'

As said before, the aim of this paper is precisely to explore these methodological lines that can be adopted to reconstruct the service sector in the Indonesian national accounts between 1900 and 2000. The next section will function as a short introduction to the service sector. It will shortly discuss problems of definition, classification and its role in the process of economic development. The third section will deal with the methodological problems and opportunities for the reconstruction of the service sector. In the fourth section we will look in more detail to the methodology that can be applied to reconstruct the Indonesian service sector for the colonial time. The fifth section will discuss the role of the service sector in the economic development in Indonesia, based on official national accounts estimates. The final section will conclude the paper.

2. A short introduction to the service sector

2.1 Definition

In 1940 Colin Clark wrote that 'we find a very firmly established generalization that a high level of real income per head is always associated with a high proportion of the working population engaged in tertiary industries (Clark 1940, p.6-7).' Therefore he concluded that the most concomitant of economic progress is the movement of working population from agriculture to manufacture, and from manufacture to commerce and services.

By economic growth is meant a substantial and sustained long-term rate of growth of real income per head of population. By structural change is meant the transfer of resources between the three sectors of the economy – the primary (agriculture), the secondary (industry) and the tertiary (services) – so that the percentage shares of employment and output are altered. According to Clark economic growth and structural change go hand in hand so that the service sector becomes a more and more important part of economic activity.

But what is a service? A hairdresser or a waitress clearly offers a service. And cars, rice, or computers are obvious examples of goods. But, what is it that distinguishes a service from a good? From a scientific point of view, the distinction between goods and services requires more thought than just to rely on common sense, ad hoc definitions, and individual intuition. However, a precise definition of services within an economic analysis is not so straightforward (Petit, 1986). Adam Smith was the first to make a dichotomy between goods and services. He stressed the perishable characteristic of services: 'they perish in the very instant of their performance.' This intangible aspect allows for neither storage nor further transaction. Hence, for classical economists, services do not contribute to an increase in the volume of exchange. 'Services seldom leave any trace or value behind them (Smith, 1937, Book II, p. 314).' According to Marx services were even associated with unproductive labour.

More recent attempts to define the service sector have tried to isolate unique characteristics of services by establishing criteria with analytical usefulness. Hartwell mentions three main groups of characteristics that have been identified: the first includes lack of durability, unstockability, producer-consumer intimacy, as well as

intangibility; the second is concerned with the unit of production, and argues that services are produced in small, labour-intensive rather than capital-intensive units of production, with a high ratio of value added to the value of total inputs; the third concentrates on the labour force of the service sector which includes a strategically important, but relatively small professional group (of high value human capital), and in comparison with other sectors, a high proportion of female, self-employed and part-time workers (Hartwell, 1973).

While recognizing the usefulness of the above criteria they do not give an unambiguous analytical framework for discussion. It might therefore be better to think of the tertiary sector as a residual. In this broader definition of services in the national accounts it comprises all activities outside agriculture and industry (Horlings, 1995, p. 63; Smits, 1995, p. 19). This because there is more agreement about what constitutes these productive activities, which are defined as agricultural or industrial. Historically it is obvious that the expansion of activities that were neither agricultural nor industrial was and important feature that came with industrialization. Hartwell, for example, states that whether services can be defined accurately or not, the expansion of 'the service sector' (in the residual sense) has been part of the history of modern economic growth (Hartwell, 1973, p. 362).

Hill most thoroughly discusses the problems of defining the service sector (Hill, 1977). He argues that common factors shared by all services are that they bring about some change in the condition of some person or good, with the agreement of the person concerned or economic unit owning the good. Secondly, the change is the result of the activity of some other economic unit. Therefore, he concludes: 'a service may defined as the change in the condition of a person, or of a good belonging to some economic unit, which is brought about as the result of the activity of some other economic unit (Hill, 1977, p. 318).'

Hill's definition has been widely used in the literature, since it is generally applicable. It clearly determines if one is dealing with a good or a service. As many others, I will therefore use this definition as well (see for example, Kögel, 1999; Stibora and de Vaal, 1995; Griliches, 1992).

2.2 Classification

Now that we discussed some different definition of the service sector, we can think about how to categorize this sector. A distinctive feature of service activities is their heterogeneity. Therefore there are several ways to do this. One way is to divide the service sector into three groups. The first group concerns services with a clearly discernible output, price and set of inputs. The value added of these services can be calculated by subtracting intermediate expenses from the value of output. These activities include, among others, trade, transport and communication.

The second group consists of services for which the production cannot be measured properly, while for some of these activities a market price does not exist. Total inputs must serve as a proxy for value added. The drawback of this method is that it precludes an analysis of productivity. Government activities are the best example of these kind of services.

Finally, housing is treated separately, since this industry presents a strange case both with respect to the definition of its output and to its combination of no employment and a large contribution to gross national product.

Another way of categorization is according to the classification of Singelmann (1978). He divides the service sector into four categories. These categories make a functional distinction between:

i.   Distributive services, which cover the distribution of commodities, information and passenger transport (i.e. trade, transport, communication).
ii. Producer services, which are those services mainly consumed by enterprises. Producer services are an intermediate input in the production process (i.e. banking, insurance, real estate and business and professional services).
iii. Social services, which are non-market activities provided by the government, and non-profit organizations (i.e. government, military medical services, education, and religion).
iv. Personal services, which are those services mainly consumed directly by final consumers (i.e. domestic servants, catering, recreation and entertainment, etc.)

Finally, in the national accounts the International Standard of Industrial Classification (ISIC) as found in table 1 is used. According to the system of national

accounts all activities classified under ISIC code 6 to 9 are considered to comprise the service sector. To these activities ownership of dwellings or housing has to be added.

Because the objective of this research is to reconstruct and analyze the service sector in the national accounts of Indonesia between 1900 and 2000, I will use this last classification as starting point.

Table 1: ISIC Classification of Activity

ISIC Code	Sector
1	Agriculture, Hunting, Forestry and Fishing
2	Mining and Quarrying
3	Manufacturing
4	Public Utilities: -Electricity -Water -Gas
5	Construction
6	Distribution
61	Wholesale trade
62	Retail trade
7	Transport, storage and communication
71	Transport and storage
711	Land transport
712	Water transport
713	Air transport
72	Communications -Postal services -Telecommunications
8	Finance, Insurance, & Real Estate (FIRE)
81	Banking services
82	Insurance services
83	Real estate
9	Services and government
91	Public administration and defence
92	Sanitary and similar services
93	Social and related community services
931	Education
933	Health services
94	Recreational and cultural services
95	Personal and household services
96	International and other extra-territorial bodies

Source: United Nations

2.3 The service sector and economic growth

The conventional view, first independently of each other introduced by Fisher and Clark, is that various sectors of economies develop according to a natural sequence (Fisher, 1935; Clark, 1940). At the beginning of the process of economic development, agriculture is the most important sector. Initially, with low levels of productivity, there is little if any surplus above the subsistence requirements, so that the economic activity of most members of the society falls into the primary sector. As agricultural techniques improve, productivity rises and the size of the surplus grows, enabling the development of a manufacturing or secondary sector, producing both equipment and also consumer goods which satisfy some less basic needs over and above subsistence levels. As the wealth and productive potential of the society grows further, even more sophisticated needs are provided for by the service or tertiary sector. This evolution is illustrated in figure 1.

Figure 1

The three-sector model
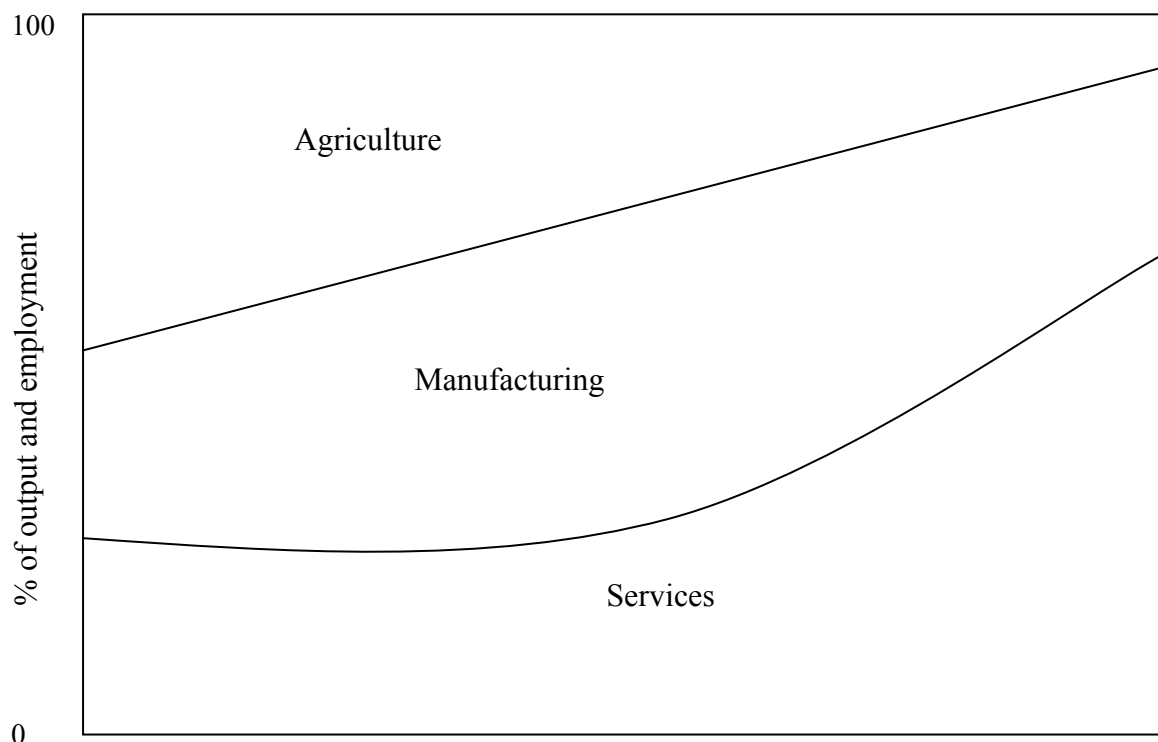
Source: Gershuny and Miles (1983, p. 250)

With respect to this sequence Hartwell (1973) argues that a significant characteristic of the industrial revolution was the emerging service sector.

> "For Western Europe it is important to remember that before the industrial revolution, industry already coexisted with agriculture, and that the expansion of industry, even in the new form of factory production, was not entirely new. It was the expansion of the non-agricultural and the non-industrial sector – thus the service sector - that created the most significant break with the past with the onset of industrialization in the advanced economies (p. 362)."

Fisher, who proposed the conceptual breakdown of the economy in three sectors – primary, secondary, tertiary –, noted that economies could be classified structurally in terms of wealth, according to the proportions of population employed in agriculture (Fisher, 1939). In his view the share of population employed in this sector was inversely proportional to wealth.

Clark stated that economic progress in the sense of a rise of the average real national income per head of the working population may take place (a) as a result of improvement in real output per head in all or any of the three fields (agriculture, industry, services) or (b) as a result of transference of labour from the less productive to the more productive fields. His argument is that labour will be reallocated from manufacturing industries, which experience high rates of productivity growth, but stagnating demand, to services, which experience lower rates of productivity growth but rising demand. Clark's findings are based on detailed empirical data for a large number of countries (Clark, 1940).

The French economist Fourastié even described the low rate of productivity growth in the tertiary sector, combined with a shift in demand to services, as the great hope for 20th century employment (Fourastié, 1949).

In Europe before the industrial revolution the smallness of the service sector and its high costs were a barrier to growth. In the case of transport, for example, only a drastic reduction in the cost of transport enabled the mobility of factors, which was vital for growth.

While the role of the service sector in the process of economic development of developed countries has received some, although surprisingly little, attention, the role of the service sector in less developed countries is still more or less a blind spot in the literature. A good reconstruction of this sector could be a starting point for a better understanding of its role in the economic development of Indonesia.

3. Methodological issues concerning the reconstruction of the service sector

3.1 Problems in estimating service's value added

In the goods-producing sectors usually the production approach is used to estimate gross value-added. The production of tangible goods such as crops, metals and manufactured goods lends itself for the direct estimation of both gross output and intermediate consumption and hence, by subtraction, gross value-added. However, this method is hard to employ for most service activities, since basic data on input and output are lacking or not provided on a comprehensive and regular basis. So, although the production approach can be used to estimate value-added in transport and trade, the income approach is the method used most often to estimate service sector output, and value-added is obtained as the sum of the estimated returns to the factors of production. The main disadvantage of the income approach is that it gives no information on the size and relative movements of gross output and intermediate consumption. Moreover, because in this way output is not measured independent from input it cannot be used for productivity studies (Krantz, 1994).

For example, sometimes wage and employment figures are used in constructing current price series. Constant price series are obtained by deflation with a consumer price index. In formula:

$$Q_c = \Sigma \, we$$

where Q stands for output, w for wages, e for employment, p for the consumer price index, c for current and f for constant prices.

If w is the same for all categories, this can be written as:

$$Q_c = w\Sigma e$$

Output in constant prices is calculated as follows:

$$Q_f = Q_c \,/\, p = w\Sigma e \,/\, p$$

Then labor productivity is:

$$Q_f / \Sigma e = w\Sigma e / p / \Sigma e = w / p$$

Hence, since w/p is real wages, this method implicitly assumes that productivity changes are identical with real wage changes (Krantz, 1994, p. 26).

3.2 Real Output estimates of individual service activities[2]

Real or constant price output series can be obtained by deflating a current price series with a price index or by extrapolating with a quantum index from a current-price estimate for a base year. The choice of whether to deflate or extrapolate depends on data availability.

Value-added is the difference between gross output and intermediate consumption, and value-added at constant prices can therefore be estimated as the difference between real gross output and real intermediate consumption. This method of estimating real value-added, which is called double-deflation whether the series for gross output and real intermediate consumption are obtained by deflation or extrapolation, is the recommend one by the System of National Accounts when accurate data are available. For Indonesia not sufficient data are available to employ the double-deflation method for the service sector.

As an alternative to double-deflation it is possible to use a single-indicator to directly deflate or extrapolate current price estimates of value-added. Since value-added is the difference between gross output and intermediate consumption, single indicator methods assume a constant relationship between intermediate consumption and gross output. Cassing (1996) shows that applying the UN double-deflation method rather than the single-deflation method does not make a big difference when output and input deflators move in a very similar fashion. This will be more likely the greater the degree of aggregation. For the whole economy, all domestic input prices for one sector are output prices for another sector, and these should move together.

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[2] This section is based on Blades e.a. (1974) who gives a detailed overview of the problems in analyzing service activities in developing countries based on national accounts.

Sometimes the basic statistics to construct these various indices are not available and national accountants have to use more approximate methods for estimating real output. For example, when there are insufficient data to construct an employment index it is often assumed that employment in a particular service sector will increase in line with the economically active population. Possible methods for estimating real output are given in table 2.

Table 2: Possible methods for estimating real service output

Activity	Method used for estimating value-added at constant prices
Tranport, Storage and Communication:	
Rail Transport[q]	Index of passenger-kilometers and ton-kilometers of freight
Road Transport[q]	Indices of numbers of vehicles in use
Water Transport[gp]	Index of consumer prices
Air Transport[q]	Index of passenger-kilometers and ton kilometers of freight
Storage[p]	Index of population growth
Communications[q]	Index of work carried out by postal authorities
Wholesale and Retail Trade[q]	Index of the volume of commodities traded
Banking, Insurance and Real Estate:	
Banking[gp]	Index of consumer prices
Insurance[e]	Index of numbers employed
Real Estate	…
Ownership of Dwellings[o]	Real output assumed to be 2% of total real GDP
Public Administration and Defence[e]	Index of government employment
Other Services:	
Education[p]	Index of population growth
Health[p]	Index of population growth
Domestic Services[p]	Index of population growth
Other[p]	Index of population growth

Notes : [pc]: Price Index of Characteristic Output
[gp]: General Price Index
[w]: Wage-rate Index
[q]: Quantum Index
[e]: Employment Index
[p]: Index of Population Growth
[o]: Real Output Assumed a Constant Proportion of Total Real GDP

Source: Blades e.a. (1974), p. 37, 48-57

4. Reconstruction of the service sector in Indonesia's national accounts, 1900-1940

The reconstruction of the service sector will initially be divided into two periods, the colonial period covering the years 1900 until 1939/1940, and the period after the Dutch handed over sovereignty in 1949 until 2000. There are two reasons to make this dichotomy. The first reason is of course the outbreak of World War II. The war and the subsequent struggle for independence were both politically and economically very disrupting. As a result only very few statistical data were collected, of which most are destroyed during these turbulent years.

The second reason for this division is that for the period 1951-2000 national income estimates are available, although its reliability especially for the 1950s is highly questionable (Neumark, 1954; Bakker, 1954; Hollinger and Tan, 1957; Muljatno, 1960; BPS several publications). For the later years, though, the national income estimates by the Indonesian central bureau of statistics (BPS) are considered of quite good standard (Arndt and Ross, 1970). For the period 1900-1940, however, only a few few tentative estimates of national income of Indonesia were published of which Götzen's (1933) attempt was the most substantive (Van der Eng, 1992). In 1943 Polak was the first to prepare estimates resembling the present day concept of national accounting, but his estimates by industrial origin for the years 1921-1939 only cover the income of the Indonesian population. Moreover, his methodology is very robust since at the time of writing (during World War II) he lived in New York. As he stated:

> "The impossibility of contact with the economy described has been felt as a serious handicap in many ways. In its most direct form it precluded the use of unpublished material which happens not to be available in the United States. Furthermore, no help could be obtained by referring back to the authors of publications for, or to Government departments for unpublished figures which are probably existent. And, finally, personal observation could not be fallen back upon as a last resort when statistical data were absent (Polak, 1943, p. 28)."

For these reasons a reconstruction of the service sector needs to be done more or less from scratch for the colonial period. For the period after independence the focus will be on improving and extending the existing estimates of the size of the service sector. This section will be dedicated to a discussion of the proposed methods

for the reconstruction of the service sector in the colonial period. Since this is work in progress, some sectors are more thoroughly discussed than others.

4.1 Reconstruction of the Indonesian service sector, 1900-1940

<u>Transport, Storage and Communication</u>
Rail transport: Using the production approach current price estimates can be derived from the profit and loss accounts of the different railway companies. During the colonial time the State Railway Enterprise (*Staatsspoorwegen*) was the most important, but not the only provider of railway services.

To arrive at the value added of this subsector, first the value added of the State Railways is estimated based on its profit and loss accounts. The contribution of the State Railway Enterprise is estimated as the sum of the wages and salaries, operating surplus and interest. This information can be found in the annual reports (*Verslag der Staatsspoor- en tramwegen in Nederlandsch-Indië*). For several benchmark years it was found that wages and salaries, and interest accounted for approximately 50 % of expenditure. So value added was calculated as:

(1) Value added State Railway Enterprise = Total revenue – 0.50 * expenditure

Then based on its share in rail transport of passengers and goods the value added of the total rail transport sector is estimated.

(2) VA Railways = VA State Railway Enterprise/share of State Railway Enterprise (t)

In the end it is checked if the movement of the value added of the State Railways Enterprise is a good representation of other railway enterprises. Therefore the value added of the State Railway Enterprise is compared with the value added of two other relatively large railway companies, the *Deli Spoorweg Maatschappij* (DSM) and the *Nederlandsch-Indische Spoorweg Maatschappij* (NISM). As can be seen in figure 1 the value added of these three railway companies seem to move together. This is confirmed by their correlation coefficients, which are all above 0.9.

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Figure 1: Value added of railway enterprises, 1900-1940
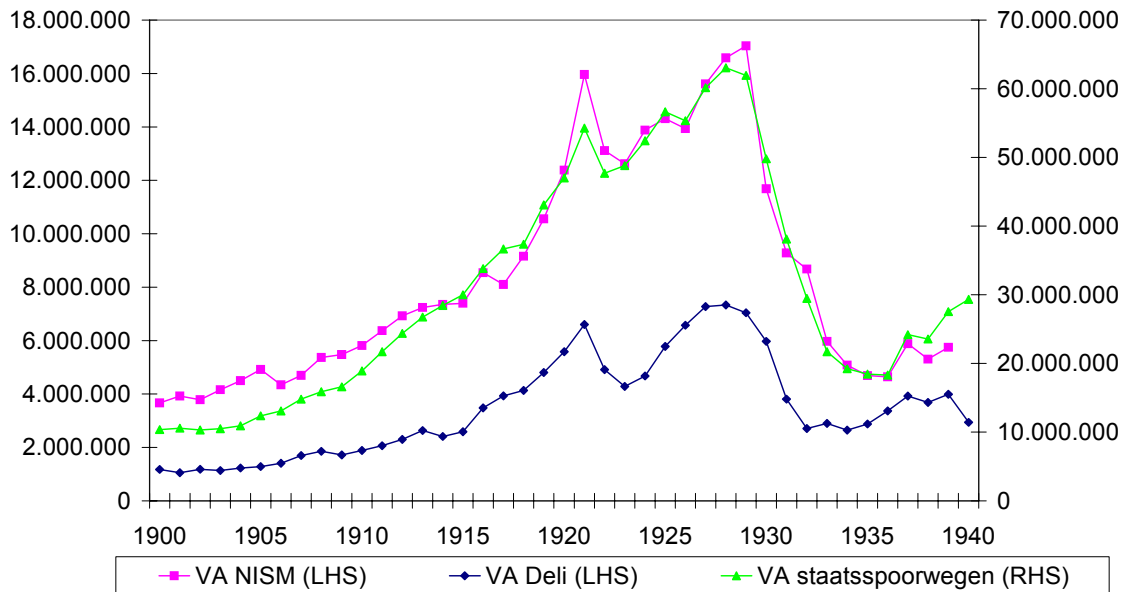
Sources: Annual reports *Deli Spoorweg Maatschappij* (DSM), *Nederlandsch-Indische Spoorwegmaatchappij* (NISM), *Staatsspoorwegen*

Air transport: The value added of air transport can also be estimated with the production approach. In 1928 the Dutch Netherlands-Indies Airlines (*Koninklijke Nederlandsch-Indische Luchtvaartmaatschappij*, KNILM) started its operation. Since its profit and loss accounts are available, it is possible to estimate value added for air transport along the same line as the railway sector.

Road transport: Cars were first imported in Indonesia in the first decades of the 20th century. Based on number of cars imported, number of cars registered and average revenue statistics current price estimates can be derived. These estimates will probably be rather robust since figures are at least until 1935, when the registration system improved, quite inaccurate. The same is true for transport by trucks, motorcycles and busses. Statistics on motor vehicles for road traffic are available in CEI IX (1989).

For traditional means of road transport a different estimation procedure has to be adopted, since no data are available for this means of transport. The best way to estimate value added for this subsector is assuming that the daily wage is a good

proxy for value added. If we assume that the wage is equal to that of an unskilled worker and we know the number of people working in this sector than it is possible to come up with an estimate. Since in 1930 a population census was held this line of estimation seems fruitful.

Shipping: During the colonial period the most important player in shipping transport was the *Koninklijke Paketvaart Maatschappij* (KPM). In 1930 it was estimated that KPM covered 42.9 % of total intra-island shipping traffic or almost 80 % of intra-island shipping under the flag of the Netherlands-Indies. Since the profit and loss accounts of this company are available it is possible to estimate its value added.

Other transport: Here is included all other transport by air, sea and road, and services incidental to transport where statistics in a proper sense are not available. The number of persons engaged in this sector can be derived residually from the population census of 1930. If we assume that this number has moved along with total population, and that people working in this sector earn a wage equal to an unskilled urban worker we can arrive at an estimate for this subsector.

Communication: This sector covers the activities of the post office, telegraph office and telephone office. During the colonial period the communication was in hands of the state-owned enterprise PTT (*Staatsbedrijf der Posterijen, Telegrafie en Telefonie*). The contribution to national income is obtained as the sum of wages and salaries, interest and operating surplus. The data available for this sector are, like that for rail and air transport, quite comprehensive and are taken from the annual reports of the PTT (*Verslag omtrent den Post-, Telegraaf- en Telefoondienst in Nederlandsch-Indië*). Based on the profit and loss accounts it is possible to come up with an estimate of the value added of this subsector.

The physical output of the transport and communication sector includes a wide range of services so that real output cannot be estimated on the basis of a single price or quantity indicator but must be built up using separate indices for the individual activities.

For rail and air transport volume indices such as freight-tons or passenger-kilometers are used. However, these highly aggregated gross output measures ignore

the heterogeneous nature of the freight and passenger services provided. A bus ticket is taken to represent the total price of the transport from one place to another, the comfort of the bus, its speed, the frequency of service and safety. But these characteristics may vary widely, which is not taken into account in the national accounts. Furthermore differences in the average distance goods and passengers are carried influences value-added per ton or passenger kilometer (Mulder, 1999).

In the case of road and water transport output indicators are often lacking. Therefore estimates of real output are based on the number of registered trucks, buses, taxis, boats, etc. This method is based on the very unlikely assumption of a constant rate of vehicle utilization. With regard to communications, as in most developing countries, a single volume indicators such as number of letters or telephone calls, is used to estimate changes in real output.

Trade

One possible approach to estimate this sector is to estimate the marketed surplus of the production in agriculture, fishing, forestry, mining, manufacturing, and the marketing of exports and imports of merchandise. For the 1960s the marketed proportions had been estimated on the basis of information supplied by the Departments of Agriculture and Trade and by other agencies. The proportions used were: for farm food crops 30 %; farm non-foods 75 %; estate crops 100 %; livestock 50 %; fishing 75 %; forestry 50 %; mining 100%; large and medium manufacturing 100 %; household industry 50 %; and import/export 100 %. Throughout the period fixed percentages had been used. Fixed trade margins had been applied to these marketed surpluses estimated by the Department of Trade. These margins were 20 % for exports, 50 % for imports and 20 % for domestically produced goods. These estimates were derived from the National Sample Survey of 1963 (BPS, 1970). These figures are in line with the numbers used by Neumark (1954) and Muljatno (1960) for the 1950s.

Another procedure is followed by Polak (1943). He based his estimates on tax data, because in 1913 a special tax of 2 % of the net income was levied on Indonesian tradesmen. Their average tax payment in 1913 was Fl 1.91 per head (Java and Madura), indicating an income of Fl 95 per head. Prices in 1939 were about one-third below those of 1913 but it is not impossible that, with increasing industrialization, the average income of the middleman has increased. Therefore Polak puts this income at

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Fl 100 per head, a figure obviously subject to rather a wide margin of error. The number of persons engaged in trade is known for 1930, when it was 909,000 (Java and Madura). Assuming a 15 % increase from 1930 to 1939, in accordance with the increase of the population, the income from trade in 1939 for Java and Madura would be Fl 105 million.

In the Outer Provinces the average income of this occupational group was, according to the tax statistics 45 % higher in 1913. The difference in tax per head may have been due to the inclusion under this tax of large numbers of other persons in the Outer Provinces. Polak, however, argues that a difference of this magnitude does not seem improbable in itself. Assuming an average income in 1939 of Fl 145 per head and using the same procedure to arrive at the number of persons engaged in trade as for Java and Madura, an income from trade in the Outer Provinces of Fl 30 million is found for 1939.

In order to obtain a time series for the income from trade a simple procedure has been followed. It has been assumed that this income formed a constant percentage of the total Indonesian income from all other occupations. Polak gives two arguments in favour of this admittedly rough procedure. In the first place, trade is intimately connected with the value of production in all other sectors of the economy and inevitably shares in the changes of these other sectors. Often the trader works on the principle of a constant percentage 'mark-up', in which case his income, neglecting overhead, moves parallel with that of the population group in whose products he deals. Polak's second argument is a rather shaky one. According to him any other procedure followed to estimate the income from trade, if it would lead to different results from the one here adopted, would introduce into the total Indonesian income certain fluctuations for which only very weak justifications could be found. The present method, on the other hand has the advantage that it does not affect the percentage change of the total Indonesian income from one year to another; however arbitrary it may be in itself, it at least does not introduce arbitrary movements into the total.

The gross output of a trading enterprise is properly defined not as the total value of its sales, but as the gross margin earned on goods sold. To obtain value-added intermediate consumption of items such as packaging materials and fuel must be deducted. In most developing countries this information is not available and therefore the mark-up method is used. This means that estimated trade margins are applied to the total value-added.

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The mark-up approach as it is applied to the trade sector has many limitations. No distinction is made between the different trading channels used such as supermarket, family shop, rural market or cooperative. Quite often there is not even a distinction made between wholesale and retail trade. Moreover, gross margins are usually estimated for rather broad groups of items and usually on the basis of irregular surveys. Finally, the mark-up for calculating gross margins is usually applied to the estimated total of goods supplied in the year and no account is taken of stock changes. But trade output is generated at the time goods are actually sold.

Financial Institutions

Banks: During the colonial period the Java Bank functioned as central bank. Income and expenditure statistics covering all state banks and the majority of private banks were collected and compiled by the Java Bank. On the basis of this information production accounts can be compiled imputing a service charge defined as interest received minus interest paid.

Insurance: Since data on insurances are practically non-existent the best way to deal with this sector is to use a mark-up.

Other financial institutions: The value added of village banks and village paddy banks in 1960 had been estimated at 50 % of interest received on the bases of norms observed in private banks, and of rough estimates of the wages and salaries bill. Some information on such banks and pawnshops is available.

In developing countries banking, insurance and real estate accounts for only a small proportion of total service sector output. The output of this sector is usually measured by an imputed service charge and interest deducted from deposits held. To get gross-value added at constant prices a price index is used with the aim of measuring the purchasing power parity of such income. The objection against this method is that it provides a measure of real income rather than real output.

Ownership of dwelling

The contribution of house property to the national income is taken as equivalent to the net rental income of residential dwellings. No distinction is made between owner-occupied houses and rented houses.

In the absence of any proper statistics an option to estimate gross value added is to assume that ownership of dwelling corresponds to a constant percentage of the gross value added of all other activities at both current and constant prices. This is also the method used by BPS in the 1960s, which assumed a 2 % contribution to GDP.

Van der Eng (2002) applies another method. He estimates gross value added in housing using population and the sub-total of all other sectors as indicators, each with a weight of 0.5. The assumption is that growth of per capita income induces people to invest in the quality of houses, which increases the rental value of dwellings.

But it seems that with the available information more reliable estimates can be made. From the 1930 census we learn that there was in Java and Madura a total of 8,784,000 Indonesian dwellings. Of these 352,000 were brick dwellings, while 4,837,000 were classified as 'other than brick dwellings with permanent roofs'. There was further a total of 48,000 European dwellings (mainly brick), 121,000 Chinese and 11,000 other dwellings. Figures for the rest of Indonesia are not available but can be estimated from this.

Besides knowing the number of dwellings per population group in Java and Madura, the 1930 census also tells us how many people from the different population groups were living in Java and Madura. From this we can calculate for the different population groups how many people on average lived in one house. If we assume that this ratio was equal in the Outer Islands we can derive the number of dwellings in the Outer Islands by multiplying this ratio by the number of people of the different population groups living in the Outer Islands. This information is also taken from the 1930 census. In this way we arrive at an estimate of the total number of dwellings in Indonesia in 1930. The results are shown in table 3.

Table 3: Number of dwellings in Indonesia, 1930

	Indonesian	European	Chinese	Other	Total
Number of dwellings in Java & Madura	8.784.000	48.000	121.000	11.000	8.964.000

Population in Java & Madura	40.891.093	192.571	582.431	52.269	41.718.364
Ratio population/dwelling in Java & Madura	4,7	4,0	4,8	4,8	4,7
Population in Outer Islands	18.246.974	47.846	650.783	63.266	19.008.869
Estimated number of dwellings in Outer Islands	3.919.715	11.926	135.200	13.314	4.084.424
Total number of dwellings in Indonesia	12.703.715	59.926	256.200	24.314	13.048.424

Sources: Own calculations based on Population census 1930

Now that we have an estimate of the total number of dwellings it is possible to calculate the contribution of housing to GDP. To arrive at this estimate information on expenditure on housing is needed. This information can be obtained from household surveys (for example Boeke (1926); CKS (1928), Huizenga (1958)).

Since a significant proportion of housing in developing countries is owner-occupied and in such cases it is necessary to impute rental incomes. Imputed rental incomes of owner-occupiers are usually based on market rents actually paid for similar tenanted dwellings. Another method is to estimate the rent as equal to annual depreciation. Either method involves subjective judgement based on weak and unrepresentative data.

Single indicator estimates are either based on a quantum extrapolation, such as estimated growth of the stock of dwellings, or number of households, or current price value-added deflated by a rent index (usually derived from a consumer price index).

Public administration

The conventional practice in national income estimation is to evaluate government services – other than those of government enterprises – in terms of expenditure made for them. Government activities can best be split into administrative and commercial activities. The former are valued at the cost of these services, that is, as equivalent to the wages and salaries paid by government administrative departments and the latter on the same basis as other productive enterprises.

The government sector includes under government services the public administration. Under commercial activities railways, post and telegraph, opium

production, salt production, etc. These major commercial activities are treated separately.

The number of people employed by the government is known for 1930 from the census. Moreover the Colonial Reports give the number of government employees as of March 1, 1932. A direct estimate of the payroll paid by the Government can be made for one single year, namely 1926. For that year the total wages and salaries paid to all employees have been published (Indisch Verslag part II, 1929, p. 430). Unfortunately this has not been published for other years.

Therefore a different method is employed as well. From the Netherlands Indies Budgets for several benchmark years the wages paid is taken for the different departments. Assuming that the ratio of wages paid to total expenditure per department is constant we arrive at an estimate of this subsector.

Gross value-added of the public administration consists of factor payments such as compensation of employees, rent and depreciation. A problem is that some countries include only cash wages and salaries, while other include in addition allowances in kind, imputed house rents for civil servants occupying free or subsidized accommodation, and government contributions to social security funds.

Because of the important role of the government in developing countries it is essential to measure changes in real output accurately. The method normally used is to assume that the output of the sector is equivalent to the labor inputs. Therefore some countries deflate current price value-added by a wages index, while other extrapolate from a current price base year estimate using indices of numbers employed.

Other services

The value added in base year had been calculated as the product of the number of persons employed in service industries derived from the Population Census in 1930, and the average earnings per person. Assuming an unchanged proportions of persons employed in this sector to total population, constant prices were obtained by extrapolation by the growth of population. From this series current prices were derived using as inflator an index of average wages of estate workers.

The main activities included in this sector are health, education and other community or social services, recreation and entertainment, business and professional services, hotels and restaurants, domestic and other personal services.

Education is usually the main service included in this sector. The value-added by education services which are provided free or subsidized by the State is taken as the cost of factor inputs. For estimating the real output, some countries extrapolate the base-year estimate with employment indices, while other use quantum indicators of output such as numbers of students enrolled or number of examination passes obtained. One general problem in this area is the connection between quantity and quality. For example, if the number of students rises while the number of teachers remains constant, has the real output of education services increased or decreased? It could be argued that there has been an increase either because each teacher is now more productive or because the physical output (i.e. students) has risen. On the other hand it appears just as reasonable to take the opposite view and claim that real output has decreased, since the quality of education provided is presumably a function of the student/teacher ratio.

Health is another important social service. Value-added by health raise the same estimation problems as for education; i.e. the problem of the proper valuation of health services provided at less than cost, and the problem of identifying output.

The solutions adopted are very similar to those mentioned above for education. Most countries use single output indicators for extrapolating value-added. The indicators may refer to the number of hospital beds, the number of patients treated or the number of doctors and auxiliary staff.

The current price estimates of value-added for other activities included in 'other services' are subject to a wide margin of error and constant price series must be viewed with skepticism. In several developing countries no attempt is made to estimate separately real changes in miscellaneous services and base year value-added is extrapolated by the estimated growth of population or labor-force.

Table 4 : Sectoral shares of employment (in % of total working population)

Sector	1930	1971	1980	1990
Agriculture	68.02 %	64.16 %	55.93 %	49.95 %
Industry	11.39 %	8.44 %	13.17 %	16.72 %
Services	20.59 %	27.4 %	30.90 %	33.33 %
Participation rate	34.4 %	34.6 %	35.0 %	39.9 %

ISIC	Sector	1930	1971	1980	1990
1	Agriculture, Hunting, Forestry and Fishing	68.02 %	64.16 %	55.93 %	49.95 %
2	Mining and Quarrying	0.81 %	0.21 %	0.75 %	1.00 %
3	Manufacturing	10.58 %	6.50 %	9.08 %	11.43 %
4	Public Utilities	-	0.09 %	0.13 %	0.20 %
5	Construction	-	1.64 %	3.21 %	4.09 %
6	Distribution, Hotel and Restaurant	6.09 %	10.33 %	12.96 %	14.73 %
7	Transport, storage and communication: Railways Road transport Air- and water transport Communications	1.51 % (0.33 % 0.80 % 0.30 % 0.08 %)	2.31 %	2.85 %	3.66 %
8	Finance, Insurance, & Real Estate (FIRE)	0.11 %	0.23 %	0.59 %	0.95 %
9	Services and government: Public administration and defence Sanitary and similar services Social and related community services Education Health services Recreational and cultural services	3.28 % (2.47 % - - 0.25 % 0.21 % 0.35 %)	9.98 %	13.86 %	13.06 %
	Others	9.60 %	4.55 %	0.65 %	0.95 %

Sources: *Volkstelling 1930*; BPS: *Hasil sensus penduduk* 1971, 1980, and 1990

5. Indonesia's official National Accounts, 1951-2000: Economic Structure

In another paper I have described the methodology used by BPS to estimate the service sector in the official national accounts (Marks, 2005). Based on these estimates it is possible to make a few remarks about the role of the service sector in the economic development in Indonesia since independence.

Figure 2 shows how, according to the official national accounts, the economic structure of Indonesia developed. This figure is derived from the various publications of the official national accounts since 1951. Comparison of nominal current price estimates is not very informative because of inflation and deflation. On the other hand, comparing constant price estimates over long time periods is questionable because 1990 prices for example do not properly represent the situation for, say, 1930. over different years because different base years are used. But by presenting the data as percentage of total gross domestic product it is possible to draw conclusion about the development of the economic structure.

In the years after Indonesia gained independence in 1949 the country can be characterized as an agricultural economy with a significant service sector. In these years the agricultural sector contributed more than 55 % to gross domestic product, while industry at the most 15 %. This is not surprising since economic policy making was not high on the agenda of president Soekarno. Nation building and keeping the country united had his priority. Policy was therefore aimed towards achieving economic sovereignty or *Indonesiasi* ('Indonesianisation'). This process, in which state enterprises were set up and others taken over from the Dutch, meant that a lot of knowledge disappeared and industrialization was actually halted.

> "In the years since independence, Indonesian development activity […] has been effective in raising output mainly in the labor-intensive sector of the economy. In the capital-intensive sector the Indonesian government's primary concern has been transferring ownership of enterprise from foreign to Indonesian nationals. On balance, the result of this policy has probably been a net reduction of capital facilities in this sector, at least outside the petroleum industry" (Paauw, 1960, p. 209.)

Moreover, because the agricultural sector was considered very important to become an autarkic nation, growth in agriculture was stimulated in order to make

Indonesia self-sufficient in this sector. Because of this pattern in which the share of the labor-intensive or traditional sectors in total output increased while that of the modern, capital-intensive sectors declined, Booth (1998, p. 70-72) calls this a period of retrogression.

Figure 2: Economic structure in Indonesia, 1951-2000

Current prices, 1951-2000
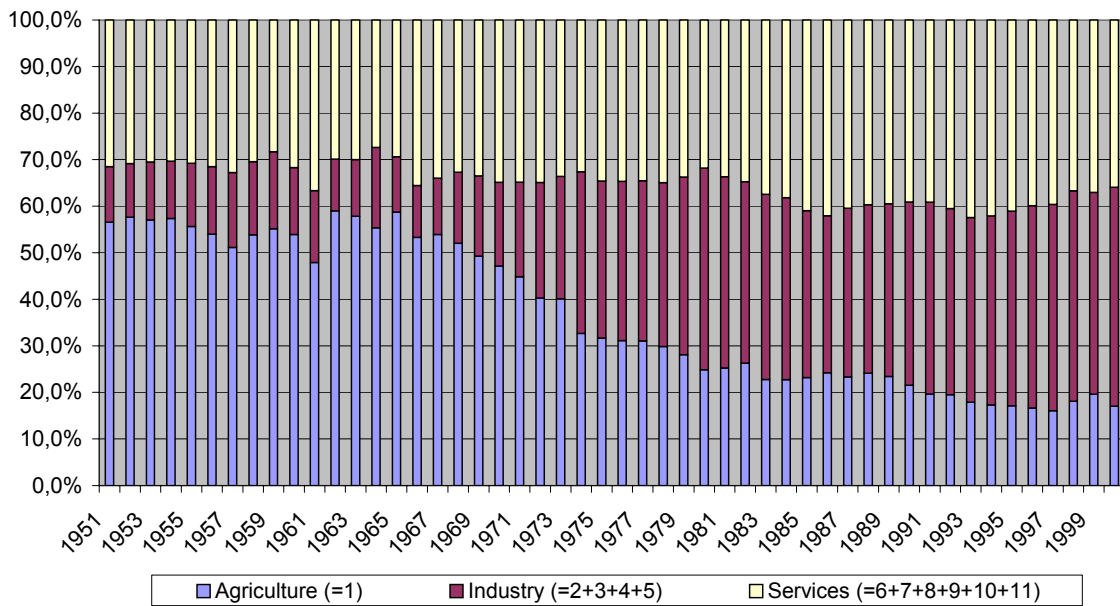
Constant prices, 1951-2000
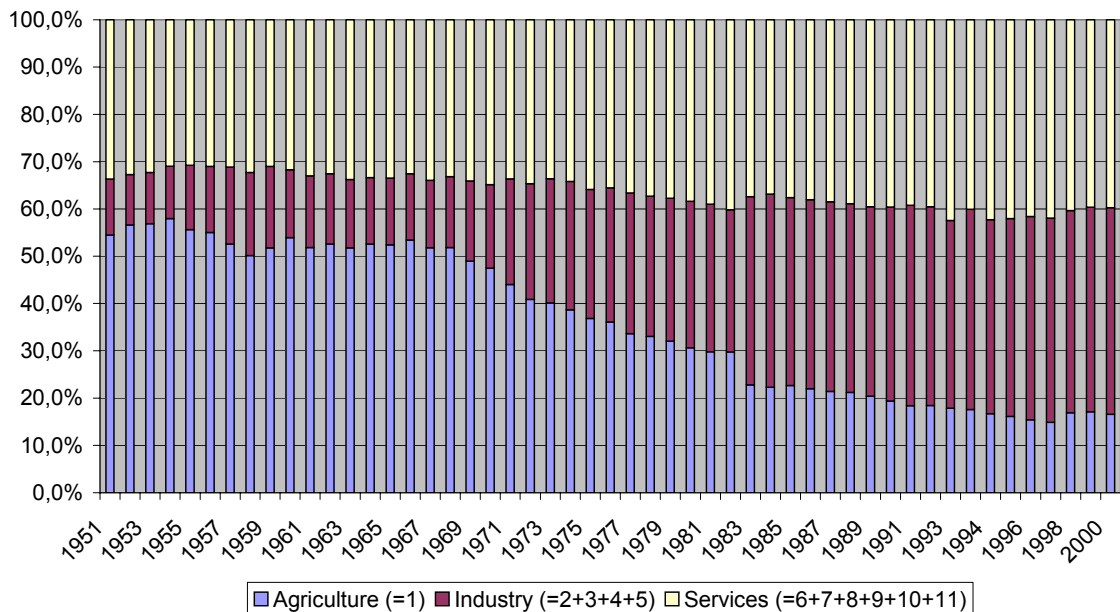
Source: Marks (2005)

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Things changed when Soekarno was forced to step down and Suharto took over the presidency in 1966. Suharto put economic development at the top of his agenda. He therefore appointed a 'Team of Experts in the Field of Economics and Finance'[3], which had the task to draw up a Program for Stabilization and Rehabilitation (Thee Kian Wie, 2002, p. 196). Suharto's policy resulted in annual growth rates of around 7 percent on average between 1967 and 1998.

This emphasis on industrialization is reflected in the economic structure. Under Suharto the contribution of industry to total GDP increased from around 13 % in 1967 to more than 45 % in 1997. This change in economic structure took place at the cost of agriculture. This did not mean, however, that output in agriculture was not growing. The industry sector was just growing faster. The contribution of the service sector to total GDP increased a little, both in current as well as in constant prices, from 34 % in 1967 to around 40 % in 1997, although no clear trend in the share of services can be seen.

A large part of the increase of industry was clearly due to the oil-boom. The oil price increases magnified the rising share of industry and accelerated the decline of agriculture. But after 1981, when oil-revenues began to decline the share of the industry sector was still growing, although slowly. In this period the share of industry rose fluctuating with high and low oil prices (around 1980 and the mid-1980s, respectively) and rising in the late 1980s in response to the strong growth on non-oil manufacturing[4] (Hill, 1996, p.19).

The changes in the economic structure as derived from the official national accounts could be due to statistical practices. Improving methods in accounting for the services might partly explain the growth of the share of the service sector. But for the largest service sectors, such as transport & communication, government & defence, and trade, methods remained more or less the same over the years. Only the sub-sectors ownership of dwelling and other services show considerable change in the methods of estimation. It is therefore likely that the changes in economic structure as derived from figure 2 indeed took place. But which sectors mainly drove this structural change?

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[3] This team is often referred to as the 'Berkeley Maffia' since several of these economists had pursued their postgraduate study at the University of California in Berkeley.

[4] Especially in the current price series these changes in oil prices translate directly into the sectoral shares.

The rapid growth of any sector will not have much effect on the overall growth rate, if that sector contributes only a small share to GDP. Another way of analyzing economic development using the national accounts is therefore by looking at the sectoral contribution to GDP growth (Table 2). The incremental contributions reflect both the size of a sector and its rate of growth. This contribution is estimated by multiplying the growth rate of each sector by its share in GDP. The first period in table 2 starts in 1960, because national account estimates before 1960 are rather unreliable. Besides, they are not disaggregated in different sub-sectors.

Table 5: Sectoral Contribution to GDP Growth, 1958-2000
(% of increment to real GDP)

Sector	Sukarno, 1960-1967	Recovery, 1968-1973	Oil boom, 1973-1981	Recession, 1982-1986	Export growth, 1987-1996	Crisis, 1997-2000	Entire period 1960-2000
Agriculture	47.36	31.07	18.05	22.98	8.20	17.88	21.93
Mining	6.65	18.72	6.53	-23.12	5.74	-2.84	2.80
Manufacturing	6.77	12.47	21.55	35.06	31.18	59.90	25.81
Utilities	1.32	0.41	1.08	2.28	1.56	6.09	1.78
Construction	3.06	6.82	8.52	4.42	10.20	4.91	7.15
Trade	13.38	16.85	16.86	20.00	15.16	8.27	15.40
Transport	1.64	2.90	7.40	6.72	7.61	5.05	5.79
Finance	0.34	0.98	2.61	9.34	6.42	-9.69	2.96
Housing	1.69	3.50	4.23	3.01	1.91	-4.49	2.13
Public administration	10.42	4.86	12.04	12.54	4.22	5.63	8.54
Other services	7.37	1.42	1.13	6.77	7.81	9.29	5.71
Total	100	100	100	100	100	100	100
(Annual average GDP growth, %)	2.02	9.20	7.94	4.37	6.69	-2.48	5.15

Source: Marks (2005)

This sectoral contribution to GDP growth further illuminates the pattern of economic growth since 1960. Agriculture's contribution to growth has declined during the period as a whole, while manufacturing apparently has become the leading sector.

In the early years agriculture and trade made the largest contributions to growth. During the recovery phase, those sectors dependent on the growth of

government expenditure, such as transport and construction, made only a relatively modest contribution. During the oil boom period major changes in these sectoral shares occur. Rapid manufacturing growth, behind rising import barriers, became the largest source of expansion, while the government sector and the transport sector also rose significantly. During the recession of the 1980s manufacturing became more and more important for economic growth. Agriculture's contribution also slightly increased in this period, due to both slower GDP growth in aggregate and strong food crop performance over part of this period (Hill, 1996, p. 21). Mining output contracted in absolute terms.

The period of export growth illustrates the structural change that was taking place during the late 1980s and first half of the 1990s. Manufacturing was still the major contributor, but less so compared to the previous period. A contracting government share is also clearly evident.

With the benefit of hindsight we can already see the causes of the subsequent crisis evolving. In the 1980s and 1990s financial liberalization boosted the role of the financial sector, its incremental share being almost twice as large as that of the government. On the other hand a strong recovery from construction had a significant impact on growth, becoming even larger than agriculture's share. In 1997, triggered by the collapse of the Thai baht, this large unregulated financial sector, combined with an inflated construction sector in which many projects where financed with short-term loans, were the main causes of a crisis that threw the Indonesian economy several years back in time.

6. Concluding Remarks

This paper aimed to be a starting point for further research into the role of the service sector in Indonesia. It discussed some conceptual and methodological issues to reconstruct the service sector in the framework of historical national accounts.

The service sector seems to play an important role in economic development. Maybe not as the main contributor to GDP, but as a driving force, which facilitates the needs of the other sectors to grow. It is therefore important to study the various sub-sectors, which together comprise the service sector, on a more micro level. In this way I hope to be able to answer questions such as: Did government policy stimulate

sustainable economic growth? And, what barriers existed to obtain loans? And, did developments in the transport sector keep pace with the growing needs of other sectors? And, how did trade barriers halt back further economic development? Hopefully during the remainder of my research I will be able to answer a few of these questions for Indonesia.

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