The Decomposition of Goods and Services in a Block Structural Path Analysis in the Indonesian Economy[†]

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Abstract

The purpose of this paper is to reveal the magnitude of the relationship between goods and service sector that is originally grouped into production activities in a social accounting matrix (SAM) framework. The decomposition of production activities into goods and services in 1995 and 1998 Indonesian SAM provide other features and interpretation on the structural changes in the Indonesian economy. Using block structural path analysis (BSPA) that traces feedback loop effects, there is evidence of the dominant role of the goods sector in generating factorial and institutional incomes in the Indonesian economy. This paper argues that the magnitude of the linkages between goods and services might have characterized a strong dependency of services on the goods sector, opposing those of typical developed countries that believe services might be relatively independent from goods sectors. Prior to the decomposition of goods and services, general pattern of the structural change in the Indonesian economy using 1975–1999 aggregated SAM will be presented.

1. Introduction

Earlier work of Sonis et al. [17] evaluated changes in the Indonesian economy during the period 1975–1985 by analyzing the change in the structure of output, factorial and institutional incomes, and the change in the hierarchy of direct coefficients of production activities. Using a series of 1975–1985 Indonesian SAMs consisting of five aggregated production activities, two and three types of factors and institutions respectively, they found that block structural path analysis (BSPA) proved to be useful in contributing to the basic understanding in the processes of identifying change within a social accounting framework. Using 1975–1999 aggregated SAM data (13×13), Achjar et al. [1] extended the Sonis *et al.* [17] analysis by examining the role of past and current policies that might have affected the structural changes in the Indonesian economy, before and after Indonesian economic crisis in mid-1997. BSPA method is proposed as a complement, not as a replacement to the more familiar forms of structural path analysis (SPA) as suggested by Khan and Thorbecke [9], Defourny and Thorbecke [7] who focus on the micro level of analysis of individual paths.

The foundation of the modern economy has shifted from the production of merchandise such as agricultural products and manufactured goods to the service sector. Many studies have highlighted the important role the service sector plays as a prerequisite for economic

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development (Riddle [15]; Bailly, A.S. et al. [4]; Bailly, A.S. and Coffey [5]; Behuria, S. and R. Khullar [6]). Stahl [19] observed the structural changes in the economies of all 21 APEC countries, including Indonesia; at the highest levels of per capita income, the income elasticity of demand for manufacturers declines marginally while the demand for services such as tourism, restaurants, health, education and banking and finance absorbs a proportionately larger share of per capita income. The declining share of manufacturing in GDP and the rising contribution of services reflects changes in the division of labor over time. More accountancy, legal, and engineering services, transport, financial and insurance needs are required that are often purchased from other companies.

Although most of the arguments on structural changes recognized the increasing share of services in total employment and GDP; however, the magnitude of the linkages between goods and services, and how the influence of each of these two sectors generates factorial and institutional incomes in the Indonesian economy has not comprehensively explored. The purpose of this paper is to reveal the nature of the linkages between goods and services, and how each has contributed to the changes in the structure of the Indonesian economy, particularly between 1995 and 1998.

2. Goods Producing and Service Sector in the Indonesian Economy

It has been widely recognized that prior to the economic recession in mid-1997, Indonesia had become one of the most rapidly growing economies in the Asia and Pacific region. Over the period 1975-95, average economic growth reached 6 to 7% annually, and income per capita rose by 4-5%. During the same period, the declining share of agricultural sector, the increasing contribution of manufacturing industries to GDP, and the changes in labor market structure have characterized the more important structural changes in the Indonesian economy. One of the striking features of the Indonesian economy was the declining share of agriculture sector from 36.8% GDP in 1975 to 16.1% in 1995, although it increased to 17.4% in 1999, almost two years after the crisis. The share of manufacturing (processing industries) increased from 10.9% in 1975 to 23.9% and 25.7% GDP in 1995 and 1999 respectively.

The share of services (including construction and utilities) increased from 41.2% in 1975 to 50.7% in 1995, but declined to 47.0% GDP in 1999. The largest share of the service sector was contributed by trade, hotel and restaurant (14-17% GDP during 1975-99 period), whereas other services account for 8-12% GDP. Transportation service contributes 4-7.5% and financial services 4-9%. Before the crisis, one of the most rapidly growing service sectors was financial services, the expansion generated by financial liberalization in the 1988. The trade sector is dominated by petty trade, mainly self-employed and family work (including stalls, market traders and hawkers that are responsible for about 40% of total employment in services in the mid 1980s (Manning [10])). It was not difficult to argue that the Indonesian service economy was largely shaped by small and informal enterprises.

Alexander and Booth [2] underlined the important role of service sector played in the Indonesian economy in past decades. Indonesia was net importer of service sector because the lack of competitiveness in consulting and professional services. The only positive account was contributed by tourism but, in general, the service sector did contribute to the absorption of employment and in GDP growth. The service sector encompasses wholesale,

retail, hotels and restaurants, transport and communications, financial, and professional services, and public, domestic, and community services. Further, Alexander and Booth [2] argued that the rapid growth of employment in the service sector was due to the large of share of government employment. The role of government focused on the provision of public services such as health and education. In the 1970s, as oil and gas revenues grew and budgetary expenditures accelerated, the government embarked on an ambitious program of economic and social infrastructure development which necessitated the recruitment not just of administrative and clerical staff but also of a wide range of skilled workers, including teachers, health workers, engineers, economists, statisticians, and financial managers. In 1975 almost 60% of all permanent government employees had at most lower secondary education, and by 1999 this had fallen under 30%.

3. Decomposition of Three Economic Subsystems

While the analysis of the structural changes in the economy using SPA¹ focuses more on individual sectors with a highly disaggregated matrix, the BSPA offers a macro perspective to trace the magnitude of the influence departing from an initial injection of an economic subsystem in a way that the transfer of influence to other corresponding economic subsystems provides a feedback loop effect to other corresponding subsystems – in other words, an augmentation process in the whole economic system. Figure 1 provides a general overview of the difference between SPA and BSPA.

One of the advantages of using BSPA is to separate the influence of one economic subsystem in the whole system. The SAM can be decomposed in such a way that self-influence and induced self-influence can be detected. Sonis and Hewings [18] extended the idea of self-influence and induced self-influence for a SAM in similar fashion to the decomposition of three regions into subsystems. Given a matrix of direct coefficients A , exogenous final demand d and total output x for a SAM framework, the system can be presented:

$$A = \begin{bmatrix} 0 & 0 & A_{13} \\ A_{21} & A_{22} & 0 \\ 0 & A_{32} & A_{33} \end{bmatrix}; \quad d = \begin{bmatrix} 0 \\ d_1 \\ d_A \end{bmatrix}; \quad x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} \quad (1)$$

The subscripts refer, respectively, to the usual tripartite division of a social accounting matrix into submatrices of factors (1), institutions (2) and activities (3) that can be decomposed as:

$$A = \begin{bmatrix} 0 & 0 & 0 \\ A_{21} & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix} + \begin{bmatrix} 0 & 0 & 0 \\ 0 & A_{22} & 0 \\ 0 & A_{32} & 0 \end{bmatrix} + \begin{bmatrix} 0 & 0 & A_{13} \\ 0 & 0 & 0 \\ 0 & 0 & A_{33} \end{bmatrix} = A_1 + A_2 + A_3 \quad (2)$$

where, the matrices A_1 , A_2 , A_3 represent the direct inputs of factors, institutions and activities separately from which a decomposed inverse can be presented:

$$B = (I - A)^{-1} = G_3 G_2 G_1 \quad (3)$$

Decomposition (3) differs from the multiplicative decomposition of Pyatt and Round

¹ See for example, a recent study by Azis [3] on the application of SPA in the Indonesian economy.

Figure 1. The Path from Origin to Destination of a SPA in SAM Framework

[14] that was primarily purposed to recognize own direct-effect, indirect self-influence and synergic cross effect by dividing matrix A into diagonal and off-diagonal elements and exploiting the properties of permutation matrices. In their system, the generalized inverse is decomposed as follows :

$$(I - A)^{-1} = M_3 M_2 M_1 \quad (4)$$

where,

$$\begin{aligned}
M_1 &= (I - A_1)^{-1} && \text{own direct effect} \\
M_2 &= \{I - [(I - A_1)A_2]^3\}^{-1} && \text{indirect self influence} \\
M_3 &= I + (I - A_1)A_2 + [(I - A_1)A_2]^2 && \text{synergetic cross effects}
\end{aligned}$$

Defourny and Thorbecke [7] proposed an additive decomposition for tracing the influence of economic subsystem :

$$(I - A)^{-1} = I + (M_1 - I) + (M_2 - I)M_1 + (M_3 - I)M_2M_1 \quad (5)$$

Sonis and Hewings [18] converted the additive decomposition (5) into a multiplicative form of a block matrix of direct inputs for three-region or economic subsystems:

$$A = \begin{bmatrix} A_{11} & A_{12} & A_{13} \\ A_{21} & A_{22} & A_{23} \\ A_{31} & A_{32} & A_{33} \end{bmatrix} \quad (6)$$

and the corresponding Leontief inverse,

$$B = (I - A)^{-1} = \begin{bmatrix} B_{11}^{III} & B_{12}^{III} & B_{13}^{III} \\ B_{21}^{III} & B_{22}^{III} & B_{23}^{III} \\ B_{31}^{III} & B_{32}^{III} & B_{33}^{III} \end{bmatrix} \quad (7)$$

However matrix (6) does not separate the influence of economic subsystems from other sub-systems. In order to separate the influence of each three region (block matrices), the Schur-Banachiewicz inverse for a pair of sub-systems is used.

Consider the row and column containing A_{33} in equation (6) that represents the domain of the block matrix (3). The formation of partial block matrix, such as the pair of block matrix (1) and (2) is considered as the domain of block matrix (3). Here, the direct inputs under the domain of (3) can be written as :

$$A(3) = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix} \quad (8)$$

Define Schur-Banachiewicz's partial block matrix as (S). The corresponding partial Leontief inverse is defined as :

$$\begin{aligned}
B(S) &= [I - A(S)]^{-1} = \begin{bmatrix} B_{11}^{II}(S) & B_{12}^{II}(S) \\ B_{21}^{II}(S) & B_{22}^{II}(S) \end{bmatrix} = \begin{bmatrix} B_{11}^{II}(S) & B_{11}^{II}(S)A_{12}B_2 \\ B_{22}^{II}(S)A_{21}B_1 & B_{22}^{II}(S) \end{bmatrix} \\
&= \begin{bmatrix} B_{11}^{II}(S) & B_1A_{12}B_{11}^{II}(S) \\ B_2A_{21}B_{22}^{II}(S) & B_{22}^{II}(S) \end{bmatrix}
\end{aligned} \quad (9)$$

Superscript II in (9) denotes a two-region or a two-block matrix of economic system that characterize the nature of feedback loop process within the system. Based on the partial Leontief inverse for pair (1, 2), the element of the Schur-Banachiewicz inverse matrix in a three-economic-subsystems is presented as the following (for proofs, see Sonis and Hewings [18]):

$$B = \begin{bmatrix} B_{11}^{III} & B_{11}^{III}A_{12}^{III}B_{22}^{II}(1) & B_{11}^{III}A_{13}^{III}B_{33}^{II}(1) \\ B_{22}^{III}B_{21}^{III}B_{11}^{II}(2) & B_{22}^{III} & B_{22}^{III}A_{23}^{III}B_{33}^{II}(2) \\ B_{33}^{III}A_{31}^{III}B_{11}^{II}(3) & B_{33}^{III}A_{32}^{III}B_{22}^{II}(3) & B_{33}^{III} \end{bmatrix} \quad (10)$$

Consider Yamada and Ihara [20], Ihara [8] augmented inputs for three-region or three

economic subsystems :

$$A_{ij}^{III} = A_{ij} + A_{is}B_sA_{sj} \quad i \neq j, \quad i \neq s; \quad i, j, s = 1, 2, 3 \quad (11)$$

and the extended regional Leontief inverses :

$$B_{ii}^{III} = [I - A_{ii} - A_{ij}B_{jj}^{II}(i)A_{ji}^{III} - A_{is}B_{ss}^{II}(i)A_{si}^{III}]^{-1} \quad i \neq j, \quad i \neq s, \quad j \neq s; \quad i, j, s = 1, 2, 3 \quad (12)$$

The corresponding augmented Schur complement that captures economic self-influence and as the result of the augmentation of inputs from other subsystems can be written as :

$$S_i = A_{ii} + A_{ij}B_{jj}^{II}(i)A_{ji}^{III} + A_{is}B_{ss}^{II}(i)A_{si}^{III} \quad (13)$$

The augmentation of inputs (13) leads to the detailed structure of augmentation in the Schur complement :

$$S_i = A_{ii} + A_{ij}B_{jj}^{II}(i)A_{ji} + A_{is}B_{ss}^{II}(i)A_{si} + A_{ij}B_{jj}^{II}(i)A_{js}B_sA_{si} + A_{is}B_{ss}^{II}(i)A_{sj}B_jA_{ji} \quad i \neq j, \quad i \neq s, \quad j \neq s; \quad i, j, s = 1, 2, 3 \quad (14)$$

Thus, in the three-block system, the self-influence of a block comprise the superposition of (i) circulation (direct self-influence) ; (ii) self-influence generated through bilateral block interdependencies and (iii) self-influence promoted by tri-lateral block interdependencies. The expressions (13) and (14) reflect the existence of a nested hierarchy of different levels of augmentation represented in the recursive form in (10) ; in a sense, the process resembles the Matrioshka idea introduced by Sonis and Hewings [16]. Furthermore, using Miyazawa ([11], [12]) fundamental equations for the case of three regions, the transfer of influence from region j to i can be defined as :

$$B_{ij}^{II} = B_{ii}^{III}A_{ij}^{III}B_{jj}^{II}(i) = B_{ii}^{II}(j)A_{ij}^{III}B_{jj}^{III} \quad i \neq j, \quad i, j = 1, 2, 3 \quad (15)$$

The augmented Schur complement (14) can also be written as :

$$S_i = A_{ii} + A_{ij}^{III}B_{jj}^{II}(i)A_{ji} + A_{is}^{III}B_{ss}^{II}(j)A_{si} \quad (16)$$

The expressions (15) and (16) offer the option of presenting the Leontief inverse for the three-block system in an alternative form :

$$B = \begin{bmatrix} B_{11}^{III} & B_{11}^{II}(2)A_{12}^{II}B_{22}^{II} & B_{11}^{II}(3)A_{13}^{III}B_{33}^{III} \\ B_{22}^{II}(1)B_{21}^{III}B_{11}^{III} & B_{22}^{III} & B_{22}^{II}(3)B_{23}^{III}B_{33}^{III} \\ B_{33}^{II}(1)A_{31}^{III}B_{11}^{III} & B_{33}^{III}(2)B_{32}^{III}B_{22}^{III} & B_{33}^{III} \end{bmatrix} \quad (17)$$

The generalizations (16) and (17) can be transferred from the meso-level of regions to the higher macro-level of the inner and outer left and right block matrix multipliers. For example, for the left multipliers :

$$B = \begin{bmatrix} B_{11}^{III} & 0 & 0 \\ 0 & B_{22}^{III} & 0 \\ 0 & 0 & B_{33}^{III} \end{bmatrix} \begin{bmatrix} I & A_{12}^{II}B_{22}^{II}(1) & A_{13}^{III}B_{33}^{III}(1) \\ A_{21}^{III}B_{11}^{III}(2) & I & A_{23}^{III}B_{33}^{III}(2) \\ A_{31}^{III}B_{11}^{III}(3) & A_{32}^{III}B_{22}^{III}(3) & I \end{bmatrix} \\ = \begin{bmatrix} B_{11}^{III} & 0 & 0 \\ 0 & B_{22}^{III} & 0 \\ 0 & 0 & B_{33}^{III} \end{bmatrix} \begin{bmatrix} B_1 & 0 & 0 \\ 0 & B_2 & 0 \\ 0 & 0 & B_3 \end{bmatrix} \begin{bmatrix} I - A_{11} & A_{12}^{II}B_{22}^{II}(1) & A_{13}^{III}B_{33}^{III}(1) \\ A_{21}^{III}B_{11}^{III}(2) & I - A_{22} & A_{23}^{III}B_{33}^{III}(2) \\ A_{31}^{III}B_{11}^{III}(3) & A_{32}^{III}B_{22}^{III}(3) & I - A_{33} \end{bmatrix} \begin{bmatrix} B_1 & 0 & 0 \\ 0 & B_2 & 0 \\ 0 & 0 & B_3 \end{bmatrix} \quad (18)$$

Augmented input of the blocks in the SAM are :

$$\begin{aligned}
A_{12}^{III} &= A_{13}B_3A_{32}; & A_{13}^{III} &= A_{13}; \\
A_{21}^{III} &= A_{21}; & A_{23}^{III} &= A_{21}A_{13}; \\
A_{31}^{III} &= A_{32}B_2A_{21}; & A_{32}^{III} &= A_{32}
\end{aligned} \tag{19}$$

The extended self-influence Leontief inverses at each block are :

$$\begin{aligned}
B_{11}^{III} &= [I - A_{13}B_3A_{32}B_2A_{21}]^{-1} \\
B_{22}^{III} &= [I - A_{22} - A_{21}A_{13}B_3A_{32}]^{-1} \\
B_{33}^{III} &= [I - A_{33} - A_{32}B_2A_{21}A_{13}]^{-1}
\end{aligned} \tag{20}$$

The corresponding augmented complements:

$$\begin{aligned}
S_1 &= A_{13}B_3A_{32}B_2A_{21} \\
S_3 &= A_{22} + A_{21}A_{13}B_3A_{32} \\
S_3 &= A_{33} + A_{32}B_2A_{21}A_{13}
\end{aligned} \tag{21}$$

have the economic network structure associated with the blocks A_{22} , A_{33} and with the components of the quasi-permutation matrix of direct inputs :

Drawing on (19), the Leontief inverse for this SAM has a form :

$$\begin{aligned}
B &= \begin{bmatrix} B_{11}^{III} & A_{13}B_3A_{32}B_{22}^{III} & A_{13}B_{33}^{III} \\ B_2A_{21}B_{11}^{III} & B_{22}^{III} & B_2A_{21}A_{13}B_{33}^{III} \\ B_3A_{32}B_2A_{21}B_{11}^{III} & B_3A_{32}B_{22}^{III} & B_{33}^{III} \end{bmatrix} \\
&= \begin{bmatrix} I & A_{13}B_3A_{32} & A_{13} \\ B_2A_{21} & I & B_2A_{21}A_{13} \\ B_3A_{32}B_2A_{21} & B_3A_{32} & I \end{bmatrix} \begin{bmatrix} B_{11}^{III} & 0 & 0 \\ 0 & B_{22}^{III} & 0 \\ 0 & 0 & B_{33}^{III} \end{bmatrix}
\end{aligned} \tag{22}$$

At the meso level for the major divisions of the economy :

$$\begin{aligned}
Bd &= \begin{bmatrix} B_{11}^{III} & A_{13}B_3A_{32}B_{22}^{III} & A_{13}B_{33}^{III} \\ B_2A_{21}B_{11}^{III} & B_{22}^{III} & B_2A_{21}A_{13}B_{33}^{III} \\ B_3A_{32}B_2A_{21}B_{11}^{III} & B_3A_{32}B_{22}^{III} & B_{33}^{III} \end{bmatrix} \begin{bmatrix} 0 \\ d_I \\ d_A \end{bmatrix} \\
&= \begin{bmatrix} A_{13}B_3A_{32} \\ I \\ B_3A_{32} \end{bmatrix} B_{22}^{III} d_I + \begin{bmatrix} A_{13} \\ B_2A_{21}A_{13} \\ I \end{bmatrix} B_{33}^{III} d_A
\end{aligned} \tag{23}$$

The expression (23) reveals the major paths of influence in the transmission of economic impulses. Within the blocks, the individual paths are still preserved; in other words, the portraits of individual trees are still preserved in the forest picture of BSPA. The network complication initially injected by the final demand of institutions (d_I) and production activities d_A and the following transformation are shown as,

$$a). \text{ Institutions : } d_I \rightarrow B_{22}^{III} d_I \rightarrow B_3A_{32}B_{22}^{III} d_I \rightarrow A_{13}B_3A_{32}B_{22}^{III} d_I \tag{24}$$

$$b). \text{ Activities : } d_A \rightarrow B_{33}^{III} d_A \rightarrow A_{13}B_{33}^{III} d_A \rightarrow B_2A_{21}A_{13}B_{33}^{III} d_A \tag{25}$$

Drawing on the previous work of Achjar et al. [1], the general pattern of the structural changes in the Indonesian economy using aggregated SAMs for 1995–1999 are displayed in tables 1a, b and figures 2a, b. Table 1a and figure 2a show the value of initial injection from institutions and its transformation to the distribution of households, firms and government incomes, and its subsequent effects to the output of production activities, then to labor and capital incomes². Table 1b and figure 2b shows the injection and transformation from

Table 1a. Transformation From Institution to Activities and Factors, 1975-99 (%)

F.DEMAND INSTITUTION	1975	1980	1985	1990	1995	1999
Households	0	25.0	11.3	16.7	12.1	10.8
Firms	4.7	11.3	8.9	24.6	23.1	0.0
Government	95.3	63.7	79.8	58.7	64.8	89.2
Total	100	100	100	100	100	100

INSTITUTION OUTPUT	1975	1980	1985	1990	1995	1999
Households	45.3	48.9	50	44.4	43.1	37.5
Firms	17	20.3	17.9	18.7	19.1	7.5
Government	37.7	32.8	32.1	37.0	37.8	55.0
Total	100	100	100	100	100	100

ACTIVITIES OUTPUT	1975	1980	1985	1990	1995	1999
Food crops	43.2	40	36.8	30.1	27.4	28.3
Estate Crops	4.1	6.6	5	10.4	11.4	8.6
Manufacturing	16.8	17.9	20.2	33.1	33.2	40.9
Trade	10.9	12.4	13.4	23.7	23.5	20.2
Other Service	24.1	23.1	24.6	2.6	4.6	2.0
Total	100.0	100	100	100	100	100

FACTOR OUTPUT	1975	1980	1985	1990	1995	1999
Labor	46.3	48.1	52.0	50.3	53.4	51.3
Capital	53.7	51.9	48.0	49.7	46.6	48.7
Total	100	100	100	100	100	100

production activities and its subsequent effects to the distribution of labor and capital, and institutional income distribution.

In 1975 for example, the impact of an institutional injection generated a share of 45.3%, 17% and 37.7% among households, firms and government output respectively. This distribution pattern was almost the same until 1995, but changed significantly in 1999. Further transformation from institutional income to production activities revealed that the largest

² In the BSPA we did not include the final demand of factors as an exogenous account.

Table 1b. Transformation From Activities to Factors and Institutions, 1975-99 (%)

F.DEMAND ACTIVITIES	1975	1980	1985	1990	1995	1999
Food crops	-16.7	-9.2	-15.3	4.1	5.0	20.5
Estate Crops	3	3.6	-0.3	1.2	0.8	5.0
Manufacturing	67.6	73.3	72.8	90.0	86.8	59.1
Trade	46.1	32.5	42.1	2.9	4.9	13.6
Other Service	0	-0.2	0.7	1.8	2.5	1.8
Total	100	100	100	100	100	100

ACTIVITIES OUTPUT	1975	1980	1985	1990	1995	1999
Food crops	30.3	21.6	21.8	19.1	19.3	26.8
Estate Crops	5	6.6	4.1	2.7	2.9	4.4
Manufacturing	34.1	43.3	42.7	46.9	43.5	33.7
Trade	21.3	19.2	21	22.9	22.8	25.6
Other Service	9.2	9.3	10.4	8.4	11.6	9.5
Total	100	100	100	100	100	100

FACTOR OUTPUT	1975	1980	1985	1990	1995	1999
Labor	38.9	38	43.9	46.6	51.1	52.9
Capital	61.1	62	56.1	53.4	48.9	47.1
Total	100.0	100	100	100	100	100

INSTITUTION OUTPUT	1975	1980	1985	1990	1995	1999
Households	63.9	52.8	61.4	68.5	72.0	70.6
Firms	25.4	30.5	25.2	20.2	19.9	18.6
Government	10.7	16.7	13.4	11.3	8.1	10.9
Total	100	100	100	100	100	100

part of institutional influence went to food crops during the whole period of 1975 to 1985, between 36-43% of activity output. From 1990 to 1999, the share of food crop dropped from 36.8% to 28%. Compared to other production sectors, estate crops from 1975 to 1985 received the influence that indicated the linkages between the output of estate crops and institutional demand was not strongly related. The transformation of production activities due to the influence of institutional income showed the declining share of food crops from

Figure 2a. The Transformation from the Injection of Institution

1975 to 1999; they were substituted by manufacturing. This pattern indicated the increasing impact of institutional consumption of and spending on manufacturing products. In the period of financial crisis, the share of food crops rose slightly from 27.4% in 1995 to 28.3% in 1999. The share of financial (include government sector) outputs declined significantly

Figure 2b. The transformation from injection of Activities to Factors and Institutions

after 1985 from 23-24% during 1975-85 to 2.6% and 4.6% respectively in 1995. In 1999 the share was down to only 2%. This result is interpreted as the declining influence of household consumption, company investment and government expenditure in the financial and government sector; this sector was badly hit by the crisis during which time many commercial

banks collapsed.

The changing pattern of production activities on factor incomes indicates the increasing share of labor compared to capital. During 1975–1980, the share of capital income was larger than labor income while over the next periods, the share of labor income increased to surpass capital income. The transformation of the influence from institution to production activities and to factors provides a positive effect on the income distribution to labor during the whole period. Given the aggregate nature of this system, nothing can be inferred about the impact on the distribution of income across income groups.

The transformation of production activity to factors of production generally increased the share of labor income between 1975–99. The distribution of labor income in factors of production changed from 38.9% in 1975 to become 51.7% in 1990. Over the period, 1990–1999, labor become has received the lion's share in the factor incomes but the impact of factor income on the transformation of production activity and its subsequent influence on institutional income distribution varied. The share of household income was still the largest from 1975 to 1999, and the share of companies income dropped significantly from 30.5% in 1980 to become 18.6% in 1999– the lowest level over the whole period.

Using a set of aggregated SAM data, at a macro scale, the results from two initial injections from institution and production activities provide some general features of the structural change in the Indonesia economy over the years from 1975 to 1999. The most important feature of the impact from the initial injection both for institution and activity is the increasing consumption of food crops during the financial crisis in 1999 with the decline in the share of trade, estate crops and financial & government services, compared to 1995. However, further conclusions about the impact of the crisis on structural changes in the Indonesian economy would need to be confirmed through the analysis of hierarchy of direct coefficient of production activity in the SAM framework with a more detailed level of aggregation and, of course, with analysis five to ten years from the end of the crisis.

An important interpretation from the impact of institutional income to the transformation of production activities is the declining share of food crops consumption, substituted by the increasing share on manufacturing consumption during the period 1975–1995. This consumption pattern follows an Engel curve process whereby a declining portion of income would be spent on food consumption when income per capita rises. In the midst of the crisis in 1999, the share of consumption of food crops rises again due to the decline of real income. In this situation, the influence of the declining institutional income from households, companies and government to production activities provided a significant impact on the financial sector. In 1999, the demand for financial services declined dramatically.

4. The Decomposition of Goods and Services

In order to capture the influence and linkages between service sector and the rest of the economy, production activity must be partitioned into goods and services sub-matrices. Two sets of 1995 and 1998 (109×109) national SAM data were aggregated into 22 consistent sectors. The production activities are : agriculture, mining, manufacturing industries, electricity, gas & water (EGW), construction, trade, hotel and restaurant, transport, finance, and other service sector. The block matrix of factor of production in the SAM is divided into

five elements, agricultural labor, production labor, administrative labor, professional labor, and capital and there are five elements in the institution accounts, agricultural households, non-agricultural household rural, non-agricultural household urban, firms, and government (see table 2).

The decomposition of the transaction matrix into goods and service sector is basically to partition A_{33} in the previous equation (1 and 2); the block matrices of the four economic subsystems is displayed as :

$$A = \begin{bmatrix} 0 & 0 & 0 & 0 \\ A_{21} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix} + \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & A_{22} & 0 & 0 \\ 0 & A_{32} & 0 & 0 \\ 0 & A_{42} & 0 & 0 \end{bmatrix} + \begin{bmatrix} 0 & 0 & A_{13} & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & A_{33} & 0 \\ 0 & 0 & A_{34} & 0 \end{bmatrix} + \begin{bmatrix} 0 & 0 & 0 & A_{14} \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & A_{34} \\ 0 & 0 & 0 & A_{44} \end{bmatrix} = A_1 + A_2 + A_3 + A_4 \quad (26)$$

where, A_3 and A_4 represents block matrix of goods and services respectively. Let the previous A_{ij} for $i=3$ or $j=3$ be denoted with subscript (*). Using equation (23) as the framework, the linkages of the whole economic subsystem with the associated final demand d of each block matrix can be written as :

Table 2. Classification of 1995 and 1998 National SAM (22 x 22)

	Sector	Abbreviation	SAM Aggregation (109×109)
FACTOR OF PRODUCTIONS	Agricultural Labor	AgLab.	1-4
	Production Labor	ProLab	5-8
	Administration Labor	AdmLab.	9-12
	Professional Labor	ProfLab.	13-16
	Capital	Cap.	17-23
INSTITUTIONS	Agricultural Household	AgHH	24-27
	Non-agricultural Household Rural	NagRural	28-30
	Non-agricultural Household Urban	NagUrban	31-33
	Firms	Firm	34
	Government	Gov.	35
PRODUCTION ACTIVITIES	Agriculture	Agri.	36-40, 61-65, 84-88
	Mining	Mining	41-42, 66-67, 89-90
	Manufacturing	Man.	43-47, 68-72, 91-95
	Electricity, Gas, and Water	EGW	48, 73, 96
	Construction	Const.	49, 74, 97
	Trades, Hotels, restaurants	Trade	50-52, 59, 75-77, 98-100
	Transportation	Trans.	53-54, 60, 78-79, 101-102
	Finance, Real Estate	Finance	55-56, 80-81, 103-104
	Other services	Other	57-58, 82-83, 105-106

$$\begin{aligned}
Bd &= \begin{bmatrix} B_{11}^{IV} & A_{1*}B_*A_{*2}B_{22}^{IV} & A_{1*}B_{**}^{IV} \\ B_2A_{21}B_{11}^{IV} & B_{22}^{IV} & B_2A_{21}A_{1*}B_{**}^{IV} \\ B_*A_{*2}B_2A_{21}B_{11}^{IV} & B_*A_{*2}B_{22}^{IV} & B_{**}^{IV} \end{bmatrix} \begin{bmatrix} 0 \\ d_I \\ d_* \end{bmatrix} \\
&= \begin{bmatrix} A_{1*}B_*A_{*2} \\ I \\ B_*A_{*2} \end{bmatrix} B_{22}^{IV} d_I + \begin{bmatrix} A_{1*} \\ B_2A_{21}A_{1*} \\ I \end{bmatrix} B_{**}^{IV} d_*
\end{aligned} \tag{27}$$

Superscript IV denotes four block matrices of economic subsystems. It can be shown here that :

$$A_{1*} = (A_{13} \ A_{14}); \ B_* = \begin{pmatrix} B_3 & 0 \\ 0 & B_4 \end{pmatrix}; \ B_{**}^{IV} = \begin{pmatrix} B_{33}^{IV} & B_{34}^{IV} \\ B_{43}^{IV} & B_{44}^{IV} \end{pmatrix} \tag{28}$$

The formation of four block matrices, the final demand of institutions (d_I), goods sector (d_G) and service sector (d_S) is presented in equation (29) :

$$\begin{aligned}
Bd &= \begin{bmatrix} B_{11}^{IV} & (A_{13} \ A_{14}) \begin{pmatrix} B_3 & 0 \\ 0 & B_4 \end{pmatrix} \begin{pmatrix} A_{32} \\ A_{42} \end{pmatrix} B_{22}^{IV} \\ B_2A_{21}B_{11}^{IV} & B_{22}^{IV} \\ (B_3 \ 0) \begin{pmatrix} A_{32} \\ A_{42} \end{pmatrix} B_2A_{21}B_{11}^{IV} & (B_3 \ 0) \begin{pmatrix} A_{32} \\ A_{42} \end{pmatrix} B_{22}^{IV} \\ (0 \ B_4) \begin{pmatrix} A_{32} \\ A_{42} \end{pmatrix} B_2A_{21}B_{11}^{IV} & (0 \ B_4) \begin{pmatrix} A_{32} \\ A_{42} \end{pmatrix} B_{22}^{IV} \\ & (A_{13} \ A_{14}) \begin{pmatrix} B_{33}^{IV} \\ B_{43}^{IV} \end{pmatrix} & (A_{13} \ A_{14}) \begin{pmatrix} B_{34}^{IV} \\ B_{44}^{IV} \end{pmatrix} \\ B_2A_{21}(A_{13} \ A_{14}) \begin{pmatrix} B_{33}^{IV} \\ B_{43}^{IV} \end{pmatrix} & B_2A_{21}(A_{13} \ A_{14}) \begin{pmatrix} B_{34}^{IV} \\ B_{44}^{IV} \end{pmatrix} \\ & B_{33}^{IV} & B_{34}^{IV} \\ & B_{43}^{IV} & B_{44}^{IV} \end{bmatrix} \begin{bmatrix} 0 \\ d_I \\ d_G \\ d_S \end{bmatrix}
\end{aligned} \tag{29}$$

The decomposition of goods and services in equation (29) provides a pseudo block matrix because of the two-way interaction between both sectors as opposed to the one-way interaction between production activities, factors, and institutions economic subsystems. The injection of final demand will create a branching out process between goods and services. Network complication initiated by institutions, goods and services and branching process resulted from the decomposition can be given as :

a). *Initial injection from Institutions :*

$$\begin{aligned}
& B_3A_{32}B_{22}^{IV} d_I \rightarrow A_{13}B_3A_{32}B_{22}^{IV} d_I \\
d_I \rightarrow B_{22}^{IV} d_I & \quad \Downarrow \\
& B_4A_{42}B_{22}^{IV} d_I \rightarrow A_{14}B_4A_{42}B_{22}^{IV} d_I
\end{aligned} \tag{30}$$

where, d_I , $B_{22}^{IV} d_I$ is the block matrix of final demand of institutions and the first transformation of institutions respectively. Branching out takes place in the form of $B_3A_{32}B_{22}^{IV} d_I$ and

$B_4A_{42}B_{22}^{IV}d_I$ is the second (goods sectors) and the third transformation (service sector) respectively. Both $A_{13}B_3A_{32}B_{22}^{IV}d_I$ and $A_{14}B_4A_{42}B_{22}^{IV}d_I$ are the fourth transformations, generated from goods and services respectively.

b). *Initial injection from Goods Sector :*

$$\begin{aligned} d_G &\rightarrow B_{33}^{IV}d_G \rightarrow A_{13}B_{33}^{IV}d_G \rightarrow B_2A_{21}A_{13}B_{13}^{IV}d_G \\ &\quad \updownarrow \\ &B_{43}^{IV}d_G \rightarrow A_{13}B_{43}^{IV}d_G \rightarrow B_2A_{21}A_{13}B_{43}^{IV}d_G \end{aligned} \quad (31)$$

where, d_G is the final demand of goods sector, $B_{33}^{IV}d_G$ and $B_{43}^{IV}d_G$ are the first and second transformation respectively as a result of branching out process generated by goods sector.

c). *Initial injection from Services Sector :*

$$\begin{aligned} B_{34}^{IV}d_S &\rightarrow A_{14}B_{34}^{IV}d_S \rightarrow B_2A_{21}A_{14}B_{34}^{IV}d_S \\ &\quad \updownarrow \\ d_S &\rightarrow B_{44}^{IV}d_S \rightarrow A_{14}B_{44}^{IV}d_S \rightarrow B_2A_{21}A_{14}B_{44}^{IV}d_S \end{aligned} \quad (32)$$

5. Empirical Application

A branching out process generated by goods and service sector in 1995 and 1998 can be seen in tables 3a, b, and 4a, b respectively. In the first transformation, final demand for goods transforms the output of the goods sector itself, and at the same time induces output in the services sector (second transformation). In the next stages, both goods and service sectors transform the composition of factors (third transformation) and institutions (fourth transformation).

Using the final demand of the goods sector as the injector, at the first transformation the goods sector produces Rp.144,708 billion and Rp.376,146 billion of agricultural output in 1995 and 1998 respectively (table 3a and 4a). In 1995, final demand of goods sector directly generated the largest share of the output of goods sector (63.0%), with the rest, 37.0%, accounted for by services. In addition to the generation of agriculture, mining and manufacturing, the goods economic subsystem generated 42.2% of the total output of services; with the rest, 57.8%, generated by services itself. From tables 4a and 5b, it can be seen that the goods sector in 1998 played a more dominant role in generating both goods and services. The goods sector alone produces 78.1% and 54.7% of total output of goods and services respectively.

Viewing the data in table 3b and 4b in more detail, it can be seen that the increasing demand for electricity, gas and water (EGW) that was generated by goods sector increased from 55.9% in 1995 to 70.1% in 1998. Another interesting feature shows that more demand for financial sector was generated by goods sector, from 47.2% in 1995 to 59.4% in 1998. The demand for construction generated by goods producing sector also increased from 3.6% in 1995 to 22.2% in 1998.

The factorial and institutional income distribution is largely generated by the goods sector. In 1995 and 1998, the direct injection from services alone (not including any induced effects from the goods sector) contributed 27.6% and 17% of factor income respectively. The declining contribution of services in generating factorial income in 1998 indicated the deterioration of service sector following economic crises that started in mid-1997. Under

Table 3a. Transformation from Goods 1995 (Rp. Billion)

Final Demand	First and Second Transformation		Third Transformation		Fourth Transformation	
GOODS	Goods	Output	Factors	Output	Institution	Output
Agri	Agri	144,708	AgLabor	30,092	AgriHH	29,087
Mining	Mining	66,793	ProdLabor	24,697	NAgrRural	33,662
Manuf	Manuf	512,003	AdmLabor	5,994	NAgrUrban	41,173
	Total	723,504	ProfLabor	1,658	Firm	34,785
			Capital	80,260	Govn.	13,793
			Total	142,701	Total	152,500
	Services	Output	Factors	Output	Institution	Output
	EGW	11,673	AgLabor	—	AgriHH	8,620
	Construc	7,295	ProdLabor	8,557	NAgrRural	21,912
	Trade	177,598	AdmLabor	42,446	NAgrUrban	52,060
	Transport	62,628	ProfLabor	7,905	Firm	19,729
	Finance	75,633	Capital	45,522	Govn.	8,188
	Otherserv	61,626	Total	104,430	Total	110,509
	Total	396,452				
SERVICES	Services	Output	Factors	Output	Institution	Output
Elect	EGW	9,213	AgLabor	—	AgriHH	11,015
Construc	Construc	195,583	ProdLabor	24,266	NAgrRural	28,815
Trade	Trade	140,798	AdmLabor	38,852	NAgrUrban	60,853
Transport	Transport	53,740	ProfLabor	9,318	Firm	23,522
Finance	Finance	84,614	Capital	54,274	Govn.	9,779
Otherserv	Otherserv	59,908	Total	126,709	Total	133,984
	Total	543,857				
	Goods	Output	Factors	Output	Institution	Output
	Agri	100,877	AgLabor	20,977	AgriHH	18,799
	Mining	31,926	ProdLabor	13,812	NAgrRural	20,489
	Manuf	292,787	AdmLabor	3,364	NAgrUrban	23,740
	Total	425,589	ProfLabor	926	Firm	20,070
			Capital	46,308	Govn.	7,980
			Total	85,387	Total	91,077
TOTAL	Activities	Output	Factors	Output	Institution	Output
Agri	Agri	245,584	AgLabor	51,070	AgriHH	67,521
Mining	Mining	98,719	ProdLabor	71,333	NAgrRural	104,879
Manuf	Manuf	804,790	AdmLabor	90,655	NAgrUrban	177,826
Elect	GOODS	1,149,094	ProfLabor	19,807	Firm	98,106
Construc			Capital	226,363	Govn.	39,740
Trade	EGW	20,886	Total	459,227	Total	488,071
Transport	Construc	202,878				
Finance	Trade	318,397				
Otherserv	Transport	116,368				
	Finance	160,247				
	Otherserv	121,534				
	SERVICES	940,310				

Table 3b. Composition After the Transformation of Goods and Services, 1995 (%)

Final Demand	First and Second Transformation		Third Transformation		Fourth Transformation	
GOODS	Goods	Output	Factors	Output	Institution	Output
Agri	Agri	58.9	AgLabor	58.9	AgriHH	43.1
Mining	Mining	67.7	ProdLabor	34.6	NAgrRural	32.1
Manuf	Manuf	63.6	AdmLabor	6.6	NAgrUrban	23.2
	Total	63.0	ProfLabor	8.4	Firm	35.5
			Capital	35.5	Govn.	34.7
			Total	31.1	Total	31.2
	Services	Output	Factors	Output	Institution	Output
	EGW	55.9	AgLabor	—	AgriHH	12.8
	Construc	3.6	ProdLabor	12.0	NAgrRural	20.9
	Trade	55.8	AdmLabor	46.8	NAgrUrban	29.3
	Transport	53.8	ProfLabor	39.9	Firm	20.1
	Finance	47.2	Capital	20.1	Govn.	20.6
	Otherserv	50.7	Total	22.7	Total	22.6
	Total	42.2				
SERVICES	Services	Output	Factors	Output	Institution	Output
Elect	EGW	44.1	AgLabor	—	AgriHH	16.3
Construc	Construc	96.4	ProdLabor	34.0	NAgrRural	27.5
Trade	Trade	44.2	AdmLabor	42.9	NAgrUrban	34.2
Transport	Transport	46.2	ProfLabor	47.0	Firm	24.0
Finance	Finance	52.8	Capital	24.0	Govn.	24.6
Otherserv	Otherserv	49.3	Total	27.6	Total	27.5
	Total	57.8				
	Goods	Output	Factors	Output	Institution	Output
	Agri	41.1	AgLabor	41.1	AgriHH	27.8
	Mining	32.3	ProdLabor	19.4	NAgrRural	19.5
	Manuf	36.4	AdmLabor	3.7	NAgrUrban	13.4
	Total	37.0	ProfLabor	4.7	Firm	20.5
			Capital	20.5	Govn.	20.1
			Total	18.6	Total	18.7
TOTAL	Activities	Output	Factors	Output	Institution	Output
Agri	Agri	100	AgLabor	100	AgriHH	100
Mining	Mining	100	ProdLabor	100	NAgrRural	100
Manuf	Manuf	100	AdmLabor	100	NAgrUrban	100
Elect	GOODS	100	ProfLabor	100	Firm	100
Construc			Capital	100	Govn.	100
Trade	EGW	100	Total	100	Total	100
Transport	Construc	100				
Finance	Trade	100				
Otherserv	Transport	100				
	Finance	100				
	Otherserv	100				
	SERVICES	100				

Table 4a. Transformation from Goods and Services 1998 (Rp. Billion)

Final Demand	First and Second Transformation		Third Transformation		Fourth Transformation	
GOODS	Goods	Output	Factors	Output	Institution	Output
Agri	Agri	376,146	AgLabor	43,385	AgriHH	66,162
Mining	Mining	250,832	ProdLabor	39,117	NAgrRural	87,634
Manuf	Manuf	1,623,225	AdmLabor	9,487	NAgrUrban	112,488
	Total	2,250,203	ProfLabor	2,809	Firm	142,568
			Capital	335,865	Govn.	51,079
			Total	430,663	Total	459,930
	Services	Output	Factors	Output	Institution	Output
	EGW	39,379	AgLabor	—	AgriHH	19,939
	Construc	76,357	ProdLabor	14,079	NAgrRural	41,433
	Trade	385,155	AdmLabor	53,866	NAgrUrban	83,557
	Transport	141,296	ProfLabor	10,277	Firm	55,200
	Finance	144,556	Capital	130,041	Govn.	20,399
	Otherserv	138,268	Total	208,263	Total	220,528
	Total	925,010				
SERVICES	Services	Output	Factors	Output	Institution	Output
Elect	EGW	16,799	AgLabor	—	AgriHH	15,537
Construc	Construc	266,837	ProdLabor	16,882	NAgrRural	31,676
Trade	Trade	215,559	AdmLabor	32,256	NAgrUrban	59,858
Transport	Transport	87,746	ProfLabor	6,936	Firm	42,224
Finance	Finance	98,659	Capital	99,472	Govn.	15,548
Otherserv	Otherserv	80,864	Total	155,546	Total	164,842
	Total	766,463				
	Goods	Output	Factors	Output	Institution	Output
	Agri	24,951	AgLabor	14,412	AgriHH	19,521
	Mining	52,459	ProdLabor	10,622	NAgrRural	24,846
	Manuf	454,572	AdmLabor	2,563	NAgrUrban	30,852
	Total	631,983	ProfLabor	753	Firm	38,954
			Capital	91,770	Govn.	13,976
			Total	120,120	Total	128,150
TOTAL	Activities	Output	Factors	Output	Institution	Output
Agri	Agri	501,097	AgLabor	57,797	AgriHH	121,159
Mining	Mining	303,291	ProdLabor	80,700	NAgrRural	185,588
Manuf	Manuf	2,077,798	AdmLabor	98,172	NAgrUrban	286,755
Elect	GOODS	2,882,186	ProfLabor	20,776	Firm	278,947
Construc			Capital	657,149	Govn.	101,002
Trade	EGW	56,178	Total	914,593	Total	973,451
Transport	Construc	343,193				
Finance	Trade	600,714				
Otherserv	Transport	229,042				
	Finance	243,215				
	Otherserv	219,132				
	SERVICE	1,691,474				

Table 4b. Composition After Transformation of Goods and Services, 1998 (%)

Final Demand	First and Second Transformation		Third Transformation		Fourth Transformation	
GOODS	Goods	Output	Factors	Output	Institution	Output
Agri	Agri	75.1	AgLabor	75.1	AgriHH	54.6
Mining	Mining	82.7	ProdLabor	48.5	NAgrRural	47.2
Manuf	Manuf	78.1	AdmLabor	9.7	NAgrUrban	39.2
	Total	78.1	ProfLabor	13.5	Firm	51.1
			Capital	51.1	Govn.	50.6
			Total	47.1	Total	47.2
	Services	Output	Factors	Output	Institution	Output
	EGW	70.1	AgLabor	—	AgriHH	16.5
	Construc	22.2	ProdLabor	17.4	NAgrRural	22.3
	Trade	64.1	AdmLabor	54.9	NAgrUrban	29.1
	Transport	61.7	ProfLabor	49.5	Firm	19.8
	Finance	59.4	Capital	19.8	Govn.	20.2
	Otherserv	63.1	Total	22.8	Total	22.7
	Total	54.7				
SERVICES	Services	Output	Factors	Output	Institution	Output
Elect	EGW	29.9	AgLabor	—	AgriHH	12.8
Construc	Construc	77.8	ProdLabor	20.9	NAgrRural	17.1
Trade	Trade	35.9	AdmLabor	32.9	NAgrUrban	20.9
Transport	Transport	38.3	ProfLabor	33.4	Firm	15.1
Finance	Finance	40.6	Capital	15.1	Govn.	15.4
Otherserv	Otherserv	36.9	Total	17.0	Total	16.9
	Total	45.3				
	Goods	Output	Factors	Output	Institution	Output
	Agri	24.9	AgLabor	24.9	AgriHH	16.1
	Mining	17.3	ProdLabor	13.2	NAgrRural	13.4
	Manuf	21.9	AdmLabor	2.6	NAgrUrban	10.8
	Total	21.9	ProfLabor	3.6	Firm	14.0
			Capital	14.0	Govn.	13.8
			Total	13.1	Total	13.2
TOTAL	Activities	Output	Factors	Output	Institution	Output
Agri	Agri	100	AgLabor	100	AgriHH	100
Mining	Mining	100	ProdLabor	100	NAgrRural	100
Manuf	Manuf	100	AdmLabor	100	NAgrUrban	100
Elect	GOODS	100	ProfLabor	100	Firm	100
Construc			Capital	100	Govn.	100
Trade	EGW	100	Total	100	Total	100
Transport	Construc	100				
Finance	Trade	100				
Otherserv	Transport	100				
	Finance	100				
	Otherserv	100				
	SERVICES	100				

these conditions, the goods sector alone contributed 47.5% of total institutional income in the economic system. Together with induced services, the injection of goods sector contributes 67% of total institutional income.

Tables 5a and 5b display the output and the composition of production activities and factor income created by initial transformation from institutions in 1995 and 1998 respectively. The comparison between 1995 and 1998 shows a great difference in the structure of the economy. The government output was decreased dramatically from 38.8% in 1995 to 18.8% of total institutional output in 1998, replaced by firms who saw their contribution rise from 18.4% in 1995 to 25.2% in 1998. With this structure, the share of manufacturing output in

Table 5a. Transformation from Institution 1995 and 1998 (Rp. Billion)

Final Demand	First Transformation	Second and Third Transformation	Fourth Transformation
1995			
INSTUTION	Institution Output	Goods Output	Factors Output
AgriHH	AgriHH 11,459	Agri 25,824	AgLabor 5,370
NAgrRural	NagrRural 14,372	Mining 3,262	ProdLabor 2,887
NAgrUrban	NagrUrban 23,135	Manuf 66,141	AdmLabor 700
Firm	Firm 20,767	Total 95,227	ProfLabor 190
Govn.	Govn. 43,325	Services Output	Capital 9,635
	Total 113,058	EGW 2,959	Total 18,782
		Construc 2,655	
		Trade 32,756	Factors Output
		Transport 12,330	AgLabor —
		Finance 18,296	ProdLabor 3,052
		Otherserv 41,371	AdmLabor 11,323
		Total 110,367	ProfLabor 4,502
			Capital 11,368
			Total 30245
		Total 205,594	Total 49,027
1998			
INSTUTION	Institution Output	Goods Output	Factors Output
AgriHH	AgriHH 17,599	Agri 38,553	AgLabor 4,447
NAgrRural	NagrRural 25,780	Mining 7,589	ProdLabor 2,664
NAgrUrban	NagrUrban 31,650	Manuf 119,001	AdmLabor 637
Firm	Firm 33,848	Total 165,143	ProfLabor 185
Govn.	Govn. 25,213	Services Output	Capital 23,027
	Total 134,090	EGW 5,318	Total 30,960
		Construc 8,975	
		Trade 45,596	Factors Output
		Transport 17,610	AgLabor —
		Finance 19,143	ProdLabor 2,122
		Otherserv 29,247	AdmLabor 7,318
		Total 125,889	ProfLabor 1,978
			Capital 17,492
			Total 28,910
		Total 291,032	Total 59,870

Final Demand	First Transformation	Second and Third Transformation	Fourth Transformation																																																																														
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6. Conclusions

The application of BSPA and the decomposition of production activities into goods and services in a more disaggregated SAM framework provide the capability to examine the contributions of these two sectors to the economy both directly and through the myriad paths

of indirect interaction that characterize a SAM system of accounts. With BSPA, it is possible to examine the various feedback loop processes as well; taken together, the picture that emerges is one in which there are strong indications of the dominant role of the goods sector in shaping the formation and development of the Indonesian economy. There was a clear indication of the deterioration of the role of the service sector in the Indonesian economy following the mid-1997 economic crisis. While there are some controversies centering on the causal links between goods and services in the modern economies, the analysis in this paper has shown the magnitude of the linkages between both sectors. The goods sector has played a dominant role in changing the output of all production activities, factorial and institutional incomes.

The creation of SAMs in the next decade will provide an opportunity to explore the degree to which the Indonesian economy returns to its former (pre financial crisis) structure and continues to change in the same directions indicative of the period from the 1970s through mid 1990s. What the present SAM structure is unable to capture is the important role played by the informal sector in serving to mute the impact of some of the changes generated by the financial crisis; as Nazara [13] has shown, many employees laid off from jobs in the formal sector retreated into the informal sector in an attempt to maintain household welfare levels. Many also returned to the agricultural sectors.

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