The Impact of Tourism on the Republic of Singapore

by

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Major Paper presented to the Department of Economics
of the University of Ottawa
in partial fulfillment of the requirements of the M.A. Degree

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ECO 7997

Ottawa, Ontario
March, 1995

Chapter 1.

Introduction

In recent years, many developing and less developed countries have come to place great emphasis on the tourist industry as one means of diversifying their economies, improving living standards, and increasing their foreign exchange earnings. The importance of tourism was recognized when the United Nations General Assembly designated 1967 as International Tourist Year and resolved that tourism is a basic and most desirable human activity deserving the praise of all peoples and governments.

For certain countries, tourism is already one of the major export industries and earners of foreign currency. Interest in the development of a tourist industry has been especially strong in areas with no natural resources or in areas which are heavily dependent on the labour and skills of its citizenry. The tourist industry has had a good performance relative to other export industries, and, therefore, there has been a growing awareness - on the part of the public authorities - of many countries of the potential benefits that can be reaped from tourism.

The tourist industry is especially attractive to many countries because of the particular problems they face, such as their dependence on many primary input commodities which have unstable prices and the protectionist policies on the part of other countries concerning manufactured goods. Therefore, tourism seems to have many advantages. It is labour intensive, and in labour-surplus countries, many operational skills can quickly be acquired by the local population. Also, in some locations tourism can provide the base and stimulus for the diversification of the economy.

The island of Singapore is an excellent example of a developing country that relies heavily on tourism for foreign exchange earnings. She has all the characteristics mentioned previously - no natural resources, high dependence on other countries for intermediate inputs. From the point of view of the government, the foreign exchange earned from the tourist industry is vital to the balance of payments. Furthermore, the local inhabitants also benefit from the jobs created in the tourist sector itself and indirectly in the other sectors that provide inputs into the tourist industry - construction, financial services, manufacturing, and so on.

This paper attempts to analyze the economic impact of tourism on the Singaporean economy and assess the prospects and implications of further developing the tourism sector. This will be accomplished by comparing the relative performance of the tourist industry with the other industries, using the input-output model. The paper evaluates tourism as an option for growth by analyzing the economic and social benefits, costs and externalities. A profile of the industry will be given, summarising its growth and the factors accounting for its development.

This paper also attempts to go beyond the purpose of updating earlier works on the role of tourism in the development of Singapore's service industries. In particular, the traditional treatment of the tourist industry in the balance of payment is examined.

The plan of the paper is as follows. In Chapter 2, the main characteristics of the tourism industry as well as its contributions - jobs, income, foreign exchange - to the economy are discussed. The analytical framework - an input-output model - for analyzing the effects that tourism has on the entire economy is presented in Chapter 3. An application of this analytical framework is given in Chapter 4. For this application, the data comes from "Singapore Input-Output Tables 1973," published by the Department of Statistics, Singapore in 1978. Standard measures such as multipliers with respect to output and income will be estimated. In Chapter 5, an attempt is made to put the structure of the Singaporean economy into a proper perspective through using q-analysis and as well, backward and forward linkages. The final chapter offers some findings and conclusions from the above trends in development and issues.

Chapter 2.

The Economics of Tourism

2.1 Definition and Characteristics of Tourism

The definitions of both "tourist" and "tourist industry" are problematic. In the former case, the United Nations/World Tourism Organization (UN/WTO) defines tourists as visitors staying at least 24 hours in the country visited under purposes specified as leisure, business, family, mission or meeting (Mathieson and Wall, 1982, p 10-12). Those staying less than 24 hours, including travellers on cruises but excluding those in transit, are termed "excursionists". Also excluded as tourists are those staying over one year, constituting migrants and members of diplomatic corps and other foreign personnel in armed forces.

The problem with the definition of "tourist industry" is that most "tourist enterprises" are available also to local residents, and many tourists purchase goods and services from enterprises that predominantly cater to the needs of local residents. In Chapters 4 and 5, where I-O techniques are used, the tourist industry is defined from the viewpoint of the production of goods and services for which the tourists spend money. Due to the multi-product nature of tourist expenditure, I-O analysis is an ideal instrument for the study of tourism.

Besides being multi-product, there are many agents involved in the tourist industry. As shown in **Figure 1**, the 3 main economic agents comprise (Cleverdon, 1979):

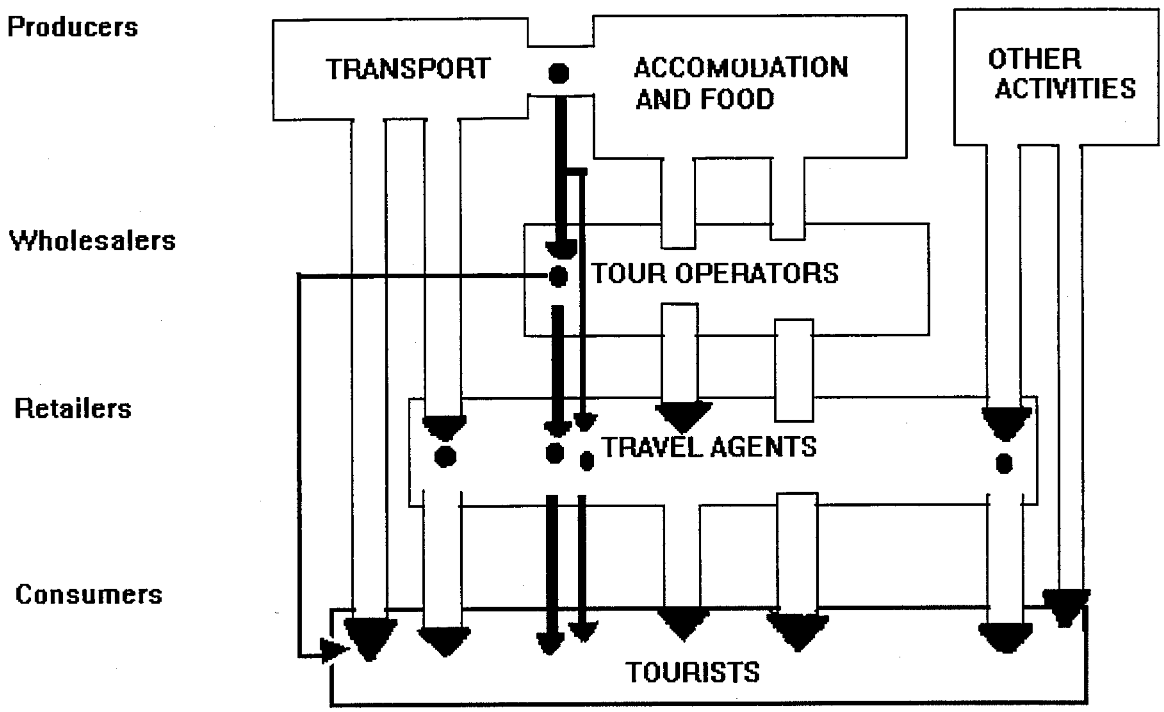
a) Passenger transport carriers operated both by transnational corporations (TNCs), as in airlines, and by local transport carriers, as in domestic land-based travel modes;

b) Accommodation, catering, and entertainment establishments;

c) Travel agents who are retailers intermediating between the tourists and the hotels, airlines, tour operators, and others;

d) Tour operators who are the wholesalers that purchase the package of tourist-related activities and combine them into a composite product.

Figure 1 Chain of Distribution of Tourism Services



A distinction may also be made between domestic (or internal) and foreign (or international) tourism.[1] It must be noted that international tourism, as an invisible export, differs from other forms of international trade in many ways:

a) The consumers "collect" or "consume" the product from the exporting country, thus eliminating freight costs for the exporters.

b) Not only is international tourism both price - and income - elastic, its demand is also highly sensitive to non-economic factors, such as socio-political conditions and changes in the fashionability of resorts/countries swayed largely by media coverage.

c) The multi-faceted nature of the tourist product affects the tourist industry directly and many other industries indirectly.

d) There are non-pecuniary effects in terms of social costs and benefits or externalities from tourism.

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[1] While the natural assumption is that domestic tourism has no great relevance in Singapore, the trend by local hotels to offer holiday packages for locals is gaining popularity.

In assessing the role of tourism in economic development, a discussion of social benefits and social costs is required. The economic benefits in terms of the positive impact on output, value-added, employment, and foreign exchange must be weighted against the costs of dependency and instability on marketing a luxury good which is income-elastic and recession-prone. For land-scarce Singapore, there are opportunity costs of building tourist attractions, although these also serve the recreational needs of Singaporeans.

The social costs are often in the forms of land and other resources used to meet tourist needs as well as required adjustments in cultural and social norms which may be undesirable or incompatible with indigenous values. While these may be harder to quantify in estimating the net impact of the tourism, they should nevertheless be borne in mind.

2.2 Growth of Tourism in Singapore

Tourism is used in Singapore as a means for economic restructuring and diversification. Both deliberate domestic policies and external factors have led to the growth of this development strategy.

The factors for growth include conscious government policies to develop the industry, primarily through the Singapore Tourist Promotion Board (STPB) set up in 1964 and the growth of Singapore Airlines (SIA) as the national carrier as well. The various strategies which resulted in internationalising the Singapore economy through its industrial, financial, and communications sectors also helped to project its image as a gateway to the region both for business and recreation.

Public sector infrastructural investment in the industry has been tremendous and is matched by private sector responses. Regional and internal growth and increase in affluence also facilitated travel. Technological factors, such as wide-bodied aircrafts, low fuel and fare cost structures prior to the oil crises also stimulated the industry. Cooperative efforts which allow close ties between Singapore and its rich regional hinterland are also relevant.

In line with the expansion of the tourist industry, hotel rooms have increased steadily as shown in **Table 2.2**.

Table 2.2 Tourist Arrivals, Hotels And Cess Collection, 1980-1991.

Year	Arrivals '000	Hotel Rooms	Occupancy Rate (%)	Cess from Hotels $'000	Sales on food and Drinks $'000
1980	2562085	12479	86.1	9671.3	17576.1
1981	2828899	13267	85.7	12355.6	20812.4
1982	2956700	13784	80.8	13789.7	22921.5
1983	2853577	13549	75.5	12880.7	24232.4
1984	2991430	14350	75.5	12569.3	25342.1
1985	3030970	16172	65.9	10998.5	23557.1
1986	3191058	18858	64.7	10224.2	23154.7
1987	3678809	21891	68.7	11503.4	26737.0
1988	4186091	22612	79.3	14420.9	31176.6
1989	4829950	22675	86.4	20408.1	35586.8
1990	5322854	22408	84.0	38607.4	51210.4
1991	5414651	22700	76.7	30883.3	42473.9

Source: Singapore Tourist Promotion Board

Between 1980 and 1991, the number of rooms increased by 81.9% although occupancy rates fell from 86.1% to 76.7% over the same period. It should also be noted from the table that per capita revenue from the tourist cess and sales tax on food and drinks in tourist establishments had also fallen between 1983 and 1987.

Besides the hotel sector, restaurants, wholesale and retail, transportation, tourist agencies and operators, other supporting sectors also grew to accommodate the tourist population. From manpower development in the form of a Hotel and Catering School sponsored by the government to the private sector response in the form of a tourism council (Straits Times, 10 January 1988) are notable signs of a maturing industry.

The government has also initiated a Tourism Task Force in 1984 in response to the poor performance in 1982 and 1983, which has been recognised as not merely a cyclical phenomenon, but more structural in nature (MTI, 1984). A concerted effort produced the Tourism Product Development Plan (MTI/STPB, 1986) in collaboration with other Ministries and Departments and other statutory boards, namely Sentosa Development Corporation (SDC), Port of Singapore Authority (PSA), and Urban Redevelopment Authority (URA) for the five years, 1986-1990. Its focus was on "Singapore as a microcosm - a unique destination combining elements of modernity with oriental mystique and cultural heritage" (MTI/STPB, 1986).

While the STPB has done a commendable job of monitoring the development and needs of the industry with earmarked revenue from the cess collected, a number of issues pertaining to its statistical activities may be taken up at this point. Since expenditure statistics are most crucial to any study on economic impact, more care should be given to tap these information in the annual survey the STPB conducts. More specifically, statistics on shopping done in Singapore by country of residence are presently given with a lot of multiple responses by the respondents who are not requested to list these items by the expenditure spent on them

(STPB, Survey of Overseas Visitors to Singapore, 1986, Table 26, p 56). In a separate question, they are asked to give their expenditures in Singapore for broad categories, such as accommodation, food and beverage, shopping, sightseeing, medical/dental treatment and others (Ibid, Table 23, p 53). For assessing the economic impact using I-O analysis, it would be more useful if the category "shopping" were broken down by the items purchased.

As Singapore is attracting visitors who come for its medical/dental and convention/exhibition facilities, more information should perhaps be sought regarding their characteristics. It is, however, appreciated that questionnaires must not be too long and cumbersome as visitors should not be bogged down with too many details that try their patience or intrude into their personal activities.

As expenditure statistics are being drawn from sample surveys, total expenditures, their patterns and composition are at best "guesstimates". One possible resort, using non-residents' expenditure from private consumption expenditure, published in the Yearbook of Statistics, has been attempted, well realising that non-residents may cover a larger population than the tourists. In this respect, some guidance is sought from the producers of such statistics in the Department of Statistics as well as the STPB.

Another point deserving some thought is that principal statistics, such as output, value-added, employment, capital and cost structure of the tourist industry are altogether absent, probably because of the composite nature of the industry, spanning many sectors, products, and economic agents. They are not easily found in either the Census of Services or the Census of Wholesale Trade, Retail Trade, Restaurants and Hotels, both from the Department of Statistics. Not even STPB publications can offer such principal statistics for more disaggregated economic analyses.

While such a development may be a little unrealistic and demanding because of the composite nature of the industry and the difficulties of distinguishing tourist versus local demand for the same goods and services, some thought should at least be put into it. In this regard, some tested and proven guidelines from international agencies (like World Tourism Organization) on how such statistics should be collected, may be illuminating. As another suggestion, all research projects and survey currently conducted or contracted out by the STPB for instance, should be properly archived and made available for future research work.

2.3 Tourism and the Balance of Payments

The potential contribution of tourism to the balance of payments as an earner of foreign exchange has been widely recognised. The effects of tourism on the balance of payments consist of two components:

1. The effects of tourism within the home country, generated by the country's own residents and visitors from overseas;

2. The effects of tourism, generated by the home country's residents, who choose a foreign country as a destination for tourism.

The necessity of separating the contribution of tourism this way has been questioned by some authors (Erbes, 1973, Thuens, 1976 and Airey, 1978). However, it is important to know the effects of the tourist activities of foreign nationals visiting the country so that one can determine the role of foreign exchange earnings in the balance of payments. It is noted that in some countries, foreign exchange earnings from tourism may be very low and tourism may even be a drain on the balance of payments. The costs of servicing both foreign and domestic tourists may be so great, and the imported component so large, that earnings from foreigners may be insufficient to offset theses high costs. Countries are also interested in the effects of tourism beyond their boundaries. They wish to know if more money is leaving the country than is brought in by international tourism.

The effects of tourism on the balance of payments can be categorised into primary, secondary, and tertiary effects. Primary effects are direct, immediate, and relatively easy to measure. They give rise to direct inflows and outflows of foreign exchange, respectively. Primary effects of tourism will only occur if travellers have crossed international boundaries.

Secondary and tertiary effects are more complex, more difficult to quantify. Hence, they are left out in most balance of payments assessments. Secondary effects are the effects on the balance of payments of the direct tourist expenditures as they circulate through the economy. Basically, they include expenditures incurred in the promotion of tourism abroad by resident entrepreneurs, and at home by foreigners. They also include the outflow of foreign exchange due to higher importation of goods and services from abroad that results from the higher income generated in the economy due to tourists activities. An attempt is made to quantify the secondary effects by means of input-output analysis in the following chapters.

Flows of currency not initiated by direct tourist expenditures are termed tertiary effects. These include imported goods, such as clothes and suitcases, purchased by residents of home country in preparation for travel, and investment opportunities created by tourist activities. The existence of tourist activities may stimulate home country companies to export specific commodities to tourist-generating countries and to import others.

It has also been noted that the information in the present format of the balance of payments record falls short of giving a comprehensive picture of the impact of international tourism on the economy. What is presently included in the balance of payments is the travel account, which records the expenditures made by overseas visitors in the home country, and by residents of the home country abroad. Some authors attempt to widen the coverage to include all readily identifiable international visitor expenditures, such as investment patterns, money spent on transport, and the training of foreign staff. When these are incorporated into the travel balance, the result is known as the tourism balance.

In spite of the reservations mentioned, the travel account may provide a useful preliminary assessment of the involvement of a country in international tourism. The travel account is an indicator of the degree to which a country attracts overseas visitors when compared with the ability of foreign countries in attracting home residents to travel abroad. The travel account makes no reference to secondary and tertiary effects occurring as a result of tourist activity. The travel account, therefore, only provides part of the total picture. In **Table 2.3**, the travel account and its importance relative to the national product, and exports and imports of goods and services for the Singapore economy is presented.

Table 2.3 Contribution of Tourism to the Balance of Payments, 1970-1990.

	1970	1980	1990
GDP (at current mkt prices)	2149.6	5804.9	37773.6
A GOODS & SERVICES (Net)	-196.5	-1727.2	1384.7
Exports of Goods & Services	3620.3	6132.3	64500.7
Merch + Non-Monetary Gold	2964.6	4428.3	46379.3
Services	655.7	1704	13201.4
Travel	30.5	279.9	4010.0
as % of Svc Exports	4.7	16.4	22.0
as % of Tot Exports	0.8	4.6	6.2
Exports of Goods & Services	3816.8	7859.5	63196.0
Merch + Non-Monetary Gold	3497.8	7047.7	51448.8
Services	319	811.8	11747.2
Travel	15.3	31.9	1417.6
as % of Svc Imports	4.8	3.9	12.1
as % of Tot Imports	0.4	0.4	2.2
Trade Balance	-533.2	-2619.4	-5069.5
Balance of Services	336.7	892.2	6454.2
Balance of Travel	15.2	248.0	2592.4
as % of GDP	0.7	4.3	6.9

Source: Singapore Tourist Promotion Board

The balance on the travel account is calculated by subtracting the expenditures by residents travelling abroad from the expenditures by overseas residents in the home country. For the past decade, Singapore has always enjoyed a surplus in the travel balance. This surplus had steadily increased from just 0.7% of GDP in 1970 to a peak of 6.9% of GDP in 1990. Tourism exports, constitute 22% of Singapore's exports of services and 6.2% of total exports in 1990, compared to 4.7% and 0.8%, respectively, in 1970. Meanwhile, growing affluence in the economy also resulted in more residents travelling abroad. Tourism imports as a percentage of imports of services has more than doubled from 4.8% in 1970 to 12.1% in 1990.

This may be an appropriate juncture to clarify a popular but somewhat misconceived explanation for the traditional large merchandise trade deficit. Some economists offer the consolation that if merchandise imports bought by tourists and hence re-exported were included, then the trade deficit would not have been so large. The counter-view is that such goods are already accounted for under travel as this includes all expenditures made by the visitors, based on payments made to Singapore residents, in the form of travellers' cheques, foreign notes and coins, telegraphic transfers, drafts and cheques (Singapore Balance of Payments, 1972-74, p. 14). To include all goods imported and brought home by tourists as re-exports, thus implies double-counting.

Chapter 3.

Analytical Framework

3.1 Introduction

Inter-industry or I-O analysis provides a method of examining, in a simple and quantifiable way, the effects of changes in final demand on the economy's output and its impact on income, employment, indirect taxes as well as on import costs. Given an exogenously derived "bill" of final expenditures during a given period, it is possible through an input-output model to calculate what output levels would be required from each industry in order to sustain the given final demand and, consequently, what its effects are on income, employment and others.

The use of I-O technique in practical tourism research has been prevalent. A good summary of the research on tourism using I-O techniques and a review of the state of art in tourism multipliers can be found in Archer (1977). One of the earliest tourism I-O studies was carried out by F.K. Harmston (1960) in Southern Wyoming. He used a 24-sectors model which included households and local government endogenously within the matrix. Other notable examples include Gamble (1965), Strang (1970), Diamond (1976), and Archer, Shea and de Vane (1974).

3.2 Input-Output Analysis

Input-output analysis attempts to quantify the economic interdependencies in an economy. Each economic activity is assigned to one of two types of sectors: production or final demand. Production sectors (e.g., agriculture, manufacturing, trade) represent all establishments in the region producing a specific product or service. The output levels of production sectors are determined within the model and are therefore termed endogenous to the model. The sectors representing final demand may include households, government, foreign trade. The levels of activity in these sectors are assumed to be determined by forces outside the model, e.g., government policy, and are, therefore, termed exogenous. All changes in the endogenous sectors of a input-output model are results of changes in the exogenous sectors.

A fundamental underlying relationship of input-output analysis is that the output (good or service) of a given sector in the economy is determined by the demands of that sector's product by all the users of this product. The users include other industrial sectors that use the product as intermediate inputs in the production of their own products (collectively referred to as intermediate demand) as well as sectors that use the product in its final form (collectively referred to as final demand). As an example, the amount of refined petroleum produced is determined by the intermediate demand (oil for plastic products, fuel used by farm tractors) and the final demand (heating fuel for consumers, gasoline for consumers' cars).

The flow of products between sectors is measured in dollars and referred to as transactions between the various sectors. The transactions in an economy can be represented by an input-output table under the following form:

Table 3.2 Simplified Input-Output Table.

									Σ_b
	X_{11}	X_{12}	.....	X_{1n}	C_1	I_1	G_1	E_1	X_1
	X_{21}	X_{22}	.....	X_{2n}	C_2	I_2	G_2	E_2	X_2
	.				.			.	.
	.				.			.	.
	.				.			.	.
	.				.			.	.
	X_{n1}	X_{n2}	.....	X_{nn}	C_n	I_n	G_n	E_n	X_n
R1	$X_{n+1,1}$	$X_{n+1,2}$	.....	$X_{n+1,n}$					
R2	$X_{n+2,1}$	$X_{n+2,2}$	.....	$X_{n+2,n}$					
R3	$X_{n+3,1}$	$X_{n+3,2}$	.....	$X_{n+3,n}$					
R4	$X_{n+4,1}$	$X_{n+4,2}$	.....	$X_{n+4,n}$					
R5	$X_{n+5,1}$	$X_{n+5,2}$	.....	$X_{n+5,n}$					
R6	$X_{n+6,1}$	$X_{n+6,2}$	.....	$X_{n+6,n}$					
Σ_a	X_1	X_2	.....	X_n					

where R1 = Compensation of employees (wages)
R2 = Gross operating surplus
R3 = Import duties
R4 = Excise duties and other commodity taxes
R5 = Other induced taxes

R6	=	Total imports c.i.f.
Σ_a	=	Total resources (supply)
Σ_b	=	Total demand (aggregate)
C	=	Consumers' final demand
I	=	Investment demand
G	=	Government expenditure
E	=	Exports

The production side of the economy is divided into **n** industries numbered **1,2,..., n**. The input-output table is made up of three quadrants.

In the first quadrant, one finds an **n * n** square matrix $(\mathbf{X}_{ij})$ $\mathbf{i = 1,...,n; j = 1,...,n}$ recording the flows of intermediate inputs among the **n** industries. More precisely, $\mathbf{X}_{ij}$ represents the value in dollars of the part of industry **i**'s output sold to industry **j** to be used by the latter as an intermediate input.

In the second quadrant, found immediately below the first quadrant, one finds the flows of primary inputs into each industry. Thus, $\mathbf{X}_{n+1,j}$ represents the wage bill of industry **j**, $\mathbf{j = 1,...,n}$. Similarly,

$\mathbf{X}_{n+2,j}$	=	the gross operating surplus of industry **j**
$\mathbf{X}_{n+3,j}$	=	the import duties paid by industry **j**
$\mathbf{X}_{n+4,j}$	=	the excise duties and other commodity taxes paid by industry **j**
$\mathbf{X}_{n+5,j}$	=	the other indirect taxes paid by industry **j**
$\mathbf{X}_{n+6,j}$	=	total imports (c.i.f.) of commodity **j**.

Thus, if we sum the terms in each column $\mathbf{j}$, $\mathbf{j = 1,2,\ldots,n}$, of the matrix constituted by quadrants 1 and 2, we obtain the total resources (supply) of commodity $\mathbf{j}$, that is,

$$(1) \qquad X_j = \Sigma_{i=1}^{n+6} X_{ij}$$

In quadrant 3, situated on the right side of quadrant 1, one finds an $\mathbf{n * 5}$ matrix of final demand. For each $\mathbf{i = 1,\ldots,n}$, C_i, I_i, G_i, E_i, X_i represent, respectively, the final demands for the output of industry $\mathbf{i}$ for private consumption, investment, government consumption, exports, and aggregate demand. Hence,

$$(2) \qquad X_i = \Sigma_{j=1}^{n} X_{ij} + C_i + I_i + G_i + E_i \qquad i = 1,\ldots,n$$

Now recall that all the entries in the above input-output table are expressed in dollars. If one changes the physical units of each commodity so that its price is equal to 1, then these entries can be interpreted as physical quantities. Thus X_{ij} now indicates the quantity of commodity $\mathbf{i}$ in physical units that industry $\mathbf{j}$ uses as intermediate inputs. The other entries in the input-output table are similarly interpreted.

Now define

$$(3) \qquad a_{ij} = X_{ij}/X_j \qquad \begin{matrix} i = 1,\ldots,n+5 \\ j = 1,\ldots,n \end{matrix}$$

Then $\mathbf{a}_{ij}$, known as a technical coefficient, represents the amount of commodity **i** needed as intermediate input in the production of 1 unit of commodity **j**. In input-output analysis, the technical coefficients $\mathbf{a}_{ij}$ are assumed to be fixed. Using (3), we can also express (2) as:

$$(4) \qquad \mathbf{X}_i = \Sigma_{j=1}{}^{n}(\mathbf{X}_{ij}/\mathbf{X}_j)\mathbf{X}_j + \mathbf{C}_i + \mathbf{I}_i + \mathbf{G}_i + \mathbf{E}_i$$

$$= \Sigma_{j=1}{}^{n}\mathbf{a}_{ij}\mathbf{X}_j + \mathbf{C}_i + \mathbf{I}_i + \mathbf{G}_i + \mathbf{E}_i \qquad (\mathbf{i} = 1,\ldots,\mathbf{n})$$

Now let $\mathbf{A} = (\mathbf{a}_{ij}), \qquad \mathbf{i} = 1,\ldots,\mathbf{n};\ \mathbf{j} = 1,\ldots,\mathbf{n}$

$$\mathbf{X} = \begin{bmatrix} \mathbf{X}_1 \\ \cdot \\ \cdot \\ \mathbf{X}_n \end{bmatrix},$$

$$\mathbf{Y} = \begin{bmatrix} \mathbf{Y}_1 \\ \cdot \\ \cdot \\ \mathbf{Y}_n \end{bmatrix} = \begin{bmatrix} \mathbf{C}_1 + \mathbf{I}_1 + \mathbf{G}_1 + \mathbf{E}_1 \\ \\ \mathbf{C}_2 + \mathbf{I}_2 + \mathbf{G}_2 + \mathbf{E}_2 \end{bmatrix},$$

then we can express (4) under the following matrix form

$$(5) \qquad \mathbf{X} = \mathbf{AX} + \mathbf{Y}$$

The vector **Y** is known as the vector of final demand. If **Y** is given, **X** can be found by using the following formula

$$(6) \qquad \mathbf{X} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{Y}$$

The matrix $(\mathbf{I} - \mathbf{A})^{-1}$ is known as the Leontief inverse in the literature of input-output analysis. It gives the vector of total resources as a function of the vector of final demand **Y**. In a comparative static exercise, if $\Delta\mathbf{Y}$ is the change in the vector of exogenous final demands, then the change in the vector of resources is

$$(7) \qquad \Delta\mathbf{X} = \begin{bmatrix} \Delta X_1 \\ \cdot \\ \cdot \\ \Delta X_n \end{bmatrix} = (\mathbf{I} - \mathbf{A})^{-1}\Delta\mathbf{Y}$$

Once $\Delta\mathbf{X}$ has been determined, we can compute the variation in $\mathbf{X}_{ij}$, say $\Delta\mathbf{X}_{ij}$, by the following formula:

$$(8) \qquad \Delta X_{ij} = a_{ij}\Delta X_j \, , \qquad \begin{array}{l} i = 1,\ldots,n+6 \\ j = 1,\ldots,n \end{array}$$

The Leontief model just presented depends on the existence of an exogenous sector, disconnected from the technologically interrelated productive sectors, since it is here that the important final demands for outputs originate. The basic kinds of transactions that constitute the activity of this sector, as we have seen, are consumption purchases by households, sales to government, gross private domestic investment, and exports. In this case of households, this exogenous categorization is something of a strain on basic economic theory. Households earn incomes (labor + capital) and, as consumers, they spend their incomes in rather well-patterned ways. In particular, a change in the amount of labour inputs needed for production in one or more sectors will lead to a change in labor income, which, in turn, will lead to a change in the amounts spend by households. In other words, the amounts of final consumption of households depend on their incomes, which are related to the output of each sector. Furthermore, private consumption expenditures constitute possibly the largest single element of final demand in the Singaporean economy.

Thus, one could move the household sector from the final demand column and place it inside the technically interrelated table, i.e., make it one of the endogenous sectors. This requires a row and a column for the new household sector - the former showing how its output (labor + capital services) is used as an input by various sectors and the latter showing the structure of its consumption purchases distributed among the sectors. More precisely, let $\mathbf{X}_{76}$ be the total income of households. Then

$$\mathbf{X}_{76} = \Sigma_{i=76}{}^{77}\Sigma_{j=1}{}^{75}\mathbf{X}_{ij}$$

Next, let $\hat{\mathbf{A}} = (\hat{\mathbf{a}}_{ij})$ $\mathbf{i} = \mathbf{1,\ldots,76}$; $\mathbf{j} = \mathbf{1,\ldots,76}$ be the matrix of technical coefficients defined as follows.

For $\mathbf{i,j} = \mathbf{1,\ldots,75}$, $\hat{\mathbf{a}}_{ij} = {}_{a}\mathbf{ij}$. For $\mathbf{i} = \mathbf{76}$, we have

$$\hat{\mathbf{a}}_{76,j} = (\mathbf{X}_{76,j} + \mathbf{X}_{77,j})/\mathbf{X}_j, \qquad \mathbf{j} = \mathbf{1,\ldots,75}$$

$$\hat{a}_{76,76} = 0$$

For $j = 76$, we have

$$\hat{a}_{i,76} = C_i / X_{76} \qquad i = 1,\ldots,75$$

Here we recall that $X_1,\ldots,X_{75}$, $C_1,\ldots,C_{75}$ are as defined before. With private consumption purchases being endogenous, the following version of (7) is used in the calculations

$$\text{(9)} \qquad \begin{bmatrix} \Delta X_1 \\ \cdot \\ \cdot \\ \Delta X_{75} \\ \Delta X_{76} \end{bmatrix} = (I - \hat{A})^{-1} \begin{bmatrix} \Delta Y_1 \\ \cdot \\ \cdot \\ \Delta Y_{75} \\ \Delta Y_{76} \end{bmatrix}$$

Chapter 4.

An Application of Input-Output Analysis to Tourism

4.1 Singapore Input-Output Tables

The Singaporean economy is partitioned into 75 sectors. This classification conforms closely to the latest 1968 version of the International Standard Industrial Classification of All Economic Activities (ISIC), which is the basis for classification of all industries. The main criteria used in defining the ISIC system are characteristics of the activities of production units which determine the similarity in the production structure and experience of the producing units, and which involve the following: the character of the goods and services produced; the uses to which the goods and services are put; and the technology of the production process. A classification of the 75 industries can be found in **Table 4.1**.

Table 4.1 Classification of Industries in Singapore.

Industry	Type
1.	Livestock
2.	Other Agriculture
3.	Fishing
4.	Quarrying
5.	Rubber Processing
6.	Meat and Meat Preparation
7.	Dairy Products
8.	Milled Cereal and Cereal Preparation
9.	Sugar and Sugar Confectionery
10.	Oils and fats
11.	Other Food
12.	Animal Feed
13.	Beverages
14.	Tobacco Products
15.	Textile, Yarn and Thread
16.	Textile Fabrics
17.	Textile Articles
18	Clothing
19.	Footwear
20.	Leather and Leather Products
21.	Sawmilling
22.	Wood Product except Furniture
23.	Rattan Processing
24.	Furniture and Fixtures
25.	Paper and Paperboard
26.	Paper and Paperboard Products
27.	Printing and Publishing
28.	Paints and Dyeing Materials
29.	Medical and Pharmaceutical Products
30.	Toilet Preparations
31.	Plastic and Plastic Products

32.	Other Chemicals
33.	Petroleum and Petrol Products
34.	Rubber Products except Footwear
35.	Pottery, China and Earthenware
36.	Glass and Glassware
37.	Bricks, Tiles and other Clay Products
38.	Cement
39.	Structure Cement and Concrete Products
40.	Non-Metallic Minerals
41.	Metal Ores and Scrap
42.	Basic Iron and Steel
43.	Non-Ferrous Basic Metals
44.	Fabricated Metal Products
45.	Non-Electrical Machinery
46.	Electrical Goods and Machinery
47.	Insulated Wires and Cables
48.	Electronics and Telecommunical
49.	Musical Instruments
50.	Vehicles
51.	Ships and Aircraft
52.	Watches and Clocks
53.	Scientific and Precision Equipment
54.	Jewellery
55.	Other Manufactures
56.	Gas
57.	Electricity
58.	Water
59.	Construction
60.	Wholesale and Retail Trade
61.	Restaurants and other Eating Places
62.	Hotels and Lodging Houses
63.	Transport and Storage
64.	Communication
65.	Financial Services
66.	Insurance

67.	Real Estate
68.	Other Business Services
69.	Ownership of Dwellings
70.	Social and Community Services
71.	Recreational and Cultural Services
72.	Personal and Household Services
73.	Producers of Government Services
74.	Domestic Services and Private Non-Profit Organizations
75.	Other Goods and Services

4.1.1 Destination of Inputs

The data in the first 75 rows (**Table 4.1.1**) shows how the value of total output in each sector is delivered to the 75 producing sectors as intermediate goods, and to final demand which is the sum total of private consumption, government expenditure, total investment, and exports (Columns 78 to 81). Reading across the first row (livestock), for example, we see that the distribution of the total output of $407.8 million produced by the livestock sector is as follows:

$2.8 million is used within the livestock industry itself;
$1.2 million is sold to the fishing sector;
$6.7 million is sold to the meat and meat preparation sector;
$303 million is sold to final users and so on.

Table 4.1.1 Input-Output Table of Singapore for the Year 1973 (Revised)

Flows in millions of Singapore Dollars of Y 1973
[Total Transactions]

Industry:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	2.8	0	1.2	0	0	6.7	0	1.5	0	0	1.2	0	0	0	0
2	0	0.6	0.9	0	1.6	0.3	0	70.8	0	32.5	56.9	45.6	0.7	18.4	29.7
3	0	0	0.4	0	0	14.7	0	0	0	0	0.1	0.1	0	0	0
4	0	0	0	1.7	0	0	0	0	0	0	0.1	0	0	0	0
5	0	0	0	0	715.3	0	0	0	0	0	0	0	0	0	0
6	0	0	0.2	0	0	0.3	0	0	0	0	0.3	0	0	0	0
7	0	0	0.2	0	0	0	21.8	0.5	3.7	0	2.3	0	0.4	0	0
8	13.4	0	0.2	0	0	0	0	15.3	1.7	0	2.1	0	2.9	0	0
9	0	0	0.2	0	0	0.1	4.7	2.4	51.6	0	2.7	0	7.4	0	0
10	17.2	0	0.1	0	0	0.2	0.1	4.6	0.8	75.2	1.5	0.2	0.1	0.1	0.1
11	2.2	0	0.4	0	0	0.4	0.2	1.5	1.4	0.1	3.1	0	5.1	0	0.1
12	134.7	0	0	0	0	0	0	0	0	0	0	82.2	0	0	0
13	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0.3	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49.9
16	0	0	0	0	0.6	0.2	0.9	0.9	0.9	1.4	0.8	0.6	0	0	5.6
17	0	0	0.9	0	0	0	0	0	0	0	0	0	0	0	0.1
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	1.7	0
26	0	0	0	0	0.9	0	0	0	0	0	0.1	0	1.6	4.4	0.5
27	0	0	0	0.1	0.1	0	0	0.1	0.1	0.1	0.2	0	0.2	0.2	0.1
28	0	0	0	0	0	0	0	0.1	0.4	0.2	0.3	0	0.8	0	2.5
29	0	0	0	0	0	0	0	0	0	0	0	5.3	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	1.6	0.4	1.9	1.9	1.9	2.8	1.5	1.2	0	0.1	1.3
32	1.2	3.5	0	0.9	0.1	0.1	0	0.7	0.2	1.8	3.9	0.1	0.7	0	5.4
33	2.1	1.1	2.1	1.3	0.4	0.3	0.1	0.5	0.8	0.7	0.4	0	0.4	0	0.5
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0.1	0.3	0.2	0.2	0.4	0.2	0.1	0	0	0
36	0	0	0	0	0	0.3	1.1	1.1	1.1	1.6	1	0.7	12.8	0	0
37	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
38	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0.1	0.2	0.2	0.2	0.4	0.4	0.1	0.5	0.2	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0.1	0
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0.7	0	0.2	0.3	1.6	1.6	1.6	2.4	1.3	1	1.4	3.9	0.3
45	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	0	0	5	0.1	0	0	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0.6	0.9	0	0	0	0	0	0	0.1	0.1	0	0	0.1	0
56	0	0	0	0	0	0.1	0	0.1	0	0	0.1	0	0	0	0
57	0.7	0.4	0	0.4	0.9	0.5	0.2	1.6	0.7	1.1	0.7	0.4	1.9	0.3	4.1
58	0.2	0.1	0	0	0.2	0.3	0.1	0.2	0.3	0.3	0.3	0.1	1.4	0	0.7
59	3	0	0	0.1	0.1	0.1	0	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2
60	22	0	0	0	0.2	2.4	3.1	6.3	3.9	3.2	4.6	13.3	3.4	1.2	6
61	0	0	0	0.1	0.2	0.1	0	0.1	0.2	0.1	0.3	0.1	0.3	0.2	0.2
62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	0.5	1	1	1.9	0.7	0.4	0.1	2.4	0.3	0.4	0.4	1.3	0.4	0.3	0.9
64	0	0	0	1	0.3	0.2	0.1	1.2	0.1	0.2	0.2	0.6	0.2	0.1	0.5
65	0	0	0	0.8	1.2	0.7	0.3	0.9	1	0.8	2.2	0.6	2.3	1.2	1.6
66	0	0	0	0.5	0.7	0.1	0.1	0.4	0.3	0.3	0.3	0.5	0.3	0.2	0.6
67	0	0	0	0.7	0.5	0.1	0.1	0.4	0.3	0.3	0.3	0.1	0.4	0.1	1.3
68	0	0	0	1	1.5	0.8	0.1	1.1	1	0.9	2.5	0.6	2.9	1.5	2.1
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	2	2.9	0.8	0.1	0.1	0	0	0.1	0.1	0.1	0.1	0	0.2	0.1	0.1
73	1.7	1.5	0.5	0.1	0.2	0.1	0	0	0.2	0.1	0.4	0.1	0.4	0.2	0.3
74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0.5	0.9	0.5	0.2	0.6	0.7	0.6	1.6	0.4	1.7	0.9	1.2
T. Inter.In	203.7	11.7	15.7	11.3	728.5	30.9	37.4	119.5	76.1	128.3	94.8	155.4	51.3	36.1	115.9
T. Inter.M	16	4.7	3.3	2.7	717.2	11.5	23.1	77.6	53.9	100.4	68.3	134.1	12.9	21.4	89.3
N. Comp.	16.7	3.4	4.7	8.8	15.3	4.2	2	9.8	6.6	4.7	9.3	4.8	15.2	7.2	20.8
G.Oper.S.	123.4	24.8	34.1	17.5	12.8	2.2	3.3	18.1	5.1	13.2	14	5.3	12.7	16.4	44.07
Imp.Duty	0	0	0	0	0	0	0	0	0	0	0	0	0	69.2	0
Ex. Duty	0.9	0.5	0.9	0	0	0	1.8	0.8	1.6	0	1	0	2.8	0	0
Ind. Taxe	0.5	0.1	0.1	1.3	0.5	0.3	0.1	0.4	0.3	0.4	0.4	0.3	1	0.4	1
Gross VA	141.5	28.8	39.8	27.6	28.6	6.7	7.2	29.1	13.6	18.3	24.7	10.4	31.7	93.2	66.5
G. Output	345.2	40.5	55.5	38.9	757.1	37.6	44.6	148.6	89.7	146.6	119.5	165.8	83	129.3	182.4
Tot. Imp.	62.6	777	61.9	11.8	751.5	41.7	58.3	21.6	59.5	87.1	68.8	95.3	52	13.2	93.3
Tot. Reso	407.8	817.5	117.4	50.7	1508.6	79.3	102.9	170.2	149.2	233.7	188.3	261.1	135	142.5	275.7

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
0	3.1	0.2	0	0	129.8	76.1	0	0.4	0	0	0	0.1	0.1	0.1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.5	0	0	0	0	0	0	0	0.1	0	0.2	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.8	2	5.4
0	0	0.1	0.1	0	0.1	0.5	0	0	0	0.2	0	0	0.1	0.2
0	0		0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.7	6.1	56.3	0.2	0.4	0	0	0	0.3	0	0.8	0	0	0	0.1
15.4	4.6	298.3	1.7	0.5	0	0	0	0.5	0	1	0.3	0	0	0
0	5.1	1.7	0	0	0	0	0	0.1	0	0	0	0	0	0
0	0	7.1	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0
0	0	0.4	6.5	13.1	0	0	0	0	0	0	0	0	0	0
0	0	0	0.1	0	8.7	47.1	0	9.1	0	0	0	0	0	0
0	0.2	0	0	0.9	0.1	10.5	0	6.3	0	4	0	0	0	0
0	0	0	0	0	0	0	7.6	0.2	0	0	0	0	0	0
0	0	0	0	0	0	0	0	3.6	0	0	0	0	0	0
0	0	0	0	0.1	0	2.6	0	0	3.4	30.3	51.6	0	0	0.6
0	0.1	2.4	0.3	0.1	0.1	0.4	0	0.1	0.1	5.1	1.9	1	2.4	2.4
0	0	0.5	0	0	0.1	0.3	0	0.1	0	0.4	5.8	0.1	0.3	0.2
2.1	0.6	0.7	0.1	0.1	0.1	0.7	0	1.9	0	1.9	5.2	10.5	0.1	0.2
0	0	0	0	0	0	0	0	0	0	0	0	0	3.1	0
0	0	0	0	0	0	0.1	0	0	0	0.1	0	0	0	3.1
3.7	0.3	11	2.5	4.9	0.1	0.6	0	1.8	0	0.6	0.3	7.3	2	2.1
0.2	0.2	2.1	0.7	0.3	0.9	14.6	0	1	0.1	1.9	2.7	8.8	18.8	9
0.2	0.1	0.3	0.1	0	0.7	0.7	0	0	0.2	0.1	0.1	0	0.2	0.4
0.3	0.1	0.6	0.5	0.1	0	0	0	0.3	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0.9	0	0	0	0	0	0.1
0.1	0	0.1	0	0	0	0.1	0	0	0	0	0.1	0.1	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0	0.1	0	0.1	0	0.1	0	0	0	0	0.1	0.1	0.1	0.2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.2	0.1	0	0.1	0	0.1	0	4.9	0	0	0.2	0	0	0
0	0	0	0	0	0	0	0	0.1	0	0.6	0.1	0	0	0
0.1	0.2	4.6	0.2	1	0.2	1.1	0	5.4	0	0.7	0.5	0.7	1.6	1.6
0	0	0	0	0	0	0	0	0	0	0.1	1.2	0	0.1	0
0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0
0	0	0	0	0	0	0.1	0	0	0	0.2	0.1	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.1	11.2	0	0.8	0	0.1	0	0	0	0.5	1.6	0.1	0.1	0.1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.3	0.4	4.2	0.3	0.1	0.7	3.6	0	0.4	0.6	0.4	1.5	0.2	0.5	0
0.1	0.1	0.8	0	0	0.2	0.8	0	0.1	0.2	0.1	0.3	0.1	0.1	0
0	0	0.2	0	0	0.1	0.3	0	0.1	0	0.1	0.2	0.1	0.3	0.2
1.4	1.7	23.9	0.8	2.3	7.7	10.7	0.9	3.7	0.4	4.6	7.3	1.6	1.2	1.2
0	0	0.4	0	0	0.1	0.4	0	0.2	0	0.1	0.3	0.1	0.4	0.2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.3	0.4	2.6	0.4	0.4	1.9	1.9	0.2	0.5	0.1	0.7	1.5	0.6	0.7	0.3
0.1	0.2	1.4	0.2	0.2	1.1	1	0.1	0.3	0	0.3	0.8	0.3	0.4	0.1
0.2	0	2.4	0.2	0.1	0.9	2.9	0.1	1.1	0.3	0.7	1.9	0.7	2.6	1.6
0.2	0.2	1.1	0.2	0.1	0.9	1.3	0.1	0.2	0.1	0.3	0.6	0.2	0.8	0.2
0.1	0.3	2.8	0.3	0	0.7	0.8	0	0.6	0.2	0.4	1.4	0.2	0.1	0.2
0.1	0.1	2.8	0.3	0	1.2	3.6	0	1.2	0.2	0.8	2.4	0.8	3.4	1.9
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.2	0	0	0.1	0.2	0	0.1	0	0	0.1	0	0.2	0.1
0	0	0.4	0	0	0.1	0.5	0	0.2	0	0.1	0.3	0.1	0.4	0.2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0	1.7	0.1	0.1	0.6	2.1	0.1	0.8	0.2	0.5	1.4	0.5	1.9	1.1
27.8	24.4	442.7	16.8	27.8	157.2	185.9	9.1	46.5	6.1	57.7	92.1	35.2	44.2	33.1
20.3	19.3	358.2	8.5	11.7	139.8	143.5	2.2	20	3.8	29.3	60.9	21.6	25.2	14.5
2.5	6.9	105.1	5.8	2.5	16.9	33.7	1.5	12.9	1.7	8.7	37.4	6.4	4.8	5.1
4.3	2.1	78.4	5.2	2.7	12.9	42.6	3.8	6	1.9	14.2	43.2	6.8	25.3	10.8
0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0.1	1.3	0.1	0	0.4	1.3	0	0.3	0.1	0.3	0.8	0.3	0.9	0.5
6.9	9.1	185.8	11.1	5.2	30.2	77.6	5.3	19.2	3.7	23.2	81.4	13.5	31	16.4
34.7	33.5	628.5	27.9	33	187.4	263.5	14.4	65.7	9.8	80.9	173.5	48.7	75.2	49.5
565.3	53.7	51.5	8	39.4	64.5	41	2.1	9	128.8	25.9	38.1	47.7	58.6	30.5
600	87.2	680	35.9	72.4	251.9	304.5	16.5	74.7	138.6	106.8	211.6	96.4	133.8	80

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.1	0	3.1	0	0.1	0.2	0	0	0.1	0	0	0	0.2	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.1	0	0.6	1.1	1.2	5.4	2.1	0	0	0	0	0
0	0	0	3.7	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0.1
0	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.5	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
1.7	0	0.1	0.6	0	0.1	0	0.6	0	0.3	0	0	0	0.1	0
0	0	0	3.9	0	0	0	0	0	0.2	0	0	0	0.1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0.1	0	0	0	0.1	0	0	0	0	0.1
0.1	0	6.6	0	0	0.4	0	0	0	0.5	0	0	0.2	1.3	0.4
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.1	0
0	0	0	0	0	0	0	0.4	0	0	0	0	0	0.1	0
0.8	0.1	0	0.1	0	0.4	0.1	0.8	0	0.5	0	0	0.1	0.3	0.1
0.1	0.2	0.8	0.1	0	0.1	0	0.1	0	0	0	0.1	0	0.2	0.2
1.8	0.4	0	0.1	0	0.1	0.1	0	0	0.5	0	0	0	2.4	0.3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0	0.1
78.1	0.3	0.5	3.6	0	0	0.3	0	0	0.7	0	0.1	0.4	1.7	20
18	14.8	21	4.1	0.1	2	0.5	0	0.3	1.4	0	0.6	0.3	3	1.3
0.2	9.1	1528.7	0.5	0	0.6	1.2	0	0.1	0.1	0	0.9	0.9	1	0.5
0	0	0	1.7	0	0	0	0	0	0	0	0	0	0	0.2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0	0	0	0	5.8	0	0	0.1	0.9	0	0	0	0.8	0.1
0	0.1	0	0	0	0	0.1	0	0	0.8	0	0	0	0	10.5
0	0	0	0	0	0	0.1	42.3	7.6	1.8	0	0	0	0.2	0
0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.3
0	1	0.7	0.2	0.3	0	1.6	0.3	0.2	1.6	0.2	9	1.3	1.4	1.6
0	0	0	0	0	0	0	0	0	4	1.7	14.9	4.8	1.8	0
0.3	0	0.3	0.3	0	0	0.1	0	0.1	4.9	0	13.3	0.3	84.6	23.6
0.1	0.1	0.5	0	0	0	0	0	0	0.4	0.1	3.1	0.9	24.4	3.1
0.6	0.9	13.8	0.8	0	0.1	0.1	0	0.7	2.5	0	0.8	0.7	47.4	10.9
0.1	0	0.4	0.1	0	0	0	0	0	0	0	0	1.6	4.5	30.3
0	0	0	0.2	0	0	0	0	0	0	0	0	7.8	11.1	2.1
0	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0.2	0.4
0	0	0.1	0	0	0	0	0	0	0.1	0	0	0.5	0.3	17.8
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.4
0	0	0.1	0	0	0	0.1	0	0.3	0.3	0.9	0	0	0.8	0.1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.2	0.1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.3	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0.6	0.2
0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0
3	2.7	11	0.7	0.2	0.4	1.1	2	0.1	0.5	0	5.4	0.5	2.9	2.3
0.3	0.3	2.9	0.1	0	0.1	0.1	0.1	0.1	0.2	0	0.4	0	0.5	0.3
0.1	0.2	0.9	0.1	0	0.1	0.1	0.1	0	0	0	0.1	0	0.3	0.3
0.9	0.8	2.8	1.2	0	0.7	0.2	4.7	0.9	2.1	0.3	4.4	2	19.3	7.9
0.2	0.3	1.4	0.1	0	0.1	0.1	0.1	0.1	0.1	0	0.1	0	0.4	0.4
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5	0.6	15.5	0.3	0.2	0.2	0.3	0.4	0.3	1.1	0	0.4	0.2	2.7	2.8
0.8	0.3	8.2	0.2	0.1	0.1	0.2	0.2	0.1	0.5	0	0.2	0.1	1.4	1.5
1.3	1.9	9.2	0.6	0	0.9	0.5	0.7	0.4	0.5	0.1	1	0.2	2.9	2.6
0.7	0.4	3.5	0.3	0	0.1	0.2	0.1	0.2	0.1	0	0.2	0.1	1	0.8
1.1	0.4	4.4	0.2	0	0	0.4	0.5	0.1	0.2	0.1	1.1	0.2	1.9	2
1.5	2.2	11.5	0.7	0.1	1.2	0.5	0.8	0.4	0.5	0	1.1	0.3	3.5	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0.1	0.6	0	0	0.1	0	0	0	0	0	0.1	0	0.2	0.2
0.2	0.3	1.5	0.1	0	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0	0.5	0.4
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.9	1.4	6.7	0.4	0	0.6	0.4	0.5	0.3	0.3	0.1	0.7	0.2	2.1	1.8
115.6	40.3	1654.3	28.4	1	15.3	9.8	56	17.9	30.1	3.6	58.2	23.7	228.6	151.1
99.3	25.2	1559.1	18.9	0.3	7.7	3.3	28.2	0.4	5.7	1.8	28.8	9.5	125.4	96.5
20	8.3	53.9	8.5	0.5	5.7	5.7	2.7	3.4	7.3	0.4	9	2.5	45.2	40.9
28.7	19.5	233.7	12.4	0.4	0.6	7.9	15.3	3.6	15.8	0.8	36.2	6.6	54.4	28.6
1.5	1.1	10.4	0	0	0	0	0	0	0	0	0.6	0	0	0.9
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8	0.7	4.1	0.3	0	0.3	0.3	0.4	0.1	0.2	0	0.7	0.1	1.3	1.3
51	29.6	302.1	21.2	0.9	6.6	13.9	18.4	7.1	23.3	1.2	46.5	9.2	100.9	71.7
166.6	69.9	1956.4	49.6	1.9	21.9	23.7	74.4	25	53.4	4.8	104.7	32.9	329.5	222.8
161	159.8	1630.7	26.6	16.6	40.3	51.2	51.6	6.1	7.5	27.8	334.6	87.4	294.5	954
327.6	229.7	3587.1	76.2	18.5	62.2	74.9	126	31.1	60.9	32.6	439.3	120.3	624	1176.8

46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0	0.3	0	0	0	0	0.1	0	12.6	0	0	0	0.6	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.2	0	0	0	0	0	0	0	0	0	0	37.8	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0
0.1	0	0.1	0	0	0.2	0	0	0	0	0	0	0.1	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
0	0	0	0	0	0	0	0	0.1	6.5	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0
0	0	0	0	0.2	1	0	0	0	0	0	0	0	20	0
0.8	0.1	1.8	0.1	0.1	0.2	0	0.6	0.1	0.9	0	0	0	32.9	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.1	0
0	0.1	0.1	0	0.2	0	0	0	0	0.1	0	0	0	2.8	6
0.4	0	0.9	0	0	0	0	0.3	0.1	0.4	0	0	0	1.1	11.7
0.2	0	0.6	0.1	0.1	0.8	0	0.1	0	0.1	0.2	1.1	0.4	1.5	24.8
0.3	0.1	0.1	0.1	0.5	20.1	0	0	0	0.2	0	0	0	22.5	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.1	0	0.2	0	0	0	0	0.1
1.8	2.3	2.2	1.3	0.1	0.2	0.1	6.5	0.1	0.6	0	0	0	6.6	14.6
2.7	0	4.6	0.1	0.3	4.1	0	0.2	0	0.6	0.3	0.7	1.6	0.4	0
0.1	0	0.1	0	0.2	1.5	0	0	0	0.2	2.2	30.3	0.1	7.4	2.2
0	0	0.3	0	1.7	0	0	0	0	0.1	0	0	0	0.9	0
0	0	0	0	0	0	0	0	0	0	0	0	0	2.5	0
0.2	0	0	0	0	0	0	1	0	0	0	0	0	4.1	0
0	0	0.1	0	0	0	0	0	0	0	0	0	0	54.2	0.1
0	0	0	0	0	0	0	0	0	0	0	0	0	65.9	0
0	0	0	0	0	0	0	0	0	0	0	0	0	29.9	0
5	0.1	1.5	0	0	0.6	0	0.3	0	0.2	0	0	0	7.4	0.1
1.2	0	3.5	0	0	0.3	0	0.1	0.7	0	0	0	0	0.5	0
2.2	0	0.5	0	3.3	84.8	0.2	0.1	0	1	0	0	0	178.6	0
3.6	12.6	2.6	0	0.3	1	0.1	0.2	0.3	0.7	0	0	0	49.9	0
8.3	0.3	36.7	0	0.9	10.3	0.1	5	0.3	3.2	0	0	0	33.3	0.1
5.3	0	3.9	0	0.1	84.5	0.1	0.4	0	0.1	0	0.3	0.1	5.9	0.5
28.4	0	13.2	0	0.2	0.3	0.1	0.1	0	0	0	0	0	1.4	0.7
0	0	0.4	0	0.1	0.1	0	0	0.1	0.1	0	0	0	61.9	0
9.1	0	540.1	0.3	0.1	0.2	0.2	0.1	0.1	0.2	0	0	0	0.9	0.1
0	0	21.8	0.3	0	0	0	0	0	0.1	0	0	0	0	0
0	0	0	0	42.4	1.1	0	0	0	0.1	0	0.1	0.1	0	0
0.1	0	0.1	0	0	110.6	0	0	0	0.1	0	0	0	2.4	0
0	0	0	0	0	0	5.5	1.8	0	0	0	0	0	0	0
0.1	0	0.1	0	0	0	0	51.5	0	0	0	0	0	0	0
0	0	9.8	0	0	0	0	0	78.8	0	0	0	0	0	0
0.1	0	0.2	0	0	0.1	0	0.1	0	6.1	0	0	0	0.1	0.1
0	0	0.1	0	0	0.1	0	0	0	0	0	0.1	0	0.1	0.4
1.8	0.3	5.8	0.1	0.4	5.3	0.1	1.8	0.2	0.7	0.2	0.3	4.1	1.6	16.4
0.1	0	0.5	0	0.1	1.2	0	0.2	0	0.1	0.1	0.2	0.1	0.2	3.1
0.3	0	0.7	0	0.1	1	0	0.1	0	0	0	0.2	0.6	11.7	8.4
4	1.4	13.8	0.1	5.1	24.2	0.6	1.1	4.5	2.4	0	0	0	33	0
0.4	0	1.1	0	0.2	1.4	0	0.2	0	0	0	0	0	0.2	27.3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.3	0.3	11.6	0.1	1.6	3.8	0.1	2.7	0.1	0.6	0	1	0.5	8.7	135.5
1.2	0.2	6.2	0	0.9	2.1	0.1	1.4	0.1	0.3	0.1	0.7	0.2	1	30.5
2.8	0.2	7.4	0.1	1.2	9.7	0.2	1.4	0.3	0.3	0	0	0	0.1	53.7
0.5	0.1	1.4	0	0.2	4.4	0.1	0.3	0.2	0.2	0	0.4	0	1	23.2
0.9	0.1	2.9	0.1	0.2	6.2	0.1	1.3	0.1	0.4	0	0	0	1.3	75
3.3	0.3	9.1	0.2	1.5	12.1	0.2	1.6	0.3	0.2	1.3	10.9	2.9	9.3	108.5
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.2	0	0.5	0	0.1	0.7	0	0.1	0	0	0.1	1.3	0.5	0.4	2.7
0.5	0.1	1.2	0	0.2	1.6	0	0.2	0	0.1	0	0	0	0.8	11.5
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.2	5.4	0.1	0.9	7.1	0.1	1	0.2	0.2	0	0	0	0	15.3
90.4	18.8	713.6	3.1	63.5	402.9	8	82	86.7	41.3	4.5	47.6	11.3	702.9	576.9
54.4	14	600.1	1	47.9	195.4	5.6	62.6	79.8	26.9	2.2	0.4	0.2	420.8	38.2
24.3	2.9	129.1	1.4	12.1	159.1	3.2	24.4	5.4	7.6	2.2	23.5	11.3	334.1	577.5
18.7	3.2	242.5	1.3	6.5	117.8	0.9	9.7	5.9	5	6.5	116.2	34.5	306.8	1661.2
0	0	0	0	0.5	0	0	0	0	0	0	0	0	2.8	0
0	0	0	0	0	0	0	0	0	0	0	13.6	0	3.2	1.3
1.1	0.1	3	0.1	0.4	3.9	0.1	0.7	0.1	0.2	0.9	14	0.9	6.1	18.8
42.1	6.2	374.6	2.8	19.5	280.8	4.2	34.8	11.4	12.8	9.6	167.3	46.7	653	2258.8
132.5	25	1088.2	5.9	83	683.7	12.2	116.8	98.1	54.1	14.1	214.9	58	1355.9	2835.7
261.4	56.7	740.8	111.6	231.8	389	128.2	154.7	106.1	122.6	0.3	0	0	0	0
393.9	81.7	1829	117.5	314.8	1072.7	140.4	271.5	204.2	176.7	14.4	214.9	58	1355.9	2835.7

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
74.9	0	8	0	0	0	0	0	0	0	0.1	0	6.4	0	0
57.4	0	6.1	0	0	0	0	0	0	0	0	0	4.7	0	0
15.4	0	1.6	0	0	0	0	0	0	0	0	0	1.3	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.9	0	1.3	0	0	0	0	0	0	0	0	0	0.8	0	0
12.3	0	1.3	0	0	0	0	0	0	0	0	0	0.9	0	0
17.1	0	1.9	0	0	0	0	0	0	0	0	0	1.7	0	0
12.8	0	1.4	0	0	0	0	0	0	0	0	0	0.8	0	0
9.3	0	0.9	0	0	0	0	0	0	0	0	0.7	0.9	0	0
22.9	0	2.4	0	0	0	0	0	0	0	0	0	2.2	0	0
0	0	0	0	0	0	0	0	0	0	0.2	0	0.2	0	0
22.9	0	3.2	0	0	0	0	0	0	0	0	0	0.3	0	0
14.5	0	2	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	6.1	0	0
7.4	8.5	3.5	0.2	1.6	1.1	1	1.1	0	2	0.8	0	15.3	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0
0	0	0	0.1	0.2	0	0	0	0	0	0	0	3.1	1	0
0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	7.9	0	0	0	0	0	0	0	0	0	0.1	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
0	0	0	0	0	0	0	0	0	0	0	0.1	3.4	0	0
0.6	0.6	1	0.5	3.5	1.7	2.4	1.9	0	0.6	0.1	0.2	2.9	0.4	0
0.1	1	2.6	0.1	3.3	1.6	2.9	2.1	0	1.3	0.5	0.5	1.6	1.1	0
2.7	3.4	6.4	0.6	10.9	2.5	1.9	6.4	0	1.8	1.1	2.1	15	3.5	0
0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
0.1	0	0	0	0	0	0	0	0	12.5	0	3	2.4	0.5	0
0.1	0	0	0	0	0	0	0	0	0.1	0	8.7	0.2	0	0
0	0	1	0	0	0	0	0.2	0	0	0	0.7	0.5	0	0
0	0	0.1	0	0	0	0	0	0	0	0	5.2	12	0	0
0.1	0	54.5	0	0	0	0	0.3	0	0	0.1	0.1	6.8	0.1	0
0	0	5.8	0	0	0	0	0	0	0	0	13.9	10.2	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.3	0	0.1	0	0.9	0.1	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.2	0	0	0	0.5	0.1	0	0
0	0	0	0	0	0	0	0	0	0	0	0.4	0.1	0	0
0	0	6.2	0	0.3	0	0	6.4	0	1.3	0.1	18.1	108.3	0	0
0.2	0.1	4.4	0.2	5.9	1.4	1.6	7.7	0	0	1.4	14.8	136.8	0	0
0	0	0	0	0.8	0	0.1	0.6	0	0	0	5.3	0.7	0	0
0	0	0	0	0	0	0	0	0	0	0	1.4	0	0	0
0	0	2.6	1.6	0.1	0	0	0.8	0	0	1.8	3.1	15.1	0	0
0	0	0	0	0	0	0	0	0	0	0	9.5	0	0	0
0	0	7.1	0.4	0	0	0	0	0	0	0	0	2.3	0	0
0	0	37.7	0	0	0	0	0	0	0	0	0.1	6.2	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.1	0	0	0	0.1	3.4	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.1	0	3	0	0	0.1	0	0	0	1.8	8.8	5.3	0
0.1	0.1	0.1	0	0.1	0	0.1	0.1	0	0	0	0	0.1	0	0
7.7	8.2	10.2	1.5	3.5	0.7	5.4	2.8	0	2	4.3	5	12.6	3.2	0
2.2	2.7	1	0.3	0.4	0.1	0.6	0.5	0	0.7	0.3	1.4	4.4	0.9	0
5.9	4.4	9.6	0.2	0.5	0.9	32.6	2.3	8.6	0.1	0.1	0	17.6	0.2	0
1.6	0	21.8	0	1.5	0	0	1.9	0	0.2	0	8.2	0	0.3	0
3	0.9	5.6	0.4	0	3.1	0.2	5.9	0	0.8	0.5	1.9	0.3	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0
2.9	0.7	286.7	1.9	6	4	5.6	22.5	0	3.2	1.6	5.8	10.8	2.5	0
1.4	8.7	11	6.6	11.8	2.9	0.9	10.5	0	1.3	0.6	1.3	13.4	1.2	0
1.4	0	5.6	0	23.5	0.7	4.8	1.5	0	1.2	2.1	0.6	0	1.8	218.3
0.6	1.4	22.1	0.2	1.8	18.6	1.3	2.5	0	0.5	0.3	0.7	0.3	0.4	0
19	2	15.9	0.5	17.1	4.6	3.2	17.3	0	5.1	3.1	8.7	2	1.3	0
10.3	15.2	30.2	3.7	19.4	7.1	14.5	26.8	0	4.6	4.2	3.3	17	4.8	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	2.7	0	0.1	0.1	0	0.1	0	2.1	0	0.7	1	4.5	0
2.6	1.1	6.1	0	2.7	0	0	1	0	0	3.3	0	3.7	0.9	0
0.6	1	46.1	1.2	3.6	0	6.4	1.8	0	2.3	5.8	8.2	9.2	3.6	0
1	0.2	4.3	0.1	0.3	1	1.1	3.5	0	0	1.8	0	4.5	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	295	21.2	12.6	28.8	0	20.9	0	0.4	20.2	0	15.2	0	0
343	60.2	945	41.5	134.5	80.9	86.6	150.1	8.6	44.2	54.4	137.1	496.6	37.5	218.3
123.1	9.8	366.8	22.1	34.1	33.9	6.6	37.5	0	16.6	23.3	41.2	312.1	6.6	0
130.1	37	382	39.6	143.4	44.2	29.3	170.9	0	46	33.8	44.2	661.1	115	0
159.3	20.6	532.5	123	295.5	37	569.8	156.2	239.1	40.1	44.2	48.6	15.4	2.8	-218.3
12.9	0	1.8	0	0	0	0	0	0	0	0	0.4	0.1	0	0
9.1	0	13.4	0	0.4	0	0	0.1	0	0	1.9	0	3.1	0	0
15.3	7.9	55.3	0.8	9.6	3.2	92.9	4.5	16.6	1.4	27.6	1.6	0.1	2.3	0
326.7	65.5	985	163.4	448.9	84.4	692	331.7	255.7	87.5	107.5	94.8	679.8	120.1	-218.3
669.7	125.7	1930	204.9	583.2	165.3	778.6	481.8	264.3	131.7	161.9	231.9	1176.4	157.6	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	-97.1
669.7	125.7	1930	204.9	583.2	165.3	778.6	481.8	264.3	131.7	161.9	231.9	1176.4	157.6	-97.1

76	77	78	79	80	81	82	83
104.8	294.4	0	0	0.5	8.1	303	407.8
553.6	232.5	0	0	24	7.4	263.9	817.5
33.6	55.4	0	0	1	27.4	83.8	117.4
50.3	0	0	0	0	0.4	0.4	50.7
719.8	0	0	0	31.8	757	788.8	1508.6
14.8	59.4	0	0	0.3	4.8	64.5	79.3
43.4	50.3	0	0	2	7.2	59.5	102.9
56.4	68	0	0	1.5	44.3	113.8	170.2
84.1	44.4	0	0	-5.8	26.5	65.1	149.2
120.5	41	0	0	3.8	68.4	113.2	233.7
44.2	93.7	0	0	-0.8	51.2	144.1	188.3
218.1	0.1	0	0	3.9	39	43	261.1
26.9	84.4	0	0	7.9	15.8	108.1	135
16.9	114	0	0	4.4	7.2	125.6	142.5
126.5	12.7	0	0	16.7	119.8	149.2	275.7
387.8	132	0	0	58.9	21.3	212.2	600
12.3	54.5	0	0.4	3	17	74.9	87.2
11.5	372.7	0	0.1	1	294.7	668.5	680
2.5	22.1	0	0	0.8	10.5	33.4	35.9
20.4	39.8	0	0	-1	13.2	52	72.4
86.5	0	0	0	1.7	163.7	165.4	251.9
77.1	5.8	0	0.1	22.6	198.9	227.4	304.5
7.9	0.8	0	0.3	0.7	6.8	8.6	16.5
7.5	38.3	0	19.8	-2.8	11.9	67.2	74.7
116.5	1.2	0	0	17.5	3.4	22.1	138.6
60.8	30.4	0	0	2.7	12.9	46	106.8
99.2	73.2	0	0.6	-1.5	40.1	112.4	211.6
78.2	1.6	0	0	6.1	10.5	18.2	96.4
26.9	40.1	0	0	4.5	62.3	106.9	133.8
13.3	50.3	0	0	1.2	15.2	66.7	80
196.3	38.5	0	0.7	25.9	66.2	131.3	327.6
180.2	12.4	0	0.2	6	30.9	49.5	229.7
1663.9	36.3	0	0	48.7	1838.2	1923.2	3587.1
36.7	22.9	0	1.3	1	14.3	39.5	76.2
4	14.4	0	0	-0.2	0.3	14.5	18.5
33.8	17.3	0	0.8	2.9	7.4	28.4	62.2
66.5	0.6	0	2.1	0.7	5	8.4	74.9
118.1	0	0	0	4.1	3.8	7.9	126
30.3	0	0	0	0.2	0.6	0.8	31.1
39.2	2.5	0	0.9	0.5	17.8	21.7	60.9
33.5	0	0	0	-1.5	0.6	-0.9	32.6
405.2	0.3	0	0.4	20.8	12.6	34.1	439.3
105.3	0.6	0	0.3	3.3	10.8	15	120.3
352.7	83.7	0	64.7	29.8	93.1	271.3	624
314.3	27.2	0	687.5	2.7	145.1	862.5	1176.8
73	56.1	0	168.4	10.8	85.6	320.9	393.9
65	4.7	0	0	8.5	3.5	16.7	81.7
595.7	134	0	77.5	2.7	1019.1	1233.3	1829
31.7	77.8	0	0.9	2.2	4.9	85.8	117.5
54.2	127.6	0	117.9	-2.3	17.4	260.6	314.8
165	0.2	0	501.6	61.7	344.2	907.7	1072.7
7.3	101.4	0	21.2	1.1	9.4	133.1	140.4
55.8	46.8	0	51.9	23	94	215.7	271.5
88.6	112.6	0	0	0	3	115.6	204.2
43.6	81.7	0	8.3	2	41.1	133.1	176.7
1.9	7	0	0.4		5.1	12.5	14.4
166.1	47.4	0	0.1		1.3	48.8	214.9
33.9	19.3	0	0.5		4.3	24.1	58
114.4	0	0	1241.5		0	1241.5	1355.9
312.9	1186.8	0	305.8		1030.2	2522.8	2835.7
60.9	608.8	0	0		0	608.8	669.7
0.3	125.4	0	0		0	125.4	125.7
574.1	335.1	0	0		1020.8	1355.9	1930
141.7	56.1	0	2.5		4.6	63.2	204.9
391	92.3	0	0		99.9	192.2	583.2
101.2	39.9	0	0		24.2	64.1	165.3
213.7	332.7	0	232.2		0	564.9	778.6
384.9	14.3	0	0		82.6	96.9	481.8
0	264.3	0	0		0	264.3	264.3
12.6	119.1	0	0		0	119.1	131.7
21.4	133.8	0	0		6.7	140.5	161.9
105.5	126.4	0	0		0	126.4	231.9
46	65.2	1065.2	0		0	1130.4	1176.4
0	157.6	0	0		0	157.6	157.6
484.2	-581.3	0	0		0	-581.3	-97.1
11148.9	6162.9	1065.2	3510.9	461.2	8215.5	19415.7	30564.6
6806.8	970.8	0	1455.8	242.3	0	2668.7	9675.4
3794.1	0	0	0	0	0	0	3794.1
5672.8	0	0	0	0	0	0	5672.8
103.2	116.7	0	18.8	0	0	135.5	238.7
56.4	149.2	0	31.4	0	0	180.6	237
313.7	0	0	0	0	0	0	313.7
9940.2	265.9	0	50.2	0	0	316.1	10256.3
21089.1	6428.8	1065.2	3561.1	461.2	8215.5	19731.8	40820.9
9475.5	0	0	0	0	0	0	9475.5
30564.6	6428.8	1065.2	3561.1	461.2	8215.5	19731.8	50296.4

4.1.2 Source of Inputs

The first 75 columns indicate the origin of all inputs in the production process of each sector. Reading down the first column, we see that to produce $407.8 million of livestock goods, the livestock sector has to source its inputs as follows:

$2.8 million of its own products;

$13.4 million of milled cereal and cereal preparation;

$17.2 million of oils and fats;

$16.7 million as wages;

$123.4 million as gross operating surplus, being renumeration to factors of production other than labour;

$0.9 million as excise duties and other commodity taxes;

$0.5 million as indirect taxes;

$62.6 million as imports; and so on.

4.1.3 GDP

We can see from **Table 4.1.1** that the total output of the 75 productive sectors equals total purchases, or inputs. The total of all rows in the production sector (rows 1, 2, 3 ... 75) must equal the total of all columns in the purchases sector. It is important to note that neither final demand nor total output is the same as gross domestic product (GDP). GDP is defined as the current market value of all final goods and services produced in the geographical area of Singapore during a given time period. The figure for GDP at current market prices can be obtained from the input-output table as the total of final demand less imports or as the sum of renumeration to factors of production and net indirect taxes.

4.1.4 Sales Structure

As mentioned in Chapter 3, we need to transform the input-output table into an input-output model in order for it to become operational. It is necessary to convert the table into a technical coefficients matrix. By dividing the figure in each cell as a proportion of the corresponding row total (total output), clarity can also be obtained about information on the sales structure **(Table 4.1.4)**.

In **Table 4.1.4**, the livestock sector sells more than 85 percent of its output to final users which include both domestic and overseas buyers. For the economy as a whole, 48.34 percent of output is sold to final users and the remaining 51.66 percent is sold as intermediate products to the various sectors. From **Table 4.1.4**, we can also determine the distribution of wages, import expenditure and indirect tax expenditure. For instance, the clothing sector(18) accounted for 0.147 percent of national import duty expenditure. Domestic services and private non-profit organizations(74) pay out 74.75 percent of the total wage bill in the country.

4.1.5 Cost Structure

Similarly, the production or cost structure of each industry is made clearer when the figure in each cell is divided by the corresponding column total (total input). The information is presented in **Table 4.1.4** and in this case, adding down the columns yields a total of 1.

4.1.6 Technical Production Coefficients

The coefficients shown in **Table 4.1.4** are called technical production coefficients. Each figure in the cell indicates the amount of product of the industry in the corresponding row required to produce one unit of output of the industry in the corresponding column. For example, the figure (0.010221) in the first row and third column indicates that the production of one unit of fishing sector output requires 0.010221 unit of livestock commodity as inputs.

These technical production coefficients show the constant relationship between inputs and output based on a given state of technology. This assumption of fixed factor proportions is a crucial one used in input-output analysis and applications. Unless the production function changes with technology in the long run, these coefficients are rather stable. As production technology changes infrequently, input-output tables compiled once every ten years, as is the practice in Singapore and most other countries remain relevant and useful.

Table 4.1.4 Technical Coefficients Matrix

Flows in millions of Singapore Dollars of Y 1973

Industry:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	0.006866	0	0.010221	0	0	0.084489	0	0.008813	0	0	0.006373	0	0	0	0
2	0	0.000734	0.007666	0	0.001061	0.003783	0	0.415981	0	0.139067	0.302177	0.174646	0.005185	0.129123	0.107726
3	0	0	0.003407	0	0	0.185372	0	0	0	0	0.000531	0.000383	0	0	0
4	0	0	0	0.033531	0	0	0	0	0	0	0.000531	0	0	0	0
5	0	0	0	0	0.474148	0	0	0	0	0	0	0	0	0	0
6	0	0	0.001704	0	0	0.003783	0	0	0	0	0.001593	0	0	0	0
7	0	0	0.001704	0	0	0	0.211856	0.002938	0.024799	0	0.012215	0	0.002963	0	0
8	0.032859	0	0.001704	0	0	0	0	0.089894	0.011394	0	0.011152	0	0.021481	0	0
9	0	0	0.001704	0	0	0.001261	0.045675	0.014101	0.345845	0	0.014339	0	0.054815	0	0
10	0.042178	0	0.000852	0	0	0.002522	0.000972	0.027027	0.005362	0.32178	0.007966	0.000766	0.000741	0.000702	0.000363
11	0.005395	0	0.003407	0	0	0.005044	0.001944	0.008813	0.009383	0.000428	0.016463	0	0.037778	0	0.000363
12	0.330309	0	0	0	0	0	0	0	0	0	0	0.314822	0	0	0
13	0	0	0	0	0	0	0.000972	0	0.00067	0	0	0	0.002222	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0.002807	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.180994
16	0	0	0	0	0.000398	0.002522	0.008746	0.005288	0.006032	0.005991	0.004249	0.002298	0	0	0.020312
17	0	0	0.007666	0	0	0	0	0	0	0	0	0	0	0	0.000363
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01193	0
26	0	0	0	0	0.000597	0	0	0	0	0	0.000531	0	0.011852	0.030877	0.001814
27	0	0	0	0.001972	6.6E-05	0	0	0.000588	0.00067	0.000428	0.001062	0	0.001481	0.001404	0.000363
28	0	0	0	0	0	0	0	0.000588	0.002681	0.000856	0.001593	0	0.005926	0	0.009068
29	0	0	0	0	0	0	0	0	0	0	0	0.020299	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0.001061	0.005044	0.018465	0.011163	0.012735	0.011981	0.007966	0.004596	0	0.000702	0.004715
32	0.002943	0.004281	0	0.017751	6.6E-05	0.001261	0	0.004113	0.00134	0.007702	0.020712	0.000383	0.005185	0	0.019587
33	0.00515	0.001346	0.017888	0.025641	0.000265	0.003783	0.000972	0.002938	0.005362	0.002995	0.002124	0	0.002963	0	0.001814
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0.001261	0.002915	0.001175	0.00134	0.001712	0.001062	0.000383	0	0	0
36	0	0	0	0	0	0.003783	0.01069	0.006463	0.007373	0.006846	0.005311	0.002681	0.094815	0	0
37	0	0	0	0	0	0	0	0	0	0	0.000531	0	0	0	0
38	0	0	0	0	0	0	0	0	0.00067	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0.001261	0.001944	0.001175	0.00134	0.001712	0.002124	0.000383	0.003704	0.001404	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0.000588	0.00067	0	0	0	0	0.000702	0
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0.005963	0	0.000133	0.003783	0.015549	0.009401	0.010724	0.01027	0.006904	0.00383	0.01037	0.027368	0.001088
45	0	0	0	0	0	0	0	0	0	0.000428	0	0	0	0.000702	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	0	0	0.042589	0.001972	0	0	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0.000734	0.007666	0	0	0	0	0	0	0.000428	0.000531	0	0	0.000702	0
56	0	0	0	0	0	0.001261	0	0.000588	0	0	0.000531	0	0	0	0
57	0.001717	0.000489	0	0.00789	0.000597	0.006305	0.001944	0.009401	0.004692	0.004707	0.003717	0.001532	0.014074	0.002105	0.014871
58	0.00049	0.000122	0	0	0.000133	0.003783	0.000972	0.001175	0.002011	0.001284	0.001593	0.000383	0.01037	0	0.002539
59	0.007357	0	0	0.001972	6.6E-05	0.001261	0	0.000588	0.00067	0.000428	0.001062	0.000383	0.001481	0.000702	0.000725
60	0.053948	0	0	0	0.000133	0.030265	0.030126	0.037015	0.026139	0.013693	0.024429	0.050938	0.025185	0.008421	0.021763
61	0	0	0	0.001972	0.000133	0.001261	0	0.000588	0.00134	0.000428	0.001593	0.000383	0.002222	0.001404	0.000725
62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	0.001226	0.001223	0.008518	0.037475	0.000464	0.005044	0.000972	0.014101	0.002011	0.001712	0.002124	0.004979	0.002963	0.002105	0.003264
64	0	0	0	0.019724	0.000199	0.002522	0.000972	0.007051	0.00067	0.000856	0.001062	0.002298	0.001481	0.000702	0.001814
65	0	0	0	0.015779	0.000795	0.008827	0.002915	0.005288	0.006702	0.003423	0.011683	0.002298	0.017037	0.008421	0.005803
66	0	0	0	0.009862	0.000464	0.001261	0.000972	0.00235	0.002011	0.001284	0.001593	0.001915	0.002222	0.001404	0.002176
67	0	0	0	0.013807	0.000331	0.001261	0.000972	0.00235	0.002011	0.001284	0.001593	0.000383	0.002963	0.000702	0.004715
68	0	0	0	0.019724	0.000994	0.010088	0.000972	0.006463	0.006702	0.003851	0.013277	0.002298	0.021481	0.010526	0.007617
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	0.004904	0.003547	0.006814	0.001972	6.6E-05	0	0	0.000588	0.00067	0.000428	0.000531	0	0.001481	0.000702	0.000363
73	0.004169	0.001835	0.004259	0.001972	0.000133	0.001261	0	0	0.00134	0.000428	0.002124	0.000383	0.002963	0.001404	0.001088
74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0.009862	0.000597	0.006305	0.001944	0.003525	0.004692	0.002567	0.008497	0.001532	0.012593	0.006316	0.004353
T. Inter.In	0.49951	0.014312	0.133731	0.22288	0.482698	0.38966	0.36346	0.702115	0.510054	0.548994	0.503452	0.595174	0.38	0.253333	0.420384
N. Comp.	0.040951	0.004159	0.040034	0.17357	0.010142	0.052963	0.019436	0.057579	0.044236	0.020111	0.049389	0.018384	0.112593	0.050526	0.075444
G.Oper.S	0.302599	0.030336	0.29046	0.345168	0.008485	0.027743	0.03207	0.106345	0.034182	0.056483	0.074349	0.020299	0.094074	0.115088	0.159848
Imp.Duty	0	0	0	0	0	0	0	0	0	0	0	0	0	0.485614	0
Ex. Duty	0.002207	0.000612	0.007666	0	0	0	0.017493	0.0047	0.010724	0	0.005311	0	0.020741	0	0
Ind. Taxe	0.001226	0.000122	0.000852	0.025641	0.000331	0.003783	0.000972	0.00235	0.002011	0.001712	0.002124	0.001149	0.007407	0.002807	0.003627
Gross VA	0.346984	0.035229	0.339012	0.544379	0.018958	0.084489	0.069971	0.170975	0.091153	0.078306	0.131174	0.039831	0.234815	0.654035	0.241204
G. Output	0.846493	0.049541	0.472743	0.767258	0.501856	0.474149	0.433431	0.87309	0.601206	0.6273	0.634626	0.635006	0.614815	0.907368	0.661589
Tot. Imp.	0.153507	0.950459	0.527257	0.232742	0.498144	0.525851	0.566569	0.12691	0.398794	0.3727	0.365374	0.364994	0.385185	0.092632	0.338411
Tot. Reso	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0	0	0	0	0.027624	0	0	0	0	0	0	0	0	0	0
0	0.03555	0.000294	0	0	0.515284	0.249918	0	0.005355	0	0	0	0.001037	0.000747	0.00125
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.013928	0	0	0	0	0	0	0	0.000473	0	0.001495	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.008299	0.014948	0.0675
0	0	0.000147	0.002786	0	0.000397	0.001642	0	0	0	0.001873	0	0	0.000747	0.0025
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.0045	0.069954	0.082794	0.005571	0.005525	0	0	0	0.004016	0	0.007491	0	0	0	0.00125
0.025667	0.052752	0.438676	0.047354	0.006906	0	0	0	0.006693	0	0.009363	0.001418	0	0	0
0	0.058488	0.0025	0	0	0	0	0	0.001339	0	0	0	0	0	0
0	0	0.010441	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.013928	0	0	0	0	0	0	0	0	0	0	0
0	0	0.000588	0.181058	0.180939	0	0	0	0	0	0	0	0	0	0
0	0	0	0.002786	0	0.034538	0.15468	0	0.121821	0	0	0	0	0	0
0	0.002294	0	0	0.012431	0.000397	0.034483	0	0.084337	0	0.037453	0	0	0	0
0	0	0	0	0	0	0	0.460606	0.002677	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0.048193	0	0	0	0	0	0
0	0	0	0	0.001381	0	0.008539	0	0	0.024531	0.283708	0.243856	0	0	0.0075
0	0.001147	0.003529	0.008357	0.001381	0.000397	0.001314	0	0.001339	0.000722	0.047753	0.006979	0.010373	0.017937	0.03
0	0	0.000735	0	0	0.000397	0.000985	0	0.001339	0	0.003745	0.02741	0.001037	0.002242	0.0025
0.0035	0.006881	0.001029	0.002786	0.001381	0.000397	0.002299	0	0.025435	0	0.01779	0.024575	0.108921	0.000747	0.0025
0	0	0	0	0	0	0	0	0	0	0	0	0	0.023169	0
0	0	0	0	0	0	0.000328	0	0	0	0.000936	0	0	0	0.03875
0.006167	0.00344	0.016176	0.069638	0.06768	0.000397	0.00197	0	0.024096	0	0.005618	0.001418	0.075726	0.014948	0.02625
0.000333	0.002294	0.003088	0.019499	0.004144	0.003573	0.047947	0	0.013387	0.000722	0.01779	0.01276	0.091286	0.140508	0.1125
0.000333	0.001147	0.000441	0.002786	0	0.002779	0.002299	0	0	0.001443	0.000936	0.000473	0	0.001495	0.005
0.0005	0.001147	0.000882	0.013928	0.001381	0	0	0	0.004016	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0.012048	0	0	0	0	0	0.00125
0.000167	0	0.000147	0	0	0	0.000328	0	0	0	0	0.000473	0.001037	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.001037	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000167	0	0.000147	0	0.001381	0	0.000328	0	0	0	0	0.000473	0.001037	0.000747	0.0025
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.002294	0.000147	0	0.001381	0	0.000328	0	0.065596	0	0	0.000945	0	0	0
0	0	0	0	0	0	0	0	0.001339	0	0.005618	0.000473	0	0	0
0.000167	0.002294	0.006765	0.005571	0.013812	0.000794	0.003612	0	0.072289	0	0.006554	0.002363	0.007261	0.011958	0.02
0	0	0	0	0	0	0	0	0	0	0.000936	0.005671	0	0.000747	0
0	0	0	0	0	0	0	0	0	0	0	0.000473	0	0	0
0	0	0	0	0	0	0	0	0	0	0.000936	0	0	0	0
0	0	0	0	0	0	0.000328	0	0	0	0.001873	0.000473	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0.000473	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.001147	0.016471	0	0.01105	0	0.000328	0	0	0	0.004682	0.007561	0.001037	0.000747	0.00125
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.0005	0.004587	0.006176	0.008357	0.001381	0.002779	0.011823	0	0.005355	0.004329	0.003745	0.007089	0.002075	0.003737	0
0.000167	0.001147	0.001176	0	0	0.000794	0.002627	0	0.001339	0.001443	0.000936	0.001418	0.001037	0.000747	0
0	0	0.000294	0	0	0.000397	0.000985	0	0.001339	0	0.000936	0.000945	0.001037	0.002242	0.0025
0.002333	0.019495	0.035147	0.022284	0.031768	0.030568	0.03514	0.054545	0.049531	0.002886	0.043071	0.034499	0.016598	0.008969	0.015
0	0	0.000588	0	0	0.000397	0.001314	0	0.002677	0	0.000936	0.001418	0.001037	0.00299	0.0025
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.0005	0.004587	0.003824	0.011142	0.005525	0.007543	0.00624	0.012121	0.006693	0.000722	0.006554	0.007089	0.006224	0.005232	0.00375
0.000167	0.002294	0.002059	0.005571	0.002762	0.004367	0.003284	0.006061	0.004016	0	0.002809	0.003781	0.003112	0.00299	0.00125
0.000333	0	0.003529	0.005571	0.001381	0.003573	0.009524	0.006061	0.014726	0.002165	0.006554	0.008979	0.007261	0.019432	0.02
0.000333	0.002294	0.001618	0.005571	0.001381	0.003573	0.004269	0.006061	0.002677	0.000722	0.002809	0.002836	0.002075	0.005979	0.0025
0.000167	0.00344	0.004118	0.008357	0	0.002779	0.002627	0	0.008032	0.001443	0.003745	0.006616	0.002075	0.000747	0.0025
0.000167	0.001147	0.004118	0.008357	0	0.004764	0.011823	0	0.016064	0.001443	0.007491	0.011342	0.008299	0.025411	0.02375
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.000294	0	0	0.000397	0.000657	0	0.001339	0	0	0.000473	0	0.001495	0.00125
0	0	0.000588	0	0	0.000397	0.001642	0	0.002677	0	0.000936	0.001418	0.001037	0.00299	0.0025
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000167	0	0.0025	0.002786	0.001381	0.002382	0.006897	0.006061	0.01071	0.001443	0.004682	0.006616	0.005187	0.0142	0.01375
0.046333	0.279817	0.651029	0.467967	0.383978	0.624057	0.610509	0.551515	0.62249	0.044012	0.540262	0.435255	0.365145	0.330344	0.41375
0.004167	0.079128	0.154559	0.16156	0.03453	0.06709	0.110673	0.090909	0.172691	0.012266	0.081461	0.176749	0.06639	0.035874	0.06375
0.007167	0.024083	0.115294	0.144847	0.037293	0.051211	0.139901	0.230303	0.080321	0.013709	0.132959	0.204159	0.070539	0.189088	0.135
0	0	0.001471	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000167	0.001147	0.001912	0.002786	0	0.001588	0.004269	0	0.004016	0.000722	0.002809	0.003781	0.003112	0.006726	0.00625
0.0115	0.104358	0.273235	0.309192	0.071823	0.119889	0.254844	0.321212	0.257028	0.026696	0.217228	0.384688	0.140041	0.231689	0.205
0.057833	0.384174	0.924265	0.777159	0.455801	0.743946	0.865353	0.872727	0.879518	0.070707	0.757491	0.819943	0.505187	0.562033	0.61875
0.942167	0.615826	0.075735	0.222841	0.544199	0.256054	0.134647	0.127273	0.120482	0.929293	0.242509	0.180057	0.494813	0.437967	0.38125
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.000435	0	0.040682	0	0.001608	0.00267	0	0	0.001642	0	0	0	0.000321	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.001312	0	0.009646	0.014686	0.009524	0.173633	0.034483	0	0	0	0	0
0	0	0	0.048556	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.000435	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.000435	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000305	0	0	0.001312	0	0.001608	0	0	0	0	0	0	0	0	8.5E-05
0	0.003483	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.001526	0	0	0.001312	0	0	0	0	0	0	0	0	0	0	0
0.005189	0	2.79E-05	0.007874	0	0.001608	0	0.004762	0	0.004926	0	0	0	0.00016	0
0	0	0	0.051181	0	0	0	0	0	0.003284	0	0	0	0.00016	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0.001608	0	0	0	0.001642	0	0	0	0	8.5E-05
0.000305	0	0.00184	0	0	0.006431	0	0	0	0.00821	0	0	0.001663	0.002083	0.00034
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	2.79E-05	0	0	0	0	0	0	0	0	0	0	0.00016	0
0	0	0	0	0	0	0	0.003175	0	0	0	0	0	0.00016	0
0.002442	0.000435	0	0.001312	0	0.006431	0.001335	0.006349	0	0.00821	0	0	0.000831	0.000481	8.5E-05
0.000305	0.000871	0.000223	0.001312	0	0.001608	0	0.000794	0	0	0	0.000228	0	0.000321	0.00017
0.005495	0.001741	0	0.001312	0	0.001608	0.001335	0	0	0.00821	0	0	0	0.003846	0.000255
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000305	0.000871	2.79E-05	0	0	0	0	0	0	0	0	0	0	0	8.5E-05
0.2384	0.001306	0.000139	0.047244	0	0	0.004005	0	0	0.011494	0	0.000228	0.003325	0.002724	0.016995
0.054945	0.064432	0.005854	0.053806	0.005405	0.032154	0.006676	0	0.009646	0.022989	0	0.001366	0.002494	0.004808	0.001105
0.000611	0.039617	0.426166	0.006562	0	0.009646	0.016021	0	0.003215	0.001642	0	0.002049	0.007481	0.001603	0.000425
0	0	0	0.02231	0	0	0	0	0	0	0	0	0	0	0.00017
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000305	0	0	0	0	0.093248	0	0	0.003215	0.014778	0	0	0	0.001282	8.5E-05
0	0.000435	0	0	0	0	0.001335	0	0	0.013136	0	0	0	0	0.008923
0	0	0	0	0	0	0.001335	0.335714	0.244373	0.029557	0	0	0	0.000321	0
0	0	0	0	0	0	0	0	0	0.001642	0	0	0	0	0.000255
0	0.004354	0.000195	0.002625	0.016216	0	0.021362	0.002381	0.006431	0.026273	0.006135	0.020487	0.010806	0.002244	0.00136
0	0	0	0	0	0	0	0	0	0.065681	0.052147	0.033918	0.0399	0.002885	0
0.000916	0	8.36E-05	0.003937	0	0	0.001335	0	0.003215	0.08046	0	0.030275	0.002494	0.135577	0.020054
0.000305	0.000435	0.000139	0	0	0	0	0	0	0.006568	0.003067	0.007057	0.007481	0.039103	0.002634
0.001832	0.003918	0.003847	0.010499	0	0.001608	0.001335	0	0.022508	0.041051	0	0.001821	0.005819	0.075962	0.009262
0.000305	0	0.000112	0.001312	0	0	0	0	0	0	0	0	0.0133	0.007212	0.025748
0	0	0	0.002625	0	0	0	0	0	0	0	0	0.064838	0.017788	0.001785
0	0	2.79E-05	0	0	0	0	0	0	0	0	0	0.000831	0.000321	0.00034
0	0	2.79E-05	0	0	0	0	0	0	0.001642	0	0	0.004156	0.000481	0.015126
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000321	0.00034
0	0	2.79E-05	0	0	0	0.001335	0	0.009646	0.004926	0.027607	0	0	0.001282	8.5E-05
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	2.79E-05	0	0	0	0	0	0	0	0	0	0	0.000321	8.5E-05
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000916	0.000435	2.79E-05	0	0	0	0	0	0	0	0	0	0	0.000962	0.00017
0	0	2.79E-05	0	0	0	0	0	0	0	0	0	0	0	0
0.009158	0.011754	0.003067	0.009186	0.010811	0.006431	0.014686	0.015873	0.003215	0.00821	0	0.012292	0.004156	0.004647	0.001954
0.000916	0.001306	0.000808	0.001312	0	0.001608	0.001335	0.000794	0.003215	0.003284	0	0.000911	0	0.000801	0.000255
0.000305	0.000871	0.000251	0.001312	0	0.001608	0.001335	0.000794	0	0	0	0.000228	0	0.000481	0.000255
0.002747	0.003483	0.000781	0.015748	0	0.011254	0.00267	0.037302	0.028939	0.034483	0.009202	0.010016	0.016625	0.030929	0.006713
0.000611	0.001306	0.00039	0.001312	0	0.001608	0.001335	0.000794	0.003215	0.001642	0	0.000228	0	0.000641	0.00034
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.004579	0.002612	0.004321	0.003937	0.010811	0.003215	0.004005	0.003175	0.009646	0.018062	0	0.000911	0.001663	0.004327	0.002379
0.002442	0.001306	0.002286	0.002625	0.005405	0.001608	0.00267	0.001587	0.003215	0.00821	0	0.000455	0.000831	0.002244	0.001275
0.003968	0.008272	0.002565	0.007874	0	0.014469	0.006676	0.005556	0.012862	0.00821	0.003067	0.002276	0.001663	0.004647	0.002209
0.002137	0.001741	0.000976	0.003937	0	0.001608	0.00267	0.000794	0.006431	0.001642	0	0.000455	0.000831	0.001603	0.00068
0.003358	0.001741	0.001227	0.002625	0	0	0.00534	0.003968	0.003215	0.003284	0.003067	0.002504	0.001663	0.003045	0.0017
0.004579	0.009578	0.003206	0.009186	0.005405	0.019293	0.006676	0.006349	0.012862	0.00821	0	0.002504	0.002494	0.005609	0.002549
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000305	0.000435	0.000167	0	0	0.001608	0	0	0	0	0	0.000228	0	0.000321	0.00017
0.000611	0.001306	0.000418	0.001312	0	0.003215	0.001335	0.000794	0.003215	0.001642	0.003067	0.000455	0	0.000801	0.00034
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.002747	0.006095	0.001868	0.005249	0	0.009646	0.00534	0.003968	0.009646	0.004926	0.003067	0.001593	0.001663	0.003365	0.00153
0.352869	0.175446	0.46118	0.372703	0.054054	0.245981	0.130841	0.444444	0.575563	0.494253	0.110429	0.132483	0.197007	0.366346	0.128399
0.06105	0.038134	0.015026	0.111549	0.027027	0.09164	0.076101	0.021429	0.109325	0.119869	0.01227	0.020487	0.020781	0.072436	0.034755
0.087607	0.084893	0.06515	0.16273	0.021622	0.009646	0.105474	0.121429	0.115756	0.259442	0.02454	0.082404	0.054863	0.087179	0.024303
0.004579	0.004789	0.002899	0	0	0	0	0	0	0	0	0.001366	0	0	0.000765
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.002442	0.003047	0.001143	0.003937	0	0.004823	0.004005	0.003175	0.003215	0.003284	0	0.001593	0.000831	0.002083	0.001105
0.155678	0.128864	0.084218	0.278215	0.048649	0.106109	0.185581	0.146032	0.228296	0.382594	0.03681	0.10585	0.078475	0.161699	0.060928
0.508547	0.30431	0.545399	0.650919	0.102703	0.35209	0.318422	0.590476	0.803859	0.876847	0.147239	0.238334	0.273483	0.528045	0.189327
0.491453	0.69569	0.454601	0.349081	0.897297	0.64791	0.683578	0.409524	0.196141	0.123153	0.852761	0.761666	0.726517	0.471955	0.810673
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000254	0	0.000164	0	0	0	0	0.000368	0	0.071307	0	0	0	0.000443	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.000109	0	0	0	0	0	0	0	0	0	0	0.027678	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0.001132	0	0	0	0	0
0.000254	0	5.47E-05	0	0	0.000186	0	0	0	0	0	0	0.001724	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0.005659	0	0	0	0	0.000705
0	0	0	0	0	0	0	0	0.00049	0.036786	0	0	0	0	0.000353
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0.001132	0	0	0	0	0
0	0	0	0	0.000635	0.000932	0	0	0	0	0	0	0	0.01475	0
0.002031	0.001224	0.000984	0.000851	0.000318	0.000186	0	0.00221	0.00049	0.005093	0	0	0	0.024264	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	5.47E-05	0	0	0	0	0	0	0	0	0	0	7.38E-05	0
0	0.001224	5.47E-05	0	0.000635	0	0	0	0	0.000566	0	0	0	0.002065	0.002116
0.001015	0	0.000492	0	0	0	0	0.001105	0.00049	0.002264	0	0	0	0.000811	0.004126
0.000508	0	0.000328	0.000851	0.000318	0.000746	0	0.000368	0	0.000566	0.013889	0.005119	0.006897	0.001106	0.008746
0.000762	0.001224	5.47E-05	0.000851	0.001588	0.018738	0	0	0	0.001132	0	0	0	0.016594	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.000368	0	0.001132	0	0	0	0	3.53E-05
0.00457	0.028152	0.001203	0.011064	0.000318	0.000186	0.000712	0.023941	0.00049	0.003396	0	0	0	0.004868	0.005149
0.006855	0	0.002515	0.000851	0.000953	0.003822	0	0.000737	0	0.003396	0.020833	0.003257	0.027586	0.000295	0
0.000254	0	5.47E-05	0	0.000635	0.001398	0	0	0	0.001132	0.152778	0.140996	0.001724	0.005458	0.000776
0	0	0.000164	0	0.0054	0	0	0	0	0.000566	0	0	0	0.000664	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.001844	0
0.000508	0	0	0	0	0	0	0.003683	0	0	0	0	0	0.003024	0
0	0	5.47E-05	0	0	0	0	0	0	0	0	0	0	0.039973	3.53E-05
0	0	0	0	0	0	0	0	0	0	0	0	0	0.048602	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.022052	0
0.012694	0.001224	0.00082	0	0	0.000559	0	0.001105	0	0.001132	0	0	0	0.005458	3.53E-05
0.003046	0	0.001914	0	0	0.00028	0	0.000368	0.003428	0	0	0	0	0.000369	0
0.005585	0	0.000273	0	0.010483	0.079053	0.001425	0.000368	0	0.005659	0	0	0	0.131721	0
0.009139	0.154223	0.001422	0	0.000953	0.000932	0.000712	0.000737	0.001469	0.003962	0	0	0	0.036802	0
0.021071	0.003672	0.020066	0	0.002859	0.009602	0.000712	0.018416	0.001469	0.01811	0	0	0	0.024559	3.53E-05
0.013455	0	0.002132	0	0.000318	0.078773	0.000712	0.001473	0	0.000566	0	0.001396	0.001724	0.004351	0.000176
0.0721	0	0.007217	0	0.000635	0.00028	0.000712	0.000368	0	0	0	0	0	0.001033	0.000247
0	0	0.000219	0	0.000318	9.32E-05	0	0	0.00049	0.000566	0	0	0	0.045652	0
0.023102	0	0.295298	0.002553	0.000318	0.000186	0.001425	0.000368	0.00049	0.001132	0	0	0	0.000664	3.53E-05
0	0	0.011919	0.002553	0	0	0	0	0	0.000566	0	0	0	0	0
0	0	0	0	0.134689	0.001025	0	0	0	0.000566	0	0.000465	0.001724	0	0
0.000254	0	5.47E-05	0	0	0.103104	0	0	0	0.000566	0	0	0	0.00177	0
0	0	0	0	0	0	0.039174	0.00663	0	0	0	0	0	0	0
0.000254	0	5.47E-05	0	0	0	0	0.189687	0	0	0	0	0	0	0
0	0	0.005358	0	0	0	0	0	0.385698	0	0	0	0	0	0
0.000254	0	0.000109	0	0	9.32E-05	0	0.000368	0	0.034522	0	0	0	7.38E-05	3.53E-05
0	0	5.47E-05	0	0	9.32E-05	0	0	0	0	0	0.000465	0	7.38E-05	0.000141
0.00457	0.003672	0.003171	0.000851	0.001271	0.004941	0.000712	0.00663	0.000979	0.003962	0.013889	0.001396	0.07069	0.00118	0.005783
0.000254	0	0.000273	0	0.000318	0.001119	0	0.000737	0	0.000566	0.006944	0.000931	0.001724	0.000148	0.001093
0.000762	0	0.000383	0	0.000318	0.000932	0	0.000368	0	0	0	0.000931	0.010345	0.008629	0.002962
0.010155	0.017136	0.007545	0.000851	0.016201	0.02258	0.004274	0.004052	0.022037	0.013582	0	0	0	0.024338	0
0.001015	0	0.000601	0	0.000635	0.001305	0	0.000737	0	0	0	0	0	0.000148	0.009627
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.005839	0.003672	0.006342	0.000851	0.005083	0.003542	0.000712	0.009945	0.00049	0.003396	0	0.004653	0.008621	0.006416	0.047784
0.003046	0.002448	0.00339	0	0.002859	0.001958	0.000712	0.005157	0.00049	0.001698	0.006944	0.003257	0.003448	0.000738	0.010756
0.007108	0.002448	0.004046	0.000851	0.003812	0.009043	0.001425	0.005157	0.001469	0.001698	0	0	0	7.38E-05	0.018937
0.001269	0.001224	0.000765	0	0.000635	0.004102	0.000712	0.001105	0.000979	0.001132	0	0.001861	0	0.000738	0.008181
0.002285	0.001224	0.001586	0.000851	0.000635	0.00578	0.000712	0.004788	0.00049	0.002264	0	0	0	0.000959	0.026448
0.008378	0.003672	0.004975	0.001702	0.004765	0.01128	0.001425	0.005893	0.001469	0.001132	0.090278	0.050721	0.05	0.006859	0.038262
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000458
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000508	0	0.000273	0	0.000318	0.000653	0	0.000368	0	0	0.006944	0.006049	0.008621	0.000295	0.000952
0.001269	0.001224	0.000656	0	0.000635	0.001492	0	0.000737	0	0.000566	0	0	0	0.00059	0.004055
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.005077	0.002448	0.002952	0.000851	0.002859	0.006619	0.000712	0.003683	0.000979	0.001132	0	0	0	0	0.005395
0.2295	0.23011	0.390159	0.026383	0.201715	0.375594	0.05698	0.302026	0.424584	0.233729	0.3125	0.221498	0.194828	0.518401	0.203442
0.061691	0.035496	0.070585	0.011915	0.038437	0.148317	0.022792	0.089871	0.026445	0.043011	0.152778	0.109353	0.194828	0.246405	0.203653
0.042397	0.039168	0.132586	0.011064	0.020648	0.109816	0.00641	0.035727	0.026893	0.028297	0.451389	0.540717	0.594828	0.22627	0.585817
0	0	0	0	0.001588	0	0	0	0	0	0	0	0	0.002065	0
0	0	0	0	0	0	0	0	0	0	0	0.063285	0	0.00238	0.000458
0.002793	0.001224	0.00164	0.000851	0.001271	0.003636	0.000712	0.002578	0.00049	0.001132	0.0625	0.065147	0.015517	0.004499	0.00663
0.10688	0.075887	0.204811	0.02383	0.061944	0.261769	0.029915	0.128177	0.055828	0.072439	0.666667	0.778502	0.805172	0.481599	0.796558
0.33838	0.305998	0.59497	0.050213	0.263659	0.637364	0.086895	0.430203	0.480411	0.306169	0.979167	1	1	1	1
0.66362	0.694002	0.40503	0.949787	0.738341	0.362636	0.913105	0.569797	0.519589	0.693831	0.020833	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
0.111841	0	0.004145	0	0	0	0	0	0	0	0.000618	0	0.00544	0	0
0.08571	0	0.003161	0	0	0	0	0	0	0	0	0	0.003995	0	0
0.022995	0	0.000829	0	0	0	0	0	0	0	0	0	0.001105	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.017769	0	0.000674	0	0	0	0	0	0	0	0	0	0.00068	0	0
0.018366	0	0.000674	0	0	0	0	0	0	0	0	0	0.000765	0	0
0.025534	0	0.000984	0	0	0	0	0	0	0	0	0	0.001445	0	0
0.019113	0	0.000725	0	0	0	0	0	0	0	0	0	0.00068	0	0
0.013887	0	0.000466	0	0	0	0	0	0	0	0	0.003019	0.000765	0	0
0.034194	0	0.001244	0	0	0	0	0	0	0	0	0	0.00187	0	0
0	0	0	0	0	0	0	0	0	0	0.001235	0	0.00017	0	0
0.034194	0	0.001658	0	0	0	0	0	0	0	0	0	0.000255	0	0
0.021651	0	0.001036	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.005185	0	0
0.01105	0.067621	0.001813	0.000976	0.002743	0.006855	0.001284	0.002283	0	0.015186	0.004941	0	0.013006	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.00017	0	0
0	0	0	0.000488	0.000343	0	0	0	0	0	0	0	0.002635	0.006345	0
0	0	0	0	0	0	0	0	0	0	0	0	0.0017	0	0
0	0	0	0	0	0	0	0	0	0	0	0.000431	8.5E-05	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.004093	0	0	0	0	0	0	0	0	0	8.5E-05	0	0
0	0	0	0	0	0	0	0	0	0	0	0	8.5E-05	0	0
0	0	0	0	0	0	0	0	0	0	0	0.000431	0.00289	0	0
0.000896	0.004773	0.000518	0.00244	0.006001	0.010284	0.003082	0.003944	0	0.004556	0.000618	0.000862	0.002465	0.002538	0
0.000149	0.007955	0.001347	0.000488	0.005658	0.009679	0.003725	0.004359	0	0.009871	0.003088	0.002156	0.00136	0.00698	0
0.004032	0.027049	0.003316	0.002928	0.01869	0.015124	0.00244	0.013284	0	0.013667	0.006794	0.009058	0.012751	0.022208	0
0	0	0	0	0	0	0	0	0	0	0	0	8.5E-05	0	0
0.000149	0	0	0	0	0	0	0	0	0.094913	0	0.012937	0.00204	0.003173	0
0.000149	0	0	0	0	0	0	0	0	0.000759	0	0.037516	0.00017	0	0
0	0	0.000518	0	0	0	0	0.000415	0	0	0	0.003019	0.000425	0	0
0	0	5.18E-05	0	0	0	0	0	0	0	0	0.022423	0.010201	0	0
0.000149	0	0.028238	0	0	0	0	0.000623	0	0	0.000618	0.000431	0.00578	0.000635	0
0	0	0.003005	0	0	0	0	0	0	0	0	0.05994	0.008671	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.000623	0	0.000759	0	0.003881	8.5E-05	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.000415	0	0	0	0.002156	8.5E-05	0	0
0	0	0	0	0	0	0	0	0	0	0	0.001725	8.5E-05	0	0
0	0	0.003212	0	0.000514	0	0	0.013284	0	0.009871	0.000618	0.078051	0.092061	0	0
0.000299	0.000796	0.00228	0.000976	0.010117	0.008469	0.002055	0.015982	0	0	0.008647	0.063821	0.116287	0	0
0	0	0	0	0.001372	0	0.000128	0.001245	0	0	0	0.022855	0.000595	0	0
0	0	0	0	0	0	0	0	0	0	0	0.006037	0	0	0
0	0	0.001347	0.007809	0.000171	0	0	0.00166	0	0	0.011118	0.013368	0.012836	0	0
0	0	0	0	0	0	0	0	0	0	0	0.040966	0	0	0
0	0	0.003679	0.001952	0	0	0	0	0	0	0	0	0.001955	0	0
0	0	0.019534	0	0	0	0	0	0	0	0	0.000431	0.00527	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.000208	0	0	0	0.000431	0.00289	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	5.18E-05	0	0.005144	0	0	0.000208	0	0	0	0.007762	0.00746	0.033629	0
0.000149	0.000796	5.18E-05	0	0.000171	0	0.000128	0.000208	0	0	0	0	8.5E-05	0	0
0.011498	0.065235	0.005285	0.007321	0.006001	0.004235	0.006936	0.005812	0	0.015186	0.02656	0.021561	0.010711	0.020305	0
0.003285	0.02148	0.000518	0.001464	0.000686	0.000605	0.000771	0.001038	0	0.005315	0.001853	0.006037	0.00374	0.005711	0
0.00881	0.035004	0.004974	0.000976	0.000857	0.005445	0.04187	0.004774	0.032539	0.000759	0.000618	0	0.014961	0.001269	0
0.002389	0	0.011295	0	0.002572	0	0	0.003944	0	0.001519	0	0.03536	0	0.001904	0
0.00448	0.00716	0.002902	0.001952	0	0.018754	0.000257	0.012246	0	0.006074	0.003088	0.008193	0.000255	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.000255	0	0
0.00433	0.005569	0.148549	0.009273	0.010288	0.024198	0.007192	0.0467	0	0.024298	0.009883	0.025011	0.009181	0.015863	0
0.00209	0.069212	0.005699	0.032211	0.020233	0.017544	0.001156	0.021793	0	0.009871	0.003706	0.005606	0.011391	0.007614	0
0.00209	0	0.002902	0	0.040295	0.004235	0.006165	0.003113	0	0.009112	0.012971	0.002587	0	0.011421	-2.2482
0.000896	0.011138	0.011451	0.000976	0.003086	0.112523	0.00187	0.005189	0	0.003797	0.001853	0.003019	0.000255	0.002538	0
0.028371	0.015911	0.008238	0.00244	0.029321	0.027828	0.00411	0.035907	0	0.038724	0.019148	0.037516	0.0017	0.008249	0
0.01538	0.120923	0.015648	0.018058	0.033265	0.042952	0.018623	0.055625	0	0.034928	0.025942	0.01423	0.014451	0.030457	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.001399	0	0.000171	0.000605	0	0.000208	0	0.015945	0	0.003019	0.00085	0.028553	0
0.003882	0.008751	0.003161	0	0.00463	0	0	0.002076	0	0	0.020383	0	0.003145	0.005711	0
0.000896	0.007955	0.023886	0.005857	0.006173	0	0.00822	0.003736	0	0.017464	0.035825	0.03536	0.00782	0.022843	0
0.001493	0.001591	0.002228	0.000488	0.000514	0.00605	0.001413	0.007264	0	0	0.011118	0	0.003825	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.15285	0.103465	0.021605	0.174229	0	0.043379	0	0.003037	0.124768	0	0.012921	0	0
0.51217	0.478918	0.489637	0.202538	0.230624	0.489413	0.111225	0.31154	0.032539	0.335611	0.33601	0.591203	0.422135	0.237944	-2.2482
0.194266	0.294352	0.197927	0.193265	0.245885	0.267393	0.037632	0.354711	0	0.349279	0.208771	0.190599	0.561969	0.729695	0
0.237868	0.163882	0.275907	0.600293	0.506687	0.223835	0.731826	0.324201	0.904654	0.30448	0.273008	0.209573	0.013091	0.017766	2.248198
0.019262	0	0.000933	0	0	0	0	0	0	0	0	0.001725	8.5E-05	0	0
0.013588	0	0.006943	0	0.000686	0	0	0.000208	0	0	0.011736	0	0.002635	0	0
0.022846	0.062848	0.028653	0.003904	0.016461	0.019359	0.119317	0.00934	0.062807	0.01063	0.170476	0.0069	8.5E-05	0.014594	0
0.48783	0.521082	0.510363	0.797462	0.769719	0.510587	0.888775	0.68846	0.967461	0.664389	0.66399	0.408797	0.577865	0.762056	2.248198
1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

4.2 Tourism Expenditures

One common application of the input-output model is in the area of forecasting. Since tourist expenditure have effects on income generation, employment creation and investment opportunities, it would be of interest for us to investigate how money spent by a tourist will contribute to income, output, balance of payments, and imports of Singapore.

4.2.1 Economic Impact

Using equation (9) from Chapter 3, we can estimate the change in output required for each sector, given a change in the value of exogenous final demand, $\mathbf{Y}_i$. The projected output will allow the computation of the value-added generated and the amount of the other primary factors required to satisfy final demand.

Table 4.2.1 shows the estimated total tourist expenditure for 1983, categorized by type of expenditure. The data has been obtained from the results of visitor sample surveys conducted by the Singapore Tourist Promotion Board (STPB) in 1983 and various years. The data, however, excludes payment for airfares.

Table 4.2.1 Total Visitor Expenditure, 1983.

Item	Expenditure (S$ million)	Percentage of Total
Shopping	1,420.6	57.2
Food and Beverage	394.6	15.9
Accommodation	509.1	20.5
Local Transport	86.9	3.5
Entertainment	47.2	1.9
Sightseeing	17.4	0.7
Miscellaneous	7.4	0.3
Total	2,483.6	100.0

Source: Singapore Tourist Promotion Board (1983)

Under each expenditure item, certain sectors in the economy must produce the goods or services to meet the tourist demand. We have to assign each expenditure item to the sector which provides it. This is done in **Table 4.2.2**. **Table 4.2.2** is a cross tabulation of a 75-sector input-output table with the expenditure items from the STPB survey appropriately assigned. While there are 75 sectors in the input-output table, there are 7 expenditure items from the STPB survey. Certain input-output sectors like agriculture, cement or construction have no expenditure item explicitly assigned to them but linkages are implicit since tourists consume food and stay in hotels and other accommodation.

Table 4.2.2 Assigning Expenditure Items to Input-Output Sectors.

Sectors in Input-Output Table	Expenditure Items
1. Livestock	
2. Other Agriculture	
3.	
4.	
60. Wholesale and Retail Trade	Shopping
61. Restaurants and other Eating Places	Food and Beverage
62. Hotels and Lodging Houses	Accommodation
63. Transport and Storage	Local Transport
64. Communication	Local Transport
71. Recreation and Cultural Service	Entertainment and Sightseeing
75. Other Services	Miscellaneous

Source: Singapore Tourist Promotion Board

4.3 Computations

One of the major uses of input-output tables is in the assessment of the effects of changes in elements that are exogenous to the model of the economy. This is called the multiplier or impact analysis. Changes in the final demand variables are considered as exogenous change because these are determined outside the system and are thus beyond the control and influence of the economy. A change in government purchases or in the demand for Singapore's exports are examples of exogenous changes.

Two of the most frequently used multipliers are those that estimate the effects exogenous changes on

(a) the output of the different sectors in the economy;

(b) the value-added or income in each sector.

Output Multipliers

An output multiplier for sector **j** is defined as the total value of production in all sectors of the economy that is necessary in order to satisfy a dollar's worth of final demand for sector **j**'s output. This can be made clear by recalling equation (9) that we have mentioned in Chapter 3:

$$(9) \quad \Delta \mathbf{X} = (\mathbf{I} - \mathbf{A})^{-1} \Delta \mathbf{Y}$$

The output multiplier for the livestock sector can be obtained by computing the total amount of output generated when the final demand for all the other sectors is zero and that of the livestock sector is unity. By putting $\Delta Y_1 = 1$, $\Delta Y_2 = \Delta Y_3 = \Delta Y_{76} = 0$ in equation (9) and summing the outputs from the 75 producing sectors, the output multiplier of the livestock sector is found to be 2.87306. The same can be done for the other 74 sectors (**Table 4.3**).

Table 4.3 Leontief Inverse Matrix

Industry:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1.040735	0.002786	0.036258	0.045497	0.003041	0.105863	0.00996	0.031154	0.016404	0.012534	0.022544	0.012041	0.025663	0.015701	0.025763
2	0.152327	1.004256	0.04374	0.056224	0.00579	0.040406	0.014315	0.494339	0.034535	0.221073	0.335058	0.270388	0.060089	0.149684	0.163807
3	0.007592	0.000616	1.009435	0.010065	0.000673	0.190874	0.002199	0.004729	0.003583	0.002773	0.004333	0.003225	0.005605	0.003474	0.005699
4	0.000569	2.36E-05	0.000208	1.035136	2.87E-05	0.000321	0.000356	0.000353	0.000427	0.000341	0.000898	0.000196	0.001509	0.00021	0.000244
5	0.00046	5.57E-05	0.000351	0.000565	1.901714	0.000236	0.00012	0.000275	0.000201	0.000159	0.0002	0.000239	0.000314	0.000194	0.000313
6	0.006299	0.000523	0.006562	0.008546	0.000571	1.007588	0.00187	0.004022	0.003048	0.002354	0.004583	0.002258	0.004787	0.002947	0.004842
7	0.007766	0.000625	0.008102	0.01021	0.000683	0.004738	1.273895	0.009807	0.052161	0.002823	0.020096	0.002702	0.012831	0.003524	0.005789
8	0.046348	0.000826	0.00995	0.013463	0.000899	0.009072	0.004125	1.105869	0.024183	0.003721	0.01768	0.003564	0.032689	0.004644	0.007636
9	0.010393	0.000787	0.010184	0.012874	0.000861	0.007901	0.091811	0.030314	1.537484	0.00356	0.028201	0.003411	0.093031	0.004444	0.007296
10	0.074999	0.00087	0.009876	0.01363	0.000911	0.015248	0.005597	0.051172	0.018049	1.478248	0.017879	0.00593	0.010929	0.005754	0.008543
11	0.017151	0.000938	0.01226	0.01529	0.001026	0.012557	0.0068	0.01736	0.020402	0.004883	1.022484	0.004083	0.048245	0.005342	0.009121
12	0.50182	0.001374	0.017539	0.022129	0.001474	0.051089	0.004838	0.015111	0.007972	0.006147	0.011032	1.465341	0.012488	0.007611	0.012617
13	0.009434	0.000784	0.007259	0.012851	0.000858	0.005207	0.0041	0.006046	0.005631	0.003535	0.004477	0.003401	1.009396	0.004429	0.007266
14	0.011259	0.000936	0.008672	0.015287	0.00102	0.006182	0.003336	0.007163	0.005388	0.004206	0.00527	0.004026	0.008429	1.008079	0.008665
15	0.005798	0.000491	0.005165	0.007686	0.000534	0.003323	0.001849	0.003716	0.00286	0.002243	0.002748	0.002135	0.004414	0.002972	1.225607
16	0.032166	0.002573	0.024222	0.041215	0.003555	0.019703	0.021243	0.025942	0.024915	0.020617	0.019267	0.014414	0.02405	0.014568	0.048918
17	0.005421	0.000463	0.012365	0.007316	0.000488	0.004484	0.00161	0.003439	0.002577	0.002028	0.002534	0.001928	0.004041	0.002527	0.004624
18	0.032973	0.002745	0.025435	0.044599	0.002975	0.018007	0.00974	0.020883	0.015627	0.012274	0.015326	0.011684	0.024528	0.015342	0.025342
19	0.001975	0.000167	0.001525	0.002664	0.000178	0.001079	0.000582	0.001248	0.000936	0.000734	0.000919	0.000699	0.001469	0.000918	0.001515
20	0.004722	0.000396	0.003655	0.006382	0.000426	0.00258	0.001394	0.00299	0.002237	0.001758	0.002195	0.001673	0.003511	0.002197	0.003627
21	0.000992	7.22E-05	0.000709	0.001208	8.58E-05	0.000536	0.000319	0.000595	0.000487	0.000378	0.000453	0.000345	0.001058	0.000621	0.000676
22	0.001976	0.000158	0.00148	0.002627	0.000211	0.001134	0.000743	0.001326	0.001089	0.00085	0.00099	0.000778	0.002673	0.002176	0.001472
23	0.000149	1.26E-05	0.000115	0.000201	1.34E-05	8.13E-05	4.38E-05	9.4E-05	7.06E-05	5.53E-05	6.93E-05	5.27E-05	0.000111	6.92E-05	0.000114
24	0.003561	0.000302	0.002751	0.004801	0.000321	0.001945	0.001052	0.002251	0.00169	0.001326	0.001658	0.001261	0.00285	0.001659	0.002729
25	0.00626	0.000493	0.004348	0.008935	0.000954	0.003685	0.002186	0.004393	0.003742	0.002678	0.003717	0.002913	0.009465	0.025107	0.00561
26	0.006115	0.000475	0.004278	0.007868	0.001729	0.003433	0.002154	0.004	0.003317	0.002454	0.003612	0.003067	0.01795	0.035334	0.006975
27	0.011551	0.00094	0.008246	0.017492	0.001181	0.006744	0.003878	0.00838	0.007223	0.005179	0.00703	0.004911	0.011225	0.00702	0.009339
28	0.001799	0.000136	0.002252	0.002176	0.000184	0.001209	0.00116	0.002091	0.005819	0.002344	0.002911	0.000749	0.008841	0.001562	0.013857
29	0.015457	0.000493	0.004281	0.007194	0.000479	0.003798	0.001567	0.003492	0.002535	0.001992	0.002561	0.032228	0.003977	0.002478	0.004079
30	0.005455	0.000585	0.004322	0.007212	0.00048	0.002949	0.00157	0.003448	0.002554	0.002032	0.00254	0.001921	0.004009	0.002518	0.004093
31	0.014896	0.000847	0.007909	0.012829	0.003523	0.012852	0.035795	0.02405	0.032988	0.027286	0.016876	0.013428	0.010761	0.005922	0.016532
32	0.013136	0.005272	0.005858	0.028407	0.000912	0.006604	0.004967	0.013432	0.008896	0.017766	0.02865	0.009487	0.017162	0.004655	0.033006
33	0.025009	0.00401	0.042388	0.069622	0.002442	0.023727	0.008777	0.020713	0.024316	0.01667	0.014887	0.007575	0.02368	0.007642	0.021187
34	0.003822	0.000531	0.003147	0.004963	0.000324	0.002059	0.001047	0.00243	0.001759	0.001399	0.001759	0.001353	0.002743	0.001692	0.002735
35	0.001717	0.000113	0.001069	0.001837	0.000123	0.002059	0.004237	0.002289	0.002903	0.00303	0.001834	0.001045	0.001226	0.000634	0.001045
36	0.005511	0.000271	0.002638	0.004403	0.000295	0.006299	0.016951	0.01062	0.015106	0.012428	0.008136	0.005517	0.108547	0.001594	0.002512
37	0.000694	3.67E-05	0.00032	0.00061	3.97E-05	0.000325	0.000168	0.000313	0.000293	0.000227	0.000825	0.00019	0.000464	0.000237	0.000358
38	0.001139	4.27E-05	0.000381	0.000866	5.62E-05	0.000517	0.000402	0.0005	0.00203	0.000386	0.000491	0.00029	0.000841	0.000379	0.000489
39	0.000289	1.01E-05	8.93E-05	0.000216	1.39E-05	0.000116	4.66E-05	0.000101	9.33E-05	6.7E-05	9.11E-05	6.55E-05	0.000144	7.49E-05	0.000115
40	0.001411	0.000116	0.000916	0.001332	8.57E-05	0.001982	0.003174	0.002224	0.002967	0.003168	0.002986	0.001022	0.004942	0.002091	0.000848
41	0.000549	4.47E-05	0.000581	0.000604	4.24E-05	0.000447	0.000564	0.000543	0.000629	0.000536	0.000486	0.000275	0.000784	0.000655	0.000356
42	0.005469	0.000414	0.008102	0.005779	0.000409	0.00418	0.004693	0.005189	0.006109	0.004183	0.003544	0.002537	0.005588	0.007012	0.003311
43	0.001785	0.000143	0.001426	0.001848	0.000141	0.001091	0.001347	0.001393	0.001515	0.001239	0.001076	0.00079	0.00174	0.002068	0.001112
44	0.018602	0.001724	0.019337	0.020209	0.00163	0.014428	0.027082	0.021884	0.026722	0.022365	0.016093	0.012012	0.025135	0.037099	0.012946
45	0.007146	0.000969	0.009502	0.009642	0.000656	0.004956	0.002238	0.004699	0.00392	0.003542	0.003895	0.002807	0.006094	0.004437	0.005249
46	0.006618	0.000633	0.005267	0.008724	0.000589	0.003718	0.00241	0.004412	0.00354	0.002805	0.003265	0.002478	0.005191	0.003701	0.004971
47	0.001166	8.8E-05	0.00065	0.001188	7.92E-05	0.000543	0.000254	0.000565	0.000455	0.000344	0.000445	0.000334	0.000714	0.000447	0.000658
48	0.018245	0.001615	0.014226	0.024809	0.001647	0.010054	0.00542	0.011673	0.008733	0.006858	0.008574	0.006553	0.013715	0.008645	0.01395
49	0.007895	0.000791	0.006213	0.010502	0.000699	0.004279	0.002277	0.004984	0.003696	0.002921	0.003649	0.002776	0.005802	0.003622	0.005938
50	0.013189	0.001104	0.010246	0.018016	0.001192	0.007257	0.003918	0.008447	0.006284	0.004932	0.006149	0.00473	0.009852	0.006147	0.010147
51	0.001798	0.000174	0.049111	0.005375	0.000166	0.009998	0.00062	0.0015	0.000973	0.000745	0.000946	0.0009	0.001415	0.000882	0.001338
52	0.009236	0.000768	0.007125	0.012491	0.000833	0.005042	0.002728	0.005849	0.004376	0.003438	0.004291	0.003272	0.006868	0.004297	0.007099
53	0.005116	0.000432	0.003952	0.006905	0.000461	0.002798	0.001517	0.00324	0.002436	0.00191	0.002387	0.001816	0.003817	0.002392	0.003925
54	0.016145	0.001343	0.012455	0.021836	0.001456	0.008815	0.004769	0.010225	0.007649	0.00601	0.007501	0.00572	0.012006	0.007512	0.012409
55	0.009327	0.001563	0.0151	0.012488	0.000846	0.006604	0.002798	0.006276	0.004525	0.004316	0.005225	0.003544	0.007126	0.005351	0.007215
56	0.000728	5.77E-05	0.000542	0.000948	6.36E-05	0.001664	0.000216	0.001105	0.000363	0.000267	0.000884	0.00026	0.000573	0.000328	0.000547
57	0.014598	0.001539	0.008822	0.023434	0.002179	0.013534	0.007196	0.018827	0.014112	0.012071	0.010403	0.00722	0.025353	0.007815	0.027336
58	0.004097	0.000418	0.002567	0.004367	0.000545	0.005755	0.002519	0.00364	0.004899	0.003234	0.003392	0.001881	0.013392	0.001612	0.005648
59	0.012935	0.000436	0.003873	0.009567	0.000618	0.005038	0.001851	0.004354	0.003967	0.002762	0.003862	0.00286	0.006108	0.003189	0.005099
60	0.196361	0.009685	0.09122	0.155288	0.010656	0.101062	0.075865	0.116565	0.098474	0.063882	0.081283	0.115802	0.117714	0.06441	0.11502
61	0.056798	0.004664	0.043058	0.077927	0.005321	0.032314	0.017137	0.036889	0.029234	0.021768	0.028119	0.021331	0.044773	0.027633	0.044146
62	0.010936	0.00091	0.008436	0.014789	0.000987	0.00597	0.00323	0.006925	0.005181	0.00407	0.005081	0.003874	0.008131	0.005087	0.008405
63	0.05704	0.005478	0.046829	0.111008	0.005473	0.03733	0.018805	0.052477	0.030499	0.022997	0.028313	0.030773	0.044026	0.026362	0.043486
64	0.012768	0.0009	0.008098	0.036237	0.00143	0.009534	0.005349	0.015787	0.007622	0.00594	0.007288	0.008548	0.011515	0.006296	0.011032
65	0.028117	0.002091	0.019243	0.057892	0.004351	0.027185	0.014829	0.026513	0.028121	0.017281	0.029287	0.016826	0.046457	0.023603	0.029276
66	0.009233	0.000627	0.005855	0.021852	0.001674	0.006121	0.004353	0.008422	0.007791	0.00525	0.005854	0.006852	0.00911	0.005295	0.008945
67	0.041395	0.003352	0.030286	0.068552	0.004293	0.02452	0.014574	0.029396	0.024077	0.01761	0.021793	0.017087	0.035023	0.02003	0.036918
68	0.022533	0.001565	0.013769	0.047209	0.003749	0.023508	0.010095	0.022585	0.02338	0.014766	0.025412	0.014569	0.043313	0.020552	0.02584
69	0.023042	0.001916	0.017775	0.031164	0.002079	0.01258	0.006806	0.014592	0.010916	0.008576	0.010705	0.008163	0.017133	0.01072	0.017711
70	0.011214	0.000941	0.008634	0.015159	0.001009	0.006131	0.003321	0.007123	0.005324	0.004174	0.005214	0.004012	0.008334	0.005204	0.008595
71	0.012715	0.001062	0.009797	0.017425	0.001181	0.007047	0.003798	0.008161	0.006142	0.004785	0.006031	0.004589	0.009648	0.005989	0.009822
72	0.021221	0.005003	0.019213	0.024373	0.00158	0.010768	0.004909	0.013023	0.008954	0.007446	0.009358	0.006982	0.014073	0.008574	0.013155
73	0.012434	0.002466	0.010152	0.012392	0.00095	0.006872	0.002644	0.006041	0.006066	0.004022	0.0066	0.004198	0.009522	0.005298	0.007515
74	0.01374	0.001142	0.010599	0.018583	0.00124	0.007501	0.004059	0.008701	0.006509	0.005114	0.006383	0.004887	0.010216	0.006392	0.010561
75	0.027251	0.00223	0.019993	0.054758	0.00379	0.022992	0.012107	0.025138	0.022428	0.014902	0.022936	0.015358	0.036517	0.019444	0.026237
76	0.825352	0.068619	0.636672	1.116259	0.074458	0.450597	0.243795	0.522669	0.391	0.307193	0.383423	0.292375	0.613686	0.383968	0.634393
Total	3.627945	1.164059	2.528986	3.645828	2.079608	2.490742	2.07007	2.982284	2.715119	2.501977	2.408946	2.540486	2.850929	2.110098	2.885314

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0.001415	0.012517	0.026217	0.037025	0.047246	0.014039	0.02765	0.050618	0.034272	0.002795	0.024087	0.034211	0.017726	0.024509	0.023979
0.0024	0.064124	0.045516	0.044085	0.02752	0.55177	0.379475	0.062413	0.148093	0.003464	0.045451	0.04306	0.025513	0.035051	0.047214
0.000313	0.002769	0.005795	0.006809	0.002943	0.003106	0.006116	0.011196	0.007584	0.000618	0.005323	0.007568	0.003922	0.005424	0.005305
2.25E-05	0.000113	0.000237	0.000297	0.000196	0.000133	0.000291	0.000385	0.000575	2.46E-05	0.000246	0.00034	0.000294	0.000344	0.000451
6.55E-05	0.000269	0.00042	0.028594	0.000323	0.000184	0.000343	0.000604	0.000821	3.36E-05	0.000292	0.001332	0.000214	0.003213	0.000296
0.000266	0.002353	0.004924	0.00579	0.002494	0.002637	0.005193	0.009518	0.006431	0.000525	0.004521	0.006428	0.003327	0.004595	0.004498
0.000318	0.00281	0.005883	0.006956	0.002989	0.003157	0.006232	0.011361	0.007694	0.000827	0.005432	0.007679	0.003979	0.005512	0.005421
0.000419	0.003704	0.007752	0.009375	0.005161	0.004159	0.008222	0.014966	0.01015	0.000827	0.007151	0.010124	0.005298	0.007331	0.007182
0.0004	0.003541	0.007413	0.008776	0.003788	0.003981	0.007862	0.014314	0.009706	0.00079	0.006854	0.009677	0.005019	0.006959	0.006849
0.000478	0.003916	0.007984	0.009736	0.006241	0.004232	0.008413	0.015129	0.010665	0.000837	0.007614	0.010606	0.019139	0.030047	0.110901
0.000482	0.004254	0.009014	0.013335	0.004732	0.005139	0.011096	0.017011	0.011781	0.000943	0.010169	0.011523	0.006026	0.00907	0.010825
0.000693	0.006093	0.012734	0.01807	0.022874	0.006831	0.013673	0.024506	0.016735	0.001357	0.011783	0.016653	0.009176	0.012661	0.012271
0.000399	0.003533	0.00739	0.008683	0.003748	0.003963	0.007799	0.014287	0.009673	0.000789	0.006789	0.009652	0.005004	0.006916	0.006762
0.000476	0.004213	0.008816	0.010364	0.004463	0.004714	0.009279	0.017051	0.01148	0.000941	0.008079	0.011503	0.005943	0.008191	0.008016
0.005903	0.093236	0.109603	0.014359	0.010909	0.002414	0.00474	0.008672	0.011276	0.000484	0.013835	0.005995	0.003347	0.004357	0.006034
1.027802	0.070882	0.481904	0.08003	0.022096	0.012761	0.025104	0.045952	0.038689	0.002558	0.032348	0.032906	0.016912	0.022624	0.022958
0.00026	1.064244	0.007013	0.005779	0.002244	0.002262	0.004445	0.008171	0.007232	0.000452	0.003869	0.005509	0.002844	0.00391	0.003839
0.001393	0.012325	1.038346	0.030338	0.01303	0.013753	0.02708	0.049907	0.033412	0.002757	0.02358	0.03362	0.01731	0.023792	0.023305
8.31E-05	0.000736	0.001541	1.015935	0.000778	0.000823	0.00162	0.002978	0.001999	0.000165	0.001409	0.002009	0.001035	0.001425	0.001395
0.000199	0.001766	0.004441	0.228523	1.222795	0.00197	0.003877	0.00714	0.004782	0.000395	0.003381	0.004822	0.002479	0.003406	0.003337
3.77E-05	0.000735	0.000705	0.00424	0.002906	1.036212	0.166674	0.001257	0.148268	7.7E-05	0.007167	0.000943	0.000567	0.000792	0.000891
8.56E-05	0.003278	0.001658	0.004991	0.016711	0.001236	1.037363	0.002663	0.094102	0.000186	0.042138	0.002257	0.001582	0.002176	0.002759
6.26E-06	5.54E-05	0.000116	0.000136	5.86E-05	8.2E-05	0.000122	1.854157	0.005366	1.24E-05	0.000106	0.000151	7.8E-05	0.000107	0.000105
0.00015	0.001326	0.002778	0.003263	0.001405	0.001484	0.00292	0.005364	1.054249	0.000298	0.00254	0.003618	0.001866	0.00257	0.002518
0.0003	0.002851	0.006193	0.008903	0.005159	0.003018	0.015149	0.009448	0.008681	1.025942	0.311868	0.286321	0.007471	0.011241	0.023214
0.000336	0.003803	0.008663	0.015047	0.00464	0.003011	0.006524	0.008932	0.00851	0.001289	1.05514	0.016178	0.015794	0.0239	0.037438
0.000511	0.004384	0.009704	0.010626	0.004873	0.005476	0.010947	0.017359	0.014055	0.001044	0.01264	1.039883	0.007668	0.011493	0.011742
0.004216	0.010029	0.005551	0.006228	0.003537	0.001143	0.004213	0.002203	0.032748	0.000144	0.022594	0.030177	1.124341	0.002996	0.005555
0.000224	0.001981	0.004139	0.004931	0.002439	0.002245	0.004382	0.007999	0.0054	0.000443	0.003789	0.005398	0.002795	1.027582	0.00378
0.000226	0.001982	0.004148	0.004905	0.002159	0.002294	0.004796	0.007926	0.00547	0.000442	0.004825	0.005394	0.002916	0.00402	1.044245
0.009216	0.010582	0.03417	0.123876	0.11347	0.004795	0.011282	0.014815	0.047545	0.000818	0.017479	0.014932	0.117429	0.028133	0.045501
0.001724	0.008748	0.012937	0.036722	0.016243	0.009305	0.061329	0.009203	0.034126	0.001408	0.030178	0.023992	0.120169	0.160708	0.134529
0.001517	0.009973	0.014782	0.023101	0.008371	0.013696	0.024585	0.021203	0.020873	0.004922	0.016342	0.018859	0.017127	0.025311	0.029495
0.000673	0.002599	0.003882	0.018008	0.003156	0.001636	0.003007	0.005268	0.008014	0.000293	0.002517	0.003587	0.001882	0.002645	0.002579
5.74E-05	0.000507	0.001061	0.001253	0.000548	0.000567	0.001118	0.00205	0.001379	0.000113	0.000975	0.001384	0.000738	0.001023	0.001145
0.000144	0.001222	0.002564	0.003077	0.001457	0.001362	0.002704	0.004897	0.01744	0.000271	0.002365	0.003334	0.001902	0.002597	0.004859
0.000195	0.000172	0.000543	0.00039	0.000208	0.000187	0.000738	0.000541	0.000584	3.46E-05	0.000384	0.001007	0.0015	0.000481	0.000507
3.83E-05	0.000224	0.000445	0.000518	0.000333	0.000258	0.000546	0.000717	0.000871	4.73E-05	0.000508	0.00067	0.002223	0.000653	0.00078
5.89E-06	5.02E-05	0.000104	0.000119	6.01E-05	6.36E-05	0.000128	0.000175	0.000175	1.17E-05	0.000115	0.000149	9.85E-05	0.000147	0.000158
0.000232	0.000458	0.001045	0.001408	0.002355	0.000427	0.001408	0.001298	0.003193	7.98E-05	0.000948	0.001606	0.002332	0.002322	0.004303
3.49E-05	0.000286	0.000444	0.000548	0.000576	0.000196	0.000464	0.000612	0.004083	3.6E-05	0.000679	0.000584	0.000475	0.000602	0.000849
0.000226	0.004392	0.004431	0.005489	0.006353	0.00187	0.004401	0.005548	0.087329	0.00033	0.004167	0.005882	0.003893	0.005441	0.007062
6.98E-05	0.000633	0.001427	0.001698	0.001432	0.000618	0.001338	0.001837	0.006788	0.000114	0.007442	0.002079	0.001317	0.001859	0.002369
0.000873	0.00831	0.019306	0.023425	0.024875	0.007338	0.01685	0.021218	0.098832	0.001235	0.018643	0.018016	0.017747	0.025726	0.035826
0.000286	0.002461	0.005112	0.006133	0.002839	0.003138	0.005982	0.009476	0.008253	0.000594	0.006081	0.012809	0.003934	0.006754	0.005938
0.000278	0.002457	0.005173	0.00614	0.002974	0.002785	0.005432	0.009612	0.008579	0.00054	0.005223	0.007173	0.003617	0.005069	0.005209
3.44E-05	0.000309	0.00065	0.000751	0.000349	0.000371	0.000719	0.001171	0.000944	7.01E-05	0.001617	0.000869	0.000497	0.000721	0.000745
0.000767	0.008798	0.014196	0.016743	0.00728	0.007888	0.015489	0.027398	0.018749	0.001517	0.015902	0.019361	0.009647	0.01335	0.0131
0.000325	0.002883	0.006026	0.007074	0.003081	0.003309	0.006401	0.011617	0.007876	0.000644	0.005536	0.007858	0.004043	0.005616	0.005497
0.00056	0.004957	0.010335	0.012186	0.005288	0.005546	0.010869	0.020034	0.013437	0.001109	0.009487	0.013467	0.006963	0.009541	0.009341
8.59E-05	0.000748	0.001389	0.001815	0.000919	0.000914	0.001567	0.002976	0.002178	0.000154	0.001397	0.001832	0.001092	0.001382	0.001373
0.00039	0.003453	0.007227	0.008499	0.00385	0.003852	0.007584	0.013982	0.009357	0.000772	0.006605	0.009422	0.004848	0.006681	0.006525
0.000215	0.001907	0.003993	0.004695	0.002023	0.002133	0.0042	0.00771	0.005218	0.000427	0.003656	0.005804	0.002887	0.003703	0.003631
0.000682	0.006036	0.012632	0.014856	0.006381	0.008733	0.013262	0.024439	0.018358	0.00135	0.011571	0.01647	0.008475	0.011645	0.011408
0.000403	0.004743	0.024482	0.011181	0.017763	0.004279	0.008263	0.013856	0.009714	0.000782	0.011794	0.01751	0.006322	0.007799	0.008356
3.01E-05	0.000265	0.000551	0.00065	0.000283	0.000297	0.000586	0.001059	0.000723	6.13E-05	0.000509	0.000717	0.000373	0.000514	0.000505
0.001202	0.010799	0.017168	0.020821	0.008102	0.008126	0.023102	0.016533	0.02131	0.005507	0.014644	0.020093	0.011029	0.014489	0.011003
0.000338	0.002711	0.004086	0.003177	0.001554	0.002281	0.005671	0.004796	0.005397	0.001758	0.003965	0.005149	0.003181	0.00343	0.002772
0.000246	0.002214	0.004558	0.005208	0.002519	0.002815	0.005636	0.007733	0.007587	0.000517	0.00508	0.006501	0.004248	0.006428	0.006787
0.007478	0.066105	0.129197	0.137592	0.089108	0.079687	0.136147	0.273971	0.181107	0.012588	0.131034	0.154049	0.08086	0.094532	0.101575
0.002407	0.021224	0.044721	0.051951	0.022661	0.024137	0.047935	0.085443	0.060608	0.004723	0.041611	0.05883	0.031056	0.044102	0.042869
0.000462	0.004088	0.008556	0.010062	0.004322	0.00458	0.00898	0.018554	0.011079	0.000914	0.00782	0.011151	0.00574	0.007887	0.007726
0.002889	0.025464	0.044799	0.061598	0.030399	0.031961	0.051958	0.103089	0.064629	0.005174	0.046298	0.059927	0.036158	0.044002	0.04242
0.000722	0.007011	0.011222	0.017259	0.008758	0.009896	0.014033	0.028579	0.018144	0.00103	0.011831	0.015565	0.010386	0.012511	0.01076
0.001721	0.011007	0.025822	0.033005	0.014982	0.016697	0.03631	0.056336	0.051554	0.005112	0.030394	0.039369	0.027001	0.047794	0.048684
0.000773	0.006028	0.00839	0.014328	0.005774	0.007629	0.012258	0.024521	0.012874	0.001498	0.009711	0.011379	0.007356	0.012972	0.00918
0.001987	0.019445	0.036488	0.046261	0.017387	0.020488	0.037346	0.061736	0.052525	0.004967	0.034492	0.048518	0.024809	0.031669	0.033316
0.001242	0.010197	0.021082	0.028431	0.01026	0.014478	0.031747	0.030352	0.043306	0.003587	0.025185	0.032975	0.022643	0.04411	0.042996
0.000973	0.008615	0.01803	0.021204	0.009106	0.009609	0.018922	0.034883	0.023344	0.001927	0.016479	0.023497	0.012094	0.016618	0.016279
0.000474	0.004191	0.008751	0.010301	0.004444	0.004692	0.009205	0.016967	0.011362	0.000936	0.008016	0.011403	0.005882	0.008078	0.007914
0.000541	0.004768	0.009967	0.011765	0.005068	0.005363	0.010549	0.019335	0.013085	0.00108	0.009176	0.013036	0.006776	0.009381	0.009194
0.00069	0.006242	0.012703	0.014851	0.00672	0.009229	0.015266	0.02403	0.01844	0.001386	0.011587	0.016628	0.008636	0.013347	0.012944
0.00035	0.003127	0.006774	0.007283	0.003479	0.004715	0.008901	0.011667	0.011487	0.000855	0.006788	0.009336	0.00553	0.009018	0.008536
0.00058	0.005137	0.010751	0.012644	0.00543	0.00573	0.011283	0.0208	0.01392	0.001149	0.009826	0.014011	0.007212	0.009909	0.009707
0.001529	0.011593	0.023968	0.030985	0.014799	0.016022	0.031953	0.05567	0.043125	0.003955	0.026861	0.0352	0.023026	0.03799	0.036809
0.034864	0.308568	0.645806	0.759494	0.326179	0.344179	0.677762	1.249461	0.838153	0.069023	0.590249	0.841836	0.433205	0.595249	0.583093
1.130413	2.011526	3.116339	3.274496	2.273717	2.403624	3.216813	4.678832	3.69351	1.196456	2.907946	3.272943	2.427706	2.700136	2.829039

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
0.017434	0.012871	0.01209	0.026175	0.00582	0.014085	0.017514	0.023029	0.036024	0.039021	0.004975	0.010421	0.009129	0.018636	0.006877
0.022349	0.017755	0.016064	0.077381	0.007301	0.023323	0.024477	0.028593	0.044586	0.054219	0.006209	0.012997	0.012039	0.024365	0.00879
0.003857	0.002849	0.002675	0.00579	0.001288	0.003116	0.003875	0.005095	0.007972	0.008633	0.0011	0.002305	0.002019	0.004123	0.001521
0.000176	0.000323	0.000128	0.001764	0.000662	0.011197	0.016239	0.015203	0.183923	0.038208	0.000297	0.000905	0.000544	0.000438	0.000341
0.000211	0.000157	0.000148	0.094764	7.39E-05	0.000183	0.000208	0.000276	0.000434	0.000469	8.2E-05	0.000125	0.00011	0.000225	0.000101
0.003276	0.002414	0.002271	0.004918	0.001093	0.00264	0.003289	0.004325	0.006757	0.00733	0.000934	0.001959	0.001716	0.003501	0.001291
0.003919	0.002889	0.002713	0.005895	0.001306	0.003187	0.00393	0.005168	0.008083	0.008758	0.001116	0.002339	0.002049	0.004183	0.001545
0.005197	0.004317	0.00358	0.007785	0.001725	0.004204	0.005183	0.00681	0.010659	0.011553	0.001472	0.003082	0.002701	0.005514	0.002036
0.004941	0.003853	0.003421	0.007435	0.001648	0.004028	0.004956	0.006516	0.010199	0.011042	0.001406	0.002947	0.002582	0.005272	0.001948
0.005426	0.004687	0.00363	0.007925	0.001748	0.004301	0.005262	0.006886	0.010775	0.011811	0.001498	0.003122	0.002737	0.00564	0.002076
0.006279	0.004336	0.004072	0.010189	0.001957	0.006565	0.005894	0.007761	0.012124	0.013189	0.00168	0.003506	0.003096	0.006282	0.002411
0.008839	0.011671	0.005911	0.012997	0.00285	0.00702	0.008525	0.011154	0.017516	0.019045	0.002412	0.005057	0.004441	0.00906	0.003345
0.004919	0.003631	0.003414	0.007382	0.001647	0.00397	0.004942	0.006499	0.010171	0.011015	0.001399	0.002939	0.002576	0.005259	0.001941
0.005859	0.004309	0.004061	0.008793	0.001956	0.004699	0.005878	0.007732	0.012057	0.013109	0.001669	0.003508	0.003072	0.006262	0.002309
0.005484	0.002188	0.002047	0.011037	0.000989	0.002468	0.002995	0.004075	0.006133	0.007092	0.000877	0.001791	0.00159	0.00323	0.001218
0.022925	0.011704	0.010996	0.035531	0.005363	0.014652	0.016007	0.028311	0.034358	0.041126	0.0046	0.009577	0.0084	0.017181	0.006372
0.002807	0.002073	0.001945	0.059826	0.000994	0.002243	0.002885	0.003707	0.005774	0.009869	0.000827	0.001759	0.001517	0.003204	0.001124
0.017115	0.01254	0.011848	0.025684	0.005695	0.013641	0.017143	0.022556	0.035042	0.03826	0.004899	0.010267	0.008986	0.018285	0.006735
0.001023	0.00075	0.000708	0.001535	0.00034	0.00082	0.001025	0.001348	0.002097	0.002287	0.000297	0.000614	0.000537	0.001093	0.000403
0.002451	0.001795	0.001695	0.003675	0.000815	0.001953	0.002453	0.003228	0.005014	0.005475	0.000701	0.001469	0.001286	0.002618	0.000964
0.000539	0.000382	0.000855	0.00073	0.000207	0.003457	0.000553	0.000876	0.00099	0.004273	0.000184	0.00034	0.000592	0.000934	0.000347
0.00151	0.000917	0.004007	0.001697	0.000508	0.008482	0.001265	0.001874	0.002212	0.011473	0.000339	0.000774	0.002584	0.003595	0.000832
7.7E-05	5.66E-05	5.36E-05	0.000116	2.56E-05	6.19E-05	7.72E-05	0.000102	0.000158	0.000172	2.25E-05	4.62E-05	4.04E-05	8.32E-05	3.03E-05
0.001843	0.001355	0.001328	0.002768	0.000612	0.001478	0.001848	0.002428	0.003782	0.004127	0.000536	0.001106	0.000989	0.002151	0.000728
0.004345	0.002917	0.002357	0.005709	0.001144	0.005734	0.003734	0.012674	0.009113	0.010206	0.001029	0.002042	0.002113	0.004091	0.001425
0.006517	0.002869	0.002095	0.006336	0.001162	0.010151	0.004662	0.014259	0.00899	0.016272	0.000986	0.002016	0.00274	0.004086	0.001431
0.006405	0.005559	0.004515	0.010367	0.002057	0.007346	0.006025	0.009608	0.013443	0.0135	0.001846	0.003828	0.003287	0.006973	0.002597
0.009184	0.002803	0.000619	0.003901	0.00044	0.002993	0.00263	0.001355	0.002135	0.012062	0.000984	0.000727	0.00073	0.005729	0.000856
0.00276	0.002134	0.001908	0.004127	0.00092	0.002229	0.002753	0.003623	0.005642	0.006147	0.000792	0.00165	0.001443	0.002941	0.001084
0.003232	0.002989	0.001961	0.004165	0.000924	0.002298	0.00274	0.003604	0.005614	0.006139	0.00078	0.001644	0.00144	0.002936	0.001181
1.319069	0.005897	0.003803	0.071983	0.001934	0.004504	0.010755	0.007051	0.010684	0.028317	0.001748	0.003732	0.008179	0.010586	0.025185
0.081617	1.072511	0.013474	0.068672	0.007403	0.041957	0.012113	0.005055	0.021307	0.037262	0.001387	0.004249	0.005915	0.010808	0.004299
0.017252	0.082418	1.750036	0.029956	0.006192	0.029758	0.040325	0.016293	0.033071	0.02758	0.002325	0.011474	0.01864	0.014346	0.005027
0.001844	0.001367	0.001292	1.025599	0.000655	0.001607	0.00182	0.002401	0.003798	0.004106	0.000544	0.001094	0.000958	0.001968	0.000915
0.000705	0.000521	0.000488	0.00106	1.000234	0.000567	0.000707	0.00093	0.001443	0.001573	0.000201	0.000422	0.00037	0.000753	0.000278
0.002146	0.001357	0.001188	0.002637	0.000836	1.104215	0.002061	0.002288	0.007176	0.020838	0.000594	0.001375	0.001145	0.003464	0.000825
0.000267	0.000719	0.000167	0.000435	0.000289	0.000272	1.001889	0.000369	0.000562	0.014029	0.000181	0.000421	0.00041	0.000414	0.009297
0.000333	0.000499	0.00024	0.000656	0.000844	0.000387	0.003395	1.506006	0.36885	0.047119	0.000398	0.001177	0.000721	0.001164	0.000354
7.51E-05	7.66E-05	5.45E-05	0.00013	4.91E-05	9.55E-05	0.000132	0.000122	1.000164	0.001837	3.43E-05	8.02E-05	6.06E-05	9.61E-05	0.000298
0.000883	0.005224	0.000777	0.003972	0.016891	0.000623	0.022803	0.00432	0.008802	1.031243	0.006929	0.022391	0.01284	0.007144	0.002448
0.000346	0.000595	0.000276	0.000866	0.001297	0.000241	0.001918	0.00057	0.001428	0.075752	1.05583	0.038988	0.043939	0.011402	0.001304
0.003772	0.00277	0.002677	0.009554	0.002207	0.002354	0.00592	0.00316	0.012661	0.097203	0.004018	1.034841	0.006791	0.154928	0.02389
0.00128	0.001268	0.001036	0.001693	0.000384	0.000816	0.001025	0.001026	0.002539	0.011113	0.00381	0.008152	1.009347	0.044921	0.003742
0.010682	0.010924	0.012636	0.02384	0.003394	0.009149	0.010273	0.010264	0.040825	0.063443	0.003152	0.007644	0.012933	1.092027	0.014107
0.003984	0.002952	0.002772	0.006815	0.00128	0.003849	0.003783	0.004781	0.008895	0.008934	0.004061	0.002333	0.016787	0.012912	1.028088
0.003428	0.00262	0.002489	0.008161	0.001142	0.002831	0.003403	0.004409	0.007409	0.008999	0.00123	0.002595	0.072518	0.027462	0.003917
0.00044	0.000354	0.000358	0.000682	0.00014	0.00044	0.000481	0.000618	0.0009	0.000958	0.000133	0.000267	0.001071	0.000861	0.000539
0.009465	0.006979	0.006657	0.014284	0.003285	0.00772	0.009519	0.012487	0.019511	0.023707	0.002858	0.005763	0.013578	0.012079	0.02588
0.004007	0.002945	0.002778	0.005987	0.001342	0.003265	0.003997	0.005261	0.008192	0.008956	0.001143	0.002402	0.002199	0.004301	0.001843
0.006871	0.005032	0.004777	0.010285	0.002345	0.005484	0.006879	0.009051	0.014121	0.015419	0.002	0.004114	0.003614	0.007741	0.003113
0.000982	0.000748	0.000826	0.001416	0.000691	0.000854	0.002655	0.001337	0.013458	0.010535	0.032804	0.001855	0.001964	0.002978	0.000584
0.004794	0.003511	0.003319	0.007195	0.001595	0.003817	0.004802	0.006318	0.009813	0.010717	0.00137	0.002876	0.002517	0.005125	0.001887
0.002651	0.00195	0.001898	0.003983	0.000882	0.00213	0.002657	0.003494	0.005444	0.005941	0.000768	0.001591	0.001419	0.003269	0.001157
0.008381	0.006138	0.005802	0.012577	0.002789	0.006674	0.008393	0.011044	0.017154	0.018756	0.002396	0.005029	0.004475	0.008971	0.003491
0.006089	0.004051	0.003379	0.007387	0.001587	0.004022	0.004817	0.006367	0.0099	0.0108	0.00141	0.002865	0.002551	0.008214	0.002106
0.000368	0.000276	0.000302	0.00055	0.000126	0.000302	0.000371	0.000496	0.000756	0.000818	0.000109	0.000224	0.000195	0.000395	0.000146
0.018832	0.017295	0.009607	0.019994	0.013062	0.0129	0.021163	0.032003	0.02331	0.024953	0.00201	0.016489	0.008037	0.013788	0.005159
0.002991	0.002723	0.002587	0.004104	0.000638	0.003275	0.003124	0.003475	0.007059	0.007417	0.000555	0.002026	0.000988	0.002867	0.001005
0.003294	0.003051	0.002383	0.005535	0.000956	0.004241	0.004277	0.005172	0.006698	0.006429	0.000991	0.001943	0.001598	0.003678	0.001455
0.06384	0.048156	0.042967	0.107652	0.020606	0.061123	0.063378	0.135114	0.168074	0.17495	0.027815	0.047383	0.050239	0.100273	0.031381
0.030003	0.022838	0.02084	0.045246	0.009781	0.025389	0.030581	0.040044	0.06399	0.067196	0.008424	0.017769	0.015552	0.032156	0.011922
0.005676	0.004158	0.003929	0.008518	0.001888	0.00452	0.005685	0.00748	0.011819	0.012689	0.001623	0.003405	0.00298	0.006064	0.002233
0.032646	0.022871	0.028368	0.044394	0.021717	0.027038	0.03142	0.042681	0.075347	0.082256	0.008019	0.017214	0.01718	0.034912	0.013685
0.009225	0.006229	0.008169	0.012013	0.007786	0.007748	0.009196	0.011083	0.020464	0.022971	0.001926	0.004201	0.004529	0.009299	0.003946
0.021021	0.021947	0.015504	0.031531	0.005516	0.033086	0.023012	0.029771	0.052985	0.044343	0.00898	0.01136	0.010955	0.022496	0.00893
0.00723	0.005129	0.004678	0.010921	0.001512	0.00567	0.007177	0.007155	0.018162	0.011803	0.001351	0.002978	0.003347	0.008808	0.002539
0.025316	0.017862	0.01658	0.034704	0.007136	0.018369	0.026555	0.034992	0.051535	0.05185	0.009683	0.015359	0.013461	0.02891	0.010396
0.017446	0.019183	0.013007	0.026388	0.009808	0.032575	0.018208	0.026284	0.042646	0.034628	0.003703	0.009602	0.009548	0.019179	0.007449
0.011961	0.00876	0.008279	0.01795	0.003979	0.009523	0.011979	0.015762	0.024482	0.028737	0.003417	0.007176	0.00628	0.012779	0.004706
0.005803	0.004253	0.004022	0.008706	0.001946	0.004642	0.00581	0.007689	0.011913	0.012995	0.001683	0.003481	0.003054	0.006214	0.002288
0.00665	0.004918	0.004822	0.009966	0.002247	0.005431	0.00667	0.008781	0.013717	0.014874	0.001916	0.003973	0.003491	0.007107	0.002624
0.008778	0.006671	0.006165	0.012528	0.003105	0.008768	0.008404	0.011116	0.017723	0.018899	0.002411	0.005208	0.004427	0.009305	0.003507
0.004866	0.004397	0.003491	0.007547	0.001399	0.007011	0.005402	0.00665	0.012273	0.011183	0.004467	0.003018	0.002423	0.005386	0.00201
0.007132	0.005224	0.004937	0.010703	0.002373	0.005679	0.007143	0.009399	0.014598	0.015943	0.002038	0.004279	0.003745	0.00762	0.002806
0.018981	0.017793	0.01437	0.027556	0.0072	0.02442	0.020469	0.025578	0.04635	0.040764	0.007448	0.010063	0.010184	0.020062	0.007895
0.428431	0.313787	0.296545	0.642936	0.142515	0.341107	0.429075	0.564591	0.876915	0.957694	0.122407	0.257032	0.224946	0.457717	0.168567
2.402748	1.909621	2.445664	2.86566	1.378233	2.052969	2.084361	2.898517	3.698504	3.662209	1.397987	1.706779	1.729186	2.42864	1.523085

46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
0.012989	0.009449	0.023705	0.002272	0.007936	0.026794	0.002864	0.015278	0.009291	0.008371	0.051091	0.050275	0.062626	0.043429	0.065449
0.017359	0.012243	0.030086	0.003114	0.010616	0.033888	0.003537	0.020413	0.011752	0.08721	0.063219	0.062161	0.077987	0.0708	0.080849
0.002874	0.00209	0.005244	0.000502	0.001756	0.005928	0.000633	0.00338	0.002055	0.001843	0.0113	0.011119	0.013849	0.009605	0.014486
0.000688	0.000198	0.000423	2E-05	0.000101	0.00038	2.6E-05	0.000254	7.85E-05	0.00013	0.000405	0.000413	0.000837	0.035284	0.000635
0.000161	0.000115	0.000307	2.81E-05	0.000688	0.000324	3.42E-05	0.000189	0.00011	0.000161	0.000656	0.000632	0.000798	0.00058	0.000794
0.002437	0.001776	0.004455	0.000427	0.001488	0.005033	0.000538	0.002868	0.001746	0.001566	0.009609	0.009458	0.011782	0.008167	0.01227
0.002919	0.002121	0.005322	0.00051	0.001781	0.006017	0.000643	0.003429	0.002085	0.00187	0.011468	0.011285	0.014084	0.009749	0.014685
0.003849	0.002796	0.007012	0.000673	0.002348	0.007928	0.000847	0.00452	0.002747	0.002468	0.015117	0.014866	0.018549	0.012844	0.019353
0.003683	0.002673	0.006706	0.000643	0.002248	0.007584	0.00081	0.004325	0.002628	0.002357	0.014444	0.014212	0.017741	0.01228	0.018537
0.003912	0.00285	0.007096	0.000695	0.0024	0.00831	0.000856	0.004627	0.002778	0.004377	0.01538	0.015089	0.018848	0.013229	0.019546
0.004658	0.003195	0.008055	0.00077	0.002678	0.009229	0.000963	0.005166	0.003126	0.002826	0.017188	0.0169	0.022803	0.014664	0.022
0.006337	0.004591	0.011499	0.00111	0.003852	0.013011	0.001387	0.007417	0.004499	0.004081	0.024861	0.024367	0.030473	0.021059	0.031689
0.003667	0.002666	0.006689	0.000641	0.002242	0.007559	0.000808	0.004315	0.002621	0.002351	0.014408	0.014179	0.01766	0.01225	0.018493
0.004351	0.003178	0.007975	0.000765	0.002655	0.009	0.000965	0.005127	0.003127	0.002803	0.017219	0.016953	0.021117	0.014634	0.021881
0.002235	0.001703	0.004043	0.000415	0.001393	0.004572	0.000492	0.002677	0.001621	0.008855	0.008687	0.008549	0.010651	0.007457	0.011856
0.011889	0.008826	0.021506	0.002147	0.007238	0.02432	0.002615	0.014082	0.009273	0.046932	0.046497	0.045674	0.056858	0.039916	0.059108
0.002132	0.001535	0.003843	0.000367	0.001614	0.004319	0.000463	0.00246	0.001498	0.00139	0.008284	0.008157	0.010168	0.007099	0.0104
0.012659	0.009296	0.023318	0.002241	0.007709	0.026284	0.002825	0.01494	0.009148	0.008201	0.050467	0.049711	0.061931	0.042872	0.063438
0.000758	0.000557	0.001393	0.000134	0.000461	0.001571	0.000169	0.000893	0.000548	0.000491	0.003012	0.002967	0.003696	0.00256	0.003792
0.001812	0.00133	0.003337	0.000321	0.001103	0.003761	0.000404	0.002138	0.001309	0.002605	0.007226	0.007117	0.008867	0.006136	0.009078
0.000786	0.000507	0.000871	0.000201	0.001035	0.00183	7.34E-05	0.000893	0.000372	0.001124	0.001342	0.001326	0.001744	0.020655	0.00172
0.0033	0.002139	0.002868	0.001016	0.00085	0.00174	0.000159	0.003864	0.001358	0.006113	0.003112	0.003035	0.003476	0.028025	0.003743
5.71E-05	4.2E-05	0.000105	1.01E-05	3.48E-05	0.000118	1.27E-05	6.73E-05	4.11E-05	3.7E-05	0.000227	0.000223	0.000278	0.000193	0.000286
0.001372	0.001004	0.002596	0.000241	0.000832	0.002833	0.000304	0.001813	0.000984	0.000888	0.005437	0.005354	0.006662	0.004695	0.00683
0.003126	0.003224	0.004668	0.000871	0.002484	0.005374	0.000565	0.003508	0.002124	0.003177	0.012989	0.010145	0.01273	0.011149	0.01743
0.003698	0.002016	0.004813	0.000458	0.001512	0.005029	0.000525	0.004288	0.002581	0.004088	0.008926	0.008491	0.010535	0.00924	0.015501
0.005255	0.003428	0.008366	0.00167	0.003326	0.010182	0.001023	0.005792	0.003402	0.003574	0.03183	0.021817	0.027841	0.015564	0.030597
0.001903	0.002119	0.001364	0.001182	0.002483	0.024833	0.000139	0.001125	0.000462	0.002178	0.002676	0.002335	0.00315	0.021304	0.003271
0.002045	0.001495	0.003743	0.00036	0.001247	0.004227	0.000453	0.002409	0.001467	0.001322	0.008178	0.008037	0.010035	0.006871	0.010254
0.002057	0.001498	0.003724	0.000364	0.00125	0.004221	0.00045	0.002898	0.001455	0.002549	0.008313	0.008127	0.010196	0.006833	0.010185
0.011165	0.040815	0.009594	0.015334	0.003507	0.012498	0.001843	0.043398	0.003966	0.008075	0.014625	0.014288	0.017925	0.023499	0.025011
0.011816	0.004906	0.00883	0.002375	0.003425	0.012623	0.000612	0.006833	0.001876	0.007146	0.03404	0.0145	0.041809	0.014583	0.012603
0.008498	0.007589	0.01159	0.00136	0.005565	0.018375	0.001403	0.009458	0.004295	0.007626	0.29196	0.266599	0.047557	0.033448	0.030815
0.001415	0.001005	0.002724	0.000239	0.007253	0.002834	0.000298	0.001659	0.000959	0.001525	0.005674	0.005529	0.006998	0.005183	0.006897
0.000523	0.000382	0.000959	9.22E-05	0.000318	0.001083	0.000116	0.000815	0.000376	0.00034	0.002074	0.002043	0.002565	0.003622	0.002616
0.002142	0.000994	0.002374	0.000226	0.000777	0.002672	0.000281	0.006585	0.000905	0.00088	0.004959	0.004881	0.006124	0.007875	0.006296
0.000524	0.000178	0.00041	2.97E-05	0.000121	0.001221	4.08E-05	0.000241	0.000108	0.00014	0.000587	0.00059	0.001117	0.041068	0.000902
0.000949	0.000301	0.000471	3.85E-05	0.000177	0.000683	4.75E-05	0.000367	0.000147	0.000217	0.000752	0.00078	0.001726	0.083224	0.001251
9.65E-05	4.26E-05	9.8E-05	8.91E-06	3.97E-05	0.000152	1.12E-05	7.34E-05	3.5E-05	3.58E-05	0.000181	0.000191	0.00044	0.022416	0.000313
0.014999	0.003494	0.002242	7.61E-05	0.000565	0.00366	0.000138	0.002026	0.000332	0.001789	0.001601	0.001449	0.001949	0.011886	0.001791
0.005697	0.007015	0.003781	3.95E-05	0.000672	0.004424	0.000144	0.001103	0.008148	0.000828	0.00068	0.000653	0.000881	0.008855	0.000839
0.013185	0.002717	0.007804	0.000299	0.014089	0.098087	0.002009	0.006053	0.001448	0.010154	0.006185	0.006017	0.008635	0.147441	0.007929
0.011828	0.156166	0.004417	0.000104	0.00175	0.003813	0.000918	0.002598	0.003017	0.005474	0.002078	0.002013	0.002866	0.048506	0.002625
0.032233	0.009728	0.041465	0.001121	0.007333	0.024816	0.00212	0.031633	0.00661	0.024347	0.024628	0.023341	0.02824	0.047692	0.028425
0.018304	0.00441	0.008193	0.000483	0.002232	0.095845	0.001375	0.005362	0.001887	0.002641	0.011343	0.011711	0.014554	0.013787	0.013561
1.081803	0.012819	0.016404	0.000468	0.002512	0.00608	0.001439	0.004048	0.002021	0.002373	0.010052	0.009791	0.012239	0.013231	0.01281
0.000385	1.00038	0.000907	5.58E-05	0.000579	0.00083	7.01E-05	0.000405	0.001022	0.000804	0.001242	0.001241	0.001968	0.047116	0.001691
0.042889	0.006504	1.432456	0.004867	0.004888	0.016768	0.003713	0.0091	0.006181	0.006306	0.02804	0.027444	0.03418	0.025026	0.035119
0.003408	0.002185	0.022408	1.003126	0.001825	0.006177	0.000684	0.003523	0.002143	0.002534	0.012037	0.011809	0.014773	0.010002	0.01484
0.005114	0.003744	0.009364	0.000899	1.158772	0.011877	0.001133	0.00805	0.003861	0.003986	0.020168	0.020385	0.028761	0.017157	0.025545
0.001408	0.000819	0.001585	0.000132	0.000573	1.116518	0.000163	0.001113	0.000679	0.00122	0.002468	0.002482	0.003145	0.004983	0.004222
0.003547	0.002803	0.006533	0.000628	0.002158	0.007362	1.041562	0.012899	0.002583	0.002297	0.014141	0.01393	0.017355	0.012013	0.01777
0.002317	0.001448	0.00372	0.000348	0.001198	0.004088	0.000438	1.236415	0.001418	0.00128	0.007845	0.007709	0.009592	0.006644	0.009829
0.006509	0.004562	0.023804	0.001129	0.003778	0.012889	0.001402	0.007321	1.632879	0.004031	0.02472	0.024349	0.030338	0.02101	0.031063
0.003918	0.002655	0.006888	0.00065	0.002191	0.007528	0.000793	0.004738	0.002558	1.038173	0.014125	0.0138	0.017205	0.012023	0.017798
0.000276	0.000202	0.000571	4.84E-05	0.000168	0.000667	6.09E-05	0.000322	0.000198	0.000177	1.001086	0.00152	0.001336	0.00098	0.001487
0.010147	0.008078	0.012546	0.001788	0.004545	0.016024	0.001746	0.014012	0.004819	0.007804	0.032196	1.018295	0.091269	0.020316	0.027028
0.001652	0.000988	0.002664	0.000238	0.001179	0.003967	0.000279	0.002461	0.000913	0.0015	0.012092	0.00586	1.007727	0.004735	0.007222
0.003049	0.001619	0.00418	0.000393	0.001734	0.005511	0.00048	0.003118	0.001542	0.001461	0.007957	0.008399	0.019656	1.015486	0.013898
0.057377	0.052724	0.093267	0.008797	0.046103	0.119012	0.014334	0.058347	0.067871	0.044258	0.176036	0.172766	0.215486	0.183296	1.221036
0.022868	0.01804	0.040475	0.003833	0.014075	0.046443	0.00485	0.026422	0.015865	0.01411	0.086466	0.084627	0.10519	0.073358	0.117449
0.004197	0.003082	0.007734	0.000743	0.002558	0.008717	0.000937	0.004954	0.003034	0.00272	0.016742	0.016492	0.020547	0.014223	0.02104
0.027908	0.019825	0.04514	0.004493	0.01958	0.045337	0.005307	0.037206	0.018244	0.017411	0.078297	0.079795	0.101187	0.074484	0.148869
0.008423	0.006236	0.01276	0.000837	0.006418	0.01169	0.001794	0.011972	0.004235	0.004867	0.025397	0.02019	0.023838	0.018259	0.032309
0.021378	0.012113	0.025788	0.003093	0.012856	0.034735	0.004162	0.021264	0.010829	0.009539	0.038924	0.037129	0.045248	0.035767	0.071888
0.004793	0.003969	0.006596	0.000569	0.002881	0.011442	0.001516	0.005264	0.004151	0.00348	0.011666	0.01323	0.013728	0.011724	0.023734
0.018819	0.013511	0.030499	0.003676	0.010893	0.03949	0.004316	0.024581	0.012746	0.012809	0.062722	0.060068	0.074143	0.054188	0.103396
0.018345	0.010885	0.020814	0.003238	0.011302	0.029886	0.003378	0.017425	0.008956	0.007119	0.123191	0.079396	0.087854	0.034238	0.075284
0.008843	0.006494	0.016297	0.001566	0.005385	0.018368	0.001974	0.010438	0.006394	0.005731	0.03528	0.034753	0.043298	0.02997	0.044335
0.004305	0.003183	0.007906	0.00076	0.00263	0.008916	0.000959	0.00508	0.003115	0.00279	0.017105	0.016842	0.020985	0.014528	0.022008
0.004973	0.003625	0.00904	0.000874	0.003037	0.010217	0.001101	0.005851	0.003546	0.003187	0.019583	0.019202	0.023898	0.018527	0.024758
0.006916	0.004617	0.011623	0.001104	0.0043	0.013421	0.001374	0.008052	0.004398	0.004346	0.031215	0.02962	0.038403	0.020737	0.032307
0.004505	0.003534	0.006335	0.00054	0.002647	0.007953	0.000675	0.004478	0.002257	0.002734	0.012087	0.011558	0.014232	0.010973	0.018738
0.005273	0.003872	0.009718	0.000934	0.003211	0.010953	0.001177	0.006224	0.003813	0.003417	0.021037	0.020723	0.025818	0.017871	0.026436
0.017975	0.011647	0.023984	0.002849	0.011321	0.030019	0.003328	0.019523	0.009486	0.008895	0.042189	0.039674	0.048229	0.035578	0.064043
0.316748	0.232609	0.583729	0.058101	0.192885	0.657915	0.070703	0.373887	0.22902	0.205263	1.263675	1.244827	1.550887	1.073498	1.588009
1.978409	1.786932	2.815615	1.154567	1.663366	2.867586	1.212786	2.209218	2.186946	1.713578	4.124691	3.955486	4.491848	3.950169	4.595791

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76
0.157817	0.054097	0.055709	0.061594	0.061919	0.055247	0.057544	0.061542	0.062905	0.058842	0.046498	0.045662	0.054212	0.061371	0.023233	0.067972
0.181483	0.06747	0.07027	0.075958	0.076904	0.068221	0.071724	0.07602	0.078032	0.073275	0.057215	0.0614	0.068641	0.07862	0.028856	0.08371
0.035936	0.011972	0.012344	0.013624	0.013693	0.012241	0.012726	0.013824	0.013911	0.013021	0.010147	0.010105	0.011992	0.013572	0.005138	0.015032
0.000797	0.001692	0.00083	0.00049	0.000539	0.000683	0.00189	0.000725	0.001581	0.000579	0.000421	0.000737	0.00098	0.000528	0.000202	0.000478
0.000525	0.00072	0.001104	0.000763	0.000789	0.000661	0.000729	0.000771	0.000733	0.001095	0.000776	0.006461	0.001517	0.000907	0.000296	0.00079
0.025986	0.010142	0.010322	0.011582	0.011648	0.010309	0.010826	0.011522	0.01184	0.011042	0.00861	0.008549	0.009831	0.011543	0.004371	0.012794
0.034935	0.012138	0.012474	0.013826	0.013899	0.012389	0.012917	0.013805	0.014121	0.013206	0.010291	0.010245	0.011963	0.013775	0.005215	0.015259
0.046645	0.015995	0.016531	0.01821	0.018306	0.016337	0.017013	0.018199	0.018597	0.017407	0.013585	0.013518	0.01622	0.018145	0.006869	0.020095
0.047651	0.015319	0.015958	0.017416	0.017503	0.015685	0.018266	0.017441	0.017777	0.01666	0.012972	0.012942	0.014967	0.01735	0.006567	0.019209
0.042834	0.016248	0.016643	0.018462	0.018592	0.016448	0.017287	0.018392	0.01881	0.020009	0.014081	0.022629	0.016316	0.01877	0.006976	0.020317
0.052027	0.018232	0.018697	0.020705	0.020826	0.018574	0.019353	0.020886	0.021142	0.019887	0.015436	0.015575	0.018373	0.020662	0.007814	0.022843
0.076193	0.026217	0.026981	0.029821	0.02999	0.028749	0.027862	0.029802	0.030454	0.028571	0.024362	0.022299	0.026562	0.029737	0.011253	0.032906
0.046413	0.015271	0.016254	0.017374	0.017463	0.015625	0.016227	0.017392	0.017734	0.016617	0.012929	0.012903	0.013986	0.017312	0.006552	0.019162
0.03608	0.018085	0.01825	0.020747	0.020881	0.018243	0.019409	0.020504	0.021238	0.019721	0.015384	0.015222	0.018383	0.020688	0.007835	0.02295
0.007338	0.009524	0.008665	0.010513	0.010693	0.00917	0.009843	0.010305	0.010713	0.010091	0.007888	0.008207	0.015165	0.011435	0.004012	0.011574
0.051123	0.118376	0.048439	0.057094	0.059721	0.056436	0.053593	0.057357	0.057032	0.068935	0.046937	0.041968	0.059538	0.060555	0.022408	0.061608
0.007077	0.008631	0.008447	0.009966	0.010049	0.008541	0.009349	0.009727	0.010206	0.009462	0.007488	0.0107	0.008605	0.010027	0.00377	0.011027
0.041839	0.052505	0.049749	0.061274	0.061614	0.052116	0.056941	0.059217	0.062385	0.057352	0.044932	0.043989	0.050698	0.067047	0.023119	0.067418
0.002501	0.003135	0.002972	0.003826	0.003858	0.003119	0.0034	0.003545	0.003723	0.003423	0.002898	0.002625	0.004597	0.003618	0.001372	0.004023
0.005989	0.007514	0.007132	0.008698	0.008776	0.007455	0.008153	0.008476	0.008927	0.008217	0.006449	0.00685	0.007376	0.008742	0.003293	0.009647
0.001286	0.002092	0.002228	0.001527	0.001806	0.001549	0.002249	0.001883	0.002152	0.001584	0.001196	0.001352	0.002035	0.001627	0.000603	0.001636
0.002552	0.004066	0.00792	0.00316	0.003486	0.003477	0.004124	0.003676	0.003917	0.003855	0.002591	0.003159	0.003693	0.003713	0.001308	0.003322
0.000188	0.000236	0.000224	0.000273	0.000275	0.000235	0.000256	0.000267	0.00028	0.000258	0.000204	0.0002	0.000389	0.000272	0.000103	0.000303
0.004507	0.005655	0.005369	0.008534	0.006587	0.005619	0.006131	0.00639	0.006706	0.006176	0.004878	0.005215	0.008234	0.006529	0.002472	0.007244
0.010273	0.025351	0.012336	0.014343	0.024263	0.030337	0.014841	0.020172	0.010285	0.022697	0.012488	0.013402	0.014881	0.021822	0.009104	0.010968
0.008682	0.018381	0.010977	0.010887	0.018905	0.021228	0.013514	0.015276	0.010189	0.022658	0.01162	0.012211	0.009957	0.018497	0.006343	0.010909
0.018388	0.047685	0.022382	0.023389	0.040389	0.036874	0.021003	0.034393	0.019435	0.034189	0.023826	0.025386	0.029151	0.043726	0.015155	0.020924
0.002775	0.004321	0.003157	0.002754	0.003408	0.003272	0.003411	0.003344	0.003247	0.003505	0.002389	0.003375	0.003835	0.003594	0.001279	0.002822
0.008047	0.008553	0.008581	0.009806	0.009913	0.008468	0.009222	0.009609	0.009962	0.108192	0.007783	0.021118	0.010043	0.016105	0.003719	0.010765
0.006896	0.008725	0.009047	0.009866	0.009992	0.00833	0.009345	0.00961	0.009845	0.010878	0.008635	0.047546	0.008155	0.010646	0.003749	0.010637
0.015451	0.016426	0.016134	0.01735	0.017945	0.01554	0.016766	0.01828	0.017894	0.019047	0.013711	0.026209	0.019291	0.018207	0.006733	0.018935
0.01135	0.012137	0.01184	0.011497	0.012088	0.010555	0.011151	0.011931	0.011454	0.027285	0.010348	0.046461	0.023247	0.01403	0.004536	0.012137
0.024456	0.039552	0.080162	0.026121	0.026493	0.024119	0.025012	0.029378	0.024349	0.029961	0.028924	0.030723	0.034872	0.031737	0.009941	0.025712
0.004542	0.006167	0.010626	0.006691	0.0068	0.005649	0.006435	0.006706	0.006378	0.007218	0.007163	0.068321	0.014515	0.007862	0.002551	0.006864
0.002037	0.002226	0.002068	0.002497	0.002519	0.00216	0.002416	0.002448	0.002621	0.002367	0.001849	0.001829	0.002015	0.002494	0.000945	0.002787
0.009284	0.005332	0.005207	0.005965	0.006015	0.005252	0.005733	0.005944	0.006219	0.005731	0.004452	0.004758	0.0051	0.005965	0.002257	0.006591
0.000937	0.002118	0.000877	0.000693	0.000847	0.001003	0.00232	0.001094	0.001941	0.000775	0.000685	0.001291	0.002248	0.000746	0.000318	0.000868
0.001567	0.003786	0.001259	0.00092	0.001031	0.001404	0.004244	0.001446	0.003498	0.001099	0.000796	0.001132	0.002047	0.001001	0.000387	0.000874
0.000391	0.000999	0.000318	0.000225	0.000258	0.00036	0.001123	0.00036	0.00092	0.000261	0.000197	0.000231	0.000535	0.000244	9.62E-05	0.000211
0.001771	0.001965	0.001707	0.00164	0.001738	0.001545	0.001981	0.002507	0.00193	0.002694	0.001488	0.007009	0.002618	0.001853	0.000652	0.001706
0.000694	0.00101	0.000877	0.000789	0.000817	0.00075	0.00106	0.001064	0.001013	0.000969	0.00071	0.002323	0.002021	0.000838	0.000306	0.000802
0.00701	0.011701	0.009986	0.008995	0.007626	0.007511	0.012404	0.010907	0.01124	0.009034	0.006527	0.023055	0.025567	0.007815	0.002861	0.007121
0.002249	0.003896	0.002647	0.00234	0.00255	0.002489	0.004127	0.003315	0.003733	0.002993	0.002194	0.008902	0.007277	0.002734	0.000957	0.002382
0.02222	0.026652	0.029458	0.026738	0.028023	0.024338	0.026332	0.042338	0.026883	0.0392	0.025347	0.111491	0.124612	0.029614	0.010514	0.028001
0.009076	0.014372	0.017557	0.013133	0.023347	0.02227	0.013598	0.030229	0.011009	0.013031	0.022527	0.078223	0.131051	0.013584	0.00876	0.011673
0.008262	0.010777	0.01068	0.011973	0.013592	0.010333	0.011497	0.013415	0.01203	0.011898	0.010019	0.038823	0.012907	0.012405	0.0051	0.012822
0.001502	0.002987	0.001649	0.001486	0.00157	0.001607	0.003298	0.001742	0.002907	0.001598	0.001374	0.007472	0.001958	0.001663	0.000589	0.001519
0.023096	0.030343	0.030432	0.044777	0.034531	0.029322	0.031389	0.035918	0.033926	0.032035	0.042055	0.0466	0.047741	0.033967	0.012957	0.038801
0.009836	0.012632	0.012812	0.014511	0.014539	0.012176	0.013573	0.014031	0.014459	0.014136	0.012234	0.053127	0.01177	0.015137	0.005455	0.015623
0.016729	0.02122	0.024879	0.026582	0.024514	0.020965	0.022724	0.023911	0.024832	0.023029	0.018005	0.017778	0.02159	0.024306	0.009198	0.026832
0.003434	0.002894	0.02808	0.003042	0.003139	0.003288	0.002925	0.004116	0.002894	0.003401	0.002506	0.003571	0.008712	0.003301	0.001178	0.00302
0.011722	0.014701	0.013931	0.017024	0.017161	0.014588	0.015955	0.016585	0.017483	0.016069	0.012576	0.012323	0.013481	0.01899	0.006439	0.018894
0.006483	0.008174	0.007722	0.009397	0.009489	0.008096	0.008811	0.009462	0.009634	0.008896	0.007013	0.007413	0.011072	0.009404	0.003561	0.01041
0.02049	0.025709	0.024376	0.029856	0.030003	0.025505	0.027889	0.029016	0.030556	0.028091	0.022133	0.021729	0.023708	0.029702	0.011258	0.033021
0.012005	0.014908	0.014517	0.017031	0.022728	0.015093	0.01582	0.016929	0.01713	0.016327	0.013214	0.020852	0.021437	0.052148	0.008528	0.018502
0.001103	0.001958	0.00113	0.001281	0.001471	0.001125	0.001326	0.001473	0.001298	0.001223	0.000972	0.000951	0.001104	0.001285	0.000552	0.0014
0.027659	0.088165	0.024271	0.027169	0.028651	0.023249	0.025369	0.026453	0.01931	0.036057	0.04345	0.040361	0.028579	0.041832	0.01	0.020614
0.008108	0.026992	0.005747	0.007256	0.008822	0.005919	0.006174	0.006909	0.005753	0.011191	0.006539	0.01094	0.008642	0.01186	0.002485	0.006189
0.017484	0.044996	0.014069	0.009944	0.011223	0.01597	0.050621	0.015802	0.041469	0.01149	0.008568	0.009035	0.02253	0.010791	0.004211	0.009314
0.1631	0.185641	0.189105	0.210738	0.216152	0.182894	0.198888	0.211624	0.216339	0.203891	0.158216	0.196795	0.173842	0.214963	0.081104	0.232547
1.075825	0.097919	0.088337	0.10471	0.103921	0.10987	0.096564	0.113273	0.105028	0.104132	0.079671	0.084032	0.08184	0.103219	0.038993	0.113457
0.013879	1.017405	0.016493	0.020155	0.020317	0.017273	0.01889	0.019635	0.020699	0.019024	0.014892	0.014585	0.016187	0.020114	0.007623	0.022369
0.06897	0.091282	1.250007	0.098471	0.102112	0.110613	0.0904	0.143596	0.087491	0.114779	0.079753	0.099402	0.08221	0.108704	0.038314	0.094033
0.016417	0.091579	0.025074	1.052939	0.04158	0.039657	0.019048	0.043094	0.0185	0.029914	0.020286	0.021978	0.027883	0.028119	0.015601	0.019865
0.036222	0.04557	0.112788	0.085248	1.096798	0.123584	0.047005	0.068693	0.042543	0.057955	0.097938	0.042211	0.042578	0.058066	0.411535	0.04574
0.010951	0.025175	0.028689	0.014282	0.017125	1.13907	0.014178	0.019777	0.012987	0.018157	0.012513	0.01497	0.011413	0.01863	0.006426	0.013934
0.079186	0.083699	0.07298	0.075034	0.103987	0.097551	1.071331	0.109188	0.071787	0.109627	0.076602	0.094282	0.059858	0.082918	0.039017	0.077404
0.042527	0.16312	0.050433	0.051547	0.069303	0.08278	0.048852	1.092699	0.030016	0.072928	0.056051	0.047076	0.043122	0.066974	0.028004	0.031948
0.029245	0.036677	0.034755	0.042473	0.042814	0.036395	0.039807	0.041373	1.043619	0.040089	0.031375	0.030735	0.03357	0.042386	0.016065	0.047138
0.014173	0.017824	0.018604	0.020576	0.020932	0.018375	0.019286	0.020341	0.021075	1.035705	0.015337	0.018123	0.017147	0.049624	0.007854	0.022774
0.020126	0.02946	0.023297	0.023567	0.028574	0.020702	0.021924	0.02532	0.023885	0.022282	1.038488	0.017108	0.021751	0.029282	0.010721	0.025808
0.022476	0.034995	0.053171	0.034874	0.035996	0.026203	0.035096	0.033648	0.028514	0.046588	0.060013	1.058856	0.031173	0.053398	0.013506	0.030773
0.012327	0.014651	0.014287	0.01418	0.014607	0.019103	0.014286	0.021259	0.013804	0.013618	0.021776	0.010823	1.015058	0.013973	0.005481	0.014864
0.017438	0.02187	0.020724	0.025326	0.02553	0.021702	0.023736	0.024671	0.026009	0.023905	0.018709	0.018327	0.020018	1.025275	0.009579	0.028108
0.034512	0.056841	0.222481	0.153004	0.073009	0.245386	0.042495	0.101275	0.042712	0.054285	0.165374	0.041818	0.052546	0.050178	1.027394	0.045935
1.047505	1.313713	1.244875	1.521334	1.533551	1.303634	1.425823	1.481936	1.582367	1.435946	1.123821	1.100883	1.202442	1.518228	0.575411	1.688421
3.950614	4.388544	4.368869	4.447669	4.495922	4.450591	4.126804	4.52856	4.289997	4.460935	3.831076	4.118468	4.083153	4.496505	2.886937	3.494666

We note that the output multipliers have values greater than one. This is due to the indirect demand generated for goods as intermediate inputs in all sectors. In our case for the Singapore economy, the rattan processing sector (23) has the highest output multiplier.

4.4 Impact of $1 million Increase in Tourist Expenditure

Suppose there is an increase of $1 million in tourist expenditure. What would be the impact on Singapore's economy? The increase in expenditure will increase the total output of all sectors. The additional output will require direct inputs from each sector and these are obtained as a product of technical coefficients and the additional output level (equation 9).

Table 4.4 Effect of an Increase in Y on X (in millions of Singapore dollars)

Industry	Effect of $1 M on Y	Resultant Changes in X (Endogenous C)
1	0	0.076951
2	0	0.093066
3	0	0.017188
4	0	0.000868
5	0	0.000739
6	0	0.01385
7	0	0.017186
8	0	0.022747
9	0	0.022261
10	0	0.022323

11	0	0.025708
12	0	0.037277
13	0	0.022033
14	0	0.023066
15	0	0.010453
16	0	0.06934
17	0	0.009371
18	0	0.056883
19	0	0.003399
20	0	0.00814
21	0	0.001716
22	0	0.003646
23	0	0.000256
24	0	0.006125
25	0	0.017619
26	0	0.014715
27	0	0.031667
28	0	0.003367
29	0	0.009433
30	0	0.009277
31	0	0.021093
32	0	0.012193
33	0	0.032213
34	0	0.006428
35	0	0.002407
36	0	0.006488
37	0	0.001146
38	0	0.001801
39	0	0.000461
40	0	0.001808
41	0	0.000846
42	0	0.008524
43	0	0.002805
44	0	0.02693
45	0	0.013295

46	0	0.011408
47	0	0.001911
48	0	0.032429
49	0	0.013455
50	0	0.023018
51	0	0.004168
52	0	0.01593
53	0	0.008821
54	0	0.027855
55	0	0.016067
56	0	0.001496
57	0	0.039581
58	0	0.011358
59	0	0.020609
60	0.572000	0.773776
61	0.159000	0.263877
62	0.205000	0.223861
63	0.017500	0.140619
64	0.017500	0.059304
65	0	0.063467
66	0	0.021539
67	0	0.093591
68	0	0.086584
69	0	0.039743
70	0	0.019604
71	0.026000	0.051254
72	0	0.032369
73	0	0.016763
74	0	0.023699
75	0.003000	0.067725
Total	1.000000	2.994989

With an increase of $1 million dollars in tourist expenditures, gross output for Singapore increased by 0.0116%. (**Table 4.4.1**)

Table 4.4.1 Effect of Increased Tourist Expenditure on Gross Output. (in millions of Singaporean dollars)

Industry	Gross Output (old)	Gross Output (with endogenous C)
1	345.2	345.2651
2	40.5	40.50461
3	55.5	55.50813
4	38.9	38.90067
5	757.1	757.1004
6	37.6	37.60657
7	44.6	44.60745
8	148.6	148.6199
9	89.7	89.71338
10	146.6	146.614
11	119.5	119.5163
12	165.8	165.8237
13	83.0	83.01355
14	129.3	129.3209
15	182.4	182.4069
16	34.7	34.70401
17	33.5	33.5036
18	628.5	628.5526
19	27.9	27.90264
20	33.0	33.00371
21	187.4	187.4013
22	263.5	263.5032
23	14.4	14.40022
24	65.7	65.70539
25	9.8	9.801246
26	80.9	80.91115

27	173.5	173.526
28	48.7	48.7017
29	75.2	75.2053
30	49.5	49.50574
31	166.6	166.6107
32	69.9	69.90371
33	1956.4	1956.418
34	49.6	49.60418
35	1.9	1.900247
36	21.9	21.90228
37	23.7	23.70036
38	74.4	74.40106
39	25.0	25.00037
40	53.4	53.40159
41	4.8	4.800125
42	104.7	104.702
43	32.9	32.90077
44	329.5	329.5142
45	222.8	252.8025
46	132.5	132.5038
47	25.0	25.00058
48	1088.2	1088.219
49	5.9	5.900676
50	83.0	83.00607
51	683.7	683.7027
52	12.2	12.20138
53	116.8	116.8038
54	98.1	98.11338
55	54.1	54.10492
56	14.1	14.10146
57	214.9	214.9396
58	58.0	58.01136
59	1355.9	1355.921
60	2835.7	2836.474
61	669.7	669.9639

62	125.7	125.9239
63	1930.0	1930.141
64	204.9	204.9593
65	583.2	583.2635
66	165.3	165.3215
67	778.6	778.6936
68	481.8	481.8866
69	264.3	264.3397
70	131.7	131.7196
71	161.9	161.9513
72	231.9	231.9324
73	1176.4	1176.417
74	157.6	157.6237
75	0	0
Total	21089.1	21091.55

Tourism Multiplier

We can also obtain the tourism multiplier from **Table 4.4.1**. By subtracting the new gross output from the old, we obtain 2.45. This implies that when tourist increase their expenditures by $1 million, the Singaporean economy gains by generating an increase in gross output of 2.45.

Income Multipliers

Income multipliers translate the impact of final demand expenditure changes into changes in income received by households, that is, labour supply. This is in contrast to output multipliers which translate changes in final demand into the total value of sectoral output. The remuneration of factors of production in a sector is considered as value-added or factor income generated. In our input-output table, the gross value-added for each sector consists of compensation of employees (wages), gross operating surplus, import duties, excise duties and other commodity tax as well as other indirect taxes.

From **Table 4.1.1** in Chapter 3, the value-added per unit output coefficient, or simply value-added coefficient for each sector can be obtained by dividing the sum of all the five components mentioned above in each sector by the corresponding sectoral total output. The resulting value-added coefficients are shown in **Table 4.1.4**.

The income multiplier of a sector **j** is the total value-added or income generated as a result of a dollar's worth of final demand of sector **j**'s output. The income multipliers are computed in the manner similar to that of the output multipliers. For instance, the income multiplier for the first industry (sector) is obtained by summing up the value-added generated in every sector when $\mathbf{Y_1} = \mathbf{1}$, and $\mathbf{Y_2 \ldots Y_n} = \mathbf{0}$. That is, the income multiplier for the livestock sector is 0.343551. The new wages for the 75 sectors in the Singaporean economy, after the increase in tourism expenditure are computed and presented in **Table 4.4.2**.

Table 4.4.2 Effect of Increased Tourist Expenditures on Wages.

Industry	Wages (old)	Wages (with endogenous C)
1	16.7	16.70315
2	3.4	3.400387
3	4.7	4.700688
4	8.8	8.800151
5	15.3	15.30001
6	4.2	4.200734
7	2.0	2.000334
8	9.8	9.80131
9	6.6	6.600985
10	4.7	4.700449
11	9.3	9.30127
12	4.8	4.800685
13	15.2	15.20248
14	7.2	7.201165
15	20.8	20.80079
16	2.5	2.500289
17	6.9	6.900742
18	105.1	105.1088
19	5.8	5.800549
20	2.5	2.500281
21	16.9	16.90012
22	33.7	33.7004
23	1.5	1.500023
24	12.9	12.90106
25	1.7	1.700216
26	8.7	8.701199
27	37.4	37.4056
28	6.4	6.400224
29	4.8	4.800338
30	5.1	5.100591
31	20.0	20.00129
32	8.3	8.300441

33	53.9	53.90048
34	8.5	8.500717
35	0.5	0.500065
36	5.7	5.700595
37	5.7	5.700087
38	2.7	2.700039
39	3.4	3.40005
40	7.3	7.300217
41	0.4	0.40001
42	9.0	9.000175
43	2.5	2.500058
44	45.2	45.20195
45	40.9	40.90046
46	24.3	24.3007
47	2.9	2.900068
48	129.1	129.1023
49	1.4	1.40016
50	12.1	12.10088
51	159.1	159.1006
52	3.2	3.200363
53	24.4	24.40079
54	5.4	5.400737
55	7.6	7.600691
56	2.2	2.200229
57	23.5	23.50433
58	11.3	11.30221
59	334.1	334.1051
60	577.5	577.6576
61	130.1	130.1513
62	37.0	37.06589
63	382.0	382.0278
64	39.6	39.61146
65	143.4	143.4156
66	44.2	44.20576
67	29.3	29.30352

68	170.9	170.9307
69	0	0
70	46.0	46.00685
71	33.8	33.8107
72	44.2	44.20617
73	661.1	661.1094
74	115.0	115.0173
75	0	0
Total	3794.1	3794.581

Balance of Payments

The effect of increased tourist expenditures on the balance of payments can also be obtained from our analysis. Taking the figures of the technical coefficients of the total imports, and multiplying them by the change in the values of the $\mathbf{X}_i$'s, we can obtain the difference in the change of imports of the Singaporean economy. When this figure is small, there tends to be a surplus in the balance of payment in the economy. This is the case for Singapore as can be seen in **Table 4.4.3**. With $1 million increase in tourist expenditure, the total change in imports is only 0.544333.

Table 4.4.3 Effect of Increased Tourist Expenditures on the Balance of Payments With Endogenous Consumption.

Industry	Technical Coefficients	Change in X	Change in Imports
1.	0.153507	0.076951	0.011812
2.	0.950459	0.093066	0.088455
3.	0.527257	0.017188	0.009062
4.	0.232742	0.000868	0.000202
5.	0.498144	0.000739	0.000368
6.	0.525851	0.01385	0.007283
7.	0.566569	0.017186	0.009737
8.	0.12691	0.022747	0.002887
9.	0.398794	0.022261	0.008878
10.	0.3727	0.022323	0.00832
11.	0.365374	0.025708	0.009393
12.	0.364994	0.037277	0.013606
13.	0.385185	0.022033	0.008487
14.	0.092632	0.023066	0.002137
15.	0.338411	0.010453	0.003537
16.	0.942167	0.06934	0.06533
17.	0.615826	0.009371	0.005771
18.	0.075735	0.056883	0.004308
19.	0.222841	0.003399	0.000757
20.	0.544199	0.00814	0.00443
21.	0.256054	0.001716	0.000439
22.	0.134647	0.003646	0.000491
23.	0.127273	0.000256	0.000033
24.	0.120482	0.006125	0.000738
25.	0.929293	0.017619	0.016373
26.	0.242509	0.014715	0.003569
27.	0.180057	0.031667	0.005702
28.	0.494813	0.003367	0.001666
29.	0.437967	0.009433	0.004131
30.	0.38125	0.009277	0.003537
31.	0.491453	0.021093	0.010366

32.	0.69569	0.012193	0.008483
33.	0.454601	0.032213	0.014644
34.	0.349081	0.006428	0.002244
35.	0.897297	0.002407	0.00216
36.	0.64791	0.006488	0.004204
37.	0.683578	0.001146	0.000783
38.	0.409524	0.001801	0.000738
39.	0.196141	0.000461	0.00009
40.	0.123153	0.001808	0.000223
41.	0.852761	0.000846	0.000721
42.	0.761666	0.008524	0.006492
43.	0.726517	0.002805	0.002038
44.	0.471955	0.02693	0.01271
45.	0.810673	0.013295	0.010778
46.	0.66362	0.011408	0.007571
47.	0.694002	0.001911	0.001326
48.	0.40503	0.032429	0.013135
49.	0.949787	0.013455	0.012779
50.	0.736341	0.023018	0.016949
51.	0.362636	0.004168	0.001511
52.	0.913105	0.01593	0.014546
53.	0.569797	0.008821	0.005026
54.	0.519589	0.027855	0.014473
55.	0.693831	0.016067	0.011148
56.	0.020833	0.001496	0.000031
57.	0	0.039581	0
58.	0	0.011358	0
59.	0	0.020609	0
60.	0	0.773776	0
61.	0	0.263877	0
62.	0	0.223861	0
63.	0	0.140619	0
64.	0	0.059304	0
65.	0	0.063467	0
66.	0	0.021539	0

67.	0	0.093591	0
68.	0	0.086584	0
69.	0	0.039743	0
70.	0	0.019604	0
71.	0	0.051254	0
72.	0	0.032369	0
73.	0	0.016763	0
74.	0	0.023699	0
75.	1	0.067725	0.067725
Total	27.70521	2.994989	0.544333

4.5 Interpretation of Results

Tourism output multipliers are considered the most important from an economic point of view and the results are now available for a wide range of countries. **Table 4.5** reproduces the comparative data given by the Singapore Department of Statistics (1983) for 16 countries; and Singapore is added to the list for the sake of comparison. For making actual comparisons, one should, however, use the output multiplier based on the latest available data. Since our present study uses information that was published in 1978 and as mentioned previously that data is valid for up to 10 years, the output multiplier of 2.45 represents the current significance of Singapore's tourism industry. Therefore, the output effects of tourism in Singapore compares very closely with those of India, Japan, France, Scandinavia, Australia and New Zealand whose multiplier values are near two.

Table 4.5 Output Multipliers by Country

Country	Output Multipliers
Canada	1.9699
United States	1.9772
ASEAN	1.9783
Hong Kong	1.9650
India	2.0202
Japan	1.9919
Taiwan	1.9833
France	1.9932
Germany	1.9692
Italy	1.9837
Netherlands	1.9846
Scandinavia	1.9906
Switzerland	1.9877
United Kingdom	1.9580
Australia	1.9955
New Zealand	1.9969

Source:Computed from Singapore Department of Statistics (1983)

A relatively higher multiplier value for Singapore than for the other countries can be justified by the fact that the tourism industry in Singapore has well-developed linkages within the economy. Linkages between tourism and all the 75 input-output industries which are included in Singapore's input-output table indicate that most of the commonly identifiable tourist industries such as transportation services, hotels, restaurants, wholesale and retail trades, food and beverage, communication and entertainment services, and other recreational services have high backward linkages.

The multiplier analysis was also applied to determine the import leakage. An import multiplier of 0.544333 means that out of every $1 of tourist expenditure, about 54 cents leak out through import requirements. Because Singapore is less than 625km^2 and has virtually no natural resources, local goods and services have a high import content. The result is, therefore, not surprising.

Net foreign exchange earnings (i.e., the foreign exchange remaining in Singapore from tourism) can be easily derived from the above leakage analysis. Since 54 cents out of $1 of tourist expenditure goes out of the country through import requirements, the net foreign currency earned by the same dollar would be 46 cents.

The effects of increased tourism expenditures on the Singaporean economy as determined by using the input-output model have been summarized in **Table 4.4.1** and **Table 4.4.2**. With an increase in $1 million of expenditures, the sectors that were affected most were wholesale and retail trade (60), restaurants and other eating places (61), hotels and lodging houses (62) respectively. Since the gross output increased the most in these three sectors, the authorities could perhaps look into further developing these sectors.

On the other hand, the increase of $1 million in tourist spending also has an impact on the wages earned by the various sectors. From **Table 4.4.2**, we see that the four highest paid sectors are wholesale and retail trade (60), hotels and lodging houses (62), restaurants and other eating places (61), and other business services (68). Hence, it would be especially beneficial for employees of these sectors to promote tourism in Singapore.

Chapter 5.

Industry Linkages: Identification of Key Sectors

5.1 Introduction

Multiplier analysis, as discussed in Chapter 4, can be extended to examine linkages or sectoral interdependence which in turn can help us to identify key sectors in the Singaporean economy. Over time, changes in such linkages and key sectors, as identified under various sets of input-output tables, would show useful results of structural changes in the economy. Such structural changes could signal the need for new government policies or industrial strategies. The main objective of this chapter is to discuss the structure of industry linkages in the Singaporean economy with the help of a mathematical technique known as q-analysis. To put our q-analysis of the structure of the Singaporean economy into a proper perspective, we shall first review the concepts of backward and forward linkages often used in input-output analysis. For a discussion of these concepts, we refer the reader to Miller and Blair (1985). After a brief review of the traditional concepts of backward and forward linkages in section 5.2, the main ideas of a q-analysis are explained in section 5.3. Section 5.4 contains the results of our q-analysis of the structure of the Singaporean economy.

5.2 Backward and Forward Linkages

Backward Linkage

In the framework of an input-output model, production by a particular sector has two kinds of economic effects on other sectors in the economy. If sector **j** increases its output, it means there will be increased demands from sector **j** (as a purchaser) on the sectors whose products are used as inputs to production in **j**. This is the direction of causation in the usual demand-side model. The term "backward linkage" is used to indicate this kind of interconnection of a particular sector to those sectors from which it purchases inputs.

The measure or strength of the backward linkage of sector **j** - the amount by which sector **j** production depends on inputs - is given by the sum of the elements in the **jth** column of the direct-input coefficients matrix, **A**, namely $\Sigma_{i=1}^{n}\mathbf{a}_{ij}$. This is known as the direct backward linkage since the coefficients in **A** are measures of direct effects only. Thus, this can be expressed as

$$\mathbf{B(d)}_j = \Sigma_{i=1}^{n}\mathbf{a}_{ij}$$

Let **B(d)** represent the **n**-row vector whose components are the direct backward-linkage measures for the production sectors in the economy. Then

$$\mathbf{B(d)} = [\mathbf{B(d)}_1, \ldots, \mathbf{B(d)}_n] = \mathbf{iA}$$

where **i** is the **n**-row vector **(1,1,...,1)**. As defined, **B(d)** represents the structure of backward linkages of the production sector of the Singaporean economy.

Now the elements of the Leontief inverse incorporate both direct and indirect connections between sectors. Hence, to take the total measure of the backward linkage of sector **j**, we can use the sum of the elements in the **jth** column of the direct and indirect coefficients matrix, $(\mathbf{I} - \mathbf{A})^{-1}$, whose elements have been denoted by $\mathbf{q}_{ij}$.

This can be expressed as the output multipliers for each sector

$$\mathbf{B(d + i)}_j = \Sigma_{i=1}{}^{n}\mathbf{q}_{ij}$$

Hence, the corresponding row vector of direct and indirect backward-linkage measures for each sector is

$$\mathbf{B(d + i)} = \mathbf{i(I - A)}^{-1}$$

Forward Linkage

An increase in the output in sector **j** means additional amounts of product **j** that are available to be used as inputs to other sectors for their own production. That is, there will be more supplies from sector **j** (as a seller) to the sectors which use good **j** in their production. This is the direction of causation in the supply-side model. The term "forward linkage" is used to indicate this kind of interconnection of a particular sector to those sectors to which it sells its output.

Parallel to the direct backward-linkage measure, the direct forward linkage of sector **i** is defined as the sum of the **ith** row of elements in **A**; that is,

$$\mathbf{F(d)_i = \Sigma_{j=1}^{n} a_{ij}}$$

and the **n**-column vector of direct forward linkages for all the sectors in the economy is

$$\mathbf{F(d) = Ai^T}$$

where $\mathbf{i^T}$ is the transpose of the **n**-row vector $\mathbf{(1,...,1)}$.

Similarly, the direct and indirect forward linkage of sector **i** is the sum of the elements in the **ith** row of $(\mathbf{I} - \mathbf{A})^{-1}$, whose elements we shall denote as $\mathbf{q}_{ij}$; hence, the total forward linkage is

$$\mathbf{F(d + i)}_i = \Sigma_{j=1}^{n}\mathbf{q}_{ij} \quad \text{and}$$

$$\mathbf{F(d + i)} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{i}^T$$

A comparison of the strengths of the backward and forward linkages for the sectors in Singapore provides for a mechanism for identifying "key" or "leading" sectors in the economy. This concept would enable the government to concentrate on certain sectors which, due to their high degree of intersectoral dependency, produce "spillover" or "carryover" growth impulses to other sectors, hence stimulating overall growth. This is especially useful in developing economies like Singapore, where capital and other resources are in short supply and competing needs have to be rationally and logically ranked to allow for a more efficient use of these limited resources.

If the backward linkage of sector **i** is larger than that of sector **j**, one might conclude that a dollar's worth of expansion of sector **i**'s output would be more beneficial to the economy than would an equal expansion in sector **j**'s output, in terms of the productive activity that it would generate throughout the economy.

Similarly, if the forward linkage of the sector **r** is larger than that of sector **s**, it could be said that a dollar's worth of expansion in the output of sector **r** is more essential to the economy than a similar expansion in the output of sector **s**, from the point of view of the overall productive activity that it would support.

5.3 The Geometric Structure of the Singaporean Economy (from the perspective of forward linkages)

The concepts of backward and forward linkages discussed in the preceding section represent, in a quantitative manner, how an industry is connected to the remaining parts of the production sector. In this section, we look at backward and forward linkages, not from the numerical perspective but through the geometrical ideas of connectivity. Here we focus our attention on how the various pieces of a system fit together, and the manner in which this connective structure serves to characterize the properties of the system. In short, we are interested in the global geometry of the Singaporean economy instead of its local properties.

In order to capture the geometric essence of any system, we must select an appropriate geometric structure in which its observations can be encoded. It turns out that the machinery of simplicial complexes of algebraic topology provides an excellent framework for analyzing the connective structures of many systems in such diverse domains as arts, literature, ecology, and games of chance. See, for example, Johnson (1985) for an analysis of the abstract structure of the famous engraving "Sky and Water" of the well-known Dutch artist M.C. Escher (1898 - 1971); Atkin (1974) invented the notion of q-connection to study the global geometry of the painting "Checkboard, Bright Colors, 1919" of the Dutch artist Piet Mondrian (1872 - 1944); Casti (1979) used the technique of q-analysis to shed light upon the hidden structures of a complex food web.

Let $\mathbf{X} = \{\mathbf{x}_1, \mathbf{x}_2, \ldots, \mathbf{x}_{75}\}$ be the set of industries in the Singaporean economy. Here

$$\begin{aligned} \mathbf{x}_1 &= \text{industry 1 (livestock)} \\ \mathbf{x}_2 &= \text{industry 2 (other agriculture)} \\ &\vdots \\ \mathbf{x}_{75} &= \text{industry 75 (other goods and services)} \end{aligned}$$

Let $\Lambda = (\lambda_{ij})_{\substack{i = 1,\ldots,75 \\ j = 1,\ldots,75}}$ be the matrix whose entries are

defined as follows:

$\lambda_{ij} = 1$ if industry $\mathbf{i}$ sells part of its output to industry $\mathbf{j}$

$\lambda_{ij} = 0$ otherwise

We shall call Λ the incidence matrix of forward linkages. It is clear that Λ can be obtained from the matrix of technical coefficients **A** by replacing every non-zero entry $\mathbf{a}_{ij}$ with 1.

Now from the input-output table, we observe that industry 1 sells its output to the following industries: $\mathbf{x}_1$ (itself), $\mathbf{x}_3$, $\mathbf{x}_6$, $\mathbf{x}_8$, $\mathbf{x}_{11}$, $\mathbf{x}_{20}$, $\mathbf{x}_{61}$, $\mathbf{x}_{63}$, $\mathbf{x}_{71}$, $\mathbf{x}_{73}$. From the forward linkage point of view, industry 1 can be represented by the abstract 9-simplex $\sigma_1 = \mathbf{x}_1\mathbf{x}_3\mathbf{x}_6\mathbf{x}_8\mathbf{x}_{11}\mathbf{x}_{20}\mathbf{x}_{61}\mathbf{x}_{63}\mathbf{x}_{71}\mathbf{x}_{73}$ whose vertices are $\mathbf{x}_1$, $\mathbf{x}_3$, $\mathbf{x}_6$, $\mathbf{x}_8$, $\mathbf{x}_{11}$, $\mathbf{x}_{20}$, $\mathbf{x}_{61}$, $\mathbf{x}_{63}$, $\mathbf{x}_{71}$, $\mathbf{x}_{73}$.

Similarly, from the forward-linkage point of view, industry 3 supplies its output to $\mathbf{x}_3$, $\mathbf{x}_5$, $\mathbf{x}_{11}$, $\mathbf{x}_{12}$, $\mathbf{x}_{61}$, $\mathbf{x}_{63}$, $\mathbf{x}_{73}$. That is, industry 3 - from the perspective of forward linkages - is the following abstract 6-simplex

$$\sigma_6 = \mathbf{x}_3\mathbf{x}_5\mathbf{x}_{11}\mathbf{x}_{12}\mathbf{x}_{61}\mathbf{x}_{63}\mathbf{x}_{73}$$

Let $\mathbf{K} = \{\sigma_1, \sigma_2, \ldots, \sigma_{75}\}$, where σ_i, $\mathbf{i} = 1, \ldots, 75$, is the abstract simplex that represents industry **i** from the perspective of forward linkages. In the terminology of algebraic topology, **K** is known as a complex whose elements are simplexes.

For any two simplexes σ_i and σ_j, it is clear that

$$\Sigma_{k=1}^{75}\lambda_{ik}\lambda_{jk}$$

represents the number of industries that use both the outputs of σ_i and σ_j as intermediate inputs. For example, both industries 1 and 6 - namely σ_1 and σ_6 - sell part of their outputs to $\mathbf{x}_3$, $\mathbf{x}_{11}$, $\mathbf{x}_{61}$, $\mathbf{x}_{73}$, i.e.,

$$\Sigma_{k=1}^{75}\lambda_{1k}\lambda_{6k} = 4$$

In this case σ_1 and σ_6 have exactly 4 vertices in common, namely $\mathbf{x}_3$, $\mathbf{x}_{11}$, $\mathbf{x}_{61}$, $\mathbf{x}_{73}$. That is, σ_1 and σ_6 share a face (a simplex) of dimension 3, namely the abstract 3-simplex $\mathbf{x}_3\mathbf{x}_{11}\mathbf{x}_{61}\mathbf{x}_{73}$.

On the other hand, if $\Sigma_{k=1}^{75}\lambda_{ik}\lambda_{jk} = 0$, then σ_i and σ_j have no vertex in common, i.e., they share the empty simplex 0.

Let $(\mathbf{m}_{ij})_{\substack{i = 1,\ldots,75 \\ j = 1,\ldots,75}} = \Lambda\Lambda^T$,

where Λ^T is the transpose of Λ. The preceding discussion demonstrates that $\mathbf{m}_{ij}$ is the number of industries that use the outputs of both σ_i and σ_j as intermediate inputs. The dimension of the common simplex shared by σ_i and σ_j is $\mathbf{m}_{ij} - 1$. The matrix $\{(\mathbf{m}_{ij} - 1)\}_{\substack{i = 1,\ldots,75 \\ j = 1,\ldots,75}}$ is called the connectance matrix. Note that $\mathbf{m}_{ij} - 1 = -1$ implies that $\mathbf{m}_{ij} = 0$, i.e., σ_i and σ_j

The Impact of Tourism On The Republic Of Singapore

by

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Major Paper presented to the

Department of Economics of the University of Ottawa

in partial fulfilment of the requirements of the M.A. Degree

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Ottawa, Ontario

March, 1995

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have no vertex in common. Furthermore, $m_{ii} - 1$ is the dimension of the abstract simplex σ_i.

Let $d = \max_{i=1,\ldots,75}\{(m_{ii} - 1)\}$

Then **d** is the dimension of the simplex in **K** that has the highest dimension. We also call **d** the dimension of the complex **K**.

q-Connection Analysis

For each $q = 0,1,\ldots,d$, let X^q be the subset of **X** that contains all the simplexes of dimension greater than or equal to **q**. It is clear that as **q** decreases X^q will get larger and larger and when **q** reaches **0**, X^q might be equal to **X**.

For each $q = 0,1,\ldots,d$, let $\sim_q$ be the relation defined on X^q as follows:

$\sigma_i \sim_q \sigma_j$ if and only if there exists a sequence of simplexes, say $\tau_1,\ldots,\tau_k$, in X^q such that

$$\tau_1 = \sigma_i,\ \tau_k = \sigma_j$$

τ_1 and τ_2 share a face of dimension n_1

τ_2 and τ_3 share a face of dimension n_2

.

.

τ_{k-1} and τ_k share a face of dimension n_k

$$q = \min\{n_1, n_2, \ldots, n_k\}$$

: is clear that $\sim_q$ called the relation of q-connection, is an ꞁuivalence relation on $\mathbf{X}^q$. Hence the relation of q-connection ırtitions $\mathbf{X}^q$ into disjoint equivalence classes, i.e., disjoint ›mponents of $\mathbf{X}^q$.

.4 Forward Linkages: a q-connection analysis of the structure of the Singaporean economy

Table 5.1 represents the matrix $\Lambda\Lambda^T$ - **[1]**, where **[1]** is the ;*75 matrix whose entries are all equal to 1. This table portrays ›mpletely the connective structure of the Singaporean economy from ıe perspective of forward linkages. In this section, we use the ıble for a q-connection analysis of the Singaporean economy.

First, we note that $\Lambda\Lambda^T$ - **[1]** is a symmetric matrix. Second, ıe entry on the **ith** row and **jth** column of $\Lambda\Lambda^T$ - **[1]** gives the imension of the face that is common to σ_i and σ_j. For example, the lement on row 1 and column 2 is 6, which indicates that σ_1 industry 1) and σ_2 (industry 2) share a face which is a 6-simplex, .e., industry 1 and industry 2 sells their outputs to the same 7 ndustries. Similarly, the entry on row 57 and column 11 indicates hat σ_{57} and σ_{11} share a face which is a 25-simplex, i.e., they sell heir productions to the same 26 industries. Also, one observes hat the entry on row 5, column 1 is -1, which indicates that stries

cally, the eccentricity of σ_2, denoted **ecc(σ_2)**, is given by onomy.

$$\mathbf{ecc}(\sigma_2) = (\mathbf{d}_2 - \mathbf{f}_2)/(\mathbf{f}_2 + 1)$$
$$= (32 - 30)/(30 + 1)$$
$$= 2/31$$

latively low value of **ecc(σ_2)** indicates that σ_2 is rather well ated in the production sector. Note that the numerator is to the difference between the dimension of σ_2, namely $\mathbf{d}_2$, and ighest-dimensional face that it has in common with the ing industries, namely $\mathbf{f}_2$. The difference $\mathbf{d}_2 - \mathbf{f}_2$ thus ents its distance from the center. It is intuitive that the e difference $\mathbf{d}_2 - \mathbf{f}_2$, the more far off the center σ_2 is. in the expression for **ecc(σ_2)** we normalize the distance in ing $\mathbf{d}_2 - \mathbf{f}_2$ by $\mathbf{f}_2 + 1$.

arly, we have $\mathbf{d}_1 = 9$, $\mathbf{f}_1 = 9$, i.e., **ecc(σ_1) = 0**: industry 1 is ctly well integrated in the production sector.

45	0
46	0
47	0
48	0
49	0
50	0
51	1/16
52	0
53	0
54	0
55	0
56	0
57	1/68
58	1/58
59	1/52
60	1/58
61	0
62	0
63	3/68
64	2/65
65	2/61
66	0
67	1/62
68	1/66
69	0
70	0
71	0
72	1/47
73	1/53
74	0
75	1/58

As portrayed in the above table, 60 industries have zero eccentricity, i.e., they are perfectly integrated into the production sector. The remaining 15 industries have nonzero but extremely low eccentricities, which indicates that they are well integrated into the production sector.

From $\Lambda\Lambda^T$ - **[1]**, one finds that the greatest entry is the diagonal element on row 63. This element is $\mathbf{d_{63} = 70}$; which is the dimension of the abstract simplex σ_{63}. **Table 5.1** reveals that there is only one entry equal to 70. Hence $\mathbf{X}^{70}$ = **{63}**, i.e., $\mathbf{X}^{70}$ contains a single element. The equivalence relation $\sim_{70}$ or $\mathbf{X}^{70}$ thus gives us a single equivalence class (component), namely $\mathbf{X}^{70}$ itself.

For **q = 69**, the only simplex that has dimension greater than or equal to 69 is still industry 63. Hence $\mathbf{X}^{69}$ = **{63}** and the equivalence relation $\sim_{69}$ or $\mathbf{X}^{69}$ still gives us one equivalence class, namely **{63}** itself.

For **q = 68**, the table reveals that $\mathbf{X}^{68}$ = **{63, 57}** i.e., $\mathbf{X}^{68}$ contains two industries, namely 63 and 57. However, there is no q-connection **(q = 68)** between σ_{63} and σ_{57}, i.e., industry 63 and industry 57 do not sell to the same 68 industries. Hence σ_{63} and σ_{57} do not belong to the same equivalence class. We now have two distinct components **{63}** and **{57}**.

For **q = 67**, $\mathbf{X}^{67}$ = **{67, 57}**. However, the entry on row 63 and column 57 is equal to 67, i.e., σ_{63} and σ_{57} share a face of dimension 67. Hence they are q-connected **(q = 67)**. In this case, there is only one component, namely $\mathbf{X}^{67}$ itself.

For **q = 66**, $\mathbf{X}^{66}$ = **{63,57,64,68}**. The same analysis can be carried out, and one discovers that $\mathbf{X}^{66}$ is partitioned into 3 distinct components **{63,57}**, **{64}**, **{68}**.

Table 5.4 lists the complete results of our q-analysis for each level of connection **q**, **q = 0,..,75**. Observe that the higher the value of **q**, the higher the degree of connectivity of the elements belonging to the same component. Economically, a component or an equivalence class at level **q** is a cluster of industries with the following property. For any industry, say **i**, in this component, one can find in this same component an industry, say **j**, such that both **i** and **j** sell their productions to the same **(q + 1)** industries. Furthermore, the greater the number of components, the less well integrated the industries in $\mathbf{X}^{q}$ are at the q-connection level. Thus for **q = 68**, we have two components while for **q = 66**, we have three components. Hence the production sector is more disjoint at **q = 66** than at **q = 68**.

Table 5.4 reveals that the number of components reaches a maximum equal to 4 when **q** descends from 70 to 52. After that the number of components assumes the value of 2 three times and the value of 1 for the remaining cases. The low values assumed by the number of components indicate that the Singaporean economy is extremely well integrated from the forward-linkage perspective. This result reinforces our analysis of eccentricities.

Table 5.1 Forward Linkages

[The Connection Matrix {[Landa*Landa Transpose] - [1]}

Industry:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	9	6	5	0	-1	5	5	6	6	7	7	2	2	1	1
2	6	32	6	6	2	5	6	7	7	16	18	2	3	2	7
3	5	6	6	0	-1	5	4	4	5	6	5	1	2	1	0
4	0	6	0	9	0	0	0	0	0	0	3	-1	-1	-1	0
5	-1	2	-1	0	4	-1	-1	-1	-1	0	2	-1	-1	-1	1
6	5	5	5	0	-1	5	4	4	5	5	5	0	2	1	0
7	5	6	4	0	-1	4	8	7	8	8	8	0	5	1	0
8	6	7	4	0	-1	4	7	9	7	9	8	2	4	1	0
9	6	7	5	0	-1	5	8	7	9	9	9	0	5	1	0
10	7	16	6	0	0	5	8	9	9	20	14	3	5	2	3
11	7	18	5	3	2	5	8	8	9	14	27	1	5	1	7
12	2	2	1	-1	-1	0	0	2	0	3	1	4	0	-1	0
13	2	3	2	-1	-1	2	5	4	5	5	5	0	5	1	0
14	1	2	1	-1	-1	1	1	1	1	2	1	-1	1	2	-1
15	1	7	0	0	1	0	0	0	0	3	7	0	0	-1	13
16	7	17	5	4	3	4	6	5	7	11	15	2	4	1	12
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4	4	8	1	2	4	0	4	-1	11	3	12	12	11	11
15	11	22	3	6	12	1	9	1	27	10	47	39	35	46
12	10	18	3	8	14	0	8	0	25	9	51	45	38	45
13	10	19	2	8	15	-1	8	0	26	12	50	47	39	43
6	5	7	2	4	6	-1	3	0	9	3	15	13	9	14
0	0	0	-1	-1	0	-1	-1	-1	2	3	7	7	6	7
4	2	5	-1	1	5	0	3	-1	8	3	17	17	15	18
4	2	6	0	0	4	-1	2	0	9	3	12	12	10	11
1	1	2	-1	0	4	-1	0	-1	2	0	7	7	5	7
1	1	2	-1	0	2	-1	0	-1	1	0	2	2	1	2
13	8	16	2	4	13	0	9	0	23	9	39	34	30	38
6	5	8	0	1	6	0	3	1	5	2	9	7	6	10
14	9	17	2	5	12	1	9	0	18	6	29	25	21	28
12	11	17	2	5	11	1	8	1	14	4	22	18	15	22
16	11	23	2	6	14	1	9	1	29	11	52	45	40	50
17	10	21	2	9	10	1	9	0	20	12	32	29	28	23
17	7	15	1	4	7	1	8	0	12	7	17	15	14	14
7	11	11	2	4	7	-1	4	1	8	3	11	9	7	11
15	11	25	3	7	11	1	9	1	17	8	25	21	18	21
1	2	3	3	0	2	-1	1	0	2	0	3	2	0	3
4	4	7	0	9	5	-1	2	-1	5	3	9	9	8	5
7	7	11	2	5	16	-1	6	0	11	5	14	13	10	13
1	-1	1	-1	-1	-1	1	0	-1	0	-1	1	0	0	1
8	4	9	1	2	6	0	9	0	9	3	9	9	8	8
0	1	1	0	-1	0	-1	0	1	0	0	1	0	0	1
12	8	17	2	5	11	0	9	0	31	9	29	27	25	27
7	3	8	0	3	5	-1	3	0	9	15	15	15	15	10
17	11	25	3	9	14	1	9	1	29	15	68	58	50	55
15	9	21	2	9	13	0	9	0	27	15	58	58	48	47
14	7	18	0	8	10	0	8	0	25	15	50	48	52	41
14	11	21	3	5	13	1	8	1	27	10	55	47	41	58
14	8	19	1	6	13	0	9	0	24	13	48	46	46	41
0	-1	0	-1	0	0	-1	0	-1	0	0	0	0	0	-1
17	11	25	3	9	15	1	9	1	31	15	67	57	51	57
17	11	24	2	9	14	1	9	1	29	15	64	55	50	54
16	11	23	3	5	14	1	8	1	27	12	58	49	45	56
17	11	24	2	8	14	1	9	1	29	15	62	54	49	55
17	11	25	3	7	15	1	9	1	28	14	60	52	47	54
17	11	25	3	9	14	1	9	1	28	15	65	56	50	54
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
4	0	5	0	1	2	-1	2	-1	6	4	8	8	7	5
2	-1	4	-1	1	1	-1	1	-1	4	5	7	7	7	4
14	7	18	1	8	11	0	9	0	26	14	45	43	43	35
14	8	20	1	7	15	0	8	0	27	13	50	47	46	43
-1	0	0	-1	-1	0	-1	0	-1	0	0	0	0	0	0
14	9	23	2	7	13	1	8	1	25	10	55	46	43	52

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
6	0	9	7	6	7	6	6	-1	1	3	7	7	-1	6
28	0	32	30	28	30	29	30	-1	1	2	24	30	-1	27
5	0	6	5	4	5	5	5	-1	1	2	4	6	-1	4
9	-1	9	9	9	9	8	9	-1	-1	-1	4	9	-1	8
3	-1	4	4	4	4	4	4	-1	-1	-1	2	3	-1	4
4	0	5	4	3	4	4	4	-1	1	2	4	5	-1	3
6	0	8	7	6	7	7	7	-1	1	2	7	6	-1	6
7	0	9	7	6	7	7	7	-1	1	2	9	8	-1	6
7	0	9	8	7	8	8	8	-1	1	2	7	7	-1	7
16	0	20	18	17	18	18	18	-1	2	2	15	17	-1	16
22	0	27	25	23	24	23	25	-1	1	2	22	23	-1	23
3	0	4	3	2	3	3	3	-1	0	1	3	4	-1	3
4	0	5	5	4	5	5	5	-1	1	2	4	4	-1	4
2	-1	2	2	2	2	2	2	-1	0	1	2	2	-1	1
8	0	13	13	11	13	12	12	-1	1	0	6	9	-1	12
29	0	37	37	33	37	35	36	-1	6	6	23	29	0	33
6	0	8	7	5	7	7	7	-1	0	0	5	7	-1	6
2	0	4	4	2	4	4	4	-1	2	2	4	3	-1	3
0	0	1	1	0	1	1	1	-1	0	0	0	0	-1	1
2	0	5	5	4	5	4	4	-1	1	0	2	2	-1	4
8	-1	9	9	9	9	8	9	-1	-1	-1	7	8	-1	8
17	0	24	23	22	23	22	23	-1	1	1	15	19	0	22
1	0	2	2	1	2	1	1	-1	0	0	1	1	-1	2
6	0	6	6	5	6	6	6	-1	1	0	6	5	0	4
21	0	28	27	25	28	27	27	-1	8	7	20	22	-1	22
38	0	47	46	43	47	45	46	-1	8	7	33	38	-1	40
44	0	50	50	45	48	47	51	-1	8	7	44	43	0	42
28	0	35	34	33	34	33	34	-1	0	0	23	29	-1	33
5	0	6	6	5	6	6	6	-1	3	2	5	3	-1	3
12	0	13	13	12	13	13	13	-1	3	1	11	11	0	11
37	0	48	47	46	47	47	47	-1	4	2	30	37	0	45
38	0	51	48	44	46	44	49	-1	2	1	35	39	0	43
38	0	51	48	44	47	45	49	-1	5	5	39	40	0	41
10	0	15	15	13	15	14	14	-1	2	1	9	10	-1	12
6	-1	7	7	7	7	7	7	-1	-1	-1	4	5	-1	6
17	-1	18	18	18	18	17	18	-1	-1	-1	13	16	-1	17
11	-1	12	12	12	12	12	12	-1	0	-1	8	11	-1	11
7	-1	7	7	7	7	7	7	-1	-1	-1	2	7	-1	6
2	-1	2	2	2	2	2	2	-1	-1	-1	1	2	-1	1
33	0	40	40	39	39	39	39	-1	4	1	25	33	0	38
7	-1	9	9	10	9	10	9	-1	-1	-1	6	8	-1	9
24	0	29	29	27	29	28	28	-1	2	1	20	23	0	26
17	0	22	22	22	22	23	22	-1	1	0	15	19	0	21
42	0	54	53	51	53	51	52	-1	6	4	36	43	0	50
26	0	32	32	27	31	30	32	-1	6	6	26	27	0	25
14	0	17	17	16	17	17	17	-1	4	2	14	14	-1	14
8	-1	11	11	11	11	11	11	-1	0	-1	7	8	0	9
19	0	25	24	23	24	25	25	-1	5	4	18	20	0	23
1	-1	3	2	3	2	3	3	-1	0	-1	1	1	-1	2
6	0	9	9	5	8	7	9	-1	1	1	8	7	-1	7
13	0	15	14	14	14	15	14	-1	2	1	11	15	0	13
0	-1	1	1	1	1	1	1	-1	-1	-1	0	0	-1	1
9	0	9	9	8	9	9	9	-1	2	1	9	8	0	8
0	-1	1	1	1	1	1	1	-1	-1	-1	0	0	-1	1
24	0	31	29	27	29	28	28	-1	6	4	26	27	0	25
13	0	15	15	12	15	14	15	-1	4	5	14	13	0	10
48	0	67	64	58	62	60	65	-1	8	7	45	50	0	55
46	0	57	55	49	54	52	56	-1	8	7	43	47	0	46
46	0	51	50	45	49	47	50	-1	7	7	43	46	0	43
41	-1	57	54	56	55	54	54	-1	5	4	35	43	0	52
49	0	49	49	46	49	48	49	-1	6	5	39	46	0	44
0	0	0	0	-1	0	0	0	-1	0	0	0	0	-1	0
49	0	70	65	60	64	61	65	-1	8	7	46	52	0	57
49	0	65	66	58	63	59	64	-1	8	7	44	49	0	55
46	-1	60	58	62	59	58	58	-1	7	5	38	47	0	56
49	0	64	63	59	64	60	62	-1	8	7	42	49	0	56
48	0	61	59	58	60	62	61	-1	8	7	40	49	0	55
49	0	65	64	58	62	61	66	-1	8	7	44	49	0	55
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
6	0	8	8	7	8	8	8	-1	8	4	7	5	-1	6
5	0	7	7	5	7	7	7	-1	4	7	7	6	-1	4
39	0	46	44	38	42	40	44	-1	7	7	47	40	0	35
46	0	52	49	47	49	49	49	-1	5	6	40	53	0	46
0	-1	0	0	0	0	0	0	-1	-1	-1	0	0	0	0
44	0	57	55	56	56	55	55	-1	6	4	35	46	0	58

Table 5.4 Forward Linkages

q	Industry	Number of Components
70	{63}	1
69	{63}	1
68	{63} {57}	2
67	{63 57}	1
66	{63 57} {64} {68}	3
65	{63 57 64 68}	1
64	{63 57 64 68 66}	1
63	{63 57 64 68 66}	1
62	{63 57 64 68 66} {65} {67}	3
61	{63 57 64 68 66 67} {65}	2
60	{63 57 64 68 66 65 67}	1
59	{63 57 64 68 66 65 67}	1
58	{63 57 64 68 66 65 67 58} {60} {75}	3
57	{63 57 64 68 66 65 67 58 60 75}	1
56	{63 57 64 68 66 65 67 58 60 75}	1
55	{63 57 64 68 66 65 67 58 60 75}	1
54	{63 57 64 68 66 65 67 58 60 75 44}	1
53	{63 57 64 68 66 65 67 58 60 75 44} {73}	2
52	{63 57 64 68 66 65 67 58 60 75 44 73} {32} {33} {59}	4
51	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27}	1
50	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27}	1

49	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61}	1
48	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31}	1
47	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26} {72}	2
46	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72}	1
45	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72}	1
44	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72}	1
43	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72}	1
42	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72}	1
41	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72} {40}	2
40	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40}	1
39	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40}	1
38	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40}	1
37	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16}	1
36	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16}	1
35	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28}	1
34	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28}	1
33	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28}	1

32	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45}	1
31	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55}	1
30	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55}	1
29	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42}	1
28	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25}	1
27	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11}	1
26	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11}	1
25	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48}	1
24	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22}	1
23	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43}	1
22	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43}	1
21	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43}	1
20	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10}	1
19	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10}	1
18	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36}	1

17	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46}	1
16	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46} {51}	2
15	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56}	1
14	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56}	1
13	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30}	1
12	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37}	1
11	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37 47}	1
10	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37 47 41}	1
9	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37 47 41 1 4 8 9 21 50 53}	1
8	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37 47 41 1 4 8 9 21 50 53 7 17 70}	1
7	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37 47 41 1 4 8 9 21 50 53 7 17 70 35 38 71}	1

6	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37 47 41 1 4 8 9 21 50 53 7 17 70 35 38 71 3 24 29}	1
5	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37 47 41 1 4 8 9 21 50 53 7 17 70 35 38 71 3 24 29 6 13 20}	1
4	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37 47 41 1 4 8 9 21 50 53 7 17 70 35 38 71 3 24 29 6 13 20 5 12 18}	1
3	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37 47 41 1 4 8 9 21 50 53 7 17 70 35 38 71 3 24 29 6 13 20 5 12 18 49}	1
2	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37 47 41 1 4 8 9 21 50 53 7 17 70 35 38 71 3 24 29 6 13 20 5 12 18 49 14 23 39}	1
1	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37 47 41 1 4 8 9 21 50 53 7 17 70 35 38 71 3 24 29 6 13 20 5 12 18 49 14 23 39 19 52 54}	1
0	{63 57 64 68 66 65 67 58 60 75 44 73 32 33 59 27 61 31 26 72 40 16 28 2 45 55 42 25 11 48 22 43 10 36 46 51 34 56 15 30 37 47 41 1 4 8 9 21 50 53 7 17 70 35 38 71 3 24 29 6 13 20 5 12 18 49 14 23 39 19 52 54 62 74} = {1 to 75 (all industries)}	1

5.5 Backward Linkages: a q-connection analysis of the Singaporean economy

One can also look at the production sector from the perspective of backward linkages. From the input-output table, one finds that industry 1 buys intermediate inputs from the following industries: **1 (itself), 8, 10, 11, 12, 32, 33, 57, 58, 59, 60, 63, 72, 73**. Thus from the perspective of backward linkages, one can represent industry 1 by the following 13-simplex

$$\sigma_1^* = \mathbf{x_1 x_8 x_{10} x_{11} x_{12} x_{32} x_{33} x_{57} x_{58} x_{59} x_{60} x_{63} x_{72} x_{73}}$$

Similarly, one can represent industries **2, ...,75** as abstract simplexes $\sigma_2^*, \ldots, \sigma_{75}^*$ from the perspective of backward linkages. We shall let $\mathbf{K}^* = \{\sigma_1^*, \ldots, \sigma_{75}^*\}$ be the complex that represents the production sector from the perspective of backward linkages. The incidence matrix associated with $\mathbf{K}^*$ is Λ^T, the transpose of Λ, the incidence matrix associated with the forward linkages. Hence the connectance matrix for backward linkages is $\Lambda^T\Lambda$ - **[1]**.

Table 5.2 represents the matrix $\Lambda^T\Lambda$ - **[1]**, where **[1]** is the 75*75 matrix whose entries are all equal to 1. This table, unlike that of section 5.4, portrays the connective structure of the Singaporean economy from the perspective of backward linkages. We shall also use the table for a q-connection analysis of the Singaporean economy.

$\Lambda^T\Lambda$ - **[1]** is also a symmetric matrix. Here, the element on row 1 and column 3 is 7, which indicates that σ_1 (industry 1) and σ_3 (industry 3) share a face which is a 7-simplex, i.e., industry 1 and industry 3 purchase their outputs from the same 8 industries. Similarly, concentrating on the entries on the diagonal of $\Lambda^T\Lambda$ - **[1]**, one can rank the various industries according to the criterion of backward linkages, i.e., the simplex that has the highest dimension is ranked number 1. The ranks of the 75 industries in the production sectors are:

Rank	Industry
1	73
2	48,59,63
5	44
6	45
7	11
8	55
9	72
10	46,51
12	33,40,61
15	18,27,53
18	8,9,22,24,34
23	26,31,50,68
27	13,32,60
30	6,10,29
33	30
34	15
35	36,37,65
38	12,14,21,28
42	43,71
44	5,19,42
47	7,17,20,70
51	39
52	16,38,64,74
56	54,67
58	62,66
60	3,4,47,52
64	1,49,57
67	2,25,41,58
71	56
72	23
73	35
74	69,75

From the above rankings, one finds the tourism sectors highly ranked. For instance, wholesale and retail trade (60) is ranked 27, restaurants and other eating places (61) is ranked 12, hotels and lodging houses (62) is ranked 58, transport and storage (63) is ranked 2, communication (64) is ranked 52, recreational and cultural services (71) is ranked 42.

To measure how well the various industries integrate into the Singaporean economy, we have similarly calculated the values of eccentricity for the 75 industries.

Industry	Eccentricity
1	1/13
2	0
3	0
4	0
5	1/22
6	0
7	0
8	1/31
9	3/29
10	1/28
11	6/32
12	2/23
13	2/28
14	2/23
15	2/25
16	0
17	1/21
18	3/30
19	3/20
20	1/21
21	0
22	2/30
23	0
24	4/28
25	0
26	3/28

27	2/31
28	1/24
29	3/26
30	3/25
31	2/29
32	3/27
33	3/31
34	4/28
35	0
36	2/24
37	1/25
38	1/19
39	0
40	3/31
41	0
42	0
43	0
44	5/36
45	5/35
46	1/34
47	0
48	5/38
49	0
50	1/30
51	2/33
52	0
53	2/31
54	1/18
55	4/33
56	0
57	0
58	0
59	5/38
60	2/28
61	2/32
62	0
63	3/40
64	0
65	1/25
66	0
67	0
68	2/29
69	0
70	2/20
71	1/23
72	4/32
73	17/40
74	2/18
75	0

The small eccentricity values of 2/28, 2/32, 0, 3/40, 0, 1/23 and 0 for industries 60 to 64, 71 and 75 respectively indicate that the tourism sector is very well integrated into the Singaporean economy from the perspective of backward linkages.

From $\Lambda^T\Lambda$ - **[1]**, one finds that the greatest entry is the diagonal element on row 73. This element is $\mathbf{d_{73} = 56}$; which is the dimension of the abstract simplex σ_{73}. **Table 5.2** indicates that there is only one entry with the value 56. Hence $\mathbf{X^{56} = \{73\}}$, i.e., $\mathbf{X^{56}}$ contains a single element. The equivalence relation $\sim_{56}$ or $\mathbf{X^{56}}$ thus gives us a single equivalence class, namely $\mathbf{X^{56}}$ itself. This pattern repeats until $\mathbf{q = 43}$.

For $\mathbf{q = 42}$, the table reveals that $\mathbf{X^{42} = \{73\}\ \{48\}\ \{59\}\ \{63\}}$. This implies that $\mathbf{X^{42}}$ is partitioned into 4 distinct components. There is no q-connection $\mathbf{(q = 42)}$ between σ_{73}, σ_{48}, σ_{59}, and σ_{63}, i.e., industry 73, 48, 59 and 63 do not purchase from the same 42 industries. Hence σ_{73}, σ_{48}, σ_{59}, and σ_{63} do not belong to the same equivalence class. We thus have four distinct components $\mathbf{\{73\}\ \{48\}\ \{59\}\ \{63\}}$.

Table 5.5 lists the complete results of our q-analysis for each level of connection $\mathbf{q}$, $\mathbf{q = 0,\ldots,75}$. One can take note that the higher the value of $\mathbf{q}$, the higher the degree of connectivity of the elements belonging to the same components. The number of components reaches a maximum when **q** descends from 56 to 31. After that, the number of components decreases from 10 to 2 and takes the value of 1 for most of the remaining cases. Here again, the low values assumed by the number of components indicate that the Singaporean economy is extremely well integrated from the backward-linkage perspective.

Table 5.2 Backward Linkages

The Connection Matrix {[Landa Transpose*Landa] - [1]}

Industry:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	13	6	7	6	8	10	6	11	11	10	12	8	11	6	10
2	6	8	5	5	7	6	3	6	6	8	8	5	7	5	7
3	7	5	16	4	5	10	6	10	9	8	14	5	10	6	8
4	6	5	4	16	14	12	8	13	14	14	15	11	14	12	14
5	8	7	5	14	22	18	13	19	19	20	21	17	19	17	21
6	10	6	10	12	18	28	19	25	23	23	28	22	21	16	20
7	6	3	6	8	13	19	21	20	21	18	20	16	18	12	15
8	11	6	10	13	19	25	20	31	28	25	30	20	25	18	22
9	11	6	9	14	19	23	21	28	31	25	28	20	26	18	22
10	10	8	8	14	20	23	18	25	25	28	27	21	23	20	23
11	12	8	14	15	21	28	20	30	28	27	37	22	27	20	24
12	8	5	5	11	17	22	16	20	20	21	22	24	18	16	18
13	11	7	10	14	19	21	18	25	26	23	27	18	29	18	22
14	6	5	6	12	17	16	12	18	18	20	20	16	18	24	18
15	10	7	8	14	21	20	15	22	22	23	24	18	22	18	26
16	5	4	2	9	14	15	14	16	16	16	17	14	15	11	16
17	5	6	5	7	14	13	11	15	14	15	16	12	14	12	17
18	9	8	8	14	21	20	15	23	23	24	26	18	23	20	25
19	5	3	3	9	15	14	13	15	15	15	16	12	15	11	17
20	4	3	3	6	11	12	10	14	13	13	15	11	12	13	13
21	9	7	6	14	20	18	13	20	20	21	22	16	21	17	22
22	9	8	7	14	20	19	14	22	22	23	25	17	22	21	22
23	1	0	0	4	5	5	5	5	5	5	5	5	5	5	5
24	7	6	5	13	20	18	13	21	21	21	22	18	21	18	23
25	5	4	1	8	11	10	9	10	10	10	11	9	11	9	11
26	8	6	5	13	19	18	14	19	20	22	22	16	19	18	22
27	8	7	5	14	21	18	14	21	22	23	24	17	20	21	21
28	7	6	5	12	18	18	13	19	20	21	23	18	20	19	20
29	10	8	8	14	21	20	15	22	22	25	25	19	23	21	23
30	8	6	8	13	18	19	14	21	21	23	24	17	22	20	22
31	9	7	6	14	20	19	15	22	23	24	24	17	21	19	23
32	11	8	8	14	20	19	14	22	22	23	26	19	23	20	22
33	8	7	6	15	19	19	14	21	21	22	22	17	18	19	19
34	8	6	6	14	21	20	15	22	22	23	24	18	22	19	24
35	2	2	0	4	4	5	4	5	5	5	5	5	5	4	4
36	9	7	6	14	19	18	13	20	20	21	23	16	21	15	21
37	7	6	5	14	18	18	13	19	20	19	22	17	19	17	19
38	5	3	1	12	15	14	11	14	16	15	17	14	15	15	15
39	6	5	4	13	14	16	13	16	18	16	17	15	16	13	14
40	6	6	6	13	18	19	15	20	21	20	23	18	19	16	20
41	1	0	1	4	4	5	4	4	5	5	5	5	5	5	4
42	8	6	4	14	18	17	13	19	20	19	19	16	18	17	18
43	4	3	2	9	13	13	12	14	14	14	14	12	13	15	13
44	8	8	8	15	21	20	15	23	24	25	25	19	22	22	23
45	9	7	7	15	19	19	15	22	23	24	25	17	23	20	21
46	9	8	8	15	20	20	15	23	23	25	25	18	23	21	22
47	3	2	2	8	11	12	11	12	13	13	13	12	12	13	12
48	9	8	8	16	20	20	14	23	22	24	27	17	23	22	22
49	3	2	0	7	9	8	7	10	10	10	10	8	9	8	10
50	8	6	4	14	18	16	12	19	20	20	19	15	19	18	19
51	9	7	7	15	18	19	14	22	22	23	23	16	20	19	20
52	2	1	1	7	10	10	10	11	11	11	10	10	9	12	10
53	7	7	5	13	19	18	13	20	20	22	22	18	20	21	19
54	2	1	1	7	12	11	11	11	11	11	12	11	10	11	12
55	7	7	7	12	18	18	15	20	20	22	22	17	20	20	21
56	4	4	1	6	7	5	4	7	7	7	7	4	7	4	7
57	6	5	2	9	10	9	6	11	10	11	11	7	10	8	10
58	7	5	3	8	9	8	6	10	10	11	10	6	10	7	10
59	8	8	7	15	19	20	14	23	23	24	27	18	22	21	20
60	6	6	5	13	18	17	13	18	18	20	22	15	17	19	19
61	11	6	12	12	17	21	15	22	21	19	26	16	22	18	19
62	5	4	2	10	13	11	7	12	12	13	14	10	12	13	13
63	12	8	15	15	21	25	18	26	25	24	31	19	26	22	23
64	5	4	2	11	14	11	8	12	13	14	14	11	13	14	14
65	6	5	4	11	16	14	11	15	15	17	18	13	15	17	16
66	4	3	1	11	14	12	9	12	13	14	14	12	13	14	14
67	5	4	2	11	14	12	8	13	13	14	15	11	13	14	14
68	7	6	5	13	19	18	14	20	20	21	22	16	18	21	19
69	0	-1	-1	0	0	0	-1	0	0	0	0	0	0	0	0
70	5	3	2	11	16	14	12	16	16	16	17	15	16	16	16
71	8	5	5	13	17	15	11	16	16	17	18	14	16	16	17
72	7	6	6	12	16	15	13	18	18	19	19	15	18	19	17
73	12	8	16	14	19	24	17	27	26	24	31	20	26	21	24
74	6	5	3	10	13	10	9	12	12	13	14	10	13	13	13
75	-1	-1	-1	0	0	0	0	0	0	0	0	0	0	0	0

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4	6	8	3	3	7	8	0	6	4	6	7	6	8	6
2	5	8	3	3	6	7	0	5	1	5	5	5	8	8
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16	15	24	15	13	21	23	5	21	10	22	23	21	25	23
17	16	26	16	15	22	25	5	22	11	22	24	23	25	24
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15	21	20	15	15	15	17	3	19	9	17	16	14	15	14
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11	9	16	10	10	14	16	5	15	10	16	17	16	15	14
13	11	16	11	10	14	16	5	15	10	14	16	15	15	14
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14	12	20	12	11	18	20	5	19	10	18	21	17	19	17
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16	19	26	15	17	22	27	5	27	12	27	30	22	24	23
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12	10	13	11	12	13	15	5	14	8	15	15	13	13	13
17	18	27	16	17	23	29	5	25	12	27	30	22	25	23
9	8	10	9	8	11	12	3	11	7	12	11	10	10	9
15	15	21	15	14	21	24	5	23	11	24	25	17	20	18
15	15	23	15	14	22	26	5	22	10	25	26	19	23	20
10	9	11	10	9	10	12	5	12	7	13	15	10	11	9
13	15	22	12	14	20	25	5	23	10	23	26	20	22	21
11	11	12	12	11	12	13	5	14	8	16	14	11	11	10
18	20	25	18	20	19	25	5	23	12	27	25	20	22	22
5	5	7	4	2	7	7	0	6	4	6	7	5	7	5
7	7	10	6	4	10	10	2	9	6	10	11	8	11	8
6	6	10	6	3	10	10	1	8	5	10	10	7	11	8
16	18	25	15	16	22	28	4	26	11	25	28	22	23	22
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10	11	18	11	9	17	19	4	16	10	19	18	15	20	18
7	8	13	7	6	12	13	2	13	7	14	15	11	13	11
15	17	24	16	16	22	25	5	22	12	25	24	20	24	22
8	8	15	8	7	13	15	3	14	8	16	17	12	14	12
11	11	18	11	11	15	18	5	16	10	19	21	15	17	15
9	8	14	9	8	13	14	4	14	9	16	16	13	14	12
8	8	14	8	7	13	14	3	14	8	15	17	12	14	12
14	14	22	13	14	18	23	5	19	11	22	27	18	21	19
-1	-1	0	-1	-1	0	0	-1	0	-1	0	0	0	0	0
12	10	17	11	11	15	18	5	16	10	17	18	15	17	16
11	10	17	11	10	16	18	4	16	10	19	20	14	17	15
14	15	21	14	15	16	22	4	19	11	22	25	17	21	19
16	20	29	18	19	21	27	4	27	10	27	28	20	25	24
9	10	15	9	8	13	15	4	12	10	14	15	12	15	13
0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
9	11	8	8	2	9	7	5	6	6	1	8	4	8	9
7	8	7	6	2	7	6	3	5	6	0	6	3	8	7
6	8	6	6	0	6	5	1	4	6	1	4	2	8	7
14	14	15	14	4	14	14	12	13	13	4	14	9	15	15
20	20	19	21	4	19	18	15	14	18	4	18	13	21	19
19	19	19	20	5	18	18	14	16	19	5	17	13	20	19
15	14	14	15	4	13	13	11	13	15	4	13	12	15	15
22	22	21	22	5	20	19	14	16	20	4	19	14	23	22
23	22	21	22	5	20	20	16	18	21	5	20	14	24	23
24	23	22	23	5	21	19	15	16	20	5	19	14	25	24
24	26	22	24	5	23	22	17	17	23	5	19	14	25	25
17	19	17	18	5	16	17	14	15	18	5	16	12	19	17
21	23	18	22	5	21	19	15	16	19	5	18	13	22	23
19	20	19	19	4	15	17	15	13	16	5	17	15	22	20
23	22	19	24	4	21	19	15	14	20	4	18	13	23	21
16	16	15	18	5	13	16	11	13	17	4	14	13	16	17
18	15	15	19	4	14	15	9	11	18	1	12	13	19	17
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16	13	14	16	4	12	13	10	10	15	3	11	14	17	16
22	21	19	21	4	22	19	14	14	20	4	18	14	22	23
25	25	24	23	5	22	22	16	16	24	5	20	18	27	29
5	5	5	5	1	5	5	5	5	5	2	5	5	5	5
25	21	22	24	4	22	19	15	15	24	5	19	15	27	25
11	11	10	11	3	10	11	10	10	11	3	10	11	12	11
27	22	25	23	4	20	18	16	14	21	5	18	19	27	27
25	24	26	25	5	19	21	17	16	23	6	21	20	30	29
19	23	18	20	5	17	21	16	15	20	5	17	13	22	21
23	24	21	24	5	20	20	15	15	19	5	19	15	24	24
23	23	19	21	4	19	18	14	14	18	5	17	14	23	23
30	23	25	24	4	22	19	15	16	22	5	20	17	27	28
23	29	22	21	5	19	21	15	15	21	6	20	15	24	25
25	22	33	21	5	18	19	15	17	22	7	21	19	30	29
24	21	21	31	5	21	22	17	17	23	5	19	17	26	25
4	5	5	5	5	4	5	4	5	5	0	5	5	5	5
22	19	18	21	4	25	18	15	15	21	3	16	12	22	22
19	21	19	22	5	18	25	16	19	24	6	18	15	23	22
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16	15	17	17	5	15	19	14	20	20	6	16	13	19	18
22	21	22	23	5	21	24	16	20	33	8	19	19	29	27
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20	20	21	19	5	16	18	14	16	19	7	22	16	22	21
17	15	19	17	5	12	15	11	13	19	6	16	23	23	21
27	24	30	26	5	22	23	18	19	29	8	22	23	40	33
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23	20	24	22	4	19	18	14	15	21	5	20	20	28	29
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13	11	14	13	3	8	11	8	10	13	4	12	15	15	15
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7	7	7	6	3	7	5	4	5	5	-1	7	4	7	7
11	10	12	10	4	10	8	7	7	7	-1	10	7	12	12
11	9	10	10	4	10	7	6	6	6	-1	9	6	11	12
25	24	28	25	5	22	24	17	19	30	7	21	22	35	34
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15	13	14	15	3	13	12	15	10	12	3	12	10	16	14
15	13	15	15	3	13	11	14	9	11	2	12	10	17	15
22	20	25	22	4	17	18	17	15	19	5	19	18	27	25
0	0	0	0	-1	0	0	0	-1	-1	-1	0	-1	0	0
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18	17	18	17	3	16	14	15	12	15	3	15	13	20	18
21	21	26	20	5	14	17	13	15	19	5	18	20	28	28
27	26	29	27	5	20	20	15	15	24	5	19	19	34	32
14	14	13	12	3	12	11	12	9	10	2	12	10	15	14
0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0

46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
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8	2	8	2	6	7	1	7	1	7	4	5	5	8	6
8	2	8	0	4	7	1	5	1	7	1	2	3	7	5
15	8	16	7	14	15	7	13	7	12	6	9	8	15	13
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15	11	14	7	12	14	10	13	11	15	4	6	6	14	13
23	12	23	10	19	22	11	20	11	20	7	11	10	23	18
23	13	22	10	20	22	11	20	11	20	7	10	10	23	18
25	13	24	10	20	23	11	22	11	22	7	11	11	24	20
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Table 5.5 Backward Linkages

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53	{73}	1
52	{73}	1
51	{73}	1
50	{73}	1
49	{73}	1
48	{73}	1
47	{73}	1
46	{73}	1
45	{73}	1
44	{73}	1
43	{73}	1
42	{73} {48} {59} {63}	4
41	{73} {48} {59} {63}	4
40	{73} {48} {59} {63} {44}	5
39	{73 63} {48} {59} {44} {45}	5
38	{73 63} {48} {59} {44} {45}	5
37	{73 63} {48 59} {44} {45} {11}	5
36	{73 63} {48 59} {44} {45} {11} {55}	6
35	{73 63} {48 59 44} {45} {11} {55} {72}	6
34	{73 63 48 59 44 45} {11} {55} {72} {46} {51}	6

33	{73 63 48 59 44 45 46} {11} {55} {72} {51} {33} {61} {40}	8
32	{73 63 48 59 44 45 46 55 51} {11} {72} {33} {61} {40} {53} {27} {18}	9
31	{73 63 48 59 44 45 46 55 51 11 72} {33} {61} {40} {53} {27} {18} {34} {24} {22} {9} {8}	12
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26	{73 63 48 59 44 45 46 55 51 11 72 33 61 40 53 27 8 18 22 50 9 31 68 6 34 24 26 60 13 10 32} {29} {30} {15}	4
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24	{73 63 48 59 44 45 46 55 51 11 72 33 61 40 53 27 8 18 22 50 9 31 68 6 34 24 26 60 13 10 32 29 15 30 37 65 21} {36} {28} {14} {12}	5
23	{73 63 48 59 44 45 46 55 51 11 72 33 61 40 53 27 8 18 22 50 9 31 68 6 34 24 26 60 13 10 32 29 15 30 37 65 21 28 43} {36} {14} {12} {71}	5
22	{73 63 48 59 44 45 46 55 51 11 72 33 61 40 53 27 8 18 22 50 9 31 68 6 34 24 26 60 13 10 32 29 15 30 37 65 21 28 43 36 14 12 71 42} {5} {19}	3
21	{73 63 48 59 44 45 46 55 51 11 72 33 61 40 53 27 8 18 22 50 9 31 68 6 34 24 26 60 13 10 32 29 15 30 37 65 21 28 43 36 14 12 71 42 5 7 70} {19} {17} {20}	4

20 {73 63 48 59 44 45 46 55 51 11 72 33 61 40 53 27 2
8 18 22 50 9 31 68 6 34 24 26 60 13 10 32 29 15
30 37 65 21 28 43 36 14 12 71 42 5 7 70 17 20 39}
{19}

19 {73 63 48 59 44 45 46 55 51 11 72 33 61 40 53 27 3
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19 16 64} {38} {74}

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19 16 64 38 67 74 54 62 66 3 4 47 52 49 57 1 25 58}

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8 {73 63 48 59 44 45 46 55 51 11 72 33 61 40 53 27 1
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2,41}

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2,41 56}

6 {73 63 48 59 44 45 46 55 51 11 72 33 61 40 53 27 1
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2,41 56 23}

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2,41 56 23 35}

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2,41 56 23 35}

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2,41 56 23 35}

2 {73 63 48 59 44 45 46 55 51 11 72 33 61 40 53 27 1
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30 37 65 21 28 43 36 14 12 71 42 5 7 70 17 20 39
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2,41 56 23 35}

1	{73 63 48 59 44 45 46 55 51 11 72 33 61 40 53 27 8 18 22 50 9 31 68 6 34 24 26 60 13 10 32 29 15 30 37 65 21 28 43 36 14 12 71 42 5 7 70 17 20 39 19 16 64 38 67 74 54 62 66 3 4 47 52 49 57 1 25 58 2,41 56 23 35}	1
0	{73 63 48 59 44 45 46 55 51 11 72 33 61 40 53 27 8 18 22 50 9 31 68 6 34 24 26 60 13 10 32 29 15 30 37 65 21 28 43 36 14 12 71 42 5 7 70 17 20 39 19 16 64 38 67 74 54 62 66 3 4 47 52 49 57 1 25 58 2,41 56 23 35 75} = {1 to 75 (all industries)}	1

Chapter 6.

Concluding Remarks

In this paper, we have used the input-output framework to analyze the impact of tourism on the Singaporean economy. In general, the tourist sector has been found to make some significant contributions to the Singaporean economy as the multipliers on output and income have demonstrated. We have also performed a q-connection analysis of the production sector of the Singaporean economy - both from the perspective of forward linkage and the perspective of backward linkage - and found this economy to be well integrated.

The long-term viability of the tourist industry for Singapore must not be overlooked. The industry appears to have grown out of a middleman function as the city-state becomes popular as an entry point for visitors into the ASEAN and Southeast Asian region. Increasingly however, as the neighbouring countries also develop their infrastructure and attractions, the comparative advantage enjoyed by Singapore in terms of accommodation, communication, shopping and other facilities have become eroded. Singapore may still have a marginal comparative advantage in some of these areas, as well as being English-speaking in a predominantly Chinese population.

Since the results of the input-output analyses attempted in this paper have shown that the tourist dollar is mightier, it makes a lot of sense to continue with the strategy of promoting tourism. However, a note of caution on interpreting the multipliers must be raised. While the multipliers for output and income are larger in the tourist industry than some of the other industries, it should not imply that resources should be reallocated, from the non-tourist to tourist sectors. The tourist sector needs a more wholesome economic environment with supporting industries in the manufacturing and services industries for instance, to thrive. Neither is over-dependence on any single sector desirable.

Moreover, the larger labour requirement in the tourist industry may imply larger importation of low-skilled workers to work in hotels, wholesale and retail trade sectors. The government has steadfastly refused to have foreign labour in the wholesale and retail trade sectors as check and balance become more difficult with such workers since they are more diffused into the various services sectors, unlike the more batch-like contracts in the manufacturing and construction sectors.[2] Automation and

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[2] Representation from the wholesale and retail trader was made to the government, which contends that there are still female and older workers to be tapped. The former Minister for Trade and industry, Brigadier-General Lee Hsien Loong has said: "Manufacturing is containable. It is a factory, you bring in 50 workers, they have a dormitory and are well looked after. When their term is over, they go back." If foreign workers are allowed in retail and services sectors, they would "scatter throughout our economy", a situation that would be "very hard to unwind"; see *Straits Times*, 24 August, 1987.

mechanisation may be quite limited in a personalised labour-intensive industry like tourism. Whatever labour released from the manufacturing sector by these technological processes may not be quite suitable. The government also does not want to encourage low-skilled jobs as in chambermaids.

It seems that Singapore's middleman function may be reaching the limits of development. Neither is there much further scope of selling Singapore purely on the strength of its attractions like Chinatown, Haw Par Villa, or tropical island resorts. Diversification to accentuate facilities which Singapore has a more competitive edge as in an exhibition/convention centre or medical/dental and other professional services, seems more substantive. Such a strategy ties in well with the attention given to the services sector and the development of Singapore into a business hub.

As travel is both income elastic and recession-prone, the move to tap corporate rather than private individual travellers, is also sensible. Catering to the needs of corporate travellers may require different strategies and investments in both the capital and human forms, and anticipating ahead of demand involves expenditure. Besides the physical infrastructure for instance, personnel well versed in linguistics and interpretation become necessary. The volume must be sufficiently generated to provide the returns to such investments. In this respect, Singapore will

With respect to the misconception that the income-generating effects of tourism are low for a very open economy (due to high leakages), our results have proved the contrary.

One message is very clear. Singapore's cost structure must be kept competitive for it to stay ahead as a tourist centre. To make up for the lack of natural attractions, built ones will only be satisfactory up to a point, though such recreational facilities also benefit the locals. More important is the continuous investment in human resources development and training to upgrade professionalism and efficiency of tourist and related services. In this respect, some official guidance could be given to tour operators and guides to ensure accountability and accuracy of information on the historical and cultural aspects of Singapore. Singapore has to offer exceptionally good services to the tourists to make up for what she does not have in landscape and indigenous commodities.

Bibliography

Airey, D., (1978); "Tourism and Balance of Payments," Tourism International Research-Europe, Third Quarter.

Archer, B.H., (1977); Tourism Multipliers: The State of the Art, Bangor Occasional papers in Economics (No. 11), Bangor: University of Wales Press.

Archer, B., S. Shea, and R. Vane, (1974); Tourism in Gwynedd: An Economic Study, Institute of Economic Research, Bangor: University of Wales.

Atkin, R., (1974); Mathematical Structure in Human Affairs, London: Heinemann.

Bulmer-Thomas, V., (1982); Input-Output Analysis in Developing Countries, New York: John Wiley and Sons Inc.

Bryden, J.M., (1973); Tourism and Development, Canbridge: Cambridge University Press.

Casti, J., (1979); Connectivity, Complexity and Catastrophe in Large-Scale Systems, New York: Wiley and Chichester.

Chenery, H.B., and T. Watanabe (1958); "International Comparisons of the Structure of Production," Econometrica, Vol. 26, pp. 487-521.

Chenery, H.B., (1960); "Pattern of Industrial Growth," American Economic Review, Vol. 51, pp. 624-654.

Cleverdon, (1979); "The Economic and Social Impact of International Tourism on Developing Countries," London, Economic Intelligence Unit, Special Report, No. 60.

Diamond, J., (1979); "The Economic Impact of International Tourism on the Singapore Economy", Havard Institute for International Development Discussion Paper No. 77, August.

Erbes, R., (1973); International Tourism and the Economy of Developing Countries, Paris: OECD.

Gamble, H.B., (1965); "Community Income from Outdoor Recreation", Paper presented to the Governor's Conference on Recreation and Parks, Ocean City, Maryland, 19 May.

Harmston, F.K., (1969); "The importance of 1967 tourism to Missouri", Business and Government Review, Vol. 10, No. 3, May-June.

Isard, I.,and T.W. Langford, (1968); Philadelphia Region Input-Output Study, Working Papers, Regional Science Research Institute, Philadelphia.

Johnson, J., (1985); Combinatorial Structure in Digital Pictures, NERC Remote Sensing Project, Discussion Paper No. 1, Center for Configurational Studies, The Open University, Milton Keynes, UK.

Khan, H., F.S. Chou, and K.C. Wong, (1989); The Socioeconomic Impact of Tourism on the Singapore Economy: The Report of a Multidisciplinary research project on Tourism, Singapore: Faculty of Business Administration, National University of Singapore.

Leontief, W., (1966); Input-Output Economics, New York: Oxford University Press.

Mathieson, A., and G. Wall, (1982); Tourism: Economic, Physical and Social Impacts, London: Longman.

Miernyk, W.M., (1965); The Elements of Input-Output Analysis, Random House, New York.

Miller, Ronald, E., and Peter D. Blair, (1985); Input-Output Analysis: Foundations and Extensions, New Jersey, Prentice-Hall Inc.

Seow, G., (1981); Economic Significance of Tourism in Singapore, Singapore Economic Review, October, pp. 64-79.

Singapore Department of Statistics, (various years); Singapore Balance of Payments, 1980-93, Singapore: Government Printers.

Singapore Department of Statistics, (various years); Economic and Social Statistics, 1980-92, Singapore: Government Printers.

Singapore Department of Statistics, 1988; Singapore Input-Output Tables 1983, Singapore: Government Printers.

Singapore Department of Statistics, (various years); Singapore Yearbook of Statistics, 1990-1993, Singapore: Government Printers.

Singapore Ministry of Trade and Industry, (1986); Report of the Economic Committee, Singapore: Singapore Tourist Promotion Board.

Singapore Ministry of Trade and Industry, (1986); Tourism Product Development Plan, Singapore: Singapore Tourist Promotion Board.

Singapore Tourist Promotion Board, (various years); Annual Report, Singapore: Singapore Tourist Promotion Board.

Song, Byung-Nak and Chong-Yong Ahn, (1983); Tourism in Asia: The Economic Impact, E.A. Pye and T. Lin, eds., pp. 101-173, Singapore: Singapore University Press.

Stone, Richard, (1961); Input-output and National Accounts, Paris: Organization for European Economic Cooperation. Strang, W.A., (1970); "Recreation and the Local Economy: An Input-Output Model of a Recreation-Oriented Economy", Technical Report No. 4, University of Wisconsin Sea Grant Program, Madison, October.

Summary, R.M., (1987); Tourism's Contribution to the Economy of Kenya, annals of Tourism Research, Vol. 14, No. 4, pp. 531-540.

Thuens, H.L., (1976); Notes on the Economics on International Tourism in Developing Countries, Tourist Review Vol. 31, No. 3.

World Tourism Organization, (1988); Yearbook of Tourism Statistics 1987, Madrid: WTO.

Appendix A. Technical Coefficients Matrix With Private Consumption Expenditure

Flows in millions of Singapore Dollars of Y 1973

Industry:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	0.006866	0	0.010221	0	0	0.084489	0	0.008813	0	0	0.006373	0	0	0	0
2	0	0.000734	0.007666	0	0.001061	0.003783	0	0.415981	0	0.139067	0.302177	0.174646	0.005185	0.129123	0.107726
3	0	0	0.003407	0	0	0.185372	0	0	0	0	0.000531	0.000383	0	0	0
4	0	0	0	0.033531	0	0	0	0	0	0	0.000531	0	0	0	0
5	0	0	0	0	0.474148	0	0	0	0	0	0	0	0	0	0
6	0	0	0.001704	0	0	0.003783	0	0	0	0	0.001593	0	0	0	0
7	0	0	0.001704	0	0	0	0.211856	0.002938	0.024799	0	0.012215	0	0.002963	0	0
8	0.032859	0	0.001704	0	0	0	0	0.089694	0.011394	0	0.011152	0	0.021481	0	0
9	0	0	0.001704	0	0	0.001261	0.045675	0.014101	0.345845	0	0.014339	0	0.054815	0	0
10	0.042178	0	0.000852	0	0	0.002522	0.000972	0.027027	0.005362	0.32178	0.007966	0.000766	0.000741	0.000702	0.000363
11	0.005395	0	0.003407	0	0	0.005044	0.001944	0.008813	0.009383	0.000428	0.016463	0	0.037778	0	0.000363
12	0.330309	0	0	0	0	0	0	0	0	0	0	0.314822	0	0	0
13	0	0	0	0	0	0	0.000972	0	0.00067	0	0	0	0.002222	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0.002807	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.180994
16	0	0	0	0	0.000398	0.002522	0.008746	0.005286	0.006032	0.005991	0.004249	0.002298	0	0	0.020312
17	0	0	0.007666	0	0	0	0	0	0	0	0	0	0	0	0.000363
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01193	0
26	0	0	0	0	0.000597	0	0	0	0	0	0.000531	0	0.011852	0.030877	0.001814
27	0	0	0	0.001972	6.63E-05	0	0	0.000588	0.00067	0.000428	0.001062	0	0.001481	0.001404	0.000363
28	0	0	0	0	0	0	0	0.000588	0.002681	0.000856	0.001593	0	0.005926	0	0.009068
29	0	0	0	0	0	0	0	0	0	0	0	0.020299	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0.001061	0.005044	0.018465	0.011163	0.012735	0.011981	0.007966	0.004596	0	0.000702	0.004715
32	0.002943	0.004281	0	0.017751	6.63E-05	0.001261	0	0.004113	0.00134	0.007702	0.020712	0.000383	0.005185	0	0.019587
33	0.00515	0.001346	0.017888	0.025641	0.000265	0.003783	0.000972	0.002938	0.005362	0.002995	0.002124	0	0.002963	0	0.001814
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0.001261	0.002915	0.001175	0.00134	0.001712	0.001062	0.000383	0	0	0
36	0	0	0	0	0	0.003783	0.01069	0.006463	0.007373	0.006846	0.005311	0.002681	0.094815	0	0
37	0	0	0	0	0	0	0	0	0	0	0.000531	0	0	0	0
38	0	0	0	0	0	0	0	0	0.00067	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0.001261	0.001944	0.001175	0.00134	0.001712	0.002124	0.000383	0.003704	0.001404	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0.000588	0.00067	0	0	0	0	0.000702	0
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0.005963	0	0.000133	0.003783	0.015549	0.009401	0.010724	0.01027	0.006904	0.00383	0.01037	0.027368	0.001088
45	0	0	0	0	0	0	0	0	0	0.000428	0	0	0	0.000702	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	0	0	0.042589	0.001972	0	0	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0.000734	0.007666	0	0	0	0	0	0	0.000428	0.000531	0	0	0.000702	0
56	0	0	0	0	0	0.001261	0	0.000588	0	0	0.000531	0	0	0	0
57	0.001717	0.000489	0	0.00789	0.000597	0.006305	0.001944	0.009401	0.004692	0.004707	0.003717	0.001532	0.014074	0.002105	0.014871
58	0.00049	0.000122	0	0	0.000133	0.003783	0.000972	0.001175	0.002011	0.001284	0.001593	0.000383	0.01037	0	0.002539
59	0.007357	0	0	0.001972	6.63E-05	0.001261	0	0.000588	0.00067	0.000428	0.001062	0.000383	0.001481	0.000702	0.000725
60	0.053948	0	0	0	0.000133	0.030265	0.030126	0.037015	0.026139	0.013693	0.024429	0.050938	0.025185	0.008421	0.021763
61	0	0	0	0.001972	0.000133	0.001261	0	0.000588	0.00134	0.000428	0.001593	0.000383	0.002222	0.001404	0.000725
62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	0.001226	0.001223	0.008518	0.037475	0.000464	0.005044	0.000972	0.014101	0.002011	0.001712	0.002124	0.004979	0.002963	0.002105	0.003264
64	0	0	0	0.019724	0.000199	0.002522	0.000972	0.007051	0.00067	0.000856	0.001062	0.002298	0.001481	0.000702	0.001814
65	0	0	0	0.015779	0.000795	0.008827	0.002915	0.005288	0.006702	0.003423	0.011683	0.002298	0.017037	0.008421	0.005803
66	0	0	0	0.009862	0.000464	0.001261	0.000972	0.00235	0.002011	0.001284	0.001593	0.001915	0.002222	0.001404	0.002176
67	0	0	0	0.013807	0.000331	0.001261	0.000972	0.00235	0.002011	0.001284	0.001593	0.000383	0.002963	0.000702	0.004715
68	0	0	0	0.019724	0.000994	0.010088	0.000972	0.006463	0.006702	0.003851	0.013277	0.002298	0.021481	0.010526	0.007617
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	0.004904	0.003547	0.006814	0.001972	6.63E-05	0	0	0.000588	0.00067	0.000428	0.000531	0	0.001481	0.000702	0.000363
73	0.004169	0.001835	0.004259	0.001972	0.000133	0.001261	0	0	0.00134	0.000428	0.002124	0.000383	0.002963	0.001404	0.001088
74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0.009862	0.000597	0.006305	0.001944	0.003525	0.004692	0.002567	0.008497	0.001532	0.012593	0.006316	0.004353
Wages	0.343551	0.034495	0.330494	0.518738	0.018627	0.080706	0.051506	0.163925	0.078418	0.076594	0.123739	0.038682	0.206667	0.165614	0.235292

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0	0	0	0	0.027624	0	0	0	0	0	0	0	0	0	0
0	0.03555	0.000294	0	0	0.515284	0.249918	0	0.005355	0	0	0	0.001037	0.000747	0.00125
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.013928	0	0	0	0	0	0	0	0.000473	0	0.001495	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.008299	0.014948	0.0675
0	0	0.000147	0.002786	0	0.000397	0.001642	0	0	0	0.001873	0	0	0.000747	0.0025
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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0.0045	0.069954	0.082794	0.005571	0.005525	0	0	0	0.004016	0	0.007491	0	0	0	0.00125
0.025667	0.052752	0.438676	0.047354	0.006906	0	0	0	0.006693	0	0.009363	0.001418	0	0	0
0	0.058486	0.0025	0	0	0	0	0	0.001339	0	0	0	0	0	0
0	0	0.010441	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.013928	0	0	0	0	0	0	0	0	0	0	0
0	0	0.000588	0.181058	0.180939	0	0	0	0	0	0	0	0	0	0
0	0	0	0.002786	0	0.034538	0.15468	0	0.121821	0	0	0	0	0	0
0	0.002294	0	0	0.012431	0.000397	0.034483	0	0.084337	0	0.037453	0	0	0	0
0	0	0	0	0	0	0	0.460606	0.002677	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0.048193	0	0	0	0	0	0
0	0	0	0	0.001381	0	0.008539	0	0	0.024531	0.283708	0.243856	0	0	0.0075
0	0.001147	0.003529	0.008357	0.001381	0.000397	0.001314	0	0.001339	0.000722	0.047753	0.008979	0.010373	0.017937	0.03
0	0	0.000735	0	0	0.000397	0.000985	0	0.001339	0	0.003745	0.02741	0.001037	0.002242	0.0025
0.0035	0.006881	0.001029	0.002786	0.001381	0.000397	0.002299	0	0.025435	0	0.01779	0.024575	0.108921	0.000747	0.0025
0	0	0	0	0	0	0	0	0	0	0	0	0	0.023169	0
0	0	0	0	0	0	0.000328	0	0	0	0.000936	0	0	0	0.03875
0.006167	0.00344	0.016176	0.069638	0.06768	0.000397	0.00197	0	0.024096	0	0.005618	0.001418	0.075726	0.014948	0.02625
0.000333	0.002294	0.003088	0.019499	0.004144	0.003573	0.047947	0	0.013387	0.000722	0.01779	0.01276	0.091286	0.140508	0.1125
0.000333	0.001147	0.000441	0.002786	0	0.002779	0.002299	0	0	0.001443	0.000936	0.000473	0	0.001495	0.005
0.0005	0.001147	0.000882	0.013928	0.001381	0	0	0	0.004016	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0.012048	0	0	0	0	0	0.00125
0.000167	0	0.000147	0	0	0	0.000328	0	0	0	0	0.000473	0.001037	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.001037	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000167	0	0.000147	0	0.001381	0	0.000328	0	0	0	0	0.000473	0.001037	0.000747	0.0025
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.002294	0.000147	0	0.001381	0	0.000328	0	0.065596	0	0	0.000945	0	0	0
0	0	0	0	0	0	0	0	0.001339	0	0.005618	0.000473	0	0	0
0.000167	0.002294	0.006765	0.005571	0.013812	0.000794	0.003612	0	0.072289	0	0.006554	0.002363	0.007261	0.011958	0.02
0	0	0	0	0	0	0	0	0	0	0.000936	0.005671	0	0.000747	0
0	0	0	0	0	0	0	0	0	0	0	0.000473	0	0	0
0	0	0	0	0	0	0	0	0	0	0.000936	0	0	0	0
0	0	0	0	0	0	0.000328	0	0	0	0.001873	0.000473	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0.000473	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.001147	0.016471	0	0.01105	0	0.000328	0	0	0	0.004682	0.007561	0.001037	0.000747	0.00125
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.0005	0.004587	0.006176	0.008357	0.001381	0.002779	0.011823	0	0.005355	0.004329	0.003745	0.007089	0.002075	0.003737	0
0.000167	0.001147	0.001176	0	0	0.000794	0.002627	0	0.001339	0.001443	0.000936	0.001418	0.001037	0.000747	0
0	0	0.000294	0	0	0.000397	0.000985	0	0.001339	0	0.000936	0.000945	0.001037	0.002242	0.0025
0.002333	0.019495	0.035147	0.022284	0.031768	0.030568	0.03514	0.054545	0.049531	0.002886	0.043071	0.034499	0.016598	0.008969	0.015
0	0	0.000588	0	0	0.000397	0.001314	0	0.002677	0	0.000936	0.001418	0.001037	0.00299	0.0025
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.0005	0.004587	0.003824	0.011142	0.005525	0.007543	0.00624	0.012121	0.006693	0.000722	0.006554	0.007089	0.006224	0.005232	0.00375
0.000167	0.002294	0.002059	0.005571	0.002762	0.004367	0.003284	0.006061	0.004016	0	0.002809	0.003781	0.003112	0.00299	0.00125
0.000333	0	0.003529	0.005571	0.001381	0.003573	0.009524	0.006061	0.014726	0.002165	0.006554	0.008979	0.007261	0.019432	0.02
0.000333	0.002294	0.001618	0.005571	0.001381	0.003573	0.004269	0.006061	0.002677	0.000722	0.002809	0.002836	0.002075	0.005979	0.0025
0.000167	0.00344	0.004118	0.008357	0	0.002779	0.002627	0	0.008032	0.001443	0.003745	0.006616	0.002075	0.000747	0.0025
0.000167	0.001147	0.004118	0.008357	0	0.004764	0.011823	0	0.016064	0.001443	0.007491	0.011342	0.008299	0.025411	0.02375
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.000294	0	0	0.000397	0.000657	0	0.001339	0	0	0.000473	0	0.001495	0.00125
0	0	0.000588	0	0	0.000397	0.001642	0	0.002677	0	0.000936	0.001418	0.001037	0.00299	0.0025
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000167	0	0.0025	0.002786	0.001381	0.002382	0.006897	0.006061	0.01071	0.001443	0.004682	0.006616	0.005187	0.0142	0.01375
0.011333	0.103211	0.269853	0.306407	0.071823	0.118301	0.250575	0.321212	0.253012	0.025974	0.214419	0.380907	0.136929	0.224963	0.19875

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.000435	0	0.040682	0	0.001608	0.00267	0	0	0.001642	0	0	0	0.000321	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.001312	0	0.009646	0.014686	0.009524	0.173633	0.034483	0	0	0	0	0
0	0	0	0.048556	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.000435	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.000435	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000305	0	0	0.001312	0	0.001608	0	0	0	0	0	0	0	0	8.5E-05
0	0.003483	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.001526	0	0	0.001312	0	0	0	0	0	0	0	0	0	0	0
0.005189	0	2.8E-05	0.007874	0	0.001608	0	0.004762	0	0.004926	0	0	0	0.00016	0
0	0	0	0.051181	0	0	0	0	0	0.003284	0	0	0	0.00016	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0.001608	0	0	0	0.001642	0	0	0	0	8.5E-05
0.000305	0	0.00184	0	0	0.006431	0	0	0	0.00821	0	0	0.001663	0.002083	0.00034
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	2.8E-05	0	0	0	0	0	0	0	0	0	0	0.00016	0
0	0	0	0	0	0	0	0.003175	0	0	0	0	0	0.00016	0
0.002442	0.000435	0	0.001312	0	0.006431	0.001335	0.006349	0	0.00821	0	0	0.000831	0.000481	8.5E-05
0.000305	0.000871	0.000223	0.001312	0	0.001608	0	0.000794	0	0	0	0.000228	0	0.000321	0.00017
0.005495	0.001741	0	0.001312	0	0.001608	0.001335	0	0	0.00821	0	0	0	0.003846	0.000255
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000305	0.000871	2.8E-05	0	0	0	0	0	0	0	0	0	0	0	8.5E-05
0.2384	0.001306	0.000139	0.047244	0	0	0.004005	0	0	0.011494	0	0.000228	0.003325	0.002724	0.016995
0.054945	0.064432	0.005854	0.053806	0.005405	0.032154	0.006676	0	0.009646	0.022989	0	0.001366	0.002494	0.004808	0.001105
0.000611	0.039617	0.426166	0.006562	0	0.009646	0.016021	0	0.003215	0.001642	0	0.002049	0.007481	0.001603	0.000425
0	0	0	0.02231	0	0	0	0	0	0	0	0	0	0	0.00017
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000305	0	0	0	0	0.093248	0	0	0.003215	0.014778	0	0	0	0.001282	8.5E-05
0	0.000435	0	0	0	0	0.001335	0	0	0.013136	0	0	0	0	0.008923
0	0	0	0	0	0	0.001335	0.335714	0.244373	0.029557	0	0	0	0.000321	0
0	0	0	0	0	0	0	0	0	0.001642	0	0	0	0	0.000255
0	0.004354	0.000195	0.002625	0.016216	0	0.021362	0.002381	0.006431	0.026273	0.006135	0.020487	0.010806	0.002244	0.00136
0	0	0	0	0	0	0	0	0	0.065681	0.052147	0.033918	0.0399	0.002885	0
0.000916	0	8.4E-05	0.003937	0	0	0.001335	0	0.003215	0.08046	0	0.030275	0.002494	0.135577	0.020054
0.000305	0.000435	0.000139	0	0	0	0	0	0	0.006568	0.003067	0.007057	0.007481	0.039103	0.002634
0.001832	0.003918	0.003847	0.010499	0	0.001608	0.001335	0	0.022508	0.041051	0	0.001821	0.005819	0.075962	0.009262
0.000305	0	0.000112	0.001312	0	0	0	0	0	0	0	0	0.0133	0.007212	0.025748
0	0	0	0.002625	0	0	0	0	0	0	0	0	0.064838	0.017788	0.001785
0	0	2.8E-05	0	0	0	0	0	0	0	0	0	0.000831	0.000321	0.00034
0	0	2.8E-05	0	0	0	0	0	0	0.001642	0	0	0.004156	0.000481	0.015126
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.000321	0.00034
0	0	2.8E-05	0	0	0	0.001335	0	0.009646	0.004926	0.027607	0	0	0.001282	8.5E-05
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	2.8E-05	0	0	0	0	0	0	0	0	0	0	0.000321	8.5E-05
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000916	0.000435	2.8E-05	0	0	0	0	0	0	0	0	0	0	0.000962	0.00017
0	0	2.8E-05	0	0	0	0	0	0	0	0	0	0	0	0
0.009158	0.011754	0.003067	0.009186	0.010811	0.006431	0.014686	0.015873	0.003215	0.00821	0	0.012292	0.004156	0.004647	0.001954
0.000916	0.001306	0.000808	0.001312	0	0.001608	0.001335	0.000794	0.003215	0.003284	0	0.000911	0	0.000801	0.000255
0.000305	0.000871	0.000251	0.001312	0	0.001608	0.001335	0.000794	0	0	0	0.000228	0	0.000481	0.000255
0.002747	0.003483	0.000781	0.015748	0	0.011254	0.00287	0.037302	0.028939	0.034483	0.009202	0.010016	0.016625	0.030929	0.006713
0.000611	0.001306	0.00039	0.001312	0	0.001608	0.001335	0.000794	0.003215	0.001642	0	0.000228	0	0.000641	0.00034
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.004579	0.002612	0.004321	0.003937	0.010811	0.003215	0.004005	0.003175	0.009646	0.018062	0	0.000911	0.001663	0.004327	0.002379
0.002442	0.001306	0.002286	0.002625	0.005405	0.001608	0.00267	0.001587	0.003215	0.00821	0	0.000455	0.000831	0.002244	0.001275
0.003968	0.008272	0.002565	0.007874	0	0.014469	0.006676	0.005556	0.012862	0.00821	0.003067	0.002276	0.001663	0.004647	0.002209
0.002137	0.001741	0.000976	0.003937	0	0.001608	0.00267	0.000794	0.006431	0.001642	0	0.000455	0.000831	0.001603	0.00068
0.003358	0.001741	0.001227	0.002625	0	0	0.00534	0.003968	0.003215	0.003284	0.003067	0.002504	0.001663	0.003045	0.0017
0.004579	0.009578	0.003206	0.009186	0.005405	0.019293	0.006676	0.006349	0.012862	0.00821	0	0.002504	0.002494	0.005609	0.002549
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000305	0.000435	0.000167	0	0	0.001608	0	0	0	0	0	0.000228	0	0.000321	0.00017
0.000611	0.001306	0.000418	0.001312	0	0.003215	0.001335	0.000794	0.003215	0.001642	0.003067	0.000455	0	0.000801	0.00034
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.002747	0.006095	0.001868	0.005249	0	0.009646	0.00534	0.003968	0.009646	0.004926	0.003067	0.001593	0.001663	0.003365	0.00153
0.148657	0.121027	0.080176	0.274278	0.048649	0.101288	0.181575	0.142857	0.22508	0.37931	0.03681	0.102891	0.075644	0.159615	0.059058

46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000254	0	0.000164	0	0	0	0	0.000368	0	0.071307	0	0	0	0.000443	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.000109	0	0	0	0	0	0	0	0	0	0	0.027878	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0.001132	0	0	0	0	0
0.000254	0	5.5E-05	0	0	0.000186	0	0	0	0	0	0	0.001724	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0.005659	0	0	0	0	0.000705
0	0	0	0	0	0	0	0	0.00049	0.036786	0	0	0	0	0.000353
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0.001132	0	0	0	0	0
0	0	0	0	0.000635	0.000932	0	0	0	0	0	0	0	0.01475	0
0.002031	0.001224	0.000984	0.000851	0.000318	0.000186	0	0.00221	0.00049	0.005093	0	0	0	0.024264	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	5.5E-05	0	0	0	0	0	0	0	0	0	0	7.4E-05	0
0	0.001224	5.5E-05	0	0.000635	0	0	0	0	0.000566	0	0	0	0.002065	0.002116
0.001015	0	0.000492	0	0	0	0	0.001105	0.00049	0.002264	0	0	0	0.000811	0.004126
0.000508	0	0.000328	0.000851	0.000318	0.000746	0	0.000368	0	0.000566	0.013889	0.005119	0.006897	0.001106	0.008746
0.000762	0.001224	5.5E-05	0.000851	0.001588	0.018738	0	0	0	0.001132	0	0	0	0.016594	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.000368	0	0.001132	0	0	0	0	3.5E-05
0.00457	0.028152	0.001203	0.011064	0.000318	0.000186	0.000712	0.023941	0.00049	0.003396	0	0	0	0.004868	0.005149
0.006855	0	0.002515	0.000851	0.000953	0.003822	0	0.000737	0	0.003396	0.020833	0.003257	0.027586	0.000295	0
0.000254	0	5.5E-05	0	0.000635	0.001398	0	0	0	0.001132	0.152778	0.140996	0.001724	0.005458	0.000776
0	0	0.000164	0	0.0054	0	0	0	0	0.000566	0	0	0	0.000664	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.001844	0
0.000508	0	0	0	0	0	0	0.003683	0	0	0	0	0	0.003024	0
0	0	5.5E-05	0	0	0	0	0	0	0	0	0	0	0.039973	3.5E-05
0	0	0	0	0	0	0	0	0	0	0	0	0	0.048602	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.022052	0
0.012694	0.001224	0.00082	0	0	0.000559	0	0.001105	0	0.001132	0	0	0	0.005458	3.5E-05
0.003046	0	0.001914	0	0	0.00028	0	0.000368	0.003428	0	0	0	0	0.000369	0
0.005585	0	0.000273	0	0.010483	0.079053	0.001425	0.000368	0	0.005659	0	0	0	0.131721	0
0.009139	0.154223	0.001422	0	0.000953	0.000932	0.000712	0.000737	0.001469	0.003962	0	0	0	0.036802	0
0.021071	0.003672	0.020066	0	0.002859	0.009602	0.000712	0.018416	0.001469	0.01811	0	0	0	0.024559	3.5E-05
0.013455	0	0.002132	0	0.000318	0.078773	0.000712	0.001473	0	0.000566	0	0.001396	0.001724	0.004351	0.000176
0.0721	0	0.007217	0	0.000635	0.00028	0.000712	0.000368	0	0	0	0	0	0.001033	0.000247
0	0	0.000219	0	0.000318	9.3E-05	0	0	0.00049	0.000566	0	0	0	0.045852	0
0.023102	0	0.295298	0.002553	0.000318	0.000186	0.001425	0.000368	0.00049	0.001132	0	0	0	0.000664	3.5E-05
0	0	0.011919	0.002553	0	0	0	0	0	0.000566	0	0	0	0	0
0	0	0	0	0.134689	0.001025	0	0	0	0.000566	0	0.000465	0.001724	0	0
0.000254	0	5.5E-05	0	0	0.103104	0	0	0	0.000566	0	0	0	0.00177	0
0	0	0	0	0	0	0.039174	0.00663	0	0	0	0	0	0	0
0.000254	0	5.5E-05	0	0	0	0	0.189687	0	0	0	0	0	0	0
0	0	0.005358	0	0	0	0	0	0.385896	0	0	0	0	0	0
0.000254	0	0.000109	0	0	9.3E-05	0	0.000368	0	0.034522	0	0	0	7.4E-05	3.5E-05
0	0	5.5E-05	0	0	9.3E-05	0	0	0	0	0	0.000465	0	7.4E-05	0.000141
0.00457	0.003672	0.003171	0.000851	0.001271	0.004941	0.000712	0.00663	0.000979	0.003962	0.013889	0.001396	0.07069	0.00118	0.005783
0.000254	0	0.000273	0	0.000318	0.001119	0	0.000737	0	0.000566	0.006944	0.000931	0.001724	0.000148	0.001093
0.000762	0	0.000383	0	0.000318	0.000932	0	0.000368	0	0	0	0.000931	0.010345	0.008629	0.002962
0.010155	0.017136	0.007545	0.000851	0.016201	0.02256	0.004274	0.004052	0.022037	0.013582	0	0	0	0.024338	0
0.001015	0	0.000601	0	0.000635	0.001305	0	0.000737	0	0	0	0	0	0.000148	0.009627
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.005839	0.003672	0.006342	0.000851	0.005083	0.003542	0.000712	0.009945	0.00049	0.003396	0	0.004653	0.008621	0.006416	0.047784
0.003046	0.002448	0.00339	0	0.002859	0.001958	0.000712	0.005157	0.00049	0.001698	0.006944	0.003257	0.003448	0.000738	0.010756
0.007108	0.002448	0.004046	0.000851	0.003812	0.009043	0.001425	0.005157	0.001469	0.001698	0	0	0	7.4E-05	0.018937
0.001269	0.001224	0.000765	0	0.000635	0.004102	0.000712	0.001105	0.000979	0.001132	0	0.001861	0	0.000738	0.008181
0.002285	0.001224	0.001586	0.000851	0.000635	0.00578	0.000712	0.004788	0.00049	0.002264	0	0	0	0.000959	0.026448
0.008378	0.003672	0.004975	0.001702	0.004765	0.01128	0.001425	0.005893	0.001469	0.001132	0.090278	0.050721	0.05	0.006859	0.038262
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000458
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000508	0	0.000273	0	0.000318	0.000653	0	0.000368	0	0	0.006944	0.006049	0.008621	0.000295	0.000952
0.001269	0.001224	0.000656	0	0.000635	0.001492	0	0.000737	0	0.000566	0	0	0	0.00059	0.004055
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.005077	0.002448	0.002952	0.000851	0.002859	0.006619	0.000712	0.003683	0.000979	0.001132	0	0	0	0	0.005395
0.104087	0.074663	0.203171	0.022979	0.059085	0.258134	0.029202	0.125599	0.055338	0.071307	0.604167	0.65007	0.789655	0.472675	0.78947

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76
0.111641	0	0.004145	0	0	0	0	0	0	0	0.000618	0	0.00544	0	0	0.031098
0.08571	0	0.003161	0	0	0	0	0	0	0	0	0	0.003995	0	0	0.024559
0.022995	0	0.000829	0	0	0	0	0	0	0	0	0	0.001105	0	0	0.005852
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.017769	0	0.000674	0	0	0	0	0	0	0	0	0	0.00068	0	0	0.006274
0.018366	0	0.000674	0	0	0	0	0	0	0	0	0	0.000765	0	0	0.005313
0.025534	0	0.000984	0	0	0	0	0	0	0	0	0	0.001445	0	0	0.007183
0.019113	0	0.000725	0	0	0	0	0	0	0	0	0	0.00068	0	0	0.00469
0.013887	0	0.000466	0	0	0	0	0	0	0	0	0.003019	0.000765	0	0	0.004331
0.034194	0	0.001244	0	0	0	0	0	0	0	0	0	0.00187	0	0	0.009898
0	0	0	0	0	0	0	0	0	0	0.001235	0	0.00017	0	0	1.06E-05
0.034194	0	0.001658	0	0	0	0	0	0	0	0	0	0.000255	0	0	0.008915
0.021651	0	0.001036	0	0	0	0	0	0	0	0	0	0	0	0	0.012042
0	0	0	0	0	0	0	0	0	0	0	0	0.005185	0	0	0.001342
0.01105	0.067621	0.001813	0.000976	0.002743	0.006655	0.001284	0.002283	0	0.015186	0.004941	0	0.013006	0	0	0.013943
0	0	0	0	0	0	0	0	0	0	0	0	0.00017	0	0	0.005757
0	0	0	0.000488	0.000343	0	0	0	0	0	0	0	0.002635	0.006345	0	0.039369
0	0	0	0	0	0	0	0	0	0	0	0	0.0017	0	0	0.002334
0	0	0	0	0	0	0	0	0	0	0	0.000431	8.5E-05	0	0	0.004204
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.004093	0	0	0	0	0	0	0	0	0	8.5E-05	0	0	0.000613
0	0	0	0	0	0	0	0	0	0	0	0	8.5E-05	0	0	8.45E-05
0	0	0	0	0	0	0	0	0	0	0	0.000431	0.00289	0	0	0.004046
0.000896	0.004773	0.000518	0.00244	0.006001	0.010284	0.003082	0.003944	0	0.004556	0.000618	0.000862	0.002465	0.002538	0	0.000127
0.000149	0.007955	0.001347	0.000488	0.005658	0.009679	0.003725	0.004359	0	0.009871	0.003088	0.002156	0.00136	0.00698	0	0.003211
0.004032	0.027049	0.003316	0.002928	0.01869	0.015124	0.00244	0.013284	0	0.013667	0.006794	0.009056	0.012751	0.022208	0	0.007732
0	0	0	0	0	0	0	0	0	0	0	0	8.5E-05	0	0	0.000169
0.000149	0	0	0	0	0	0	0	0	0.094913	0	0.012937	0.00204	0.003173	0	0.004236
0.000149	0	0	0	0	0	0	0	0	0.000759	0	0.037516	0.00017	0	0	0.005313
0	0	0.000518	0	0	0	0	0.000415	0	0	0	0.003019	0.000425	0	0	0.004067
0	0	5.18E-05	0	0	0	0	0	0	0	0	0.022423	0.010201	0	0	0.00131
0.000149	0	0.028238	0	0	0	0	0.000623	0	0	0.000618	0.000431	0.00578	0.000635	0	0.003834
0	0	0.003005	0	0	0	0	0	0	0	0	0.05994	0.008671	0	0	0.002419
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.001521
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.001827
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.34E-05
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.000623	0	0.000759	0	0.003881	8.5E-05	0	0	0.000264
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.000415	0	0	0	0.002156	8.5E-05	0	0	3.17E-05
0	0	0	0	0	0	0	0	0	0	0	0.001725	8.5E-05	0	0	6.34E-05
0	0	0.003212	0	0.000514	0	0	0.013284	0	0.009871	0.000618	0.078051	0.092061	0	0	0.008841
0.000299	0.000796	0.00228	0.000976	0.010117	0.008469	0.002055	0.015982	0	0	0.008647	0.063821	0.116287	0	0	0.002873
0	0	0	0	0.001372	0	0.000128	0.001245	0	0	0	0.022855	0.000595	0	0	0.005926
0	0	0	0	0	0	0	0	0	0	0	0.006037	0	0	0	0.000496
0	0	0.001347	0.007809	0.000171	0	0	0.00166	0	0	0.011118	0.013368	0.012836	0	0	0.014155
0	0	0	0	0	0	0	0	0	0	0	0.040966	0	0	0	0.008218
0	0	0.003679	0.001952	0	0	0	0	0	0	0	0	0.001955	0	0	0.013479
0	0	0.019534	0	0	0	0	0	0	0	0	0.000431	0.00527	0	0	2.11E-05
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.010711
0	0	0	0	0	0	0	0.000208	0	0	0	0.000431	0.00289	0	0	0.004944
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.011894
0	0	5.18E-05	0	0.005144	0	0	0.000208	0	0	0	0.007762	0.00748	0.033629	0	0.00863
0.000149	0.000796	5.18E-05	0	0.000171	0	0.000128	0.000208	0	0	0	0	8.5E-05	0	0	0.000739
0.011498	0.065235	0.005285	0.007321	0.006001	0.004235	0.006936	0.005812	0	0.015186	0.02656	0.021561	0.010711	0.020305	0	0.005007
0.003285	0.02148	0.000518	0.001464	0.000686	0.000605	0.000771	0.001038	0	0.005315	0.001853	0.006037	0.00374	0.005711	0	0.002039
0.00881	0.035004	0.004974	0.000976	0.000857	0.005445	0.04187	0.004774	0.032539	0.000759	0.000618	0	0.014961	0.001269	0	0
0.002389	0	0.011295	0	0.002572	0	0	0.003944	0	0.001519	0	0.03536	0	0.001904	0	0.125363
0.00448	0.00716	0.002902	0.001952	0	0.018754	0.000257	0.012246	0	0.006074	0.003088	0.008193	0.000255	0	0	0.064308
0	0	0	0	0	0	0	0	0	0	0	0	0.000255	0	0	0.013246
0.00433	0.005569	0.148549	0.009273	0.010288	0.024198	0.007192	0.0467	0	0.024296	0.009883	0.025011	0.009181	0.015863	0	0.035397
0.00209	0.069212	0.005699	0.032211	0.020233	0.017544	0.001156	0.021793	0	0.009871	0.003706	0.005606	0.011391	0.007614	0	0.005926
0.00209	0	0.002902	0	0.040295	0.004235	0.006165	0.003113	0	0.009112	0.012971	0.002587	0	0.011421	-2.2482	0.00975
0.000896	0.011138	0.011451	0.000976	0.003086	0.112523	0.00167	0.005189	0	0.003797	0.001853	0.003019	0.000255	0.002538	0	0.004215
0.028371	0.015911	0.008236	0.00244	0.029321	0.027828	0.00411	0.035907	0	0.038724	0.019148	0.037516	0.0017	0.008249	0	0.035143
0.01538	0.120923	0.015648	0.018058	0.033265	0.042952	0.018623	0.055625	0	0.034928	0.025942	0.01423	0.014451	0.030457	0	0.001511
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.027916
0	0	0.001399	0	0.000171	0.000605	0	0.000208	0	0.015945	0	0.003019	0.00085	0.026553	0	0.012561
0.003882	0.008751	0.003161	0	0.00463	0	0	0.002076	0	0	0.020383	0	0.003145	0.005711	0	0.014133
0.000896	0.007955	0.023886	0.005857	0.006173	0	0.00822	0.003736	0	0.017464	0.035825	0.03536	0.00782	0.022843	0	0.013352
0.001493	0.001591	0.002226	0.000488	0.000514	0.00605	0.001413	0.007264	0	0	0.011118	0	0.003825	0	0	0.006887
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.016647
0	0	0.15285	0.103465	0.021605	0.174229	0	0.043379	0	0.003037	0.124768	0	0.012921	0	0	-0.0614
0.432134	0.458234	0.473834	0.793558	0.752572	0.491228	0.769458	0.678912	0.904654	0.653759	0.481779	0.400172	0.57506	0.747462	2.248198	0

Appendix B. Input-Output Table of Singapore With Endogenous Consumption

Flows in millions of Singapore Dollars of Y
[Total Transactions]

Industry:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	2.800528	0	1.200176	0	0	6.70117	0	1.5002	0	0	1.200164	0	0	0	0
2	0	0.600068	0.900132	0	1.600001	0.300052	0	70.80946	0	32.5031	56.90777	45.60651	0.700114	18.40298	29.70113
3	0	0	0.400059	0	0	14.70257	0	0	0	0	0.100014	0.100014	0	0	0
4	0	0	0	1.700029	0	0	0	0	0	0	0.100014	0	0	0	0
5	0	0	0	0	15.30035	0	0	0	0	0	0	0	0	0	0
6	0	0	0.200029	0	0	0.300052	0	0	0	0	0.300041	0	0	0	0
7	0	0	0.200029	0	0	0	21.80364	0.500067	3.700552	0	2.300314	0	0.400065	0	0
8	13.40253	0	0.200029	0	0	0	0	15.30204	1.700254	0	2.100287	0	2.900473	0	0
9	0	0	0.200029	0	0	0.100017	4.700785	2.400321	51.6077	0	2.700369	0	7.401208	0	0
10	17.20325	0	0.100015	0	0	0.200035	0.100017	4.600615	0.800119	75.20718	1.500205	0.200029	0.100016	0.100016	0.100004
11	2.200415	0	0.400059	0	0	0.40007	0.200033	1.5002	1.400209	0.10001	3.100423	0	5.100832	0	0.100004
12	134.7254	0	0	0	0	0	0	0	0	0	0	82.21174	0	0	0
13	0	0	0	0	0	0	0.100017	0	0.100015	0	0	0	0.300049	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0.400065	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49.90189
16	0	0	0	0	0.6	0.200035	0.90015	0.90012	0.900134	1.400134	0.800109	0.600086	0	0	5.600212
17	0	0	0.900132	0	0	0	0	0	0	0	0	0	0	0	0.100004
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	1.700275	0
26	0	0	0	0	0.9	0	0	0	0	0	0.100014	0	1.600261	4.400712	0.500019
27	0	0	0	0.100002	0.1	0	0	0.100013	0.100015	0.10001	0.200027	0	0.200033	0.200032	0.100004
28	0	0	0	0	0	0	0	0.100013	0.40006	0.200019	0.300041	0	0.800131	0	2.500095
29	0	0	0	0	0	0	0	0	0	0	0	5.300757	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	1.600001	0.40007	1.900317	1.900254	1.900283	2.800267	1.500205	1.200171	0	0.100016	1.300049
32	1.200226	3.500398	0	0.900015	0.1	0.100017	0	0.700094	0.20003	1.800172	3.900532	0.100014	0.700114	0	5.400205
33	2.100396	1.100125	2.100307	1.300022	0.4	0.300052	0.100017	0.500067	0.800119	0.700067	0.400055	0	0.400065	0	0.500019
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0.100017	0.30005	0.200027	0.20003	0.400038	0.200027	0.100014	0	0	0
36	0	0	0	0	0	0.300052	1.100184	1.100147	1.100164	1.600153	1.000137	0.7001	12.80209	0	0
37	0	0	0	0	0	0	0	0	0	0	0.100014	0	0	0	0
38	0	0	0	0	0	0	0	0	0.100015	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0.100017	0.200033	0.200027	0.20003	0.400038	0.400055	0.100014	0.500082	0.200032	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0.100013	0.100015	0	0	0	0	0.100016	0
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0.700102	0	0.2	0.300052	1.600267	1.600214	1.600239	2.400229	1.300177	1.000143	1.400228	3.900631	0.300011
45	0	0	0	0	0	0	0	0	0	0.10001	0	0	0	0.100016	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	0	0	5.000732	0.100002	0	0	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0.600068	0.900132	0	0	0	0	0	0	0.10001	0.100014	0	0	0.100016	0
56	0	0	0	0	0	0.100017	0	0.100013	0	0	0.100014	0	0	0	0
57	0.700132	0.400046	0	0.400007	0.9	0.500087	0.200033	1.600214	0.700104	1.100105	0.700096	0.400057	1.90031	0.300049	4.100155
58	0.200038	0.100011	0	0	0.2	0.300052	0.100017	0.200027	0.300045	0.300029	0.300041	0.100014	1.400228	0	0.700027
59	3.000566	0	0	0.100002	0.1	0.100017	0	0.100013	0.100015	0.10001	0.200027	0.100014	0.200033	0.100016	0.200008
60	22.00415	0	0	0	0.2	2.400419	3.100518	6.300842	3.900582	3.200306	4.600628	13.3019	3.400555	1.200194	6.000227
61	0	0	0	0.100002	0.2	0.100017	0	0.100013	0.20003	0.10001	0.300041	0.100014	0.300049	0.200032	0.200008
62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	0.500094	1.000114	1.000146	1.900033	0.7	0.40007	0.100017	2.400321	0.300045	0.400038	0.400055	1.300186	0.400065	0.300049	0.900034
64	0	0	0	1.000017	0.3	0.200035	0.100017	1.20016	0.100015	0.200019	0.200027	0.600086	0.200033	0.100016	0.500019
65	0	0	0	0.800014	1.200001	0.700122	0.30005	0.90012	1.000149	0.800076	2.2003	0.600086	2.300375	1.200194	1.600061
66	0	0	0	0.500009	0.7	0.100017	0.100017	0.400053	0.300045	0.300029	0.300041	0.500071	0.300049	0.200032	0.600023
67	0	0	0	0.700012	0.5	0.100017	0.100017	0.400053	0.300045	0.300029	0.300041	0.100014	0.400065	0.100016	1.300049
68	0	0	0	1.000017	1.500001	0.80014	0.100017	1.100147	1.000149	0.900086	2.500341	0.600086	2.900473	1.500243	2.10008
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	2.000377	2.90033	0.800117	0.100002	0.1	0	0	0.100013	0.100015	0.10001	0.100014	0	0.200033	0.100016	0.100004
73	1.700321	1.500171	0.500073	0.100002	0.2	0.100017	0	0	0.20003	0.10001	0.400055	0.100014	0.400065	0.200032	0.300011
74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0.500009	0.9	0.500087	0.200033	0.60008	0.700104	0.600057	1.600218	0.400057	1.700277	0.900146	1.200045
N. Comp.	16.70315	3.400387	4.700688	8.800151	15.30001	4.200734	2.000334	9.80131	6.600985	4.700449	9.30127	4.800685	15.20248	7.201165	20.80079
G.Oper.S.	123.4233	24.80282	34.10499	17.5003	12.80001	2.200384	3.300551	18.10242	5.100761	13.20126	14.00191	5.300757	12.70207	16.40265	44.07167
Imp.Duty	0	0	0	0	0	0	0	0	0	0	0	0	0	69.2112	0
Ex. Duty	0.90017	0.500057	0.900132	0	0	0	1.800301	0.800107	1.600239	0	1.000137	0	2.800457	0	0
Ind. Taxe	0.500094	0.100011	0.100015	1.300022	0.5	0.300052	0.100017	0.400053	0.300045	0.400038	0.400055	0.300043	1.000163	0.400065	1.000038
Gross VA	141.5267	28.80328	39.80583	27.60047	28.60001	6.70117	7.201203	29.10389	13.60203	18.30175	24.70337	10.40148	31.70517	93.21509	65.87252
G. Output	345.2651	40.50461	55.50813	38.90067	757.1004	37.60657	44.60745	148.6199	89.71338	146.614	119.5163	165.8237	83.01355	129.3209	182.4069
Tot. Imp.	62.61181	777.0885	61.90906	11.8002	751.5004	41.70728	58.30974	21.60289	59.50888	87.10832	68.80939	95.31361	52.00849	13.20214	93.30354
Tot. Reso.	407.877	817.5931	117.4172	50.70087	1508.601	79.31385	102.9172	170.2227	149.2223	233.7223	188.3257	261.1373	135.022	142.5231	275.7105

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0	0	0	0	2.000225	0	0	0	0	0	0	0	0	0	0
0	3.100333	0.200017	0	0	129.8009	76.10091	0	0.400033	0	0	0	0.100003	0.100007	0.100012
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.500047	0	0	0	0	0	0	0	0.100015	0	0.200014	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.800028	2.000141	5.400626
0	0	0.100008	0.100009	0	0.100001	0.500006	0	0	0	0.200028	0	0	0.100007	0.200023
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.700312	6.100656	56.30471	0.200019	0.400045	0	0	0	0.300025	0	0.80011	0	0	0	0.100012
15.40178	4.600494	298.655	1.700161	0.500056	0	0	0	0.500041	0	1.000138	0.300045	0	0	0
0	5.100548	1.700142	0	0	0	0	0	0.100008	0	0	0	0	0	0
0	0	7.100594	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.500047	0	0	0	0	0	0	0	0	0	0	0
0	0	0.400033	6.500615	13.10147	0	0	0	0	0	0	0	0	0	0
0	0	0	0.100009	0	8.700059	47.10056	0	9.100746	0	0	0	0	0	0
0	0.200021	0	0	0.900101	0.100001	10.50013	0	6.300517	0	4.000551	0	0	0	0
0	0	0	0	0	0	0	7.600118	0.200016	0	0	0	0	0	0
0	0	0	0	0	0	0	0	3.600295	0	0	0	0	0	0
0	0	0	0	0.100011	0	2.600031	0	0	3.400432	30.30417	51.60772	0	0	0.60007
0	0.100011	2.400201	0.300028	0.100011	0.100001	0.400005	0	0.100008	0.100013	5.100703	1.900284	1.000035	2.400169	2.400278
0	0	0.500042	0	0	0.100001	0.300004	0	0.100008	0	0.400055	5.800868	0.100003	0.300021	0.200023
2.100243	0.600064	0.700059	0.100009	0.100011	0.100001	0.700008	0	1.900156	0	1.900262	5.200778	10.50037	0.100007	0.200023
0	0	0	0	0	0	0	0	0	0	0	0	0	3.100219	0
0	0	0	0	0	0	0.100001	0	0	0	0.100014	0	0	0	3.100359
3.700428	0.300032	11.00092	2.500237	4.900551	0.100001	0.600007	0	1.800148	0	0.600083	0.300045	7.300255	2.000141	2.100244
0.200023	0.200021	2.100176	0.700066	0.300034	0.900006	14.60017	0	1.000082	0.100013	1.900262	2.700404	8.800307	18.80133	9.001044
0.200023	0.100011	0.300025	0.100009	0	0.700005	0.700008	0	0	0.200025	0.100014	0.100015	0	0.200014	0.400046
0.300035	0.100011	0.60005	0.500047	0.100011	0	0	0	0.300025	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0.900074	0	0	0	0	0	0.100012
0.100012	0	0.100008	0	0	0	0.100001	0	0	0	0	0.100015	0.100003	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.100003	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.100012	0	0.100008	0	0.100011	0	0.100001	0	0	0	0	0.100015	0.100003	0.100007	0.200023
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.200021	0.100008	0	0.100011	0	0.100001	0	4.900402	0	0	0.20003	0	0	0
0	0	0	0	0	0	0	0	0.100008	0	0.600083	0.100015	0	0	0
0.100012	0.200021	4.600385	0.200019	1.000112	0.200001	1.100013	0	5.400443	0	0.700096	0.500075	0.700024	1.600113	1.600186
0	0	0	0	0	0	0	0	0	0	0.100014	1.20018	0	0.100007	0
0	0	0	0	0	0	0	0	0	0	0	0.100015	0	0	0
0	0	0	0	0	0	0	0	0	0	0.100014	0	0	0	0
0	0	0	0	0	0	0.100001	0	0	0	0.200028	0.100015	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0.100015	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.100011	11.20094	0	0.80009	0	0.100001	0	0	0	0.500069	1.600239	0.100003	0.100007	0.100012
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.300035	0.400043	4.200351	0.300028	0.100011	0.700005	3.600043	0	0.400033	0.600076	0.400055	1.500224	0.200007	0.500035	0
0.100012	0.100011	0.800067	0	0	0.200001	0.80001	0	0.100008	0.200025	0.100014	0.300045	0.100003	0.100007	0
0	0	0.200017	0	0	0.100001	0.300004	0	0.100008	0	0.100014	0.20003	0.100003	0.300021	0.200023
1.400162	1.700183	23.902	0.800076	2.300259	7.700052	10.70013	0.900014	3.700303	0.400051	4.600634	7.301092	1.600056	1.200085	1.200139
0	0	0.400033	0	0	0.100001	0.400005	0	0.200016	0	0.100014	0.300045	0.100003	0.400028	0.200023
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.300035	0.400043	2.600217	0.400038	0.400045	1.900013	1.900023	0.200003	0.500041	0.100013	0.700096	1.500224	0.600021	0.700049	0.300035
0.100012	0.200021	1.400117	0.200019	0.200022	1.100007	1.000012	0.100002	0.300025	0	0.300041	0.80012	0.30001	0.400028	0.100012
0.200023	0	2.400201	0.200019	0.100011	0.900006	2.900035	0.100002	1.10009	0.300038	0.700096	1.900284	0.700024	2.600183	1.600186
0.200023	0.200021	1.100092	0.200019	0.100011	0.900006	1.300016	0.100002	0.200016	0.100013	0.300041	0.60009	0.200007	0.800056	0.200023
0.100012	0.300032	2.800234	0.300028	0	0.700005	0.80001	0	0.600049	0.200025	0.400055	1.40021	0.200007	0.100007	0.200023
0.100012	0.100011	2.800234	0.300028	0	1.200008	3.600043	0	1.200098	0.200025	0.80011	2.400359	0.800028	3.40024	1.90022
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.200017	0	0	0.100001	0.200002	0	0.100008	0	0	0.100015	0	0.200014	0.100012
0	0	0.400033	0	0	0.100001	0.500006	0	0.200016	0	0.100014	0.300045	0.100003	0.400028	0.200023
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.100012	0	1.700142	0.100009	0.100011	0.600004	2.100025	0.100002	0.800066	0.200025	0.500069	1.40021	0.500017	1.900134	1.100128
2.500289	6.900742	105.1088	5.800549	2.500281	16.90012	33.7004	1.500023	12.90106	1.700216	8.701199	37.4056	6.400224	4.800338	5.100591
4.300497	2.100226	78.40656	5.200492	2.700304	12.90009	42.60051	3.800059	6.000492	1.900242	14.20196	43.20647	6.800238	25.30178	10.80125
0	0	1.000084	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.100012	0.100011	1.300109	0.100009	0	0.400003	1.300016	0	0.300025	0.100013	0.300041	0.80012	0.30001	0.900063	0.500058
6.900797	9.100978	185.8155	11.10105	5.200585	30.20021	77.60093	5.300082	19.20157	3.70047	23.2032	81.41218	13.50047	31.00219	16.4019
34.70401	33.5036	628.5526	27.90264	33.00371	187.4013	263.5032	14.40022	65.70539	9.801246	80.91115	173.526	48.7017	75.2053	49.50574
565.3653	53.70577	51.50431	8.000757	39.40443	64.50044	41.00049	2.100033	9.000738	128.8164	25.90357	38.1057	47.70167	58.60413	30.50354
600.0693	87.20937	680.0569	35.9034	72.40814	251.9017	304.5036	16.50026	74.70613	138.6176	106.8147	211.6317	96.40337	133.8094	80.00928

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.100005	0	3.100262	0	0.10001	0.200003	0	0	0.100003	0	0	0	0.200009	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0.100008	0	0.600063	1.100017	1.200017	5.40008	2.100062	0	0	0	0	0
0	0	0	3.700312	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.100005	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0.100005	0	0	0	0	0	0	0	0	0	0	0	0	0
0.100006	0	0	0.100008	0	0.10001	0	0	0	0	0	0	0	0	0.100001
0	0.800042	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.500032	0	0	0.100008	0	0	0	0	0	0	0	0	0	0	0
1.700109	0	0.100001	0.600051	0	0.10001	0	0.600009	0	0.300009	0	0	0	0.100004	0
0	0	0	3.900329	0	0	0	0	0	0.200006	0	0	0	0.100004	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0.10001	0	0	0	0.100003	0	0	0	0	0.100001
0.100006	0	6.600059	0	0	0.400042	0	0	0	0.500015	0	0	0.200005	1.300056	0.400005
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.100001	0	0	0	0	0	0	0	0	0	0	0.100004	0
0	0	0	0	0	0	0	0.400006	0	0	0	0	0	0.100004	0
0.800052	0.100005	0	0.100008	0	0.400042	0.100002	0.800011	0	0.500015	0	0	0.100002	0.300013	0.100001
0.100006	0.200011	0.800007	0.100008	0	0.10001	0	0.100001	0	0	0	0.100002	0	0.200009	0.200002
1.800116	0.400021	0	0.100008	0	0.10001	0.100002	0	0	0.500015	0	0	0	2.400104	0.300003
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.100006	0.200011	0.100001	0	0	0	0	0	0	0	0	0	0	0	0.100001
78.10503	0.300016	0.500004	3.600304	0	0	0.300005	0	0	0.700021	0	0.100002	0.400009	1.700073	20.00023
18.00116	14.80079	21.00019	4.100346	0.100013	2.000209	0.500008	0	0.300004	1.400042	0	0.600012	0.300007	3.000129	1.300015
0.200013	9.100483	1528.714	0.500042	0	0.600063	1.200018	0	0.100001	0.100003	0	0.900017	0.900021	1.000043	0.500006
0	0	0	1.700143	0	0	0	0	0	0	0	0	0	0	0.200002
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.100006	0	0	0	0	5.800605	0	0	0.100001	0.900027	0	0	0	0.800035	0.100001
0	0.100005	0	0	0	0	0.100002	0	0	0.800024	0	0	0	0	10.50012
0	0	0	0	0	0	0.100002	42.3006	7.600113	1.800053	0	0	0	0.200009	0
0	0	0	0	0	0	0	0	0	0.100003	0	0	0	0	0.300003
0	1.000053	0.700006	0.200017	0.300039	0	1.600024	0.300004	0.200003	1.600048	0.200005	9.000175	1.30003	1.40006	1.600018
0	0	0	0	0	0	0	0	0	4.000119	1.700044	14.90029	4.800112	1.800078	0
0.300019	0	0.300003	0.300025	0	0	0.100002	0	0.100001	4.900145	0	13.30026	0.300007	84.60365	23.60027
0.100006	0.100005	0.500004	0	0	0	0	0	0	0.400012	0.100003	3.10006	0.900021	24.40105	3.100035
0.600039	0.900048	13.80012	0.800067	0	0.10001	0.100002	0	0.70001	2.500074	0	0.800016	0.700016	47.40205	10.90012
0.100006	0	0.400004	0.100008	0	0	0	0	0	0	0	0	1.600037	4.500194	30.30034
0	0	0	0.200017	0	0	0	0	0	0	0	0	7.800182	11.10048	2.100024
0	0	0.100001	0	0	0	0	0	0	0	0	0	0.100002	0.200009	0.400005
0	0	0.100001	0	0	0	0	0	0	0.100003	0	0	0.500012	0.300013	17.8002
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.200009	0.400005
0	0	0.100001	0	0	0	0.100002	0	0.300004	0.300009	0.900023	0	0	0.800035	0.100001
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.100001	0	0	0	0	0	0	0	0	0	0	0.200009	0.100001
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.300019	0.100005	0.100001	0	0	0	0	0	0	0	0	0	0	0.600026	0.200002
0	0	0.100001	0	0	0	0	0	0	0	0	0	0	0	0
3.000193	2.700143	11.0001	0.700059	0.200026	0.400042	1.100017	2.000029	0.100001	0.500015	0	5.400105	0.500012	2.900125	2.300026
0.300019	0.300016	2.900026	0.100008	0	0.10001	0.100002	0.100001	0.100001	0.200006	0	0.400008	0	0.500022	0.300003
0.100006	0.200011	0.900008	0.100008	0	0.10001	0.100002	0.100001	0	0	0	0.100002	0	0.300013	0.300003
0.900058	0.800042	2.800025	1.200101	0	0.700073	0.200003	4.700067	0.900013	2.100062	0.300008	4.400085	2.000047	19.30083	7.900089
0.200013	0.300016	1.400013	0.100008	0	0.10001	0.100002	0.100001	0.100001	0.100003	0	0.100002	0	0.400017	0.400005
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.500097	0.600032	15.50014	0.300025	0.200026	0.200021	0.300005	0.400006	0.300004	1.100033	0	0.400008	0.200005	2.700117	2.800032
0.800052	0.300016	8.200074	0.200017	0.100013	0.10001	0.200003	0.200003	0.100001	0.500015	0	0.200004	0.100002	1.40006	1.500017
1.300084	1.900101	9.200083	0.600051	0	0.900094	0.500008	0.70001	0.400006	0.500015	0.100003	1.000019	0.200005	2.900125	2.600029
0.700045	0.400021	3.500031	0.300025	0	0.10001	0.200003	0.100001	0.200003	0.100003	0	0.200004	0.100002	1.000043	0.800009
1.100071	0.400021	4.40004	0.200017	0	0	0.400006	0.500007	0.100001	0.200006	0.100003	1.100021	0.200005	1.900082	2.000023
1.500097	2.200117	11.5001	0.700059	0.100013	1.200125	0.500008	0.800011	0.400006	0.500015	0	1.100021	0.300007	3.500151	3.000034
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.100006	0.100005	0.600005	0	0	0.10001	0	0	0	0	0	0.100002	0	0.200009	0.200002
0.200013	0.300016	1.500013	0.100008	0	0.200021	0.100002	0.100001	0.100001	0.100003	0.100003	0.200004	0	0.500022	0.400005
0	0	1.5	0	0	0	0	0	0	0	0	0	0	0	0
0.900058	1.400074	6.70006	0.400034	0	0.600063	0.400006	0.500007	0.300004	0.300009	0.100003	0.700014	0.200005	2.100091	1.80002
20.00129	8.300441	53.90048	8.500717	0.500065	5.700595	5.700087	2.700039	3.40005	7.300217	0.40001	9.000175	2.500058	45.20195	40.90046
28.70185	19.50104	233.7021	12.40105	0.400052	0.600063	7.900121	15.30022	3.600053	15.80047	0.800021	36.2007	6.600154	54.40235	28.60032
1.500097	1.100058	10.40009	0	0	0	0	0	0	0	0	0.600012	0	0	0.90001
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.800052	0.700037	4.100037	0.300025	0	0.300031	0.300005	0.400006	0.100001	0.200006	0	0.700014	0.100002	1.300056	1.300015
51.00328	29.60157	302.1027	21.20179	0.900117	6.600688	13.90021	18.40026	7.100105	23.30069	1.200031	46.5009	9.200215	100.9044	71.70081
166.6107	69.90371	1956.418	49.60418	1.900247	21.90228	23.70036	74.40106	25.00037	53.40159	4.800125	104.702	32.90077	329.5142	222.8025
161.0104	159.8085	1630.715	26.60224	16.60216	40.3042	51.20078	51.60074	6.10009	7.500223	27.80072	334.6065	87.40204	294.5127	954.0108
327.6211	229.7122	3587.132	76.20643	18.50241	62.20649	74.90115	126.0018	31.10046	60.90181	32.60085	439.3085	120.3028	624.0269	1176.813

46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.100003	0	0.300005	0	0	0	0	0.100003	0	12.60115	0	0	0	0.600009	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.200004	0	0	0	0	0	0	0	0	0	0	37.80057	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0.200018	0	0	0	0	0
0.100003	0	0.100002	0	0	0.200001	0	0	0	0	0	0	0.10002	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	1.000091	0	0	0	0	2.000546
0	0	0	0	0	0	0	0	0.100014	6.500591	0	0	0	0	1.000273
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0.200018	0	0	0	0	0
0	0	0	0	0.200015	1.000004	0	0	0	0	0	0	0	20.0003	0
0.800023	0.100002	1.800032	0.100011	0.100007	0.200001	0	0.600019	0.100014	0.900082	0	0	0	32.9005	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.100002	0	0	0	0	0	0	0	0	0	0	0.100002	0
0	0.100002	0.100002	0	0.200015	0	0	0	0	0.100009	0	0	0	2.800043	6.001637
0.400012	0	0.900016	0	0	0	0	0.30001	0.100014	0.400036	0	0	0	1.100017	11.70319
0.200006	0	0.600011	0.100011	0.100007	0.800003	0	0.100003	0	0.100009	0.200021	1.100203	0.400078	1.500023	24.80677
0.300009	0.100002	0.100002	0.100011	0.500037	20.10008	0	0	0	0.200018	0	0	0	22.50034	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.100003	0	0.200018	0	0	0	0	0.100027
1.800052	2.300054	2.200039	1.300149	0.100007	0.200001	0.100011	6.500211	0.100014	0.600055	0	0	0	6.6001	14.60398
2.700078	0	4.600082	0.100011	0.300022	4.100016	0	0.200006	0	0.600055	0.300031	0.700129	1.600313	0.400006	0
0.100003	0	0.100002	0	0.200015	1.500006	0	0	0	0.200018	2.200229	30.30558	0.10002	7.400112	2.2006
0	0	0.300005	0	1.700124	0	0	0	0	0.100009	0	0	0	0.900014	0
0	0	0	0	0	0	0	0	0	0	0	0	0	2.500038	0
0.200006	0	0	0	0	0	0	1.000032	0	0	0	0	0	4.100062	0
0	0	0.100002	0	0	0	0	0	0	0	0	0	0	54.20082	0.100027
0	0	0	0	0	0	0	0	0	0	0	0	0	65.901	0
0	0	0	0	0	0	0	0	0	0	0	0	0	29.90045	0
5.000145	0.100002	1.500027	0	0	0.600002	0	0.30001	0	0.200018	0	0	0	7.400112	0.100027
1.200035	0	3.500062	0	0	0.300001	0	0.100003	0.700095	0	0	0	0	0.500008	0
2.200064	0	0.500009	0	3.300241	84.80033	0.200023	0.100003	0	1.000091	0	0	0	178.6027	0
3.600104	12.60029	2.600046	0	0.300022	1.000004	0.100011	0.200006	0.300041	0.700064	0	0	0	49.90076	0
8.30024	0.300007	36.70065	0	0.900066	10.30004	0.100011	5.000162	0.300041	3.200291	0	0	0	33.30051	0.100027
5.300153	0	3.900069	0	0.100007	84.50033	0.100011	0.400013	0	0.100009	0	0.300055	0.10002	5.90009	0.500136
28.40082	0	13.20023	0	0.200015	0.300001	0.100011	0.100003	0	0	0	0	0	1.400021	0.700191
0	0	0.400007	0	0.100007	0.1	0	0	0.100014	0.100009	0	0	0	61.90094	0
9.100264	0	540.1096	0.300034	0.100007	0.200001	0.200023	0.100003	0.100014	0.200018	0	0	0	0.900014	0.100027
0	0	21.80039	0.300034	0	0	0	0	0	0.100009	0	0	0	0	0
0	0	0	0	42.4031	1.100004	0	0	0	0.100009	0	0.100018	0.10002	0	0
0.100003	0	0.100002	0	0	110.6004	0	0	0	0.100009	0	0	0	2.400036	0
0	0	0	0	0	0	5.500624	1.800058	0	0	0	0	0	0	0
0.100003	0	0.100002	0	0	0	0	51.50167	0	0	0	0	0	0	0
0	0	9.800174	0	0	0	0	0	78.81075	0	0	0	0	0	0
0.100003	0	0.200004	0	0	0.1	0	0.100003	0	6.100555	0	0	0	0.100002	0.100027
0	0	0.100002	0	0	0.1	0	0	0	0	0	0.100018	0	0.100002	0.400109
1.800052	0.300007	5.800103	0.100011	0.400029	5.300021	0.100011	1.800058	0.200027	0.700064	0.200021	0.300055	4.100803	1.600024	16.40448
0.100003	0	0.500009	0	0.100007	1.200005	0	0.200006	0	0.100009	0.10001	0.200037	0.10002	0.200003	3.100846
0.300009	0	0.700012	0	0.100007	1.000004	0	0.100003	0	0	0	0.200037	0.600117	11.70018	8.402292
4.000116	1.400033	13.80024	0.100011	5.100373	24.20009	0.600068	1.100036	4.500614	2.400218	0	0	0	33.0005	0
0.400012	0	1.10002	0	0.200015	1.400005	0	0.200006	0	0	0	0	0	0.200003	27.30745
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.300067	0.300007	11.60021	0.100011	1.600117	3.800015	0.100011	2.700088	0.100014	0.600055	0	1.000184	0.500098	8.700132	135.537
1.200035	0.200005	6.20011	0	0.900066	2.100008	0.100011	1.400045	0.100014	0.300027	0.10001	0.700129	0.200039	1.000015	30.50832
2.800081	0.200005	7.400131	0.100011	1.200088	9.700038	0.200023	1.400045	0.300041	0.300027	0	0	0	0.100002	53.71465
0.500014	0.100002	1.400025	0	0.200015	4.400017	0.100011	0.30001	0.200027	0.200018	0	0.400074	0	1.000015	23.20633
0.900026	0.100002	2.900051	0.100011	0.200015	6.200024	0.100011	1.300042	0.100014	0.400036	0	0	0	1.30002	75.02047
3.300096	0.300007	9.100161	0.200023	1.50011	12.10005	0.200023	1.600052	0.300041	0.200018	1.300135	10.90201	2.900568	9.300141	108.5296
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.300355
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.200006	0	0.500009	0	0.100007	0.700003	0	0.100003	0	0	0.10001	1.300239	0.500098	0.400006	2.700737
0.500014	0.100002	1.200021	0	0.200015	1.600006	0	0.200006	0	0.100009	0	0	0	0.800012	11.50314
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.000058	0.200005	5.400096	0.100011	0.900066	7.100028	0.100011	1.000032	0.200027	0.200018	0	0	0	0	15.30417
24.3007	2.900068	129.1023	1.40016	12.10088	159.1006	3.200363	24.40079	5.400737	7.600691	2.200229	23.50433	11.30221	334.1051	577.6576
16.70048	3.200075	242.5043	1.300149	6.500475	117.8005	0.900102	9.700315	5.900805	5.000455	6.500675	116.2214	34.50676	306.8047	1661.653
0	0	0	0	0.500037	0	0	0	0	0	0	0	0	2.800043	0
0	0	0	0	0	0	0	0	0	0	0	13.6025	0	3.200049	1.300355
1.100032	0.100002	3.000053	0.100011	0.400029	3.900015	0.100011	0.700023	0.100014	0.200018	0.900094	14.00258	0.900176	6.100093	18.80513
42.10122	6.200145	374.6066	2.800321	19.50143	280.8011	4.200477	34.80113	11.40156	12.80116	9.600997	167.3308	46.70915	653.0099	2259.416
132.5038	25.00058	1088.219	5.900676	83.00607	683.7027	12.20138	116.8038	98.11338	54.10492	14.10146	214.9396	58.01136	1355.921	2836.474
261.4076	56.70133	740.8131	111.8128	231.8169	389.0015	128.2145	154.705	106.1145	122.8111	0.300031	0	0	0	0
393.9114	81.70191	1829.032	117.5135	314.823	1072.704	140.4159	271.5088	204.2279	176.7161	14.4015	214.9396	58.01136	1355.921	2836.474

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
74.92951	0	8.000583	0	0	0	0	0	0	0	0.100032	0	6.400091	0	0
57.42262	0	6.100444	0	0	0	0	0	0	0	0	0	4.700067	0	0
15.40607	0	1.600117	0	0	0	0	0	0	0	0	0	1.300019	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.90469	0	1.300095	0	0	0	0	0	0	0	0	0	0.800011	0	0
12.30485	0	1.300095	0	0	0	0	0	0	0	0	0	0.900013	0	0
17.10674	0	1.900138	0	0	0	0	0	0	0	0	0	1.700024	0	0
12.80504	0	1.400102	0	0	0	0	0	0	0	0	0	0.800011	0	0
9.303664	0	0.900068	0	0	0	0	0	0	0	0	0.700098	0.900013	0	0
22.90902	0	2.400175	0	0	0	0	0	0	0	0	0	2.200031	0	0
0	0	0	0	0	0	0	0	0	0	0.200063	0	0.200003	0	0
22.90902	0	3.200233	0	0	0	0	0	0	0	0	0	0.300004	0	0
14.50571	0	2.000146	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	6.100087	0	0
7.402916	8.515138	3.500255	0.200058	1.600174	1.100143	1.00012	1.100198	0	2.000298	0.800253	0	15.30022	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.200003	0	0
0	0	0	0.100029	0.200022	0	0	0	0	0	0	0	3.100044	1.00015	0
0	0	0	0	0	0	0	0	0	0	0	0	2.000028	0	0
0	0	0	0	0	0	0	0	0	0	0	0.100014	0.100001	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	7.900576	0	0	0	0	0	0	0	0	0	0.100001	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.100001	0	0
0	0	0	0	0	0	0	0	0	0	0	0.100014	3.400048	0	0
0.600236	0.601069	1.000073	0.500145	3.500381	1.700222	2.400288	1.900341	0	0.600089	0.100032	0.200028	2.900041	0.40006	0
0.100039	1.001781	2.600189	0.100029	3.300359	1.600208	2.900349	2.100377	0	1.300194	0.500158	0.50007	1.600023	1.100165	0
2.701064	3.406055	6.400466	0.600174	10.90119	2.500326	1.900228	6.40115	0	1.800268	1.100348	2.100293	15.00021	3.500526	0
0	0	0	0	0	0	0	0	0	0	0	0	0.100001	0	0
0.100039	0	0	0	0	0	0	0	0	12.50186	0	3.000419	2.400034	0.500075	0
0.100039	0	0	0	0	0	0	0	0	0.100015	0	8.701214	0.200003	0	0
0	0	1.000073	0	0	0	0	0.200036	0	0	0	0.700098	0.500007	0	0
0	0	0.100007	0	0	0	0	0	0	0	0	5.200726	12.00017	0	0
0.100039	0	54.50397	0	0	0	0	0.300054	0	0	0.100032	0.100014	6.800097	0.100015	0
0	0	5.800423	0	0	0	0	0	0	0	0	13.90194	10.20015	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.300054	0	0.100015	0	0.900126	0.100001	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.200036	0	0	0	0.50007	0.100001	0	0
0	0	0	0	0	0	0	0	0	0	0	0.400056	0.100001	0	0
0	0	6.200452	0	0.300033	0	0	6.40115	0	1.300194	0.100032	18.10253	108.3015	0	0
0.200079	0.100178	4.400321	0.200058	5.900642	1.400182	1.600192	7.701384	0	0	1.400443	14.80207	136.8019	0	0
0	0	0	0	0.800087	0	0.100012	0.600108	0	0	0	5.30074	0.70001	0	0
0	0	0	0	0	0	0	0	0	0	0	1.400195	0	0	0
0	0	2.600189	1.600463	0.100011	0	0	0.800144	0	0	1.80057	3.100433	15.10022	0	0
0	0	0	0	0	0	0	0	0	0	0	9.501326	0	0	0
0	0	7.100517	0.400116	0	0	0	0	0	0	0	0	2.300033	0	0
0	0	37.70275	0	0	0	0	0	0	0	0	0.100014	6.200088	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.100018	0	0	0	0.100014	3.400048	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.100007	0	3.000326	0	0	0.100018	0	0	0	1.800251	8.800125	5.300797	0
0.100039	0.100178	0.100007	0	0.100011	0	0.100012	0.100018	0	0	0	0	0.100001	0	0
7.703034	8.214604	10.20074	1.500434	3.500381	0.700091	5.400649	2.800503	0	2.000298	4.301361	5.000698	12.60018	3.200481	0
2.200867	2.704808	1.000073	0.300087	0.400044	0.100013	0.600072	0.50009	0	0.700104	0.300095	1.400195	4.400063	0.900135	0
5.902325	4.407836	9.600699	0.200058	0.500054	0.900117	32.60392	2.300413	8.601293	0.100015	0.100032	0	17.60025	0.20003	0
1.60063	0	21.80159	0	1.500163	0	0	1.900341	0	0.20003	0	8.201145	0	0.300045	0
3.001182	0.901603	5.600408	0.400116	0	3.100404	0.200024	5.90106	0	0.800119	0.500158	1.900265	0.300004	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0.300004	0	0
2.901143	0.701247	286.7209	1.90055	6.000653	4.000521	5.600673	22.50404	0	3.200476	1.600507	5.80081	10.80015	2.500376	0
1.400552	8.715494	11.0008	8.60191	11.80128	2.900378	0.900108	10.50189	0	1.300194	0.60019	1.300181	13.40019	1.20018	0
1.400552	0	5.600408	0	23.50256	0.700091	4.800577	1.50027	0	1.200179	2.100685	0.600084	0	1.800271	218.1477
0.600236	1.402493	22.10181	0.200058	1.800196	18.60242	1.300156	2.500449	0	0.500074	0.300095	0.700098	0.300004	0.40006	0
19.00749	2.003562	15.90116	0.500145	17.10186	4.600599	3.200385	17.30311	0	5.100759	3.100981	8.701214	2.000028	1.300195	0
10.30406	15.22707	30.2022	3.701071	19.40211	7.100925	14.50174	26.80482	0	4.600685	4.20133	3.300461	17.00024	4.800722	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	2.700197	0	0.100011	0.100013	0	0.100018	0	2.100313	0	0.700098	1.000014	4.500677	0
2.601024	1.101959	6.100444	0	2.700294	0	0	1.00018	0	0	3.301045	0	3.700053	0.900135	0
0.600236	1.001781	46.10336	1.200347	3.600392	0	6.400769	1.800323	0	2.300342	5.801836	8.201145	9.200131	3.600541	0
1.000394	0.200358	4.300313	0.100029	0.300033	1.00013	1.100132	3.500629	0	0	1.80057	0	4.500064	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	295.0215	21.20614	12.60137	28.80375	0	20.90376	0	0.40006	20.20639	0	15.20022	0	0
130.1513	37.06589	382.0278	39.61146	143.4156	44.20576	29.30352	170.9307	0	46.00685	33.8107	44.20617	661.1094	115.0173	0
159.3628	20.63669	532.5388	123.0356	295.5322	37.00482	569.8685	156.2281	239.136	40.10597	44.21399	48.60678	15.40022	2.800421	-218.148
12.90508	0	1.800131	0	0	0	0	0	0	0	0	0.400056	0.100001	0	0
9.103586	0	13.40098	0	0.400044	0	0	0.100018	0	0	1.900601	0	3.100044	0	0
15.30603	7.914069	55.30403	0.800232	9.601045	3.200417	92.91117	4.500809	16.6025	1.400208	27.60874	1.600223	0.100001	2.300346	0
326.8287	65.61665	985.0718	163.4473	448.9489	84.411	692.0832	331.7596	255.7384	87.51302	107.534	94.81323	679.8097	120.1181	-218.148
669.9639	125.9239	1930.141	204.9593	583.2635	165.3215	778.6936	481.8866	264.3397	131.7196	161.9513	231.9324	1176.417	157.6237	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	-97.0323
669.9639	125.9239	1930.141	204.9593	583.2635	165.3215	778.6936	481.8866	264.3397	131.7196	161.9513	231.9324	1176.417	157.6237	-97.0323

COMMENTS: