CHAPTER SIX

EMPLOYMENT POTENTIAL OF THE INFORMAL SECTOR

ONE HUNDRED SIXTY FIVE
Summary: One of the obvious reasons for the rapid diffusion of the urban informal sector in the developing countries is the implementation of massive urbanisation programmes without a balanced policy of industrialisation. In this chapter, we are concerned with the employment potential of the informal sector which starts with the disclosure of present volume of employment of the urban informal sector including some notable points which are based on several study reports concerning this sector. The respective governments of some of the developing countries, as disclosed by these study reports, have already upheld the informal sector. Several policies are being implemented for improving this sector, we have marked here some of the relevant points which should not be left outside.

Next we have explored into the nature of informal sector in order to know whether this sector is characterised by an autonomous capacity for improving the incomes of the urban poor. In this context, we have enlightened different study reports of the practitioners. In the long run period, employment potential depends very much on the growth potential. Keeping this in view the growth potential of the informal sector has been explained in detail. The result shows that the informal activities operating under oligopoly may not be evolved in a permanent way. But an evolution is possible for such informal activities which are carrying outside the oligopolistic arena. In addition, an emphasis has been made on the transfer of surplus from informal sector to rest of the economy.
Thereafter, the determinants of employment potential of the informal sector have been identified and analysed in an input-output framework. As evident in our model, the crucial variables which, in conjunction with the elasticity of employment with respect to output in the informal sector, determine the employment potential are:

(i) changes in aggregate income, (ii) changes in the relative price levels, (iii) technical change and (iv) changes in consumer tastes.

The expatiation of the mathematical model clearly indicates that several advantages can be derived if there is an evolutionary growth of the informal sector. It also discloses the types of changes which affect the informal sector. There must be an equal share of income and, in order to make it possible, the policy makers should frame policies in a way which could drift the final demand towards the informal sector.

The promotion of employment in the informal sector, as explained by the mathematical model, is complementary with an emphasis of agricultural development. Finally, an analysis has been made as to how upgradation of employment is possible through foreign investment and how consumer welfare can be maximised through product substitution.

In the conclusion, we have stressed on the need for the formulation of policies for tapping the employment potential of the informal sector. This should be a major policy objective due to the population explosion in the developing countries. Apart from investment and other factors, a direct utilisation of consumer demand has a favourable impact on such
potential. However, informal sector could grow evolutionary if there is official support to treat this sector at par with the formal sector which might not be favourable for the latter.

In the developing countries, planning for urbanisation has not been matched properly with industrialisation. This, in turn, creates a space for the growth of informal sector whose behaviour is induced by the modern sector. The growing urban labourers (more practically, the 'victims' of massive urbanisation without industrialisation) are being absorbed in the informal sector increasingly. The agglomeration of economically productive urban populace in this sector has already been enlightened in different studies. The informal sector has been demarcated as a sector where among other features (i) labour market is flexible in terms of wages and supply of labour and (ii) the use of overhead imposes minimum burden on the prevailing social infrastructure.

In fact, there is a diversity of opinion among the researchers which make it difficult to relate the broad contours of the informal sector. "......detailed analysis of the sector is, however, handicapped by lack
of not only data but also standard definitions and measurement techniques. In addition, the problem arose when we are to define such people who are not regarded under the conventional categories as employed though they are working at economically viable and rewarding jobs. From a group of such works which may be considered as informal, the term informal employment may include the self employed, proletariat and even those who support themselves but yet do not consider as vagrants.

However, the data available in this regard will exhibit a picture about the percentage of urban labour force engaged in the informal sector of some of the developing countries. This is represented in the following table:

**TABLE : 1:21: SELECTED ECONOMIES IN THE ESCAP REGION**

<table>
<thead>
<tr>
<th>Name of the Country</th>
<th>City/District</th>
<th>%age or urban labour force employed in the informal sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh(a)</td>
<td>Dhaka(1981)(b)</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Ahmedabad(1971)(c)</td>
<td>44-75</td>
</tr>
<tr>
<td></td>
<td>Bombay(1971)(c)</td>
<td>46.5</td>
</tr>
<tr>
<td></td>
<td>Calcutta(1971)(d)</td>
<td>39.5-50.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40-50</td>
</tr>
</tbody>
</table>

ONE HUNDRED SIXTY NINE
<table>
<thead>
<tr>
<th>Name of the Country</th>
<th>City/District</th>
<th>%age of urban labour force employed in the informal sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia(e)</td>
<td>Delhi(1971)(c)</td>
<td>53.8</td>
</tr>
<tr>
<td></td>
<td>Madras(1971)(c)</td>
<td>50-70</td>
</tr>
<tr>
<td></td>
<td>Valsad(1977)(c)</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Jakarta(1976)(d)</td>
<td>54</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Not available</td>
<td></td>
</tr>
<tr>
<td>Pakistan(1972)(d)</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>Sri Lanka(a)</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Thailand(1976)(d)</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Colombo(1971)(d)</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Bangkok(1981)(f)</td>
<td>87</td>
</tr>
</tbody>
</table>
It is evident from above that the informal sector is equipped with employment potential. Perhaps, this is the reason why this sector becomes more viable as economic entities. In the prevailing circumstance in India, it is doubtful whether large scale industries or agricultural sector could solve the problem of unemployment. As there is the scarcity of capital and plethora of labour, it would be prudent to emphasize on the capital light industries which might play due role in creating additional job opportunities.

In a recent survey in Bangkok, it was found that 70% of the workers of informal sector are unskilled and over 60% come from rural areas. While analysing them in the criteria of sex, it has been marked that male workers are concentrated in the field like construction, tailoring and transport while the female workers predominate in the small trading and service activities. In Thailand, percentage of women engaged in the informal sector is more than that of male workers. This fact does not keep a pace with the informal sector of other countries where male workers predominate. Other relevant features disclosed by the above study are: workers are paid at piece rate and non-existence of fixed working hours specially for the self-employed persons.
In Bangladesh\(^{(h)}\), the workers of informal sector work, in most cases, for all days in a week. The working hours is as long as twelve hours while the earning of 59\% of workers is as low as $30\text{ p.m.}$ i.e. the average wage of the country as a whole. In this context, it is not irrelevant to note that in Calcutta, the average wage of the workers of informal sector is less than $20\text{ p.m.}$ and that of Bangkok is $80\text{ p.m.}$

The above facts about the informal sector may not be encouraging. But what is important to note that this sector provides a source of sustenance to a considerable portion of urban labour force in many developing countries which the formal sector fails to provide. Informal sector has been viewed as a new growth pole, an island of development and an effective training school for larger industry. In addition, the petty producers of the informal sector also constitute a sizeable proportion of the urban economically active population\(^{(1)}\).

In this regard, one might encounter the relationship of a city with the urban system as a determinant of the induced labour demand in the informal sector.

As there is the existence of two distinct sector in the developing country's economy, namely formal and informal, we should search for the growth potential of the latter in the terms
dictated by the former. This is because the former dominates the latter. In broad sense, such terms may be within the scale of production or in the technological progress.

In the ESCAP region, many governments have adopted some ameliorative programmes and policy measures for an improvement of the informal sector. These include provision of infrastructure, stemming the rural-urban exodus by launching development in the former area, providing vocational training programmes, promoting the production and sales co-operatives and improving the credit system in order to minimise the obstacles for sanctioning loan to informal sector.

Of these, the effect of social infrastructure investment on the urban poverty levels should be considered with due importance. Since, it creates not only direct employment but also provides an additional source of real income to the urban poor by the development of housing, health and education.

In addition to the above, the respective authority of some of the developing countries also provides contracts to the petty producers for supplying such commodities which are required by various government departments as the existing rules of those countries militate against them for being accepted as a contractor. However, the government should be more cautious that the beneficiaries (i.e. the petty producers)
do not utilise their accumulated wealth to act as a contract brokers.

OFF THE TRACK

The point to be highlighted is the informal sector causes due concern in the government level. There is every sign to encourage the evolution of this sector by the state authorities. It discloses that there is a trend to appreciate a basic fact that the unmarked, unaided petty producers of the informal sector can progress. The problems related to the development of this sector are considered as being remedial through some promotion schemes as mentioned above.

The aggregate result of such schemes have been misunderstood as the analysis of different projects have been based upon a pragmatic, disjointed and essentially dualistic conception of economy. In this regard, the state must determine the most efficient allocation of its available resources. The initial question which should be asked and answered is: whether is distributes the total promotion budget equally among a large number of informal unit owners or ameliorate them selectively? The state's preoccupation with the success of promoted units
may require partial treatment which will undoubtedly affect those units not benefited from promotion. Similarly, an open economy might inspire, by virtue of promotion, predatory attacks by the successful enterprises whose strategies are not limited by small budget.

THE NATURE OF THE INFORMAL SECTOR

Eyeing the employability of the informal sector, the question raises inevitably whether the labourers of the informal sector represent a passive, exploited majority or whether their activities pose an autonomous power for improving the level of income of the urban poor?

In order to answer it, an exploration into the process of accumulation is required. This will, in turn, enlight the nature of the informal sector. "Informal sector activities generate surplus or can do it provided that the policy environment does not discriminate against them\(^1\)". Hart '70 and '73 and ILO '72 observed that the informal sector is characterised by the potential of growth with a more egalitarian distribution of income. A sizeable portion of labour force gets an opportunity within the informal sector to produce or sell something which generates income. These labourers would other
wise swell the rank of unemployment. "Their ingenuity to make a living out of a situation of lack of access to resources and to markets and their capacity of survival under unfavourable conditions proof that they have the potential for further developing their activities\(^m\)." The growth potential of this sector has been marked as autonomous and the informal sector, itself, has been defined as a self-contained segment of the economy. (ILO '72, Oshima '71, Sethu Raman '75)

Oshima\(^n\) ('71) pointed out "Proprietors and their family help and employees work for each other and buy each other's products". In fact, the autonomous informal sector is more efficient and comparatively advantageous if we consider such activities which are developed in both formal and informal sector. "It's main advantage is the socially adequate factor proportions used in the process of production, since labour is used at a maximum without exerting heavy pressures on capital or on foreign exchange\(^o\)". In addition to this, there is the use of second hand machinery and indigenous technology which help to minimise the new capital requirements. This does not indicate inefficiency because there is a variety of activities in the informal sectors performed with a very little capital cost even with an upgrading of techniques. The most efficient use of the prime components create a surplus
which, if properly re-invested, can foster further growth. Individual savings of the persons within the informal sector are too low and spend mostly for durable goods, house improvements and new constructions. Frankenhoff ('67) cited an example of capital formation in housing in favela communities of Rio de Janeiro which disclosed that the value of capital formation reached at a significant level and that the rehabilitation of that community constitute and economically more feasible alternative than their abolishment. The growth potential of the informal sector gets a momentum when it is articulated to the rest of the economy.

Hart ('73) pointed out that informal sector is mainly the exporter of different products and services, specifically, the illegitimate services. In the circulation process, this sector plays an important role due to its easy accessibility to the customers. Besides, the provision of credit and selling in as small units as required should also be counted in this respect. Informal sector, as viewed by him, if properly managed, could offer means to generate independent and development oriented industrialisation.

According to Mc Gee ('73), the traders of informal sector are engaged in vertical exchange of commodities, both upward,
and downward. He argued that it would be upward vertical exchange when such traders are selling foodstuffs to the urban poor. But, it would be downward vertical exchange when they deal in urban produced goods like textiles.

As pointed out by Hart ('70), informal sector provides important service in transport and communication in such developing countries where these basic services are not sufficient. Webb ('74) marked that the informal sector is highly integrated to the rest of the economy. Three-fourth of the total production of this sector is being exported while a similar proportion is being imported to this sector for consumption. Such an articulation is fruitful since the export is service oriented - related either to commerce or household - which is complementary to the production of the formal sector. The growth potential of the informal sector is accelerated by its access through these traders which finally inroads to the expanding markets of the rest of the economy. For this reason, it has become a realised fact that this sector has a growth potential whether autonomous or integrated. In addition, this growth may be considered evolutionary since an increasing number of labourers can be absorbed at higher average income.

ONE HUNDRED SEVENTY EIGHT
The latter part has been elaborated by Week ('73). The
maintains that the growth of informal sector is beyond doubt;
therefore, in his opinion, the relevant question is whether
this growth is involutionary or evolutionary. In the former
case, a large number of working masses is incorporated at
a stagnant or diminishing level of real income. While in the
latter case, such an absorption is at an incremental wage
rate.

Another point to be noted is the rate of expansion of the
informal sector depends neither on the growth of the formal
sector nor on the increased supply of labour. However, with
several types of growth in both formal and informal sector,
it is probable that average income and productivity will remain
constant while employment grows rapidly in the informal sector.
Moreover, the growth rate of formal and informal sector is
likely to be the same provided consumer's preference for the
informal sector goods remains stable.

The economic surplus of the informal sector is transferred
to the rest of the economy. This may be viewed as an inter-
mediate step of the transfer of surplus from periphery to
centre. Although the mechanism through which surplus is transferred from this sector takes a variety of shape. For example, the working masses of the informal sector receives poor wages. This, in turn, enlarges the surplus value which is transferred to the formal sector through financial mechanism. It is not irrelevant to point out in this context that the demand for the products of the informal sector is limited due to its marked subordination.

In the yardstick like transfer of surplus, it is beyond question that there is a significant link between the informal sector and the rest of the economy. Different studies make it clear that in a competitive framework, the growth potential of the informal sector is higher specially when the related activities of this sector are already well advanced (q).

In order to depict the growth potential, product wise classification (for example, manufactured goods, personal services, distributory services, financial services etc.) of the informal sector activities is justified. However, it would be imprudent to expect a permanent expansion of those informal activities which are being operated in oligopolistic condition. Because, the evolution of such activities pass through continuum where expansion or contraction depend solely on the trend of demand, minimum scale of operation, economies of scale etc. They could benefit from short-term profits but
in the long period they might have to loss markets which is, in fact, a case of most informal manufacturing activities. Of course, this does not mean that the informal activities operating under the condition of oligopoly will be abolished, nor that they will steadily decline, as the prevailing factors might create a less pronounced trend or even a reverse one. For example, factors like clientele relations, location and minimum size of sale favour the informal sector alongwith the predominant family labour which makes wages more flexible and lets a space for evasion of official regulations.

However, an evolution is possible for those informal activities which are not under oligopoly marked. As found in many developing countries, such a possibility is marked with the informal unit's producing shoes.

Although technical change in the informal activities relating to personal services is more gradual but their existence in an economy with higher level of income is sufficient for presuming their expansion. However, such an expansion may not be rapid due to their low income elasticity. There is also the possibility of "unequal exchange" which might develop against the service workers specially when other activities do not transfer the benefits of productivity gains to prices.
For informal commerce activities, a trend to oligopolisation seems unlikely and there is a gradual change in technology such activities might survive for long period due to market imperfection, particularly, the demand behaviour at low income levels. The latter induces product differentiation which, in turn, makes a room for permanency of this sort of activities. In addition, these activities could enjoy a share in the overall market due to such factors like infinite product subdivision, limitless business hours, owner - customer relationship etc.

A recent phenomenon of the less developed countries, as disclosed by the official surveys concerning employment is that a mild growth of employment has been accompanied by a rapid growth of output. This is simply because a large number of wage earners of the informal sector are not counted in official surveys. As a consequence, there is a tendency to swell the level of urban unemployment.

The fact that the informal sector could provide mass employment has already been mentioned. What we are yet to describe is the determinants of growth of output and employment in the urban informal sector of the less developed countries (r). For this purpose, we exhibit below an analytical framework in order to describe the interaction between thr formal and
THE MATHEMATICAL MODEL

The determinants of the employment potential i.e., the growth of employment in the informal sector can be organised in an input-output framework. Our model has four sectors: peasant agriculture (sector 1), the informal sector (sector 2), the private formal sector (sector 3) and the government sector (sector 4).

The outputs of the sectors are $X_1, X_2, X_3, X_4$ and the final demands $Y_1, Y_2, Y_3, Y_4$ where these are for peasant agriculture, informal sector, formal sector and government respectively.

In order to provide an analytical tool, we have arranged the above assumptions in an input-output flow table in the following way:
### TABLE: 1:22 FCUR SECTOR INPUT-OUTPUT MODEL

<table>
<thead>
<tr>
<th>SECTORS</th>
<th>INPUTS TO SECTOR 1</th>
<th>INPUTS TO SECTOR 2</th>
<th>INPUTS TO SECTOR 3</th>
<th>INPUTS TO SECTOR 4</th>
<th>FINAL DEMANDS</th>
<th>OUTPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$a_{11}X_1$</td>
<td>$a_{12}X_2$</td>
<td>$a_{13}X_3$</td>
<td>$a_{14}X_4$</td>
<td>$Y_1$</td>
<td>$X_1$</td>
</tr>
<tr>
<td>2</td>
<td>$a_{21}X_1$</td>
<td>$a_{22}X_2$</td>
<td>$a_{23}X_3$</td>
<td>$a_{24}X_4$</td>
<td>$Y_2$</td>
<td>$X_2$</td>
</tr>
<tr>
<td>3</td>
<td>$a_{31}X_1$</td>
<td>$a_{32}X_2$</td>
<td>$a_{33}X_3$</td>
<td>$a_{34}X_4$</td>
<td>$Y_3$</td>
<td>$X_3$</td>
</tr>
<tr>
<td>4</td>
<td>$a_{41}X_1$</td>
<td>$a_{42}X_2$</td>
<td>$a_{43}X_3$</td>
<td>$a_{44}X_4$</td>
<td>$Y_4$</td>
<td>$X_4$</td>
</tr>
<tr>
<td>Labour</td>
<td>$X_{01}$</td>
<td>$X_{02}$</td>
<td>$X_{03}$</td>
<td>$X_{04}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. $a_{11}$, $a_{12}$, $a_{13}$ etc are the input coefficient;
2. $a_{11}X_1$ indicates amount of $X_1$ going as input to $X_1$. Similarly, $a_{21}X_1$ indicates amount of $X_2$ going to $X_1$ as an input and so for others;
3. The FINAL DEMANDS column shows the commodity breakdown of what is available for consumption;
4. Each column, thought of as a whole (i.e. as a VECTOR) represents the input (or cost) structure of the respective sectors;
(5) Each row shows the allocation of total output of the respective sectors; (6) We make the convention that labour is not directly consumed. It is coming from outside at an exogenously given rate. Let $X_0 =$ total labour supply $= X_{01} + X_{02} + X_{03} + X_{04}$.

The total output of different sectors, as evident in the above table, is exhausted according to the following identity:

$$X^i = a_{1i} X_1 + a_{12} X_2 + a_{13} X_3 + a_{14} X_4 + Y^i$$

Let us arrange the above in the form of matrix:

$$\begin{bmatrix}
X_1 \\
X_2 \\
X_3 \\
X_4
\end{bmatrix} =
\begin{bmatrix}
a_{11} & a_{12} & a_{13} & a_{14} \\
a_{21} & a_{22} & a_{23} & a_{24} \\
a_{31} & a_{32} & a_{33} & a_{34} \\
a_{41} & a_{42} & a_{43} & a_{44}
\end{bmatrix}
\begin{bmatrix}
X_1 \\
X_2 \\
X_3 \\
X_4
\end{bmatrix} +
\begin{bmatrix}
Y_1 \\
Y_2 \\
Y_3 \\
Y_4
\end{bmatrix}$$
Note: $a_{11}, a_{12}, a_{13}$ etc, are the technical coefficients of $A$. With the help of the above matrix, the relationship between the use of inputs, final outputs and final demands can be expressed as:

$$X = AX + R$$

Where $X =$ vector of gross output, $A =$ matrix of technical coefficients and $R =$ vector of final demands.

Equation (1) can be written as: $X - AX = R$ or, $(I - A) X = R$, we place below an identity matrix of order $(4 \times 4)$

$$\begin{bmatrix}
1 & 0 & 0 & 0 \\
0 & 1 & 0 & 0 \\
0 & 0 & 1 & 0 \\
0 & 0 & 0 & 1
\end{bmatrix}$$

Hence, $(I-A) =$

$$\begin{bmatrix}
1-a_{11} & 0-a_{12} & 0-a_{13} & 0-a_{14} \\
0-a_{21} & 1-a_{22} & 0-a_{23} & 0-a_{24} \\
0-a_{31} & 0-a_{32} & 1-a_{33} & 0-a_{34} \\
0-a_{41} & 0-a_{42} & 0-a_{43} & 1-a_{44}
\end{bmatrix}$$
Premultiply both side of \((I-A)X=R\) by \((I-A)^{-1}\) we get,

\[
X = (I-A)^{-1}R.
\]

It is to be noted here that the following technical coefficients are not needed at all for the informal sector (i.e. sector 2) and, therefore, these are assumed to be zero: \(-a_{31}, -a_{41}, -a_{32}, -a_{42}\) and \(-a_{14}\).

The cofactors of different elements of the base matrix are as under:

\[
1 - a_{11} = \begin{bmatrix}
1-a_{22} & -a_{23} & -a_{24} \\
-a_{32} & 1-a_{33} & -a_{34} \\
-a_{42} & -a_{43} & 1-a_{44}
\end{bmatrix}
= 1-a_{22} \{ (1-a_{33})(1-a_{44}) - a_{34}a_{43} \}
\]
\[-a_{12} = \begin{bmatrix}
-a_{21} & -a_{23} & -a_{24} \\
-a_{31} & 1-a_{33} & -a_{34} \\
-a_{41} & -a_{43} & 1-a_{44}
\end{bmatrix}\]

\[-a_{13} = \begin{bmatrix}
-a_{21} & 1-a_{22} & -a_{24} \\
-a_{31} & -a_{32} & -a_{34} \\
-a_{41} & -a_{42} & 1-a_{44}
\end{bmatrix}\]

\[-a_{14} = \begin{bmatrix}
-a_{21} & 1-a_{22} & -a_{23} \\
-a_{31} & -a_{32} & 1-a_{33} \\
-a_{41} & -a_{42} & -a_{43}
\end{bmatrix}\]

\[-a_{21} = \begin{bmatrix}
-a_{12} & -a_{13} & -a_{14} \\
-a_{32} & 1-a_{33} & -a_{34} \\
-a_{42} & -a_{43} & 1-a_{44}
\end{bmatrix}\]

\[-a_{21} = a_{12} \{(1-a_{33})(1-a_{44})-a_{34}a_{43}\}\]
\[ 1-a_{22} = \begin{bmatrix} 1-a_{11} & -a_{13} & -a_{14} \\ -a_{31} & 1-a_{33} & -a_{34} \\ -a_{41} & -a_{43} & 1-a_{44} \end{bmatrix} \]
\[ = 1-a_{11} \{ (1-a_{33})(1-a_{44})-a_{34}a_{43} \} \]

\[ 1-a_{23} = \begin{bmatrix} 1-a_{11} & -a_{12} & -a_{14} \\ -a_{31} & 1-a_{32} & -a_{34} \\ -a_{41} & -a_{42} & 1-a_{44} \end{bmatrix} \]
\[ = 0 \]

\[ 1-a_{24} = \begin{bmatrix} 1-a_{11} & -a_{12} & -a_{13} \\ -a_{31} & 1-a_{32} & 1-a_{33} \\ -a_{41} & -a_{42} & -a_{43} \end{bmatrix} \]
\[ = 0 \]
\[-a_{31} = \begin{bmatrix} -a_{12} & -a_{13} & -a_{14} \\ 1-a_{22} & -a_{23} & -a_{24} \\ -a_{42} & -a_{43} & 1-a_{44} \end{bmatrix} = -a_{12} \left\{ (-a_{23};(1-a_{44})-a_{24}a_{43} \right\} + a_{13} \left\{ (1-a_{22})(1-a_{44}) \right\} \]

\[-a_{32} = - \begin{bmatrix} 1-a_{11} & -a_{13} & -a_{14} \\ 1-a_{21} & -a_{23} & -a_{24} \\ -a_{41} & -a_{42} & 1-a_{44} \end{bmatrix} = - \left\{ 1-a_{11} \left\{ (-a_{23};(1-a_{44})-a_{24}a_{43} \right\} + a_{13} \left\{ (1-a_{22})(1-a_{44}) \right\} \right\} \]

\[l-a_{33} = \begin{bmatrix} 1-a_{11} & -a_{12} & -a_{14} \\ 1-a_{21} & -a_{22} & -a_{24} \\ -a_{41} & -a_{42} & 1-a_{44} \end{bmatrix} = l-a_{11} \left\{ (1-a_{22})(1-a_{44}) \right\} + a_{12} \left\{ (1-a_{21})(1-a_{44}) \right\} \]

\[-a_{34} = - \begin{bmatrix} 1-a_{11} & -a_{12} & -a_{13} \\ 1-a_{21} & -a_{22} & -a_{23} \\ -a_{41} & -a_{42} & -a_{43} \end{bmatrix} = - \left\{ l-a_{11}(1-a_{22})(-a_{43}) \right\} -a_{12} \left\{ (-a_{21})(-a_{43}) \right\} \]
\[-a_{41} = -\begin{bmatrix} -a_{12} & -a_{13} & -a_{14} \\ 1-a_{22} & -a_{23} & -a_{24} \\ -a_{32} & 1-a_{33} & -a_{34} \end{bmatrix}\]

\[= a_{12} \begin{bmatrix} (a_{23}a_{34}) & -(1-a_{33})(-a_{24}) \end{bmatrix} - a_{13} \begin{bmatrix} (1-a_{22})(-a_{34}) \end{bmatrix}\]

\[-a_{42} = -\begin{bmatrix} 1-a_{11} & -a_{13} & -a_{14} \\ -a_{21} & -a_{23} & -a_{24} \\ -a_{31} & 1-a_{33} & -a_{34} \end{bmatrix}\]

\[= 1-a_{11} \begin{bmatrix} (a_{23}a_{34}) & -(1-a_{33})(-a_{24}) \end{bmatrix} + a_{13}(a_{21}a_{34})\]

\[-a_{43} = -\begin{bmatrix} 1-a_{11} & -a_{12} & -a_{14} \\ -a_{21} & 1-a_{22} & -a_{24} \\ -a_{31} & -a_{32} & -a_{34} \end{bmatrix}\]

\[= -\begin{bmatrix} 1-a_{11}(1-a_{22})(-a_{34}) + a_{12}(a_{21}a_{34}) \end{bmatrix}\]

\[1-a_{44} = -\begin{bmatrix} 1-a_{11} & -a_{12} & -a_{13} \\ -a_{21} & 1-a_{22} & -a_{23} \\ -a_{31} & -a_{32} & 1-a_{33} \end{bmatrix}\]

\[= 1-a_{11} \begin{bmatrix} (1-a_{22})(1-a_{33}) \end{bmatrix} + a_{12} \begin{bmatrix} (-a_{21})(1-a_{33}) \end{bmatrix}\]
With the help of the cofactors of different elements, as shown above, the adjoint of \((I-A)\) can be arranged in the following way:

\[
\begin{align*}
1-a_{11} &= 1-a_{22} \{ (1-a_{33})(1-a_{44})-a_{34}a_{43} \} \\
-a_{12} &= a_{21} \{ (1-a_{33})(1-a_{44})-a_{34}a_{43} \} \\
-a_{13} &= 0 \\
-a_{14} &= 0 \\
-a_{21} &= a_{12} \{ (1-a_{33})(1-a_{44})-a_{34}a_{43} \} \\
1-a_{22} &= 1-a_{11} \{ (1-a_{33})(1-a_{44})-a_{34}a_{43} \} \\
-a_{23} &= 0 \\
-a_{24} &= 0 \\
-a_{31} &= -a_{12} \{ (-a_{23})(1-a_{44})-a_{24}a_{43} \} + a_{13} \{ (1-a_{22})(1-a_{44}) \} \\
-a_{32} &= -\{ 1-a_{11} \{ (-a_{23})(1-a_{44})-a_{24}a_{43} \} + a_{13} \{ (-a_{21})(1-a_{44}) \} \} \\
1-a_{33} &= 1-a_{11} \{ (1-a_{22})(1-a_{44}) \} + a_{12} \{ (-a_{21})(1-a_{44}) \} \\
-a_{34} &= -\{ 1-a_{11}(1-a_{22})(-a_{43}) \} -a_{12} \{ (-a_{21})(-a_{43}) \}
\end{align*}
\]
\[
\begin{align*}
-a_{41} &= a_{12} \left\{ (a_{23}a_{34})-(1-a_{33})(-a_{24}) \right\} -a_{13} \left\{ (1-a_{22})(-a_{34}) \right\} \\
-a_{42} &= 1-a_{11} \left\{ (a_{23}a_{34})-(1-a_{33})(-a_{24}) \right\} + a_{13} (a_{21}a_{34}) \\
-a_{43} &= - \left\{ 1-a_{11}(1-a_{22})(-a_{34})+a_{12}(a_{21}a_{34}) \right\} \\
1-a_{44} &= 1-a_{11} \left\{ (1-a_{22})(1-a_{33}) \right\} + a_{12} \left\{ (-a_{21})(1-a_{33}) \right\}
\end{align*}
\]

The determinant of \((I-A)\) has been calculated in the following way:

\[
d = 1-a_{11} \begin{bmatrix} 1-a_{22} & -a_{23} & -a_{24} \\ 0 & 1-a_{33} & -a_{34} \\ 0 & -a_{43} & 1-a_{44} \end{bmatrix} + a_{21} \begin{bmatrix} -a_{12} & -a_{13} & 0 \\ 0 & 1-a_{33} & -a_{34} \\ 0 & -a_{43} & 1-a_{44} \end{bmatrix}
\]

\[
= (1-a_{11})(1-a_{22}) \left\{ (1-a_{33})(1-a_{44})-a_{34}a_{43} \right\} + (a_{21})(-a_{12}) \left\{ (1-a_{33})(1-a_{44})-a_{34}a_{43} \right\}
\]

\[
= (1-a_{11})(1-a_{22}) \left\{ (1-a_{33})(1-a_{44})-a_{34}a_{43} \right\} + (a_{21})(-a_{12}) \left\{ (1-a_{33})(1-a_{44})-a_{34}a_{43} \right\}
\]

Thus, after finding \((I-A)^{-1}\), we can solve for the gross outputs \(X_1, \ldots, X_4\) in terms of the final demands. \(X_2\) can be written as follows:
We have considered \( b = (1-a_{11})(1-a_{22})-a_{21}a_{12} \) and \( c = (1-a_{33})(1-a_{44})-a_{34}a_{43} \). Now, the above can be written as:

\[
x_2 = \frac{1}{d} \left[ a_{21}(1-a_{33})(1-a_{44})-a_{34}a_{43} \right] y_1 + \frac{1}{d} \left[ (1-a_{11}) \left\{ (1-a_{23})(1-a_{44}) - a_{24}a_{42} \right\} + a_{13} \left\{ (1-a_{21})(1-a_{44}) \right\} y_3 + \frac{1}{d} \left[ (1-a_{11})(a_{23}a_{34})-(1-a_{33})(-a_{24}) + a_{13} (a_{21}a_{34}) \right] y_4
\]

Rearranging the above:

\[
x_2 = \frac{1}{b} \left[ a_{21} y_1 \right] + \frac{1}{b} \left\{ (1-a_{11}) y_2 \right\} - \frac{1}{bc} \left[ (1-a_{11}) \left\{ (1-a_{23})(1-a_{44}) - a_{24}a_{43} \right\} + a_{13} \left\{ (1-a_{21})(1-a_{44}) \right\} y_3 + \frac{1}{bc} \left[ (1-a_{11})(a_{23}a_{34})-(1-a_{33})(-a_{24}) + a_{13} (a_{21}a_{34}) \right] y_4
\]

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In precise form, the above can be expressed as:

\[(3) \quad x_2 = \frac{1}{b} [a_{21} Y_1 + (1-a_1) Y_2 + g_1(a_{23}, a_{24}, M_1) Y_3 + g_2(a_{23}, a_{24}, M_2) Y_4] \]

where the functions \( g_1 \) and \( g_2 \) are coefficients which are a function of various technical coefficients, \( a_{23} \), \( a_{24} \) and the remaining ones aggregated within \( M_1 \).

The final demands of the sectors are given by the following functions:

\[(4) \quad Y_1 = Y_1 (Z) \]

Where \( Z \) = aggregate income.

\[(5) \quad Y_2 = Y_2 (Z, P, Q) \]

Where \( P \) = ratio of the price level in sector 2 to that in sector 3, and \( Q \) = consumer taste parameter.

\[(6) \quad Y_3 = Y_3 (Z, P, Q) \]

\[(7) \quad Y_4 = Y_4 (p, Z) \]

Where \( p \) = population.
We make three simplifying assumptions: (i) the price levels in sector 1 and 4 are constant, (ii) there is substitution between products for sector 2 and 3 only; and (iii) changes in consumer tastes affect the distribution of final demands between sector 2 and 3 only. Further, for policy purposes, the input coefficients should not be treated as constant over time. For current purposes, we are interested in the intermediate demands for sector 2, the informal sector. We are particularly interested in the intermediate demands by the formal sector and government, which, can be affected by government policy. Assuming production costs constant, the technical coefficients are determined by technological change:

\[(8) \ a_{23} = a_{23} (T)\]

Where \( T \) = technological shift parameter.

\[(9) \ a_{24} = a_{24} (T)\]

We now substitute expressions (4) to (9) into the expression for total output. Assuming all technical coefficients except \( a_{23} \) and \( a_{24} \) to be constant, or that all others change in a compensating manner (so that \( dM_1 = 0 \)). We take the total
derivative of \( X_2 \). This equation is rendered an expression for employment growth by substituting:

\[ X_2 = l_2 L_2. \]

Where \( l_2 \) = marginal output labour ratio in sector 2.

Now, \( X_2 = l_2 L_2 \)

Or, \( l_2 = \frac{X_2}{L_2} \)

we assume that average and marginal are equal. So,

\[ l_2 = \frac{\delta X_2}{\delta L_2} \]

Therefore, \( X_2 = \frac{\delta X_2}{\delta L_2} \times L_2 \)

Or \( \frac{X_2}{L_2} = \frac{\delta X_2}{\delta L_2} \)

We define elasticity of employment or \( E \) with respect to \( X_2 \) as:

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E = \frac{\text{Proportionate change in the level of employment}}{\text{Proportionate change in } X^2 \text{ (Cet. par.)}}

\begin{align*}
E &= \frac{dL_2}{L_2} \\
&= \frac{dX_2}{X_2} \\
\text{Or, } E &= \frac{dL_2}{L_2} \cdot \frac{X_2}{dX_2} \\
\text{Or, } E &= \frac{dL_2}{dX_2} \cdot \frac{X_2}{L_2} \\
\text{Or, } \frac{E \cdot dX_2}{X_2} &= \frac{dL_2}{L_2}.
\end{align*}

\begin{align*}
\text{Or, } L'_2 &= \frac{dL_2}{L_2} = \frac{E}{X_2} \cdot d \left[ \frac{a_{21}Y_1 + (1-a_{11})Y_2 + g_1(a_{23},a_{24},M_1)Y_3 + g_2(a_{23},a_{24},M_2)Y_4}{X_2} \right] \\
\text{Or, } L'_2 &= \frac{dL_2}{L_2} = \frac{E}{X_2b} \cdot d \left[ \frac{a_{21}Y_1 + (1-a_{11})Y_2 + g_1(a_{23},a_{24},M_1)Y_3 + g_2(a_{23},a_{24},M_2)Y_4}{X_2} \right]
\end{align*}

\text{ONE HUNDRED NINETY-EIGHT}
In the short run, if population is constant, we get:

\[
\frac{dL_2}{L_2} = \frac{E}{X_{2b}} \left[ a_{21} \frac{\partial Y_1}{\partial z} + (1-a_{11}) \frac{\partial Y_2}{\partial z} + g_1 \frac{\partial Y_3}{\partial z} + g_2 \frac{\partial Y_4}{\partial z} \right] dz
\]

\[
+ \{ (1-a_{11}) \frac{\partial Y_2}{\partial p} + g_1 \frac{\partial Y_3}{\partial p} \} dp
\]

\[
+ \frac{\partial a_{23}}{\partial t} \left( \frac{\partial a_1}{\partial a_{23}} Y_3 + \frac{\partial a_2}{\partial a_{23}} Y_4 \right) dt + \frac{\partial a_{24}}{\partial t} \left( \frac{\partial a_1}{\partial a_{24}} Y_3 + \frac{\partial a_2}{\partial a_{24}} Y_4 \right) dt
\]

\[
+ \{ (1-a_{11}) \frac{\partial Y_2}{\partial q} + g_1 \frac{\partial Y_3}{\partial q} \} dq
\]

The four lines inside the square bracket in expression (10) of the model can be expressed as follows, moving from top to bottom: the induced and final demand effect on employment (dZ); the relative price change effect on employment, i.e., the change in the ratio of price level in the informal sector to the price level in the formal sector (dP), it being assumed in the model that the price levels in the two other sectors...
are constant; the technological effect on employment \((dT)\); and the consumer taste effect on employment \((dQ)\). Thus the crucial variables in determining the growth of informal sector demand are (i) the changes in aggregate income, (ii) changes in the relative price levels, (iii) technical change and (iv) changes in consumer tastes. It is these variables which, in conjunction with the elasticity of employment with respect to output in the informal sector \((\text{Sector 2})\) determine the employment potential \(i.e.\) the growth of employment in that Sector\((L'_2)\)

**AN INTERPRETATION OF THE MATHEMATICAL MODEL**

From expression (10) of the mathematical model we could frame out policies for an evolutionary growth in the informal sector \((\text{Sector 2})\). The advantages of such a growth in a developing country are:

Firstly: as the informal sector provides a supply of significant portion of consumer goods for the lower income group, an expansion of this sector will reduce the dependency on import 'reproduction'\((u)\) which due to the dependence on foreign
technology contributes a little to employment expansion.

Secondly: the workshops of the informal sector provides the source of a local capital goods industry as well as an apprenticeship for the indigenous entrepreneurs.

Thirdly: the growth of informal sector will induce a labour-intensive form of industrialisation which, will increase employment/output ratio and ensure an efficient utilisation of capital.

The above expression of the mathematical model also discloses the sorts of change that affect the informal sector.

Firstly: Considering changes in aggregate demand, it is evident that the upward shift in aggregate income (Z) will have a large effect on the rate of growth of employment in the informal sector (L' 2). Other things remaining unchanged, the higher the rate of induced and final demand effect on employment (dZ), the greater will be the rate of growth of employment in the informal sector (L' 2). The component of final and intermediate output for a given dZ depends on the distribution of income. Other than house-hold service, workers of the informal sector produce such goods and services which cater to the taste of lower income groups. Hence, a
mal_distribution of income keeps the final and intermediate demand apart from the informal sector. This indicates that in course of time demand will change towards less labour intensive production system.

Therefore, such a policy should be framed which could shift the final demand towards the informal sector in order to generate an equal distribution of income through its employment promoting effect.

In the above context, government purchases of goods and services from the informal sector have a good role to play. This might cause for a shift in the level of private final demand towards the informal sector which, in turn, results in less capital and import intensive public demand. This is inevitable because of the complimentarity between private and public demand.

However, the potentiality lies in firming out orders to informal sectors is not realised because of excessive and irrelevant 'quality' requirements. Nevertheless, it is possible to trace out the following as changeable from capital-intensive to labour-intensive suppliers such as construction, clothing, furniture, printing, maintenance etc. It is beyond
doubt that to monitor the small manufacturers is much difficult than large expatriate producers. But, in course of time, it would be a less serious problem than that of a growing surplus labour of the urban areas.

Considering the first line of expression (10) in the mathematical model, it is clear that the promotion of employment in the informal sector is complementary with an emphasis on agricultural improvement. For a country where "...... the agricultural sector is predominantly small holder, pouring development expenditure into agriculture will stimulate small-scale rural non-agricultural activity as a by product". The informal sector (Sector 2) could provide ordinary agricultural tools and the processing (For example : Grain milling, tobacco - drying, sawmilling, brick making and other less important types of processing) and transportation. This indicates the facilities that could be obtained from the informal sector (Sector 2) industrialisation for assisting the peasant agriculture (Sector 1). It can be said, therefore, the expansion of the informal sector is complementary with the growth of the peasant agriculture. The second line of expression (10) in the mathematical model clearly depicts that raising of wages in the formal sector may lead
to price-rise of sector 3 output and as a consequence there might be product substitution between sectors 2 and 3. Another point which has not been considered is the effect of increased wages in sector 3 on the level of demand. If the wage increases relative to other factor shares and the preference of wage earners for consuming sector 2 products is greater than that of group whose income increases more slowly, the output of informal sector (Sector 2) will raise proportionately to any given change in final demand.

The nature and pace of technical change determines the degree of relation between the informal sector and the private formal and government sectors. Again, technical change, itself, is a function of choice of products. Due to the operation of sophisticated technology for quality reason the private formal sector can not provide sufficient opportunity for sub-contracting or for primary inputs supplied by the small producers. Through proper distribution of income, such a situation can be altered indirectly. Since the common tendency of the lower income groups is to consume labour intensive basket of goods.

Another remedial method for redressing factor price imbalances
which encourage capital intensity might be to eliminate the
duty-free access to machinery, accelerated depreciation rebates
etc, and to allocate more resources on research which, in
turn, will innovate the techniques and equipments most suitable
for the small enterprise.

The countries which are seriously suffering from unemployment
problem should offer such condition to the foreign investors
that their investment plans would be allowed to implement
only when it includes definite proposals for small-scale
subcontracting including industrial expansion and training
services.

The above measures have a possible effect for changing the
values of the technological parameters. In fact, in most of
the underdeveloped countries, the tendency to change technology
in favour of large scale formal sector is not inherent but
the consequence of improper distribution of income,
institutionally administered input prices and favourable terms
and conditions for the foreign investors. "To the extent that
large, capital-intensive enterprises are technically more
efficient, this is the consequence not of the inexorable march
of technology but of the fact that most industrial research
and development is conducted in labour-scarce economies". (x)

One recent feature of the underdeveloped countries is to replace indigenous products by standardised, mass produced consumer goods. (For example, plastic sandals, bread, cold drinks, soap etc.). These products have a wide market and the consumption of these products might well increase with a more equal distribution of income. There is nothing inexorable for the substitution of these products.

In this regard, one should trace out the reasons of the customer's choice. There might be four reasons(y) behind such preference:

1) the mass produced products are manufactured in a technically more efficient manner and would be cheaper at any wage/profit ratio.
2) the mass produced products are cheaper only at existing wage and profit rates and capital is under valued in the market.
3) while no cheaper, the products are produced by firms making monopolistic profits which can afford extensive advertising outlays beyond the resources of informal sector enterprises.

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4) consumers in less developed countries genuinely prefer formal sector products independently of advertising propaganda and even if informal sector products are cheaper.

From the point of view of social welfare, only point number (1) and (4) are reasonable for the substitution of product. It would be prudent to exclude the subsidies to equipments and privileged treatment of advertising outlays in order to make a situation when any substitution of product will upgrade consumer welfare.

CONCLUSION

The above discussion makes it urgent to prescribe policy for an improvement of the informal sector. According to ILO ".....although the informal sector has potential for dynamic, evolutionary growth but under the existing nexus of restrictions and disincentives the seeds of involutionary growth have been sown" (2). The informal sector grows up without any state support and in spite of continuous hazards. An improved policy environment will shift resources towards the informal sector allowing it to absorb the increasing labour
force at higher levels of productivity (ILO '72, Weeks '73, Sethu Raman '76). Policies are then devised within an autonomy framework such as technological improvement in the informal sector (Oshima '70) or within a more integrated sector by strengthening its link through subcontracting with the public and formal private sector by increasing the sales of informal products such as tools and equipments to the agricultural sector and by redistributing income in favour of the lower income groups (ILO '72, weeks '72).

The growth potential of the autonomous informal sector rests on the size of the surplus labour who are left outside the formal employment and on the possibilities of market expansion, but it suffers due to its subordination which lies in the lack of access to resources in both input and output market. This, in turn, induces an involutionary growth. The causes of underdevelopment do not lie within the informal sector but in the process of accumulation of the central economy.

Due to the obstacles mentioned above, there would be a decrease in the share of income for the informal sector. Although it does not indicate that the informal sector will gradually disappear because the resistance factors together with market evolution will allow their survival (Souza and Tokman '76).
It can be well imagined that in the absence of any measure, there would be an involutionary growth of the informal sector due to excess supply of labour. However, evolutionary growth may also be expected but for that one should not depend only on favourable policies. To make such policies effective, they should be complemented with the variation in the distribution and allocation of surplus and with the changes in the pattern of growth. This means policies should not only be favourable to informal sector activities but also to affect directly the formal sector activities.

Whatever might be the consequence of state promotion whether progressive or merely placatory the repercussions, it is of utmost importance to the petty producers of the informal sector. There would be no improvement if the socio-economic base in which production carries on is not considered properly.

If the interest of the self-sustained and self-centred development are subservient to the domestic ruling group who themselves are the subordinates of foreign capital, how could we expect an appreciable accumulation in the informal sector? It is rather possible that indigenous production will be stunted, distorted and exploitative than development oriented as long as the above conditions prevail.

TWO HUNDRED NINE
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(h) Please see reference 'b' above.

(i) For example, in Senegal, official sources estimate that the urban 'artisanal' population is between 30,000 and 50,000. In the Region de cap vert, the most recent figures suggest that there are 6,365 urban artisanal enterprises: The urban informal sector: ed. by R. Bromley: P 1150.

(j) In particular, the public undertakings might play a key role by providing employment in the construction of dams, roads etc. The seasonally unemployed or the unemployed in times of drought natural disasters might have a field for earning the means of living. But, the fact is, in most of the developing countries, such works have been modernised to a great extent which consequently reduce the share of public employment.
(k) Sulabha Brahme: "Producers co-operative: Experience and lessons from India". ISS occasional papers 99. (The Hague, Institute of social studies, June '84)


(m) Victor E. Tokman: ibid: P: 1067.


(p) Oshima ('70) does not uphold this view, since most of the persons related to this sector are, in fact, forced to dissave to survive. He solicits for such a policy in favour of the informal sector which will help to eliminate dissavings.

(q) It was found when the industrial structure of Ecuador, Peru and Venezuela were compared. The degree of structural heterogeneity found was disproportionate to the level of industrialisation. See: Tokman:('74)


(t) please see F. Stewart and J. Weeks: "The employment effects of wage changes in poor countries" discussion paper no.8 (London, department of economics, Birkbeck College, University of London, 1973)

(u) Import reproduction indicates production of the same goods domestically without using indigenous factor prices or inputs.


(w) The East African Industrial Research Organisation jointly financed by Kenya, Uganda and Tanzania, carries out

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such research. The ILO, for its part, has carried out a field project in Tanzania designed to develop improved animal-drawn farming implements.

(x) J. Weeks : ibid : P:12.
(y) J. Weeks : ibid : P:12.
(z) ILO : ibid : P:505.