CHAPTER 2

LABOUR MARKET DISCRIMINATION AGAINST WOMEN TOWARDS A REVIEW OF THEORETICAL AND EMPIRICAL ISSUES

This chapter attempts a brief review of the economic theories that explain labour market discrimination. The main causes for discrimination are identified and the effects of discrimination on the economy are discussed. A summary of empirical studies on sex discrimination is also presented here.

2.1 THE CONCEPT OF DISCRIMINATION

Discrimination in the broadest sense of the term means 'unequal treatment'. For decades together, women have been discriminated against, through the three main institutions of the home, the school and the workplace. Unequal treatment in the non-market sphere, i.e., at home and at school through early socialization and different quality of education imparted will subsequently create women with different aptitudes and weaker skills required for the labour market, as compared to the men. If it is assumed that women receive the same treatment as the men in the non-market sphere and they enter the labour market with identical preferences and equal set of skills, then they can be considered as perfect substitutes to men in any production activity. In such a situation if the labour market still does not reward the women equal to the men (in terms of wages or occupational status), this phenomenon can be treated as discrimination arising from the labour market.

Non-market discrimination arises from the supply side of labour and labour market discrimination is from the demand side whose main agents could be the employer,
employee or the consumer (Becker, 1971). The distinction between non-market and market discrimination is quite narrow. This is because most of the non-market discrimination against women occurs as a feedback effect of labour market discrimination (Blau and Ferber, 1986). Women anticipating future labour market discrimination may invest less in human capital accumulation or may have restrained career aspirations.

Various economic theories have been developed to explain why the labour market bases its valuation on a seemingly irrelevant and non-economic characteristic such as the sex of the individual. Most of the earlier theories focussed on racial discrimination but the analysis is equally applied to sex-based discrimination.

The economic theories of labour market discrimination are invariably based on a microeconomic foundation. The theories centered on explaining the causes for the discriminatory behavior. Among the various causes elicited, the most probable causes are that due to ‘tastes’ of some individuals (Becker, 1971), uncertainty in the labour market (Phelps, 1972), social customs (Akerlof, 1976) and monopsony in the labour market. Only few of the theories then further delve into the effects of discrimination on the economy.

In this section, a brief explanation on the different causes of discrimination are given followed by a discussion on the effects of the various types of discrimination.

2.2 CAUSES OF DISCRIMINATION IN THE LABOUR MARKET

2.2.1 ‘Taste’

Becker (1971) conceptualized discrimination as a phenomenon that arises due to the ‘taste’ among some individuals against associating with a particular group. Blau and Ferber (1986) note that this ‘taste’ for a physical or social distance away from the
discriminated group may be quite appropriate for Becker's initial analysis on racial discrimination, but for the case of sex-based discrimination it is better to postulate that it is a desire to maintain socially appropriate roles. This is observed in the case where men dislike working under women supervisors but would not mind them as subordinates.

Becker's potential agents of discrimination are the employer, fellow employee and/or the consumer. In his analysis, the employer is a utility maximizer where his utility depends not only on profits but also on the composition of his workforce. His taste for discrimination against women implies that he would be willing to employ women but at a lower wage than their equally productive male counterparts. The value of the women's marginal product is discounted due to this 'taste' and analytically this discount represents the psychic cost that the employer attaches to interacting with women workers. Discriminatory employers when faced with women workers available at the money wage \( W_w \), act 'as if' the net wage rate were \( W_w (1 + d_i) \) where \( d_i \) is the employer's discrimination coefficient against women. \( W_w d_i \) is the monetary equivalent of the psychic cost '\( d_i \)' involved in the transaction with women. Becker's innovation lies in the quantitative treatment of a subjective phenomenon such as 'taste'.

When fellow male employees develop tastes for discrimination against women, they will demand a wage premium to compensate for the disutility in working with women. In this case, a non-discriminatory, profit maximizing employer who finds both the men and women to be perfect substitutes would choose either an all-male or all-female workforce as this would avoid the necessity of paying a wage premium to the male workers. The resulting situation is job segregation with no wage discrimination.

Finally, consumer's 'taste' against women, make them discount the value of the goods or services produced by them. Consumer discrimination would be more relevant in the service sector where the buyer and seller meet face to face (Arrow, 1972).
occupations such as doctors, lawyers, accountants or pilots, the consumers, be it the men or women, may show preferences in wanting a particular sex for a particular service. For women who have stepped into non-traditional jobs that have hitherto been male domains, one can anticipate strong consumer discrimination (Blau and Ferber, 1986). Bus drivers, pilots, ship engineers, auto mechanics, metal workers, railway guards, cinema projectionists are some examples of such non-traditional jobs in the Indian context, where the presence of women is almost negligible.

Becker's critics have observed that his theory is not complete as it does not explain how the 'tastes' have evolved. Becker treats them as 'exogenous' to his model but Arrow (1972) rightfully questions the exogeneity of these 'tastes'. They may be very much endogenous to the model as they themselves could be the 'tools of economic exploitation'. When the discriminatory values are accepted as a social norm, it could be a mechanism by which men sustain their dominance at the expense of the women, without even being consciously aware of it.

2.2.2 Uncertainty

In a labour market situation where firms have incomplete information about the productivity of the applicants and if the cost of gaining information about them is excessive, then a profit maximizing employer who believes that women on the average are less productive than the men, would prefer the men for a job assignment. Their belief on an average level may be correct but it still amounts to discrimination if a woman from this group turns out to be equally productive as the men. The labour market is discriminating against such individuals by imposing the average level group characteristics on them without giving due recognition to their individual merits. This concept of discrimination is more popularly called 'statistical discrimination', and was originally presented by Phelps (1972).
Unlike Becker's model where the employer maximizes his utility at the cost of realizing higher profits, here in this case the employer is a profit maximizer behaving unprejudiced and rationally in a condition of uncertainty. Group affiliation based on sex is used as an inexpensive and potential 'index' for the firms when making employment decisions. 'Index' was a term initially coined by Spence (1974) in his analysis on imperfect information, to indicate variables such as sex that are readily observable and unalterable, to convey information on the essential but unobservable variables such as productivity of the job applicant.

Olson (1990) observes that this theory is not ideologically neutral as it claims to be. The employers in this model are assumed to behave rationally without any sexist bias but the outcome of the model is the same 'as if' sexism were present. The women may on the whole belong to a group with lower average productive characteristics due to pre-market discrimination. The variance of the productivity distribution for the women is then larger than the men, hence the employer may be justified in preferring the men. Some of the women from this group who may be just as equally productive as the men receive unequal rewards on account of such employer behaviour. Implicit in the model is the notion that the employer's conventional beliefs carry more weight than productivity considerations.

2.2.3 Social customs

Even as early as 1891, Sidney Webb followed by other British economists Eleanor Rathbone, Francis Edgeworth and others have explained discrimination as a phenomenon occurring due to certain social conventions maintained among the employers. Their theories were however analytically poor as they could not explain how these conventions existed and influenced female work conditions (Lundahl and Wadensjö, 1984). Akerlof
(1976) with his strong theorizing, incorporated social structure into his model to explain the economic phenomena of income distribution and resource allocation.

In a rigid caste-based society where there are certain conventions of transaction, as to who should transact with whom, if an individual hires an outcaste for a job reserved for a certain caste, then by this very act the individual himself becomes an outcaste. This characteristic of a caste society is upon which Akerlof (1980) builds his theory of social customs. It however goes against the fundamental assumption in most economic theory that, current transactions between two parties do not influence the subsequent transaction with a third party. Social customs may set codes in the labour market for hiring, promoting or wage payment which may make the employer behave discriminatorily. These discriminatory codes are followed by those who believe in it; and also by others who don't believe in it but all the same refrain from disobeying for the fear of losing social reputation. Here Akerlof assumes that the person's utility depends not only on consumption but also on his prestige and reputation in society.

His theory specifically deals with caste-based discrimination, hence one is skeptic to its relevance in explaining sex-based discrimination. Birdsall and Sabot (1991) note that employers' behaviour based on social customs is quite indistinguishable to that based on taste or prejudice. The employer who acts under the pressure of a social custom shows a revealed preference for the males, the traditionally appropriate group over the females who belong to the traditionally inappropriate group, in the form of higher wages paid to them even when the females prove to be just as equally productive as the males. The motive here is to avoid any socially deviant behaviour.
2.2.4 Monopsony

In their review of literature, Lundahl and Wadensjö (1984), observed that Joan Robinson as early as 1933 explained discrimination to occur as a result of the monopsony power enjoyed by some firms. A firm has monopsony power when it is a large buyer of labour relative to the size of the particular market. A firm can exercise its monopsony power over the females, on account of the females’ labour supply being more inelastic 'to any firm' compared to the males. (The overall female labour supply elasticity is however higher than that of the males). The homemaker's responsibility resting entirely on the females, her mobility is restricted and moreover she will have to follow her husband wherever he moves to. This then makes her labour decisions be governed by her family obligations, hence she may have to settle for second best situations. Here in this model, the employers are not consciously indulging in discriminatory treatment, but the wage differential that arises is a manifestation of the inefficiency of a non-competitive labour market (Ashenfelter and Oaxaca, 1991).

Monopsony can also exist in combination with employee discrimination. Men are better organized and dominate the trade unions. Their trade union power can restrict or exclude women membership, and can make them fix higher wage rates or reserve certain advantageous positions for their own group (Stiglitz, 1973).

The Neo-Marxist or the radical labour market theory postulates a monopsony model where the worker's bargaining power is greatest when the work force is ethnically homogenous. With an integrated workforce, the employer uses the divide-and-rule policy and is thus able to pay lower wages to the minority or the discriminated group. The dominant group here may get higher wages than the discriminated group but their wages will be lower than what they could get in a segregated firm.
Diametrically opposite to the radical labour market theory, is the dual labour market model, where segregating the workforce into primary and secondary jobs, results in wage differentials for the same level of productivity. In this model, the females (the minority group) are crowded into the secondary market which is characterized by labour-intensive, low-wage, dead-end jobs while the high-paying primary jobs with more opportunity for advancement are reserved for the males. Pay in the predominantly female jobs is artificially depressed which may be due to cartelization or monopsonization of the labour market wherein the employers conspire and collude together to prevent the wages from adjusting according to market pressures.

2.3 EFFECTS OF DISCRIMINATION

Discrimination in the labour market, whatever be the cause, has far-reaching retrogressive effects on the society, markedly for the women. Wage differentials and occupational segregation are the two major outcomes of labour market discrimination.

2.3.1 Wage differentials as an economic effect of discrimination

As the definition of discrimination itself states, it has the effect of unequal wages for men and women of equal productivity. In the Becker-Arrow model where males and females are assumed perfect substitutes, employer ‘tastes’ ensure that in equilibrium the wages of the males will equal female wages plus the discrimination coefficient. This then implies that female wages will be lower than male wages. Wage differentials, in turn, produce adverse effects on female productivity and employment. In the discriminatory firms, the women receive lower pay than their men co-workers, even when they are equally productive; it is then implicit here that the women receives a labour price lower than the value of the marginal product that they contribute to the firm. If the women are
aware of this injustice meted out to them it is plausible that their worker morale sinks and in due course of time their productivity comes down to the level of the wages they receive. Their declining productivity imposes costs on the firm and the economy, which may further justify discrimination in subsequent periods thereby setting in motion the 'vicious circle' (Birdsall and Sabot, 1991). If discrimination were eliminated one can then expect an increase in production and output in the economy.

In the discriminatory firms, when the marginal product exceeds the female wages, the profit maximizing employer would opt to hire fewer than the optimal number of women. The proportion of women employed among firms is then found to vary inversely to the degree of the employers’ discriminatory 'tastes'. Consequently the marginal product of female labour also varies among firms indicating an inefficient allocation of labour. If the labour market were free to adjust then, more women would be employed in firms where their marginal product is higher, in the long run closing the gap between their wages and marginal product. Here again an elimination of discrimination points to a higher employment level and thereby higher output in the economy.

Allocative inefficiency in the labour market and reduced worker productivity as a result of discrimination will tend to slow the economic growth. The losses due to discrimination are likely to be greater for the developing economies where the pace of change is likely to be rapid (Birdsall and Sabot, 1991). A rise in the earnings of women in the absence of discrimination would also serve to bring a substantial number of female-headed families out of its poverty status and would ensure a more equitable distribution of income in the population. Theoretically there is no clear answer as to who is the beneficiary in the presence of discrimination but it is certain that women are the losers and this loss is unjustifiable. Hence the elimination of discrimination would highly benefit
women without any adverse effects on the men’s wages as their real wages would have risen with the economic growth of the economy. In the words of Psacharapoulos and Tzannatos (1992, p.138) ‘if women competed with men on an equal footing, men would have a smaller share of the pie, but the size of the pie will be greater as the allocative mechanism of the market will improve’.

2.3.2 Segregation: As an Economic Effect of Discrimination

Discrimination implies wage differentials among substitutes but may not always result in segregation. Wage differentials can exist without segregation of the workforce (as in Becker’s employer prejudiced model) or segregation can also occur without wage differentials (as in Becker’s employee discrimination model). Wage differentials and occupational segregation can occur together as in the case where women are found in larger proportion in the low paying jobs (the crowding hypothesis).

In Becker’s model employees discrimination against women, when the two groups are perfect substitutes leads to workplace segregation. When the male employer or employee is prejudiced against women in certain occupations it results in occupational segregation.

In the statistical discrimination model, employers may ‘rationally’ judge women’s ‘actual’ productivity to be inferior to that of the men, thereby excluding women from some occupations. Here group characteristics are used in screening job applicants resulting in occupational segregation. A comparison of male and female workers in the different occupations reveals differential occupational structure which in economic literature is termed occupational sex segregation. In addition to differences in the distribution ‘among’ occupations, women also tend to be employed at different levels ‘within’ occupations.
This hierarchy within occupations is termed ‘vertical segregation’. For instance, in the medical field, more often the men are the doctors and the women the nurses; in education, a majority of the professors are men and the lower ranking elementary school teachers are the women.

Social and cultural beliefs about the appropriate roles for women mould each gender to perform sex specific adult roles and train them with the skills, values and occupational aptitude compatible with their roles. Women in general have been thought to act on impulse, lack stamina and aggressiveness hence unsuitable for the ‘male’ jobs. On the other hand it is assumed they possess greater dexterity and better tolerance for tedium needed for clerical and operative jobs. It is believed that women always put their family before their career, are unpredictable on jobs, opt for jobs that are not risky or dangerous, prefer workplaces closer to home, and jobs that can be easily interrupted. Their relatively weak physical structure makes them unsuitable for manual jobs where muscular strength is a prerequisite. In this context, when women are weighted on the basis of the characteristics typical of her group, statistical discrimination occurs, leading to occupational segregation. Similarly, in Akerlof’s model, if social custom decrees that certain jobs are reserved for members of a particular group, and if individuals believe and follow this custom, occupational segregation results. Polacheck (1981) suggests that occupational segregation does not so much occur as due to discriminatory forces, as it may be due to the individual choice of the women. As the woman expects intermittency in her career, she opts for occupations where interruption will not be costly for her; in other words occupations where depreciation of human capital will be relatively low. These occupations may give high initial earnings and low lifetime income.
There is still much research to be done to ascertain how much of the occupational segregation is due to natural preferences of the sexes and how much due to societal constraints.

2.4 **STABILITY OF THE DISCRIMINATION MODELS**

One of the issues that theories on discrimination have found hard to explain is the persistence of discrimination in the long run.

Becker’s model assumes that employers have varying degrees of the taste for discrimination. Employers with relatively lower taste for discrimination can earn profits by hiring the discriminated group at the lower wages. In the long run, the less discriminatory firms facing higher costs and lesser profits will soon be out of the market. Here it is assumed that there are no restrictions for the free entry of firms. Becker thus predicts that in the long run, the competitive nature of the market will wipe out discriminatory tendencies and thereby close the earnings gap between the sexes. However, empirically it is found that discriminatory wage differences still persist in the competitive industries, much contrary to Becker’s prediction.

Likewise discrimination based on imperfect information is also a temporary phenomenon. Hartog (1981) studied job-worker allocation and his work reveals that allocation is initially done on the basis of signals, such as educational qualification but later on job allocation improves to match the applicants true abilities as revealed from their productive performance. In other words, an individual’s labour force history will be added to his or her set of signals. The employer who can infer from other employers’ experience (those who have hired women) will have no other choice but to start employing women or face market expulsion owing to competitive pressures of the market.
The theory of social customs was a theory mainly formulated to answer the long run stability of discrimination. According to Akerlof, caste-based discrimination is a form of stable equilibrium wherein caste customs are obeyed, yet no single individual, by behaving differently can make himself better off. However Akerlof does not rule out the possibility of an equilibrium wherein nobody believes or follows the social norm. The transition to this equilibrium can be made in stages with the formation of coalitions that could challenge the existing norms. The maximum coalition necessary to break the rules is a coalition of economic size that is sufficient to allow all the coalition members to be at least as well off as they would be through adherence to the rules of the society. The smaller this minimum rule-breaking coalition, the more unstable is the equilibrium where the rules are followed.

Arrow (1972) who subsequently developed Becker's theory, offered a strong explanation for the persistence of discrimination. In the case of employee discrimination as in Becker's model it was posited that the non-discriminatory employer who finds both men and women equally productive would subsequently hire only men or women thereby ruling out any sex-based wage differences. But Arrow argues that this may not be the case as it may be extremely costly to substitute quickly one group of workers for another due to adjustment costs involved in the hiring of new personnel and firing the old. Hence the employer would find it more profitable to retain the old employees (say the males) at a higher wage along with new entrants (females) rather than face the adjustment costs.

In the case of statistical discrimination, Arrow provides an explanation for the persistence of occupational sex segregation. In developing countries where women come from disadvantaged background in terms of educational qualification and labour market skills, the employer is rationalized by preferring men. But this behaviour of the
employer generates a self-fulfilling prophecy. The discouraging labour market experience of women will depress their incentive to invest in human capital thereby lowering their productivity and further reinforcing the gender stereotypes held by the employers.

The theories do not offer a very satisfactory explanation of the stability of discrimination; moreover all theories, face a problem in explaining the stability in the case of very large wage differences. There is scope for more theoretical research in this area.

The phenomenon of income differentials is an economic phenomenon but when it is sex-based it takes on strong social overtones. An issue of this kind can best be studied in a historical perspective incorporating links between socio-cultural facts and economic behaviour. The causes for discrimination, be it, taste, statistical decisions, social customs or restricted mobility can without loss of generality be traced to the centuries-old conviction of the women's right place as being within the home.

2.5 EMPIRICAL ISSUES

Among the different theories developed, Becker's work stands out as the most complete and coherent analysis which is also viable for empirical treatment.

2.5.1 Empirical methodology : the decomposition approach

After Becker's seminal work on discrimination, later economists have made several attempts on a valid method to quantitatively estimate discrimination. Most of the methodologies adopted have been quite independent of a theoretical framework. Among the alternative theories Becker's theory stands out as the only one that can be put to rigorous empirical examination. According to him, the 'taste' for discrimination results in lower earnings for an equally productive woman. This subjective phenomena of 'taste'
is very difficult to test empirically. However economists have found approximations to account for this ‘taste’; most empirical studies often attribute the portion of the earnings wage differential that cannot be explained in terms of productivity differences to this ‘taste’ for discrimination. This methodology is more popularly called the decomposition technique. The method essentially involves the estimation of earnings function for the men and women separately. The estimated earnings difference is then decomposed into a component attributable to endowment differences and the residual to discrimination. The present study also uses the decomposition method and a detailed explanation of the methodology is given in Chapter 4.

2.5.2 Studies on Sex Discrimination using the Decomposition Method

The decomposition method or the residual method has been widely applied in empirical work on sex discrimination. In estimating the earnings function, factors that affect earnings are identified as hours of work, age, marital status, city size, region, seniority, unionization, turnover, absenteeism, education, health, occupation, work experience, unemployed duration among many others. Earnings determination themselves determine lifetime labour supply and human capital investment; to deal with this simultaneity problem, Blinder (1973) proposed the reduced form and the structural form. The reduced form equation seeks to explain the wage rate only on the basis of characteristics that are truly exogenous to the individual, rather than simultaneously determined with wage rates. Family background variables, for example, would enter the reduced form equation. The structural equation, on the other hand represents an equilibrium between individual human capital investment and the market returns on these investments (Mincer, 1974). Possible variables that can be considered for the structural equation could be education and occupation among others.
A good summary of some important studies dealing with sex discrimination in wages is given in Lloyd and Niemi (1979) and Cain (1986). Most of the empirical work is done in the industrialised and developed economies. A brief summary of the discrimination studies conducted in the developing economies of Brazil, Tanzania, Nicaragua, East Africa are given in Schultz (1991). Sex discrimination studies for India is almost negligible.

A ready comparison of the discrimination estimates across countries is not possible as these estimates vary according to the sample characteristics, variable definition and methodology used. In the studies that used the decomposition technique, the results vary according to the choice of the weights, in the context of the index number problem.

Some of the studies reviewed here is particularly relevant to the present study, as they use the same estimation technique and pertains to male-female wage differences alone (Table 2.1).

2.5.3 Limitations of the decomposition technique

The first and most crucial step in the decomposition analysis is the proper specification of the earnings function. This is because, discrimination in this method is measured as a residual after controlling for differences in the productivity variables given in the earnings specification.

The method requires that all possible variables which determine earnings be specified in the equation and at the same time it demands that these productivity variables should be exogeneous to the process of discrimination under study. This raises complex issues of 'omitted variables bias', 'measurement errors', 'endogeneity' and 'selectivity' in the empirical estimation of discrimination.
### Table 2.1

Sex Discrimination Studies: Estimate of Discrimination using Decomposition method

<table>
<thead>
<tr>
<th>Author</th>
<th>Data Source</th>
<th>Explanatory Variables</th>
<th>Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blinder (1973)</td>
<td>Michigan Survey 'Panel Study of Income Dynamics' (1967)</td>
<td>reduced form: a set of family background variables &amp; other exogenous variables</td>
<td>0% 100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>structural form: education, occupation, training, union membership, tenure and other exogenous variables</td>
<td>33% 67%</td>
</tr>
<tr>
<td>Malkiel and Malkiel (1973)</td>
<td>Professional Employees-U.S.A. 159 males 113 females (1971)</td>
<td>education, experience, tenure in present job</td>
<td>55% 45%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>above variables &amp; Ph.D., publications, marital status, area of study, absence rate</td>
<td>65% 35%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>above variables &amp; job level</td>
<td>98% 2%</td>
</tr>
<tr>
<td>Corcoran and Duncan (1979)</td>
<td>Michigan Panel of Income Dynamics (1975) 2250 white males 1329 white females</td>
<td>education, work history and on the job training variables, indicators of labour force attachment, demographic control variables</td>
<td>44% 56%</td>
</tr>
<tr>
<td>Gunderson (1979)</td>
<td>Canadian data (1970) 13698 males 7866 females</td>
<td>education, experience training, marital status, language, residence, province, hours worked, occupation and industry</td>
<td>37% 63%</td>
</tr>
<tr>
<td>Ofer and Vinokur (1981)</td>
<td>Soviet family budget survey (1973) 1117 males 989 females</td>
<td>education, experience, hours worked, age, job role, industrial branch</td>
<td>49% 51%</td>
</tr>
</tbody>
</table>
## Table 2.1 (contd.)

**Sex Discrimination Studies: Estimate of Discrimination using Decomposition method**

<table>
<thead>
<tr>
<th>Author</th>
<th>Data Source</th>
<th>Explanatory Variables</th>
<th>Estimates</th>
<th>Endowment</th>
<th>Discrimination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolton and Makepeace (1986)</td>
<td>U.K. National Postal Survey (1977)</td>
<td>education, qualifications, experience, marital status, no. of jobs, age, part-time job, no. of children, age of eldest child, type of school, grade, unemployed months, log of starting salary, occupational status index</td>
<td>30%</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>Birdsell and Fox (1991)</td>
<td>Brazil - school teachers (1970 census)</td>
<td>education, experience, hours worked, head dummy, school, locational characteristics</td>
<td>90%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Birdsall and Behrman (1991)</td>
<td>Urban Brazil Census (1970)</td>
<td>education, experience, hours worked, agricultural work dummy, control for participation selectivity (formal sector) (informal sector)</td>
<td>-13%</td>
<td>113%</td>
<td>1% 99%</td>
</tr>
<tr>
<td>Knight and Sabot (1991)</td>
<td>Tanzania - manufacturing sector data (1970)</td>
<td>education, current employment years, previous employment years, training, age</td>
<td>83%</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>810 males 74 females</td>
<td>above variables &amp; occupational variables</td>
<td>96%</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Behrman and Wolfe (1991)</td>
<td>Nicaraguan national labour market data (1977-78)</td>
<td>education, experience, nutrition, days ill, hours worked, controls for participation selectivity and reporting earnings selectivity</td>
<td>29%</td>
<td>71%</td>
<td></td>
</tr>
</tbody>
</table>
Apart from standard human capital variables of schooling and experience there are many other attributes that are influential in pay considerations such as innate ability, motivation, preschool investment, family background and formal and informal training. There could be substantial differences among the sexes with respect to these attributes, but more often they are unmeasurable and hence omitted from earnings functions. If men were to earn a premium on these omitted characteristics, then the exclusion of these variables would upwardly bias the estimate of discrimination.

When a woman enters the labour market as equally qualified as a man with respect to all the relevant labour market skills she must actually be more efficient than him for having survived through all the pre-market discrimination. In this context, the discrimination component will be an underestimate of the true measure. Differential endowments can also occur due to anticipated discrimination in the market, through feedback effects that dampen the initiative of women to invest in human capital. For instance, the different experience levels between the sexes could also be due to current or past labour market discrimination. Similarly the differential occupational attainment is also endogeneous to labour market discrimination if the women faced restricted access to certain occupations. Thus an earnings specification which has experience or occupation as the productivity variables will be underestimating discrimination since the endowment effect would have captured the unjustified differences in these characteristics.

The results are thus highly sensitive to the specification employed. If as in Blinder's study one controls for a set of completely exogeneous variables such as age or family background which may be similar for men and women, almost all the pay gap can be attributed to labour market discrimination; whereas if, more control variables are added in which the men and women have differences such as motivation, union status, turnover,
then all the pay gap can be explained as due to endowment differences, with discrimination being nil. The residual discrimination measured could thus be an over or underestmate of the true value.

2.5.4 Alternatives to the decomposition method

The decomposition technique has been criticized for its narrow concept as the method is largely based on average characteristics of men and women which may have a large dispersion. The method can be improved if one could compare the whole distribution of the logarithm of earnings with and without discrimination (Dolton and Makepeace, 1985). The difficulty lies in constructing the hypothetical distribution of the logarithm of earnings in the absence of discrimination. However more empirical research is needed in this direction.

To counter the shortcomings of the decomposition method Robinson and Wunnava (1989) suggested an alternative in the frontier approach. This method involves the estimation of an earnings frontier for females that depends upon their marginal productivity (as measured by human capital and labour market characteristics). Discrimination here is measured as the amount of female earnings removed from the frontier, less any labour market inefficiency. These estimates will depend solely on female data. The earnings equation to be estimated is of the form

\[ \ln (\text{female earnings}) = f (\text{human capital}) + e_u + e_v \]

where \( e_u \) is the normal error and \( e_v \) is the truncated error. The amount of direct wage discrimination against the women on an average can be measured by determining the expected value of the half normal error term \( e_v \) (provided there is no assymmetric inefficiency). The maximum likelihood estimation method is used to derive the estimate. The method is yet to receive sufficient empirical treatment.
Another alternative to the traditional method is the reverse regression, where qualifications are regressed on wages and sex. This method was developed to remove the bias that may occur due to error-in-variables. Blau and Kahn (1985) argue that the reverse regression may be subject to similar biases as existing under traditional methods, and it also does not provide enough information to examine whether employers behave discriminatorily.

The decomposition method despite its limitations still stands to date as the most popular method in discrimination literature. It also gains importance with the increasing role of wage techniques being employed to settle litigations (Ashenfelter and Oaxaca, 1987 and Becker and Goodman, 1991). However a direct measurement of discrimination is much needed for more reliable estimates.