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# INDUSTRIALIZATION, TRADE AND FEMALE EMPLOYMENT IN DEVELOPING COUNTRIES:

Experiences of the 1970 's and After

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**United Nations International Research  
and Training Institute for the Advancement of Women  
(INSTRAW)**

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INDUSTRIALIZATION, TRADE AND FEMALE EMPLOYMENT  
IN DEVELOPING COUNTRIES

Study prepared by Susan P. Joeke  
at the request of INSTRAW

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## PREFACE

The United Nations International Research and Training Institute for the Advancement of Women (INSTRAW) aims to promote through research, training and information activities, the full participation of women in the development process. This requires that the Institute monitor closely the current debate on development and international economic relations, and participate in the ongoing search for meaningful ways to address development issues in order to contribute through its work to the fulfillment of the objectives of the International Development Strategy for the Third United Nations Development Decade.

Pursuant to the search for solutions to development problems arising from the present world economic situation, it has been found necessary to study the impact of this situation on the role of women in the development process focusing on the interdependence between the international and national levels of the economy, thereby helping into taking into account women's participation and requirements in development processes.

As a result of surveying the area of women and development, it was found that the aspects to be further developed are: a) to review and analyze the present model of development and different approaches and concepts so far used in these development strategies; b) to identify the economic dimension of actual development theories and approaches especially where they merge into the social perception of the work and life of women; c) to assess the benefits and losses to women that derive from the economic and social changes in present-day society; d) to examine the linkage between the international and national dimensions, taking into consideration the economic, social and cultural aspects as they relate to women; e) and to examine problems emerging from the world economy and influencing national economic and social policies which affect the role, status and well-being of women.

The Board of Trustees of INSTRAW at its Third Session in January 1983 decided that the Institute should conduct a series of research studies on the role of women in international economic relations, concentrating particularly on the analysis of the interlinkages between the macro and micro economy and their impact on the role and status of women.

In this respect, the United Nations General Assembly requested that the Institute's activities continue to contribute to the full integration of women in the mainstream of development and that due attention be given to the interdependence of the micro and macro levels of the economy and its impact on women's role in the development process.

This programme has, therefore, been carried out by the Institute in two successive phases. The first phase consisted of the preparation of a series of research studies on industry, trade, agriculture, technology and money and finance, examining the interlinkages between the macro and micro economy and their consequent impact on women in collaboration with a number of internationally renowned academic and research institutions. The second phase consists of a number of meetings including a high-level meeting of eminent experts to review

the studies and to consolidate them into a publication on women in international economy,

This study entitled "Industrialization, Trade and Female Employment in Developing Countries: Experiences of the 1970's and after" places emphasis on female employment following not only from the fact that it is the most quantifiable index of women's participation in industrialisation, but also from the premise that access to wage employment is the precondition, though not the guarantor, for improvements in women's social position and related generally beneficial changes. Though it is a complex matter to assess the effect of earnings on women's social status, there are grounds for supposing that reduction in sexual inequality is directly and systematically correlated with women's participation in production markets.

The views expressed in this study are those of the author Susan P. Joekes, Institute of Development Studies at the University of Sussex, who worked in close collaboration with the Institute in the preparation of the study and to whom the Institute wishes to express its gratitude.



## 1. Introduction

Industry is the most productive of all economic activities and because of this the means of fastest accumulation of capital for economic growth. It is also the provider of ever more effective machinery and equipment for harnessing natural resources for human benefit. Industrialisation is therefore at the core of the structural transformations that constitute economic development.

Women have played an important role in the industrialisation of developing countries over the past twenty years. They have formed a substantial and increasing share in the industrial labour force: in 1960 women constituted 21 percent of the industrial labour force in developing countries, while by 1980 the share had risen to 26.5 percent (Hopkins 1983). Moreover, women's force participation has had the probable macro-economic benefit of facilitating faster national economic growth than if the labour force had been entirely male because female labour comes cheap. In 1982 the ratio of total female to male earnings in manufacturing averaged 70 percent in the eight developing countries for which information was available (ILO 1985). The differential arises not only because of the concentration of women in low grade occupations but also because the wages paid to women are lower than men's within the same occupation, even though their productivity is no less. Because of the differentiation of the labour force by sex, the use of female labour has allowed industry higher profits and reinvestible surpluses than otherwise, or permitted firms to survive and compete, or both. In the context of an increasingly competitive world economy it has meant that countries with large shares of women in the industrial labour force have grown faster than average. Women's role in industrialization, though important, has been limited. The limits lie in the sexual divisions present in all societies. In the labour market these divisions take the form of channelling female labour into a sub-set of industries and into a particular type of occupations. In all countries, developed as well as developing, women workers are concentrated in industries producing light consumer goods such as garments, textiles, processed foods, toys and sports goods. These industries and one other very new industry, electronics, which probably employs the highest share of women in its labour force of any sector, absorb most of the female labour force, and conversely most of the labour force employed in these industries is female. But women are poorly represented in the rest of the manufacturing industry, where production processes tend to be more advanced technologically and more heavily capitalised and where, partly for these reasons, rewards to the workers are considerably greater.

Such light industries, despite their mostly traditional character, have proved to have new strategic value to low income countries in the modern world. They have always been important in the early stages of industrialisation as easy start-up activities, efficient at relatively small scale and not requiring large amounts of financial capital for equipment, but the development of international transport and communications has opened up vast new markets and given these industries new importance to

present day developing countries as generators of foreign exchange. Foreign currency earnings allow countries to leapfrog the slow and tedious building up of indigenous technological capability by the import of capital and other goods embodying the most advanced technologies available anywhere. The low income countries which have grown fastest in the post war period have been those that gave early prominence to setting up large export industrial sectors. Trade in manufactures has consistently grown faster than the total output of manufactures. As a result, taking all developing countries together, the share of exporting industries in the total output of industry has increased in the post war period. The reliance of these industries on female labour does not seem to be slackening in any way - rather the contrary, as pre-established industries turn to export markets, they increase their use of female labour in conformity with the rest (Joekees 1982) - and this largely explains why female labour has become increasingly important for industrial production.

The concentration of women into these industries has implications for the share out between men and women of rewards and benefits from industrialisation. There are two main types of consequences. First, the crowding of women into light industrial jobs has helped to keep female wages even lower than the relatively unskilled nature of the work warrants; it has probably also through a similar mechanism of excess supply of labour, militated against improvement in working conditions for women; and it has entrenched a low level of expectations about the quality of employment for women among men and women alike. Secondly, it makes it possible that changes in international market conditions in recent years have had a differential impact on "male" and "female" industries.

There are three issues here. Most immediately, the question is how the predominantly female-labour using export industries have coped with the upheavals in the international economy over the past ten years, compared to other parts of industry. Low-income countries' opportunities for exports have been curtailed as the previously fast rate of growth of world trade in manufactures had fallen back, even in some recent years fallen absolutely in volume, over this period. Secondly, as those countries which have grown fastest move into a subsequent phase of industrialization, diversifying their exports and modifying their industrial structure, does the pattern of occupational segregation by sex evolve? Does female labour remain disproportionately employed in the less productive traditional branches? and thirdly, how much of an impact has the technological revolution in microelectronics had on the efficiency of cheap labour based industrial production in low-income countries relative to other regions? Microelectronic technology has the potential for automating and streamlining many production processes that up to now have relied on manual labour, swinging comparative advantage towards economies with capital resources and away from those with abundant labour, however cheap. If the present pattern of male and female labour use continues, any fall back in low-income countries' export competitiveness would restrict women's employment opportunities in industry even more tightly. We will examine these more specific issues with special reference to the two industries which are the

most important source of export earnings from developing countries, textiles and garments and electronics.

The emphasis on female employment in this paper follows not only from the fact that it is in principle the most quantifiable index of women's participation in industrialisation (though employment is in fact far from fully measurable). It stems also from the premise that access to wage employment is the precondition, though certainly not the guarantor, for improvements in women's social position and for related generally beneficial changes such as reductions in fertility. The relation is likely to be particularly strong in urban areas where there are fewer productive non-monetised activities than in subsistence agriculture. Though it is a complex matter to assess the effect of earnings on women's social status, taking all the indirect and direct and long and short term effects into account, there are grounds for supposing that reduction in sexual inequality is directly and systematically correlated with women's participation in production markets (through the sale of either labour or goods) (Chafetz 1984). Some recent studies suggest that in the chicken-and-egg situation of social subordination on the one hand and discrimination in employment on the other that faces women the world over, increases in women's wage employment opportunities have a demonstrably positive effect on the welfare and social valuation of female children at least (Rosenzweig and Schultz 1982). And it can be asserted, even more confidently, that the welfare of all members of low-income households, including but not only women, is especially dependent on the income brought in by women. The rapid expansion of employment in developing countries, necessarily and most graphically through increases in the number of jobs for women, has proved to be the single most telling factor in the reduction of poverty (Sen 1980).

## 2. The Growth of Industry in Developing Countries

After Britain's industrial revolution in the nineteenth century, first the United States and Germany and then other North West European countries and Japan followed suit, building up industrial capacity and strengthening and diversifying their economies and technological base. Now, in the past twenty five years or so, it has become the turn of some among the developing countries, particularly in East Asia and Latin America. Industrial output has however grown much faster than agricultural output in almost all developing countries during this time, marking the same historic shift away from the overwhelming predominance of agriculture that had occurred earlier in the presently developed countries. By 1980 manufacturing contributed about 20 percent of the developing countries' total national output compared to 13 percent twenty years before (Singh 1984). The developing countries have also increased their share of world manufacturing output from under 7 percent in 1960 to over 10 percent in 1980 (UNTACD 1981). This increase did not rely on stagnation in other regions, but on a faster positive rate of growth of industrial production in the developing countries. Between 1960 to 1970 total world manufacturing output grew at 6.6 percent, while the developing countries' rate of increase was 7.6 percent; the



difference was magnified in the following decade as world industrial output growth slowed to 6 percent while developing countries' rose to 8 percent (Singh 1984).

This shift in output composition has been reflected in the changing disposition of the labour force in developing countries. The expansion of industry has led to the creation of new jobs in the industrial sector, alongside the decline of agricultural employment. Though industry still has the smallest labour force of the three main economic sectors - 1980 agriculture employed 59 percent, services 21 percent and industry 20 percent of the labour force in developing countries (Hopkins 1983) - it has been the fastest growing sector. In the developed economies by contrast, industrial employment has generally been falling absolutely, the services sector has become the largest employer and agricultural employment has shrunk to minuscule proportions: in the industrial market economies the three sectors employed respectively 38 percent, 56 percent and 6 percent of the total labour force in 1980 (World Bank 1984). The very high share of the labour force in agriculture in the developing countries is perhaps the single most telling indicator of their enduring relative poverty. The level of productivity is far lower in agriculture than in the other sectors: average per capita income in developing countries was \$400, \$2,500 and \$3,150 in agriculture, services and industry respectively in 1980 (Hopkins 1983).

Just as with the labour force as a whole, female labour has been moving out of agriculture and into services and industry, but at an even faster rate than male labour. As a result, the proportion of women in the industrial labour force in developing countries has been rising, from 21 percent in 1960 to 26.5 percent in 1980. The increase took place while the overall share of women in the total labour force remained constant at around 32 percent (Hopkins 1983).

This was not a random change. The character of industrial development in this period has been drawing greater numbers of women into industrial employment. The distinctive features of female labour, stemming from the social pattern of gender relations, have made women particularly sought after by industrial employers. The pattern of industrialization in the developing countries in the recent period has been different from that of their earlier development in ways which have rested very much on the use of female labour.

### 3. The Structure of Industrial Production and Female Employment

#### 3.1 Composition of output and the distribution and total share of female Employment in industry

As the relative size of the industrial sector increases with economic development, the mix of manufactured goods produced changes. Initially the

industrial sector is relatively very small and the single most important manufacturing activity is the processing of food and agricultural products for consumption. With the broadening of the manufacturing base other types of consumer goods are commonly produced, often textiles and clothing in the first instance. Chemicals, metals and machinery of all kinds are developed later. Some higher income developing countries, and not only oil-exporters, have built up large heavy and petro-chemicals industries to levels that compare with developed countries. But developing countries as a group remain distinctively lacking in their capacity to produce machinery and equipment. Capital goods accounted for about 33 percent of the major industrial market economies' industrial output in 1980 while in only four developing countries did they account for more than 20 percent (Brazil, Argentina, Israel and Singapore) (World Bank 1983).

Although female workers now constitute more than one quarter of the industrial labour force in developing countries, there is not an even spread of female labour across these various branches of industry. In a pattern of concentration similar to that found in the industrialised countries, female workers are concentrated in light industrial production, where they form far more than 26.5 percent of the labour force, and are greatly under-represented elsewhere. Clothing (and to a lesser extent textiles), food processing, rubber and plastics goods and electronics, all tend to employ disproportionate numbers of women. There is no comprehensive data but the situation in individual countries is consistently in favour of this view. In South Korea, Taiwan and Singapore women accounted for between 68 percent and 83 percent of the labour force in textiles and clothing and between 59 percent and 90 percent in electronics (broadly defined), while in none of these countries did women account for more than 50 percent of the manufacturing labour force (see Tables 2 and 3). Further information is given in Table 4 for the six developing countries for which data is available, showing the same pattern of bunching of female employment into the light industrial branches. Women are rarely completely excluded from other branches of manufacturing, but they are employed only in very small numbers.<sup>1/</sup>

The larger relative share of light consumer goods in the industrial output of developing than of developed countries might then suggest that female labour is more important in the manufacturing labour force in the former regions. This is not so in aggregate, though there are several individual developing countries where women are more important in the industrial labour force than they are in any developed country. Female

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<sup>1/</sup> This statement must not be allowed to obscure the fact that the proportion of women employed may well be rising across all branches of manufacturing, so that concentration in the branches cited is diminishing. A recent study of Brazilian industry illustrates this phenomenon (Humphrey 1984). But these situations need not be inconsistent with the view that female employment remains limited to light industrial production processes, in the sense to be defined below. Production of this kind is not limited by product category. Unfortunately however labour statistics by sex are far too aggregated for any conclusions to be possible on this point.

labour accounted for 29 percent of the total industrial labour force in developed countries as against 26.5 percent in developing countries in 1980. (ILO 1985). In Hong Kong, Korea, Taiwan, the Philippines, Singapore, Thailand, Tunisia and Haiti for instance, the share of women in manufacturing labour force is more than 40 percent, while in no industrialised market economy do women account for more than 31 percent.<sup>2/</sup> (ILO 1983 & 1984). But it is also the case at the aggregate level that there are fewer women in the total labour force in developing than in developed countries according to the conventional measures of labour force participation (33 percent compared to 40 percent). Taking this into account, it can be said that women are less under-represented in industry in developing countries, compared to their overall share of employment, than they are in developed countries. The light consumer industries where women workers are concentrated have a number of distinctive economic features relevant to employment which explain why they should particularly demand female labour. Light industry tends to use relatively little capital in relation to labour, compared to other industries; to be characterised by low technology operations (with the obvious but revealing exception of electronics, as will be seen); and to provide generally relatively repetitive, low-skilled and non-career promotion jobs. But these distinctions only have any significance in combination with the fact of differentiation within the labor force, which confers certain characteristics on female labour.

### 3.2 Differences between male and female labour

Male and female labour form two categories in the labour market, distinguished in two dimensions, neither of which is necessarily inherent as opposed to socially or market determined.<sup>1/</sup>

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<sup>2/</sup> The "manufacturing labour force is not the same as the "total numbers in paid employment in manufacturing" (as in Table 4); the former includes own account and unpaid family workers.

<sup>1/</sup> Neither feminists nor neoclassical economists in fact presume that there are any genetic or "natural" differences of endowment or application relevant to employment between men and women on average. Neoclassical economic models explain the differences in terms of a vicious circle of market disincentives facing women and feminists in terms of systematic social subordination of women extending to the labour market.



First, women's earnings are lower than men's. In 1982 the ratio of female to male earnings in manufacturing averaged 70 percent for the 8 developing countries for which information was available (and 69 percent in 17 developed countries) (ILO 1985). This is partly a consequence of the occupational distribution, with women being more important in low-grade occupations. But it is being increasingly recognised that women's earnings are less than men's even in the same occupation and for the same job (Lele 1985; Treiman and Roos 1983; and Lloyd and Niemi 1979). This wage differential is reduced but not eliminated by adjusting for differences in educational attainment and training between male and female workers.

The main correlates of men's higher wages seem to be seniority and work continuity. At the macro-economic level, that is, there are no factors apart from men's longer and more continuous time in employment which can explain by association why this differential exists. (Women's absences for childbearing and childcare reduce their total time in wage employment). But micro-studies of manufacturing employment suggest that employment practices which make sense only as instances of gender discrimination are the real cause; it was also established in another context that interpersonal status plays a major part in determining wage differentials between workers within the firm (Frank 1984).

A few of the small number of case studies of different kinds on employment practices illustrate the kinds of discriminatory treatment in existence. A study of Brazilian firms examines why workers in occupations using carefully selected, educated labour trained several months on the job are paid less than others for which recruitment is virtually unconditional and no entry qualifications and no training are required. The latter are male, the former female (Humphrey 1985). Another shows that in one large organisation women are consistently placed in jobs in the lower points of the grades to which their qualifications and experience entitle them (Malkiel and Malkiel 1973). A third econometric study shows that in one country (Taiwan), across manufacturing as a whole, there is something akin to what might be called a "marital masculinity premium" as an element in wage determination. Workers' marital status has a definite influence on wages, but for males it is a positive increment, for females a negative one (Gannicott 1983). Marriage may lead to productivity - related differences, e.g., women's absentee rate may rise on marriage, while married men's attendance and reliability are enhanced, but it is extremely unlikely that differences in absentee rates are proportional to the wage differential. In any case, what little concrete information is available on labour turnover and absenteeism by sex (Humphrey 1985, Joeke 1985) shows no such systematic difference and often that female absentee rates are lower than men's. The prevailing wisdom that women's absentee rates are higher probably derives less from reality than from the ideological stereotype of the female role, which requires women to give their families first claim on their time, over and above the demands of their job.

The male wage premium that exists in Taiwan is a clear expression of the "breadwinner" ethic - the apparently universal idea that men are



responsible for the material support of familial dependants. It encapsulates the concept of women as "secondary" workers, uninterested in promotional prospects in employment and satisfied to bring home a mere supplementary income to the household. This idea is enormously powerful in reinforcing sexual stratification and it legitimises women's inferior treatment in industrial work in both men's and women's eyes. It accounts for the fact that neither men nor women are in general concerned to press for equal rewards for equal work as between workers of different sex. The fact that vast numbers of women are in practice responsible for the upkeep of dependant children and that even in multiple income households women's incomes are devoted solely to household expenses (unlike male earnings) and thus contribute as much or more to household maintenance and reproduction than men's, does nothing to disturb the ideology of gender relations in this respect.

The second dimension of sex differentiation in labour markets is that women tend to be less educated than men, according to the normal bias in educational provision in developing countries in favour of males, and by extension they occupy more unskilled positions in employment. There seems little doubt that there are significant differences by sex in the labour force as regards both school educational preparation (World Bank 1984) and vocational training and that women have fewer skills in this sense. But again, micro-studies put into question whether the differences are large enough fully to explain the distribution of male and female labour by occupational level. Job descriptions in terms of skill level are normally closely matched to wages and this is taken to mean that higher skills are rewarded by higher wages. But the match can be interpreted differently. The wage level attached to a job may set its skill label in a purely nominal sense (Phillips & Taylor 1980). The Brazilian study cited earlier (Humphrey 1985) provides examples where the real skill levels of "female" jobs are clearly higher than those of more highly paid male jobs, despite the fact that the official job gradings denote them as lower skilled in accordance with the ranking by wages.

All such apparently anomalous cases can be explained by reference to the prior existence of different wage rates by sex. Differing male and female wage rates are the product of market forces in segmented labour market conditions resting on discriminatory social gender relations, such as are reflected in the "breadwinner" ethic. Discrepancies between skill levels and wages in women's jobs compared to men's can be explained as a consequence of the employers' being able to pay women the going female wage rate, and then determining the nominal (as opposed to real) skill level of the job in conformity with that lower wage. It is not clear to what extent occupational descriptions would be altered if real rather than nominal skill levels (in this sense) were to be recorded. But this consideration does nevertheless point back to a truly discriminatory element in the observed differential in male and female wages.

### 3.3 Economic Characteristics of Industrial Production and the Demand for Female Labour

In this section we examine the economic characteristics of production

in different industries in an attempt to explain the concentration of female labour in certain branches. Varying factor proportions are obviously relevant; on the other hand, the role of technological change, while often raised in this context, is more problematical.

There is first of all a rough correlation between the end-use characteristics and the methods of production of a product, in terms of its relative use of the two main factors of production, capital and labour. Capital goods production uses a larger complement of machinery and equipment and higher valued materials and components, which makes it a more heavily capital-using procedure than light consumer goods production.<sup>1/</sup> It is not surprising in this perspective that the industrialised countries, with their greater accumulated wealth, should have relatively large capital goods sectors; and it is also in the broadest sense congruent with the developing countries' relative lack of capital and abundance of labour that light industries have greater weight in the structure of their manufacturing industry.

The relevance of labour intensity of production to the sex composition of the labour force is two-fold. First, since wages are proportionally much more important than capital as a factor in costs of production in labour intensive industries, in competitive markets light industrial firms must minimise their unit labour costs as a priority. This can be done by enhancing productivity and/or paying lower wages. Employers' scope for enhancing productivity in these industries is on the whole limited to training and organizational and work flow improvements rather than radical changes in machining methods and tool design. Although significant savings can be made in these ways, the imperative to minimise wages remains overwhelming. The option of using cheap female labour is an obvious solution to this problem. The widely remarked greater docility and obedience of female than male labour in this perspective not only strengthens the unit labour cost advantage of female labour but adds to the potential for successful organisational changes in production procedures, which rest on the co-operativeness of the workforce (Joekes 1982).

Secondly, in light consumer industries one of the restrictions in the use of female labour met with elsewhere is no hindrance to the employment of women (Armstrong 1982). This is the prohibition on night shift work by women often enshrined in social custom and also found on the statute books of most developing countries. For heavy industrial firms using continuous processes frequent shut-downs would be prohibitively expensive for technical as well as financial reasons. Continuous round-the-clock working is the norm and a proportion of the workforce works at night. In other capital intensive operations there need not be technical reasons but a purely economic incentive to continuous working; expensive equipment needs to be worked as much as possible to defray the fixed cost it represents. In

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<sup>1/</sup> This correlation is far from universal however: the production of machine tools for example, a quintessential capital good, can sometimes be quite labour intensive. But for expository purposes the distinction can be allowed to stand here.

lightly capitalised industries, by contrast, the value of equipment is small relative to the cost of labour. Operations can afford to be rested overnight, especially in view of the labour premiums that usually have to be paid for night over daytime shift work. In these industries therefore, with no pressures on producers to operate at night, employers can and do employ all female workforces without coming up against the social and legislative barriers on women working at night.

There are other aspects of light industrial production which seem to be systematically associated with female labour use. These relate to the type of work performed in such industries. For the majority of the workforce in these industries the jobs that have to be done are repetitive, short cycle, relatively quickly learned tasks for which thorough technical knowledge of the production process as a whole is unnecessary; assembly line work is stereotypical. They are categorised as unskilled jobs. Women are concentrated world over in unskilled jobs of this kind. It has been shown for example that in France women perform more assembly-line and machine-paced work, and that even when they are classified as skilled workers they are more likely to be working for piece-work and doing repetitive operations than unskilled and semi-skilled male workers (Kergoat cited in Humphrey 1984).

The allocation of these jobs to women is done for two reasons. First, insofar as they indeed carry relatively low skill requirements, it is appropriate that they should go disproportionately to women whose educational attainments and training are in aggregate less than men's (partly for reasons of sexual discriminations). Secondly, women are considered by employers as the more expendable sex, more easily laid off and rehired or replaced as required. The idea that women have lower "work commitment" than men is the legitimating concept here that women are in no position to bargain against.

It has often been argued that the application of technological changes to industry modifies the nature of work for industrial workers. Technical progress is held to lead to the "deskilling" of occupations in capitalist manufacturing. The idea is familiar from Adam Smith: as the drive for profits leads to increasing specialisation of labour through the use of more effective organisational methods and the application of improved tools and equipment, so the skill and knowledge required of the worker decrease, even as the work pace rises and more detailed accuracy is needed. Assembly line work is the archetypal outcome of increasing specialisation of this kind. Given the concentration of women into unskilled jobs, the argument amounts to a theory of the "feminization" of many new jobs in industry as production processes evolve. Braverman (1974) has been the seminal contemporary advocate of this argument, while Coyle (1982) applies it to the historical development of the British clothing industry as an example.

The problem with this hypothesis is that it does not always fit the facts. It is unhelpful to the hypothesis in its most general form that Chinese industry, presumably the least capitalist of any, displays the all too familiar pattern of female concentration in textiles, garments,



food processing and the like (see p,42). More importantly, there are many instances of the displacement rather than new use of female labour with industrial development, and of the up-grading of average skills in industries with technical change. This has occurred not only historically in Britain, for example, but also, to take two other cases, in the textile industries of India (Baud 1983) and Colombia (Keremitisis 1976) in the modern period. In the latter case, the share of women in the labour force fell from 74 percent in 1938 to 32 percent in 1979. The effects of technological change in industry on labour use are clearly varied. The "masculinisation" of industrial processes is evidently an equally plausible hypothesis in some circumstances.

It is worth nothing, in terms of the previous discussion, that the textile industry has in fact changed from labour intensive to what are in many cases capital intensive and heavily automated techniques. It fits our categorisation of the relevant features of heavy versus light industrial production that textiles should thus move away from a largely female labour force. The problem could be restated: what conditions determine increase or decrease in the labour intensity of production, the "deskilling" of work on the one hand versus the introduction of new tools and equipment of a kind generating more complex and responsible jobs that are somehow thought socially appropriate for males on the other, respectively? Is it in any case indeed true that "male" occupations are intrinsically more complex and responsible? Our previous discussion of the dubious link between skills and wages casts doubt on the idea.

A social theory of male cartelisation in conjunction with a less simplistic view of the nature of technological change gives a plausible interpretation. It could be not so much the real nature of the tasks in increasingly mechanised or automated processes that lead them to be taken by male labour, but the pre-empting by males of occupation where technological change leads to such increases in labour productivity that employers can be made to pay higher wages. "Male" jobs are then characterised as more skilled to lend justification to the higher wages which men demand (Cocburn 1981). However, productivity changes are the result not only of factor costs but also of final product prices themselves, determined by market conditions. Final prices and thus labour productivity are higher, other things being equal, the more uncompetitive are market conditions. The potential for male claims is contingent on market conditions and the labour supply situation.

The force of competition thus reappears as an influence on the distribution of employment between men and women, acting against the male advantage. Competition undermines male claims on potentially high paying jobs in two ways. First, competition among producers keeps final product prices down, depressing labour productivity and so lowering potential wages. Garments, plastics, food processing and other such cheap product industries characterised by large numbers of local producers are examples of this effect. There is however a confusing correlation with labour intensity here. Labour intensive industries tend to be competitive because capital start-up costs are small and economies of scale often not significant. Entry to the industry is easy and usually large numbers of



competing small firms exist. Labour intensity depresses labour productivity so that labour intensive industries can only, on the whole, pay low wages. This is the fundamental reason why male labour cedes this area of work to women.

The second case where competition undermines male claims to employment is in industry that is in aggregate highly capital intensive and where potentially the rewards to labour could be high. The prime example is the electronics industry where there is extraordinarily intense international competition. Electronics employers are driven to take advantage of pre-existing differentiated labour forces in developing countries to make savings where they can and they employ almost entirely cheaper, female labour despite high labour productivity in total. Of course this is only possible where female labour is available; the female labour force participation has risen remarkably in the past twenty years so that female labour has generally been available.

It is useful, finally, to consider the sex composition of the labour force in relation to a commonsense notion of the level of technology used in different industries. Many of the industries in which female employment is concentrated can be thought of as relatively unadvanced in their techniques of production. The food processing and clothing industries make essentially traditional products in more or less traditional ways; plastics and rubber products are based on modern scientific discoveries but the level of technology is relatively simple. All these industries use predominantly female labour. Textiles, which uses less female labour in total, comprises processes of greatly varying levels of mechanisation. The overall level of technology can be measured by the importance of research and development expenditure in relation to total industrial expenditure. Garments, textiles and food processing are at the bottom of a list of industries ranked by "technology intensity" in this way, with food processing having the lowest intensity of all industries (Scott 1985).

The electronics industry is very obviously not in the same position. It is among a group of industries that are at the opposite end of the technology intensity spectrum according to this classification. But it is a very revealing exception. The presence of women in the electronics labour force is in fact consistent with the foregoing argument in terms of factors proportions. It also points to a major institutional change which has been influential in shaping industrial development in the low-income countries in the past twenty years, the involvement of transnational corporations.

#### 4. The Role of Transnational Corporations (TNCs)

Technology intensity in an industry is significant in employment terms because on the whole it translates into capital intensive techniques of production. This is true at the aggregate industry level, but it does not always apply at each plant or factory. In different industries many complex production activities break down into a number of steps which need

not be adjacent to each other, can indeed be oceans apart. Some production stages may be heavily capital intensive, others highly labour intensive with, in the extreme case, the work merely consisting of assembly and testing of brought in materials. There is little possibility of physical separation of production sites in continuous processes industries but many light industrial process do have the potential for it, all that is required being that the components in various stages of fabrication be transportable between sites. Post-war improvements in transportation and telecommunications have vastly increased the scope for the long distance fragmentation of production. Firms have a strong incentive to spread production sites across international boundaries because absolute factor costs vary greatly between countries. In particular, there is an enormous spread in wage levels internationally and the potential savings from locating labour intensive processes in developing countries are very large. A new generation of TNCs has sprung up to exploit these possibilities of internationalised production through what is known as "global sourcing".

Despite its high total average technology and capital intensity, the production of many electronic products falls into discrete segments, with some very labour intensive processes in use. In principle some of the operations involved could be automated, but paradoxically the very speed of scientific advance in this field has made it uneconomic in practice. The extremely short product cycles prevalent in electronics mean that it is not cost effective to undertake expensive tooling up for each new product (Eisold 1984); human labour has the strong advantage of flexibility in learning new procedures. This partial labour intensity together with the separability of production stages, and the compactness of electronics parts and components which means they can be transported internationally relatively cheaply - has made electronics the archtypal industry for production on a global scale. Electronics TNCs carry out many of their labour intensive production operations in developing countries. In the early 1970s almost 40 percent of the employees of United States electronics firms were in developing countries (UNIDO 1981). The enormous research and development expenditures required of firms to survive in an industry with rapid innovation and volatile demand predisposed firms to be very large and able to finance and manage the complex business of co-ordinating production in plants dispersed throughout the world.<sup>1/</sup> No electronics firms all sell to many different national markets, and competitive survival requires them to have globally planned production and sales strategies.

There is another twist to electronics and other TNCs location of labour intensive operations in developing countries. The cheapness of labour is the fundamental attraction when these locational decisions are made although other financial considerations of course enter in also - the

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<sup>1/</sup> This is less true of consumer electronics than of components production. Some East Asian countries have significant locally owned capacity in this area. TNCs do not monopolise production completely but existing TNCs do all source abroad (ILO 1983a).



local tax regime, start-up and other subsidies offered by the host government and the political stability of the area, for example. Cheapness of labour of course entails a whole host of variables apart from the crude wage rate which together determine total unit labour costs. The reliability of supply of labour, level of education of working population, prevailing rates of absenteeism and turnover are some such factors. It is not surprising in this light that transnational electronics corporations should not only have chosen first to locate virtually all of their assembly production capacity in developing countries but that they use predominantly female labour, which has all the characteristics that, as discussed, combine to make women the cheapest type of labour. Foreign operators come in without the cultural inhibitions against employing women which may weigh with local firms, and in this sense are able to behave more rationally than local employers. In the Moroccan clothing industry for example, it was foreign owned firms that set the precedent of working with effectively all-female workforces (Joeke 1982).

At best two thirds of the developing countries' electronics workforce consists of women workers (see p.8). Electronics TNCs' developing country plants are concentrated in East Asia. Many of these countries provide a congenial environment for foreign enterprises because of their political stability, central government's authoritarian control of labour markets and so on and have also large and well educated female forces. Both US and Japanese TNCs have been attracted to this region; Japanese firms no doubt also influenced by its geographical and cultural proximity. Early US electronics plants were set up in Mexico for this reason.

TNCs have long been active in manufacturing in developing countries of course, but before the era of global sourcing they were limited to manufacturing operations more or less duplicating those in the home country. These were set up to gain access to market otherwise blocked by import restrictions or to supply goods of the type where proximity to the final market was important (because of high transportation costs) or to make use of local raw materials. The production by TNCs of automobiles, agricultural engineering products, is spread far and wide among developing countries. For scale efficiency reasons of one kind or another the main producing firms tend to be very large and to operate on a global scale in all of these industries. This kind of manufacturing production still predominates in the large Latin American countries that were the main sites for TNCs overseas production facilities in the earlier phase. The manufacturing sector in these countries is still dominated by transnationals to a greater extent than in other regions: in the mid 1970s, to take the extreme case, almost one half of Brazil's industrial output was produced by transnationals (see Table 5). This older type of investment was not guided to the same degree by the search for cheap labour. But it is notable that where plant operations were labour intensive, as in pharmaceuticals (in developing country plants essentially an assembly operation), transnationals seem also to have employed many women in evidence again of their profit maximising behaviour.

Many "sourcing" activities are identifiable on the ground because they are located in "export processing zones" (EPZs). Not all sourcing is confined to these sites, though it is impossible to estimate the proportion.

These are free trade zones which have been set up by developing country governments in increasing numbers as an enticement to foreign capital, precisely for the production of manufactured goods for export. The zones attract sourcing facilities because they offer duty-free passage not only for exported products but for imports too: and most of the production in EPZs is the assembly of imported parts. These activities are the purest form of the internationalisation of production in accordance with factor cost, as it were; so it is not surprising to find that the labour force employed in EPZs is overwhelmingly female (Edgren 1982). It is remarkable also that particularly in Asian countries, this female labour force is very young, with 25 years often being the ceiling (Eisold 1984, Lim 1981). Their youth - and often their uniform unmarried status - is sometimes apparently an accident of this age group's higher educational qualifications: at other times it follows from firms' explicit recruitment and employment criteria. Women are dismissed on marriage or when they reach a certain age. At this stage in their lives women are considered to have no domestic responsibilities to compete with their commitment to their employer. In the extreme case of firms in EPZs remote from their places of origin, workers are housed in dormitories at the plant itself. They are treated as virtually continuously available and called up on variable shifts to suit the firm's production schedule. The extra-territoriality of EPZs is demonstrated by the waiving in some countries of "protective" legislation forbidding night shift work for women EPZ workers (Edgren 1982).

The availability of male labour in many of these countries affirms that there is a systematic preference amongst TCNs for female labour. Even in some regions where the age of effective marriage and of first childbirth is so low that a sizeable cohort of unmarried childless women is not available on the labour market, for example in Haiti and other Caribbean countries, the preference for women remains: older women, whose children have grown, are employed instead, rather than the younger, usually better educated, men amongst whom the rate of open unemployment is very high in these societies. That is, it is women workers' gender rather than their marital status which determines their distinctiveness. The sexual segmentation of the labour market ensures a lower for all females wage rate. Asian women workers' youth and freedom from domestic tasks probably makes them an even more compliant and productive workforce, but the sex wage differential is large enough in all societies to make women attractive to the cost minimising employer whatever their domestic circumstances.

## 5. The Growth of Trade in Manufactures

Rapid growth of trade in manufactures has been one of the remarkable features of the world economy in the post war period. The volume of manufactured goods traded has consistently grown faster, year by year, than both total trade and industrial output (and of course also than national output) (see Table 6). There was a fall of about half in the trend rates of growth of both in output and trade around 1973 - for reasons to be discussed in the next section - but the relation between the two remained the same: from 1963-73 world output of manufactures grew



at 7 percent annually while trade in manufactures increased at 11 percent on average; from 1973-80 output grew at 3-1/2 percent, trade at 5 percent. Since 1980 however total trade has not increased at anything like even this lower rate: after increasing by 3.5 percent in 1981, manufactures trade fell absolutely by 2.3 percent in 1982 (World Bank 1984)

The pivotal year 1973 marked another change: a reversal in the relative trade performance of different economic regions of the world. Since 1973 the developing countries have sustained their total exports better than the developed countries, even though at a reduced rate compared to the previous period. From 1974/5 to 1978/9 the developing countries increased exports at an annual rate of 7 percent, while the developed countries exports fell back to grow at 5.5 percent (Table 6); they achieved an average rate of growth of 10.6 percent of manufactured exports from 1973 to 1980 (World Bank 1984). In the 1980s the developing countries have experienced the general downturn in manufactured trade but again to a lesser extent than the rest of the world: in 1982 the volume of developing countries' manufactured exports declined by 1.6 percent (compared to the 2.3 percent fall in total world manufactured exports), after increasing by fully 16.3 percent in 1981; in 1983 exports picked up to increase again by 6 percent (World Bank 1984).

The growth of exports of manufactures from developing countries has been most dramatic from the "newly industrialising countries" (the NICs) sometimes tautologously in this context referred to as the "fast growing exporters of manufactures" or, in a slightly wider grouping, "middle income oil importing countries". This group now accounts for about three quarters of the total exports of manufactures from developing countries. Most of these countries are in East Asia, with South Korea, Taiwan Singapore and Hong Kong in the vanguard in terms of total manufactured export growth. They are being joined by a second lower income tier of countries including Malaysia, Thailand and the Philippines. Some other countries from outside the region are also involved, e.g. Tunisia. Some of the Central American and Caribbean economies have increased the importance of manufactures in thier total exports (without any significant growth of total exports) but they still account for only a very small share of total developing countries' manufactured exports. The larger Latin American economies export disproportionately small amounts of manufactures in relation to their share of total developing countries' industrial capacity. Each of the four Asian NICs exports more manufactured goods than the whole Latin American continent.

The crude size of national economies has much to do with individual countries' interest in exports but it is far from everything. The two developing countries which have the highest share of exports in relation to their total economic activity - Hong Kong and Singapore - are entrepot city states: their only realistic option for economic growth is to produce for foreign markets. Their ratio of exports total national income - 100 and almost 200 percent respectively (World Bank 1984) - indicate their freakish status in this respect. On the other hand, the other two first generation NICs, South Korea and Taiwan, are not particularly small, with populations

of 40 and 20 millions. They have increased their total exports (now almost entirely of manufactured goods in both cases) to 40 and 50 percent of GNP respectively, compared to the middle income countries' total average of around 23 percent in 1982 (World Bank 1984). At the other end of the spectrum, the main Latin American countries, Brazil, Mexico and Argentina, large by world standards, have, to date, sold little of their total industrial output abroad, though Mexico's share has been rising quite rapidly, and so more recently has Brazil's.

At the same time as the Asian NICs have become heavily dependent on manufactured exports they have enjoyed extrordinarily high rates of total economic growth. Over the past twenty years they have achieved the highest economic growth rate of all countries (with the exception of a few capital surplus oil exporters whose fortunes were transformed by the oil price rises of the 1970s) The association has led to the frequent supposition that their growth has been "export led", and that more exactly the key to economic development is to stimulate production of manufactured exports. The association is less obviously causal than it seem - these countries' general economic dynamism may have been as much responsible for as due to increases in exports - but at any rate, partly for this reason, partly as a matter of financial need to pay for imports, increasing numbers of developing countries are trying to put into effect internal policy changes to encourage exports of manufactures.

The strong showing that developing countries' manufactured exports made in 1980 might seem to suggest that their prospects for success are fairly good. But whether in fact conditions in the world market for industrial goods, and conditions particularly in the industrialised countries which purchase 65 percent of developing countries' exports of manufactures, will be as propitious in the future as in the 1970s is debatable. The long drawn out recession that started in 1980 resulted in the first absolute fall in world trade in manufactures in decades in 1982. Future growth in trade, and developing countries' export prospects, depend fundamentally on demand in the industrialised countries which rests in turn on their general ability to pull out of the recession. Recovery is hesitant in many countries, including the United States, despite its growth surge in the early part of 1984.

More particularly, unless industrialised countries' international competitiveness and capacity to generate employment improve, trade from developing countries is likely to be inhibited for political reasons, even if overall rates of economic growth revive. There is much evidence of creeping neo-protectionism in the 1980s. The letter of free trade on the whole continues to be observed, so that restrictions take the form of non-tariff barriers to trade. These are inherently difficult to measure. But restrictions of this kind do seem to have been becoming more widespread: it has been estimated that in 1983, 22 percent of world imports were subject to restriction. Moreover, developing countries face more barriers on their exports to industrial countries than do industrial countries trading with each other, and they have relatively more restrictions on their manufactured products (Nogues, Olechowski and Winters 1985). In 1979, 30 percent of developing country manufactured imports into OECD countries were subject to



regulation, compared to 11 percent of imports from other OECD countries (Page 1981). In other words, when market conditions are tight, as they have been recently, developing countries are significantly discriminated against in access to the rich country markets that are destination to most of their exports. This makes their better export performance than the industrialised countries since 1973 all the more remarkable; but it does suggest also that the industrialised countries are in effect taking steps to ensure that the export expansion is contained in future.

With respect to the composition of manufactured exports, labour intensively produced, light industrial products figure even more prominently in the exports of developing countries than they do in total industrial output. The main feature is the preponderance of textiles, garments and footwear: these items accounted for 37 percent of developing country manufactured exports in 1975 (Table 7) and in 1981 for 42 percent of low income economies' manufactured exports, 23 percent of middle income economies' and 23 percent of upper-middle income countries' manufactured exports. (World Bank 1984). Other major export product groups are electrical machinery and apparatus and consumer electronics products which have together accounted for a rapidly growing share, amounting to 16 percent of non-primary product based manufactured exports in 1977; and a miscellaneous set of light industrial consumer goods such as plastic items, toys, sports goods, leather goods, watches, etc. (see Table 8) <sup>1/</sup>. Trade thus takes place particularly in goods whose production, for the reasons discussed in the previous section, uses mostly female labour.

The East Asian NICs conform less to this pattern of export composition than the average developing country. They have been expanding their exports of higher technology products in a conscious imitation of the Japanese path to economic growth. The extent to which they have been succeeding is evident in the fact that in a 57-way categorisation of industrial products according to technology intensity cited above (see p.20), the four NICs increased their world market share in 15 of the top 20 ranked industries between 1967 and 1980 (Scott 1985). The process is still in its infancy however, for even despite these trends, the NICs are still heavily dependent on the normal developing country export goods particularly textiles and garments. In South Korea and Hong Kong textiles and garments account for 33 and 43 percent respectively of manufactured exports (in Singapore the share is less) (World Bank 1984).

The importance of TNCs to the pattern of industrialisation of developing countries is evident in relation to trade. The new type of transnational involvement in internationally fragmented production

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<sup>1/</sup> Structural measures of underdevelopment such as output and exports composition differentiate developing countries from industrial economies more clearly than do income levels where there is now some overlap between the two broad categories.

processes has an inevitable corollary in adding to the amount of internationally traded manufactures, partly in the form of intermediates, partly in finished products. Though it is difficult to assess what proportion of trade in manufactures takes place between different parts of global corporations, a recent estimate is that one half of all developing country manufactured exports consist of intra-firm trade (Taylor 1982). The definition of "intrafirm" is fairly wide, covering any two enterprises in different countries linked by ownership above a minimum level but not necessarily 100 percent: the estimate therefore goes beyond intra-TNC trade properly speaking. But the bulk of the intrafirm trade flows is probably of movement of goods in varying stages of completion between fully incorporated plants belonging to a single centrally run corporation. The expansion of "sourcing" activities by transnationals using largely female labour must, in this perspective, have contributed significantly to the rapid growth of manufactured exports from developing countries.

There are many major labour intensive exporting industries however where transnational corporations are not involved at both ends and where international application between firms, while not altogether absent is not the rule. Institutional links here take the form of "international sub-contracting" between independent enterprises not more than one of which is a TNC (and probably neither); trade is only classed as "intra firm" if there is an equity stake involved as well. This is the main form of international involvement of firms in the clothing industry for example.<sup>1/</sup> Even so, international subcontracted goods accounted for only 10% of U.S. and 17% of West German imports of clothing from developing countries in 1974 (Joeke 1982a). The great bulk of developing country clothing exports are by autonomous local firms. Nevertheless, the world wide geographical distribution of production in capacity in these products has been changing areas fast. Much of production capacity in these cases is now located in the developing countries while consumption has remained centred in the industrial countries. The divergence in the distribution of production and consumption has been reconciled through trade.

Developing countries' increasing international competitiveness in these products has been based primarily again on labour costs. This type of changing distribution of capacity is sometimes referred to as the "relocation" of industry, though the term tends to disguise the institutional difference from transnational corporations' production activities. In this case there is no concrete agency taking a decision to site production in one country or another. Competitive market forces bring about the change, not any centralised authority.

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<sup>1/</sup> Equity links in clothing additional to the contractual relationship are probably concentrated in new supplying countries (e.g. Tunisia) and of little importance in countries with pre-established production capacity.



Precisely for this reason, the process of industrial relocation of this kind has been more contentious than the expansion of multinational operations - it has not been directed by rich country industrial interests, but has largely conflicted with them. Accordingly, it is in these products that there is restriction of international trade to a far greater degree than in electronics and other transnationally produced goods. Rich country industrial interests, being long established, have much to lose in old product areas; in many fields of electronics much of the totally new production capacity was set up abroad, away from the U.S., Japanese or European headquarters right from the start. But the multinationality of a producer makes it easier for production facilities to be sited abroad for two other reasons. Where any closedown or diminution of developed country industrial capacity is required, the decision is internal to the organisation, which sees increased global profitability for itself in a move abroad. Secondly, insofar as TNCs continued to be based in and valuable to the rich countries - to house their high value added R & D departments and declare global profits there - they have had political access to the process of trade policy formulation and were able to influence provisions in their product areas so as to minimise financial and regulatory restrictions on trade. Thus the U.S. Trade Commission from early on reduced the import duties on goods fabricated abroad by American companies, compared to products wholly fabricated outside the U.S.

It is mostly therefore in non-transnationally produced products that neo-protectionist quotas and other non-tariff barriers have been applied. Textiles and garments have been notoriously the most subject to chronic restrictions on entry to developed country markets. International specialisation of production between developed and developing countries according to comparative advantage has clearly been inhibited in these product areas in comparison to, say, electronics. In principle, the developing countries might by now most efficiently be sole suppliers of clothing for the whole world. In this perspective the market advances that have been made have been small in relation to the developing countries' potential for expanding production.

#### 6. International Economic Changes over the Past Ten Years

The growth of trade, particularly in manufactures, and the spread of transnational corporations' activities have both signalled the increasing interdependence of national economies in the post war period. The other side of the coin of interdependence is increased vulnerability. Economic events in one part of the world can now have widespread international ramifications. Great upheavals have indeed taken place in the world economy in the past ten years, disrupting economic growth in many countries which were not the source of the initial difficulties. Some of the developing countries have been the main economic victims. The course of industrial employment of women in the developing countries over this period can be understood by reference to the polarising effects of the recessions between different groups of developing countries.

The mutuality of economic relations that has grown up between the industrialised and developing countries is not balanced; the industrialised economies are the overwhelming force in the world economy. Their wealth

The U.S. trade deficit does of course mean that other countries have increased their exports to the U.S. But many developing countries have not in practice benefited in full from the advantage presented by the high value of the US dollar, i.e., from their own increasing nominal competitiveness. Many still have their own currency formally tied to the dollar. Others have been deprived of potential extra export earnings because the protectionist restrictions on U.S. imports have limited the gain. Industrial countries have also been subject to restrictions on their exports to the U.S., but relatively less than the developing countries.<sup>1/</sup> Moreover the incidence of trade barriers among developing countries has been greatest on the main debtor countries, the very group that most needs to increase its foreign exchange earnings (Nogues, Olechowski and Winters 1985).

The two world recessions have had a polarising effect among the three main developing country regions. The Latin American countries' predicament lies primarily in their high level of debt, attributable in large part to the historically high level of interest rates and to the high valued dollar. In retrospect their response to the first oilprice shock was a costly mistake, but its impact has been magnified out of all proportion by the international repercussions of subsequent industrialised country (mainly U.S.) policy.

The African countries are also in severe economic difficulty. Their problems lie partly similarly in debt and partly in a much more gravely weakened potential for earning foreign currency because of even weaker international markets for the primary products they specialise in. The burden of debt carried by a number of African countries is comparable with some Latin American economies in relation to export earning and national income. The striking difference is that the African economies are in the main at a far lower level of per capita income and their urgency for development is all the greater for this very reason. African aspirations to industrialise have been cut short by the falls in real income consequent on the recession.

The Asian countries are conspicuously absent from this catalogue of woes among developing countries. This is the region that has been least damaged by recession and has managed most successfully to continue economic growth during this period, most notably in the continued expansion of export of manufactures (Lele 1984). Prices of manufactures rose all through the 1970s, adding to the value of export earnings from Asian countries, but volumes increased also. They had, like the Latin American countries, borrowed to finance their way through the first oil shock, but the buoyancy of their exports has had the favourable spinoff effect of winning them relatively good terms of their borrowing so their debt burden was not magnified to the full extent by the 1980/1 interest rate increases. The region now accounts for an even larger proportion of

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<sup>1/</sup> This bias is demonstrated in Nogues, Olechowski and Winters (1985), and contradicts the impression given in the World Bank's World Development Report 1984, Table 2.5, particularly in respect of the balance of U.S. import restrictions. The first source is both more up-to-date and more comprehensive than the second.



developing countries' total exports than ten years ago. But their success is not, in an accounting sense at least, unrelated to the Latin American and African countries' difficulties. Especially in view of the restrictions on access of developing countries' imports to industrialised country markets which limit the total scope for expansion, it is arithmetically true that success on the part of the Asian exporters necessarily entailed a squeezing out failure of the remaining developing countries. Their economic strategy was in this respect preemptive, and not replicable universally.

The growth of female industrial employment in the developing countries has roughly paralleled the differing international fortunes of these three regional country groupings. Table 9 shows that female industrial employment has grown absolutely in all regions, in accordance with the general increase in population and spread of industrial capacity throughout the developing world, but fastest in Asia and slowest in Latin America, matching the regions' respective performance. The differences among regional growth rates of employment of women in industry are not apparently very large - all within a range of increase of 43 and 62 percent from 1970 to 1980. But they are more pronounced set against the local rates of population increase: population increased slowest in Asia but considerably faster in Latin America and Africa, inversely to the pattern of female industrial employment growth.

There has been a strong association between rate of growth of female industrial employment in the regions and not just general economic growth but, more specifically, growth of manufactured exports. The exploitation of export markets gives access to markets that are (in principle) indefinitely large for any one country, permitting relatively fast expansion of total industrial capacity. Part of the reason for the strong growth of female employment in industry in Asia lies in the strong general growth in demand for all industrial labour in those countries, which cannot be met by male labour alone: women have, to some extent, got drawn into employment in industry residually to increase total labour supply. (They also get expelled from the labour force when there is any reversal, as we shall see). But the sexual differentiation of the industrial labour market allows a more direct connection to be made between export performance and female employment. Increases in exports translate into specific demand for female labour because manufactured exports mostly consist of the types of goods produced by female labour, as we have seen (p.30). Moreover, international markets are inherently competitive and competition is, as suggested above, a factor working in favour of increased use of female labour (see p.18). For this reason industries which turn toward export markets tend to increase their proportional use of female labour (Joekes 1982).

The association between female industrial employment growth and manufactured exports holds both over time and across individual countries. First, the importance of women in industrial employment in the developing countries increased faster in the 1960s than in the 1970s (Table 1) as did the rate of growth of developing countries' total manufactured exports. Secondly, Table 9 shows that it is in countries which had the highest rates of export industrial growth that female employment increased fastest in the 1970s. Korea and the Philippines, countries which have had particularly high rates of growth of manufactures exports, have had exceptionally fast growth of female relative to male industrial employment, so also to a lesser extent Tunisia, Hong Kong and Colombia. In consequence, countries now



manufacturing employment fell back sharply. Women's employment fell by 14 percent, compared to 8 percent among men. Mainly this was a consequence of the immediate impact of the sudden slowdown to world trade - the world rate of growth of manufactured exports fell back in 1974/5, never to regain the momentum of the 1960s and early 1970s; the export industries in Taiwan, which are also the most "femininised" (leathergoods, toys, electricals and electronics, plastics and clothing) were the worst hit by the recession. But in most other industries too, where women were not particularly important in the industrial labour force, job-loss was felt disproportionately among them. There was an across-the board-bias against female workers when jobs suddenly became scarcer.

## 7. Market Conditions and Female Employment by Sector

Textiles, garments and electronics are the largest developing country export industries employing women. Their growth in the past twenty years has provided large numbers of jobs for women. But how have they fared compared to other industries in the two world recessions?

Over the long term, neither industry has suffered any relative deterioration in its economics of production. The capital intensive industries, such as steel, shipbuilding and automobiles, have been worst hit by changes in international conditions, specifically by the rise in interest rates in the early 1980s. All manufacturing industries, however, have been adversely affected by the falls in market demand with the recessions; textiles, garments and electronics have faced additional particular problems of market limitation and instability respectively.

In the case of textiles and garments, access to rich country markets is limited by trade barriers to a greater extent than for any other industrial products. The arrangements are subject to periodic renewal and so far they have become more restrictive on each occasion. The demand for clothing, in particular, is also variable, depending on the weather and, for certain products, on the vagaries of fashion. Though largely spared trade control regulations the electronics market is even more highly volatile. Demand for electronics consumer products is fundamentally strong but sensitive to variations in personal incomes and tastes; the speed of technological changes makes the life expectancy of any all one product uncertain; and finally semiconductors and other components are also highly subject to extremely rapid technological change and are additionally high vulnerable to cyclical ups and downs.

In this section we concentrate on changes in market conditions over the past ten years or so and examine the changes in employment for women in these industries. Employment has been comparable to output growth in clothing industry, but fallen behind in textiles where labour productivity has risen with increasing mechanisation. In electronics, especially semiconductors, there have been changes in production technology which have markedly reduced the relative demand for labour and employment which has not kept up with the extraordinary growth of electronics production in developing countries. In both cases however, the employment effect of

recession has been directly and immediately negative, especially in electronics. Industries producing for export essentially treat their workforce as casual, and lay off workers as soon as demand falls off, which is not always the case in other industries. In consequence, overall female employment in industry in developing countries has probably been more vulnerable in the short term to international set backs than male.

### 7.1 Textiles and Garments

Textiles and garments are the single largest product category in developing country manufactured exports, with garments rather than textiles (yarns, fabrics, etc.) predominating. Garments accounted for 15 percent and textiles 12 percent of total developing country exports manufactures in 1979 (GATT 1983). Developing countries supplied 20 percent of world exports of textiles and 38 percent of world exports of clothing in 1978. Developing countries supply the world market and have penetrated developed country markets more successfully in clothing than in any other comparably broad sector. About one fifth of the total sales of clothing in developed country markets are of goods manufactured in the developing countries (Robert 1983).

Because the market penetration rate is so high and clothing and textiles are important sources of employment in the developed countries, trade in these products has been tightly controlled by the developed countries since the early 1960s. Tariffs on textiles and clothing remain relatively high (Gatt 1983) and tariffs are supplemented by other restrictions. At first the scope of the rules, laid out in the Long Term Arrangement on Cotton Textiles (later called the Multi-Fibre Arrangement (MFA), was limited to textiles, but as exports of garments speeded up so clothing was regulated too. The nature of the regulations was made stricter, at first with only a global ceiling set on the permissible rate of growth of designated clothing products, then later (after 1977) with specific supplier country quotas imposed product by product. In addition, preference is now given to outward processed clothing, that is to production where industrialised country firms are involved as owners or contractors (Joeke 1982a). The motivation behind this preference was clearly political in the sense that it confers some benefit on industrialised country firms, disadvantaging autonomous indigenous exporters.

The supposedly benign purpose behind the bilateral quotas was to prevent the longer established developing country producers from entirely blocking access to limited markets to the poorer developing countries which were beginning to achieve international competitiveness. The previous dominance of Hong Kong (and later Korea) has been to some extent diminished by increasing exports from increasingly competitive second-generation Asian NICs such as Malaysia, Thailand, the Philippines and Indonesia, and a few other countries, such as Tunisia, Morocco and Egypt. But without the MFA it is quite likely that these second tier exporters' lower production costs would have allowed them to undercut the primary suppliers further and supply a larger share of the world market.

Total exports from developing countries were undoubtedly held back by

these limitations on market access, though growth in developed country imports of clothing from developing countries (27.5 percent from 1973-76 and about 20 percent from 1978-80 in value) has far exceeded the volume growth ceilings (latterly 6 percent globally) laid down in the MFA (Table 10). (Industrial countries absorb about 70 percent of developing country textiles and clothing exports (GATT 1983). The growth of textiles has been weaker. There have been two main reasons why imports have exceeded MFA levels. Hong Kong, and perhaps also to some extent other producers, were able to greatly increase the value of their exports while staying within the product number quotas by upgrading the quality of their products, increasing the revenue and profit from each sale. Secondly, despite the widening scope of the regulations, there are some non-restricted categories and developing countries have been able to supply more of these goods. The MFA restrictions have had the perverse benefit that, by holding market access down below its maximum (albeit if not fully to the extent planned by developed country policy makers), export suppliers have been shielded to some extent from the full fluctuations in market demand in the developed countries. In consequence, developing countries' export of clothing in particular have not in aggregate suffered loss of business proportionally to declines in world activity. For example in 1980 clothing imports grew much less in 1980 than in previous years, but still by 13.5 percent (GATT, 1983), compared to the increase in world exports of manufactures of only 3.5 percent (Table 6).

The relative buoyancy of export demand and growth in local consumption of clothing have led to a steady expansion of output and employment in clothing and, to a lesser extent, of textiles in developing countries (Tables 11 and 12). Between 1968 and 1979 total employment grew at 6.5 percent a year in clothing according to one source (Table 11); according to another, there was a marked increase in the rate of growth of employment from 4.1 percent a year between 1963 and 1973 to 5.7 percent a year between 1973-80 (Table 12). This was one of the highest rates of employment growth in any industrial sector (Table 13).

The increase in the rate of growth of employment between the two periods is in interesting contrast to the decline in world trade (Table 6). It suggests the strength of developing countries' comparative advantage in this field and the sheltering effect of the trade regulations. But it is also revealing of the lack of technical progress in the industry. Employment grew significantly faster than output, and concomitantly productivity declined more seriously than in any other branch, particularly in the latter period. In the textile industry on the other hand, which uses far more mechanisation, output grew faster than employment between 1963 and 1974 as productivity increased and kept approximately in step thereafter as it stabilised subsequently (Tables 11 and 12).

The labour force employed in clothing and to a lesser extent textiles is predominantly female (see Tables 2, 3 and 4). Textiles also employs many women, though generally proportionally fewer than clothing. Employment expansion in these industries was interrupted in the first recession of 1974/5, when clothing employment growth fell behind the total rate in manufacturing for the first time in many years (Table 11). But the fall was quickly compensated for in following years (Table 12). Even in a



major clothing exporter, Taiwan, the employment impact was not so marked as in some other export industries (e.g. leather, toys). In this particular case, textiles employment declined much more sharply, probably in large part because of exceptionally fast productivity growth (Table 3).

The second recession is too recent for employment data yet to be available. A recent study of some Asian economies suggests however that manufacturing employment growth has been sharply reduced, or even negative in some cases. Malaysian manufacturing employment growth fell off sharply in 1980, probably as a result of absolute declines in export industries, particularly textiles, where output fell between 1981 and 1983. In Singapore, total manufacturing employment stagnated between 1980 and 1981, breaking the strongly upward previous trend. In the Philippines employment in the factory sector declined absolutely in 1980; in Korea it fell slightly the following year (1981); in Hong Kong the year after that, in each of these cases again reversing a strongly upward previous trend (Lee 1984). In Taiwan there was a greater decline in total manufacturing employment than in 1974/5. The importance of the clothing and textile industries in all these countries suggests that the decline must also have applied to that sector, as in Singapore.

There are particular reasons why the falls in textiles and particularly clothing exports should have been translated directly into declines in employment for women, related to the conditions of employment in this sector. Not only are total labour costs high relative to other production costs in this sector, but the proportion of direct production labour is high within that total; that is, most workers are immediately involved in the fabrication of current output rather than as supervisors, etc., whose work is not directly a function of the firms' level of operations. These are the workers who are immediately redundant when demand slackens for the product. Women are generally concentrated in these grades within the occupational hierarchy. In addition there is very little organisation of labour in these particular industries. Statutory protection against lay-offs are few. Employers thus face no disincentives which would hold them back from making dismissals, and they have little incentive to keep unskilled workers of this kind on during slack periods; unskilled women workers can easily be replaced by others (starting at the bottom of the pay scale, usually as "apprentices") when business revives. During periods of tight market competition the imperative is on firms to seek out ways of cheapening their labour costs still further, not of carrying extra labour.

These pressures operate even though wages and conditions are poor in both industries, particularly again in the clothing industry (Robert 1983). In Korea, wages in clothing are significantly less than in textiles and only about two thirds the level in electronics (the other main feminised industry) (Table 14). Nevertheless, production costs can be reduced still further by the use of sub-contracted outworkers, based in their homes. The clothing industry has historically been a major source of outwork. The great majority of the workers are women, often prepared to take on this type of employment because their childcare demands do not allow them to leave the home regularly. Their autonomy means they are totally unorganised. Their conditions of work as regards pay for the job and employment protection are worse than any in the factory sector. Outworkers' exploitation is

clearly related to their sex, specifically to the sexual division of labour which confers responsibility for household work on women rather than men. Habitual outworkers may even fail to make the comparison between their wages and factory wages on the grounds that they are just filling in time or indulging in a sideline that brings in a little - however little - cash, not doing "proper" work (Mies 1982). Even if displaced women factory workers more hard-heartedly do make the comparison, the going rate for outwork is held down by the first group. Neither set of women of course is in any position to bargain, especially in times of contraction when household incomes are squeezed.

The low wage is however only one element in the various cost advantages which induce employers to use domestic outworkers. Many infrastructural fixed costs can be avoided, e.g., on buildings and utilities as can non-wage labour costs e.g., health insurance premiums and vacation pay which impinge to a greater or lesser extent on factory operations. (Some, though not all of these lesser costs, translate into lower rewards for outworkers than for factory employees, compounding the payment disadvantage). But perhaps most importantly labour is transformed from being the fixed cost it often in reality represents to being a strictly variable expense. The producer pays only by the piece for work on order, not for labour downtime. The risk of production variations, in other words, is shifted onto the outworkers, away from the employer himself (Rubery and Wilkinson 1981).

Employers have greater incentive to use domestic outworkers at some times than others. The incentive is strengthened, first, when market conditions tighten and competitive pressures become more intense. Outworkers' bearing of risk is their special attraction in such circumstances because market retraction translates into erratic orders for any one enterprise. Structural factors can also shift employers' preferences towards outwork. More active labour organisations can increase cost of all regular labour considerably, with respect to both wage and non-wage costs. Increased government intervention in the labour market in shape of greater regulation of factory conditions, stricter labour legislation, etc., increases fixed costs in general and labour costs in particular. In both cases the lower wage cost of domestic outworkers is attractive, and in the latter case so also is transfer of part of production process out of the factory into non-regulated (domestic) locations.

It is of course difficult to know when any increase in the amount of contracted domestic outwork occurs, but many authors believe that there has been such an increase recently. Portes and Benton (1984) attribute the increase in outwork in Latin America to structural factors rather than to changing market conditions. The greater volatility and uncertainty which the recession has brought into many international manufactured product markets will have been an additional influence in the same direction.

The clothing industry is likely to remain a major source of factory employment (and outwork) to women in developing countries. Its expansion is however limited by trade restrictions imposed by industrialised countries.



Factory work seems unlikely to recover the fast rate of growth of the latter years of the 1970s. Total employment growth will probably expand in line with output because there has been little technical progress in clothing production. Radical improvements in production technology (eg. application of microelectronics) have proved elusive. So long as productivity remains low clothing will continue to be the source of the lowest paid jobs perhaps in all of the manufacturing industries and remain a rewarding and underprivileged bastion of female employment opportunities, holding down average female earnings. Textiles jobs are slightly higher paid, but the growth prospects of the industry are probably less - comparative advantage of developing countries in international markets is not so strong. With increasing mechanisation the industry will be a less important source of new jobs and the proportion of jobs offered to women is also likely to fall for the same reason.

## 7.2 Electronics

The electrical sector, broadly defined, has been the fastest expanding industry in the developing countries in the recent period. From 1968 to 1980 output increased at an average of 12 percent a year, almost twice as fast as total manufacturing output (see Table 11). The electricals category includes electric and electro-mechanical as well as fully electronic products, but electronic technology is being incorporated into an even wider range of pre-existing products and providing basis for product innovations; as such, it has been the impetus for the extraordinary expansion of this sector. Electronics itself is a highly heterogeneous category too, comprising final consumer products such as TVs, VCRs and radios, as well as components, primarily semiconductors (the integrated micro-circuits at the heart of all electronic products). The electronics sub-sector (not electricals generally) is effectively a female based industry. 80 percent or so of its workers are women (Eisold 1984).

Production is highly internationalised in many branches of electronics. Most developing countries' electronics production is exported, at least 80 percent in total (Table 14). Table 15 sets out data on the main electrical and electronics product groups traded in 1980 and 1981. The figures on market shares are not entirely satisfactory in that some of the larger product groups (e.g., telecommunications, sound recorders) are very heterogeneous and in some of the sub-categories concerned, developing countries' share is major (e.g., telephone hand sets). Semiconductors, radios and TVs were developing countries' main exports in that order, in 1981.

The involvement of developing countries in trade in these different products depends on the amount of assembly work entailed and on the relative simplicity of the product. Thus, developing countries have the largest world market share in semiconductors (40 percent) and radios (35 percent), respectively the subject of the most extreme "sourcing" for cheap labour for assembly and the most "mature" or standardised of consumer electronic products. Similarly, in TVs, where the overall market share is 27 percent, developing countries are far more important as suppliers of simpler monochrome than in more technically complex colour sets. The few



developing countries with significant production capacity in electronics are all in Asia. In varying order, Taiwan, Hong Kong, Singapore and South Korea figure in each product category as the main developing country suppliers (Table 15). Singapore is pre-eminent in semiconductors, Hong Kong in radios and South Korea in TVs. Data on the composition of Taiwan's electronic products is difficult to obtain, though it is in total the largest supplier.

Changes in trade flows even between 1980 and 1981 indicate that the international market in these various products is very unstable (Table 15). While world exports of manufactures rose in total by 3.5 percent in 1981, exports of both radios and TVs fell slightly, while exports of semiconductors and sound recorders rose strongly, by 27 and 37 percent respectively. In consumer electronics products changes in demand are explained mainly by evolving consumer preferences shifting towards newer products, with the decline in demand for older products probably intensified by the recession. The components market is rather different. The semi-conductor market is not swayed directly by consumer preferences, but by cyclical factors with periodic overstocking by producers and consumers followed by drastic cutbacks. Annual swings in semiconductor production of at least 10 percent are the norm (UNIDO 1981). There have been various peaks and troughs even on top of these fluctuations. In 1975, there was a "chip crisis" when production fell by about 20 percent in the U.S.; in 1979 there was a world-wide shortage; and by 1980/81 massive over production, which took the form of intense price competition between major producers. 1985 seems set, according to some reports, to be the most difficult year yet for semi-conductor producers: one authority estimates that demand will be down 30 percent in 1985 against 1984 (Washington Post, May 25, 1985).

Data on employment in electronics (particularly changes over time) are unfortunately sparse. The number of overseas workers in U.S. semiconductor firms increased more than four times from 1968 to 1978 (Table 15); most of the increase was in the early years. At the peak, 40 percent of their workforce was overseas. From 1974 to 1978 overseas employment more or less stagnated - the chip crisis of 1975/6 seem to have had an effect in U.S. firms in developing country locations. Statistics on electronics employment in Taiwan and Singapore tell the story unequivocally. Between 1973 and 1975, Taiwanese employment in electronics fell 24 percent (Table 3). Electronics employment fell by more than 30 percent in Singapore in 1975 (table 18); the fall was concentrated in semi-conductors (ILO 1982). These were drastic turnarounds from previous extremely fast rates of employment expansion. In Singapore at least the cutback in employment was much more severe than the fall in production (about 10 percent). Employment did recover subsequently to pre-1973 levels, and above, but there is no doubting the immediately negative effect of the recession, nor the fact that the trend in the rate of growth of employment has levelled off subsequently.

There is as yet no information on the effects on employment of current cutbacks in semi-conductor production: declines in demand

ultimately attributable to the recession of 1981 and onwards seem to have hit the industry with a 3 or 4 year lag, too recently for published statistics to record. 1/ If the ratio of falls in production declines in employment in electronics which obtained in Singapore in 1975 holds again, however, lay-offs in the industry are likely to be even more severe than in 1975.

Employment conditions in electronics, particularly in export processing zones where many firms are located, predispose, as they do in the clothing industry, to easy lay-offs when production is cut back. It has been suggested that "disguised labour-shedding" may have taken place during the mid 1970s and more recently, that is that firms dismiss more workers than warranted by production declines in order to be able to take on fresh labour when demand picks up (Lee 1984). Certainly, in Singapore in 1975, the number of lay-offs in the electronics industry was disproportionately large.

Clearly, whatever the proportional effect, the volatility of production leads to large fluctuations in employment and so to extraordinarily insecure jobs for individual workers. Particular workers have minimal claims to compensation and no right or expectation of reinstatement. Because work is not highly skilled and ample female labour is available, employers can avoid seniority payments due to experienced workers by replacing them with new employees from time to time. This pattern of induced turnover leads to prospect of only short-term job in electronics, where the workforce is always reported as very young (Lim 1981). The insecure and short-lived nature of employment in electronics has to be set against the relatively high wages obtained in this sector compared to other industrial jobs open to women. Korea is probably typical in this respect; electronics workers earn approximately 50 percent more than clothing workers, though the differential has narrowed over time (Table 13).

This chronic instability of employment for individuals in electronics is a separate issue from that of the "footloose" behaviour of TNCs in this sector. It is often alleged that when wages or local conditions become more unfavourable to foreign firms they close down their operations and withdraw to other locations. It is certainly true that through the 1970s increasing numbers of developing countries began producing and exporting

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1/ Lee's (1984) data on changes in employment in East Asia between 1980 and 1983 show that the largest electronics producing countries did not suffer particularly at that time. In particular total manufacturing employment in Singapore - where about one quarter of the workforce is in electronics - did not fall in this period. On this occasion the downturn in the electronics cycle has not coincided with the onset of world recession, as it did in the 1975.

electronics products. For example, in 1981 Malaysia, Mexico, India and Israel all exported significant quantities of semi-conductors for the first time and in the late 1970s the Philippines, Sri Lanka and Thailand, among others, all began producing consumer electronics. Insofar as production facilities in these countries were operated by TNCs there was diversion of foreign investment which might otherwise have gone to Singapore, Hong Kong, Korea and so on. But this did not entail net closure of operations in the original sites (see Table 19). In semiconductors, the number of transnational firms operating has not declined in any country, even where, as in Korea, real wages have increased rapidly. Cheap wages are a strong factor in original location decision of these firms, but once an investment in sunk increases in local wages are not sufficient in themselves to prompt withdrawal. Changes in the wage levels among developing countries remain insignificant in relation to the gap between developing and industrialised countries' average wage levels.

As wages rise production facilities are upgraded and to a degree automated in an early location. Particularly in semi-conductors there have been great changes in the techniques of production as new products have been developed. The manufacture of new generation, complex semi-conductors requires more expensive materials and significantly less labour (see Table 17). In Singapore value added per worker in semiconductors increased from \$15,000 in 1975 to \$26,000 in 1980, consistent with this evolution in production methods (ILO 1982). In the manufacture of consumer electronics tendencies to automation have been much weaker; design simplifications reduce assembly work (Ballance and Sinclair 1983) but the labour intensity of production has not declined so much. The new products are still made in long-established sites, even to some extent in locally owned firms (especially in Korea, (ILO 1983a) where only half of the total electronics production is done by TNCs). It is older "mature" products that are relocated. In other words, an inter-developing country pattern of specialisation may be emerging in electronics.

Some analysts argue that changes in production conditions encourage the future return of developing countries, operations to the U.S. and Japan, providing a different reason TNCs to pull out. It has been suggested that developing countries' comparative production cost advantage based on cheap labour will be drastically undermined by generalised automation and an increasing user service orientation in the components industry, favouring proximity to the final market for the product. However, there is to date little empirical evidence to support this view (UNIDO 1981). Some new investment has taken place in the industrialised countries, in the U.S. and particularly Europe (e.g. U.K. increased its share of world semiconductor exports from 6 to 17 percent between 1980 and 1981) (UN 1981). But this was the result of precautionary Japanese investment (the U.K. being one of the cheapest wage sites in Europe with free trade to the rest of the EEC), an anticipatory move taken by the Japanese to defend sales against possible restrictive measures as already on TVs and VCRs. This is the investment of the same kind as TNCs first made in Latin America in the era of widespread protective policies, not totally prompted by narrow cost considerations. But whatever the trend bend towards centralisation it will have been dampened anyway by the recent rise in the



value of the U.S. dollar, which has considerably widened the wage gap between the U.S. and developing countries.

Some proportional growth in the industrialised countries' final production capacity in some product areas of electronics is however to be expected. The newest microprocessors being produced in the U.S. are so small that ultra-hygenic conditions are necessary for their manufacture - the mere presence of a human operator is enough to pollute the atmosphere and production has to be entirely automated. Developing countries do not have equipment to make these "leading edge" products and their labour cost advantage is irrelevant in this case because no labour is used. The well established East Asian semiconductor producers will not necessarily lose market share as components product composition shifts upwards however. Submicron chips are as yet a minute part of the market and developing countries are upgrading their own techniques to produce only less slightly advanced products. The increasing labour productivity of semi-conductor production in Singapore (and no doubt South Korea and Hong Kong too), is partly due to the automation of some processes in this way.

Despite the likelihood of a fall off in relative labour demand in the production of semiconductors, the underlying buoyancy of the market means that employment in semiconductors in developing countries is unlikely to decline in aggregate. Production techniques are not changing to the same extent in consumer electronics, which in total account for more of the exports from developing countries than semiconductors. TVs, radios, VCRs and so on are now more or less mature products, and there is no prospect of automation in production techniques comparable to that in the latest semi-conductors. This area of electronics is therefore likely to remain labour intensive (notwithstanding productivity increases) and become more important as a source of employment in developing countries, for two reasons. As demand grows worldwide for consumer electronics, a highly income elastic products category, employment will increase in total if not exactly proportionally, at a not much lower rate. Secondly, capacity for producing the maturer products will probably spread more widely among developing countries: it is in this area that the "second tier" of NICs (and other developing countries which may come to promote exports on the basis of low comparative wage costs) will enter the electronics industry. So long as labour markets remain differentiated by sex in wages and other productivity-related characteristics the great bulk of this employment will be for women. Electronics may not any longer be the boom industry for women's jobs it once was, but it is not going to fade away in developing countries as a major employment creating activity.

#### 8. Assessing Changes in Employment for Women Workers

The number of jobs for women in manufacturing industry in developing countries has been increasing faster since about 1960 than it has for men, and, as a result, the share of women in the total manufacturing labour force in developing countries has risen. In terms of crude job creation women have thus benefitted relatively well in this sector, and we have argued that this has been due in large part to developing economies' increased supply of manufactured goods to international markets.

But crude job creation is an inadequate index for assessing the value for women of changes in manufacturing employment, even if we take for granted that wage employment has an absolute value of its own for women as a means to emancipation. For a start, the employment statistics from which the quantitative statements derive are incomplete as a measure of remunerated work. Secondly, most of the new jobs have been created in a small number of countries, so that women in the majority of developing countries have not benefited relatively from recent industrialisation. There is also some evidence that on balance the quality of employment available to women has been deteriorating relative to that available to men (without that necessarily of course, implying an absolute deterioration in the conditions of work available to women over time). And finally, the increase in industrial employment opportunities for women due to increased international integration has rested on an explicit inferiority of treatment of female labour compared to male.

How do all these qualifications modify the generally positive picture of female employment in manufacturing which a focus on the number of new factory jobs alone brings about?

There is a bias in official employment statistics towards recording large scale, factory employment. Work in small, less formally organised and little regulated operations and individual employment of an erratic or casual kind is underrepresented. In principle it is quite possible that the apparent relative increase in total female employment in industry is spurious. If traditionally women informally employed in small scale industrial activities have lost work because their products have been superseded by factory products, the reduction in their number should offset the number of factory jobs created. But if their work had been unrecorded in the statistics then the subtraction is not done and the supposed scale of job creation is an overestimate. If men are not displaced from the informal sector to the same degree by the expansion of factory industry then women's apparently increased presence in the manufacturing labour force and relatively greater benefit from industrialisation could be an illusion.

The displacement of women's work in rural industrial activities, mainly food processing, is quite well established. Much of the disadvantage rural women have suffered through the introduction of modern technology has in fact been in industrial rather than agricultural activities: the case of women rice-huskiers of Indonesia, whose livelihood was wiped out by the introduction of rice mills, is perhaps the best known. But displacement of wage work opportunities for women has probably been much less serious in urban industry. Many manufactured goods are new products supplied to new markets. They do not displace products sold locally and by extension do not displace the local producers of such goods. The export sector which clearly produces for new markets is where incremental female employment has been concentrated as we have seen. Electronics products (both consumer goods and components) are the most obvious totally new product category. Though mostly exported, they might be said, by stretching the imagination, to have displaced local traditional musicians and orators (but are just as likely to have stimulated demand for these services). But otherwise they have had no displacement effect.

The young women employed in electronics would previously in many countries merely have married earlier; they have not in any meaningful sense deprived others (or themselves) of alternative employment. Much exported clothing is also of goods not made previously or not suitable for the local market, being of higher price and quality or of "fashionable" design or both.

Food processing and plastics are probably the two main female labour force industries which have displaced female workers in the informal sector. As in rural areas, much urban food processing is traditionally done by women commercially as well as for domestic consumption; their livelihoods may well have been cut back by increased factory food production. Some factory food production is again for export however and furthermore, factory production itself introduces a new type of demand for processed foods in the shape of ready-to-eat street foods for factory workers. Preparation of these foods is an expanding informal sector activity in which women predominate in many countries (Cohen 1985). Cheap plastic goods have superseded many traditional utensils such as baskets, pottery, cutlery, etc., some previously made by women. But the production of metal cutlery, for example, is a male occupation, so the displacement effect has not fallen only on women. The net effect by sex will be difficult to judge and probably varies from country to country.

On balance, taking these four main female employing industries together, it therefore seems unlikely that there has been a significant displacement of women informal sector workers. And male employment creation, predominantly in heavy industry, is very unlikely to have displaced female informal sector workers to any significant degree. Metal products, autos, chemicals and the like are in the main also product innovations which, when they do substitute for indigenous female produced materials (e.g., fertilizers for dung, traditionally collected by women in the Middle East, India and Africa) so enhance total productivity that the work-opportunities they create far outweigh loss of value from traditional activities - largely, of course for women in any event unpaid. Moreover, the displacement effect frequently falls on men doing traditional work (e.g., carts replaced by trucks), so that to argue selectively that women are the only victims of such changes is not convincing. The judgement that total net job creation in industry has favoured female employment can stand.

The second reason why the quantitative assessment of female employment changes is not necessarily undermined when the biases of official statistics are taken into account, is that changes in informal sector industrial employment do not always reduce women's wage work opportunities. Indeed, statistical bias may lead in some cases to an underestimate rather than an overestimate of total net job creation for women. There is some evidence that total employment opportunities for women in manufacturing industry may have been increased by an expansion of outwork. The increase in the street food is one example. More importantly, domestic outworkers carrying out piece-work operations can in some industries substitute satisfactorily for factory employees. The production line has not to be physically integrated, the machinery and equipment used not too large to be used in a domestic setting and not in need of constant technical monitoring, and quality control standards



have not to be too exacting: but many processes meet these conditions, especially in light industrial assembly type operations; the clothing industry (discussed above Section 7.1) is a major but not the only one (IDS 1981). Women provide the bulk of domestic outworkers, basically because domestic piece-work is a way of reconciling unpaid household work (especially childcare) which though time consuming is often of an intermittent nature, with wage labour. (In addition, they can very often also make older children take part in the work, so that outwork is one of the commonest ways in which children can earn some income for household).

The reasons for supposing that outwork may have been increasing in recent years as a consequence of recession have already been mentioned (p.31). Many authors believe that such an expansion has been taking place; Portes and Benton (1984) survey the literature and give broad estimates. Most of the evidence comes from Latin America, the region where, as we have seen, growth of formal sector industrial employment for women has been weakest internationally - and where in some countries there has been an actual decline - (Tables 1 and 9 and p.44). In Latin America the informal sector is larger and more important as a source of work for women than in any other region (Boserup 1970), so there probably is a high base level of domestic outwork and industrial contracting out in any case. But the evidence for increase in these activities as presented by Porters and Benton is quite convincing, and further reinforced when the international market situation is considered. As we have seen, Latin American export suppliers have tended to be marginally competitive internationally; so they have probably suffered more than most fluctuating sales.

It is possible therefore that there has not in fact been a fall in the total numbers of women employed in Latin American industries, but rather a change in the relative proportions of factory and mostly unrecorded domestic outworkers, with the latter increasing. At any rate, the formal sector employment figures certainly underestimate the number of industrial jobs for women. In terms of numbers of women employed, the regional situation may not have been as bad for women as it seems from official statistics of the 1970s.

Consideration of outwork may redress a little the fact that new industrial jobs for women in developing countries in the past twenty years or so have been heavily concentrated in Asia, particularly East and South Asia (Table 1). In a sense concentration of new employment for women in particular regions and countries does not matter unless the improvement for women in one region has been had at the expense of those of another. Insofar as the increasing internationalisation of industrial production lies behind increases in female employment it is arguable that Asian gains have up to a point necessarily entailed Latin American losses. However, if there has been an increase in informal sector industrial outwork for women in Latin America the overall world picture does not present quite such a poor downside as appears.

Counting the numbers of people in employment is only half the story however. The other aspect is the conditions of their work. For a start, domestic outwork has the worst conditions in the industrial sector; quintessentially insecure, with the lowest piece-rate wages and without any of the non-output related benefits which are to a greater or lesser

extent the due of women in factory employment (though of course more routinely attainable by men in factory work). It is also arguable that in different ways the feminised industries in the formal sector offer work under worse conditions than the average in manufacturing. The clothing and textiles industry, particularly clothing, operates in relatively small premises, often immune to labour and occupational safety laws which do something to ensure minimal standards in larger factories (ILO 1980). In the electronics industry considerable occupational hazards are presented by work with many toxic substances and with microscopes; workers are generally protected from the toxic materials, but eye disorders are frequently reported (Lim 1981, Eisold 1984).

There are, of course, also damaging working conditions in male based industries, e.g., in steel, coal mining, etc., and it is not easy to claim that women have a monopoly of unpleasant and harmful tasks in manufacturing. No other industry however dispenses with the members of its workforce as electronics does, after a mere five or ten years, nor presents them with such unstable prospects of employment from year to year. For women who only wish for paid employment for a relatively few years between school and marriage this limitation on length of employment may not be a problem. But many others want and need to continue to earn wages and for them being ejected from the electronics labour force is disastrous, because often few wage earnings opportunities exist for women in the local labour market (Lim 1981). Employment insecurity has far more damaging consequences for female workers than it does for male in such circumstances.

The terms of women's work in developing countries' industry may well have also deteriorated relatively in recent years with the recession (quite apart from a shift to outwork). The effect is again attributable to tighter conditions in international markets. Data on employment conditions in Korean industry illustrate what may have been happening more widely for women who remain in factory employment - perhaps even more strongly in countries without Korean manufacturing industry's competitive edge (Table 13). Hours worked increased significantly in all three major export industries in the recessionary years 1976 and 1980 whereas they had been falling previously in each case. The intensity of work in manufacturing was increased and wages per hour, while increasing in nominal terms, did not rise as much proportionally as at other periods. Evidence on a number of developing countries combined is not inconsistent with this as a general possibility (UNIDO 1983). In the few industrial branches for which information was available, the wage gap between developed and developing countries increased between 1970 and 1978 (a period spanning the first recession). The wage gap widened most in the feminised, light (food and textiles) industrial branches; longitudinal data on relative hours worked are unfortunately not available, but in 1978 textile workers worked the longest hours.

Outright job loss represents in a sense the ultimate deterioration in conditions of employment. There is a proposition, dating from Marx, that women, as the "reserve" part of the labour force, are drawn in to formal employment only when male labour is no longer available and are the first to be expelled from the labour force when job opportunities fall back. The cross country data presented in Table 9 shows that women are drawn

into the manufacturing labour force most rapidly when growth of total employment is fastest and the availability of male labour most stretched, the positive part of the prediction is fulfilled to that extent. There is less evidence on the negative side, what happens when total employment falls back. Studies of the industrialised countries show that women lost employment disproportionately in manufacturing in the mid 1970s but that in aggregate this was more than compensated by continued expansion of the service sector and female jobs there (OECD 1976). Women here lost on the swings but gained on the roundabouts of occupational segregation. In the developing countries in the 1970s, including the recessionary years, female industrial employment growth was relatively slow (even sometimes negative) where total employment grew slowly. The one case where detailed data on branch level employment changes by sex are available shows also that in the situation of sharp, sudden cutback female employment declines were larger than male in aggregate and in most branches (Table 3 and p.26 ). The service sector in developing countries though also offering many jobs for women, is much smaller than in the industrialised countries and cannot have provided compensating new jobs to the same extent as in the OECD countries.

One reason female industrial employment may be relatively vulnerable is that in all branches, even the little feminised ones, women are concentrated in direct production jobs (archetypally in production assembly line as opposed to design, supervisory and maintenance positions). Demand for direct production labour fluctuates more closely with the actual level of a firm's operations than demand for other types of labour. Other principles may apply within firms and industries in determining lay-offs, for example the "last-in, first-out" rule. Such rules are not necessarily sexually discriminatory in intent, even if the outcome is uneven as between male and female workers. However the contradictory evidence on sex differences in labour turnover rates (p. 7 ) suggests that the application of the last-in, first-out rule at least should not in practice lead to a systematic bias against female labour. Lay-offs may well be imposed in a purely discriminatory way, trading on the fact that women are considered more "docile" than male workers and docility extends to a relative lack of protest at lay-offs (Elson and Pearson 1980).

There is plenty of evidence, in developed countries at any rate - not least in Britain in public statements by the Prime Minister - of the widespread acceptance of the view that women should have less access to employment when jobs are scarce. This view springs directly from the "male breadwinner" ethic: family welfare is held to be less damaged when a woman loses her job rather than a man, on the presumption that his wage is larger. In family income terms, when there is a sex wage differential, this is true. But in terms of the interests of industrial employers, the opposite applies; given equivalent productivity, employers should tend to dismiss male workers. If the competitive pressures in general lead employers to prefer cheaper female labour in certain industries are overturned in times of recessionary contraction it would be testament to the greater power of ideological forces than economic ones in times of crisis, mediated of course by the established position of male labour.

In conclusion, recent industrialisation in developing countries has



incorporated women into the sectoral workforce to an unprecedented extent. But it is arguable (though all these propositions need wider empirical verification) that women's conditions of employment in industry are inferior to that of men in various dimensions; that they have been worsening in periods of recession, in that when there has been retraction in industry women have suffered disproportionate loss of work. More certainly, it is undoubtedly the case that women are concentrated in low-grade, relatively unskilled jobs without significant promotion prospects and that women's access to employment is severely limited in many industrial branches. Women also have lower earnings than men in industry to a greater extent than can be explained by this pattern of differentiation. In sum, women have an inferior position in employment in the industrial sector even in the new high technology branch, electronics, where they are employed in large numbers. That the increased incorporation of women into the industrial labour force will not in itself guarantee any improvement in their position in that sector is suggested by two further observations. Occupational segregation by sex in Britain has not diminished over 70 years (Hakim 1979). Secondly, it has been noted that the differential between male and female wages in manufacturing has been widening recently in Japan (Lele 1985). This is probably due to the relative increase in Japan, to a greater extent than in any other country, of high technology manufacturing in total industry. Women's lesser technical and scientific qualifications prevents them from entering these high productivity, high wage expanding branches. Other fast growing Asian countries are following the Japanese example and similarly increasing their capacity in science-based industries, and they have the same bias in educational provision and attainment by sex.

The increase in women's participation in developing countries' industry over the past twenty years has therefore reinforced - certainly not undermined - sexual stratification in the labour market. Even if the level of participation continues to increase, the quality of female employment can only decline further relative to men's, unless women enter high wage paying jobs in the highly productive manufacturing activities for which access to technical education and training is a prerequisite. Occupational segregation has to be broken down not only to allow women's access to these jobs but to give the incentive for technical training. Women will otherwise continue to be confined to labour intensive, low wage paying work while male wages rise on average. Furthermore, the presently feminised jobs will become less important in the industrial structure as economies evolve beyond the stage of labour intensive manufacture. And women will be in a weak position to hold onto to employment even in the presently feminised industries if radical technological changes should be introduced and mechanise the production of, for example, garments. It is crucial for women's social position that they challenge their subordination in industrial labour markets before - if - an era of labour surplus reemerges with the generalised use of labour saving technology.

Table 1

Expansion in the Female Labour Force in Industry  
in Developing Countries' by the Region 1960 - 1980

	Per Cent					
	Change in Total Industrial Labour Force 1970-1980	Change in Female Industrial Labour Force 1970-1980	Share of Women in Total Industrial Labour Force 1960 1970 1980			Share of Total Female Labor Force in Industry in Developing Countries <sup>1/</sup> 1980
All developing countries	52	56	21	25.7	26.5	100
Latin America & Caribbean (middle income)	51	43	16	16	15	6
Latin America & Caribbean (low income)	59	51	23	22	21	1
Asia (middle income)	61	62	34	32	32	7
Asia (China)	47	56	20	29	31	51
Asia (India)	56	62	25	26	27	19
Asia (other low income)	57	54	23	28	27	8
Africa & Middle East (capital surplus oil)	55	52	19	25	24	2
Africa & Middle East (middle Income)	56	56	14	14	14	4
Africa & Middle East (low income)	56	60	18	20	21	2

<sup>1/</sup> Excludes Taiwan

Source: Hopkins (1983); International Labor Organisation Bureau of Statistics.

Table 2

Percentage of female workers in electronics and  
textiles in the Republic of Korea.

321	Textiles	68%	(70%)
322	Clothing	77%	(76%)
324	Footwear	58%	(56%)
383	Electrical Machinery	55%	(56%)
3831	E. Machinery	23%	(23%)
3832	Cons. Electronics	65%	(65%)
3833	Domestic Appliances	34%	(34%)

Source: 1980 Labour Statistics Yearbook, Figures in  
parentheses come from EPB Manufacturing and  
Mining Census, 1978; cited in ILO (1983a).



Table 3

CHANGES IN TOTAL AND FEMALE EMPLOYMENT IN  
MANUFACTURING 1973-75: TAIWAN PROVINCE OF CHINA

Industrial Branch	Share of Female Workers 1973	Total Employment Change 1975-73	Female Employment Change 1975-73
1. Clothing	81	-14	-16
2. Leather goods	74	-25	-32
3. Textiles	71	-11	- 9
4. Toys	71	-27	-24
5. Electrical goods, etc.	59	-14	-24
-----			
6. Miscellaneous	55	- 9	- 4
7. Plastic products	54	- 9	-28
8. Rubber products	54	- 7	-13
9. Precision machinery	51	-11	- 7
10. Beverages & tobacco	47	+43	+19
11. Non-metallic mineral prod.	14	- 6	-11
12. Food products	43	-11	-20
13. Food products	40	+ 5	+ 8
14. Wood products	37	-23	-19
-----			
15. Metal products	27	-19	-19
16. Paper & printing	23	- 1	+ 1
17. Chemical materials	23	+15	+68
18. Transport equipment	15	- 1	- 4
19. Machinery & equipment	14	- 6	-10
20. Petroleum products	12	+ 4	- 9
21. Base metals	9	- 5	- 2
22. Ship-building	6	-19	+ 5
-----			
TOTAL	48	-11	-14

Source: Calculated from Republic of China Monthly Bulletin of Labour and Statistics

Note : Industries and ranked by share of female workers.

Table 4

Industrial Concentration of Female Employment, Selected Developing Countries

Country and Year	Share of Females in Total Paid Employment in Manufacturing	Share of Females in Total Paid Employment in Food Beverages & Tobacco (31) <sup>1</sup>	Textiles (321)	Garments (322)	Chemicals (351/2)	Leather (355)	Plastics (356)	Electrical Machinery appliances etc. <sup>3</sup> (383)	Share of Total female employment in these Industries	Share of Total male employment in these Industries
Hong Kong (1983)	50	23	47	69	38	80	49	63	85	59
India (1981)	10	33	7	25	9	2/	7	7	94	58
Korea (1982)	43	38	67	76	30	56	43	52	78	44
Philippines (1977)	37	21	42	65	21	5	28	42	84	57
Kenya (1983)	9	12	9	23	19	2/	10	2/	75	56
Egypt (1978)	8	8	9	2/	18	26	22	14	83	65

Source: ILO Yearbook of Labour Statistics 1984.

Notes : 1/ Bracketed numbers indicate ISIC categorisation

2/ negligible

3/ This industry includes but not limited to electronics.

Table 5

Shares of transnational corporations in the production and export of manufactures: selected developing countries, early or mid-1970s

Country or Territory	Value added in 1975 (\$ billion)	Production		Exports	
		Share of TNCs (Percentage)	Value in 1975a (\$ billion)	Share of TNCs (Percentage)	
Hong Kong	2.0	..	6.48	10	
India	12.6	13	1.84	under 10	
Pakistan	1.9	..	0.65	under 10	
Rep. of Korea	5.5	11	3.90	28	
Singapore	1.3	30	2.84	nearly 70	
Argentina	18.4	31	0.70	30	
Brazil	33.7	49	2.10	over 40	
Colombia	2.9	..	0.30	30	
Mexico	18.0	28	0.88	30	

Source: UNCTAD, Trade and Development Report 1982, cited in North-South Institute (1985).



Table 6

GROWTH OF WORLD EXPORTS AND PRODUCTION, 1963-1980  
(Average annual rate of change in volume, percentages)

	1963-73	1973-80	1974	1975	1976	1977	1978	1979	1980
<u>World Commodity output</u>									
<u>All commodities</u>	<u>6</u>	<u>3</u>	<u>2 1/2</u>	<u>-1</u>	<u>7</u>	<u>4 1/2</u>	<u>4</u>	<u>3 1/2</u>	<u>1</u>
Agriculture	2 1/2	2	1 1/2	3	2	2	4	- 1/2	1/2
Mining	5 1/2	2	2	-1/2	6	5 1/2	-1	3	-1
Manufacturing	7	3 1/2	3	-1/2	8	5	4 1/2	5	1
<u>World exports</u>									
<u>Total</u>	<u>8 1/2</u>	<u>4</u>	<u>3 1/2</u>	<u>-3</u>	<u>11</u>	<u>4 1/2</u>	<u>5 1/2</u>	<u>6</u>	<u>1 1/2</u>
Agricultural Prod.	4	4 1/2	-3 1/2	5	9 1/2	2	9	7	1
Minerals <sup>a</sup>	7	- 1/2	-2 1/2	-7 1/2	4 1/2	2	11 1/2	4	-7
Manufactures	11	5	8 1/2	-4 1/2	13	5	5	5 1/2	3 1/2

<sup>a</sup> Including fuels and non-ferrous metals.

Source: GATT Prospects for International Trade, GATT/1295, 1981.

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Country or Territory	Value added in 1975 (\$ billion)	Production		Exports	
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Hong Kong	2.0	..	6.48	10	
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	1963-73	1973-80	1974	1975	1976	1977	1978	1979	1980
<u>World Commodity output</u>									
All commodities	<u>6</u>	<u>3</u>	<u>2 1/2</u>	<u>-1</u>	<u>7</u>	<u>4 1/2</u>	<u>4</u>	<u>3 1/2</u>	<u>1</u>
Agriculture	2 1/2	2	1 1/2	3	2	2	4	- 1/2	1/2
Mining	5 1/2	2	2	-1/2	6	5 1/2	-1	3	-1
Manufacturing	7	3 1/2	3	-1/2	8	5	4 1/2	5	1
<u>World exports</u>									
Total	<u>8 1/2</u>	<u>4</u>	<u>3 1/2</u>	<u>-3</u>	<u>11</u>	<u>4 1/2</u>	<u>5 1/2</u>	<u>6</u>	<u>1 1/2</u>
Agricultural Prod.	4	4 1/2	-3 1/2	5	9 1/2	2	9	7	1
Minerals <sup>a</sup>	7	- 1/2	-2 1/2	-7 1/2	4 1/2	2	11 1/2	4	-7
Manufactures	11	5	8 1/2	-4 1/2	13	5	5	5 1/2	3 1/2

<sup>a</sup> Including fuels and non-ferrous metals.

Source: GATT Prospects for International Trade, GATT/1295, 1981.



Table 7 PERCENT COMPOSITION OF MANUFACTURES EXPORTED FROM SELECTED  
LDCS AND DEVELOPED COUNTRIES IN 1975

Country	Capital Goods	Consumer Engineering	Clothing & Footwear	Other Clearcut Consumer Goods	Textiles Incl. rugs	Standardized Intermediate excl. Textiles	Other and Miscellaneous
Developed Countries	31.8	9.4	2.7	4.0	4.6	24.1	23.3
Developing Countries <sup>a/</sup>	12.5	5.8	21.8	9.8	14.9	16.2	19.0
Group I							
Israel	8.9	1.7	6.9	4.1	3.2	6.4	68.8
Greece	5.2	1.3	17.8	3.1	17.3	40.1	15.2
Hong Kong	2.8	11.3	45.7	19.7	9.7	0.7	10.0
Portugal	9.0	5.9	18.4	2.5	23.0	15.2	25.9
Taiwan	9.5	9.8	27.8	14.9	15.1	8.5	14.4
Korea	7.0	5.2	32.4	12.3	15.7	14.7	12.7
Group II							
Spain	23.5	5.6	11.4	8.4	4.6	22.3	24.2
Yugoslavia	25.4	3.1	13.2	5.5	6.1	21.1	25.5
Argentina	18.0	7.8	2.8	4.3	0.3	24.9	41.9
Brazil	25.4	6.1	12.2	5.0	12.4	21.1	17.8
Turkey	2.8	0.5	25.2	2.0	33.6	22.6	13.4
Group III							
Venezuela	0.3	-	-	0.7	2.1	40.3	56.6
Iran	0.7	0.5	10.9	1.0	60.1	6.5	20.3
Malaysia	11.4	4.5	8.5	3.4	5.1	16.6	50.5
Tunisia	1.1	0.4	26.7	1.4	11.5	51.8	7.1
Colombia	6.7	1.2	11.4	12.1	21.9	25.7	20.9
Ivory Coast	20.2	0.9	2.1	-	20.5	26.4	29.9
Morocco	2.4	0.2	26.6	6.4	29.2	20.9	14.4
Philippines	-	0.4	14.1	25.5	8.7	22.2	29.1
Thailand	0.9	2.9	16.2	7.4	24.5	16.5	31.6
Group IV							
Egypt	1.0	0.3	22.0	6.5	47.7	13.6	8.9
India	9.3	1.2	11.2	4.4	30.6	21.0	22.3
Pakistan	2.0	-	7.2	6.4	66.1	13.1	5.2
Bangladesh	-	0.4	-	0.3	88.2	9.5	1.6

<sup>a/</sup> Countries listed only.

Source: World Development Report 1978. Background Paper #5, 1978.

Table 8

The LDCs' major exports of manufactures  
as a percentage of total manufactured exports, 1977

Non-resource based exports (SITC)	Cumulative percentage	Resource based exports (SITC)	Cumulative percentage
Clothing except fur (841)*	20.37	Petroleum products (332)	37.21
Electrical machinery and apparatus (729)*	26.18	Sugar, refined or raw (061)	44.20
Telecommunications apparatus (724)	30.83	Feed stuff for animals (081)	50.50
Cotton fabrics, woven (652)*	34.92	Copper (682)	56.16
Textile yarn and thread (651)*	38.76	Vegetable oils (422)	60.71
Woven textiles, fabrics. not cotton (653)*	42.01	Tea, maté (074)	64.29
Road motor vehicles (732)	45.17	Tin (687)	67.29
Toys, games, sporting goods (894)*	48.20	Rice, glazed or polished (0422)	69.95
Footwear (851)*	51.15	Meat and poultry chilled, frozen (011)	72.48
Non-electrical Machines, parts (719)	53.06	Wood, shaped or worked (243)	74.94
Leather (611)*	55.15	Veneers, plywood boards (631)	77.09
Made-up textile articles (656)*	57.21		
Watches, clocks (864)	58.98		
Electrical power machinery switchgear (722)*	60.63		
Floor covering tapestries (657)*	62.27		
Non-electrical power generating machinery (711)	63.71		
Travel goods, handbags (831)*	65.10		
Lime, cement, building materials (661)	66.47		
Office machines (714)	67.75		
Finished structures and parts (691)	68.97		
Scientific, measuring optical instruments (861)	70.17		
Pig iron, spiegeleisen (671)	71.35		
Tubes, pipes of iron, steel (678)	72.53		
Printed matter (892)*	73.65		
Medicinal, pharmaceutical products (541)	74.73		
Medical Instruments, sound recorders (891)*	75.76		

Note: An asterisk (\*) indicates a  
labour-intensive industry.  
Source: Ballance and Sinclair (1983).

Table 9

Changes in Total and Female Employment in Manufacturing, Selected  
Developing Countries, approximately 1974-1983

Country	Growth of Employment in Manufacturing			Share of Female in Total Employment in Manufacturing
	Total	Female	Male	
Sri Lanka (1974-80)	-14	-18	-12	31
Bolivia (1976-82)	- 1	0	- 2	39
Haiti (1974-83)	0	-17	+22	46
Thailand (1974-80)	+ 6	0	+11	42
Jamaica (1974-81)	+ 8 +17	-17 + 8	+18 +17	24 9
Kenya (1974-82)	+17	+ 8	+17	9
Egypt (1977-81)	+18	+22	+16	12
India (1975-83)	+22	+33	+21	10
Zimbabwe (1974-82)	+24	+40	+21	25
Brazil (1976-82)	+24	+40	+21	25
Philippines (1974-83)	+28	+37	+21	47
Malawi (1974-81)	+31	+30	+31	n.a.
Singapore (1974-83)	+37	+34	+38	44
Tunisia (1974 -82)	+44	+37	+53	50
Hong Kong (1974-83)	+44	+43	+45	50
Korea (1974-83)	+63	+74	+57	38
Colombia (1975-81)	+70	+100	+56	36

Notes: 1/ Countries are ranked by order of change in total manufacturing employment

2/ Time periods are not strictly comparable in many cases

Source: International Labor Organization Yearbook of Labour Statistics 1984.



Table 10

Imports of Textiles and Clothing of Selected Industrial Countries, 1973-76 and 1978-80

(Change in value in per cent per annum)

	Textiles				Clothing			
	1973-76	1978	1979	1980	1973-76	1978	1979	1980
Canada	9.5	9.0	24.0	-5.0	30.5	-3.5	23.5	-2.5
Of which:								
Industrial Countries	10.0	7.5	24.0	-5.5	15.5	-19.0	23.5	-9.5
Developing Countries	10.0	8.5	23.0	6.5	42.0	6.0	16.5	2.5
European Community	10.5	23.5	27.0	6.5	19.0	22.5	29.5	14.5
Of which:								
Southern Europe	17.0	14.5	34.5	3.0	23.5	25.0	33.5	12.5
Other Industrial Countries	9.0	24.5	25.0	5.0	14.0	24.5	25.0	11.5
Developing Countries	15.5	14.5	34.5	12.0	32.0	17.0	36.5	21.5
European Free Trade Association (EFTA)	8.5	14.0	25.0	12.5	19.5	12.5	26.0	18.5
Of which:								
Southern Europe	-	10.0	45.5	12.5	14.5	5.5	35.5	26.0
Other Industrial Countries	8.0	15.0	24.0	9.5	16.0	18.5	26.5	17.0
Developing Countries	17.5	4.5	30.5	33.5	39.5	-5.5	17.0	27.5
Japan	-7.0	72.5	35.5	-18.5	11.5	42.5	45.5	-15.0
Of which:								
Industrial Countries	-10.0	37.5	44.5	-8.4	8.5	40.0	59.5	-3.7
Developing Countries	9.0	93.0	29.5	-29.0	11.0	44.0	37.5	-27.0
United States	1.5	18.0	-	12.5	18.5	33.0	4.5	13.5
Of which:								
Industrial Countries	-3.5	17.0	-9.0	8.0	-1.0	21.0	16.5	-
Developing Countries	7.5	15.0	12.0	10.5	25.0	34.0	7.0	15.0
All Industrial Countries	8.0	23.0	25.0	5.5	19.0	23.5	24.0	12.5
Of which:								
Southern Europe	12.0	33.5	33.0	3.0	20.5	22.0	33.0	12.5
Industrial Countries	7.5	21.5	23.0	5.0	12.5	22.5	23.0	11.0
Developing Countries	9.0	24.0	28.0	4.5	27.5	24.5	21.0	13.5

Source: GATT (1983).

Table 11

Growth of Industrial Production and Employment in Developing  
Market Economies, 1968-1980, Selected Branches

Branch of Activity	Percentage Weight 1975	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Growth Rate 1968-1979 or 1980
		1975	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	
All Manufacturing															
Production	100	61	66	70	76	84	93	98	100	107	114	121	125	128	6.4
Employment	100	67	69	72	76	84	89	95	100	105	109	114	116	-	5.1
Textiles:															
Production	10	73	75	80	85	90	96	98	100	105	106	108	110	110	3.5
Employment	20	74	75	78	80	87	91	99	100	101	102	107	108	-	3.5
Clothing, leather and footwear:															
Production	5	70	71	71	77	81	91	95	100	105	106	108	110	111	3.9
Employment	11	57	60	62	67	71	77	85	100	105	108	111	114	-	6.5
Electrical Machinery:															
Production	4.8	42	47	52	54	66	79	91	100	119	127	145	156	163	12.0
Employment	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Not available															

Source: UN Yearbook of Industrial Statistics 1980.

Table 12

Growth rates of manufacturing output, employment and productivity in major industrial groups and branches by economic grouping, 1963-1973 and 1973-1980 (Percentage)

Major industrial group or branch	ISIC	Developed market economies			Developing countries			Centrally planned economies		
		Output		Productivity	Output		Productivity	Output		Productivity
		1963-1973	1973-1980		1963-1973	1973-1980		1963-1973	1973-1980	
Food, beverages and tobacco	31	3.7	2.6	0.6 -0.0	3.1	2.7	5.7	4.7	3.4	5.7
Textiles	321	3.9	0.1	-1.2 -3.0	5.2	3.2	4.7	2.1	2.6	6.3
Wearing apparel, leather & footwear	322-324	2.1	0.3	0.9 -1.4	1.2	1.7	3.9	2.9	4.1	7.6
Wood products and furniture	33	4.5	0.9	1.2 -0.9	3.4	1.7	4.7	5.1	4.0	6.5
Paper printing & publishing	34	4.6	2.4	1.0 -0.0	3.6	2.4	8.7	2.9	4.5	7.8
Chemical, petroleum, plastic products	35	8.1	3.6	1.9 0.1	6.1	3.5	10.1	4.8	5.5	6.8
Non-Metallic mineral products	36	4.9	1.9	0.5 -1.1	4.3	3.1	7.8	6.1	4.9	8.3
Basic metal industries	37	4.8	-0.1	0.2 -2.0	4.6	1.9	7.7	6.9	6.3	6.7
Metal products, machinery & equipment	38	5.9	2.8	2.1 0.1	3.7	2.8	10.6	6.7	5.9	11.2
Total manufacturing	300	5.2	2.3	1.2 -0.5	4.0	2.8	7.1	5.0	4.2	8.9

Source: UNIDO data base and data supplied by the Statistical Office of the United Nations Secretariat

Source: UNIDO Industry in a Changing World, 1983



Table 13

Average Monthly wage and hours worked in selected industries, Republic of Korea

	Textile		Garment		Electronics	
	Hours	Wage/hour	Hours	Wage/hour	Hours	Wage/hour
1970	231.5	49.7	233.3	42.8	215.3	70.7
1971	224.7	59.3	235.2	51.3	221.3	84.3
1972	226.3	68.5	232.8	62.9	213.8	88.8
1973	222.5	84.1	234.3	63.8	212.0	95.5
1974	221.1	124.7	215.0	92.7	205.5	135.5
1975	222.3	150.2	230.6	109.0	203.8	186.0
1976	230.7	198.0	238.3	149.8	212.5	234.5
1977	230.1	246.4	240.7	190.0	209.2	297.4
1978	229.0	325.2	238.8	254.9	218.2	363.2
1979	222.2	434.0	235.0	342.4	212.5	470.3
1980	239.7	505.6	242.6	401.8	218.0	618.9

Source: ILO (1983a).

Table 14  
Characteristics of the Asian Electronics Industry

Country	Production (Million \$)	Composition	Dependence on (exports/ production)	Number of workers (1000)	Dependence on foreign investment	Stage of development
Korea	3,300	consumer appliances 40% industrial appliances 10% components 50%	70%	180	25% (50% including joint ventures)	export base for consu- mer electronic applian- ces and components
Taiwan 1/	3,200	consumer appliances 45% industrial appliances 6% components 49%	80%	230	45% (including joint ventures)	export base for consumer electronic appliances & components parts
Hong Kong	2,000	consumer appliances 68% industrial appliances 2% components 30%	more than 90%	90	approx. 10%	export base for low-to- medium priced consumer electronic appliances
Philippines	320	65% components other- wise for consumer appliances	90%	34	extremely high	export base for compo- nents and assembly base for electronic applian- ces for local market
Singapore	1,850	consumer appliances 39% industrial appliances 2% components 59%	90%	66	extremely high (more than 80% of total production)	export base for consumer electronic appliances (dependence on imported components more than Korea and Taiwan)
Indonesia	541	more than 90% for consumer appliances	2%	43	high (foreign investment is res- tricted to some areas but most producers are recei- ving tech. assist.)	assembly base for elec- tronic appliance for local market
Malaysia	990	90% components	75%	61	extremely high (more than 90% of the total production)	Export base for low-to- medium priced consumer electronic appliances and some components
Thailand	106	90% consumer appliances	10%	40	extremely high	assembly base for electronic appliances for local market
Sri Lanka	little	small production of radios	0	NA	low	assembly base of some electronic appliances for local market

Note 1/ In the source document Taiwan appears as "Other Asia".

Source: H.Coote (1983) Consumer Electronics: Employment,  
Production and Trade, ILO World Employment Programme  
Research Working Paper WEP 2-36/WP 22, Geneva

Table 15

Total World Market Economy Exports <sup>1/</sup> and Developing Countries' Share:  
Major Electronic Products

Product (SITC)	World Market Economy Exports <sup>1/</sup>		Developing Countries Approx. Share (1981) <sup>1/</sup>	US\$ Million Main Developing Country Exporters' Share
	1980	1981		
Telecommunications Equipment	17,635	17,331	negligible	
Automatic Data Processing Equip.	12,532	11,775	3% (1980)	
Office Machinery Parts	9,111	9,144	6% (1980)	Hong Kong (4%)
Office Machines	6,394	5,548	6%	Hong Kong (2%) Singapore (2%)
Sound Recorders Phonographs	5,502	7,553	7% (1980)	Korea (2%) Hong Kong (2%) Singapore (2%)
Electronic micro- circuits	- 4,743	- 6,054	- 50%	- Singapore (11%), Korea (6%) Hong Kong (4%)
Radio Receivers	6,177	6,002	35%	Hong Kong (13%) Singapore (10%) Korea (6%)
TVs	5,591	5,516	27%	Korea (9%) Singapore (6%) Hong Kong (3%)

<sup>1/</sup> Excluding Taiwan

Source: UN 1981 Yearbook of International Trade Statistics, vol.II.



Table 16

Development of World Employment Figures  
for US Semiconductor Firms, 1966 - 1978 (thousands)

Year	Employment		
	U.S.A.	Abroad a) (estimation)	Total
1966	82	4	86
1967	85	10	95
1968	87	20	107
1969	99	40	139
1970	88	45	133
1971	75	50	125
1972	98	60	158
1973	120	80	200
1974	133	85	218
1978	-	89	-

a) -Till 1974, the great majority of foreign employees was located in Third World locations. In 1974 for instance, of a total of 85.000 only 5.000 were employed in factories located in Western Europe and Japan.

Source: UNIDO (1981).

Table 17

Circuit Complexity and Changing Cost Structure

Type of Circuits Cost Categories	Discrete Semiconductors or Simple Integrated Circuits		Complex Integrated Circuits	
	Value (\$)	(%)	Value (\$)	(%)
Cost of the chip	0.015	10	1.00	29
Cost of the capsule	0.050	33	0.50	15
Labour costs for assembly operations	0.050	33	0.15	4
Test	0.020	13	0.75	22
Rejects	0.015	10	1.00	29
	0.150	100	3.40	100

Source: UNIDO (1981)

Table 18

Aggregate Data on the Electronics Industry in Singapore, 1970-1980

Year	Number of Establishments	Number of Workers	% of Manufacturing Workforce	Output (%a)	% of Manufacturing Workforce	Output per Worker (\$'000)	Value-Added per Worker (\$'000)	Average remuneration per employee (\$'000)	Direct Export as % of total Sales	Direct export as % of total manufacturing direct export
1970	35	11,251	9.3	212.8	5.5	18.9	8.8	2.1	73.9	9.3
1971	49	15,874	11.3	319.0	6.8	20.1	8.9	2.7	84.8	14.4
1972	55	27,270	16.0	616.8	10.8	22.6	10.5	2.9	93.0	16.0
1973	64	39,210	19.7	1,096.8	13.8	28.0	10.8	3.3	92.8	19.7
1974	91	46,247	22.4	1,603.6	12.0	34.7	14.5	5.9	92.4	18.8
1975	95	32,026	16.7	1,457.9	11.6	45.5	14.8	5.2	90.9	18.1
1976	105	43,718	21.1	1,987.8	13.0	45.5	14.6	5.0	91.0	19.2
1977	115	46,441	21.2	2,322.7	13.3	50.0	15.2	5.4	90.6	19.0
1978	135	53,440	21.9	2,821.9	14.3	52.8	16.7	5.6	89.5	19.8
1979	168	66,844	24.8	4,092.7	15.5	61.2	19.1	6.3	86.5	21.0
1980	172	71,727	25.1	5,344.0	16.3	74.5	23.3	7.1	87.1	23.5

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Source: ILO Trade Employment and Industrialisation in Singapore, 1982

Table 19

Offshore Investments in Various Third World  
Location by Major U.S., Japanese and West-european  
Semiconductor Firms a/ - 1971 - 1979

Country	Number of Firms Present <u>b/</u>			
	1971	1974	1976	1979
South-East Asia:				
Korea	6	8	8	8
Hong-Kong	1	6	6	7
Indonesia	0	3	3	3
Malaysia	0-2	11-13	13-14	14
Philippines	0	0	1	6 + 1 planned
Singapore	9	10	12	13
Taiwan	3	3	6	8
Thailand			1	1
Latin America:				
Brazil	0-2	2	5	5 +3 planned
Mexico			12	13
Barbados	0	0	0	1
Puerto Rico			2	3
El Salvador		1	1	2
Mediterranean Bassin:				
Morocco			1	1
Malta			1	1
Portugal			2-3	3

a/ The sample includes 24 US firms

b/ Each firm is counted only once in each country, even if it own more than one plant.

Source: UNIDO (1981).

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