

INCOME INEQUALITY, EMPLOYMENT AND GROWTH : EUROPEAN AND
AMERICAN PRODUCT AND LABOUR MARKETS REVISITED

Peter M. Smith
Weatherhead Center for International Affairs, Harvard University

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I. Introduction

A conventional wisdom holds that the European and American economies represent different ways of organising the generation and distribution of wealth to produce similar outcomes in terms of economic performance. Around a common long-run growth rate of 2.5% per annum, the United States has opted for slow productivity growth, more employment and an army of working poor while Europe has opted for higher productivity growth, more unemployment and a much tighter distribution of incomes. Recently this wisdom has come under attack as growing evidence of superior US performance in growth and improved performance on productivity along with very low unemployment has contrasted with anemic European growth and a very poor employment performance. Under this new scenario, rigidities in European product and particularly labour markets are undermining recovery and leading to jobless growth of modest proportions.

Europeans fear that the implementation of widespread structural reforms would lead to the emergence of growing income inequalities and societal breakdown associated with higher levels of drug abuse, violence and homelessness. There is a need therefore to address the European fears by a considered appraisal of recent US performance. This appraisal should begin by seeking to identify the causes of both its successes and weaknesses. It should then examine the likely repercussions of a move towards US style flexible labour markets in the context of different European labour traditions and skill generation systems before pointing out the policies which are available to mitigate any adverse consequences of such a move.

In an integrated world economy with rapid diffusion of innovation across borders and convergence in living conditions, demand conditions can be considered as increasingly comparable among developed countries. Sources of inequality such as skill biased technical change or competition from low wage countries can therefore be expected to affect the US and European economies in a similar fashion. Labour supply conditions do not necessarily follow the same pattern. Female participation developed in parallel across both sides of the Atlantic, whilst demographic pressures and immigration have been quite different. The relative strength of different supply and demand aspects will therefore determine to a large extent the degree to which widening income inequality can be expected to occur in Europe with faster liberalisation of product and labour markets.

The supply, demand, institutions framework developed by Freeman, Katz and others has been used as the basic analytical tool in this paper. It stresses the importance of developments in labour supply as a key factor behind the low growth of average incomes in the US over the last quarter century and that of the composition of the labour force in the growth of earnings inequality in the 1980s. On the demand side, a weakening of the market power of the low skilled as a result of increasing trade and foreign investment from developed countries (specifically Japan and Germany) and liberalisation of key markets for services, particularly those sold to other businesses, is identified as the main cause of widening disparities. Trade with developing countries and skill biased technical change are not identified as the main causes.

The continued growth and then stability of inequality in earnings in the 1990s in the face of developments in labour supply and a labour market at or approaching full

employment, which should have reversed the trend in the 1980s, is more difficult to explain. To the continued importance of loss of market power in an increasingly competitive environment should be added strong growth in trade in services serving the top of the earnings distribution, and the possibility of some effect of imports of manufactures from newly industrialised countries (but not very low wage developing countries). The growing application of new technology may also have enhanced the income generating potential of very high earners compared with others in the same industry and occupation.

An important distinction between inequality in earnings and inequality in income needs to be made. Low growth in average and below average earnings and high growth in employment means that most of the gains in income have come from multiple earners in the same household. Sociological developments, particularly the increase in both the dual earner and the single parent household hold the key to the divergence in performance between incomes at the bottom and the top of the household income distribution.

A division of the US economy into a simple two skill (high and low) and two sector (tradable and non-tradable) model leaves certain crucial relationships unaccounted for. Instead a three skill, three sector model is proposed. The skill categories recommended are college graduates, skilled labour with a minimum of two years training in transferable skills and unskilled labour with only minimal training in company specific skills. The sectors are the production of differentiated goods (most of which are traded), the production of high value added services (which are increasingly tradable) and the production of low value added “industrialised” services (most of which can only be traded by inward foreign direct investment).

The functioning of the skills generation system lies at the heart of possible policy responses to growing income inequality. The US and countries with similar deficiencies in the supply of skilled labour (as opposed to highly educated labour) need to solve the market failure for the supply of transferable skills in order to restore the “vanishing middle” of the earnings distribution. Those European countries with strong generation systems for transferable skills need to ensure that they will not be threatened by further liberalisation of product and labour markets.

The rôle of remedial as opposed to preventive policies also needs to be re-examined. In the US, the earned income tax credit has become the main instrument of correcting for excessive income inequality. As with all redistributive policies, it does nothing to prevent the emergence of a further widening of the pre-tax income gap. Applying to all low wage earners and not just to new entrants to employment, the cost is very high for a relatively limited impact on post-tax incomes. In the US context, it remains vulnerable to political attack from those higher up the income distribution. For the US, therefore, the earned income tax credit can be considered a highly defective instrument for dealing with the growing inequality in incomes.

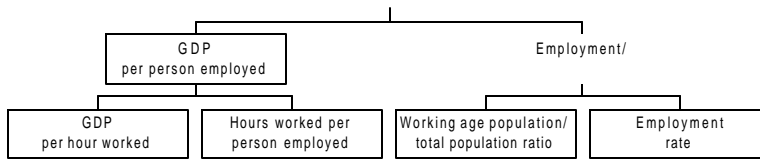
For Europe, however, an EITC type instrument presents many advantages in the current situation. The pressing requirement is to price people into jobs without creating an army of working poor. The cost of such an option depends critically on the amount that wages at the low end will need to drop in order to create large numbers of low skilled jobs. In view of the lower numbers of uneducated, unskilled in the European labour force and some evidence that price elasticities for labour supply and demand are lower than in the US, it would be reasonable to expect that the average cost of the EITC for a given

level of post-tax income would be lower in Europe than in the US. The introduction of such a redistributive measure would need to be accompanied by tighter restrictions on benefits for those not working in order to increase the incentive for employment and ensure that the total tax burden did not rise. Once in employment, the low skilled unemployed need appropriate special measures to ensure that they have access to training in transferable skills so that they do not remain trapped permanently in low wage, low productivity jobs.

II. US and European Performance Compared¹

The growth rate of an economy can be computed by summing its two main determinants, the rate of growth of labour productivity and the rate of growth of labour input. In the same way, levels of GDP per capita, as a rough proxy for living standards, can be decomposed into four components : the level of labour productivity (output per hour), the employment content of the economy measured by hours worked, the employment rate (the number of employed as a percentage of the population of working age) and the demographic structure of a population (the working age population as a percentage of the total population). Each of these variables offers a different insight into the workings of an economy compared with a benchmark country, in this case the United States.

¹ This section is based on the introductory chapter of the 1998 Report on the Competitiveness of European Industry prepared by the IFO Institut for the European Commission. Since this report is not freely available a resume of the main argument is provided here.



The substantial gap that remains between US and average European Union GDP per capita can be attributed essentially to a combination of low European employment rates and labour productivity. A shorter number of hours worked per person employed plays a lesser role and the demographic structure is in Europe's favour (Figure 1). In the case of Japan, the overwhelming source of the difference in level can be attributed to low labour productivity, essentially in agriculture, services and some manufacturing industries not exposed to international competition.

Starting with levels of productivity and employment provides a striking contrast to the conventional wisdom, which is based on rates of growth. In order for its capita incomes to converge on those of the US, the European Union would need to grow substantially faster than that of the US. As per capita income levels converged, it would be expected that growth rates would also converge. Similar growth rates combined with lower absolute levels leaves the laggards in a permanent position of (relative) underdevelopment. This puts Europe's relatively strong performance in labour productivity and weak performance in employment in perspective (figure 2). There should have been no need for a trade off between employment and productivity. Indeed for certain Member States, such as Ireland, no such trade off has occurred. The recent upturn in US productivity and continued strong growth in employment and downturn in Europe's productivity growth combined with very weak employment growth further underlines the

major structural weakness of the European economy. In the 1990s total factor productivity growth in the US at 1.1% per annum even exceeded that of Europe at 0.7% per annum for the first time since World War II.

For the US, which is at the frontier of levels of productivity, the possibilities for easy gains through the assimilation of current best practice have been largely exhausted. It is to be expected that further gains are harder to achieve than for those areas playing catch up. However, this can not explain the productivity slowdown of the last quarter century, since the US has been the undisputed leader in productivity for most of the twentieth century and in many industries back into the nineteenth century. Equally, the very high US employment rate (around three quarters of the population of working age have a job) and slower population growth mean that the potential for employment related growth is now low.

Looked at in more detail, the record of European employment growth does indeed point to deep rooted structural problems in the functioning of the European economy that prevents the full realisation of its productive potential. Over the long term, employment growth in Europe has been weak compared to both Japan and the US. As a result, the employment rate has declined while in the US it has risen and in Japan remained at a similarly high rate (figure 3). Going back further in time, employment growth in Europe was already very low in the 1960s at a time when the employment rate was substantially above that of the US.

The extent of the US success creating employment has been all the more impressive taking into account that there have been 50% more entrants on the job market than in Europe. In contrast with the US where job creation has kept pace with the

increased supply of labour, the European Union is facing relative employment stagnation despite less demographic pressure.

Going into the European employment performance in more detail, it appears that slow growth in numbers employed has been compounded by a fall in the number of hours worked so that the total amount of labour provided barely increased at all (figure 4). Behind this very poor employment performance lie two important developments. First structural adjustment to the new service economy has been much slower in Europe, particularly for market services (privates services in American terminology). Secondly, capital/labour substitution has been an important facet of European experience, contributing nearly half of the increase in in labour productivity, whereas in the US it has been insignificant (figure 5). As a result, a marked fall in European capital productivity has occurred. At the same time, capital productivity rose in the US. This puts the strong growth in European labour productivity into perspective. Not only is it in a phase of catch up but it is being achieved at the expense of employment growth.

Properly assessed, therefore, the strong claims made for the European compared to the US economic model rely entirely on distributional issues. Measures of disparities in income distribution, such as that of wage dispersion, show much higher absolute levels of dispersion in the US than for European countries with the exception of the UK and Ireland (figure 6). Measures of changes in the income distribution also show rising levels of inequality in the US compared with stable or only modest increases for European countries (again with the exception of the UK).

Even within Europe, levels of inequality vary substantially. There is no simple explanation of the phenomena. Economic structures may play some rôle, with a heavy

emphasis on the tertiary sector producing a more unequal distribution of income. Pre- and post-tax levels of income inequality vary substantially according to the importance of redistributive taxes and social transfers. There is a strong cultural bias to acceptable levels of post-tax inequality. Nordic countries appear least inclined to accept inequality, the majority of countries of central Europe accept inequality up to a point and English speaking countries are willing to accept a higher degree still.

However, there are substantial within country variations. The attachment to equality has long been a dominant characteristic of Scottish society compared with that of England and New England has long had a much more egalitarian economic and social structure than the south or south-west of the United States². These attitudes appear to have a strong cultural foundation, going back in some instances for several centuries. For instance, at the time of Domesday Book in the late 11th Century the eastern part of England, which had been colonised by the Vikings and which also furnished the lion's share of the settlers to the Massachusetts Bay colony, was already noted for the much higher proportion of free peasants or sokemen than the rest of the country. The settlers of Virginia came largely from the south-west and west of England, which at the time of Domesday Book also had the most developed manorial structure.

Tolerance to inequality also varies over time. During the post-war period in both Europe and north America the desire to limit variations in income was quite strong, albeit from different starting points, at the same time as economic developments were already making for a more egalitarian distribution of pre-tax income. Since the first oil shock, the situation has reversed with higher tolerance for inequality going hand in hand with

greater inequality in the generation of income. England has even migrated from a position of moderate opposition to one of strong tolerance of inequality, accentuating the difference with Scotland, which has maintained a quasi-Nordic aversion to it. As with income so with unemployment. European tolerance of unemployment has risen to levels which would have been unthinkable throughout most of the post-war period. American tolerance of unemployment, initially higher than that in Europe, has not risen to anything like the same degree.

Ideally, Europeans would like to know to what extent changes in their labour market and other institutions to make them more employment creation friendly will lead to a widening of income inequality such as that observed in the US and some other countries that have embarked on wide-ranging market oriented reforms of their product and labour markets. It implies an accurate understanding of the forces lying behind recent developments in the US – an issue on which consensus has yet to emerge.

III. The nature of income inequality

In theory, income inequality is a pure distributional issue. In practice, levels and distribution can rarely be separated. Much of the discussion of the rise in US income inequality has been related to the very poor performance of average incomes (whether measured as the mean or the median) over the last two decades. Thus discussions of the “vanishing middle” have become linked to the issue of how the middle is doing. When average incomes are growing strongly a more unequal distribution may be more acceptable because “a rising tide lifts all boats”, albeit not to the same extent.

² Hackett Fischer has some interesting developments on both initial social structure and attitudes towards inequality during the early years of the settlement of north America in “Albion’s seed”.

The degree of income inequality alone may not be a very relevant indicator for making international comparisons of living standards. In the case of the US, average incomes are considerably higher than in Europe (reflecting the different levels in per capita GDP) so that even those in the lower regions of the American income distribution may have higher incomes than most of the Europeans. A contrario, a very unequal US income distribution may mean that most Europeans have a higher level of income than most Americans even with lower average incomes. That such an outcome can by no means be considered unlikely, it is sufficient to recall that the income distribution is not perfectly symmetrical but heavily skewed towards those in the lowest categories with a very long tail spreading out amongst the high earners. The “middle” in terms of most frequent class in the distribution is not the “middle” in terms of average incomes. In statistical terms the income distribution is log normal rather than normal.

A second area in which absolute and relative levels become entangled is that of poverty. Standard international definitions of poverty, such as those of the Luxembourg income survey, emphasise relative levels. In effect, they describe the income distribution in a specific way as the ratio of low income earners to average or some other measure of other income earners. Discussin poverty entails highly emotive connotations and relative poverty can be discussed just as well in terms of the overall distribution of income.

Some countries, amongst them the US, also define absolute levels of poverty. In 1963 the Social Security Administration selected a figure of \$3,200 for a family of four (with comparable standards for families of other sizes) as the official poverty rate and subsequently indexed on the consumer price index so that by 1996 the figure had reached \$16,036 (Levy 1998). The current figure (June 1999) is \$12,075 for a single person and

\$16,275 for a couple. Using these figures, it is possible to compute a figure for the percentage of all persons living in households below the official poverty line (even for individual categories of persons such as children).

The US measure of poverty compounds several methodological drawbacks including a precise definition of what constitutes poverty in an absolute sense, how that might change over time and measurement problems related to the index chosen for updating. For instance, if part of living in poverty is not having access to the same quality of information as the rest of the population, then in the 1960s having access to a television would be an important part of that definition. By the late 1990s, having access to the internet could be considered in the same light. At the present time, access to the internet increases sharply with income. The Department of Commerce (1998) in its study of the emerging digital economy quotes a 1997 CommerceNet/Nielsen study of internet users in the United States and Canada that 33.9% of users have household incomes of \$60,000 or more, compared to 19.5% for the population as a whole. Clearly internet access was no part of the original 1960s definition of poverty nor of the consumer price index (CPI) for most of the subsequent period.

Another set of issues concerns which distribution is being measured over what time span. Most measures of inequality take the distribution at certain points in time and then plots the evolution between those point estimates using synthetic indicators such as the Gini coefficient. Since earnings vary with age, changes in the distribution may reflect changing demographic structure rather than any change in the lifetime earnings capacity of an individual (Sarlo, 1992, 1998). Because the post-war baby boom was so large in the US, the demographic profile has changed much more rapidly than in other developed

countries. This affects both intertemporal and international comparisons of inequality. Again, because earnings vary with age, a substantial part of inequality at any point in time is represented by the distribution of low earning young workers and high earnings prime aged workers. To a certain extent, the higher degree of income inequality in the US reflects its younger population and changes to the proportion of young people in the labour force rather than any heightened inequality in lifetime earnings. This point will be returned to subsequently in the examination of the impact of labour supply on inequality.

What is being measured constitutes probably the most difficult of all issues connected with income distribution. The first aspect concerns the generation of income. Wages and salaries constitute an easily accessible source of information on distribution from social security records. In order to derive income a number of additions and subtractions must be made. From this should logically be subtracted all taxes, including taxes on consumption such as sales tax in the US or value added tax in Europe (the tax wedge). In practice, only taxes levied at the point of employer are usually subtracted. Other sources of income, including income from investments and social transfers, should then be added. Since these can not be assessed directly from employer records, the data on earnings also usually excludes them. Measures of inequality based on earnings (such as those in figure 6) will overstate inequality in countries where employment is high but earnings low compared with those in which employment is low and earnings high. In much of Europe, low income categories are concentrated among the recipients of social transfers without work, who do not show up in the earnings statistics. In the US, the phenomenon of the working poor means that a higher proportion of low income categories are working, and therefore included in the earnings inequality measure.

A second type of source concerns tax or revenue statistics which typically include income from investments but exclude many forms of social transfers, which are often tax exempt. Considerable under-reporting can occur at the top and bottom of the income distribution since the incentive to limit or defer taxes is highest for high earners and many low income families fall below tax thresholds. Countries with a very high share of the informal or “black” economy are particularly prone to this bias both at the top and bottom ends of the income distribution which can lead to serious mismeasurement of the distribution. In particular, it would appear that certain European countries with low measured inequality but very large informal sectors (such as Italy and Belgium) fall into this category.

A third type of source concerns household surveys in which the respondent is asked to declare their income. This represents a very unreliable source since respondents may not know accurately their incomes, particularly with regard to irregular or extraordinary items. Respondents are often asked to reply for other members of the household, which confounds the problem.

On the list of adjustments to earnings or income should be added social transfers received, including those received in kind. These may affect lower income categories substantially, even in the US where the scale of such transfers is typically lower than in Europe. For instance, Jenks and Mayer (1996) in their study of child poverty rates found that the growth of Medicaid, food stamps and rent subsidies had raised many children’s material standard of living without raising their household’s money income.

The issue of health coverage may be a particularly significant element that also has an impact on cross country comparisons, sometimes in surprising ways. Just as the

availability of health coverage may mitigate some of the measured disadvantages of those without work, the non-existence of health coverage will accentuate them. A key issue for the US in changes to welfare provisions concerns the continued availability of health coverage. A report from Families USA (1999) demonstrates that loss of medical cover is widespread for families coming off welfare.

Countries with truly universal health systems (the Nordic countries, UK and Canada) clearly do not introduce biases from potential recipients “falling through the cracks”. However, those countries that finance their health systems from employer contributions are likely to introduce such biases. According to the French Ministry of Employment and Solidarity, 700,000 persons are excluded from compulsory health insurance (out of a population of 55 million). Of these 550,000 have private health insurance and 150,000 are without any health coverage. Only 84% of the population had supplementary health insurance covering most health outlays beyond basic provision.

Finally, measuring income per person or per household and controlling for family composition may make a substantial impact on outcomes. Having one or two earners in a household will make a substantial difference to disposable income per capita, even when average earnings are growing only slowly. It will also affect the standard of living in that household since many costs such as accommodation do not vary proportionately with number of persons in the household. In addition to household composition, cost of living varies markedly from one location to another. An income with which it would be difficult to make ends meet in Manhattan or Mayfair may be perfectly adequate in Peoria or Preston. Comparisons of income distribution, whether domestic or international, virtually never compensate for such differences, although international comparisons of average

incomes increasingly use purchasing power parities to correct for national price levels of comparable goods and services.

Inter-temporal comparisons of income inequalities will be particularly sensitive to changes in household composition and social norms. Comparing post-war American families with the current state as Frank Levy (1998) has done is instructive. Between a typical situation of the 1950s with a two parent family with one bread winner and three or four children and a situation typical of the 1990s with either two working parents with one, two or no children or a single parent, most likely working, with one or two children a social and economic revolution has taken place. Much of the measured increase in inequality can be attributed to this revolution in household composition.

IV. The development of income inequality in the US

A large number of authors have set out to measure the development of income inequality in the US using fairly similar sources and indicators (for instance Freeman 1997 and 1998, Levy 1998). David Ellwood at the Kennedy School of Government has devoted particular attention to the issue of measures of inequality (1998). Similar work on Europe, although by no means absent, is much less developed and concentrated in certain countries which have a well developed tradition of social enquiry (particularly the UK with such institutions as the Joseph Rowntree Foundation and France with the Centre d'études des revenus et des coûts until it was axed). Typically, treatments of inequality contain a presentation of median earnings or incomes and their distribution by quintile (or by decile). Aggregate measures such as the Gini coefficient are also much employed.

Following David Ellwood, it is worthwhile to begin with the development of average incomes. He shows that the macro-economic definition of incomes - national

income per person taken from the income definition of the National Income and Product Accounts - has continued to grow steadily since the 1960s. Between 1973 and 1996 national income per person rose by 34%. Over the same period, median earnings of full-year full-time male workers - a commonly used measure of income – declined by 10%. The difference between the two figures, the income generated by the economy and a measure of average earnings, constitutes essentially a distributional issue.

Because falling incomes are a big issue irrespective of their distribution, much attention has been focused on the inflation adjustment that produces this result. Following the Boskin report (1996), the degree to which the Consumer Price Index (CPI) overstates inflation became a major source of contention. On more plausible estimates of inflation, median incomes rose by just 1% in total over the period 1973 to 1996, which is equivalent to stagnation. This is not a good result either. Using the Boskin committee estimate for inflation male earnings would actually have risen by 12%. However, similar adjustments would need to be made to the national income per person figures to adjust real growth upwards so that the difference between the mean and the median income remains just as large³. Explanations for slow growth in average incomes will be examined in subsequent sections of this paper.

In Table 1 David Ellwood shows that with a mid-point estimate of inflation (Personal Consumption Expenditure index less 0.5%) of the \$8,278 increase in national income per adult between 1973 and 1996, \$2,662 – or 32% of the total increase - accrued to income on capital and that of own proprietors (in national accounts terminology 1-unadjusted labour income). Although the self-employed have below average incomes,

³ This is the same point as Paul Krugman's speedometer analogy with regard to growth and productivity.

income from capital is concentrated in households with the top third of incomes. It therefore adds to income inequality when returns to capital grow faster than average incomes, as occurred after the first oil shock.

The remainder of the increase accrued in the form of labour income. Of this women with wages in the top third gained \$2,461, women with wages in the middle third gained \$1,001 and women in the lower third \$432. Overall, gains in women's earnings account for 47% of the total increase, concentrated amongst those with highest incomes⁴. The corresponding figures for men are \$1,991 for the highest third of wage earners, -\$138 for the middle third and -\$130 for the lower third. Overall, men accounted for 21% of the total increase, exclusively concentrated among higher wage earners. Thus the bottom two thirds of men saw their incomes fall, while the rest saw gains of variable size. By far the largest absolute gains were made by men and women at the top of the income distribution, further boosted by strong gains from income from capital.

Gains at the top of the income distribution reflected strong increases in the returns to education somewhat mitigated by a rise in the the returns to age, in spite of the fact that the young are proportionately more educated than their predecessors in the work force. For men, median wages by age group fell for all those below the age of 45 between 1973 and 1996, but rose strongly for the age groups 45-54 and 55-64. For women, the losses were modest for the 18-24 age group, turned into gains thereafter and peaked for the 35-44 and 45-54 age groups. These figures are consistent with the median figures for men and women presented earlier and also for the similar percentage premium

⁴ Within each category of the income distribution, women still earn less than men.

to education for men and women bearing in mind that few women in the 55-64 age group went to college.

Accounting for benefits received actually increases the level of income disparity rather than flattening out the distribution. Both men and women at higher ends of the wage distribution are more likely to receive employer supported benefits for health and pensions than those lower down the scale. For men, the coverage of benefits actually fell at all levels of the distribution between 1979 and 1996 so that average coverage fell from 68% to 58% for health, and from 53% to 48% for pensions. The largest falls were among the lower income categories, particularly for health. For women, health coverage remained stable for the top and middle thirds of wage earners and declined for the bottom third. For pensions, declines were observed for each of the categories, although coverage was already so low for the bottom third of wage earners that the decline was negligible. In all cases benefit coverage for women lay below that of men in comparable parts of the wage distribution so that lower benefits combined with lower earnings to push women's incomes further behind those of men, in spite of their strong growth in earnings.

Broadening the scope of benefits to include the redistributive effects of taxation and social transfers modifies somewhat the image. Contrary to popular perception, the US tax system is more progressive than those in Europe. Direct taxes make up not only a higher proportion of total taxes but also take a higher share of GDP than the European average. Indirect taxes are much less significant both absolutely and relatively. Any differences between the US and Europe in the overall impact of the welfare state on income distribution lie therefore in the generosity of benefits obtained.

In 1995, public transfers to households represented 14% of GDP in the US against 20% of GDP in Europe. Over the previous twenty years, the increase in public transfers to households was quite similar in both cases (6% of GDP in the US and 8% in Europe). The degree to which these transfers redistribute income can vary quite substantially. Most transfers are made under entitlement programmes such as pensions (social security in American terminology). Although there is usually some redistributive element in these programmes, the effect is not great except with regard to the age distribution of income. The main redistributive effect comes from targeted programmes at particular low income categories or categories at risk (such as children, the disabled). Because the US (and the UK) has much greater recourse to means tested benefits, it would be expected that the redistributive effect would actually be greater in those countries. Set against this is the degree of generosity of minimum income guarantees such as the French RMI (revenu minimum d'insertion) or of unemployment benefits.

Some indication of the redistributive effect of the tax and benefit system for the US can be given by developing a set of standard cases in the way David Ellwood has done. A single female parent household where the mother does not work would receive \$7,799 in net transfers (benefits less tax), down from \$8,720 in 1985. A single female parent household in which the mother works and earns \$10,000 per year would receive \$6,353 in net transfers, up from \$2,228 in 1985. A married couple with children in which the father works earning \$15,000 per year but the mother does not work will receive \$3,639 up from \$720 in 1985. A married couple with children and two earners and household earnings of \$25,000 will pay \$1,685 in net transfers as against \$2,438 in 1985. A single man with no children earning \$15,000 per year would pay \$2,378 against \$2,288

in 1985. The existence of government paid health coverage (Medicaid) for non-working single mothers and now for the children of low income households in which one of the members work adds to the value of net transfers for low income households. The results of the simulation outlined above indicate that the big change in US policy has been in favour of the working poor and against the non-working poor.

Putting the story of the US income distribution together by household composition shows that irrespective of the level of parental education – a key determinant of income – household total income for husband and wife families grew using the mid-point inflation adjustment between 1973 and 1996. The largest gains accrued to those with the highest educational level and the smallest to those with the lowest. The gains for households in the top third of parental educational levels were seven times as large as those in the bottom third. Gains for families at the lowest end of the distribution can be attributed essentially to rising earnings for women, of which at least half came from an increase in hours worked rather than higher pay per hour. Differences in the mean number of children per household were not significant.

Single parents also saw a rise in household income for all levels of education, but only those with the highest education saw a sizeable rise (seventeen times as large as for single parents with the lowest educational achievement). The very small gains in the lowest groups occurred in spite of large increases in earnings, which nearly doubled between 1973 and 1996. The decline in other income, which almost halved, offset the rise in earnings. Both welfare payments, which represented one third of other income, and income from others in the household fell precipitously.

Combining the impacts of household composition and different earnings gains across the distribution and between men and women (Table 2), David Ellwood concludes:

‘As a result of changes in family structure, the greater earnings gains of wives in high income families, and the differential earnings of men at different parts of the distribution, the family income distribution widened even more dramatically than the wage distribution did. Families at the top did unusually well. Those at the bottom were falling further and further behind’.

V. Possible sources for growing income inequality

The description in the two previous sections point to a number of possible sources for growing income inequality. They include changing demographic structure of the population, changing social structures with an increase in the number of single parent households counterbalancing the significant improvement in incomes of the elderly, who were among the lowest income categories thirty years ago and changes to the taxation and benefit system (including employer provided benefits). These partial sources remain very far from a plausible general explanation linking cause with effect.

Economists have paid particular attention to a different set of factors than the social scientists. In particular, competition from low wage countries following the growing liberalisation of international trade and skill biased technical change have become recent favourites for explaining the wider dispersion of earnings as opposed to incomes.

Rather than search for the cause for widening income disparities, a number of possible causes linking economic developments with the social and political in a single, rigorously specified model would be required to provide an analytically sound explanation for recent trends. In view of the growing integration of the world economy, such a model should also be capable of explaining divergent patterns in the different parts of the world, both within countries with similar levels of development such as the US and Europe and between developed countries, newly industrialised countries and the rest of the world.

Equally, any general model would need to integrate the interlinkage between the tradeable and non-tradeable sector of the economy and their respective impacts on the development of inequality. Davis (1996a) has attempted a partial specification of how US and European labour markets can interact followed by a more general specification for the global economy (1996b). Lebow (1992) has looked at average earnings of production workers and the non-tradeable sector.

Some elements for such a model could be specified with a greater degree of clarity. Economists would naturally concentrate on earnings, including employer provided benefits, rather than post tax household disposable income. Earnings are directly linked to the productive economy and capable of analysis from different perspectives, of which the level and development of productivity and the functioning of labour markets are probably the most important. Since demand for labour is derived from the demand for a final product, it is impossible to treat labour market analysis separately from that of the product markets that determine demand. Developments in the supply side have been well studied, particularly by labour market economists and analysts of social

change, but the integration of supply and demand elements with regard to the explanation of growing inequality remains deficient.

Simultaneity between supply and demand elements poses a particular problem when attempting to identify causality. Growing supply of labour with specific profiles in terms of age or educational attainment will naturally induce opportunistic reactions to exploit such new sources on the part of employers if blockages on the functioning of product or labour markets do not prevent them from so doing. What appears as a demand side induced development may actually turn out to be a reaction to a supply induced development. For instance, it is possible to argue that skill biased technical change raises the returns to education leading more and more young people to go to college and seek further degrees. However, a large increase in the supply of graduates could make investments by employers in those areas which are heavy users of graduates more attractive. It also implies a large market size for skill-complementary technologies and encourages faster upgrading of the productivity of skilled workers. The returns generated to these new activities may be so high that they can sustain relatively higher earnings for the most educated, in spite of their relative abundance (Acemoglu, 1998).

A similar type of feedback effect may have occurred with the least educated American workers inducing the expansion of low wage, labour intensive activities concentrated in locality based services. Such developments would simultaneously widen the gap in earnings at both extremes of the income distribution, which is compatible with the evidence provided in the previous section.

Productivity developments should provide a link with average earnings, since real wages tend to follow productivity over time. They can also provide part of the

explanation of disparities when levels of productivity vary significantly between different characteristics of worker, particularly through the returns to education. Both average productivity and its distribution amongst different skill categories are linked with the product markets, in particular the degree of competition, and with macro-economic variables such as the rate of investment.

The literature on sources of rising income inequality can be caricatured rather than characterised as falling into one of four categories:

1. Comprehensive discussions about causality based essentially on case study evidence, particularly linked with business schools and the disciplines of human resources and operations management. Such presentations rarely contain much statistical evidence and there is no attempt at mathematical rigour in the specification of causality or a fortiori to collect data to test the hypothesis;
2. Discussions based on descriptive statistics. Pertinent evidence is presented but the specification and testing of causality is absent. Government departments and international organisations are particularly adept at producing this kind of literature, of which section one in this paper is an example.
3. Rigorously specified and tested hypotheses of a single explanatory factor using a partial equilibrium framework. International trade theorists and labour market economists have been particularly active in this area. Inter-linkages between different possible causes are neglected.

4. Well specified general equilibrium approaches, usually of a highly formal mathematical nature, using very restrictive simplifying assumptions and untested by data or empirical work. These are the realm of the theoretically oriented macro-economist.

VI. Explanations for slow growth in average incomes

As indicated in the previous section, the principal question relating to the development of average incomes in the US to be answered is: “why did the development of median incomes diverge from mean income per capita under the macro definition?” To repeat, disposable personal income per capita continued to grow at a fast rate after the first oil shock and there is no discernible break down after allowing for business cycle effects (figure 6). DPI per capita even grew faster than GDP per capita so that different price indices used for deflation or a greater share of GDP taken in taxes can not explain slower growth in earnings.

Since the growth in GDP represents the sum of changes in employment and labour productivity, the change in per capita GDP can be written as:

$$\Delta \text{GDP} / \Delta \text{Pop} = \Delta \text{E} + \Delta \text{LP} / \Delta \text{Pop}$$

where E represents employment, LP labour productivity and Pop the total population.

Because, the development of disposable personal income closely mirrors that of GDP and the increase in population is a common constant to both sides of the equation, it is reasonable to begin the search for explanations to growing inequality in the relationship between growth, employment and productivity, carrying on from section two.

Up until the end of the 1970s, the growth in DPI and labour productivity proceeded at an almost identical pace, with employment growing more slowly (fig.7). The early eighties saw employment, productivity and income growth flat before recovering in the mid-eighties. From 1987 onwards, however, an important development occurs with employment growing much faster than labour productivity. With fast employment growth but slow productivity growth, per capita incomes can continue to grow strongly even as earnings stagnate. The number of earners per household then becomes a crucial determinant of how the fruits of growth are distributed. This picture closely resembles that of the previous section.

To go beyond the descriptive statistics requires an examination of the relationship between employment and productivity growth. Does an acceleration in employment growth necessarily imply a productivity slowdown? The law of diminishing returns implies that the marginal output of each additional unit of a factor will ultimately decline. However, at the macro-level a constantly rapid pace of technical change has seemed to invalidate this staple of micro-economics. Over the relatively short time span of twenty-five years with which we are dealing here, however, the probability of the relationship holding is greatly enhanced.

In order for productive capacity to keep pace with the increase in the rate of growth of labour supply, the rate of investment should have increased. With a low and declining level of investment in the US economy, the capital/labour ratio can only have declined. This implies that labour productivity in the US can not have increased through capital deepening but only through organisational change. The absence of capital/labour substitution reported in section two supports this hypothesis.

Figures 8 and 9 detail the productivity and employment data more closely, distinguishing between total non-farm business and manufacturing productivity. The divergence in trends between employment and labour productivity comes somewhat earlier, at the beginning of the eighties, for the non-farm business sector than for the economy as a whole. Capital productivity after increasing to the late sixties, declines to the early eighties and remains flat thereafter. As a result, multi-factor productivity posts only modest gains during the last twenty-five years. The data on capital stocks, and therefore capital productivity, are quite weak, particularly in a period of rapid diffusion of information technologies which makes many old investments obsolete more quickly. However, the available evidence supports the overall story of a fast growth in employment leading to a slow-down in growth of labour productivity and recovery in that of capital productivity.

A dramatic divergence in trends between non-farm business and manufacturing productivity can be observed. Contrary to overall productivity, growth in manufacturing productivity actually accelerates from the early eighties onwards, while employment and capital productivity remain flat and multi-factor productivity improves somewhat. Gordon (1996) shows that all of the productivity slowdown in the US economy over the period 1972-94 compared with the period 1950-72 can be attributed to the non-farm, non-manufacturing business sector (farm productivity continued to grow apace). Not only that, but manufacturing productivity growth actually accelerated to surpass that of the 1950s and 1960s, a trend that has continued at a still accelerating pace over the period 1992-1998.

Comparing developments in productivity and earnings (figure 10), it is clear that the break in trends occurred around the time of the first oil shock⁵. Up until then productivity and earnings developed in parallel and there were few significant differences between the manufacturing sector and the economy as a whole. After the first oil shock, not only did productivity performances diverge but also that between manufacturing productivity and earnings. Manufacturing earnings did grow faster than for the economy as a whole, but increasingly their development mirrored that of the economy as a whole with gains in productivity not reflected in stagnant earnings. The BLS indicator of weekly earnings for production workers naturally understates the earnings gains made by other wage and salary earners. However, these are the earnings that lie at the heart of the growing earnings inequality dilemma.

The parallel development of earnings for production workers in manufacturing and in the economy as a whole indicates a high degree of substitution between the two categories of workers. Otherwise, some of the substantial gains in labour productivity in manufacturing should have accrued to workers. The degree of substitutability between different categories of labour remains a fundamental and neglected aspect of explanations for growing income inequality. Perfect substitution implies that all workers will receive the same wage and that there is a single supply and demand curve for all workers. No possibility of substitution will imply that separate demand/supply curves must pertain for each category of worker. A high degree of earnings inequality is consistent with the second hypothesis and a low degree with the first.

⁵ In order to maintain consistency with the figures for DPI, the price deflator for earnings is that of Personal Consumption Expenditures (PCE). Using the Consumer Price Index (CPI) would further depress earnings relating to productivity. Following Ellwood with an adjusted PCE would narrow the gap in the absence of similar adjustments to GDP.

The story for manufacturing over the last twenty-five years resembles the secular shift from agriculture to manufacturing during the previous century. Scherer (1996) describes the process well. With productivity rising fast and demand only slowly rising because of the application of Engel's law⁶, it is possible to feed a growing population with less and less people. At the same time, the organisation of farming in small production units means that individually farmers have little bargaining power (but substantial voting power at least in previous times). In this case, the gains in productivity lead to a fall in real (and often absolute) prices leading to a gain in real incomes for the rest of the population rather than workers on the land.

Two major explanations can be advanced for the very slow pace at which experience in agriculture applied to manufacturing. The first concerns market power and the very high entry barriers to many (but by no means all) manufacturing activities. This issue will be treated more extensively in the section on demand for labour. The second concerns innovation and the way in which a fast pace of new products has maintained increasing demand for goods even in the face of slower population growth and rising incomes (Engel's law did not operate). Ultimately, productivity gains outpaced the expansion of markets by innovation in many areas so that Engel's law did begin to operate.

Underlying the slow growth in earnings, therefore lay the slow growth in service sector productivity (Kozicki, 1997). The question then arises whether this slow growth can be attributed to measurement factors or to real factors (Webb, 1998). There are strong reasons why service sector productivity has been underestimated, but there are equally

⁶ Engel's law states that consumption rises less than proportionately with income.

strong reasons why such under-measurement can not affect the development of inequality but only of average earnings.

Service sector output can only be measured directly through the production definition of GDP (the sum of sectoral value added after correction for the financial sector and taxes on imports). However, on the assumption that output in the goods producing sector has been measured accurately, service sector output can also be derived as a residual from the consumption (sum of final uses) or income definition (the sum of labour, capital and own proprietors income) of GDP. In practice, the production and consumption measures of US national income are not independent and underreporting in one measure is likely to be reflected in underreporting in the other. On both the direct and indirect measures of services, productivity grew only slowly in aggregate, which suggests that measurement problems are concentrated within different individual services rather than between services and the rest of the economy.

As far as growth in GDP and productivity are concerned, the crucial problems in measurement apply to the constant price rather than the current price series. Output at current prices can usually be correctly measured through the price system. The main exceptions concern under-reporting of the informal or “black” economy and non-market services (government in American terminology). The output of government or non-market services are by convention measured as the sum of their inputs and the same amount is entered both as a sector in the production account and as final demand in the consumption account. Since labour input constitutes the principal volume measure of output for non-market services, labour productivity change must by definition be zero.

This is not the only example of such definitional problems in the service sector. Similar problems afflict for instance the fast growing financial services sector.

Under a strict definition of GDP, under-reporting of service sector output in the production measure unless compensated for by over-reporting in the goods producing sector must have as an exact counterpart under-reporting in the overall consumption measure of GDP. Again, there are good reasons why this should be so, not least because final services are included under both production and consumption accounts (“services” accounted for 40% of GDP under the consumption measure of GDP in 1997 and “government” for a further 18%). As Paul Krugman has pointed out, any changes to upgrade productivity growth in one part of the economy without offsetting declines elsewhere must have as a counterpart an increase in the growth rate of the economy as a whole. This makes everybody better off, but leaves income differentials unchanged.

In addition, only changes in the degree to which mis-measurement applies will affect growth rates. Griliches (1994) estimated that output from well measured sectors declined from 43% in 1959 to 30% in 1994. Most of this change comes from the rising share of services in total output. Kozicki points out that in spite of a good productivity performance the manufacturing contribution to productivity growth fell by 0.5 percentage point since 1972 because of the decline in share of manufacturing employment. She concludes “the interaction of the widening manufacturing-services productivity growth gap with shifts in employment shares of manufacturing and services accounted for most of the productivity growth slowdown”.

An important element in the productivity slowdown concerns the extent to which other countries also display similar slowdowns and the extent in particular to which

services are responsible for such a slowdown. Both Gordon and Kozicki provide data that shows that the productivity slowdown was general among leading developed countries and not confined to the US. However, in addition Gordon shows that contrary to the US the big drop in productivity in countries such as Japan, France, Germany and Italy occurred in manufacturing. The first three countries incurred only a modest slowdown in service sector productivity (private non-farm, non-mining, non-manufacturing). No satisfactory explanation can be provided for the collapse in Italian service sector productivity growth.

The UK represents a special case. By European standards, productivity growth had been slow prior to the first oil shock and collapsed, particularly in manufacturing, during the period 1973-1979. As is well-known, restrictive macro-economic policy at the beginning of the 1980s resulted in the loss of half of manufacturing output followed by an investment boom in the second half of the 1980s and a number of major reforms in both product and labour markets which raised growth in productivity in manufacturing to the highest level of any G7 country during the period 1979-1992. However, in spite of continued strong growth in the 1990s, the UK remains a low productivity country compared to all other leading developed countries (and indeed has currently been overtaken by Ireland). In services, no such recovery in productivity occurred and indeed the rate of growth continued to decline in 1979-1992 over 1973-1979 in spite of major reforms in product markets which essentially affected services, particularly telecommunications, financial services and public utilities. Given the similarity in UK and US employment performance over the recent past, this finding is significant.

General recourse to full double-deflation measures for service sector output growth and major differences in the accuracy with which certain service sectors are measured, particularly the financial sector (FIRE or Finance, Insurance and Real Estate in American terminology) and other market services (miscellaneous services in American terminology, sometimes just “service”) provide some explanation for the better performance of European and Japanese service sector performance. Further detail on US productivity is available from the National Income and Product Accounts (NIPA). The Bureau of Labour Statistics also provides data on a gross output per hour rather than value added per hour basis (for the detail of BLS productivity measures see Dean and Harper, 1998). From these sources the outstanding performance of the US telecommunications sector, and mixed results in transport and commerce and distribution can be observed. Retail establishments involved with food and drink (including restaurants and fast food outlets) had a poor productivity record.

Once again it is important to distinguish absolute levels from rates of growth. In Europe, average productivity in market services remains above that for manufacturing. Relative productivity in the service sector in the US only dipped below that of goods producing sectors in the 1980s (Griliches, 1992). On both sides of the Atlantic, services are not noticeably less capital intensive than goods. Rather the dichotomy within services between very capital intensive sectors (such as telecommunications, transport and financial services) and non-capital intensive sectors (such as many services to households) is appreciable.

Nor, contrary to popular belief, are services in general intrinsically non-tradable. All services can be traded by foreign investment and setting up a local presence, but the

narrow definition of trade equivalent to that of goods comprises the three categories of services that flow across borders (for instance packaged software), services for which the producer goes to the user but remains resident in the country of origin (many forms of consultancy) and services for which the consumer comes to the producer (typical of tourism). Measuring the degree of tradability of services implies that statistics on trade can be directly related to production (or at least gross output) rather than value added. In practice the lack of detail and imprecision of the data on trade and on services in the domestic economy make this a fairly hazardous exercise.

In the European statistical system, the input-output tables are the only source for consistent data on exports imports and production of services. From this source it can be seen that certain services (air and maritime transport) constitute the most traded of all sectors (with shares of imports and exports in domestic production above 50%). No goods producing industry comes even close to this level. Equally, certain services are hardly traded at all (health and education for example). Construction, a goods producing sector, represents the least traded of all market sectors (in spite of an internationally traded segment represented by major companies such as Bechtel and Bouygues). Compared with manufacturing industry, services remain characterised by their dualistic nature as either highly traded or not substantially traded. Using conventional levels of tradability observed in the manufacturing sector in the 5-20% range of domestic production and including those sectors such as telecommunications, where regulatory restrictions rather than technology have impeded trade, the share of tradable sectors in market services may be as high as 50%. Non-market or government services are by definition non-tradable.

Although for statistical purposes, services, defined as a residual, are placed after goods producing sectors, this does not reflect the flow of goods and services through the economy (European Commission, 1997). According to whether they are primarily sold to businesses as intermediate consumption or to individuals, services are to be found either at the beginning of the production process as primary inputs to the other sectors of the economy (producer services) or at the end of the production cycle (consumer or household services). The 1997 Gross Product by Industry tables (BEA 1998) show that for the US producer services as defined above accounted for 34.1% of GDP (up from 32.4% in 1992), 44.6% of services (including government) and 53.4% of private services. This is a higher share than for Europe, where producer services represent approximately 40% of market services. A small part of the difference concerns electric, gas and sanitary services (2.4% of US GDP), which are included under goods production in Europe as energy and water. Producer and consumer services contain both high and low productivity areas, sometimes within the same segment. For instance, market research and office cleaning are both business services. However, over the last twenty years producer services have grown faster than consumer services, in part because of outsourcing and in part because of changing structure of demand. They also contain many more high productivity segments.

The contribution of producer services to overall productivity growth is usually discounted because it is seen as a distributional problem. Productivity gains which are miscalculated for producer services are compensated for by offsetting corrections in the sectors they supply and do not affect final demand. Therefore, the argument goes, measurement defects do not affect the measurement of the overall performance of the

economy. Such an assessment seriously underestimates the significance of producer services for economic growth. Certain of these services have become of critical importance to the efficiency of the economy as a whole, particularly communications and information services.

Because of their situation at the beginning of the production cycle, many services are embodied in both goods and other services. To take a typical example from the automobile industry, a steel company will purchase producer services as part of the production and distribution process before delivery to the component manufacturer and assembler of finished vehicles, the component maker will purchase further services before delivery to the automobile manufacturer, which is also buying in services from the design stage right through to the delivery to the dealer, the dealer in turn will provide finance to prospective customers, usually by buying in financial services from a specialised finance house. Tracing the flow of such services through the input-output tables is a tricky business. In Europe, it takes 22 Euros to produce 100 Euros of manufacturing gross output and even 13 Euros to produce 100 Euros of consumer services. For all user industries the average is 19 Euros. Productivity growth in these industries therefore constitutes a key determinant for the growth of productivity in the economy as a whole.

Related to this issue is that of innovation, in particular the emerging digital economy. At least in the US, the goods producing side of the digital economy has been quite well addressed (Moulton, 1999 and Haltwinger and Jarmin, 1999). The service economy, particularly innovatory services using telecommunications infrastructure such as e-commerce rather than already well-established industries such as software, remains

under-reported. However, as Moulton points out the real issue concerns the extent to which the digital economy is transforming the efficiency of user industries, often referred to as the productivity paradox whereby the huge investment in new technologies does not produce results in terms of a rise in productivity for the economy as a whole (see for instance Carlson and Schweitzer, 1998).

Part of the explanation for the productivity paradox lies in the by now familiar measurement issues. Amongst the largest users of IT investments are the financial sector with its hard to measure output. It is not clear that productivity gains in the banking sector really show up as productivity gains for the rest of the economy. Because of the way much of banking output is measured as the difference between the interest rates paid and received, it could show up as fall in the cost of capital.

Between the introduction of new process technologies and their successful exploitation lies a time lag. At the beginning of the diffusion cycle, similar tasks are performed as before (for instance typewriters are replaced by word processors). Reorganisation of work is required before the potential of such innovations can be properly exploited (direct entry by authors replaces secretaries). Finally, new products are developed which could not have existed without the enabling technology (e-commerce, tele-banking). It is the third phase that really provides a pay-off to the economy rather than the first phase (mainly capital/labour substitution) or the second phase (cost cutting but without additional growth). The recent up-turn in US productivity gives some plausibility to its explanation, particularly since it comes at an unusual time when productivity growth could be expected to slow during the mature phase of an

exceptionally long expansion. The upturn remains both too recent (since 1996) and too short lived (only three years) to conclude that a new era of secular growth has dawned.

Comparisons of absolute productivity between different countries for the same sector are fraught with difficulty. A major source of difficulty lies in the measurement of real output which requires separate deflation of intermediate consumption and gross output for each industry and the construction of sector specific purchasing power parities. Some attempts with increasing success have been made with manufacturing (van Ark and Pilat, 1993). No such similar work has yet to be undertaken for services, in part because of the methodological problems for measuring domestic productivity levels, let alone international ones.

An alternative approach, valid for both manufacturing and services and for labour and capital productivity has been attempted by the McKinsey Global Institute (1992, 1993 and 1996). Essentially this approach goes back to the early days of productivity measurement and attempts to construct sector specific indicators of physical output to which various inputs can be related. Conceptually, this approach is much closer to the BLS approach of using gross output than the value added approach of national accounts. In addition the various measures of output are not comparable between sectors so that no attempt at aggregation can be made. Nevertheless, the approach yields interesting results. Not only does the US lead the world in productivity over all, but also its lead is at least as great for services than for manufacturing and higher for capital than for labour. This puts the slow growth in US service sector productivity in a different light and explains how other countries can exhibit much higher growth in a period of catch-up.

Ambiguity in the concept of productivity, or at least what is being measured, can also bias substantially the discussion. Measuring productivity by physical units of output, for instance pizzas per person per hour, may give a different image from value added per hour among pizza producers. Value added includes a relative price and quality element that physical output measures ignore. In terms of economic value of a transaction, this is clearly preferable. If, however, the difference in what is measured comes from different capacity to extract rents from suppliers or consumers, then the level of productivity measured by value added per hour (or by unit of capital) may actually be in some sense fictitious.

Following its lead in developing assembly line manufacture for low skilled workers, which had flooded into the US during the period of very high immigration prior to World War One, the US also led the world in developing standardised “industrial” type services, typified by fast food outlets and supermarkets, for the growing number of domestically produced low skilled workers in the period after World War Two. These workers can not be considered “unproductive” in a physical output sense. However, labour and product market demand and supply conditions may mean that this higher physical productivity shows up in the form of lower prices to consumers (which increases real incomes for the population at large) rather than in wages for employees of the sector in question. Lower prices are likely to lead to a larger sector with much greater employment than ones in which prices and wages are kept high.

The McKinsey study on Removing Barriers to Growth and Employment in France and Germany (1997) goes into this issue in some detail for the retail sector. The two European countries, particularly France, had better developed large efficient formats such

as mass merchandisers and large-scale specialized chains than the US, less modern high-service formats (speciality chains) and a high market share for traditional stores. In spite of differences in format mix and levels of service, overall productivity of the retail sector was quite comparable across the three countries. Instead the differences mainly concerned employment.

After adjustment for hours worked, the US retail sector has 52% and 46% more input than France and the former West Germany respectively. Since 1973, the US retail sector created eight jobs per thousand working age population whereas former West Germany destroyed one and France destroyed four. The employment gaps were ascribed to three factors: fewer goods purchased than in the US, fewer hours worked in comparable format in France and former West Germany than the in the US, fewer hours worked due to less labour-intensive formats in France and former West Germany than in the US. High cost of low skilled labour combined with restrictions on opening times and zoning laws acted to dampen employment growth.

Apart from the case of Italy mentioned above, a consistent story can be pieced together from the sectoral output and productivity figures from this section and the macro figures presented in section I. Although the productivity slowdown after the first oil shock was general, in part it stemmed from different causes on both sides of the Atlantic (and Pacific). The long period of high growth in productivity in both goods and service producing industries associated with post-World War II reconstruction and catch up built on strong export-led growth came to a halt in continental Europe and Japan, brought on by the deflationary impact on world trade of the first oil shock. A rebound occurred in the latter part of the seventies before the second oil shock and again the middle eighties,

characterised by the investment boom in Europe and bubble economy in Japan⁷. During the nineties, these easy sources of productivity growth had been almost played out while structural rigidities and the effects of German reunification (in Europe) and difficulties with overcoming the financial consequences of the bubble economy (in Japan) led to a prolonged period of slow growth and weak recovery from the recession of the beginning of the decade.

Service sector productivity in continental Europe continued to grow apace as a result of substantial capital/labour substitution brought on by downwardly sticky wages and less pressure of increased supply of labour. Compared with the US (and subsequently the UK) more of the investment went into efficiency raising measures and less into the development of new products and reconversion from slow-growing to growth industries. Apparent productivity growth therefore exceeded true productivity growth by a considerable margin. This holds not just for labour productivity but also for total factor productivity. Essentially, the possibility to obtain further growth by employing the less productive was limited at the expense of the economy as a whole.

In the US (and the UK from the eighties), the productivity slowdown largely occurred in services and is associated with high employment growth. Although absolute productivity levels between the two countries remain at opposite parts of the spectrum of developed countries, in both cases flexible labour markets acted to absorb new entrants or the unemployed in low productivity segments of the economy which were not exposed to international competition. This did not prevent considerable growth taking place in high productivity service industries, particularly public infrastructure services, financial

⁷ Strictly speaking the periods considered go from cyclical peak to peak, so that the seventies refers to the

services and high level business services, including but not restricted to information services. The balance between high and low productivity growth sectors is largely determined by a race between labour supply on the one hand and the speed of sectoral adjustment brought on in particular by the growing application of innovations brought about by the information revolution on the other.

VII. Explanations for income disparities from developments in labour supply

The supply-demand-institutions paradigm developed by Borjas, Freeman and Katz remains the most convincing theoretical basis for identifying the causes of growing income inequality since it allows for multiple causation and feedback mechanisms. By adding the institutional dimension, the framework can also help explain why similar developments throughout the developed world (often confused with the global economy) can lead to different outcomes. In terms of US developments, a satisfactory explanation must be able to show why, in spite of a productivity slowdown beginning about 1973, earnings and income inequality only began to rise significantly during the 1980s and why rising inequality continued into the 1990s in spite of major changes in the composition of the workforce and an exceptionally tight labour market that could have been expected to lead to a narrowing of differentials in earnings and also in incomes (Motley, 1997). In terms of European developments, a satisfactory explanation must be able to show why the employment rate fell and unemployment increased in spite of weak supply side pressure – at least compared to the US.

Because of its significance in the current debate, this and subsequent sections will concentrate on possible causes for widening US inequality, calling on European

period 1973-79, the eighties to 1979-1989 and the nineties from 1989 to the present day.

experience where appropriate to illuminate certain issues. Although most attention in the literature on the growth of US inequality has been focused on the demand side, it would be more reasonable to begin with the supply side and institutional mechanisms since the current state of international economic integration should have led to similar pressure from demand factors on both sides of the Atlantic.

As illustrated in sections II and VI, the most significant difference in performance between the US and Europe has been the major increase in US employment rather than any difference in overall growth or, once correctly specified, productivity. An increase in employment through supply side pressures inducing a demand side reaction through the setting of a market clearing wage level could be sufficient to account for slow growth in average earnings. It should not necessarily lead to increasing disparity in earnings. For that it is necessary to turn to the composition of respectively supply and demand. In practice, it is not always easy to separate the two and this section will begin with developments in the size and composition of labour supply while anticipating some of the elements of the discussion of demand developments in the next sections.

Ho and Jorgenson (1998) have made an extensive analysis of the volume and quality of the US labour force over a long period for the purpose of correctly specifying the labour input used in the analysis of productivity. However, their work can also be used in the current context. They divide the growth of labour as an input into two parts: hours worked and quality. The measures used to calculate quality reflect characteristics of individual workers such as age, sex and education as well as class of employment (employee or self-employed) and industry of origin. Industry of origin did not prove a

discriminating factor in evaluating quality and was subsequently dropped (Valleta, 1997 found similar results for the impact of industry structure on the distribution of earnings).

As a proxy for quality, Ho and Jorgenson essentially take labour compensation as an acceptable approximation of the value that the market places on quality (this ignores the issue of market power). Because young persons and women earn less, on average, than prime age males and the self-employed earn less than employees, the quality adjusted index will fall when the share of these categories in the labour force increases. A contrario, for all categories of workers by age and sex, higher educational achievement translates into higher earnings and a labour force with higher educational attainment will also be corrected upwards for quality as will one with a higher proportion in prime earning age classes.

By modifying the composition of the labour force, an increase in the rate of growth of the labour supply for women, young people and the self-employed could be expected to depress earnings and widen inequality. An increase in the growth of employees, prime age workers and the better educated could be expected to raise earnings and lessen inequality. Clearly different trends, for instance for rising female participation and increasing numbers of young people can co-exist with rising educational achievement, so that the net effect may be much less than the component elements. In the case of the US, the contribution of these other components of the labour force provides an important corrective to the data on rising numbers of college graduates, which could have been expected to erode the premium to education over time.

In terms of their impact on earnings inequality, these figures need to be tempered by the developments over time in the labour compensation differentials. Since the

differential between males and females has diminished over time, the impact on earnings disparities will be less than the increase in female participation would lead one to suppose. Equally, the premium to age and education has widened significantly so that a rising share of the educated and prime age workers will accentuate the natural tendency towards earnings inequality.

Overall, Ho and Jorgenson found that:

“Growth in labour input can be divided between the increase in hours and improvement in the quality of those hours. Quality improvements accounted for forty percent of labor input growth through 1968, but largely disappeared between 1968 and 1979, as a consequence of the absorption of postwar “baby boom” age cohorts into the work force. Increases in quality have resumed during the 1980’s. Almost all of the trend in labor quality improvement can be attributed to the rise in average levels of educational attainment. These trends will continue well into the next century.”

In order for labour supply developments to provide a convincing contribution to the widening of US inequality in earnings, the timing of changes in composition should match those of changes in inequality (allowing for the possibility of some lags). The overall conclusions cited above at first sight do not provide such confirmation. Labour quality fell at the same time as inequality in the seventies and rose in the 1980s along with widening inequality. Further examination is required to disentangle the possible effects of development in labour supply on rising US inequality of earnings.

Table 3 sets out the results in more detail. The increase in the number of hours worked in all cases represented the major part of the increase in labour input as calculated

by Ho and Jorgenson. The acceleration in the growth of the number of hours worked constitutes the most marked feature of the post-war period (with the exception of 1979-85 market by the exceptionally deep recession of the early eighties). Marked variations in the rate of growth of overall labour quality also occurred, with no clear trend line. Since 1973, however the increase in quality of the labour force has been expanding at an accelerating pace from the historically low point reached during the period 1968-73, without approaching the rate of increase in quality achieved during the period 1948-68.

Until 1985 rising female participation acted to depress the measured improvement in quality at an accelerating pace, whereafter its contribution declined as further gains became more difficult. Overall, female participation can be expected to have widened earnings disparities significantly in the period 1973-85, but much less so over the most recent period. A rising share of employees in total employment provided a boost to labour quality in the early post-war years, but its overall impact has been negligible since 1973. The arrival of the baby boom generation in the 1970s should have had the effect of further widening disparities. However, the particularly high proportion of college educated young people entering the workforce in that decade meant that this impact was offset by rising educational quality.

By the 1980s, the baby boomers were entering prime earning age categories and the cumulative effect of successively higher proportion of young college educated people raised the educational level of the workforce substantially. The increasing premiums to age and education would have acted to raise earnings disparities even though the impact of the age distribution should have been to lower them. During the nineties the impact of changes in composition of the labour force lessened and earnings disparities could have

been expected to decline somewhat. Clearly, changes in the composition of the labour force have been offsetting in certain instances and reinforcing one another in others. During the 1970s, offsetting tendencies appear to have predominated while in the 1980s they came together to reinforce one another.

The major part of the riddle concerns the impact of education on earnings disparities. Katz (1999) has shown that the college/ high school wage differential narrowed in the forties, widened in the fifties and sixties before narrowing in the seventies and then widening again in the eighties and to a further small degree in the nineties. He also shows that relative demand growth for the educated has been high since the 1950s accelerating somewhat in the 1980s, but declining sharply thereafter. That earnings differentials should rise as a result of changes in relative demand (although the sources of such a rise need to be better specified) can not be considered surprising. Rather, it is the lack of supply side response to such a rise in the form of an increase in the numbers of educated workers. Indeed Katz concludes “A comparison of the period of large increase in the college wage premium from 1980-98 with the period of little change from 1960-80 suggests a deceleration in relative supply growth is more important than an acceleration in relative demand growth in explaining the recent expansion of educational wage differentials.”

This finding is at odds with the estimates of Ho and Jorgenson, which cover all levels of educational attainment, including the highest level with five or more years of college education, and which point to a large increase in the average educational attainment of the workforce at precisely the time when differentials were widening most in the 1980s. Indeed the share of college educated workers is now more than a quarter of

the total labour force (fig. 11). Katz also has the relative supply of college educated workers increasingly substantially, but he place the biggest increase in the seventies with a sharp deceleration in the rate of increase in the eighties and a similar increase in the nineties. Where does the discrepancy come from?

There are two possible sources of explanation. The first concerns age specific educational attainments. Since the beginning of the 1980s the distribution of the age group 25-34 with college degrees has been stable, implying that the proportion of young people who now complete college is stable. Combined with a fall off in the number of young people entering the work force in the 1980s, it is clear that the number of young persons with college degrees also declined relative to the 1970s. All of the increase in educational attainment came from the working through the labour force of previous cohorts with rising qualifications and the retirement of older cohorts with lower levels of attainment. This implies that for the first time new entrants to the labour force would not have enjoyed an education premium over their seniors. Rising educational attainment for young people in the seventies had compensated for their lower age-related earnings, but young people entering the work force in the eighties could not expect to enjoy such a boost relative to prime age workers.

A second type of explanation concerns the relative development of the volume of labour input as traditionally measured by number of hours worked and educational attainment (fig. 12). Over most of the post-war period, educational attainment was rising faster than the number of hours worked. During a short period, corresponding to the recovery from the recession of the early 1980s up to the onset of the recession of the early nineties the two were proceeding in parallel. In other words the rise in number of

hours was concentrated in the late eighties at a time when the increase in the growth of educational attainment was falling. This translated into particularly strong labour supply pressure on the part of those with low educational attainment and, in a context of market clearing wages set on flexible labour markets, very low growth in earnings at the bottom of the scale.

More support for the significance of labour supply developments in determining developments in earning differentials in the face of similar demand and institutional structures can be found in a comparison of the contrasting US and Canadian experience. Murphy, Riddell and Romer (1998) found that the variation in the college graduate premium, which rose sharply in the US and fell slightly in Canada in the 1980s and 1990s, can be explained by the higher Canadian increase in supply of educated workers during the relevant period.

A related issue with regard to the composition of labour supply with relevance to the treatment of skill-biased technical change in the following section concerns the definition of skills. The US literature on wage inequality treats skills as essentially a dualistic process of the skilled versus the unskilled (for instance Davis and Reeve, 1997). Skills are further defined exclusively with reference to levels of education and ignore training. This literature also makes no distinction between capacity to do a job and the educational level required, irrespective of whether that education is general or vocational.

The dualistic structure of the US education system has attracted some attention. In particular, the collapse in educational standards and the degree to which high school graduates and drop outs compare to their peers in other countries has become a public policy issue. International surveys of basic literacy and numeracy provide the basic data

for this discussion, although the reliability of this data should be questioned. Such surveys for instance indicate that 21% of US citizens are unable to interpret a weather chart in a newspaper. High school leavers barely perform better than the population at large (18.4% of those had completed upper secondary education in the US were unable to interpret a weather chart compared with 4.1% in Germany, 2.7% in the Netherlands and 4.8% in Sweden).

Deficiencies in basic educational achievement have a knock-on effect on skill acquisition, since the quantity of in-house training provided by firms rises with educational attainment. In the absence of a sufficient level of basic literacy and numeracy either training is not provided or resources will need to be devoted to providing remedial courses in these areas before going on to train staff in productivity and earning enhancing skills. The widening contrast between educated US college graduates and the rest of the population with increasingly weak general skills could be expected to widen earnings inequality.

Differences in the nature of skills generation systems constitute an important underlying factor behind widening earnings differentials in the US (and the UK) compared to those in some European countries. Following the human capital literature associated with Gary Becker, skills are defined as general or specific. Firm specific skills will be developed by on-the-job training, because the employer can be fairly sure of reaping the benefits in terms of higher productivity or better quality products over the subsequent period of employment. General human capital involves skills that are of equal value in many different organisations. The individual may be expected to invest in

acquiring general skills if the net present value of the discounted increment in earnings over the working life exceeds the acquisition expense of those skills.

In practice, the US skills development process closely resembles the Becker paradigm. General skills are acquired externally through the educational system, which is heavily oriented towards very general knowledge, and paid for by the individual with a contribution from the state. At the higher levels, a vocational element appears at graduate schools with either a general orientation (the MBA) or a specific one (Law Schools, Schools of Medicine). Lower level vocational skills are dispensed by community colleges, which increasingly are perceived as highly inferior substitutes for the general education dispensed by universities in four-year degree programmes. Extensive remedial teaching in basic numeracy and literacy are common requirements for entrants to community colleges to enable them to follow courses, making these institutions as much a source of basic educational attributes that schools have failed to provide as a specific skills development venue.

As Booth and Snower (1996) point out, the US and similar systems of skill development lead to a market failure for a third category of skill known in Europe as transferable skills (to the extent that they exist these skills are known rather quaintly in American terminology as “craft”). These skills are common to several enterprises but not widely generic throughout the economy. Often they will be industry specific, but sometimes they may be common to several industries without covering the whole of the economy. Computer programming represents an example of a true general skill usable throughout the economy. The ability to operate and programme numerically controlled machine tools would be an example of a transferable rather than a general skill. Using a

company specific pay-roll programme would be a specific skill valuable only to that particular company.

The market failure associated with transferable skills concerns the ability of outside firms to poach employees who have acquired them from their current employer. This restricts the incentive for the employer to invest in such training. In order for the individual to be willing to invest in it, the returns must be verifiable. Lynch and Black (1995) show that the acquisition of a qualification which has been validated by an outside organisation are required if the employee is to receive benefit from acquiring such skills. Not only does the US system not provide any incentives for the employer to develop transferable skills, but also the absence of a national system of recognised vocational qualifications also takes away the incentive for the employee to invest in their acquisition, even though the benefits in terms of increased productivity are in fact substantial. Evaluations of displaced worker programmes also indicate that, lacking transferable skills, workers usually suffer a loss in earnings on re-employment (Kodrzycki, 1996 and 1997, Decker and Corson, 1995, Clark, Herzog and Schlottmann, 1998).

Studies of matched manufacturing plants in the US and Germany show differing skill compositions. The US plant uses a higher proportion of engineers and other highly educated employees employed in a supervisory capacity and many more unskilled workers undertaking routine tasks than those in Germany, where the bulk of the workforce is made up of skilled workers enjoying considerable autonomy in the workplace. In the US, highly educated personnel complements unskilled workers, while in Germany the skilled workers substitute to a large extent both unskilled and highly

educated ones. It is to be expected that the German situation would generate a narrower earnings distribution than the US one. In particular, the lack of a wide base of workers with transferable skills in the US may contribute to the polarisation of earnings and the phenomenon of the “vanishing middle”.

The process by which these different outcomes arose can not be established. Causality beginning with labour supply would posit that the presence of a large force of unskilled workers available at low cost for manufacturing and services in the US drove that country to find productive uses for them by applying substantial quantities of highly educated ones to the productive system. Causality beginning with the skill generation process would identify the difficulty of finding skilled workers in the German sense as forcing this evolution.

Standard presentations of supply and demand and their impact on relative wages implicitly adopted a model of two skills (high and low) and two sectors (tradable and non-tradable). Following the preceding discussion, it would be preferable to specify a three skill, three sector model. In such a specification low skilled workers, skilled workers and highly educated ones would operate with different combinations in three sectors:

- differentiated products, covering most of manufacturing;
- very high value added activities, concentrated in producer services but with some extension to consumer services such as audio-visual services, sports, higher education and portions of the health sector;

- low value added activities, concentrated in proximity services to households and other very labour intensive activities such as loading baggage in airports.

Differentiated products are typified in Europe by a very high content in skilled workers and in the US by a high content of both highly educated and unskilled workers. High value added activities display high content of highly educated workers. Low value added activities display a high content of low skilled workers, combined in Europe with medium content of skilled workers and in the US a medium content of highly educated ones.

Finally, the impact of immigration on labour supply and wage differentials has attracted some attention (Borjas, Freeman and Katz, 1997). Immigration, trade and direct investment are related phenomena and in a fully consistent treatment should be taken together. However, immigration is a pure labour supply issue, while trade and investment act on both supply and demand. For this reason they will be kept separate at this stage for ease of exposition later. In addition, immigration acts directly on the wages of workers in non-traded products. Since low-paid workers are concentrated in parts of the locality based service economy, this represents a significant difference. The potential for immigration as a source of rising inequality in US earnings can also be deduced by analogy from the previous period of heightened international economic integration before World War I. Williamson (1998) has shown that immigration was a substantial factor then making US real wages 9% lower than they would have been in the absence of immigration, widening differentials within the US but lowering them between the US and the countries which supplied the immigrants.

As pointed out by Borjas et al., the effect of immigration on wage differentials depends on the distribution of skills brought by immigrants compared to those of the domestically born population. Only if the two distributions are different will they affect relative wages. If immigrants are less skilled than the domestically born population, this will increase the skill premium by bidding down wages at the low end.

Following changes in the Immigration and Nationality Act in 1965, legal immigration increased essentially from those with the lowest levels of educational attainment, although those with the highest levels also increased substantially. Overall, the effect of immigration was to increase the supply of poorly educated workers in the economy. In this the US experience differed from that of Canada, which continued to maintain an immigration policy favouring the highly skilled. In view of their levels of educational, it is perhaps not surprising that immigrants concentrate disproportionately in occupations requiring the least skill, including domestic service, and in agriculture, manufacturing and trade. In terms of the impact on wage differentials, Borjas et al. find that they are highly localised:

“We conclude that the immigrant-induced increases in relative labor supply are strongly concentrated on US workers with fewer than twelve years of schooling and that the slowdown in the rate of decline of the relative supply of dropouts due to unskilled immigration may explain a sizable fraction of the decline in the earnings of dropouts relative to those with twelve or more years of schooling over the period 1980-95. In contrast, the immigrant supply contribution for a broader group of less educated workers is too small to account for even 10% of the sharp growth in the college-high school wage differential during this period.”

The fact that the impact of immigration is concentrated on the lowest end of the wage distribution nevertheless means that it has had a disproportionate effect on widening the extreme forms of earnings inequality. The overall modest impact is consistent with experience in the UK, which saw a very substantial widening in earnings inequality during a period of negligible immigration, implying that other factors are more important.

When replying to the question addressed in this paper of whether changes in European labour market regulations towards the American model could be expected to lead to dramatically widening income inequality, developments in the volume and composition of labour supply provide mixed evidence. Volume increases in labour supply have been much greater in the US than in Europe, with Canada occupying a middle position. Both demographic developments, with very large numbers of young people entering the labour market and low numbers of those taking retirement, and immigration played a rôle. Increases in female participation also added to labour supply, although it is not clear that this increase has been more significant in the US than in Europe. Pressures from an increase in the volume of labour supplied could be expected to depress average earnings rather than widen the distribution. The operation of a filter down effect, by which the more qualified take jobs below those to which their level of qualification would entitle them, might exercise a disproportionate effect on those at the bottom of the earnings distribution. Evidence from the UK, with similar institutional and product market frameworks as the US, but much lower supply pressure, would suggest that other factors are more important, since a similar widening in earnings disparities occurred.

Changes in the composition of the labour force do seem to play a major rôle in determining outcomes with regard to earnings inequality. In Canada, differences in the composition of labour supply, specifically the level of educational attainment of new entrants, appear to have played the major rôle in holding down the growth of earnings inequality. Education and skill levels of the workforce therefore appear to hold the key to the impact of labour supply developments on earnings inequality.

Although major institutional differences in education and training systems can be observed between the US and European countries, there is no objective method to measure these differences. Using observed compensation differentials leads to a circular argument by which differences in skill and earnings are each considered to explain the other. From the institutional structures, it remains clear that the US produces a higher proportion than Europe of those with a high level of general education (college graduates), with Canada and the UK also following this path. It is also clear that compared to some but not all European countries, the average level of skill with those without a college education is much lower in the US. Finally, there is some evidence that basic educational standards differ and are noticeably deficient for the part of the US labour force that did not go to college, particularly among recent entrants.

These differences in structure can be expected to lead to a higher level of earnings inequality in the US than in Europe, although with marked differences from country to country. Countries such as Germany with a sound basic educational system and highly developed vocational training in transferable skills can expect the least increase in inequality from labour market reform. Countries such as France, with a sound basic educational system, but a deficient basic vocational training system in part compensated

by a developed system for ongoing training, can expect to see earnings inequality widen more than in the case of Germany but less than in the case of the US. The relative importance of basic educational attainment and vocational training as determinants of outcomes will be important here along with the price elasticities of supply and demand for unskilled labour in Europe as the wage drops towards market clearing levels.

VIII. Explanations for income disparities from developments in demand: skill biased technical change

Skill biased technical change has become the current favourite among both economists and policy makers to account for the growing disparity in earnings. Technical change is perceived as an exogenous force and one that brings with it positive effects in terms of productivity and growth. Unlike trade and investment or the liberalisation of product markets, technical change can not be immediately and directly related to policy changes made during the last two decades to improve the functioning of the economy after the two oil shocks. It therefore appears as policy neutral in causation. In addition, it naturally calls for the development of flanking policies to correct the unwanted side effects of an otherwise positive development. For policy makers starved of new initiatives by the progressive liberalisation of the economy and withdrawal of government from direct intervention, this brings an added bonus. Like all convenient explanations, it needs to be subjected to rigorous appraisal.

Fig. 13 shows in diagrammatic form the consequences of a rise in demand for skilled workers relative to unskilled ones. An outward shift in the demand curve leads to an increase in the relative wage from R^* to R^{**} and increase in relative employment from E^* to E^{**} . Therefore, both an increase in relative wage and an increase in relative employment must be effective simultaneously for skilled biased technical change to

operate. The figures for relative wages of college graduates by Katz in table 4, as well as those from Ellwood and other authors all point to a widening in the relative wage according to level of education. The first condition for skilled biased technical change is therefore met. The portion of the US labour force with some college education rose from 26% in 1970 to 37% in 1980, 46% in 1990 and 51% in 1995 (fig. 11). The equivalent figures for those having completed four or more years of college education are 13%, 19%, 25% and 27%. While there were 2.8 workers with no college education for every worker with some college education in 1970, by 1995 there was one worker with some college education for every one without any. The second condition for skilled biased technical change that the relative employment of the skilled compared with the unskilled should rise has therefore also been met.

A third condition concerns the rate of change of the skill bias. In order to account for a radical increase in earnings inequality, beginning at a specific point in time and continuing over a fifteen year period, the intensity of change must be both substantial and demonstrate a marked acceleration around the point at which inequality began to rise. On the contrary, the figures in table 4 indicate a clear secular trend with a certain amount of variation. The rate of change in relative demand for college graduates is estimated by Katz to have accelerated by 18% in the eighties compared with the seventies, but then to have decelerated by 40% in the nineties. For the whole period 1980-98, the rate of change falls slightly below that of the seventies. It should be emphasised that relative demand shifts can only be calculated as a residual from the relative wage and supply data and under certain assumptions about elasticities. Like any residual it is subject to error from any mis-specification in the other variables or in the implied elasticities. In order to

confirm or infirm the hypothesis of skill biased technical change, direct, measurable evidence must be produced. In particular, evidence on the acceleration in the rate of diffusion or uptake of technical change rather than innovation per se and a very low elasticity of substitution between skilled and unskilled labour would be required.

A second major objection to the thesis of a demand shift origin for increasing inequality has already been made. Such a major shift could be expected to induce a supply side response (Bishop, 1996). Rising college premia raise the rate of return on a college education, which should induce a higher proportion of young people to enter higher education or spend more years therein. A simultaneous supply and demand shift for more educated workers increases relative employment in fig. 14 still further from E1 to E4, instead of from E1 to E2 in the demand shift hypothesis. At the same time, it dampens the rise in relative wage from R1 to R4 instead of from R1 to R2 in the example.

The exact outcome will depend on the relative intensity of the shifts in supply and demand, but the stronger the demand shift the stronger also the incentive for supply to increase in response. In the short term, supply can evidently not increase substantially because it requires a long-term investment, so that wage differentials could be expected to cycle first from R1 to R2 before falling back subsequently to R4. Over a fifteen year period, such a supply response could be expected. Instead, the smaller cohort of those of college age and the high number of non-completions have kept the share of recent college graduates stable, suggesting that the supply response to changing demand rather than the implicit skill bias of technical change has dominated the recent rise in earning inequality.

Technical change may not necessarily be skill biased, even when it is labour saving (Cappelli, 1996). In terms of a three level skill and sector model, changes in the organisation of labour intensive service sectors in the US has been biased towards the unskilled and highly educated and against the skilled. Changes in manufacturing organisation, based around Japanese models of just-in-time and continuous quality improvement, have been shown to have a skilled labour bias in terms of the three skill level model. Their main effect, however, has been labour economising. General managers, plant supervisors and blue collar workers are alike affected but because of the larger numbers involved the main cuts have fallen on blue collar workers, whether unskilled or skilled. As a result, the move towards high performance work places (a synonym for production level reorganisation of work) does not appear to have led to increased earnings for the remaining production workers (Handel, 1999).

A second type of evidence for skill biased technical change in manufacturing comes from the rising proportion of non-production workers throughout the OECD (Berman, Bound and Machin, 1998). The bias was considered pervasive because it incurred within industries rather than between industries. A rise in the share of non-production workers may be produced either by a decline in the number of production workers or by a rise in the number of non-production workers. Lowering the period between the introduction of new models of automobiles from seven years to four years requires a corresponding decrease in development time from five years to less than three years. CAD/CAM and computer simulation can help improve the productivity of designers, but the whole chain from design, through engineering, the planning of new production processes and marketing leads to an increase in the number of highly educated

non-production workers required. Rising numbers of off-floor design and sales staff make non-production workers a complement to production workers, while organisational change in production makes skilled workers a substitute for non-skilled ones.

In terms of the impact on earnings inequality, the issue of whether different categories of workers are complements or substitutes is crucial. When the different categories are substitutes increasing demand for one category will inevitably lower the earnings of the other categories. In terms of policy responses, increasing the relative provision of skills of the category in demand will also increase the earnings of the other categories. In the case of skill-biased technical change, improving skills of the workforce will also raise the wage of the unskilled.

When different skill categories are complements, the impact is neither as direct or as straightforward. Increasing the number of designers or marketing professionals in an automobile plant does not reduce the number of assembly workers required to produce a vehicle. The development of the relative earnings of production to non-production workers will more likely be influenced by the productivity gains to be made on the shop floor and the market power of those that represent them in wage discussions than skill biased technical change. From the argument developed in section VI, it would appear that developments in shop floor productivity and the degree of substitutability of unskilled labour across sectors have been significant in influencing the decline of the relative wage of production workers.

Machin and Van Reenen (1998) found that the share of highly educated workers rose in all the countries they studied, but particularly in the US, and relate the changes to

rising R&D intensities. However, they also make two points that seriously question the validity of the results:

“We cannot deduce the full effect of technology on labor market structure without also closing the model by looking at supply side effects and the nonmanufacturing sector, which is beyond the scope of this paper;

In common with most of the existing literature, we have so far taken technical change to be exogenous. This may be a problematic assumption. If firms expect skills to be growing at a particularly fast rate in their sector, it may be less costly for them to adopt new technologies and perform more R&D.”

Concerning the exogeneity or endogeneity of skill-biased technical change, Chennells and Van Reenen (1996) address this issue based on experience in the United Kingdom. By modelling simultaneously technology and wages, their results appear to show that the technology-earnings relationship does not appear to be driven primarily by the effects of new technologies on earnings.

Ignoring the point on the supply side which has already been covered, the effect of skill biased technical change in the manufacturing sector might be expected to release unskilled workers to the service sector, under-bidding existing workers in that sector and driving down the wage of the unskilled everywhere. However, rising productivity in manufacturing can be expected to lower the price of goods thus raising real incomes in the rest of the economy, particularly for the low paid, who are goods rather than service intensive purchasers (the income elasticity demand for services is highly positive). Overall, the fall in the price of goods is likely to raise demand for services so that it is impossible to state with any degree of certainty what the equilibrium wage for the low-

skilled will be in the economy after adjustments have been completed. It should be observed that the release of huge quantities of low skilled workers from agriculture⁸ did not give rise to an increase in wage inequality or a fall in the wages of the low-skilled, even though technical change in agriculture was also skill-biased.

Few analyses of skill biased technical change have been made of the service sector. Increasing demand for high valued services with very high content of college educated workers, associated with growing intangible content of the economy and the outsourcing of many key producer services to specialised suppliers, has clearly been a major development. Whether this constitutes skill biased technical change becomes essentially a question of semantics. This increase in demand can be expected to have raised the returns to college educated workers in value added services, since possibilities to substitute with lower educated workers are low (in spite of the growing numbers of para-medics and para-legals).

The development of low-value added “industrialised” services in the US created large numbers of jobs for the unskilled as well as some jobs for the highly educated. Therefore, the impact of skill biased technical change on earnings inequality at the level of the lowest skill categories largely depends on the relative intensity and the timing of organisational change in manufacturing and labour intensive services. The overall impact on earnings inequality also needs to take into account the effect of the development in value added services on raising earnings of college graduates. Manufacturing industry contributed only 17% to US GDP in 1997 against at least 21% for labour intensive proximity services (the degree of detail available does not allow an accurate breakdown

⁸ Labour input into farming decreased by 3.93% per annum during the period 1950-70 after even steeper

into high and low value added local services) and 34% for producer services. From these data, some idea of the relative strength of the different contributions can be gleaned.

A different strand of the skill bias literature looks at the direct impact of specific technologies on the wages of those that use them. Krueger (1993) in particular looked at the impact of computer usage to conclude that it had a positive impact on the earnings of users. Katz (1999) points out that the direct substitution of computers for human judgement and labour is likely to have been more important in clerical and production jobs than in managerial and professional ones. For managers and other problem solving activities, computers are more likely to be complementary than substitutes. Thus computers could drive wider earning differentials both through a decreased demand for the low skilled and enhanced demand for the highly educated. This represents a variant on the observed relationship that capital and skill labour tend to be complementary, but that capital and non-skilled labour are substitutes.

Empirical support for this hypothesis comes from a recent micro-study of 303 US bank branches by Hunter and Lafkas (1999). They found that IT which improves the quality of organisational information and work practices that increase the importance of discretionary effort are associated with significantly higher earnings than are IT used to automate basic tasks and more restrictive work practices.

A key problem with direct measures of skill-biased technical change remains the issue of timing. If, as seems likely, the pay-off to investment in new technologies takes time, the largest increases in the returns to skills should have taken place in the nineties, when firm evidence for productivity enhancing effects first became available. Instead,

declines in previous decades.

over the most recent years since 1996, the upsurge in productivity has been associated with rising wages for the low skilled and falling inequality in earnings.

A final, little observed effect of technology on earnings inequality concerns rising differentials within similar educational and occupational categories. The largest gains and highest earners are to be found among a select group of entertainers, sportsmen and women and CEOs. The average National Basketball Association salary was \$2.6 million in 1998. The minimum salary for a NBA rookie was \$287,500. Even the lower figure represents a sizeable sum, but it would not be correct to conclude that all basketball players earn big money. In practice, such sums are paid only to the small fraction of talented players who make it to the NBA. The NBA is able to pay its players so well because of broadcast rights. Tickets sold to spectators could never generate such income. The basketball player is an example of a wider phenomenon identified by Shapiro and Varian (1999). They show that the effect of network economies is to raise the fixed cost of information acquisition, but to lower its marginal cost. It costs virtually nothing to diffuse information over the Internet, to press a CD or broadcast a live or recorded sports event. However, the maximum audience or sales are reached only by employing the most gifted stars, so that these earn huge salaries but the second or third tier members of these professions see their relative earnings fall sharply.

Bearing in mind the differing skill compositions of the US and European workforces and the questionable extent to which skill biased technical change has really contributed to growing US earnings inequality, it appears unlikely that changes in labour market institutions would lead to a widening of earnings inequality for low wage earners in Europe. Increasing demand for high value added services has been a common feature

of both the US and Europe, but the speed of change has been faster in the US. Most of the effect on earnings inequality in Europe should already have taken place, but a further substantial impact can not be excluded.

IX Explanations for income disparities: international trade and investment

Because of its power to induce emotive responses in the public mind, and the exploitation of that power in the political realm by such figures as Ross Perot (“giant sucking sound”) or the late Sir James Goldsmith (“The Trap”), trade with developing countries and its impact on job creation and income inequality became an important issue for economists. That trade can create widening disparities is not in dispute. A long tradition of international trade theory based on comparative advantage and factor price equalisation culminating in the Stolper-Samuelson (1941) demonstration show that this is a real possibility.

Trade raises the relative price of exported products and lowers the relative price of imported products. A country exporting skill intensive goods should see the returns to skills rise and the returns to those producing unskilled goods fall. Freer trade with developing countries could reduce the wages of unskilled workers in developed countries while raising the wages of skilled workers. In addition, under the standard Heckscher-Ohlin model, factor price equalisation can take place through trade instead of through the international movement of labour and capital.

Trade acts on both the supply and demand for labour. It raises demand by increasing returns on those products for which a country has a comparative advantage. It raises supply by expanding the pool of available supply to those countries which are abundant in labour but deficient in capital. Trade economists have tended to evaluate the

impact of trade on wages by applying the Stolper-Samuelson theorem (for instance Lawrence and Slaughter, 1993). They analyse the extent to which there is convergence in prices of products with different factor contents (upwards in the case of skill intensive goods and downwards for unskilled intensive goods for developed countries). Labour market economists (for instance Freeman, 1995) have tended to apply the factor proportions theory and attempt to derive directly from trade data an estimate of the impact of the attendant increase in labour supply on wages. Theoretically, the first approach is superior in that the threat of imports rather than imports themselves may affect wages in the same way as the threat of entry on product markets may affect prices, even in the absence of observed patterns of trade. It also covers the impact of exports as well as of imports.

The key question is whether empirical evidence on increasing trade and investment supports the theoretical demonstration that trade can widen wage differentials. The literature on this issue has been conveniently summarised by Lawrence (1996), Slaughter and Swagel (1997) and the volume edited by Collins (1998). Overwhelmingly, the findings of both trade and labour economists have been that trade with developing countries has not significantly affected wage differentials in the US or unemployment in continental Europe. The reasons behind this absence of impact merit investigation. Since trade and investment data are more readily available than international price data, it is easier to begin with them rather than the theoretically superior approach of product prices.

Fig. 15 traces the development of US imports of goods and services over the past quarter century. The major increase came in the seventies. After allowing for cyclical

developments the ratio of imports to GDP remained essentially flat during the eighties before beginning an upward climb after the recession of the early nineties. Clearly the timing of import penetration does not correspond with the increase in earnings inequality.

Fig. 16 looks at the contribution to US imports of goods of food and raw materials on the one hand and manufactures on the other, distinguishing between developing and developed countries. Some fairly dramatic changes can be observed. In the sixties, the rise in imports can be attributed almost exclusively to the rise in manufactures from developed countries. During the seventies, the situation reversed with imports of food and raw materials from developing countries the most important factor, although imports of manufactures from developed countries still continued to make a substantial contribution.

During the eighties, as oil prices fell the situation reversed again. Imports of food and raw materials (by value) from developing countries actually fell. Manufactures from developed countries regained their dominant position as a source of change (60% of the rise in imports compared with 67% in the sixties), although imports of manufactures from developing countries (40%) became significant for the first time. During the nineties, the contribution of imports of manufactures from developing countries (52%) actually surpassed that from developed countries (40%) for the first time. As a result, the share of developing countries imports of merchandise peaked in the early eighties after the second oil shock, fell precipitously thereafter to a level equivalent to that of 1973 in the late eighties before beginning a slow recovery. The share of US exports to developed countries followed a parallel, albeit much attenuated, path (fig. 17). The share of Asian NICs in US trade (both imports and exports) rose steadily after 1961, with a marked acceleration from the late eighties (fig. 18).

Trade data suggests that any affect of developing countries on widening wage differentials was likely to be stronger in the 1990s than in the 1980s. It could then have contributed to the failure of wage differentials to narrow, as would have been expected from developments in labour supply. There remains a need, therefore, to repeat the work done on the 1980s for the 1990s, even though the earlier work did not find substantial impacts.

It could be of some interest to explore in more detail why trade with developing countries produced so little impact on the earnings distribution. There are both theoretical as well as practical reasons why the impact should be so low. Foreign competition from industries employing low skilled labour can be mitigated in a number of ways.

Productivity differences compensate for the major part of the difference in wages between developed and developing countries, even at the low end. By international standards, US wages even at the low end are so high that those jobs vulnerable to foreign competition have already disappeared or production systems have been adjusted to minimise the impact of low wages on overall competitiveness. Indeed most low paying jobs are concentrated in low value added services rather than manufacturing industry.

The same good can be produced in different countries using different production systems and factor compositions. For instance, the German textile industry, a major exporter, represents an example of a capital intensive developed country industry but a labour intensive developing country one. Since capital intensive industries pay high wages, this provides international competition to high wage rather than low wage industries. It also the identification of low wage intensive products difficult for both Stolper-Samuelson and factor proportions type analysis difficult.

A breakdown of total costs provides some key evidence for the relative lack of importance of labour costs in manufacturing industries for the competitiveness of the goods they produce. The purchase of goods and services is equivalent to more than two thirds of turnover in manufacturing industries (and around three quarters of total costs). Of these, one fifth of industry's inputs come from services. In most manufacturing industries, direct labour in assembly now accounts for only 5% to 10% of total production costs, as against 25% in the 1970s (European Commission, 1997). As a result, the importance of the price and quality of purchased services and infrastructure – in which the US and other developed countries have a significant advantage – greatly exceeds that of low-skilled labour in the final production cost. Higher wages for production workers can be compensated for by lower costs in purchased inputs.

Interestingly, the breakdown of labour costs in low wage, developing countries does not greatly differ from that of developed countries. For example, in Bangladesh a typical breakdown of costs in the clothing industry is as follows :

Materials :	71%
Labour costs :	10%
Bank charges :	4%
Operating costs :	3%
Overhead and administration :	2%
Profit :	10%

Because of the nature of its skill distribution, the US should be more vulnerable than Europe from competition from low wage developing countries. In the light of the previous paragraphs some of the reasons for this relative lack of impact have been

advanced. It remains that the US and to a certain extent Europe could be more vulnerable to competition from newly industrialised countries in east Asia and formerly centrally planned economies of central Europe that combine high skills with low wages than to very low skill, low wage countries such as Bangladesh. The possibilities of rapid general productivity gains in the economy in well educated populations through technology transfers and opening up of infrastructure services to foreign investment and management are more real. However, countries which have already made the transition, such as Singapore, also sustain high wages. It would still be worthwhile to distinguish high and low skill categories of country in future analysis of the impact of trade on wages.

The significance of trade in services as a source of widening wage inequality has been ignored. It is true that until recently very little detail existed on the breakdown by partner country or type of service. In addition, the data does not allow the calculation of unit prices from services. However, US services trade has grown to 27% of total exports in 1997 and 17% of imports. US exports of services account for 19.8% of world exports compared with 17% of goods, while imports of services make up only 14.4% of world imports compared with 20.1% for goods (table 5). The European Union (including intra-EU trade) accounts for a similar share of world trade in services as for goods and Japan a lower share of world exports of services and higher share of world goods. Potentially, therefore, US exports of services can explain part of the difference in widening income inequality compared with Europe.

Up until the mid-eighties, US imports and exports of services rose in parallel at a fairly modest pace (fig. 19), but after 1989 trade in services expanded at a much faster pace, particularly for exports leading to an increasingly significant surplus contrary to the

trade balance in goods. The US surplus (fig. 20) is concentrated in travel (22.1%), royalties and licence fees (30.1%) and other private services (48%). The most significant exports in other private services are education (9.8%), financial services (13.1%), telecommunications (4.5%) and business, professional and technical services (25.2%). Over half of the exports of other private services (52.6%) are in the area of high value added services. A further 31% are transactions between affiliates of US companies. It is likely that these services follow a similar pattern to services to unaffiliated companies so that nearly 84% of other private services would be expected to be in the area of high value added services using highly educated workers. US trade in services in the nineties can be expected to have raised the returns to college graduates.

A related issue connected with internationalisation from trade concerns US foreign direct investment in developing countries and the so-called exit option (Rodrik, 1997). Under this hypothesis, firms may move their activities to take advantage of lower wage costs overseas, thereby destroying higher paid jobs. As with trade, the threat of delocalisation is considered sufficient to bring wages down to those which would pertain if the firm was to shift its production abroad. Companies often threaten their employees with the exit option as part of the wage bargaining process (if you do not accept wage moderation/cut, I will move elsewhere).

At the local level, examples of cross-border high skill/low skill combinations can be found. For instance, Ciudad Juarez on the US border with Mexico produces assembly type manufactured goods in maquiladore plants, but receives high level business services, including telecommunications, from El Paso across the border. Unskilled wages in El Paso are low by US standards (although above those across the border) even though the

combination provides an overall employment and wage advantage to El Paso. Similar combinations can be found on the border between Bavaria and the Czech Republic. The issue is whether widespread outsourcing of low skilled activities can affect the wages of US or European workers more generally. For example, Feenstra and Hanson (1996) found that outsourcing can account for 31-51% of the increase in the relative demand for skilled labour that occurred in US manufacturing industries during the 1980s. This represents a very substantial figure but appears overdone.

Most FDI takes place between developed countries. The overwhelming reason given for undertaking FDI, even in newly industrialised countries, is that of market access, which is trade creating for home countries and therefore employment enhancing. Moving existing production is a highly disruptive process, not to be undertaken lightly. Key suppliers may well not be available. The quality of local infrastructure and support services in low wage countries often leaves much to be desired. There is an element of political risk involved as well as exchange rate risk both for the investment and the rate at which it will be possible to export from the new production site. The share of low-skilled labour costs in total production costs is also too low to influence decisively investors' decisions.

When a country's domestic cost base gets seriously out of line with those of its competitors, delocalisation may occur. Germany in the mid 1990s provided such an example. This constitutes a macro-economic issue rather than a trade and investment one. The standard response to such an occurrence lies in a correction in the exchange rate. With the weaker DM, pressure for delocalisation largely evaporated. During the period when it was occurring, the overwhelmingly destination of choice was not east Asia, but

the neighbouring countries of central Europe, such as the Czech Republic (Zysman, Doherty and Schwartz). Here the impact of outward FDI is similar for that of other emerging markets. Demand for capital goods is generated in the home country. The net effect on employment will not usually be negative, although the distribution will clearly change.

An interesting example of the impact of delocalization on employment is provided by the Belgian diamond industry. At the beginning of the 1980s, the Antwerp area employed about 12,000 people in this sector, of which 8,000 in cutting and 4,000 in service and trade activities. During the 1980s cutting and setting was relocated to Thailand and India resulting in 4,000 job losses. In the meantime, Antwerp invested heavily in the development of trade logistics, marketing, financing, certification and R&D in cutting and setting machinery, which more than offset these losses. Indeed employment rose to around 15,000. From this example a number of important conclusions can be drawn. Relocating part of the production chain can improve the competitiveness of the whole so that overall performance increases. The jobs that were relocated were not low-skilled jobs, but skilled ones. Indeed for manufacturing in general, the threat comes far more from the large numbers of skilled workers in newly industrialised countries than from the unskilled, which do not represent a significant part of production costs. Again the overall positive impact is to some extent offset by a negative impact on certain types of worker, who may not be able to find equally well paying employment again.

If the impact of trade and investment with developing countries does not appear to have contributed significantly to widening US earnings inequality, it is even more

unlikely that it would do so in Europe. European and US openness to foreign trade and investment (intra EU excluded) are now comparable, but the US experience of integration with the world trading system is much more recent, dating essentially from the 1970s. As a result, European countries have had a much longer period of time to adjust to the effects of trade on wages than has the US.

X. Explanations for income disparities: competition and market power

Developments in the structure and functioning of product markets as a source of widening wage inequality have received relatively little attention (Cappelli, 1999, represents an exception). This is surprising in view of the attention they receive elsewhere, in particular with regard to the recent performance of the US economy and its ability to grow with low inflation. Since wage-push inflation constitutes a prime source of general inflation and increases in wages at a time of quasi-full employment have been recently very low, this constitutes a surprising omission.

Labour market economists such as Freeman (1997), who examine institutional issues, observe the decline in trade union power and relate it to the development of earnings. He accords equal weight to a combination of declining trade union power and a decline of the real value of the minimum wage with changes in domestic labour supply, trade and immigration and technological change in accounting for the rise in wage inequality. However, these evaluations represent “guestimates” rather than those derived from econometric analysis.

The reasons behind the decline in trade union power are of least as great significance. Unions can not raise wages or employment above non-union levels and expect a firm to survive unless either the firm has product-market power or the union is

able to increase productivity above non-union plants. If a union increases wages in a firm without market power, losses or bankruptcy are likely to ensue. Under these conditions, competitive firms are likely to resist unionisation or at least resist raising wages or employment to union members more than in firms with non-union members. Firms with excess profits are more likely to be willing to share these benefits with their workers.

The elasticity of demand for labour must also be low for unions to be able to raise wages or employment for members. Unionisation is more likely in manufacturing establishments where blue-collar labour is substantially less substitutable for white-collar labour and capital. When labour accounts for a large share of total costs, the incentive to resist unionisation are greater. Finally, concentrated and capital-intensive industries give unions more leverage because they are easier to organise and the costs of disruption of operations greater to employers.

In the US, industries with below-average unionisation, such as wholesale and retail trade, finance and services have relatively little product market concentration. Manufacturing, transport, public utilities and mining are characterised by firms with substantial product market power and the use of capital-intensive methods of production. The collapse of market power during the 1980s by firms in many of these industries and the strong growth of employment in industries where market power was already weak can help explain the growing inequality in wages. There are two aspects to this change in market power: trade and investment and regulatory reform. Furthermore, similar changes to those that occurred in the US also occurred in the UK, but only to a more limited extent in continental Europe and hardly at all in Japan.

The concentration on the impact of trade and investment with less developed countries has masked the significant impact of trade with developed countries. During the early 1980s, the dollar exchange rate surged under the impact of large capital inflows associated with high real interest rates and a large public deficit which could not be financed from domestic savings. The result was an unprecedented squeeze on American manufacturers.

Absolute unit labour costs are the best yardstick for measuring the degree of international competitive squeeze on a sector. However, there are formidable methodological problems in measuring absolute as compared to developments in unit labour costs. In a pioneering study, Hooper and Vrankovich show that Japanese unit labour costs in manufacturing fell from 95% of the US level in 1980 to 79% in 1985 (table 7). For three sectors (food, beverages and tobacco, textiles, apparel and footwear and other manufactured products), Japanese unit labour cost were actually above those for the US, while for chemicals, basic metals and machinery unit labour costs were low initially in the 41-93% range and remained low or declined further to the 41-69% range in 1985.

Developments in Germany and other G7 countries also showed a substantial drop in relative unit labour costs. In 1980, German unit labour costs in manufacturing were 28% higher than those in the US, but then declined to a situation by which they were only 76% of US levels in 1985. German unit labour costs in chemicals fell from 131% of the US level to 84%, in basic metals from 126% to 65% and in machinery from 111% to 66%. With the decline in the dollar after the Plaza agreement, the US regained its competitive edge so that by 1990, unit labour costs in Japanese manufacturing were 21%

higher than those in the US (although costs in its core export industries remained competitive) and in German manufacturing 52% higher. Data on developments in unit labour costs show that both Japanese and German relative unit labour costs deteriorated further in the first half of the 1990s.

The squeeze on American manufacturers, although severe, was not prolonged. For a long term and fundamental change to have occurred in bargaining power, some other factor or factors needed to prolong the effect of the high dollar. Poor quality and lack of product innovation in certain major industries, such as automobiles, combined with the efficiency of Japanese developed techniques of just in time, total quality management and team work and their integration with the difference stages of development to produce very fast development times, constituted one set of factors. In order to regain their competitive edge, American manufacturers needed to master these techniques. The MIT studies on “Made in America” and on the automobile industry “The Machine that Changed the World” were influential in persuading corporate America of the need for change.

Combined with the perceived need for change was the strong upsurge in foreign direct investment from developed countries from the mid-eighties onwards. On a geographical basis, Europe remains by far the principal investor in the US, followed by the Asia-Pacific region and Canada (fig. 25). The Canadian share of foreign affiliates US gross output declined in the 1990s while that of France and the Netherlands increased. Apart from the UK, for which investment in financial services and portfolio type FDI remains important, the most significant investors in the US are Japan (16.1% of gross

output) and Germany (11.9%). They were also the most significant investors behind the UK and Canada in 1991.

Foreign direct investment proved a permanent force in reshaping the manufacturing landscape and breaking market power of major companies and the employees that worked for them in three ways:

1. Foreign direct investment in green field sites represents a permanent addition to productive capacity and, unless domestic suppliers are eliminated, competition. Even when FDI takes place through acquisition the acquiring company will usually have superior financial capacity enabling them to develop the competitive power of the acquired firm, which typically will not be the industry leader but weaker brethren;
2. Greenfield FDI has often been undertaken away from traditional manufacturing centres, where union traditions are weak and wages lower (even though the wages paid by incomers are higher than the prevailing regional average, they are lower than the prevailing industry average). Typical examples are Nissan in Tennessee, Toyota in Kentucky, BMW in South Carolina and Mercedes in Alabama. Some relocation amongst domestic manufacturers occurred to meet the competitive challenge (for example GM's Saturn plant in Tennessee);
3. The demonstration effect of FDI, particularly for organisational change is much greater than that of imports. Superior methods can no longer be ascribed to "foreign cultures" or other extraneous factors. The NUMMI joint venture in

California between General Motors and Toyota provided visible proof of how far behind American automobile producers had become.

The breakdown of data for development in inward FDI to the US supports the thesis of weakening market power concentrated in certain industries and at a time when earnings inequality was rising strongly. Foreign direct investment began to rise strongly after 1983, reaching a peak in 1988 (fig. 21). During the recession of the early nineties FDI declined rapidly before rebounding and surpassing the previous peak in 1996. The data of the share of FDI in the gross product of private industries, which goes back further, shows a substantial increase in the seventies and another increase in the late eighties, corresponding with the surge in inward investment (fig. 22). However, during the nineties the foreign affiliates share of gross product has been quite stable. The rapid growth of the US economy means that the upturn in FDI has not resulted in a heightened share of US output accounted for by the US operations of foreign firms. The employment shares developed in a similar way, as would be expected, but the increase in the employment share of US affiliates of foreign companies increased dramatically in the late eighties, not only compared to the surrounding periods, but also to the 1970s (fig. 23).

The key to this discrepancy lies in the sectoral composition of investment. During the 1970s, there was heavy investment in oil and natural resource related industries, which are highly capital intensive, rather than in manufacturing. In 1991, after the investment boom of the eighties, manufacturing accounted for just under half (48.9%) of the gross product of US affiliates and petroleum (9.6%) and mining (1.9%) accounted for a further 11.2% (fig.24). By contrast private services made up only 37.7% of gross output

of US affiliates, even though manufacturing accounted for only 18.7% of private industry GDP and mining and petroleum 1.7% against 71.3% for private services. During the nineties, the share of services in the gross output of US affiliates grew to 41.5% of the total, and that of manufacturing declined to 46.1%. Since the US service industry was growing faster than manufacturing, this does not imply a decline in the importance of FDI within manufacturing.

Because it is the impact of FDI on bargaining power that is of interest here, the share of employment within each industry accounted for by the US affiliates of foreign companies is of particular interest. For all private industries this averaged 5.3% in 1991 and 4.8% in 1996. They accounted for 11.4% of all employment in manufacturing and just 7.6% in services in 1996. While the employment share of affiliates in services declined during the nineties, that of manufacturing remained stable.

At a more disaggregated industry level, employment shares of over 10% by foreign companies are to be found in mining (24.2%), petroleum (11.7% down from 18.9% in 1991), chemicals (30.7%), primary metals (14.1%), industrial machinery (11%), electronic products (18%), rubber and plastics (14.7%), stone, clay and glass (20.9%), motor vehicles (14.2%) and instruments (12.8%). There are two types of industry here, process type industries such as glass, chemicals, petroleum and primary metals and assembly type industries dominated by scale economies and high R&D such as industrial machinery, motor vehicles, electronic products and rubber and plastics (particularly tyres). Both of them are types of industries in which traditionally workers have been able to extract a premium over the average. No service industry had employment shares

controlled by foreign affiliates above 8.6% in 1991 or 6.2% in 1996 (hotels in both cases).

Table 6 provides information on the development of hourly wages for production workers in selected manufacturing industries. In 1978, steel workers earned 71% more than the average hourly wage than manufacturing workers in general. By 1987, this premium had declined to 53% and by 1992 to 47%. The premium remained substantial but had declined by a third. In the case of automobile workers, the premium actually increased from 59% in 1978 to 84% in 1992 with two-thirds of the increase in the latter period, coinciding with the upsurge in foreign investment rather than the earlier period corresponding to trade.

Because of the degree of customisation required and differences in consumer preferences, it is much easier to increase imports of steel than of automobiles. However, competitive pressures on automobile producers were also strong and increasing during the eighties, but the method of reaction differed. Faced with escalating labour costs, automobile manufacturers bought in a bigger and bigger share of parts. The premium over average wages in component plants actually fell during the eighties, so that wages for component workers in the automobile industry as a percentage of assembly workers fell from 87% in 1978 to 72% in 1992, with the strongest decline at the end of the period. Faced with strong unionisation driving up assembly wages, automobile manufacturers also moved plants south to non-unionised states and then to Mexico.

If a convincing case can be made for the impact of trade and FDI on wage differentials in manufacturing, one would be hard put to find such a relationship for services – even those that are inherently tradable. Many services, particularly high value

added services paying above average wages, went through a period of regulatory reform which transformed the prospects and operating procedures of these industries. Beginning with trucking and civil aviation in the 1970s, reform spread to telecommunications and other public utilities in the 1980s. At the same time, new technology was having a profound impact on the structure of previously stable industries such as banking and television broadcasting. Since all these industries have been strong growth performers throughout the period, any increases in earnings of the low paid could have been expected to start here. The absence of upward wage pressure in those industries can largely be attributed to the heightened competition induced by regulatory reform and new technology.

Whether the collapse in market power arises from trade and investment or from domestic liberalisation of product markets, erosion of the premium which certain categories of workers could extract in the form of rents ensues. The underlying productivity of the individual worker or category of worker as well as the supply of comparable workers then become the key determinants of wages. The long period during which US workers could continue to enjoy high wages without reference to their educational and skill endowment came to an end. However unpleasant it may be, the very low wages of Americans with basic educational attainment do reflect their intrinsic economic value.

In Europe, heightened competition on product markets for both goods and services has largely been associated with the Single Market programme – the most comprehensive trade and investment liberalisation initiative ever undertaken. Industrial restructuring has become a major feature of the corporate landscape, although it began it

later than in the US and has not proceeded as far. This has resulted in substantial job losses, concentrated in manufacturing industries, without either a substantial job gains elsewhere or a substantial widening of earnings disparities among workers. A great deal of pain has been inflicted for little gain in terms of increased employment or higher growth. As a result, support for the liberalisation process both within Europe and under the Uruguay Round has been undermined.

The standard institutional interpretation of this divergent pattern between Europe and the US emphasises rigidities on the labour market which make it difficult to lay off workers, thereby discouraging also hiring, and an effective wage floor which prevents the going rate to fall to the market clearing level. Since on competitive markets, marginal costs must ultimately equate with marginal revenue, less employment and output results accompanied by higher apparent labour productivity than would otherwise be the case. A lower degree of earnings inequality has been achieved at the expense of a lower amount of employment creation and higher unemployment.

The speed of liberalisation for key infrastructure services has also been much slower in Europe than in both the US and the UK, which began domestic liberalisation of services earlier than elsewhere in Europe. For instance, full liberalisation of the telecommunications market has only been implemented since 1 January 1998. A study for the European Commission by DRI on price convergence in the context of the Single Market Review (1998b) concluded that although substantial price convergence had occurred for goods, there was little sign of such convergence for services. Since much of the effort of the Single Market Programme was devoted to services, this can be

considered a disappointing outcome. However, it also demonstrates that there is still considerable potential left for greater competition in services in Europe.

The effect of greater competition on basic service infrastructure in Europe can be considered likely to lead to an erosion of market power for workers in the previous public monopoly providers which have characterised these industries. The different institutional context will limit the degree to which this can be expected to lead to a fall in wages. However, the effect on employment will be proportionately larger.

XI. Policy implications of flexible labour markets and income inequality

The combination of US flexible labour markets and liberalisation of product markets both internationally and domestically has led to strong increases in employment, more growth and some evidence of a productivity upswing, accompanied by a period of low inflation. Such strong economic fundamentals could have been expected to provide a solid basis for addressing the issue of rising inequality in earnings and incomes – or at least making better provision for those at the bottom of the income distribution. After the Second World War, elderly people represented the prime category of poverty in the US. The establishment of a comprehensive system of pension provision largely eradicated old age as a source of poverty. No comparable initiative for the current very low income categories has developed.

There have been two types of initiatives in the US to deal with the problem of structural change in the economy and the widening of income inequality, specifically the growing phenomenon of the working poor. The first category comprises a number of targeted schemes for those suffering economic dislocation. They are relatively small scale and restrictive in nature. Of these probably the most important, or at least the most

studied, has been Trade Adjustment Assistance, created under the Trade Expansion Act of 1962 and subsequently expanded. Assistance to displaced workers under this Act is conditional on the identification of import competition as the main cause of displacement.

Evaluations of Trade Adjustment Assistance (Decker and Corson, 1995, Kodrzycki, 1997, Clark, Herzog and Schlottmann, 1998) conclude that the programme has had little impact on the outcome of displaced workers. In particular the impact of training provisions compared to those for job search appear to be weak, and displaced workers continue to suffer a substantial drop in earnings on finding employment. The findings on training are not inconsistent with European experience with massive training programmes for the unemployed (known as active labour market policies), which have a similarly poor record in placing unemployed workers in stable remunerative jobs.

The decision to single out trade as a source of displacement rather than other possible sources such as technology, the implementation of environmental standards or regulatory reform may appear puzzling. The relatively recent opening of the US market to international competition may have influenced the perception of this as a major source of restructuring of the economy. In Europe, which has traditionally been more open to international competition than the US, technology would be considered the main driver. If programmes such as Trade Adjustment Assistance help to build and maintain support for free trade, they can be justified even though the impact in terms of improving the situation of displaced workers may be slight.

The appropriateness of targeted programmes to deal with economic adjustment depends to a great extent on the nature of the change process involved. A change process dominated by specific shocks which can be traced to clearly identifiable causes and

which can be expected to last for a limited duration may call for specific targeted action. It is in the nature of the political system that such action tends to outlive the problem and takes on an independent life of its own.

Targeted action is unlikely to deal effectively with a change process dominated by multiple causes, supply as well as demand, and which corresponds to a continuous increase in competitive pressure on companies. For this type of situation, general policies which strengthen an economy's ability to adjust and the ability of the individual to take positive advantage of these adjustments would be more appropriate. Identifying the culprit of widening income inequality constitutes a largely futile exercise when it comes to designing policies.

Policies to strengthen an economy's ability to adjust act on a number of dimensions across the board rather than focusing on individual industrial sectors. One of the most important, but least amenable to action by policy makers, concerns entrepreneurship. Maintaining a very high degree of new firm formation, particularly in areas with high growth potential represents the foundation of fast and flexible reaction to new challenges in an economy. In both the US and Europe examples of very entrepreneurial regions and very unentrepreneurial regions can be found. Local conditions have been found to be important in both cases, some of which can be traced to public action or which are capable of being influenced by public action. Examples include the quality of local infrastructure, particularly for certain specialised and advanced forms of education and research, the capacity to attract skilled managers through a high quality of life, and an open attitude to public procurement as opposed to public provision of certain services. Fiscal policy, in particular the tax treatment of stock

options, has been shown to be an important influence on the ability of small, high growth companies to attract experienced executives. Industry structure exerts a significant effect, which is more difficult for policies to influence. Regions dominated by hierarchical structures built around large firms tend to be less entrepreneurial than those with a dense network of inter-related ones such as Silicon Valley or the Emilia-Romagna region of Italy. Overall, the level of entrepreneurship in the US can be considered superior to that in Europe.

Innovation represents an important complement to entrepreneurship as a source of adaptation to structural change as well as a driving force for change itself. Recent business history is littered with examples of firms that have successfully re-created themselves in different markets (such as IBM in computer services). Increasingly existing firms as well as new entrants are using the Internet to develop new ways of serving existing markets (Barnes and Noble as well as Amazon.com for books) or to create new markets for information based products. Ensuring an adequate regulatory framework for innovation as well as strong competition policy that keeps barriers to entry are key elements in the policy mix which sustain innovation. Infrastructure, particularly telecommunications infrastructure, and adequate tariffing for local calls also influences the speed of diffusion. The organisation of public research capacity and its links with private industry has recently been demonstrated to affect the innovatory capacity of an economy (European Commission, 1998).

A third major pole of adjustment policies concerns mobility. Labour mobility between regions has traditionally been much higher in the US than in Europe, even than mobility between regions of the same country. A recent trend, particularly for dual

income, high qualified households, to change jobs frequently but to remain in metropolitan areas where the choice of jobs is greater may signal a fall in US mobility. Many factors, some well outside the organisation of labour markets, affect innovation. Lack of availability of housing for rent constitutes a major barrier in many European countries where rent controls have effectively driven the rented sector out of the market.

The organisation of the welfare state on both sides of the Atlantic can both constitute a major barrier to mobility and accentuate the impact of inequality of earnings. Provision for many types of insurance, pension, unemployment and often health are linked to the employment status of the individual. These provisions were first generalised after the Second World War, when full-time, usually male, semi-permanent employment with a firm constituted the model.

In a time of rapid structural change, when large firms are down-sizing and small and medium sized firms become the motor of job creation, there is a need to promote the ability of individuals to actively seek out opportunities for advancement rather than waiting for events to make existing jobs obsolete. The dualistic organisation of social security systems, by which enterprises provide for those in employment and the state provides for the unemployed and those unable to work, clearly discriminates against those who are temporarily between jobs or are seeking means to improve their chances for advancement through mid-career time off in further education and training. The threat of losing benefits can act as a powerful disincentive to mobility. Systems that are universal in coverage and state rather than pay-roll financed, such as almost all provision in Denmark and health insurance in Scandinavia, the United Kingdom and Canada do a better job in this regard than the continental European or US model.

Intangible investment constitutes the fourth area in which public policy can influence the capacity of an economy to adjust. Research and development has already been mentioned under the heading of innovation. In terms of the impact on income inequality, investment in human capital, specifically education and training, remains the major item. The US and countries with similar deficiencies in the supply of skilled labour (as opposed to highly educated labour) need to solve the market failure for the supply of transferable skills in order to restore the “vanishing middle” of the earnings distribution. Those European countries with strong systems for generating transferable skills need to ensure that further liberalisation of product and labour markets does not undermine their continued ability to deliver the required level of skills.

The market failure in training, already clearly evident in the US and the UK, may actually be worsening. According to a report prepared by the Commerce Department’s office of technology policy, US companies often are uninterested in training workers for high technology jobs, preferring instead to compete for a limited pool of existing talent (Financial Times of 1 July, 1999). Since many of these workers require general as opposed to transferable skills, this specific market failure should not have occurred. With rising returns to IT professionals, the individual should have had ample incentive to train in these areas and the general education system to adapt to supplying these skills. Indeed, in times of cyclical downturns, such as the beginning of the nineties, a glut of IT professionals has been observed both in the US and in Europe.

One explanation of the reluctance to train or be trained would lie in a perceived short term shortage such as the need to solve the millenium bug. In the US, this has led to a call from large users of IT staff for a relaxation of immigration controls to allow more

foreign professionals to enter the country. No such call has been heard in Europe, where the increased requirement for the Y2K problem coincided with the changeover to the Euro. A more convincing explanation for the attitude of US companies lies in their unwillingness to pay the high wages that would be needed to attract sufficient new entrants to the profession. When it comes to skills, the legendary market orientation of the US information technology sector appears to meet its limit.

Clearly, resisting pressure to allow increased immigration of IT professionals will not solve the general US (and UK) problem of transferable skills. Finding ways to overcome the free rider problem in countries characterised by flexible labour markets remains their greatest challenge in order to resolve the lack of skills problem. A number of routes are available, but typically they include a measure of state intervention that contradicts the liberal ethos of market economies. Prior to the labour market reforms of the early to mid-eighties, the UK maintained a system whereby on agreement between the social partners all firms in a particular industry could be levied for training. Firms which undertook training would be reimbursed for the cost of training, while firms that undertook no training would still be required to contribute to the cost of its financing. This system worked well in the engineering industry, which maintained a well developed apprenticeship system. However, even prior to the abolition of the training levy, the apprenticeship system was under threat from overly generous compensation for apprentices. In Germany, apprentices earn less than half the wage of skilled workers and this represents an important incentive for employers to provide training. Under pressure from trade unions fearful of undercutting of members wages, the wages for apprentices

was raised in the UK (and in France) to near those of full-time, adult workers. As a result, employers became increasingly reluctant to take on apprentices.

The French government introduced a levy system for continuous training in 1970, which has subsequently become a staple of the skill generation system. However, the absence of a well developed initial vocational training system means that much of the training goes into making up for the lack of basic skills rather than upgrading and modernising existing skills. There is evidence that training by US employers also suffers from this drawback (Lynch and Black, 1995).

If firms are not to be given the chance to organise themselves collectively and provided with the powers to compel non-participating firms to contribute to the financing of training, public authorities would be required to intervene more directly in order to solve the transferable skills deficiency. One route compatible with the general education orientation of countries such as the US would be to expand public provision of the lower level vocational education component on the Scandinavian model. This implies essentially developing and upgrading the community college system in the US rather than developing an apprenticeship system on the German model. There are two drawbacks to this approach. The best vocational training systems establish strong links between the public and private providers (the dual system). Pure public provision has difficulty in identifying sufficiently clearly the requirements of companies and adapting to new technologies and new markets sufficiently quickly. Pure private provision tends to concentrate overly narrowly on the specific needs of individual companies and to neglect the transferable portion, which is the key to addressing not only adaptability but also earnings inequality among the low paid.

If the general education is not sufficiently sound it is unlikely that good vocational training will be possible. For instance, over half of the entrants to community colleges in South Carolina in 1993 required remedial tuition in basic literacy and numeracy. However, under a system of publicly funded training provision students who are sufficiently able to do so will naturally choose the college education route, where the returns are higher, than the community college route.

For Germany and other countries which provide training on the German model, the ability to maintain a high degree of discipline on participating and non-participating firms in the training process will be essential if the move to less labour market regulation is not to lead to an erosion of the level of skills. Because of the training culture that organisations have developed, it should be easier to maintain an adequate training system in these countries than in the US or the UK. At the present time, one of the means to avoid poaching is through the stringent rules on hiring and firing of labour. Because these rules protect insiders they discourage changing job once in permanent employment. As a side effect, poaching of skilled workers by other firms is also discouraged. However, the impact on job creation is clearly negative. In exchange for a relaxation of rules on taking on and laying off workers, regulation could ensure that all firms in an industry continue to contribute to the maintenance of the training system. This would represent a move towards more employment creation friendly regulation rather than deregulation.

Policies to enable an economy to adjust better and to enable individuals to participate positively in the adjustment process, through better skills and more mobility, clearly out to take precedence over remedial measures. In the US, public authorities have sustained more successfully aspects such as entrepreneurship, innovation and mobility

than in Europe. Education and skills generation remains the area where certain European countries have done better than the US.

In terms of remedial policies, the US has placed considerable emphasis on redistribution to relieve the situation of the working poor, mainly through the Earned Income Tax Credit (EITC). Progressively extended in the 1980s, the EITC offset a significant share of recent increases in income inequality and increased female participation among single women with children (Liebman, 1997). Liebman has estimated that the EITC offset 23% of the decline in income between 1976 and 1996 for households in the lowest fifth of the income distribution and offsets 10% of the decline for households in the second fifth. Compared with classic welfare payments, the EITC has many advantages. The impact on incentives is much less severe than an across the board payment since only those in employment receive a payment. The phaseout of credit as income rises appears to have only a limited effect on labour supply. Cost of administration compared with direct payments also comes in much lower, since all earners are obliged to file a tax return in any case. Payment in the form of an annual lump sum also reduces the cost of administration. Finally, in terms of the self esteem of recipients and the political acceptability of the measure, the EITC has clear benefits over other redistributive systems, since it is perceived as a reward for working, thus reinforcing the incentive effect.

Not surprisingly, the EITC has come to be seen as the panacea to deal with rising inequality of earnings (to deal with inequality in incomes would require dealing with the issue of differences in household composition). A certain number of caveats to this over-optimistic view are in order. Intended to correct a negative pre-tax situation, the EITC

does nothing to prevent a further widening of causes of earnings inequality. Applying to all low wage earners and not just to new entrants to employment, the cost is very high for a relatively limited impact on post-tax incomes. In the US context, it remains vulnerable to political attack from those higher up the income distribution, once its permanent rather than temporary character for most low wage earners is understood. The earned income tax credit can be considered a highly defective instrument for dealing with the growing inequality in US incomes. In the absence of the EITC, nevertheless, inequality of earnings would have been even higher.

The same drawbacks apply to the adoption of an EITC type solution in Europe, but in a heavily attenuated form. Europe already spends so much on relieving the effects of unemployment or non-employment⁹ that putting people to work and sustaining some of their income is clearly preferable to paying people to stay out of employment. Since EITC type schemes apply to all workers and not just to those coming out of non-employment, the cost of such an option depends critically on the amount that wages at the low end will need to drop in order to create large numbers of low skilled jobs. Crucially, it is the impact of liberalisation of labour markets on the wages of those currently employed at the low end of the earnings distribution that will determine the overall cost. (Solow, 1998, has a similar point with regard to the transition from welfare to work in the US.)

In view of the lower numbers of uneducated, unskilled in the European labour force and some evidence that price elasticities for labour supply and demand are lower than in the US, it would be reasonable to expect that the average cost of the EITC for a

given level of post-tax income would be lower in Europe than in the US. The introduction of such a redistributive measure would need to be accompanied by tighter restrictions on benefits for those not working in order to increase the incentive for employment and ensure that the total tax burden did not rise. Once in employment, the low skilled unemployed need appropriate special measures to ensure that they have access to training in transferable skills so that they do not remain trapped permanently in low wage, low productivity jobs. Under these circumstances, an earned income tax credit could be deemed an appropriate response in Europe to threat of widening income inequality as a result of institutional reform of the labour market, but at best a flawed response to the US situation.

⁹ Discouraged workers and women who are not in the labour force, but would be so if employment opportunities were to present themselves.

Tables for CFIA paper

TABLE 1 NATIONAL INCOME PER ADULT 1973 and 1996				
	1973	1996	<i>Absolute Change</i>	<i>Percentage Change</i>
Total National Income per Adult	\$23,703	\$31,981	\$8,278	35%
Profits/Rents/Proprietors Income/Net Interest	\$6,683	\$9,345	\$2,662	40%
Total Compensation for Female Wage and Salary Workers :				
Women with wages in top 1/3	\$2,331	\$4,792	\$2,461	106%
Women with wages in middle 1/3	\$1,261	\$2,263	\$1,001	79%
Women with wages in bottom 1/3	\$472	\$904	\$432	92%
Total Compensation for Male Wage and Salary Workers				
Men with wages in top 1/3	\$7,136	\$9,127	\$1,991	28%
Men with wages in middle 1/3	\$4,123	\$3,985	-\$138	-3%
Men with wages in bottom 1/3	\$1,694	\$1,564	-\$130	-8%

Source : Ellwood

TABLE 2 FAMILY INCOME AND STRUCTURE 1973 AND 1996				
	1973	1996	Absolute Change	Percentage Change
Children with Family Income in the top third				
Average Family Income	\$69,788	\$99,855	\$30,067	43%
Fraction of Children in Husband-Wife Families	0.98	0.96	-0.01	-1%
Children with Family Income in the middle third				
Average Family Income	\$36,662	\$40,053	\$3,391	9%
Fraction of Children in Husband-Wife Families	0.94	0.84	-0.10	-11%
Children with Family Income in the bottom third				
Average Family Income	\$16,673	\$13,987	-\$2,686	-16%
Fraction of Children in Husband-Wife Families	0.62	0.43	-0.19	-31%

Source : Ellwood

TABLE 3 GROWTH RATE OF CIVILIAN LABOUR INPUT , QUALITY AND HOURS (% per year)						
	1948-95	1948-68	1968-73	1973-79	1979-85	1985-95
Labour input	1.80	1.88	1.24	1.90	1.41	2.01
Labour quality	.59	.94	-.08	.21	.41	.54
Hours worked	1.22	.95	1.32	1.70	1.00	1.55
First order quality indices						
Sex	-.16	-.10	-.21	-.25	-.29	-.11
Employment class	.10	.23	.04	.01	-.00	-.00
Age	.07	.11	-.39	-.13	.15	.31
Education	.51	.59	.44	.52	.61	.32

Source : Ho and Jorgenson

TABLE 4 GROWTH OF COLLEGE/HIGH SCHOOL RELATIVE WAGE, SUPPLY AND DEMAND, 1940-98 (100*Annual Log Changes)			
	Relative Wage	Relative Supply	Relative Demand
1940-50	-1.86	2.35	-0.25
1950-60	0.83	2.91	4.08
1960-70	0.69	2.55	3.52
1970-80	-0.74	4.99	3.95
1980-90	1.51	2.53	4.65
1990-98	0.36	2.25	2.76
1980-90	1.00	2.41	3.81

Source : Katz

TABLE 5 WORLD TRADE SHARES, 1997						
	Exports			Imports		
	Goods % world trade	Services % world trade	Annual rate of growth %, 1990-97	Goods % world trade	Services % world trade	Annual rate of growth %, 1990-97
N.America	17.0	19.8	8	20.1	14.4	6
European Union	39.7	40.5	5	37.1	39.8	6
Japan	7.9	5.2	7	6.2	9.4	5

Source : WTO

TABLE 6 DEVELOPMENT OF HOURLY WAGES FOR PRODUCTION WORKERS IN SELECTED INDUSTRIES 1978-92						
	Average hourly wages for production workers \$			% of average hourly wages for production workers		
	1978	1987	1992	1978	1987	1992
All manu- facturing	6.37	10.35	11.95	100	100	100
Steel	10.88	15.84	17.55	171	153	147
Automobile assembly	10.12	17.33	21.97	159	167	184
Automobile components	8.81	14.16	15.84	138	137	133

Source : Scherer

TABLE 7 UNIT LABOUR COSTS IN MANUFACTURING AS % OF US							
	US	Japan	Germany	France	Italy	UK	Canada
1990	100	121	152	124	133	134	115
1985	100	79	76	82	76	85	84
1980	100	95	128	136	110	147	92

Source : Hooper and Vrankovich

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