

Labour Market Polarization:
Canada in International Perspective

Peter Kuhn

McMaster University

December 1995

This paper was prepared for the fourth annual Bell Canada Papers Conference, "Policy Frameworks for a Knowledge Economy", John Deutsch Institute for the Study of Economic Policy, Queen's University, November 15-17, 1995. I would like to thank Tom Crossley for expert research assistance; Rick Harris, Harvey Lazar and Keith Maskus for helpful comments.

I. INTRODUCTION.

The fact that the Canadian labour market has become more polarized in the last fifteen years has been noticed by a number of researchers. Among the trends noted by these researchers are an overall increase in earnings inequality (Burbidge et al. 1994, Myles and Picot 1994); an increase in earnings differentials between more- and less-educated workers (Freeman and Needels 1993, Bar-Or et al., 1995); between older and younger workers (Burbidge et al., 1995); an increased dispersion in weekly hours worked across individuals (Morrisette, Myles and Picot 1994); and an increase in the concentration of unemployment and non-working time among the least-skilled workers in Canada (Kuhn and Robb 1995).

What are the causes of this polarization? What are its consequences? And what, if any, policy responses are called for? This paper attempts to answer these questions by considering recent Canadian labour market trends in an international context. I begin in Section II by comparing recent labour market trends in Canada to those in some other developed countries. Section III reviews the available research on the causes of increased polarization in a number of countries including Canada. Consequences of polarization and possible policy responses are discussed in Section IV.

The main conclusions of this paper are as follows. First, as is well known, Canada has not been alone in experiencing a polarization of labour market outcomes among its workers, with growing gaps between its best-paid and least-paid workers. At the same time, however, labour market polarization has not been a universal phenomenon across all developed countries either, nor has it taken the same form in all such countries in recent years. For example, France and Germany have experienced very little wage polarization, though long-term unemployment among the less-skilled has increased in importance there. The U.S. experienced considerably more wage polarization than Canada, and Canada's polarization had a larger age-related component, with growing gaps between old and young workers. The U.K. also experienced significant wage polarization, but in the context of rising, rather than falling real wages of the

less-skilled. Examined closely, these differences provide important clues to the likely causes of increased Canadian polarization as well as to likely effects of various policy responses to this polarization.

Second, current economic research on the possible causes of increased polarization has focused on three main categories of explanations: factors which shift the relative **supply** of skilled and unskilled workers, factors which shift their relative **demand**; and **institutional** factors such as changes in wage-setting institutions (e.g. unions, minimum wages) and social programs. By **labour supply shifts** we mean changes in the relative supply of skilled and unskilled labour within a country, stemming for example from (i) changes in the educational attainment of Canadians, (ii) large changes in labour force participation rates, such as have occurred among women, and/or (iii) immigration and/or emigration of labour. On balance, while some of these factors play an important role in determining the ultimate size of a country's increase in inequality, most analysts do not believe that such supply-shift factors constitute the major driving force behind the changes in wage structure that have recently occurred in developed countries, including Canada.

Among factors which may have caused significant **labour demand shifts** in developed countries over the last 20 years, the two which have received the most attention are the dramatic increase in international trade, and the rapid pace of unskilled-labour saving technological change in modern industry. At the moment, there remains some dispute over which of these two factors has been the more important, though it seems likely that both had some significant inequality-increasing effects. A third possible source of labour demand shifts which has, to date, received relatively little attention among economists is the increased international mobility of capital, particularly in the form of foreign direct investment. In my opinion, more work is needed to get even a rough assessment of this factor's past and future impact on labour market polarization in Canada.

Chief among the **institutional** explanations for rising inequality in some developed countries are

trends toward de-unionization and/or decentralization of collective bargaining, trends in minimum wage legislation, and the nature of a country's social policy (e.g. UI and welfare systems). While these undoubtedly have some role in explaining recent increases in earnings inequality in countries like Sweden, the U.K. and the U.S., which experienced significant institutional changes in this regard, it seems unlikely they play a major role in Canada, precisely because those institutions did not change dramatically in Canada over those years. Indeed, the relative stability of Canada's wage setting institutions and social safety net throughout the 1980's has been cited as an explanation of the relatively smaller amount of polarization experienced here, compared with the United States over the same period.

Third, there are a number of negative **consequences** of increased polarization, including the potential of increased crime and social unrest, and a tremendous fiscal strain on existing, traditional social welfare programs. One potential consequence, however, is beneficial: by raising the incentives to acquire skills, increased polarization may encourage quicker adjustment and entry into the new knowledge-based economy. To the extent this raises the supply of skilled relative to unskilled labour --as it appears to be doing in Canada today--, increased polarization may thus carry with it some of the seeds of its own destruction.

Fourth, one can think of long list of **policy options** which might play a useful role in reversing, slowing, or at least mitigating the effects of the recent labour market polarization in Canada. One of these, as mentioned, is to do nothing, thus allowing market signals operate to encourage greater adaptation to global realities, especially in the area of skill formation. While potentially effective, one potential consequence of this option may however be considerable short-term hardship for less-skilled Canadians, and/or increased financial strain on existing income support programs.

Other policy options discussed in the paper are of three main kinds. The first take direct aim at reversing, or trying to shelter the economy from, the fundamental forces working to cause increased

polarization. These include trade barriers, immigration restrictions, restrictions on capital mobility and on uses of new technology. The second are largely palliative measures designed to reduce the transitional costs involved in the move to a knowledge-based economy, and include such factors as adjustment assistance to trade- or technology-displaced workers, providing public-sector employment for unskilled workers, and expanding or maintaining the social safety net more generally. The last involve positioning the Canadian economy, as much as possible, in a way that ensures that the strong market forces currently at work in the world work to our national benefit, rather than against us. In this category are expanding and reforming the system of higher education, to take advantage of increasing demand for skilled labour, and attempting, as much as possible, to become a society of net savers rather than net borrowers, to take advantage of the increasing demand for capital worldwide. In the paper I argue that by far the best and most sustainable solutions to the "polarization" problem are of the latter kind, precisely because they do not involve swimming against an overwhelming global tide which is not favourable to less-skilled workers in developed countries.

II. TRENDS IN LABOUR MARKET POLARIZATION: CANADA IN INTERNATIONAL CONTEXT.

1. Canada.

In this section we review the evidence on recent trends in the level and distribution of real wages and earnings in Canada. These changes have been well documented, with a fairly consistent picture emerging from studies by various authors using different data sources and alternate methodologies. To summarize the main facts: (1) Real wages for men rose through the early seventies and then declined through the present (though the gains of the early seventies have not been entirely erased). (2) The real wages of women continued to grow through this entire period, though more slowly since 1977 than before.

(3) The wage distribution was compressed in the early seventies but has been widening since, for both men and women. (4) Unlike the U.S., more of the increase in variance has been due to growing age differentials, than to education differentials.

The figures for wages reported by Kuhn and Robb (1995) are representative of most studies. Kuhn and Robb use data from the 15 repetitions of the (Canadian) Survey of Consumer Finances between 1971 and 1991 to examine wage, employment and unemployment trends in that period. Focusing on mean annual earnings of full time, full year workers, they find that the mean annual real earnings of men rose by 14% between 1971 and 1975. After peaking in 1975, they declined by 6% between 1975 and 1991. The mean real earnings of women grew throughout the entire period; by 16% between 1971 and 1975 and by a more moderate but still significant 13% between 1975 and 1991.

Turning to the distribution of wages and earnings, Kuhn and Robb divide the Canadian population into six different skill groups, defined by percentiles of the predicted wage distribution. (Predicted wages are used to minimize the effects of measurement error in wages, and to allow nonworkers --for whom no current wage is observed) to be included in the analysis. Changes in wages, labour market activity and earnings for these six skill groups are summarized in Tables 1 and 2, taken from the Kuhn-Robb paper.

There are several things to note in these tables. First, for both men and women, Canada experienced wage growth and compression between 1971 and 1977 (this has also been noted by Dooley 1986). After that, wages became more unequal for both men and women, with moderate growth continuing for women of all skill levels and wages falling at the median for men. Second, note the important role of changes in weeks worked per year in the changes in yearly earnings. This is true not just for women (as one might naturally expect, with growing participation) but also for men. In particular, a good part of the yearly earnings losses of men at the bottom of the wage distribution appears to be the

result of reduced weeks of work. Relatedly, Morissette, Myles and Picot (1994) have documented the role of increases in weekly hours heterogeneity in the increase in earnings heterogeneity. They report an increase in 50+ hour work weeks, especially at the top of the wage distribution.

Other recent studies of the changing level and distribution of Canadian wages include Freeman and Needels (1993), Beach and Slotsve (1994), Bar-Or et al. (1995), Burbidge et al. (1994, 1995), Morissette, Myles and Picot (1994), and Myles and Picot (1994). Freeman and Needels examine changes in the distribution of wages in Canada using the 1976, 1980, 1987 and 1988 editions of the Survey of Consumer Finances and the 1971, 1981 and 1986 Censuses. The latter allow comparison with U.S. data from the March CPS. They report that educational differentials increased in Canada by much less than in the U.S., a result which is confirmed by Bar-Or et al. (1995) using more years of SCF data. Freeman and Needels however also report significant increases in Canadian age differentials - quite comparable to those observed in the US. This confirms the greater importance of age (over education) among observable characteristics, which has been observed by other analysts, for example Myles and Picot (1994). Freeman and Needels also report a narrowing of gender pay gap, the obvious consequence of the gender differences in trends of wage levels reported above. Finally they report that within educational groups, the distribution of earnings has widened.

2. United States.

Developments in the wage and earnings distributions in the U.S. have become the subject of an enormous literature. Two of the seminal papers in the area are Murphy and Welch (1992) and Katz and Murphy (1992). Murphy and Welch focus on the returns to observable worker characteristics. They note that while the pattern of these differentials (increasing wages with education, and an increasing, concave

wage - age profile) have been relatively constant through time, the size of these differentials has moved substantially. Using successive March CPS supplements from 1963 to 1989 and focusing exclusively on white males, Murphy and Welch chart the changes in wages and employment across age - schooling categories. They report that the returns to schooling increased between 1963 and 1971. For young workers the returns to schooling began to decrease in 1971; a similar decline began among older workers somewhat later. These trends were dramatically reversed in the early 1980s and by the end of that decade schooling differentials were as large as in any year covered by Murphy and Welch's data.

Murphy and Welch also discuss experience (or age) differentials. They consider movements in these differentials on either side of the period when the peak of the baby boom entered the labour market, approximately 1973 to 1980. They report a decline in the relative wages of younger workers in every educational category with the entry of the baby boom into the labour market. However, as the peak passes, the age differential begins to contract only for college graduates: for high school graduates it continues to expand.

Using the March CPS supplements from 1964 to 1988, Katz and Murphy add to the picture of a changing US wage distribution in several ways. First, they report movements in the mean level of wages, holding the distribution of demographic characteristics constant at its average for the entire period. Considered this way, real wages grew almost 20 percent between 1963 and 1971 and then declined by over 3 percent by 1987. Next, they consider wage growth by gender, education and potential experience categories. Women's wages rose by some 9 percent relative to men's. Turning to educational groups, they demonstrate that college graduates lost the most between 1971 and 1979, but actual posted substantial wage growth in the 1980s. Finally, they report that the real wage decline after 1971 was more substantial for young workers.

Since they find that changes in gender, education and experience differentials can account for only

about one third of the growth in raw wage variation, Katz and Murphy then turn to the within cell variation in wages. They measure this as the residual of a regression of weekly log wages on experience, experienced squared, education categories, gender and numerous interactions terms. They show that the variance of these residuals expanded dramatically over almost the entire period covered by their data. They label this residual variance "skill differentials".

Finally, Katz and Murphy summarize the growth in overall wage dispersion by reporting the differential in log wages between the 90th and 10th percentile. For both men and women, this grew by some 0.25 from 1963 to 1987.

The basic patterns described by these two papers can be summarized as follows: 1) educational differentials expanding in the 1960's, falling in the 1970's and rising rapidly in the 1980s, 2) a rise in age or experience differentials, especially in the 1980s, 3) a decline in the gender wage differential in the 1980's, 4) an apparently continuous increase in "within group" inequality from the middle 1960's to the end of the 1980's and 5) a substantial growth in overall wage inequality over that period. These basic patterns have been confirmed and further documented by other authors. The basic patterns appear robust to both the way the data is divided and the summary statistics used. For example, Juhn, Murphy and Pierce (1993) divide the wage distribution into deciles and consider the growth in wages for each decile of the data over same period as examined by Murphy and Welch. They find that the wages of the "most skilled" (top decile) rose substantially while the wages of the "least skilled" (bottom decile) declined. Bushinsky (1994) uses quantile regression to document increases in wage dispersion both between and within demographic groups. These and other studies are reviewed in Levy and Murnane (1992).

As in Canada, the widening of the earnings distribution appears to be a consequence of not just growing disparity in wages, but also of a shift in the hours distribution. Coleman and Pencavel (1993a,b) report a decrease in hours (especially in the upper tail of the hours distribution) for those with little

schooling coupled with increase (again especially in the upper tail) for those with higher levels of schooling.

3. Other Countries.

As demonstrated in the preceding subsections, both Canada and the U.S. have experienced stagnation in real wage and earnings growth for men, and an increase in wage and earnings inequality for both women and men. The U.S. experienced a larger rise in wage inequality, and as part of this, a rise in education differentials not apparent in Canada. How do the experiences of these two countries compare to those of other industrialized nations?

Katz, Blanchflower and Loveman (1995) examine somewhat comparable wage inequality series for the US, UK, Japan and France. In the 1980s, the US and UK had dramatic increases in wage inequality. Japan had a moderate increase in the same period while in France, wage inequality declined until 1984 and then rose through 1990. Turning to the role of observable worker characteristics, these authors report that educational and occupational (manual/nonmanual) differentials narrowed in the 1970s in all four countries. In the 1980s, these differentials exploded in the US and UK, and rose moderately in Japan. In France these differentials continued to narrow in the 1980s, with some evidence of an upturn for males after 1985.

A further investigation of inequality in the U.K. is conducted by Schmitt (1995) who employs the General Household Survey from 1974 to 1988. According to Schmitt, overall earnings inequality actually fell in the UK in the 1970s (unlike the U.S.) but rose substantially in 1980s (as it did in the U.S.). Schmitt also reports an important contrast between the U.S. and U.K.: earnings (levels) for low skill workers actually rose over this period (in the U.S. there was stagnation and decline).

Gregory and Vella (1995) contrast the Australian experience with that of the U.S. This is an

interesting comparison because the countries have such starkly different labour market institutions. Australia has high trade union coverage and a centralized wage fixing institution. These authors focus on both employment and wages. They report that the Australian experience is similar to that of the U.S. except between 1969 and 1976, when Australian real wages increased rapidly versus the U.S., but with a decrease in employment and increase in unemployment. More recently, Gregory and Hunter (1995), in a widely-publicized paper, document a dramatic increase in income polarization across urban neighbourhoods in Australia. The extent to which this is due to greater income inequality across individuals or to increasing geographical concentration of the poor is as yet however not clear.

Another country with labour market institutions quite different from North America is Italy. Erikson and Ichino (1995) discuss wage developments in Italy in the 1970s and 1980s. Italy experienced a compression of wage differentials in the 70's ending in 1982 or 1983. There is some weak evidence of a reversal in the 1980.

Sweden has long been cited as an example of a successful economy with an institutionally dominated and egalitarian labour market, though it has experienced rapid change in the last few years. Edin and Holmlund (1995) report a rapid decline in wage inequality in Sweden in 1960's and 1970's. In addition to a decline in the raw dispersion of wages they document declines in education, age and gender differentials. They also report a substantial decline in wage inequality within occupation and educational groups. These trends are reversed in mid 1980s and into the 1990's. They report a small rise in overall inequality, some rise in educational differentials and a rise in within group inequality. As in Canada, the relative position of youth has deteriorated. Interestingly, differentials attributable to observable characteristics were more important in the 1960s and 1970s decline in inequality, while within group variance has been more important in the subsequent increase.

Turning to Germany, Abraham and Houseman (1995) report that there has been virtually no

growth in inequality in the former West Germany in recent years. The overall distribution of earnings has narrowed, mostly due to a compression of the bottom half of the distribution. They report no change in occupational, educational or age differentials and no consistent evidence of change in the dispersion of earnings within age - education groups. Krueger and Pischke (1995) complete the German picture by considering the former East Germany. Before reunification overall wage dispersion was lower in East Germany than West. Education differentials were however similar. Since reunification education differentials in the former East Germany have fallen, while overall wage dispersion has risen.

To summarize, the experiences of other industrialized countries provide some interesting contrasts to those which have been documented in North America. Virtually the only other industrialized country to experience increased polarization on the scale observed in the U.S. is the U.K., with other countries experiencing either no significant change (e.g. Germany) or even more muted, and/or delayed, increases than Canada (e.g. Japan, France, Italy). One exception might be Sweden, which has seen a reversal of the very substantial decline in inequality it experienced in the 1960s and 1970s. And even in the U.K., which was most like the U.S., steady underlying wage growth for even the least skilled workers provided an important contrast to U.S. and Canadian trends.

III. EXPLANATIONS FOR INCREASED POLARIZATION

Why has wage growth stagnated among Canadian males? Why did wage dispersion decrease in Canada in the early seventies and then increase for both men and women? That the trends in both the level and dispersion of wages have changed dramatically in the last 20 years demonstrates that these trends are not inexorable properties of a modern economy. This argument is strengthened by the many international differences reviewed in the previous section. The stark contrast in international experience over the last 20 years also suggests that there may be important policy choices to be made in this area.

Explanations which have been proposed by various authors to explain recent increase in North American labour market polarization fall into three main categories: labour supply shifts, labour demand shifts, and changes in labour market policies and institutions. We consider each in turn below.

1. Supply Shifts.

One set of factors which have repeatedly been linked to changes in national wage structures are shifts in the relative supply of skilled and unskilled labour within countries. Such shifts can arise from a number of factors, including (a) changes in the fraction of the population with higher education, (b) changes in labour force participation rates, such as have occurred among women, and (c) immigration and/or emigration of labour.

(a) Changes in educational attainment.

Evidence from a number of countries has shown that changes in a country's relative supply of educated labour, via greater educational attainment among the population, can have substantial effects on the relative wages of more- and less-educated labour, and thereby on the degree of inequality. For example, in the early to mid-seventies, considerable attention was paid to the declining returns to university education in both the US and Canada (Freeman 1976, Dooley 1986). The consensus view at the time was that this was essentially a supply side phenomenon: in the late sixties and early seventies the relative supply of university educated labour exploded in both countries. Similarly, Schmitt (1995) attributes the decrease in inequality in the UK in the 1970's to large rise in relative supply of skilled labour at that time. Edin and Holmlund (1995) argue that education and age differentials in Sweden can be explained by changes in relative supply. They also seem to suggest a cobweb model: increased supply of university graduates decreased the wage premium in the 1970s. As a result fewer people went to university. As a result the premium rebounded in the 1980s. And Abraham and Houseman (1995) point out that the different trends

in supply of highly educated workers probably explain why education premiums grew in U.S. but declined in Germany in the 1980's.

According to Freeman and Needels (1993), relative supply factors may also have played an important role in explaining the divergent trends in U.S. and Canadian inequality since the late 1970's. Essentially, while the returns to higher education rose in both countries, they increased much more in the U.S. than Canada. An important factor behind this divergence, as they point out, could be the dramatic slowdown in the supply growth of college graduates in the U.S., coupled with the continued strong growth in supply in Canada.

Overall, then, increasing educational attainment has been cited as a potential cause of narrowing wage differentials in several countries in the 1970's, and as a potential factor in the **rate** at which wage differentials **increased** since 1980, in the U.S. and Canada. Clearly, however, it cannot by itself explain why differentials widened in a number of countries, including Canada, in the 1980's, because it constitutes a force in the "wrong" direction: the continuing increase in supply of educated labour should have acted to reduce wage inequality, not raise it. Thus, while education is not likely the disease, the substantial evidence on the role of education suggests it could be, at least, partly, the cure: increased education apparently has potential as an effective policy response to pressures for polarization across the developed world.

(b) Female labour force participation

A striking feature of the now large international research on changing wage structures and labour market polarization is its almost exclusive focus on men. Equally interesting is the fact that those studies which do consider women (e.g. Kuhn and Robb 1995) find much greater increases in polarization among men than women (see for example the Tables 1 and 2). In particular, although inequality increased

modestly among Canadian women, wages and employment of even the least skilled women continued to rise throughout the 1980's. A natural question that might arise in this context is thus whether increased competition for jobs by women played any role in the declining earnings opportunities of men, especially of less-skilled men.

While some interesting studies of the gender dimension of increased wage equality have recently emerged (e.g. Blau and Kahn 1994), these studies tend to focus on the effect of an increase in overall wage inequality on the relative average wages of women and men (the gender-wage gap), without reference to possible effects of women's labour market entry on men's market wages. To date, I am aware only of three papers which have attempted to address the latter issue empirically. One (Topel, 1994) assesses the role of supply factors in explaining the divergence across U.S. regions in the amount of wage polarization which has occurred. Dividing the male labour force into three skill groups, and the female labour force into two skill groups, Topel finds that women's employment growth does have negative effects on men's wages, but the pattern of these effects across skill groups is difficult to understand: it is primarily labour force growth among highly-skilled women that is associated with falling wages of low-skilled men.

In a recent working paper, Nicole Fortin and Thomas Lemieux (1995) use rank regressions to examine the impact of rising female labour force participation on the wages of men (especially unskilled men) in U.S. Current Population Survey (CPS) data. They begin with the strong assumption that the overall wage distribution of wages is constant. Such an assumption is consistent with a pure assignment model of wages, and ensures the result that gains by women are offset by male losses. More interestingly, their model and estimation procedure (using U.S. (CPS) data for 1979 and 1991) capture several other features of the data, including the fact that inequality increased both for women and men, but did so faster in the upper tail for women and in the lower tail for men. Finally, Juhn and Kim (1995), in a closer examination of the timing and regional distribution of U.S. wage and employment trends, find patterns

which are inconsistent with a simple supply-shift model wherein exogenous increases in women's participation put downward pressure on men's wages.

More generally, the gender dimension of increased labour market polarization is an area where not enough is known to date, with most studies of the phenomenon to date being confined to men's wage distributions. More work is clearly needed, especially on a cross-national basis. If indeed it turns out to be the case that autonomous shifts in women's labour supply are having important effects on overall wage levels and wage inequality among men, our understanding of these trends would be very different than if it were based on factors currently in vogue, like trade or technology shifts.

(c) Immigration

To the extent that immigrant workers are disproportionately unskilled (or required to work in unskilled jobs because their credentials are not recognized), it is possible for large inflows of immigrant labour to have the effect of "crowding" the low end of the labour market, thus bidding down the wages of unskilled Canadian workers and increasing inequality. That this is at least an important possibility is illustrated by some recent studies of the effects of immigration to the U.S. on the wages of unskilled American workers (e.g. Borjas, Freeman and Katz 1992; Topel 1994). Interestingly, while some earlier studies (e.g. LaLonde and Topel, 1991, and the studies reviewed in Friedberg and Hunt 1995) found only very small effects of large immigrant inflows to U.S. urban areas on unskilled natives, these more recent studies find considerably bigger effects on a regional or national level. Thus Borjas et al. conclude that immigration to the U.S. contributed materially to the declining earnings and employment opportunities of high-school dropout workers, and Topel concludes that, between 1973 and 1990 "immigration of unskilled Asian and Hispanic workers reduced the wages of unskilled natives in the [U.S.] West by about 10 percent." (p. 21).

Unfortunately, although we know that immigrant "quality" (in the sense of earnings relative to natives upon arrival) has recently been declining in Canada (e.g. Baker and Benjamin 1994) there has been essentially no research on the impacts of immigration on the wages of unskilled **or** skilled Canadians. (This is partly because of the small size of our country, with only three cities as its major immigrant destinations). To the extent that Canadian immigration has a smaller unskilled component (which seems likely given the smaller role of illegal immigrants and the Canadian point system), one would suspect less of a deleterious effect of immigration on unskilled Canadian workers, but no hard evidence on this point exists.

Overall, immigration of unskilled workers to Canada could have had some negative impact on the wages of unskilled Canadians, though the magnitude of this effect is hard to judge from available evidence. It is however important to note that, like high-school dropouts, very highly skilled workers may also be overrepresented in immigrant flows to Canada and the U.S., which should work to compress the very top of the wage distribution. Also important to note is a key distinction between the effects of immigration of unskilled labour and the effects of increased imports of unskilled-labour intensive goods, discussed in a following section. Unlike imports, which are confined largely to the manufacturing sector, unskilled immigrant workers are able to compete directly with Canadian workers employed in the nontraded, service sector, where the great majority of unskilled Canadians are in fact now employed. This aspect of immigration should work to accentuate any negative effects it may have on the labour market outcomes of unskilled Canadians.

Overall, a number of supply-related factors may have affected the speed or size of Canada's recent increase in labour market polarization. Our rapid increase in the supply of well-educated labour probably prevented the polarization from being worse than it would otherwise have been. If women had not entered

the labour market in record numbers, perhaps there would have been more good jobs left over for unskilled men, though evidence on this point is much weaker. And if our immigration policy had been even more selective on the basis of skill, perhaps there would be less competition for low-wage jobs than there is today. Taken together, however, none of the above "supply" factors constitutes an obvious "smoking gun" as the likely cause of increased polarization: increasing education actually acted to reduce polarization, the effect of women's labour supply shifts on men is unclear, and it seems doubtful that the composition or size of Canada's immigrant population changed enough over the last 15 years to affect the wages or job opportunities of unskilled natives substantially more than before. Given these mixed results, it seems prudent to continue our search for explanations in other directions, such as shifts in labour demand.

2. Demand Shifts.

By labour demand shifts, I mean factors which change the number and kind of workers Canadian firms wish to hire at any particular wage rate. There are at least three such factors which could have caused a major change in labour market polarization over the last 15 years: technological change, the liberalization of international trade, and the increased international mobility of capital, especially in the form of foreign direct investment. In what follows, I first describe the evidence in favour of the "trade" and "technological change" hypotheses in turn. I then briefly summarize the main points of a lively ongoing debate between proponents of these two views, and end with a discussion of what I believe is an important but neglected area: foreign direct investment.

(a) Trade.

While most economists tend to favour freer international trade for efficiency reasons, a number of economists (e.g. Borjas et al. 1992; Wood 1994; Freeman 1995) have recently expressed the view that

increased openness of North American and European economies to international trade may have increased inequality in those countries by hurting their unskilled workers. These analysts point to the well-known Heckscher-Ohlin model of international trade, which predicts (a) that freer trade with less-developed countries should lead developed countries to increased their imports of goods whose production uses a lot of unskilled labour, and (b) that this trade, while efficient in the sense of raising total domestic (and world) income, will have adverse effects on the wages and employment prospects of unskilled workers living in developed countries.¹

Empirically, supporters of this "trade" hypothesis note that current trade patterns between the "North" and the "South" are indeed highly consistent with the predictions of the Heckscher-Ohlin model. (Northern exports to the South are highly intensive in the use of skilled labour; imports from the south are intensive in unskilled labour). These analysts also point out that the recent decrease in unskilled workers' wages occurred concurrently with a considerable increase in developed-country imports from low-wage less-developed countries (for example, Freeman notes that imports from less-developed countries rose from 14% of all U.S. imports in 1970 to 35% in 1990). Closely related is the finding that the timing of the recent increase in U.S. inequality is remarkably consistent with trends in the U.S. manufacturing trade deficit, both on a national level (Murphy and Welch (1988); Borjas and Ramey (1994)) and in a panel model of U.S. regions (Karoly and Klerman 1994). In a recent review, however, Burtless (1995) questions whether the Borjas/Ramey and Karoly/Klerman results would stand up if the sample period were extended beyond 1988, when the U.S. trade deficit improved but inequality continued to rise.

Finally, a number of more disaggregated studies of the effects of import competition on industry wages and employment yield ample evidence that international trade developments can have important

¹According to Wood (1994), this adverse effect took the form of increased unemployment among the unskilled in those European countries which did not experience increased wage polarization during last two decades.

adverse effects on those outcomes (e.g. Grossman (1987), Abowd and Lemieux (1988, 1990), and Revenga (1992)). For example, Revenga studies thirty-eight U.S. manufacturing industries between 1977 and 1987. Using industry source-weighted exchange rates she finds a moderate but significant effect of international competition on wages and employment. Dollar appreciation between 1980 and 1985 seems to have reduced wages by two percent and employment by between four and one half and seven and one half percent.

(b) Skill-Biased Technological Change.

While there is no *a priori* reason to expect efficiency-increasing innovations to increase or decrease firms' relative demands for skilled versus unskilled labour, a number of economists have recently expressed the belief that --in contrast to the move toward assembly-line technology in earlier decades, which required large amounts of unskilled or semiskilled labour-- the kinds of innovations recently made possible by the explosion of computing power tend to be "biased" in favour of skilled versus unskilled labour. If so, then technological change could be an important explanatory factor behind the recent increase in wage and earnings polarization.

While many econometric studies treat "technological change" as a residual factor to be invoked when all other explanations fail (e.g. Bound and Johnson 1992), some more direct evidence on the role of technical change in firms' decreasing demands for unskilled labour has recently become available. For example, in a study of 450 U.S. manufacturing industries during the 1980's Berman, Bound and Griliches (1994) find that those manufacturing industries which had the greatest increases in skilled labour demand (as measured, imperfectly, by the share of nonproduction workers in employment) are also those which have made the biggest investments in "new" technologies (as measured, again imperfectly, by factors like computer use). Similar results are also found for the U.K. by Machin (1995), and are confirmed by a

variety of case studies undertaken by the U.S. Bureau of Labor Statistics (cited in Berman et al.).²

Berman et al. also make the following point concerning the relative plausibility of the "trade" and "technology" explanations of decreased demand for unskilled labour in the U.S. Because the "trade" hypothesis is based on an increased U.S. specialization in the production of certain types (i.e. skill-intensive) of goods rather than others, much of the effect of changed international trade patterns on unskilled labour demand should work through changes in the **mix** of goods produced by U.S. industry, with unskilled-labour-intensive, "sunset" industries declining and skilled-labour, export-intensive "information economy" industries expanding. They find, however, that most of the decrease in U.S. firms' employment of unskilled labour during the 1980's occurred **within** fairly detailed, four-digit manufacturing industries, rather than being attributable to shifts in activity across these industries. They interpret this evidence as being inconsistent with the "trade" explanation of declining demand for unskilled labour.

(c) The Technology versus Trade Debate.

The debate over whether technological change or increased trade with low-wage developing countries is the more important cause of decreased demand for unskilled labour in developed countries like Canada is far from over. For example, Wood (1994) has pointed out that Berman et al.'s conclusion based on within- versus between-industry shifts is unwarranted: much of the increased specialization of the North American economy in skill-intensive goods **could** actually be occurring within detailed industry groupings. This is supported by empirical research on the manufacturing **plant** level by Bernard and Jensen (1994), who show that at least half of the employment gains of skilled (i.e. nonproduction) workers in U.S. manufacturing between 1973 and 1987 is associated with a reallocation of production away from

²For a recent study of technological change in Canadian manufacturing, see Baldwin et al. (1995).

plants which export towards those which do. Bernard and Jensen also measure the effect of technological investment but find it to be considerably less important than the import versus export orientation of the plant.

Arguing against the "trade" hypothesis, Cragg and Epelbaum (1995) have observed that relative wages of unskilled workers in Mexico have fallen in recent years. Since increased exports to the U.S. should have acted to raise the wages of unskilled Mexican workers, Cragg and Epelbaum conclude that more than just increased trade was likely behind the wage trends in both the U.S. and Mexico. In favour of trade as the driving force, Wood argues that this interpretation ignores the existence of a third class of extremely unskilled, or illiterate labour in less-developed countries like Mexico, whose wages may not be raised by increased trade with developed regions. Wood further argues that much of the technological innovation seen in North American industry may in fact be a "defensive" reaction to increased trade pressures, and thus not the primary exogenous force behind the changes in labour demand.

Clearly, more research is needed to assess the relative importance of technology and trade in the recent decline in unskilled labour demand in developed countries. Some important directions for such research are the following. First, more good work is needed on countries other than the U.S.: our faith in the "trade" hypothesis would, for example, be much enhanced if observed changes in trade patterns could explain the above-noted cross-country variations in wage trends: for example, have Germany and France been less subject to trade shocks with adverse impacts on unskilled labour than the U.S., Canada and the U.K.? Another key requirement is for work which goes beyond the boundaries of the manufacturing sector. Indeed, while almost all of the studies cited above focus on manufacturing only, this sector now employs only 15 percent of U.S. unskilled workers. Although some versions of trade theory imply the opposite (claiming that "the tail can [indeed] wag the dog"), it remains an open question whether changes in manufacturing technology **or** trade can have large enough impact on wages in the

(largely nontraded) service sector, where the bulk of unskilled workers are now employed, to explain recent trends in inequality. Some efforts to confront the serious data problems involved in measuring outputs and trade of service industries are thus clearly required.

(c) International Capital Flows: Foreign Direct Investment

Another demand-shift factor that might explain labour market polarization in North America is the increased international mobility of capital, particularly in the form of foreign direct investment in plant and equipment. To what extent is the relocation of production facilities into low-wage developing countries, greatly facilitated by recent advances in communications and transportation technology, responsible for declining wages of unskilled workers in North America? Interestingly, while some calculations (e.g. World Bank, 1995, pp. 61-64) suggest that these factors have not, as yet, been of major importance for workers in the "North", this area has to date been largely neglected by economists studying changes in wage structure.³ While clearly seen to be of major importance by some political scientists and noneconomists (e.g. Reich 1992), little hard quantitative evidence on the overall importance of this factor for developed countries has to my knowledge yet been produced.

3. Institutional Factors.

In addition to the market forces of supply and demand, there exist a number of institutional factors with potentially important roles in shaping levels and changes in wage structures in different countries. Among the more important of these are a country's system of collective bargaining and its minimum wage

³Feenstra and Hanson's (1994) study of U.S.-Mexico trade, wages and investment flows is a recent exception.

laws. In what follows I consider the available evidence about how both these factors can work to affect wage structure in different countries, and whether they likely play any role in explaining the recent increase in Canada's labour market polarization.

a) Unions and Collective Bargaining.

One set of factors to receive considerable attention as possibly contributing to the rise in wage inequality in the US and elsewhere are changes in union density and collective bargaining arrangements. Higher unionization rates tend to operate to reduce wage inequality in two ways: First, to the extent that unions disproportionately organize low-wage workers, and raise the wages of those workers, the fact that unions tend to raise their members' wages will act to reduce inequality. Second, it is common for unions to adopt "standard" wage policies within firms, and "solidarity wage" policies across firms and industries, which reduce wage differentials among union members.

The empirical labour economics literature yields a number of important examples of how changes in the collective bargaining structure of a country appear to be associated with increases or decreases in the degree of wage polarization in those countries. For example, several authors have noted the coincidence of the precipitous decline in union coverage in the U.S. with the increase in wage inequality (and particularly the decline in the fortunes of low skilled workers) in that country. An early example is Freeman (1991) and additional support is provided by DiNardo, Fortin and Lemieux (1995).

Other authors find support for this thesis in international comparisons. For example, Canada has experienced some decline in private sector unionization but nowhere near the collapse in union coverage witnessed in the U.S. At the same time, the growth in earnings inequality has been significantly less in Canada than in the U.S. To pursue this idea more carefully, Lemieux (1993), estimates the effect of unions on wage inequality in Canada and compares those estimates to existing ones for the U.S. His overall conclusion is that differences in union coverage account for some 40 percent of the difference in

wage dispersion between Canada and the U.S.

A union-based explanation of changes in wage structures is also consistent with the fact the only country rivalling the U.S. inequality increase is the U.K., particularly during the Thatcher years of declining union power. Leslie and Pu (1994) evaluate competing explanations for the steep rise in U.K. wage inequality and conclude that changes in institutional pay setting arrangements were the main cause. Schmitt (1995) also suggests that U.K. institutions (unions, wage councils, income policies) may have delayed the rise in inequality relative to U.S., a point to which we return below.

The role of unions and collective bargaining has also been emphasized with regard to continental European labour markets. Recent trends in Swedish inequality seem to be quite closely linked to the collapse of centralized collective bargaining in that country. This is emphasized by Hibbs (1990). Edin and Holmlund (1995) also note that Sweden's period of declining wage inequality corresponds to the "heyday" of the solidarity wage policy, when the main Swedish trade unions pursued an active policy of reducing wage dispersion. The reversal of this trend is coincident with the decline of centralized bargaining in that country. Erickson and Ichino (1995) attribute the absence of an increase in wage dispersion in Italy to unions and egalitarian wage setting policies, and Cardoso (1995) argues that, from 1983-1992, despite face of strong pressures toward increasing wage dispersion, Portuguese trade unions compressed the bottom of wage distribution, though they were unable to prevent divergence at top via wage drift.

While very suggestive, it is important to remember that one potential problem with all the above studies is their failure to deal adequately with the endogenous nature of labour market institutions themselves: Is the decline in U.S. unionization an autonomous cause of increased labour market polarization, or are changes in unionization and wage structure both the results of some more fundamental economic pressures, such as the tendency toward global factor price equalization inherent in freer

international trade? This is a difficult conceptual issue which needs to be borne in mind when assessing the importance of "institutional" factors on labour market outcomes more generally.

(b) Minimum Wages.

A second institution to receive considerable attention in the literature on rising wage inequality is the minimum wage. The role of the decaying real value of the minimum wage in increasing U.S. wage dispersion has been investigated by Blackburn, Bloom and Freeman (1990) and by DiNardo, Fortin and Lemieux (1995). The latter authors apply nonparametric techniques to data from the CPS covering the years 1979 to 1988. They provide quantitative and striking visual evidence of the role of minimum wages in compressing the bottom of the wage distribution and hence reducing overall wage inequality.

(c) Labour Market Institutions as Mediators of Labour Supply and Demand Shocks

In addition to being the source of autonomous changes in inequality, it is important to note that national (and provincial/state) institutional differences can influence wage distributions another way: by mediating the way an economy responds to other shocks, such as those based on changes in trade and technology. For example, if a country has a centralized collective bargaining system with the power and desire to maintain narrow wage differentials among workers, if it has high and binding minimum wage laws, and/or if it has a generous social safety net providing an income floor to unemployed workers, technology- and/or trade-based reductions in the demand for unskilled labour may not be allowed to translate into wage reductions for those groups. Unfortunately, however, as the OECD (1994) has pointed out, such a system may not be without its costs: priced out of the new labour market, unskilled workers may end up unemployed, sometimes for long periods of time. Related to this "OECD" hypothesis is the notion that unions may protect the jobs and wages of their current members, or "insiders" at the expense

of new jobs for "outsiders", leading not only to higher unemployment but a growing gap between the labour market outcomes of older and younger workers. Certainly, the fact that unemployment, and especially long-term unemployment, has increased much more in those countries with relatively stable wage distributions (Canada, Europe) than those with large wage shifts (the U.S.), and the fact that age differentials appear to have grown more in those countries as well, is consistent with this hypothesis. Wood (1994) makes this argument generally, while Katz, Blanchflower and Loveman (1995) use it with regard to France and Abraham and Houseman (1995) discuss it in the context of Germany. In sum, although their effect is probably overstated by the rather mechanistic measurement techniques used, major changes in wage-setting institutions in some countries, such as the U.K., U.S. and Sweden over the last two decades are likely responsible for at least some of the increased labour market polarization in those countries. A similar explanation for Canada's polarization does not seem so plausible, simply because our system of collective bargaining and wage regulation remained much more stable over this period. This is not, however, to say that Canada's relatively (to the U.S.) high unionization rate and its maintenance of minimum wage standards has not had an effect on Canada's labour market polarization. These policies may both have mitigated the amount of wage polarization that would otherwise have occurred in Canada, and may be responsible for polarization taking the form of increased long-term unemployment and greater a greater age, or generation gap in Canada rather than the increase in the working poor population seen in the U.S.

4. Other Factors.

Several other factors, which do not fit neatly into the above "supply-demand-institutional" (SDI) paradigm (Freeman and Katz 1994), might also be playing an important role in explaining the current trend toward labour market polarization in Canada, the U.S., and some other countries. Among these are the

widely-touted changes in firms' human relations practices towards increased use of incentive pay, of a "core" work force combined with extensive contracting out and temporary or part-time work, and of less job security even for senior, white collar workers. To the extent these factors contribute to increased inequality among a firm's workers at a point in time, or to increased instability of a typical worker's earnings over time, they could be contributing to the observed increase in polarization. Related to these factors is a possible trend towards smaller firm sizes and a trend towards increased self-employment in many countries, including the U.K., U.S., and Canada.

Interestingly, despite many attempts to detect the presence of these "new" human relations practices in aggregate data on the labour force, little such evidence has been found. For example, looking for evidence of the decreasing importance of lifetime jobs, both Farber (1995) in the U.S. and Green and Riddell (1995) in Canada have been largely frustrated. Whether this is due to deficiencies in the aggregate data, or to exaggeration and overgeneralization of the results of case studies in the more popular literature, remains an open question. One recent study which sheds some light on this question, however is Gottschalk and Moffitt's (1994) analysis of the U.S. Panel Survey of Income Dynamics. In their analysis, they find that one third of the increase in earnings inequality identified by previous researchers in the U.S. is **not** due to increased inequality of lifetime incomes across individuals at all, but to increased earnings instability for individuals over time.⁴ Gottschalk and Moffitt's analysis points out one very important shortcoming of almost all the other recent evidence on earnings polarization in the U.S. and elsewhere: its failure to distinguish between the increase in earnings **inequality** across individuals and that in earnings **instability**, or mobility, experienced by a typical individual over time. Clearly, this distinction needs to be more fully assessed if we are to fully understand recent increases in labour market polarization in the

⁴Note however, that contrary to Gottschalk and Moffitt, Bushinsky and Hunt (1995) have recently found evidence of **decreased** earnings mobility in the U.S. using a different panel data source.

U.S., Canada, or elsewhere.

Finally, one possible contributing factor to the increase in inequality in the U.S., and perhaps other countries, is changes in the distribution of cognitive skills among workers with given levels of schooling. While much attention has been focused on the long-term decline in U.S. Scholastic Achievement Test (SAT) scores, little is yet known concerning whether this decline is at all linked to the decline in wages among U.S. men, especially the less-skilled. Interestingly, Murnane et al. (1995) have recently shown an increase in the economic returns to cognitive skills in the U.S., suggesting that such skills are now more important than they once were. As well, two studies (Blackburn and Neumark 1993 and Murnane et al. 1995) have asked whether changes in the measured cognitive skill differential between high-school and college-educated workers can explain the increase in the returns to college education in the U.S., and obtained conflicting results. There are, however, two important reasons to doubt whether changes in the distribution of cognitive skills, at least as measured by standardized test scores, can explain much of the increase in U.S. earnings inequality: First, when such measures are added to a standard cross-sectional earnings equation, they typically reduce residual earnings variation by no more than 6 percent. Thus, as Levy and Murnane (1992, p. 1366) point out, even a doubling in the importance of such scores would only have modest effects on overall earnings inequality. Second, the at least in the U.S., the recent increase in inequality occurred even within older cohorts of workers, not just between cohorts with potentially different levels and variances of cognitive skills.

V. CONSEQUENCES, POLICY RESPONSES, and FUTURE RESEARCH

1. Consequences of Increased Polarization

Given stable or declining average wages, and a relatively stable social safety net, one of the most direct and obvious consequences of increased polarization in labour market opportunities should be an increased use of government transfer programs by less-skilled workers, as is shown for Canada by Kuhn and Robb (1995). The increased fiscal strain on these programs is now being felt across Canada, and can be seen as an important legacy of the increased polarization of Canadian labour markets in the 1980's and 1990's. An even more profound potential consequence of declining earnings opportunities for unskilled workers, especially men, is examined by Freeman (1994) for the U.S. The number of men incarcerated in that country has exploded since 1980, and in 1993 stood at a post-war high of 1.9 percent of the male work force overall, and 8.8 percent for black men. Since incarcerated individuals are not counted as unemployed, this sheds a whole new light on the low male unemployment rates attained by the U.S. relative to other countries in recent years. While really hard evidence on the connection is hard to come by, Freeman concludes that "the continued high rate of crime in the U.S., despite massive imprisonment of criminals, may be one of the costs of the rising inequality in the country, and in particular of the falling earnings of the less educated". Clearly, the possibility of increased crime, as well as of other forms of social unrest and political instability, should not be minimized as a potential consequence of increased labour market polarization in Canada, especially if the fiscal strains on our income support system necessitate further substantial cuts in those programs.

One remaining consequence of increased labour market polarization may be more benign. This is the fact that increased wage differentials between skilled and unskilled labour raise the incentives to acquire skills. There is, in fact, some evidence that this has already been occurring in Canada: Between 1981 and 1992, a period during which university tuitions increased substantially in much of the country, the fraction of men enrolled in school full time rose from 77 to 90 percent among 15-18 year olds, from 22 to 46

percent among 19-22 year olds, and from 3.7 to 10.1 percent among 23-28 year-olds.⁵ (Very similar, but slightly less dramatic trends occurred for women). At the same time, older women and men were returning to school in record numbers. This has two positive values: first, by reducing their relative supply of unskilled labour, it should help mitigate the recent decline in wages among unskilled Canadian workers. Second, increased education may have some positive value in itself, by producing a more-informed and tolerant citizenry employed in more stimulating and interesting jobs.

2. How Permanent is the Trend to Polarization?

Increased polarization has clearly been a key feature of Canadian labour markets in the last 15 to 20 years. What is less clear is whether it will continue to be so in the near to medium term: will increased international mobility of goods, services and capital continue to put downward pressure on unskilled workers' wages, and if so, will this pressure outweigh the substantial decreases in the supply of unskilled workers in Canada resulting from the massive educational upgrading that is now occurring? Clearly, whether the labour market changes recently seen in Canada are permanent or temporary is a crucial factor in assessing the appropriate policy response to those changes. Yet it is something that is very hard to predict.

Some perspectives on the likely permanence of the recent polarization in Canadian labour markets are provided both by historical experience, and by the diverging points of view on this matter by various proponents of the debate on its causes. Concerning the former, for example, it is worth recalling the policy concern surrounding the **decrease** in polarization that occurred in the U.S. and Canada in the

⁵These are based on my own computations from Survey of Consumer Finances public use microdata files. For both women and men, it is important to note that not all of the increase in schooling among the young was at the expense of employment: the fraction neither in school nor working actually fell somewhat over this period.

1970's: widespread concerns about a serious oversupply of educated workers were voiced in both Canada and the U.S. (Freeman 1976; Dooley 1986); economic theorists began to examine models in which overinvestment in education was arose (e.g. Spence 1973). Yet just one decade later, market forces (possibly related to the oversupply itself via a "cobweb" pattern) had completely reversed this trend. Other potential parallels are the two oil price shocks affecting the developed world in the 1970's: their effects were not as permanent as many had predicted, again partly because of market adjustments brought about by the price shocks themselves. Thus, while there may appear to be compelling reasons to expect the current trends in labour market polarization to continue, it is important to bear in mind that other trends, which appeared just as inexorable in the past, did not turn out to be so.

Interestingly, the uncertainty regarding whether current trends in polarization are likely to continue in North America is also reflected in the diversity of opinion among contributors to the debate on its causes. For example, some of the analysts who believe expanded North-South trade has **not yet** had a large effect on unskilled U.S. workers (e.g. Sachs and Shatz, 1994; Slaughter 1994) argue that despite this, massive effects are **about** to occur as China and India enter world markets. At the same time, some analysts who believe such trade has (Wood, 1994) or may have (Freeman, 1995) **already** had a major effect, believe those effects are **unlikely to continue** long into the future. Aside from the supply responses of educated labour mentioned above, these analysts point to the increasing specialization of North American economies in the production of nontraded services: the fewer low-skill manufactures we produce, the less vulnerable we are to cheap imports of these goods (indeed, then, lower barriers to the imports of these goods become an unmitigated benefit to Canadians, as the prices paid by Canadians for these goods falls, and no Canadian workers are left in those sectors to be displaced).⁶

⁶An important caveat to this analysis, however, is the potential for increased competition in middle- and even high-skill manufactures, as a result of both developing countries, such as Taiwan or Korea, acquiring more skills, and entry of highly-skilled workers in Eastern Europe and the former Soviet

3. Policy Options.

In this section, I discuss the likely impacts of a number of possible policy responses to the current polarization of Canadian labour markets. In discussing these options it is important to bear in mind the preceding discussions of the likely permanence of the polarization phenomenon: if the phenomenon is largely temporary and self-rectifying, some of these policy responses, as well as being too late, may in fact exacerbate a cob-web pattern in which labour market imbalances in one direction in one decade give rise to imbalances in the opposite direction in the next.

Our discussion of policy options begins with the "do nothing" option. This is an important option to consider, not only for the reasons given above, but because, politically, it may be the most likely one to ensue, given the current state of constitution-induced political paralysis in the country. Other options are grouped into three broad headings: "defensive" measures which attempt to directly counteract the possible causes of increased polarization; "palliative" measures designed to minimize the social costs of increased polarization; and "adaptive" measures designed to take advantage of, rather than fight, current global market trends.

(a) The Do-Nothing Option.

As mentioned, one possible, and perhaps likely, Canadian policy response to the "polarization" phenomenon is to do nothing specifically directed at that phenomenon. As mentioned as well, while this may have (and already has had) the beneficial effect of inducing a large amount of educational upgrading among the Canadian workforce, it may also create some problems, at least temporarily, in the form of increased fiscal strain on existing income support programs. Indeed, given the current unsustainable state

Union into to world trading system. Also potentially important is increased international trade in at least some kinds of services, which could compete more directly in the sector where most North American workers are now employed.

of financing for those programs, this "do-nothing" option would likely have to be combined with cuts in the generosity of social welfare programs, creating the potential for increased crime, social unrest, and political instability. While perhaps unavoidable, these could be some of the costs of the "do-nothing" approach.

(b) "Defensive" Measures

If increased trade with low-wage countries is responsible for labour-market polarization in Canada, then why not restrict that trade? The traditional answer given by economists is that trade restrictions create a deadweight loss, reducing national income by inducing a suboptimal allocation of resources across sectors of the domestic economy. While such losses probably do exist, I do not think they provide a compelling case against trade restrictions at all, for the following reasons. First, virtually every calculation of static allocative efficiency losses due to price distortions like tariffs yields very small numbers. This should not be surprising, since --mathematically speaking-- such losses are second-order, rather than first-order effects of market interventions. Second, the result that freer trade increases the national income of Canadians rests on the assumption that there is no foreign-owned capital operating in Canada, which is patently untrue. Third, the distributional effects of trade restrictions, unlike their deadweight-loss effects, are first-order effects and hence much larger in magnitude. Thus, if tariffs against low-skill-intensive manufactures can redistribute a lot of income from skilled workers and (foreign-owned) capital employed in Canada to unskilled Canadian workers at a small cost in allocative efficiency, then they should not automatically be written off as a policy tool. Indeed, given the current fiscal situation in Canada, the case for tariffs is strongly enhanced by the fact that, rather than costing governments money, they yield tax revenues. Further, by raising the rewards to productive work rather than subsidizing nonwork, they have important incentive advantages over typical income-support programs.

This is not to say that there is not a case against tariffs. That case, rather than resting on static efficiency costs, however, would have to rest on other grounds. The first of these is pragmatic. Not only is Canada already committed to a number of free-trade agreements, but the unprecedented expansion of international trade, especially in intermediate goods, has made the administration of any tariffs based on national origin a legal and logistic nightmare: it is simply becoming too difficult to determine "where" any given product is actually made. Thus, unless we are willing to impose a blanket tariff on imports, the tariff option seems increasingly unworkable with each passing year. Second are economic arguments based on induced productive (rather than allocative) inefficiencies due to the absence of foreign competition, or based on the valuable learning and resulting growth that occurs when producing for a global market, both of which are first-order effects. While these are much harder to quantify, they could potentially provide an economically much more compelling case against tariffs than the traditional static efficiency argument outlined above. Overall, in my assessment, the pragmatic arguments and the "newer" but less-well-documented dynamic economic arguments against tariffs probably make this option an unrealistic one for Canada in the near future.

If unskilled foreign immigration is an important cause of Canadian labour market polarization, why not restrict it? Here there is no pragmatic argument parallel to the tariffs case against restrictions: we are not bound to any major international agreements on the freedom of labour mobility, nor is it difficult or even necessarily desirable to base immigration policy on the national origin, rather than the skill levels, of immigrant workers. The main cases to be made against tighter restrictions on immigration of unskilled labour probably revolve, instead, around the hardships this might place on those immigrants to Canada who are currently not selected on the basis of labour market skills: "family class" immigrants and refugees. Reducing the amount of unskilled immigration probably means cutting into these categories, and causing hardships we may not be willing to cause. Reducing immigration in general probably also has a long-run

fiscal cost, since the age structure of immigration tends to reduce the dependency ratio in the country's population.

Conceptually, other "defensive" measures against polarization would be policies to restrict adoption of new technologies, or to restrict international capital flows. Clearly, dynamic and pragmatic factors probably rule out such factors as helpful policy responses to what may, after all, still be just another temporary imbalance in the labour markets of three main countries: Canada, the U.S. and the U.K.

(c) "Palliative" Measures

"Palliative" measures designed to cushion the effects of wage and earnings polarization on the incomes and living standards of less-skilled Canadians include maintenance or expansion of the general social safety net, adjustment assistance to trade-displaced, and/or technology-displaced, workers, and (a policy pursued by a number of European countries) absorption into public sector of unskilled workers. Of these, the first and third seem unlikely given the current fiscal situation of the federal government. The second, while potentially helpful to a minority of workers, has yielded mixed results in terms of effectiveness in facilitating re-employment (see, e.g., World Bank 1995, p. 109).

An interesting observation can, however, be made regarding the third, public sector, option. Rather than expanding, the Canadian public sector is currently undergoing a significant downsizing. Public sector workers in Canada also tend to be **much** more highly educated than workers in the private sector. For example, in 1992, 28 percent of men employed in the public sector had education beyond a bachelors degree, compared with 13 percent in the private sector. For women, the difference was even greater at 31 versus 10 percent.⁷ If it is the case that relative wages of more- and less- educated labour are largely set in the private market sector, the potentially massive infusion of highly-educated, public sector labour into the private sector could, in the next few years, constitute a powerful equalizing force among workers,

⁷Author's own calculations from 1992 Survey of Consumer Finances public use microdata file.

by bidding down the relative wages of skilled labour.

(d) Adaptive Measures

If global forces, mostly beyond our control, are causing the relative wages of skilled labour to rise, then why not raise the number of skilled workers in the country to take advantage of those trends? Such a policy is adaptive, in the sense that it involves positioning the Canadian economy so that it benefits, rather than being hurt by, these global forces.

Clearly, the experiences of a number of countries, including Canada, over a number of years, provide ample evidence that educational and skill upgrading "works" in reducing education-related wage differentials. Market forces have already ensured that this process is going on, despite government policies, in the form of rising university tuitions, which are leaning against it. The main policy questions in this area therefore concern the extent to which governments will hold the line on tuitions, as well as questions concerning improved quality of education at all levels. Also key is ensuring that education becomes and remains relevant to the export-oriented, information-economy jobs we hope these new cohorts of educated workers will fill. One limitation of this educational upgrading option, however, is the speed at which it can work: since it is largely (but not exclusively) the youngest cohorts of workers who can change their educational attainment, changes in college and university enrollment tend to take a long time to affect the economy-wide relative supplies of skilled and unskilled labour. Another limitation, of course, is that increases in inequality on dimensions other than education do not seem likely to be mitigated by changes in education alone.

4. Directions for Future Research.

The discussion of Canada's labour market polarization in this paper has highlighted a number of

areas in which further research could substantially increase our understanding of the causes of this important trend. Before considering these areas in turn however, one general point regarding the nature of research in this area needs to be made: With very few exceptions (e.g. Bound and Johnson 1992), almost all empirical papers in this vast and expanding literature consider the potential importance for increased earnings polarization of **only one factor at a time**. This has the following, rather paradoxical, implication: while most papers generally manage to explain only a small fraction of the increase in polarization, it would not be surprising, if, together, the factors examined in the literature, taken together, claim to account for several hundred percent of the actual changes that have occurred by now! Clearly, more attempts to play the various stories off against each other, as well as more attempts, like the present one, to come to a critical overall assessment, would be very useful.

Turning now to specific areas for future research, one such area identified in this paper is the **gender dimension** of increased inequality: to date the vast majority of "polarization" studies have been on men only. We need to know why increased polarization, where it has occurred, has apparently been much less pronounced among women, and what are the interrelations among women's wages, women's huge increases in labour force participation, and men's labour market outcomes? Another such area is the effects of trade, technological change and other demand factors in **nonmanufacturing industries**: almost all studies of the effects of these factors on wage inequality have been for manufacturing industries only. How important is, and will be, the effects of such changes in the huge service sector that now makes up the great bulk of our economy?

A third neglected area to date concerns the need, in studies of the effects of trade and technology on wages, for **measures of cross-country differences in the trade and technology pressures on unskilled workers**. Such measures would allow analysts to directly assess a common maintained hypothesis in this literature: namely that all developed countries have been subject to the same demand-

side pressures of this kind (e.g. Freeman and Katz 1994, p. 43). If, for example, European countries have been subject to less intense pressure of this kind, the "superior" nature of European institutions need not be invoked to explain the lesser degree of wage polarization that has occurred there recently. Fourth, as mentioned, a deeper understanding of the differences between trends in **earnings inequality versus earnings instability** is needed: how much of the recent polarization reflects true increases in lifetime earnings inequality across individuals, versus more variable earnings for individuals over time? This is especially true in countries other than the U.S., where this distinction has not been addressed at all to date.

Fifth, as mentioned, case studies and the business press have drawn considerable attention to recent changes in firms' personnel practices, such as increased outsourcing, use of temporary workers, and so on, which could conceivably contribute substantially to increased earnings instability and inequality. Despite this, there is as yet little or no evidence **linking changing human resource practices by firms to aggregate changes in wage and earnings polarization**. Several issues in this area clearly need more attention. For example, why we do not see major changes in job tenures in the aggregate U.S. and Canadian data? Is it because these new personnel practices have only affected a small minority of firms, and thus are not (at least yet) an important factor in explaining overall polarization? Or are the aggregate data failing to capture important and widespread, but subtle changes in the work relationship that have caused major changes in wage inequality? Investigating these questions would forge an important link between the more qualitative research results in the industrial relations literature and the quantitative trends focused on in this paper.

A final neglected area to date appears to have been the effects of increased **international capital mobility** on workers in developed countries. Interestingly, this factor has been seen as very important by a number of noneconomists (e.g. Reich 1992), who view the increased ability of "American" or

"Canadian" corporations to move their production facilities offshore as the source of a major shift in the relative bargaining power of capital and labour within developed countries. At the same time, a number of macroeconomists (e.g. Phelps 1994, pp. 346-7) have recently suggested that the opening up of world capital market to Eastern Europe, Latin America and China, combined with the reduction in capital supply by Germany (now investing in East Germany) may explain both the high real interest rates and unemployment rates in developed economies in the 1990's. Together, these observations suggest a further perspective for future research, on which we end the current discussion: **Because it ignores changes in the relative rewards and bargaining power of capital and labour, the very heavy emphasis placed by the "polarization" debate on distributional developments *within* the labour market may be seriously misplaced.**

To see the latter point, note that in Canada, from 1977 to 1992, even the 90th decile of men's real weekly wages fell, from \$1268. to \$1243., in 1991 dollars. (The wages of the 10th decile fell from \$352 to \$288).⁸ Since, aside from capital mobility, the two most likely causes of this polarization --technological change and international trade-- are both factors which should have increased total domestic income in Canada, the question which naturally arises is **where did these gains go?** Aside from women (whose role also requires future study) the obvious place to look seems at capital.

Further work in this area thus might gain significantly by returning to a study of what is actually a more traditional focus of economists interested in income distribution: the determinants of factor shares in national income. Are we seeing a historic shift in the share of national and world income away from labour, towards capital? And to the extent that much of the capital owned by Canadians today is not employed in Canada, and much of the capital employed in Canada is not owned by Canadians, how should this enter into national policy decisions designed to enhance the well-being of the majority of our citizens?

⁸Author's own calculations from SCF public use microdata files.

Interestingly, this suggests an "adaptive" policy response similar to the argument for increasing Canada's supply of educated workers: trying to become, as a nation, a net supplier of capital to the world economy. Certainly, Canada's current policy of borrowing extensively on international markets to finance current consumption is exactly the wrong thing to do. Since (given the international mobility of capital) the taxation which ultimately finances this borrowing will ultimately fall on Canadian labour, any policy that reduces this borrowing will almost surely result in a long-run increase in living standards for all Canadians.

TABLE 1: Changes in Men's Wages by Percentile of the Predicted Wage Distribution, Ages 25-54 (source: Kuhn and Robb, 1995)			
1971-1977			
Percentile	% change weekly wages	% change yearly earnings	absolute change weeks worked per year
90-100	0	+5	0
75-90	+8	+7	+0.2
50-75	+14	+16	0
25-50	+18	+15	-0.1
10-25	+24	+25	-0.2
0-10	+33	+33	-0.6
1977-1991			
90-100	-10	+2	-0.8
75-90	-12	-12	-2.9
50-75	-15	-17	-3.4
25-50	-16	-19	-3.6
10-25	-15	-21	-5.1
0-10	-16	-28	-7.1

TABLE 2:
Changes in Women's Wages by Percentile of the Predicted Wage Distribution, Ages 25-54
(source: Kuhn and Robb, 1995)

1971-1977			
Percentile	% change weekly wages	% change yearly earnings	absolute change weeks worked per year
90-100	-5	+29	+5.8
75-90	+2	+43	+6.5
50-75	+8	+57	+6.0
25-50	+9	+67	+4.9
10-25	+12	+96	+6.1
0-10	+16	+128	+3.8
1977-1991			
90-100	+22	+29	+5.4
75-90	+19	+51	+10.3
50-75	+15	+61	+11.1
25-50	+18	+68	+12.0
10-25	+16	+67	+9.5
0-10	+11	+61	+8.8

References

- Abowd, J. and T. Lemieux, "The Effects of International Trade on Collective Bargaining Settlements: Evidence from Canada", mimeo, Cornell Univ., 1988.
- Abowd, J.M. and Lemieux, T. "The Effects of International Competition on Collective Bargaining Outcomes: A Comparison of the United States and Canada," in Abowd, J.M. and Freeman, R. (Eds.) Immigration, Trade and the Labour Market. University of Chicago Press, 1990.
- Abraham, Katharine G. and Susan N. Houseman, "Earnings Inequality in Germany", in Differences and Changes in Wage Structures, edited by Richard B. Freeman, and Lawrence F. Katz. Chicago: University of Chicago Press, 1995.
- Baker, M. and D. Benjamin, "The Performance of Immigrants in the Canadian Labour Market", Journal of Labor Economics 12 (July 1994): 369-405.
- Baldwin, J., B. Diverty and D. Sabourin, "Technology Use and Industrial Transformation: Empirical Perspectives" Bell Canada Papers on Economic and Public Policy 3 (1995): 95-130.
- Bar-Or, Y., J. Burbidge, L. Magee, and A. L. Robb, "The Wage Premium to a University Education in Canada: 1971-1991", Journal of Labor Economics 13 (October 1995): 762-794.
- Beach, C. and G. Slotsve, "Polarization of Earnings in the Canadian Labour Market", Bell Canada Papers on Economic and Public Policy 2 (1994): 299-348.
- Berman, E., J. Bound and Z. Griliches, "Changes in the Demand for Skilled Labour within U.S. manufacturing: Evidence from the Annual Survey of Manufactures", Quarterly Journal of Economics 109 (May 1994): 367-398
- Bernard, A. B. and J. B. Jensen, "Exporters, Skill Upgrading, and the Wage Gap", U.S. Bureau of the Census, Center for Economic Studies, Discussion paper CES 94-13, November 1994.
- Blackburn, M., D. Bloom, and R. Freeman, "The Declining Economic Position of Less-Skilled American Males", in G. Burtless, ed., A Future of Lousy Jobs?: The Changing Structure of U.S. Wages, Washington: Brookings Institution, 1990.
- Blackburn, M. and D. Neumark, "Omitted-Ability Bias and the Increase in the Returns to Schooling" Journal of Labor Economics 11 (July 1993): 521-544.
- Blau, F. and L. Kahn, "Rising Wage Inequality and the U.S. Gender Wage Gap", American Economic Review 84 (May 1994): 23-37.
- Borjas, G., R. Freeman, and L. Katz, "On the Labour Market Effects of Immigration and Trade", in Borjas and Freeman, eds., Immigration and the Work Force: Economic Consequences for the United States and Source Areas. Chicago: University of Chicago Press, 1992.
- Borjas, George J. and Valerie A. Ramey, "Time-Series Evidence on the Sources of Trends in Wage

- Inequality", American Economic Review; 84(2), May 1994.
- Bound, J. and G. Johnson, "Changes in the Structure of Wages in the 1980's: An Evaluation of Alternative Explanations," American Economic Review, June 1992, 371-392.
- Burbidge, J.B., L. Magee, and A.L. Robb, "Disentangling Year, Cohort and Age Effects in Canadian Earnings Data", mimeo, McMaster University, June 1995.
- Burbidge, J.B., L. Magee, and A.L. Robb, "Canadian Wage Inequality Over the Last Two Decades", mimeo, McMaster University, Fall 1994.
- Burtless, Gary, "International Trade and the Rise in Earnings Inequality", Journal of Economic Literature, Vol. XXXIII, No. 2, June 1995.
- Bushinsky, M. "Changes in the U.S. Wage Structure 1963-87: Application of Quantile Regression", Econometrica 62 (March 1994): 405-458.
- Bushinsky, M. and J. Hunt, "Earnings Mobility in the United States", mimeo, Yale University, 1995.
- Cardoso, A. R. "Workers or Employers: Who is Shaping Wage Inequality?", mimeo, European University Institute, Florence Italy, Sept. 1995.
- Coleman, M. and J. Pencavel, "Changes in Work Hours of Male Employees: 1940-1988", Industrial and Labor Relations Review, January 1993a.
- Coleman, M. and J. Pencavel, "Trends in Market Work Behavior of Women since 1940", Industrial and Labor Relations Review, July 1993b.
- Cragg, M. and M. Epelbaum, "The Return to Skills and the North American Wage Debate: Evidence from Mexico", mimeo, Columbia University, 1995.
- DiNardo, J., N. Fortin and T. Lemieux, "Labor Market Institutions and the Distribution of Wages, 1973-92: A Semiparametric Approach", NBER working paper no. 5093, April 1995.
- Dooley, M. "The Overeducated Canadian?", Canadian Journal of Economics, February 1986.
- Edin, Per-Anders and Bertil Holmlund, "The Swedish Wage Structure: The Rise and Fall of Solidarity Wage Policy?", in Differences and Changes in Wage Structures, edited by Richard B. Freeman, and Lawrence F. Katz. Chicago: University of Chicago Press, 1995.
- Erickson, Christopher L. and Andrea C. Ichino, "Wage Differentials in Italy: Market Forces, Institutions, and Inflation", in Differences and Changes in Wage Structures, edited by Richard B. Freeman, and Lawrence F. Katz. Chicago: University of Chicago Press, 1995.
- Farber, H. "Are Lifetime Jobs Disappearing? Job Duration in the United States, 1973-1993", National Bureau of Economic Research, working paper no. 5014, Feb. 1995.

- Feenstra, R. and G. Hanson, "Foreign Investment, Outsourcing, and Relative Wages", manuscript, October 1994.
- Fortin, N. and T. Lemieux, "Rank Regressions, Wage Distributions, and the Gender Wage Gap" Universite de Montreal, unpublished paper, June 1995.
- Freeman, R. B. The Overeducated American (New York: Academic Press), 1976.
- Freeman, Richard B. "How Much has De-Unionization Contributed to the Rise in Male Earnings Inequality?", National Bureau of Economic Research Working Paper: 3826, August 1991.
- Freeman, R. B. "Crime and the Job Market", NBER working paper no. 4910, October 1994.
- Freeman, R. B. "Are Your Wages Set in Beijing?", Journal of Economic Perspectives 9 (Summer 1995): 15-32.
- Freeman R. and L. Katz, "Rising Wage Inequality: The United States versus Other Advanced Countries", in R. B. Freeman, ed., Working Under Different Rules, New York: Russell Sage Foundation, 1994.
- Freeman, R. and K. Needels, "Skill Differentials in Canada in an era of rising Labor Market Inequality", in Small Differences that Matter: Labor Markets and Income Maintenance in Canada and the United States, R. Freeman and D. Card, eds., Chicago: University of Chicago Press, 1993.
- Friedberg, R. and J. Hunt, "The Impact of Immigrants on Host Country Wages, Employment and Growth", Journal of Economic Perspectives 9 (Spring 1995): 23-44.
- Gottschalk, Peter and Robert Moffit "The Growth of Earnings Instability in the US Labor Market." Brookings Papers on Economic Activity, 1994:2.
- Green, D. and C. Riddell, "Job Duration in Canada", mimeo, University of British Columbia, 1995.
- Gregory, Robert G. and Francis Vella, "Real Wages, Employment and Wage Dispersion in US and Australian Labour Markets", in Differences and Changes in Wage Structures, edited by Richard B. Freeman, and Lawrence F. Katz.
- Gregory, R. G. and B. Hunter, "The Macro Economy and the Growth of Ghettos and Urban Poverty in Australia", Centre for Economic Policy Research, Australian National University, discussion paper no. 325 (April 1995).
- Grossman, G.M. "The Employment and Wage Effects of Import Competition", Journal of International Economic Integration, 2:1- 23, 1987.
- Hibbs, Douglas, "Wage Dispersion and Trade Union Action in Sweden", in Inga Persson, ed., Generating equality in the welfare state: the Swedish experience, New York: Oxford University Press, 1990: 181- 200.

- Juhn, C. and D. I. Kim, "The Effects of Rising Female Labor Supply on Male Wages", National Bureau of Economic Research working paper no. 5236, August 1995.
- Juhn, C. K. Murphy and B. Pierce, "Wage Inequality and the Rise in the Returns to Skill", Journal of Political Economy, June 1993.
- Karoly, L. and J. Klerman, "Using Regional Data to Reexamine the Contribution of Demographic and Sectoral Changes to Increasing U.S. Wage Inequality", in J. Bergstrand et al., eds., The Changing Distribution of Income in an Open U.S. Economy. Amsterdam: North-Holland, 1994.
- Katz, Lawrence F., David G. Blanchflower, Gary W. Loveman, "A Comparison of Changes in the Structure of Wages in Four OECD Countries", in Differences and Changes in Wage Structures, edited by Richard B. Freeman, and Lawrence F. Katz. Chicago: University of Chicago Press, 1995.
- Katz, L. and Murphy, K. M., "Changes in Relative Wages, 1963-1987: Supply and Demand Factors" Quarterly Journal of Economics, February 1992.
- Kuhn, P. and A. L. Robb, "Unemployment, Skill, and Labour Supply: Evidence from Canadian Microdata: 1971-1991", McMaster University, economics department working paper no. 95-11, September 1995.
- Krueger, Alan B. and Jorn-Steffen Pischke, "A Comparative Analysis of East and West German Labor Markets: Before and After Unification", in Differences and Changes in Wage Structures, edited by Richard B. Freeman, and Lawrence F. Katz. Chicago: University of Chicago Press, 1995.
- Lalonde, R. J., and R. Topel, "Labor Market Adjustments to Increased Immigration", in J. Abowd and R. Freeman, eds., Immigration, Trade, and the Labor Market, Chicago, University of Chicago Press, 1991.
- Lemieux, T. "Unions and Wage Inequality in Canada and the United States", in Small Differences that Matter: Labor Markets and Income Maintenance in Canada and the United States, R. Freeman and D. Card, eds., Chicago: University of Chicago Press, 1993.
- Leslie, D. and Y. Pu, "What Caused Rising Earnings Inequality in Britain? Evidence from Time Series 1970-93", mimeo, Manchester Metropolitan University, September 1994.
- Levy, Frank and Richard J. Murnane, "U.S. Earnings Levels and Earnings Inequality: A Review of Recent Trends and Proposed Explanations", Journal of Economic Literature, Vol. XXX, No. 3, September 1992.
- Machin, Stephen, "Changes in the Relative Demand for Skills in the UK Labour Market." in W. Booth and D. Snower, eds., The Skills Gap and Economic Activity Cambridge: Cambridge University Press, 1995 (forthcoming).
- Morissette, Rene, John Myles and Garnett Picot, "Earnings Inequality and the Distribution of Working

- Time in Canada", Canadian Business Economics, Vol 2, No. 3, Spring 1994.
- Murnane, R., J. Willett, and F. Levy, "The Growing Importance of Cognitive Skills in Wage Determination", Review of Economics and Statistics 77 (May 1995): 251-266.
- Murphy, Kevin and Finis Welch, "Wage Differentials in the 1980's: The Role of International Trade", Unicon Research Corp., Los Angeles CA, Sept. 1988.
- Murphy, Kevin and Finis Welch, "The Structure of Wages", Quarterly Journal of Economics 107, (February 1992): 285-326.
- Myles, J. and Picot, G, "What is Happening to Earnings Inequality in Canada?", mimeo, Statistics Canada, 1994.
- OECD, The OECD Jobs Study: Evidence and Explanations, Paris, OECD, 1994.
- Phelps, E. S. Structural Slumps: The Modern Equilibrium Theory of Unemployment, Interest and Assets. Cambridge, Mass.: Harvard University Press, 1994.
- Reich, R. B. The Work of Nations, New York: Vintage Books, 1992.
- Revenge, A. "Exporting Jobs: the Impact of Import Competition on Employment and Wages in U.S. manufacturing", Quarterly Journal of Economics, Feb. 1992.
- Sachs, J. D. and H.J. Shatz, "Trade and Jobs in U.S. Manufacturing", Brookings Papers on Economic Activity 1994 (1): 1-84.
- Schmitt, John, "The Changing Structure of Male Earnings in Britain, 1974-88", in Differences and Changes in Wage Structures, edited by Richard B. Freeman, and Lawrence F. Katz. Chicago: University of Chicago Press, 1995.
- Slaughter, M. J. "The Impact of Internationalization on U.S. Income Distribution", in R. O'Brien, ed., Finance and the International Economy 8: The Amex Bank Review Prize Essays. London: Oxford University Press, 1994: 144-58.
- Spence, M. "Job Market Signalling", Quarterly Journal of Economics 1973.
- Topel, R. "Time Series Evidence on the Sources of Trends in Wage Inequality", American Economic Review 84 (May 1994): 17-22.
- Wood, Adrian, North-South Trade, Employment, and Inequality, Oxford: Clarendon Press: 1994.
- World Bank, World Development Report 1995: Workers in an Integrating World, New York, Oxford University Press, 1995.

