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## **An Index of Labour Market Well-being for OECD Countries**

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# **An Index of Labour Market Well-being for OECD Countries**

## **Executive Summary**

Is labour “better off”?

To answer such a question one needs an index of labour market well-being that is capable of measuring the well-being that individuals in a given society at a given point in time can obtain through the labour market. .

This paper therefore focuses on the well-being of individuals *as workers*. The proposed Index of Labour Market Well Being (ILMW) covers all persons of working age and is based on: 1) the average current return from work; 2) the aggregate accumulation of human capital, which enables future returns from work; 3) inequality in current returns from work; and 4) insecurity in the anticipation of future returns from work.

Estimates of the proposed Index are developed for 16 OECD countries for the 1980-2001 period, and comparisons are made both for changes in labour market well-being over time in each country and for differences in labour market well-being across countries. Of the 16 countries considered, in 2001 the highest level of labour market well-being was in Norway and the lowest in Italy, with Canada ranking 10<sup>th</sup>. The largest increase over the 1980-2001 period was in Finland and the smallest in New Zealand, while Canada had the fourth largest increase.

One commonly used indicator for summarizing labour market well-being is the unemployment rate, but this report finds virtually no relationship between the unemployment rate and the ILMW: Belgium is a high unemployment country but ranks among the best scores according to the ILMW, while the United States has a low unemployment rate but scores poorly with the ILMW.

# An Index of Labour Market Well-being for OECD Countries<sup>1</sup>

## Introduction

Are workers better off or worse off – now compared to past years or in one country compared to another?

To answer such a question, we need an index of labour market well-being – i.e. an index of the well-being that individuals in a given society at a given time obtain via the labour market. Of course, in the real world the same individual simultaneously has many roles in addition to that of “worker” – e.g. individuals may own some capital, and are also citizen members of a polity, as well as inhabitants of an eco-system. However, although the total well-being of each individual clearly depends on the well-being derived from all domains of life, it is often useful, both for analysis and for the development of public policy, to focus attention on the well-being generated by a particular domain – in this case the labour market.

The Centre for the Study of Living Standards (CSLS) has in recent years developed an Index of Economic Well-being (IEWB) based on trends in consumption flows, stocks of wealth, inequality, and economic security.<sup>2</sup> This report has a narrower focus – labour market well-being – because in policy debates one often hears statements of the form “Policy X will benefit/harm workers” or “In country Y, workers are better/worse off than in country Z”. However, to make sense of such statements, one must recognize that any statement about a group of individuals (either workers or citizens in general) and about a general evaluation of well-being has to summarize outcomes across individuals and across aspects of well-being. Even if one is only concerned with comparisons of the economic well-being *of individuals in their capacity as workers*, those comparisons will depend on the relative importance assigned to differences in the current average returns from work, the asset acquisition which enables

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<sup>1</sup> An earlier version of this report was presented in the session “Understanding and Improving Labour Market Statistics I” organized by the Centre for the Study of Living Standards at the Annual Meeting of the Canadian Economics Association, Carleton University, Ottawa, Ontario, May 29-June 1, 2003. It has also been prepared for the forthcoming volume *Toward a New Architecture for Labor Market Statistics* edited by Barry Bluestone and Andrew Sharpe, University of Chicago Press. As well, it was presented at the Ford Foundation Conference on the Development of a New Cross-National Architecture for Labour Market Statistics, September 23-28, 2002, Rockefeller Center, Bellagio, Italy. All data underlying the estimates presented in this report are freely accessible from the website of the Centre for the Study of Living Standards ([www.csls.ca](http://www.csls.ca)) under Index of Economic Well-being. We would like to thank Jeremy Smith and Dimitry Kabrelyan for excellent research assistance in the preparation of this report. We would like to thank Barry Bluestone for his excellent comments on the paper at the conference, as well as other conference participants for comments.

<sup>2</sup> Estimates for the index have been developed for Canada and the United States (Osberg and Sharpe, 2002a), OECD countries (Osberg and Sharpe, 2002b), and the Canadian provinces (Osberg, Sharpe, and Smith, 2002a). Readers are referred to these papers, which are posted at [www.csls.ca](http://www.csls.ca), for a full discussion of the IEWB.

future returns from work, the inequality of current returns from work and the insecurity of future returns from work.<sup>3</sup>

We therefore argue that the four dimensions of well-being (i.e. current consumption, accumulation, equality and security) that were developed in the IEWB and applied at the societal or economy-wide level can also serve as a useful organizing framework for the study of well-being at the more disaggregated level. However, the consideration of a more restricted domain – labour market well-being – also poses some unique problems for analysis. This report therefore proposes an Index of Labour Market Well-being (ILMW), putting forward a number of specific labour market variables that we hope will serve as a reliable measure of labour market well-being.

The first section of the report develops the framework for the Index of Labour Market Well-being, laying out the different variables that comprise the labour market income, human capital, labour market equality, and labour market security components of the Index. The second section then presents estimates for selected OECD countries of trends for all sub-components and components of the Index as well as the overall Index for the 1980-2001 period.

## **A Framework for An Index of Labour Market Well-being**

### **Basic Concepts and Issues**

Ideally, an index of labour market well being would capture both trends over time within countries and allow cross-country comparisons of the level of labour market well-being at particular points in time. Cross country level comparisons do, however, have to recognize the uncertainty associated with purchasing power parity estimates and the implications of differences in statistical definitions and methodologies across countries. As a consequence, less attention will be devoted to them in this report, although preliminary estimates will be presented.

In considering the economic well-being of some – but not all – members of society, the first issue is to define the population of interest. Because the issue at hand is “Labour Market Well Being”, our focus is the well being of individuals *as workers*, either actually or potentially. At any given time, some potential workers may be “between jobs” and be counted in surveys as unemployed or outside the labour force – and the dividing lines between the jobless and the unemployed, and between the unemployed and the employed will depend on the functioning of the labour market (particularly the level of

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<sup>3</sup> We note that the common practice of considering only the average current earnings of workers implicitly makes three very strong assumptions – (1) that changes in the inequality of earnings have no welfare consequences; (2) that changes in the worker skills that will produce future earnings are irrelevant for well-being; and (3) that changes in worker security have no effect on workers’ utility. All three assumptions are highly questionable – indeed belied by much observable behaviour.

aggregate demand). Our population of interest is those people who actually or potentially participate in or rely on the labour market for access to economic resources, so we focus on the working age population. Since we are interested in trends in labour market well being, we abstract from the receipt of capital income or transfers within the family. Transfer payments from government will be included if they are contingent on labour market participation (e.g. unemployment insurance and earnings-related pensions), but not if they are universal demogrants.

The proposed index therefore covers all persons of normal working age,<sup>4</sup> including both the employed and the unemployed, and does not have specific sub-indices for each group. In practice, the employed greatly outnumber the unemployed, so the proposed index reflects the well being of unemployed workers in proportion to their relative numbers. The Index developed in this report is for all persons of working age and can in principle be disaggregated – e.g. by socio-economic groups or by region, depending on data availability. Although space constraints prevent this paper from doing so, it would be straightforward to develop sub-indexes –e.g. for women, youth, and racial groups. We would argue that if our aggregate index is a better measure of labour market well being for all people, then the between group differences in sub-indexes of labour market well-being will be a better indicator of differences in labour market outcomes and, for example, the impact of labour market discrimination between groups.

If the first issue is to define “who”, the second is to be clear about “what”. Specifically, what are the “returns from employment” that the labour market generates, which should enter an “Index of Labour Market Well-being”?

A standard neo-classical perspective is to think of each potential participant in the labour market as deriving utility, in each period of time, from the potential consumption of market goods and services that their market income from labour enables ( $C_{it}$ ), their available non-work time ( $L_{it}$ ) and from measurable job characteristics ( $X_{it}$ ).<sup>5</sup> We can write this formally as in [1].

$$[1] \quad U_{it} = u(C_{it}, L_{it}, X_{it}) \quad U' > 0 \quad U'' < 0$$

Clearly, money earnings in the labour market contribute to well being by enabling the consumption of marketed goods and services. Current period labour market earnings are the product of the observed hourly wage and total hours of paid work – as summarized in [2]. Individuals optimize subject to the constraints of the offered hourly money wage rate, the non-wage characteristics of jobs on offer (including any constraints such jobs impose on the hours and timing of work) and total time available.

$$[2] \quad C_{it} = w_{it}H_{it} \quad H_{it} + L_{it} = T$$

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<sup>4</sup> In practice, countries differ somewhat in their conventions – e.g. whether normal working age is 15 and over (Canada), 16 and over (United States), 15 to 64 (most OECD countries), 18 to 64 (used by certain researchers) , or 15 to 60 (UK for women) – but whatever the precise definition, the crucial issue is comparability over time and across countries. Note that we adopt the convention of ignoring child labour.

<sup>5</sup>As examples of elements of  $X_{it}$  one can cite the pace of work or personal autonomy in workplace decision making .

Together, Equations [1] and [2] already imply that observed average money earnings are a poor guide to labour market well being, since increased hours of paid work have a cost in foregone leisure time. An increase in average earnings due to longer working hours, at the same hourly wage, would yield a benefit in material consumption [ $C_{it}$ ] at the cost of decreased leisure time [ $L_{it}$ ] which would have to be netted out before the associated change in well being could be calculated.

Moreover, since Becker (e.g. 1993) economists have also distinguished between the observed money wage at a point in time ( $w_{it}$ ) and the potential wage available to individuals ( $W_{it}$ ) – the difference being the proportion of working time ( $k_{it}$ ) that individuals devote to accumulating human capital, either by investing in on the job training or through formal education, as Equation 3 summarizes.

$$[3] \quad w_{it} = W_{it} (1 - k_{it}) \quad k_{it} \neq 1$$

From this perspective, the potential wage ( $W_{it}$ ) is the best indicator of the potential tradeoff between goods and leisure available to an individual at that point in time, while the observed current wage ( $w_{it}$ ) indicates how much of that potential well being is received in the current period. If the change in an individual's human capital stock is written as  ${}^aHK_{it}$ , Equation [3] can be alternatively expressed as:

$$[3'] \quad k_{it} W_{it} = {}^aHK_{it} \quad {}^aHK_{it} + w_{it} = W_{it}$$

Both formulation [3] and [3'] are based on the idea that individuals derive utility from both their current consumption and from the future consumption that is enabled by their current investment in greater stocks of human capital. If the observed money wage were to remain constant, while the potential wage fell, this would mean a fall in human capital acquisition (which would be modeled by a decrease in  $k_{it}$  and  ${}^aHK_{it}$ ) and would correspond to a decline in well being.

Similarly, if the observed money wage were to remain constant, while jobs became more unpleasant, this would be modeled as a fall in the “compensating differentials” for unpleasant employment and would correspond to a decline in well being obtained from the labour market. The “compensating differentials” approach has a long history, going back to Adam Smith's observation, over two centuries ago, that when considering alternatives for employment, workers will consider “the whole of the advantages and disadvantages of employment.” In the notation of equation [1], we summarize job attributes as  $X_{it}$  and in principle we would like to include objectively measurable determinants of job satisfaction, such as job autonomy or pace of work, in our index. However, unfortunately the time series evidence on job characteristics needed to estimate such trends in the workplace is not available.

In equation [1] above, we intend  $X_{it}$  to represent the current experience of job attributes such as work pace, noise, heat, etc. An analytically distinguishable characteristic of jobs is the extent to which they come with credible promises for the



future – like academic tenure and other forms of job security. If individuals are risk averse, then greater uncertainty about future labour market outcomes has a cost in worker well being, quite distinct from any trends in labour market well being that reflect *average* current or *average* future labour market outcomes. Imagine, for example, that all workers lose any job security guarantees that they now have, but that, on average, current and future earnings are unchanged - labour market well being would, in our view, fall.

In order to summarize trends in the factors that affect labour market well-being (in terms of [1], trends in  $(C_{it}, L_{it}, X_{it})$ , one must somehow aggregate over the experiences of  $n$  workers  $i=1 \dots n$  in ' time periods  $t=1 \dots T$  ).<sup>6</sup> Since there are many individuals, multiple time periods and an unequal and uncertain distribution of labour market experiences, average observed money earnings in the current period ( $w^*_t H^*_t$ ) can only be only part of the story.<sup>7</sup> The aggregate human capital that individuals accumulate will help determine their average future returns in the labour market<sup>8</sup> – but the mean is only the first moment of the distribution of returns in the labour market. Individuals also care about where they will sit in the distribution of current labour market returns and the uncertainty that surrounds how much they can expect to receive in future periods.

Hence, our index considers: 1) average current observed money returns from work; 2) aggregate accumulation of human capital which enables future average returns from work; 3) inequality in current returns from work; and 4) insecurity in the anticipation of future returns from work. Figure 1 illustrates the dimensionality of our index.

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<sup>6</sup> Conceptually, one can think of the data on which a measure of “Labour Market Well-being” will depend as consisting of a matrix, with  $n$  rows and  $3T$  columns (each time periods data, for each worker, has elements  $(C_{it}, L_{it}, X_{it})$ ). The current ( $t=1$ ) period’s outcomes may be known, but future periods outcomes are uncertain.

<sup>7</sup> Using average income as a summary statistic for worker well-being amounts to saying that the entire matrix discussed in the previous footnote can be adequately summarized by the mean of its first column.

<sup>8</sup> Although future average real wages will also depend in part on the size of the capital stock that workers have available to work with in future periods, the focus of this article is “well-being derived from the labour market”, and the size of the future stock of capital will depend on aggregate public and private savings decisions. In a partial analysis, such as this paper, we ignore possible interdependencies of trends in capital or labour markets.

**Figure 1 - Dimensions of Labour Market Well-being**

<b>Concept</b>	<b>Present</b>	<b>Future</b>
“Typical Worker”  or  “Representative Agent”	Average Current Earnings	Accumulation of Productive Skills – Human Capital
Heterogeneity of Experiences	Distribution of Earnings	Insecurity of Future Returns

When average labour market earnings are used as a summative index of labour market well-being, the analyst implicitly is stopping in the first quadrant, and assuming that the current experience of a representative agent can summarize the well-being generated by the labour market and that one need not explicitly distinguish between present labour income flows and the accumulation of human capital stocks which will enable future labour income flows.

However, average current money labour earnings could remain the same even if the distribution of wages were to become much more unequal, even if on the job training were to cease and even if all workers were to lose any job security that they now have. Would it be reasonable to say that labour market well being is not at all affected by such trends? I

If society is composed of diverse individuals living in an uncertain world who typically “live in the present, anticipating the future”, each individual’s estimate of labour market well-being will depend on the level of human capital accumulation,<sup>9</sup> As well, individuals are justifiably concerned about the degree to which they and others will share in prosperity. There is a long tradition in economics that “social welfare” depends on both average incomes and the degree of inequality in the distribution of incomes. If the future is uncertain, and complete insurance is unobtainable, risk averse individuals will also care about the degree to which their personal economic future is secured by their labour market participation.

<sup>9</sup> Given the positive externalities associated with human capital accumulation (see Haveman and Wolfe (2002) all workers benefit from a more educated and skilled labour force, not just those who attain more education and skills. Note that if citizens have differing rates of time preference, any given rate of human capital accumulation will only be “optimal” from some persons’ points of view.

These four components therefore have a logical rationale and a manageable number of headings. If the objective of index construction is to assist public policy discussion, one must recognize that when too many categories have to be considered simultaneously, discussion can easily be overwhelmed by complexity. We therefore do not adopt the strategy of simply presenting a large battery of indicators. However, because reasonable people may disagree on the relative weight they would assign to each dimension – e.g. some will argue that inequality in labour market returns is highly important while others will argue the opposite – we argue that it is preferable to be explicit and open about the relative weights assigned to components of well-being, rather than leaving them implicit and hidden.

An additional reason to distinguish the underlying components of labour market well-being is that for purposes of labour market policy, it is not particularly useful to know only that well-being has gone “up” or “down”, without also knowing which aspect of well-being has improved or deteriorated. We specify *explicit* weights to the components of well-being, and test the sensitivity of aggregate trends to changes in those weights, in order to enable others to assess whether, by their personal values of what is important in economic well-being, they would agree with an overall assessment of trends in the economy.

The weights given the four proposed components of the Index, and the different sub-components, will influence both trends over time and level comparisons across countries. Based on our experience with the Index of Economic Well-being, we propose that the starting point for discussion should be the assignment of equal weights to the four components. We recognise that equal weights reflect an implicit value judgement about the importance of the components, and future work will explore the sensitivity of our conclusions to the relative weighting of components.

If individuals “live in the present, anticipating an uncertain future” each person’s present well-being depends partially on their expectation of future events. In this sense our index takes a forward looking approach to labour market well-being. However, we do not want to assume that capital markets are perfect or that the future can be foreseen with certainty – so we make, for example, no attempt to calculate the present value of future lifetime income. We focus instead on current money earnings as a measure of potential current consumption enabled by work and we use the variable for risk from poverty after the completion of one’s working life as a measure of insecurity about the future.

In a labour market context, many of the adjustments to income flows corresponding to the consumption component in the IEWB are inappropriate.<sup>10</sup> Similarly,

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<sup>10</sup> For example, the IEWB adjusted consumption per capita for the change in economies of scale in consumption arising from changes in household size – but those changes come from outside the labour market. As well, the IEWB emphasized consumption, not income, per capita because it did not assume that capital markets automatically produce the socially optimal national savings rate (especially since some assets, such as the environment, are not priced). However, it is more plausible that each individual worker can decide their personal savings rate, hence it is potential consumption derived from money earnings that is relevant for labour market well-being.

when considering wealth acquisition, it is only the human capital component of aggregate wealth accumulation which is determined in the labour market.<sup>11</sup>

As well, labour market equality is a concept that refers to differences among workers in their personal returns from work. Since individuals often live in households within which resources are shared, the family status and the earnings of other household members will affect personal consumption. The material standard of living of each person depends on the number of household members who share income, economies of scale in household consumption and total household income from all sources. All these variables must be considered in constructing a plausible measure of equality in living standards. However, equality *as a worker in the labour market* is an individual concept, which is independent of living arrangements and of income from capital or transfer payments.

Finally, the labour market security component of a measure of labour market well-being should consider only the risks which individuals are exposed to through the labour market (i.e. the risk of poverty consequent on marital breakup is excluded). In many respects, therefore, an Index of Labour Market Well-being refers to only a subset of the issues considered in the Index of Economic Well-being.

A complicating factor in international comparisons of the ILMW is the fact that countries differ in the range of issues determined through the labour market – i.e. in the relationship between Labour Market Well-being and Economic Well-being, more broadly conceived. (Another way of putting it is to say that the “Social Wage” of goods and services supplied to all citizens by the state differs, across countries, both in absolute size and relative to the amount of market goods whose purchase is enabled through earnings.) To take a specific example, health insurance in the United States is primarily provided through employer-based private health insurance plans (with public funding for health care limited to the indigent and the elderly) while Canada has a system of government financed, universal health care (other OECD nations also have public health insurance, but sometimes with a supplemental role for employer paid schemes). This institutional difference will affect both the measurement of average labour compensation and of inequality and insecurity determined by the labour market.

Employer paid health insurance premiums are a fringe benefit of employment and part of total labour compensation, but the tax revenue which finances public health care will not be similarly counted. Since some workers in the United States are not covered, or not covered fully, by private health insurance, the inequality generated by the labour market will be understated if one considers only the level of wage inequality – there is no similar understatement in Canada. Similarly, in contemplating the future, the chance that

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<sup>11</sup> The IEWB attempts to measure societal wealth, including the accumulation of physical capital in machinery and equipment, intellectual capital via R&D, and environmental assets – all of which are determined outside the labour market. Implicitly, the idea of “Labour Market Well-being” presumes it is possible, or at least analytically useful, to separate the labour market from other processes which influence well-being – thus we assume here that any impact of labour market changes on other processes (for example, capital formation ) are of small enough magnitude to be ignored.

a loss of employment will cause a loss of health care entitlement is a risk to which US workers are exposed, but not Canadian workers. In cross country level comparisons, these differences imply that US Labour Market Well-being will be overstated, relative to Canadian.

We would highlight the fact that (unlike many other indices) we do not assume that “the labour market well-being” in a particular society is a single, *objective* number (like the average altitude of a country). It is more accurate, in our view, to think of each individual in society as making a subjective evaluation of objective data in coming to a personal conclusion about labour market well-being in their society. Well-being has multiple dimensions and individuals differ (and have the moral right to differ) in their subjective valuation of the relative importance of each dimension of well-being. Because individuals are occasionally called upon, in a democracy, to exercise choices (e.g. in voting) on issues that affect the collectivity (and some individuals (e.g. civil servants) make such decisions on a daily basis), individuals have reason to ask questions of the form: “Would public policy X make ‘labour’ better off?” Presumably, self-interest plays some role in all our choices, but unless self-interest is the sole criterion, an index of labour’s well-being is useful in helping individuals answer such questions.

Although conceptually there may be no way to measure some of the different dimensions of labour market well-being in comparable units, as a practical matter citizens are frequently called upon to choose between policies that favor one or the other. Hence, individuals often have to come to a summative decision – i.e. have a way of “adding it all up” – across domains that are conceptually dissimilar. From this perspective, the purpose of index construction should be to assist individuals – e.g. as voters in elections and as bureaucrats in policy making – in thinking systematically about labour market outcomes, without necessarily presuming that all individuals have the same values.

Our hypothesis is that indices of social well-being can best help individuals to come to reasonable answers about social choices if information is presented in a way that highlights the objective trends in major dimensions of well-being and thereby helps individuals to come to summative judgments – but also respects differences in values. Although it may not be possible to come to an *objective* index of labour market well-being, individuals still have the problem (indeed, the moral responsibility) of coming to a *subjective* evaluation of social states, and they need organized, objective data if they are to do it in a reasonable way.

The report’s basic hypothesis that a society's labour market well-being depends on average current earnings, the accumulation of human capital, and the degree of equality and security of individuals in the distribution of labour market income.

### **Average Current Labour Market Income Component**

Trends in average money earnings are measured by two variables: (1) total economy labour compensation per person employed; and (2) total economy labour

compensation per hour worked. [Both variables are expressed in real terms, after deflation by the Consumer Price Index.] We use pre-tax compensation because it is the direct result of labour market processes while post-tax compensation is also influenced by tax rates (which reflect the outcome of collective choice on the mix of the private/public provision of goods and services – an issue not directly determined by the labour market).

Total economy labour compensation per person employed is the total money income from labour market activity including fringe benefits and supplementary labour income (i.e. employer contributions on behalf of employees to social insurance schemes) and the labour component of the earnings of the self-employed. However, if workers on average work fewer hours, either because of increasing frequency of part-time work, or because total annual hours worked for full-time employees decline, the greater time available for greater home production and leisure increases worker well-being, conditional on average hourly compensation per worker. The conceptual issue is the value placed on the opportunity cost of paid working time. In our index, total economy labour compensation per hour worked and total economy labour compensation per person are given equal, additive weight in the construction of the labour market income component of the Index of Labour Market Well-being - which is equivalent to valuing any increase or decrease in non-work time at half the value of total economy labour compensation per hour worked.<sup>12</sup>

## Human Capital

Educational attainment is a key determinant of labour market income, labour force participation, and unemployment<sup>13</sup>. Higher levels of human capital over time raise labour market well-being by raising future expected earnings from the labour market – hence countries with greater levels of educational attainment enjoy higher levels of labour market well-being than countries with lower educational attainment, *ceteris paribus*.

Haveman et al (2003) use the concept of earnings capacity to estimate a measure of the annual rental value of human capital and provide estimates for the United States from 1975 to 2000 – but many of the income producing characteristics they use are not available in other countries' data. This report therefore uses the average level of completed educational attainment in years for the population aged 25 and over as the sole variable for this component of the Index.<sup>14</sup>

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<sup>12</sup> If  $w$  is total economy labour compensation per hour worked and  $H$  is average hours worked, then  $wH$  is total economy labour compensation per person employed. We propose to model trends in Average Current Labour Market Income by  $(w + wH)/2$  – hence a change in earnings that reflects only changes in hours of labour supply will be deflated by half the change in hours of labour supply.

<sup>13</sup> In the human capital perspective, full time education for people of working age corresponds to  $k_{it} = 1$ .

<sup>14</sup> An alternative measure of educational attainment is the proportion of the labour force with formal educational attainment at or above a certain level, such as a university degree. The weakness of this measure is that it ignores improvements in educational attainment above and below the cut-off. An alternative measure of human capital is a measure of the literacy and numeracy levels of the labour force. Such measures are currently available for selected OECD countries and over time (at least for 1994 and

In principle, we would like to include the change in aggregate human capital attributable to training – either on the job or in a classroom environment, as well as the work-related component of adult education. Ideally, one would also measure the depreciation of human capital. However, the necessary data are not available – hence this paper should be seen as presenting a first, tentative version of the ILMW, which hopefully will be improved in future as better data becomes available.

### **Labour Market Equality**

More equal outcomes in the labour market contribute to a higher level of equality of living standards in society as a whole, but is not the same thing. Labour market inequality refers to inequality in the returns to a factor of production, but economic inequality is usually interpreted in terms of inequality in standard of living – i.e. inequality of consumption. Hence, issues such as the correlation of the earnings of husbands and wives, the degree of progressivity in taxes and transfers and the number of household members that share a given post tax/post transfer income – all of which are important determinants of inequality in effective consumption – are not relevant for an Index of Labour Market Well Being.

Nevertheless, individuals clearly care about relative pre-tax individual wages. Survey evidence indicates that most people accept the existence of some inequality in wages, but think that the current degree of wage inequality is excessive. When people are asked how much they think specific occupations *do* earn and how much those occupations *should* earn, in every country surveyed in the International Social Survey Program, individuals thought that actual wage inequality was greater than the inequality in what they estimate people should earn – i.e. there is a general preference for greater equality in earnings (see Osberg et al, 2002, 2003:). As well, low individual wages will increase the odds that a family will be exposed to the stresses of working poverty.

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2000) from the OECD's Adult Literacy and Numeracy Survey. However, because of the limited time series, we propose not to use this variable. We may however use this measure of human capital for sensitivity analysis in level comparisons of labour market well-being.

We therefore propose two measures of labour market (in)equality<sup>15</sup>:

- a wage distribution measure, namely the Gini coefficient or the ratio of the top to bottom decile or quintile for pre-tax hourly wages of all workers; and
- a measure of the importance of low-income employment in total employment, namely the proportion of workers below one half or two thirds median earnings.

Readers will note that there is no mention here of gender wage ratios (or of inter-regional differences in average wages or of differences in average wages between racial or ethnic groups). Since we are arguing that average earnings are a seriously incomplete indicator of labour market well being, we argue that if one is interested in assessing the degree of inequality between groups (e.g. between men and women) in returns from the labour market, one should consider the issues addressed by the ILMW – i.e. the training and education received by men and women, and their differential experiences of inequality and insecurity. Hence, we argue that an accurate assessment of trends in the gender gap in employment should compute and compare the Index of Labour Market Well-being separately for men and for women. Assessment of such an expanded indicator of gender advantage and disadvantage is a subject for our further research.

It should be noted that the use of an hourly wage measure instead of an earnings measure for gauging labour market inequality avoids the thorny issue of deciding whether to use earnings (hourly wages multiplied by hours worked/paid) for full-time, full-year workers or earnings for all workers, including workers who voluntarily or involuntarily work part-time and/or part-year. A disadvantage of hourly wages is that it abstracts from the number of hours worked, which affects total earnings inequality. The overall index for labour market inequality is the weighted average of the sub-components, each weighted equally.

In the section on Average Current Labour Market Income Component above, we used measures of total economy labour compensation. In principle, one would like to measure inequality in a similar way. But the lack of information on fringe benefits and supplementary income in household surveys, which are the source of labour income data for individuals, means that one is effectively restricted to total or hourly earnings data. The OECD has produced estimates of earnings inequality in a number of studies and these estimates may be used where considered appropriate. The household micro-data sets maintained by the Luxembourg Income Study were used to generate estimates of the Gini coefficient for post-tax income in the Index of Economic Well-being. This data source may again be used, such as for Gini coefficients of hourly earnings inequality and estimates of the proportion of the workforce below one half median earnings.

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<sup>15</sup> These two sub-components are analogous to the two measures used in the equality sub-index of the IEWB, namely the Gini coefficient for total income for all households and the relative poverty rates for all households (defined as less than one half median equivalent post-tax household income).



## Labour Market Security

Individuals who have diminishing marginal utility (as implied in Equation [1]), will (*ceteris paribus*) be averse to risk. For any given level of current income and any given expected value of future income, an increase in uncertainty about future returns from work will diminish current labour market well-being. Risks to future returns from work can come in the form of future unemployment (i.e. the unavailability of future work), or in uncertain future wages or in risks attached to non wage aspects of employment such as workplace hazards to health (which may imply either lower future earnings potential or future incapacity to work).

As well, part of the return to current employment comes in the form of a deferred payment – i.e. pension entitlements. Uncertainty about the size of the pensions which will actually be paid in retirement years is a potential source of insecurity, although in this case the issue is uncertainty/worry about the actual size (when received) of the deferred payment which is promised in exchange for foregone current wages.

We thus approach labour market security in a similar manner to the Index of Economic Well-being, by identifying objective risks that the labour force faces. Specifically, we identify the risks associated with unemployment, the risks to health from employment, and the risks to income security once working life is complete.<sup>16</sup>

### Risk imposed by unemployment

The possibility of unemployment, and its financial implications, is a major risk for the workforce. We use four sub-indexes: the arithmetic average of the overall unemployment rate and the long-term unemployment rate; the coverage of the currently unemployed by the unemployment insurance (UI) system; the UI benefits replacement rate; and a measure of the overall degree of employment protection provided by legislation. The four sub-indexes are weighted equally and multiplicatively, (not additively) because of each can be seen as a conditional probability. It is the product of all these probabilities that determines the income of a person who was exposed to unemployment, became unemployed, qualified for UI benefits and received UI benefits at the average replacement rate.

The rationale for inclusion of a long-term unemployment measure is that short spells of unemployment are not as costly to individuals as long spells (in terms of atrophy of skills, financial impact or personal psychological well-being). Hence, a country with a larger proportion of long-term unemployed will have lower labour market well-being than a country where unemployment is shared among a larger proportion of the labor force with shorter spells, even if the overall unemployment rate is the same in the two countries.

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<sup>16</sup> The risk of single-parent poverty is included in the IEWB, but is not considered here. Although there is a literature which links the probability of divorce to such labour market issues as unemployment, shift work and wages levels, we ignore such influences for present purposes.

The rationale for the inclusion of the two UI variables is to capture the degree to which the UI system protects workers from the financial consequences of job loss. The UI coverage rate is in principle the proportion of those currently unemployed who are drawing UI benefits and the wage replacement rate is in principle the ratio of average UI benefits to the average industrial wage. These statistics are relatively easy to obtain for Canada and the United States, but have proven difficult to obtain for OECD countries. Because of the integration of the UI and welfare systems in certain European countries, it is not possible to obtain separate statistics for UI coverage and wage replacement and in this report we use a measure of the net replacement rate of government income support programs developed by the OECD.

The rationale for the inclusion of an indicator of employment protection is that job security represents an aspect of labour market security (i.e. the probability that an employed individual will lose their job). The OECD in 1999 produced an index of employment protection legislation (EPL) for OECD countries for the mid-1980s and mid-1990s (OECD, 1999). The measure is a weighted average of regular and temporary worker protection against dismissal, as well as collective protection. Regular worker protection includes dismissal procedures, notice and severance pay provisions, and penalties for unfair dismissal. Temporary worker protection includes restrictions in the use of temporary contracts and renewal restrictions. A first version of the EPL indicator provides estimates for the late 1980s and late 1990s. A second version of the EPL for the late 1990s is more comprehensive because it incorporates collective dismissal indicators.

### Risk to Health Imposed by Employment

The possibility of risks to health from labour market activity to some degree affects all workers. The lesser the incidence of workplace-induced health problems, the greater the degree of labour market well-being. We use the death rate from workplace accidents and the time-loss rate due to workplace injury (and workplace illness). The two variables are weighted equally and additive.

### Risk of Poverty in Retirement

Workers typically do not sell their labour power for their entire lives – during their working years they acquire pension entitlements (through the private sector and the state) to finance their retirement years. We think of pensions as being, typically, “deferred wages” – but any deferral creates the risk that anticipated benefits will differ in magnitude from those actually delivered. The degree to which workers’ retirement incomes are protected in old age is an important element of labour market security – and we think it is plausible that the insecurity that people may feel about their prospects in old age depend particularly on the probability of poverty. The third and final sub-component of the labour market security component of the Index of Labour Market Well-being captures the future income replacement available to workers who are no longer of working age, i.e. those 65 or over.

This sub-index has four component variables. The first is poverty intensity for households headed by an elderly person (65 and over). Osberg (1998) argued that perceptions of insecurity are heavily influenced by the probability of extreme outcomes – hence we include this variable on the grounds that it is rational for individuals to be particularly concerned by the chances of deprivation in their old age. Trends in personal savings or pension plan benefits will affect retirement incomes throughout the income distribution, but there is a “bottom line” on poverty among senior citizens.

The second and third components essentially ask: (a) what the chances are that a worker gets a private pension; and (b) how much uncertainty is there in the size of that pension. If the workforce had complete pension coverage and there was no uncertainty about the eventual size of pension benefits, then there would be no insecurity among workers about the size of the deferred wage. In this case, the cost of pension contributions by firms could simply be added to wage and salary costs to produce the data on average total labour compensation which has already been discussed.

However, incomplete coverage and uncertain benefits produce insecurity, which detracts from well-being. The overall prevalence of occupational or employer paid pension coverage among the workforce indicates the incidence of contractual savings for retirement (if not the level of such savings). When all other aspects are equal, a greater coverage rate increases security. The ratio of membership in defined benefit pension plans to the total membership of all pension plans (defined benefit and defined contribution plans) is an indicator of the certainty of pension amounts since defined benefit pension plans, in contrast to defined contribution plans, provide more labour market security by guaranteeing a defined benefit level.<sup>17</sup>

Since workers can receive deferred wages either through the public or the private sector, and since the structure of private pension schemes is typically influenced fairly heavily by the design of public pension plans, the fourth and final variable is the level of social security benefits as a proportion of the average industrial wage. The four variables are weighted equally and are additive.

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<sup>17</sup> In a defined benefit plan, the portfolio performance risk of the pension plan (both positive and negative) is borne entirely by the pension plan administrator, while defined contribution plans shift the risks of portfolio management to the worker. Note that the risk allocation feature of defined benefit and contribution plans is quite distinct from the level of pension plan contributions, which is part of average total labour compensation (discussed above).

## Overall Labour Market Security

The overall labour market security component of the Index of Labour Market Well-being is the weighted average of the three sub-components, namely the risks imposed by unemployment, the risks to health from employment, and the risks of poverty in retirement. The weighting of the components is assumed equal.

## **Overview of the Four Components of the Index of Labour Market Well-being**

The proposed Index of Labour Market Well-being (ILMW) contains four components or dimensions, broken down into a total of nine sub-components, with an additional ten variables within three of the sub-components. Figure 2 provides a

### **Figure 2: Index of Labour Market Well-being Components**

#### **A. Labour Market Income (LMI)**

- 1) Labour Compensation Per Worker (LCPW)
- 2) Labour Compensation Per Hour (LCPH)

#### **B. Human Capital (HC)**

- 1) Average Educational Attainment (EA)

#### **C. Labour Market Equality (LME)**

- 1) Hourly Wage Inequality (HWI)
- 2) Incidence of Low Wage Employment (LWE)

#### **D. Labour Market Security (LMS)**

- 1) Risk from Unemployment (RU)
  - Average of the Overall (UR) and Long-term Unemployment Rate (LUR)
  - UI Coverage Rate (UICR)
  - UI Benefits Rate (UIBR)
  - Index of Employment Protection (EP)
- 2) Risk to Health from Employment (RH)
  - Labour Market Death Rate (DR)
  - Labour Market Workplace Injuries Rate (IR)
- 3) Risk of Poverty in Retirement (RPR)
  - Poverty Intensity for Households Headed by a Person 65 and over (PIE)
  - Social Security Replacement Rate (SSRR)
  - Occupational or Employer-Sponsored Pension Coverage Rate (OPCR)
  - Defined-benefit Pension Plan Membership as Proportion of Occupational Plan Membership (DRP)

#### **The Index is calculated as:**

$$\begin{aligned}
 \text{ILMW} &= (0.25)\text{LMI} + (0.25)\text{HC} + (0.25)\text{LME} + (0.25)\text{LMS} \\
 &= 0.25((\text{LCPW} + \text{LCPH})/2) + 0.25\text{HC} + 0.25((0.5)\text{HWI} + (0.5)\text{LWE}) \\
 &+ 0.25((0.33)((\text{UR} + \text{LUR})/2) * \text{UICR} * \text{UIBR} * \text{EP}) + (0.33)((\text{DR} + \text{IR})/2) + \\
 &(0.33)((\text{PIE} + \text{SSRR} + \text{OPCR} + \text{DRP})/4)
 \end{aligned}$$

schematic representation of the Index in the form of a weighting tree.

## **Estimates of the Index of Labour Market Well-being for OECD Countries**

This section of the report presents estimates of the different components and sub-components of the Index of Labour Market Well-being for selected OECD countries for the 1980-2001 period inclusive. It first discusses the methodology used to construct the Index and then looks at the labour market income component of the Index, followed by an examination of the human capital, labour market equality, and finally labour market security components.

### **Scaling Methodology**

Once variables are chosen for an index, an essential question is whether variables should be scaled, and if so, what is the meaning or interpretation of a scaled variable.<sup>18</sup> Because raw data may have significantly different ranges, without scaling, composite indices will be heavily influenced by variables with large ranges. Since the range of a variable can be influenced by arbitrary measurement choices about units of measurement as well as substantive differences in the variability of outcomes, the aggregation of unscaled indices is an implicit weighting scheme with properties that may be hard to defend.<sup>19</sup>

In the first version of this report the normalization technique was essentially one of aggregating percent changes over time in each variable. The advantages are that the per cent changes over time are highlighted, which is valuable for tracking temporal trends.

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<sup>18</sup> Booyen (2002: 123), in a recent survey of methodological techniques, says that the “aim [of scaling variables] is to point out the relation among certain objects, how far apart they are and in what direction they lie relative to each other”. Booyen outlines four possibilities for treatment of the scaling issue: no scaling, the use of normalized variables so that their mean is 0 and their standard deviation is 1, the use of ordinal response scales, and conventional linear scaling transformation (LST). We differentiate between standardization with an emphasis on transforming variables in order to standardize their range or variance and standardization of the base year level which emphasizes percentage change. The following classifications of methods to standardize variables are used: 1) no standardization, 2) normalization, 3) Z-Score or Gaussian normalization, 4) linear scaling, where ordinal ranking and LST are subsumed in the category of linear scaling. Note that LST scales variables to a common range, the Gaussian normalization scales variables to a common mean and standard deviation (0 and 1 respectively), and normalization scales variables to a common base year level.

<sup>19</sup> For example, the UNDP’s Human Poverty Index for developed countries (HPI-2) aggregates four unscaled variables, among which are the long term unemployment rate and the percent of people lacking functional literacy skills. The range of values of percentage of people lacking functional literacy skills is three times the range of values of long term unemployment (UNDP: 2002). Since the variables are aggregated without scaling, there are higher implicit weights for overall changes in the index composite put on the percentage of people lacking functional literacy skills.

The disadvantage is that variables with low bases compared to the range of values can skew the index and cause small absolute changes in this variable to overwhelmingly affect the composite. Switzerland, for example, experienced very large *per cent* changes in the unemployment rate and the long-term unemployment rate, because unemployment started from a very low base. (Note that a change from 0.5 per cent unemployment to 5 per cent will be a ten fold increase. However, in a different range of data, say between 10.5 per cent and 15 per cent, the same absolute change of 4.5 per cent is less than a 1.5 fold increase.)

In addition there is the directionality issue. For some variables, such as labour income, an increase in the variable corresponds to an increase in well-being, whereas increases in other variables, such as unemployment, correspond to decreases in well-being. It is desirable to standardize variables so that an increase in the standardized score corresponds to an increase in overall well-being.

To deal with both the unequal range and directionality issues, this report adopts a scaling procedure called the Linear Scaling Technique (LST). Empirical estimates are made for the high (Max) and low (Min) values which represent the observed range of a variable for all time periods and for all countries – to which maximum and minimum values we add or subtract 10 per cent from the actual maximum and minimum values respectively. The data are then scaled according to these values. If a variable increase corresponds to an increase in overall welfare, the variable, Value, is scaled according to the Formula (1). In this case, increases in the Value correspond to increases in scaled Value. (Notice that if the Min is equal to zero, the formula above reduces to Value/Max.) If, in contrast, an increase in Value corresponds to a decrease in overall welfare, the Value is scaled according to the complementary Formula (2).

$$\text{Formula (1) Scaled value} = \frac{\text{Value}-\text{Min}}{\text{Max}-\text{Min}} \quad \text{Formula (2) } \frac{\text{Max}-\text{Value}}{\text{Max}-\text{Min}}$$

In this case, we see that increases in the Value correspond to decreases in the scaled Value. In both cases, the range of values is 0-1, and 0 corresponds to the lowest level of welfare, and 1 corresponds to the highest. Note that this formula reduces to (Max-Value)/Max when Min is set to 0.

This scaling technique is used in many indices of social and economic well-being, including: the Human Development Index produced by the United Nations Development Programme (UNDP), the Index of Social Health calculated by Human Resources Development Canada (HRDC), the Index of Economic Freedom produced by the Heritage Foundation, and a second Index of Economic Freedom prepared by the Fraser Institute and has now been adopted for use in the Index of Economic Well-being (Osberg and Sharpe, 2003) and the Index of Labour Market Well-being.

### **Labour Market Income**

The starting point for the Index of Labour Market Well-being is the average compensation paid to workers in return for their labour market contribution. Aggregate labour compensation paid to all employees in nominal prices is a component of income-based GDP, and so is easily available for a long time period for OECD countries. This aggregate can then be used to calculate compensation per employee and compensation per hour, each of which are deflated by the consumer price index (CPI) to arrive at estimates in constant dollars.

### Compensation per employee

The OECD collects data on employees and labour compensation for member countries and makes these data available through the OECD Health Data CD-ROM. Employees are used instead of total employment since the labour compensation component of GDP excludes income from unincorporated businesses (the self-employed), which is included in a separate category. This separate category, however, includes returns to capital and therefore exceeds labour compensation. While the labour compensation portion of self-employed income could be estimated through various procedures, it has not been done so in this report. Thus the self-employed are excluded from the labour market income component.

Compensation per employee, as shown in Appendix Table 2 for 16 OECD countries (Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and the United States) is hence calculated as total nominal labour compensation divided by the number of employees, and is then deflated to 1995 national currency units using the CPIs of the respective countries.

From 1980 to 2001, real compensation per employee was up 54.3 percent in Finland, 47.9 per cent in Norway, 43.9 per cent in Japan, 41.8 per cent in the United Kingdom, 38.9 per cent in Canada, 30.7 per cent in the United States, 26.0 per cent in Australia, 24.1 per cent in Sweden, 23.1 per cent in Belgium, 20.1 per cent in France, 14.5 per cent in Italy, 13.3 per cent in Denmark, 12.1 per cent in Switzerland, 5.9 per cent in Germany, and down 4.9 per cent in the Netherlands, and 8.3 per cent in New Zealand.

### Compensation per hour

Total hours actually worked per year by all workers are available from the OECD Statistical Portal. These series are used to calculate compensation per hour series in nominal dollars, which can also be converted to constant dollars using the CPI in each country. A crucial assumption is that the annual hours of employees are the same as self-employed workers, which may not be true given the longer hours the self-employed often work. Consequently, there may be an upward bias to the hourly labour compensation levels.

From 1980 to 2001, real labour compensation per hour (see Appendix Table 1) was up 69.4 per cent in Japan, 68.2 per cent in Finland, 64.0 per cent in Norway, 46.9 per cent in the United Kingdom, 40.8 per cent in France, 40.7 per cent in Canada, 39.5 per cent in Belgium, 30.8 per cent in the United States, 28.8 per cent in Australia, 24.2 per cent in Germany, 22.4 per cent in Italy, 18.5 per cent in Switzerland, 17.1 per cent in Denmark, 16.5 per cent in Sweden, 4.2 per cent in the Netherlands, and down 6.5 per cent in New Zealand.

### Total labour market income

The labour market income component of the ILMW is defined as the average of the scaled value of compensation per employee and the scaled value of compensation per hour, each receiving equal weight. Trends for 16 OECD countries are found in Table 1 and in Chart 1 for G-7 countries and in Chart 2 for 9 non-G-7 OECD countries. From 1980 to 2001, the labour market income component of the ILMW increased in all countries except the Netherlands and New Zealand. The largest absolute change between 1980 and 2001 (0.430) was recorded by Japan (Table 1). In 2001, the highest level of labour compensation was found in Belgium, followed by the United States and Switzerland, while the lowest level was in New Zealand, followed by the United Kingdom, and Sweden (Table 1).

### **Human Capital**

De la Fuente and Domenech (2000) have noted that existing educational data are of poor quality and do not provide a good proxy measure of the stock of human capital. They have consequently refined existing sources of educational data to arrive at more reliable estimates of human capital, as measured by average years of schooling for the population 25 and over. Their estimates are available from the OECD for most OECD countries every five years from 1960 to 1990. Recently estimates for 1995 have been produced, and have been made available on the internet (De la Fuente and Domenech, 2001). Data for OECD countries for the 1980-2001 period are found in Table 2, with linear interpolation employed to bridge the five-year gaps between estimates and extrapolation of the trend in the 1990-95 period used to create estimates for the 1996-2001 period.

In 2001, the United States had the highest average years of schooling of the population at 13.43 years, followed by Germany (13.32 years), Canada (13.32 years), Australia (13.17), Switzerland (12.83 years), New Zealand (12.44 years), Japan (12.17 years), Norway (12.12 years), Denmark (12.04 years) Finland (11.94 years), the Netherlands (11.94 years), Sweden (11.80 years), UK (11.38 years), France (11.12 years), Belgium (11.00 years), and Italy (9.37 years).

Over the 1980-2001 period, the fastest rate of increase in educational attainment was recorded in Italy (34.3 per cent), followed by Sweden (22.9 per cent), the Netherlands (20.9 per cent), Finland (20.1 per cent), Belgium (17.6 per cent), Japan (16.8



per cent), UK (16.5 per cent), Norway (14.7 per cent), France (12.8 per cent), Germany (10.9 per cent), United States (10.5 per cent), Switzerland (10.3 per cent), Canada (9.8 per cent), New Zealand (7.3 per cent), Australia (6.1 per cent), and Denmark (4.3 per cent).

The human capital component of the ILMW is defined as the scaled value of the educational attainment series. Trends for 16 OECD countries are found in Table 2 and in Chart 3 for G-7 countries and in Chart 4 for 9 non-G-7 OECD countries. From 1980 to 2001, the human capital component of the ILMW increased in all countries. The largest absolute changes were recorded by Italy (0.309), Sweden (0.284), and the Netherlands (0.266) (Table 2). In 2001, the highest level of human capital was found in the United States, followed by Germany and Canada, while the lowest level was in Italy, followed by Belgium and France (Table 2). Not surprisingly, the scaled values give the same ranking as the unscaled values.

## **Labour Market Equality**

### Earnings inequality

The OECD has produced two studies dealing with wage inequality (OECD 1993 and 1996), and the data therein can be used to calculate the ratio of the highest hourly earnings decile to the lowest. As shown in Appendix Table 8, this ratio ranged from a high of 5.8 in 1995 (the most recent year for which data are available) in the United States to a low of 2.0 in Norway. The ratios for other countries were the following: Canada (4.2), UK (3.4), France (3.3), Japan (3.0), New Zealand (3.0), Australia (2.9), Italy (2.8), Switzerland (2.7), the Netherlands (2.6), Finland (2.4), Germany (2.3), Belgium (2.3), Denmark (2.2), and Sweden (2.1).

Between 1980 and 2001, it is estimated that the largest increase in earnings inequality, as measured by the ratio of the top earnings decile to the bottom, took place in the UK, with a 21.4 per cent increase, closely followed by the United States with a 19.7 per cent rise (Table 3). Inequality increased in nine of the remaining OECD countries included in this study, namely: Italy (6.0 per cent), Canada (5.6 per cent), New Zealand (5.4 per cent), Sweden (4.4 per cent), the Netherlands (3.1 per cent), Australia (2.9 per cent), Denmark (1.1 per cent), France (0.7 per cent), and Japan (0.2 per cent). In contrast, inequality fell in five countries over the period: Germany (-13.8 per cent), Belgium (-3.5 per cent), Finland (-3.2 per cent), Norway (-3.0 per cent), and Switzerland (-0.1 per cent).

### Low-wage employment

If data on earnings inequality are sparse, data on low-wage employment are virtually non-existent. An OECD study dealing with earnings inequality (OECD, 1996) also briefly examines low-wage employment, and provides data for selected countries. The OECD uses a relative definition of low wage employment, namely any worker earning a wage less than two thirds of the median wage, and bases calculations on full-

time employees only. Howell (2002) also has calculated estimates of the incidence of low-wage employment for some OECD countries. The estimates of low-wage employment found in Table 3 and Appendix Table 8 are drawn from these two sources.

The highest incidence of low-wage employment for the 14 OECD countries for which at least one estimate was available was found in the United States, at 24.53 per cent, closely followed by Canada at 23.7 per cent. The incidence in the other 12 countries, in descending order, was 19.6 per cent in the UK, 16.9 per cent in New Zealand, 14.6 per cent in Japan, 14.6 per cent in the Netherlands, 14.3 per cent in Australia, 13.3 per cent in France, 13.0 per cent in Switzerland, 12.9 per cent in Germany, 12.5 per cent in Italy, 7.3 per cent in Belgium, 5.9 per cent in Finland, and 5.2 per cent in Sweden.

For the eight countries with two or more years of data on low wage employment, four countries experienced an upward trend over the 1980-2001 period and four countries a downward trend (Table 3). The country with the largest increase in low wage employment was the Netherlands at 13.0 per cent, followed by the United States (11.6 per cent), the UK (10.6 per cent), and Australia (5.7 per cent). The country with the largest decline in low wage employment was Japan (-20.3 per cent), followed by Germany (-9.8 per cent), and Belgium (-9.4 per cent).

### Overall Index of Labour Market Equality

Because of the lack of availability of estimates for low wage employment – available for more than two years for only seven of the 16 countries covered in the report – we have decided to not include this variable at this time in the overall index of labour market equality. Thus the trend in overall labour market equality is assumed identical to the trend in earnings inequality. In future work, we hope to include estimates of low-wage employment for all countries covered by the report.

The labour market equality component of the ILMW is thus defined as the scaled value of the earnings inequality series. Trends for 16 OECD countries are found in Table 3 and in Chart 5 for G-7 countries and in Chart 6 for 9 non-G-7 OECD countries. Between 1980 and 2001, the labour market equality component of the ILMW increased in five countries, decreased in 11. The largest percentage point increase was recorded by Germany (0.081 points) and the largest decrease (increase in inequality) by the United States (-0.208). In 2001, the highest level of labour market equality was found in Norway, followed by Sweden and Denmark, while the lowest level was in the United States, followed by Canada and the United Kingdom (Table 3). Not surprisingly, the scaled values give the same ranking as the unscaled values.

### **Labour Market Security**

The labour market security component of the Index of Labour Market Well-being is composed of three sub-indexes or sub-components: security from the risk imposed by unemployment; security from the risk to health imposed by unemployment; and security from the risk imposed by poverty at the end of working life.

#### Security from the risk imposed by unemployment

The starting point for this sub-index of the labour market security component is the unemployment rate, taken as a measure of the risk that a worker will lose his or her job. However, a given unemployment rate may be produced by a high incidence of unemployment, combined with a low average duration of unemployment or by a low incidence process, combined with a long average duration of unemployment spells. The unemployment rate, by itself, does not reveal any variation in the expected duration of unemployment. We argue that it is the risk of losing one's job, combined with being unable to find a new job quickly, that drives worker insecurity. For this reason the trend in the risk of unemployment is modelled as the average of the trend in the unemployment rate (the number of unemployed workers as a percentage of the labour force) and the trend in the long-term unemployment rate (the number of workers unemployed for 52 weeks or longer as a percentage of the labour force).

Scaled values of these variables are shown in Table 4. In 2001, the standardized unemployment rate varied greatly among the 16 OECD countries covered by this study. It was highest in Italy at 9.4 per cent, followed, in descending order, by Finland (9.1 per cent), France (8.5 per cent), Germany (7.8 per cent), Canada (7.2 per cent), Belgium (6.7 per cent), Australia (6.7 per cent), New Zealand (5.3 per cent), Japan (5.0 per cent), the United Kingdom (5.0 per cent), Sweden (4.9 per cent), the United States (4.7 per cent), Denmark (4.3 per cent), Norway (3.6 per cent), Switzerland (2.5 per cent), and the Netherlands (2.4 per cent).

After 1980, a large number of OECD countries experienced very large increases in their unemployment rate. The country that experienced by far the largest percentage increase in its unemployment rate was Switzerland, up 539.7 per cent. This was because of the extremely low Swiss unemployment rate in 1980, 0.4 per cent. Other countries that experienced very large increases in their unemployment rates were Germany (178.9 per cent), Japan (148.2 per cent), Sweden (135.9 per cent), Norway (119.5 per cent), New Zealand (117 per cent), Finland (70.2 per cent), Italy (56.1 per cent), and France (41.4 per cent). Australia had a modest increase of 8.3 per cent. The largest decline was recorded by the United States (-33.9 per cent), followed by Denmark (-26.1 per cent), the Netherlands (-21.3 per cent), Belgium (-14.3 per cent), the United Kingdom (-7.8 per cent), and Canada (-3.8 per cent).

In 2001, the long-term unemployment rate defined as the proportion of the labour force unemployed for 27 weeks or longer, also varied greatly across countries (Table 4). It was highest in Italy at 5.8 per cent, followed by Belgium (4.1 per cent), Germany (4.0 per cent), France (3.4 per cent), Finland (2.7 per cent), Australia (2.0 per cent), United Kingdom (1.5 per cent), Sweden (1.5 per cent), Japan (1.1 per cent), New Zealand (1.1

per cent), the Netherlands (1.0 per cent), Switzerland (1.0 per cent), Denmark (0.9 per cent), Canada (0.8 per cent), the United States (0.3 per cent) and Norway (0.2 per cent).

Between 1980 and 2001, Switzerland and Sweden experienced massive per cent increases in their long-term unemployment rates, 1452.6 per cent and 1191.2 per cent respectively, because of the extremely low level of long-term unemployment in these countries in 1980 (Table 4). Other countries that experienced very large increases were New Zealand (471.2 per cent), Japan (237.0 per cent), Norway (210.9 per cent), Germany (208.1 per cent), Canada (110.7 per cent), Finland (86.6 per cent), France (74.8 per cent), Italy (64.7 per cent), and Australia (60.8 per cent). A modest rise took place in the United States (4.6 per cent). The country with the largest decrease was Denmark, with a 65.8 per cent fall, followed by the UK (-39.7 per cent), the Netherlands (-29.9 per cent), and Belgium (-20.0 per cent).

Given the chances of losing one's job, and not being able to find a quick replacement, two other variables are relevant for a worker's security – the probability of being covered by an unemployment insurance program and the proportion of one's earnings that are replaced under the unemployment insurance program. While estimates for these variables are readily available for Canada and the United States (Osberg, Sharpe, and Smith, 2002b), they are much harder, if not impossible, to obtain for most OECD countries because of the integration of the unemployment insurance and social assistance systems. Consequently, this report uses estimates prepared by the OECD on the gross replacement rate of social benefits.

In 2001, the gross replacement rate not surprisingly varied greatly across OECD countries (Table 4). It ranged from a high of 65.5 per cent in Denmark to a low of 12.2 per cent in Japan. The rates in other countries were the following: Netherlands (50.9 per cent), Norway (41.3 per cent), Finland (39.7 per cent), Belgium (39.0 per cent), Switzerland (37.3 per cent), France (36.9 per cent), Germany (30.3 per cent), Canada (30.0 per cent), New Zealand (29.7 per cent), Sweden (25.7 per cent), Australia (24.8 per cent), Italy (20.0 per cent), UK (16.6 per cent), and the United States (14.0 per cent).

Between 1980 and 2001, the gross replacement rate fell in only two countries (Table 4). The largest decline took place in the UK (-30.7 per cent), followed by Belgium (-14.2 per cent). The largest increase in the rate occurred in Switzerland (189.9 per cent), followed by Norway (69.1 per cent), Finland (58.0 per cent), Japan (39.0 per cent), France (33.6 per cent), Denmark (26.0 per cent), Canada (18.1 per cent), the Netherlands (6.6 per cent), the United States (6.5 per cent), New Zealand (6.1 per cent), Australia (5.7 per cent), Germany (2.3 per cent), and Sweden (2.3 per cent).

A third component of security from unemployment is the degree of employment protection enjoyed by employees. Employment protection legislation is measured by the OECD's 1999 Employment Protection Indicator (EPI). This is based on dismissal procedures, notice and severance pay provision and penalties for unfair dismissal for regular workers, and restrictions on temporary contracts and renewals for temporary workers.

The measure ranges from 0 to 4, with a higher score representing greater employment protection. In the late 1990s, the highest score was recorded by Italy (3.3) and the lowest by the United States (0.2) (Table 4). The ratings in other countries in descending order were: France (3.0), Norway (2.6), Germany (2.5), Japan (2.4), Sweden (2.2), Belgium (2.1), Netherlands (2.1), Finland (2.0), Denmark (1.2), New Zealand (1.0), Switzerland (1.0), Australia (0.9), Canada (0.6), and UK (0.5).

Between the 1980s and 1990s the EPI is estimated to have remained relatively unchanged in Australia, Canada, Japan, New Zealand, Switzerland, UK, and the United States (Table 4). In all other countries except France it fell: 42.9 per cent in Denmark, 37.1 per cent in Sweden, 33.3 per cent in Belgium, 22.2 per cent in the Netherlands, 21.9 per cent in Germany, 19.5 per cent in Italy, 13.3 per cent in Norway, and 13 per cent in Finland. In France, it increased 11.1 per cent.

Overall security from the risk imposed by unemployment is modelled as a multiplicative index of the indexes of the three sub-components, namely the security from the risk of losing one's job (including unemployment trends and legislated employment protection), and the gross replacement rate for income foregone from job loss. A multiplicative approach is used because each variable represents a conditional probability – i.e. we look at the economic risk of unemployment as the chance of unemployment, the chance of getting UI benefits if unemployed and the proportion of income replaced by UI benefits received if one is unemployed and entitled to the benefits. As a result, the overall risks from unemployment arising from the variables are multiplicative. Estimates of the overall index are found in Table 4.

The overall sub-component of the security from the risk imposed by unemployment for the labour security component of the ILMW is defined as the average of the scaled values of the three variables that make up the sub-component: the average of the unemployment rate and the long-term unemployment rate, the gross replacement rate, and the index of employment protection. From 1980 to 2001, security in this area increased in eight countries and decreased in eight countries. The largest absolute change was recorded by Norway (0.057) and the largest decrease by Sweden and Germany (-0.116) (Table 9). In 2001, the highest level of security from the risk imposed by unemployment was found in Norway, followed by the Netherlands and Denmark, while the lowest level was in the United States, followed by the United Kingdom and Canada (Table 9).

#### Security from the risk to health imposed by employment

Data are available for many types of injuries, such as cases in which mobility is limited but no time is lost from work, cases in which a certain number of days are lost, and cases in which there is a fatality. For comparability across OECD countries and in order to obtain time series for as long a period as possible, this sub-index focuses on

trends in the rates of these last two types of work accidents, namely fatalities and cases in which at least one day is lost from work due to injury. Data from the International Labour Organization are provided in Appendix Table 9 and indexes of the trends in Table 5.

In 2001, the incidence of non-fatal workplace injuries per 100,000 workers was in descending order the following: France (4,432), Italy (4,030), Germany (4,001), Canada (3,145), Finland (2,956), Switzerland (2,580), Australia (2,058), Denmark (1,574), Norway (1,266), Sweden (970), and the United Kingdom (645). The large international variation in the incidence of injuries is surprising and may be related to differences in national definitions of injuries.

There has been a downward trend in the incidence of non-fatal workplace injuries in the vast majority of OECD countries. Between 1980 and 2001, the incidence fell 39.3 per cent in Switzerland, 35.0 per cent in Italy, 28.9 per cent in the United States, 26.5 per cent in Germany, 19.8 per cent in Belgium, 19.0 per cent in Norway, 18.3 per cent in Canada and the United Kingdom, 15.9 per cent in France, 14.1 per cent in Finland, 8.4 per cent in Denmark, and 6.4 per cent in Australia.

The incidence of workplace fatalities may be a more accurate measure of the risk to health imposed by labour market participation because the definition of workplace fatality is more precise than injury, although the range of incidence estimates is even greater than for non-fatal workplace injuries. In 2001, the incidence of workplace fatalities per 100,000 workers was the following: Italy (7.0), Canada (7.0), New Zealand (5.3), France (5.0), Australia (4.0), the United States (4.0), Germany (3.1), Switzerland (2.3), Finland (2.1), Denmark (2.0), Norway (1.6), Sweden (1.5), and the UK (0.9). The magnitude of these differences may raise some suspicion that countries differ in the extent to which fatalities are linked to workplaces (e.g. whether workplace fatalities only include deaths at the worksite or whether a later death in hospital from injuries is also counted). However, time trends within countries will generally be measured more reliably.

The downward trend in the incidence of workplace fatalities has been even stronger than that for non-fatal injuries. Between 1980 and 2001, all countries for which data are available saw a falling fatality rate, with many countries enjoying large decreases (Appendix Table 9). The largest fall was in New Zealand (68.1 per cent), followed by Belgium (66.7 per cent), Finland (64.4 per cent), Italy (59.8 per cent), UK (57.1 per cent), France (55.4 per cent), Japan (50.0 per cent), Switzerland (47.7), Australia (42.9 per cent), Germany (39.8 per cent), Denmark (33.3 per cent), the Netherlands (32.0 per cent), and Canada (6.6 per cent).

The overall sub-component on the security from the risk to health imposed by employment for the labour security component of the ILMW is defined as the average of the scaled values of the two variables that make up the sub-component: the workplace injury rate and the workplace fatality rate. From 1980 to 2001, security in this area increased in all countries except Norway. The largest absolute change was recorded by

Italy (0.240). In 2001, the highest level of security from the risk to health imposed by employment was found in the United Kingdom, followed by the Netherlands and Japan, while the lowest level was in the United States, followed by Belgium and France (Table 9).

### Security from the risk imposed by poverty in retirement

What are the chances that workers will be financially secure in old age? We think of “financial security” as having the two components – avoiding deprivation and maintaining an accustomed life style.

We start with the risk of poverty in old age, modelled as poverty intensity among the elderly – i.e. the product of the poverty rate and average poverty gap for the elderly population. These data are calculated from the Luxembourg Income Study micro-data base, and are shown in Appendix Table 10. In 2001, the poverty rate and gap for households headed by a person 65 or older, based on the OECD equivalence scale of the square root of household size and a poverty definition of one half of median equivalent post-tax household income, varied widely across OECD countries.

The poverty rate was highest in Australia at 33.1 per cent, followed by the United States (24.4 per cent), Italy (14.7 per cent), UK (12.8 per cent), Norway (11.7 per cent), Belgium (10.0 per cent), Germany (7.9 per cent), Canada (6.2 per cent), Sweden (6.0 per cent), Denmark (5.7 per cent), France (5.2 per cent), Finland (4.3 per cent), and the Netherlands (2.6 per cent). The poverty gap was highest in Denmark at 48.7 per cent, followed by the Netherlands (41.4 per cent), Germany (31.6 per cent), United States (28.3 per cent), Australia (27.6 per cent), Belgium (19.6 per cent), Italy (18.3 per cent), Canada (14.8 per cent), Sweden (12.7 per cent), UK (11.7 per cent), France (11.4 per cent), Finland (9.8 per cent), and Norway (9.2 per cent).

Between 1980 and 1990 the rate of poverty intensity for elderly households fell in 10 of the 13 countries for which LIS estimates are available. The largest decline was in Canada at 83.0 per cent, followed by Finland (74.2 per cent), France (71.4 per cent), Norway (59.0 per cent), Netherlands (46.7 per cent), Germany (31.0 per cent), Denmark (23.9 per cent), United States (22.1 per cent), Italy (14.2 per cent), and the UK (13.4 per cent). The largest increase was in Australia at 162.9 per cent, followed by Sweden (22.4 per cent), and Belgium (18.6 per cent).

When they leave the workforce, individuals can expect to maintain an accustomed life style if they receive a pension with adequate income replacement. However, how likely are they to be in a pension plan and, if they are, how sure can they be of the pension benefits they will receive in their retirement years? Defined benefit pension plans provide more financial security than defined contribution plans since with the former the amount of retirement benefit is known with near certainty. Hence, three additional components of old age security are the proportion of employees covered by employer pensions; the fraction of covered workers who are in defined benefit pension plans; and the social security replacement rate, defined as the proportion of the average wage that is

replaced by social security payments. Unfortunately, comparable international estimates on these two variables have not yet been obtained. It is hoped that later versions of this report will include estimates of these three variables.

The overall sub-index of security from the risk imposed by poverty at the end of working life is the average of the indexes of the four sub-components, namely the security from the risk of elderly poverty, the proportion of workers covered by a retirement plan, the proportion of retirement plan members covered by a defined benefit plan, and the social security replacement rate. Because of lack of information for the last three of these variables, only the first variable has been used in this report.

The overall sub-component on the security from the risk imposed by poverty at the end of working life is defined as the scaled value of the only variable currently available for this sub-component: the poverty intensity for the elderly. From 1980 to 2001, security in this area increased in eight countries and decreased in five countries (no estimates were available for three countries). The largest absolute change was recorded by Canada (0.482) and the largest decrease by Denmark (-0.237) (Table 9). In 2001, the highest level of security from the risk imposed by poverty at the end of working life was found in Finland, followed by France and Sweden, while the lowest level was in Australia, followed by Denmark and the United States (Table 9).

#### Overall index of labour market security

The overall labour market security component of the ILMW is defined as the average of the scaled value of the three sub-components: security from the risk of imposed by unemployment, security from the risk to health imposed by employment, and security from the risk imposed by poverty at the end of working life. Trends for 16 OECD countries are found in Table 7 and in Chart 7 for G-7 countries and in Chart 8 for 9 non-G-7 OECD countries. From 1980 to 2001, the labour market security component of the ILMW increased in 12 countries and decreased in four countries. The largest percentage point increases were recorded by France (0.179) and the largest decrease by Denmark (-0.079) (Table 9). In 2001, the highest level of labour market security was found in Norway, followed by Sweden and Finland, while the lowest level was in the United States, followed by Australia and Germany (Table 9).

#### **Overall Index of Labour Market Well-being**

The overall Index of Labour Market Well-being is defined as the average of the scaled value of the four components: labour market income, human capital, labour market equality, and labour market security. Each component can be assigned a weight based on any chosen criteria, but for discussion purposes equal weights have been arbitrarily assigned.



Trends for 16 OECD countries are found in Table 8 and in Chart 9 for G-7 countries and in Chart 10 for 9 non-G-7 OECD countries. From 1980 to 2001, the Index increased in all countries. The largest percentage point increases were recorded by Finland (0.1989), followed by Norway (0.1906), and Japan (0.1687) and the smallest by New Zealand (0.0290) and Denmark (0.0323) (Table 9). Canada had the fourth largest increase.

In 2001, the highest level of labour market well-being among the 16 countries included in this study was found in Norway, followed by Belgium and Switzerland, while the lowest level was in New Zealand, followed by the United States and Italy (Table 9). Canada ranked 10<sup>th</sup> out of 16.

## **A Comparison of the Index of Labour Market Well-being with the Unemployment Rate in OECD Countries**

The unemployment rate has often been pointed to and used as an indicator of labour market well-being. But although the unemployment rate enters directly into our labour market security component, its financial impact can, in principle, be offset by unemployment insurance. By itself, the unemployment rate cannot capture all the dimensions of well-being associated with the labour market. The relationship between the unemployment rate and broader measures of labour market welfare such as the Index of Labour Market Well-being is an empirical issue.

Chart 27 plots the standardized scaled unemployment rate and the Index of Labour Market Well-being in 16 OECD countries. There appears to be basically no relationship between the level of the unemployment rate and the level of the Index. The United States, with one of the lowest unemployment rates, had the lowest level of labour market well-being. On the other hand, high unemployment Belgium ranked 3<sup>rd</sup> in terms of labour market well-being.

On the other hand, Chart 28 shows that there appears to be a weak negative relationship between changes over time in the Index of Labour Market Well-being and changes in the unemployment rate. The two countries with the largest percentage point increase in the Index of Labour Market Well-being over the 1980-2001 period were among the countries with the largest decline in their unemployment rate. Equally, two of the three countries with the smallest increase in the Index had the two largest increases in the unemployment rate.

Charts 11 to 26 plot the scaled values of the standardized unemployment rate and the Index of Labour Market Well-being for 16 OECD countries over the 1980-2001 period. The absolute changes (percentage points in terms of the 0-1 scale) in the two variables relative to the 1980 value are also plotted. One notes that the unemployment rate exhibits much more variability than the Index. This is not surprising as the ILMW includes many non-cyclical variables (such as educational attainment) – and this inclusion will dampen the cyclical variability of the Index. Over the period in almost all

countries the unemployment rate did worse than the Index. This indicates that the deterioration of employment opportunities as represented by the unemployment rate over the 1980-2001 period in OECD countries appears to have been worse than the deterioration of overall labour market well-being.

## **Conclusion**

This report on the Index of Labour Market Well-being represents a first attempt to construct a measure of labour market well-being for OECD countries based on the framework developed in the Index of Economic Well-being. A major limitation has been the lack of data for a number of the variables. Future work will hopefully fill these gaps and permit the development of more comprehensive and reliable estimates of the various components of the Index as better data sources are identified and data obtained. Nevertheless, we believe that the current report, despite its exploratory nature, provides significant insight into trends in labour market well-being in OECD countries over the last two decades.

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