Construction of a New Architecture for Labour Market Statistics: A Synthesis of the Results from a Rockefeller-Ford Foundation-funded International Project

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This paper provides a synthesis of a major international research project funded by the Rockefeller and Ford Foundations on the construction of a new architecture and indicators to capture the realities of the labour market. The paper first outlines the background of the current project, which follows up an earlier project on the international comparability of labour market statistics. The second section of the paper presents the main findings of the project in the areas of labour market performance and labour market capacity. The third and final section presents a number of recommendations for new types of labour market statistics to improve the measurement of both labour market capacity and labour market performance.

Background

From 1998 to 2000 a team of labor market experts from nine countries (United States, Canada, Italy, United Kingdom, Germany, France, Spain, Denmark, and Sweden) worked to investigate the comparability of labor market statistics across developed nations with a focus on the official unemployment rate. The project, entitled "Understanding Unemployment and Working Time: A Cross-National Comparative Study" was funded by the Rockefeller and Ford Foundations.

The purpose of the project was to determine whether the apparent difference in economic "success" between the United States and many European countries could be attributed to differences in measurement or to real differences in economic performance. With the U.S. unemployment rate falling to 4 percent and European rates in double digits, there was a widespread belief among economists, policy experts, and policymakers that Europe's higher jobless rate was due to the inflexibility of its labour markets and its more liberal social welfare policies. The policy implication was that if Europe was to perform better economically, it would have to adopt American style labour markets and weaken social welfare protections.

While the project was not directed at commenting on economic policy per se, its objective was to investigate whether some or perhaps even much of the difference in economic performance was an illusion based on incomparable statistics. The objective of the project was to study the extent to which the current gap in official unemployment rates between the United States and most European countries reflects a real difference in labor market performance or is at least partly due to definitional or methodological incomparabilities in the statistics themselves.

The initial hypothesis motivating the project, namely that a significant portion of the inter-country differences in reported unemployment rates could be explained by differences in the methodology and definitions, proved incorrect. Over the past decade,

we found that great strides have been made by international statistical agencies to standardize the methodology and definitions used to calculate labor market statistics. Our best estimates suggest that in the late 1990s only 20 percent of the difference in unemployment rates between the United States and Canada and only about 10 percent of the difference between the United States and Europe could be attributed to differences in methodology and definition.

But our research turned up something much more important. While the actual statistics on labour force performance were comparable, we found that unemployment has very different meanings across countries. Because of differences in unemployment insurance systems, social welfare programs, and the extent of underground economy activity, the *same* unemployment rate (even measured in exactly the same way) does not mean the same thing in each country. Italy's 20-25 percent unemployment rate in its southern region is not comparable to what such a high rate would be in the United States. The same is true of Spain's 16-18 percent experienced in the late 1990s. Media focus on differences in unemployment rates across countries fails to recognize this fact. Debates over public policy often fail to recognize this as well.

Even more importantly, the project found that the unemployment rate is no longer an adequate measure of labor market capacity, economic performance, or social well-being. Ironically, just as more and more energy has been devoted to collecting labour market statistics that are more comparable across countries, fundamental changes in the structure of the labour market in all of our countries have made these statistics less and less relevant as measures of capacity, performance, and well-being.

When the standard labour market statistics were first refined soon after World War II, almost all jobs were full-time; the typical job was in manufacturing or construction; most workers were male; and fewer workers (outside of agriculture) were self-employed. Over the years, the structure of the labour market has changed markedly. Instead of the simple three-dimension categorization of "employed-unemployed-out of the labor force" which still underlies standard statistics, there is now a broad spectrum of labor market status. Hours of work per day, per week, and per year differ dramatically between individual workers; the combining of dependent and independent (self-employed) work has increased; and a growing underground economy in some countries (related to changes in tax rates and labour market regulations) all have profound effects on the usefulness of the standard statistics for measuring capacity, performance, and well-being.

The key recommendation arising from the project was that a new framework or architecture was needed for labor market statistics to make them consistent with the current and evolving structure of the labor market. In particular, it was concluded that new statistics were needed to provide more accurate measures of labour market "tightness," overall economic performance; and economic well-being.

In 2000, a second project entitled "Constructing a New Cross-National Architecture for Labor Market Statistics" was funded by the Ford Foundation to

undertake the first project's major recommendation that a new framework for labor market statistics be developed. This project brought together the original participants from the first effort plus researchers from Japan and the Netherlands. The specific objectives of this second project were to improve the use of labor market statistics as policy tools and social indicators through 1) the downplaying of the official unemployment rate as a measure of labour market performance, capacity, and well-being through the identification of a new set of core labor market statistics; 2) the development of a new composite indicator to complement the underemployment rate; and 3) the development of new single and composite indicators for the measurement of labor market capacity, performance, and well-being.

This second project is now in its final phase. A concluding conference was held in September 2002 at the Rockefeller's Conference Centre in Bellagio, Italy where all of our findings were reviewed. Conference participants have revised their papers for publication and team leaders are currently working on the final report.

The University of Chicago Press has recently accepted to publish a two-volume study on labor market statistics in OECD countries based on the work of the two international research projects outlined above. The first volume will report on the combined findings of the first project on the comparative nature of unemployment in developed countries and the second project on the construction of a new cross-national architecture for labor market statistics. The second will be an edited volume based on revised versions of selected papers from the second project's final conference.

The first volume, tentatively entitled *Understanding and Improving Labor Market Statistics: A Cross-Country Comparative Study*, will provide a comprehensive overview of the findings of both projects. A general outline is provided in Appendix 1. The volume consists of nine chapters organized into two main parts. The chapters in the first part of the volume compare official and standardized unemployment rates across countries through 2001. The chapters in the second part discuss and develop new labour market indicators that will lead to a better understanding of labour market capacity, performance and well-being and make concrete proposals for a new architecture for labour market statistics.

The second volume, tentatively entitled *Toward a New Architecture for Labor Market Statistics*, consists of revised versions of papers presented at the second project's final conference held in Bellagio, Italy in September 2002. Eleven of the 19 papers presented at the conference were identified for possible inclusion in the volume on the basis of their quality and relevance to the themes of the project. See Appendix 2 for the list of the papers in the volume.

We believe that the two volumes will represent an important contribution to the study of labour market statistics. The intense interaction over a five-year period among the project participants from 11 countries has generated much insight and perspective on labour market issues. This international nature of the two projects has consequently greatly enriched the findings.

Main Findings from the Project

This section of the paper synthesizes the key findings from the project's labour market performance and labour market capacity teams. The final report will also include a section on labour market well-being, which at this stage is not completed.

Labour Market Performance[1]

Often the unemployment rate is used as a straightforward performance indicator of the economy. At first glance the rationale for such a use of the unemployment rate is clear. If the purpose of economic activity is to transform productive resources into goods and services, *ceteris paribus* an economy that uses all or most of its labour force should clearly be considered as a better performing economy than one that lacks the ability to put all or most of its labour force to work and thus leaves idle productive resources.

Nevertheless, when comparing the economic performance of countries, it is important to go a step further and include the ability of the different economies to transform the effort of the employed labor force into goods and services. This section argues that when discussing the performance of an economic system it is important to distinguish between *economic performance* and *labor market performance*. The former is related to the ability of a social system to deliver goods and services, and the latter is related to the important, but more specific issue, of how well the labour market manages to match supply and demand.

The ability of an economy to deliver goods and services can be captured, from a very simple approach (although not without shortcomings, as the growing literature on growth and well-being shows[2]) by GDP per capita. At the same time, GDP per capita can be expressed as labour productivity (output per hour worked), times the average working hours per year, times 1 - the unemployment rate, times the participation rate, times the relation between the ratio of working age population to total population:[3]

GDP pc = GDP/ population = GDP/ total hours of work per year, (Π_h) ·
Total annual hours of work/employment, (j)·
1- unemployment/labour force (1-u) ·
Labour force/ Working age population (a) ·
Working age population/total population (d)

$$(1)\ \text{GDP pc} = \text{GDP/ population} = \Pi_h \cdot j \cdot (1-u) \cdot a \cdot d$$

[1] This section draws on the chapter prepared for the final report by Rafael Munoz de Bustillo, team leader of the labour market performance team.

[2] On this issue see, for example, Sharpe (1999).

[3] A similar approach can be found in Van Ark and McGuckin (1997)

So we could have the paradox that, in terms of delivering goods and services, an economy with a low unemployment rate but low labour productivity could be behind another economy with a larger unemployment rate but with higher productivity. That is the case of most less developed economies or, without leaving Europe, of the neighboring countries of the Iberian Peninsula: Spain and Portugal, the former with a higher unemployment rate and higher output and income per capita.[4]

There are different paths, combinations or even trade-offs of employment and productivity levels that can lead to the same level of economic performance (in terms of per capita income). If that is the case, in order to talk about performance we would need more than just the unemployment rate.

As noted above, trends in GDP per capita are the result of the behavior of five different components, each one responding to different stimulus. The first element, productivity per hour,[5] is determined by the sectoral composition of the economy, the stock of physical and human capital, and technology, including both the technology embodied in the physical capital and the intangible technology used in the production process. The second component, the average number of hours worked, depends on the preferences of individuals when it comes to deciding between labour and leisure and on the collective decision taken by society in relation to the same matter, including here the choices concerning the use of part-time labour, the regulation of working time (40 hours in most European countries) and institutional rigidities in choosing hours. The third element of the equation is the unemployment rate. Among the elements affecting this component are the level of actual demand, and the efficiency of the labour market in matching supply and demand. In fourth place we have the labor force participation rate. Again, institutional and cultural factors, as well as personal preferences plus economic factors such as demand and wages, account for the value of this component. Finally, we have the ratio of potential labour force or working age population to total population, mostly explained by demographic factors.

Countries have different performances in these five fields that, when combined, explain the level of GDP per capita. Having "good marks" in terms of employment (*i.e.* low unemployment rate) does not guarantee an overall good final performance in terms of GDP per capita. This is the case, for example, of Portugal, a country that ranks sixth in terms of employment rate and next to last in terms of GDP per capita. In this case, the low rate of unemployment and the above average hours of work per year are not enough to compensate its well below average productivity per hour, leaving Portugal with an income per capita slightly over half the American one. At the other end, Spain has a well above average unemployment rate, more than twice the Portuguese rate, but

[4] The countries of the former Soviet Bloc before the fall of the Berlin Wall, with guaranteed job, are also a good example of the potential problems associated with using unemployment as an indicator of performance of a whole economy. Of course, behind the low unemployment rate of the soviet economy there was the extended practice of Soviet firms of labor hoarding, so we could talk of the existence of large hidden unemployment. Nevertheless, the open unemployment rate was low.

[5] It is beyond the scope of this paper to study the growing difficulties related to the measurement of labor productivity. For a good review of the problem faced when measuring productivity growth see the OECD Productivity Manual (2001). For a summary of the manual see Schreyer (2001)

with a productivity per hour 26 per cent higher and higher working hours per worker, which allows the country to enjoy a GDP per capita 15 per cent higher than that of Portugal.

Table 1 shows the contribution of the components of GDP per capita to GDP per capita growth in OECD countries. The United States was the only country with positive or null contributions from all factors. Sweden was the only country experiencing an increase in working time. Growth of GDP per capita in the Netherlands was based on the increase in participation rate and part-time work. Germany, France, and Switzerland were the countries with the highest contribution of productivity growth to GDP per capita growth, with negative or negligible contributions from the other factors

Table 1. Contribution to GDP growth by factor (%)

Country	Period	GDP p.c. Growth (1999 $, PPP)	Contribution to GDP p. c. growth (%)				
			Productivity per hour	Hours	1-unemployment rate	Participation rate	Demographic Structure
Australia	1980-01	51.61	83.73	-5.32	-1.78	15.64	7.73
Belgium	1980-01	45.37	136.34	-44.53	4.96	2.67	0.56
Canada	1980-01	39.60	79.18	-3.78	1.10	20.29	3.21
Denmark	1980-01	47.07	110.69	-16.93	7.25	-5.72	4.70
Finland	1980-01	55.74	132.33	-19.42	-10.71	0.89	-3.09
France	1980-01	40.67	149.58	-46.40	-8.24	-1.17	6.23
Germany	1991-01	24.85	147.83	-27.78	-11.69	3.83	-12.19
Greece	1980-01	40.26	101.60	-12.65	-24.25	31.02	4.29
Ireland	1980-01	169.88	92.67	-19.17	4.67	8.11	13.72
Italy	1980-01	43.96	111.78	-18.28	-6.07	11.18	1.39
Japan	1990-01	55.82	126.03	-34.38	-7.47	14.03	1.79
Netherlands	1980-01	47.85	61.51	-41.15	5.12	69.19	5.33
Norway	1980-01	64.27	99.77	-20.82	-3.77	17.83	6.99
Portugal	1980-01	77.73	96.29	-21.07	5.03	6.49	13.26
Spain	1980-01	65.71	70.49	-19.47	1.91	21.91	25.16
Sweden	1980-01	37.47	95.78	19.79	-9.18	-9.43	3.05
Switzerland	1980-01	19.35	146.96	-85.27	-13.38	48.54	3.14
United Kingdom	1980-01	58.31	97.66	-7.27	1.92	5.89	1.79
United States	1980-01	50.71	80.20	-0.20	6.36	14.26	-0.62

Source: Author's analysis from OECD, GGDC and KILM (2001) data.

(*) 1980-2001, except Germany, 1991-2001.
Source: Table 3

Productivity differentials play a key role in explaining differences in growth rates and level in income across countries, while differences in the unemployment rate have a minor impact. To sum up, following Esteban (1999) we can decompose the dispersion of GDP per capita in a given moment of time, as shown by the Theil Index, as the sum of the indices corresponding to the five factors considered in the analysis: productivity, hours of work, employment, participation rate and the demographic structure. As can be seen in Table 2, almost 2/3 of the dispersion is explained by differences in productivity per hour, and almost one fifth by differences in hours of work. These two factors explain more than 4/5 of the dispersion of GDP per capita. The rest of the dispersion of GDP per capita is explained by factors related to the labor market and changes in the demographic structure, among them the unemployment rate. This last variable plays a relatively marginal role, being responsible for only one percentage point of the difference.

Table 2. Decomposition of per capita income inequalities (2001).

	GDP p.c. ($, PPP)	Output per hour ($)	Hours	1 - unemployment rate	Labor force participation rate	PLF/ Pop.
Theil Index	0.01930	0.01233	0.00370	0.00024	0.00250	0.00053
%		63.89	19.15	1.26	12.94	2.76

Source: Author's analysis from OECD data.

Productivity and employment in a set of OECD countries.

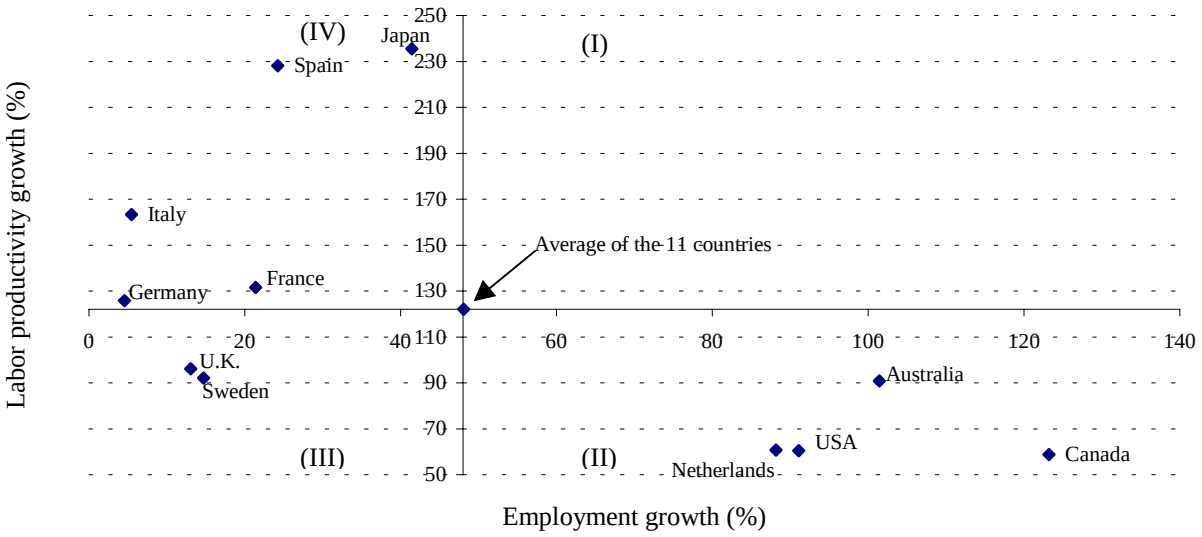
In this section we will focus on the behavior of employment and productivity in a set of OECD countries with the purpose of generating a taxonomy of countries based on the combined evolution of both variables. In order to be able to work with longer time series, in this section we use data on labour productivity defined as GDP/employment, instead of labour productivity defined as GDP per hour.

Figure 1 shows the position by a group of OECD countries over the 1965-2000 period in terms of their labour productivity growth and employment growth. The axes, which intersect at the average values of productivity growth and employment growth, define four different quadrants: (a) in quadrant I we would have those countries with higher than average employment and labor productivity growth; (b) quadrant II is reserved for those countries with higher than average employment growth but lower productivity growth; (c) quadrant III includes those countries with both lower employment and productivity growth; (d) last, quadrant IV is reserved for those countries with higher than average productivity growth but lower employment growth.

None of the countries has a better than average performance in terms of both employment and productivity, so quadrant I is empty. Not surprisingly, the United States is in quadrant II, along with Canada, Australia and the Netherlands. In this last case, the position is explained by the low average working time of the Dutch workers. Quadrant III

is reserved for two very different countries, the UK and Sweden, which nevertheless on this occasion share their underperformance in terms of employment and productivity. Finally, France, Germany, Italy, Spain and Japan exhibit below average employment growth, but above average productivity growth. This is especially true for Spain and Japan, with a rate of productivity growth for the whole period almost twice the average. This higher than average increase in productivity reflects a catch-up effect, as at the beginning of the period both countries had a level of productivity considerably lower than the average.

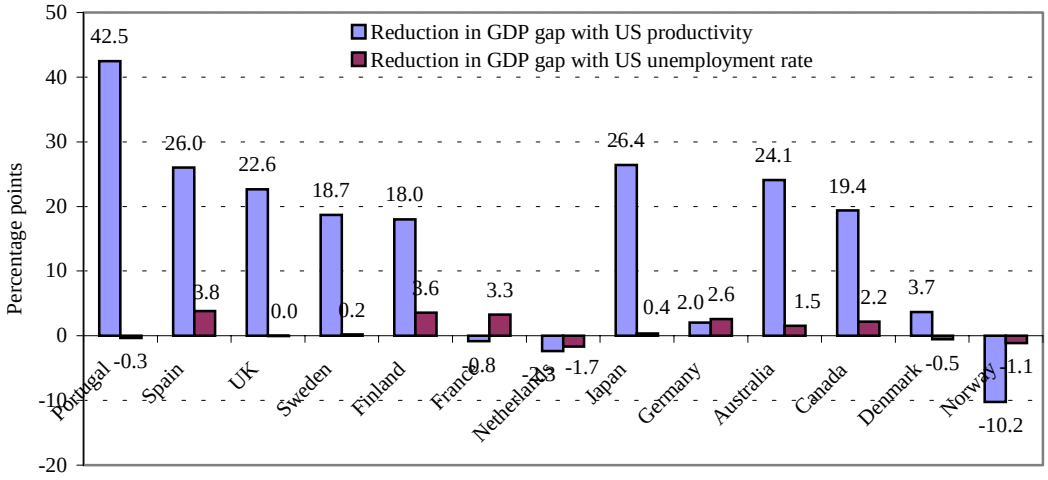
Figure 1. Labour productivity and employment growth.
G-7, Australia, The Netherlands, Spain and Sweden (1964-2000)



(*) Germany = 1965-1997. Source: Author's analysis on GGDC data.

Figure 2 shows the impact on GDP per capita in OECD countries under the dual assumptions that these countries had the U.S. level of output per hour and the U.S. unemployment rate.

Figure 2. Reduction of GDP per capita gap with the US, assuming US hour labor productivity and US unemployment rate (*).



(*) A negative value means an increase in the GDP p.c. gap.
Source: Author's analysis on GGDC and OECD data.

For Portugal, the elimination of the existing productivity gap with the United States would reduce the GDP per capita differential by 42.5 percentage points (that is, from almost $16,000 to less than $1,600), leaving the GDP per capita gap at only 5 points. In fact, as we can see, productivity differentials play a major role (around half or more of the existing difference in GDP per capita explained by difference in labor productivity per hour) in explaining GDP differentials in two thirds of the countries considered. In the rest of the countries, productivity differentials play a secondary role, explaining less than a third of the difference in GDP per capita. In the case of France, the Netherlands and Norway, having the US hourly productivity level would lead to an increase in the existing GDP gap between these countries and the United States of 1, 2 and 10 percentage points respectively.

With the exception of Spain and Finland (countries, especially the former, with an abnormal level of unemployment), the unemployment rate *per se* plays a secondary role in explaining the gap in GDP per capita with the United States. In France and Germany, having the American unemployment rate would also reduce the GDP per capita gap (3.3 and 2.6 percentage points respectively), although in the former case, the negative impact of a lower unemployment rate on the relative level of GDP per capita. is partially compensated by higher productivity per hour.

But this secondary role played by the unemployment rate in explaining the GDP per capita gap should not lead us to conclude that the existing gap is not related to the utilization of labor. Nothing further from the truth. When we add the role of all the elements related to the utilization of labor (hours, participation rate, unemployment rate and demographic structure) only in Japan, Australia, Canada and Portugal, do these, considered together, play a marginal role. In Germany and Denmark differences in labour

utilization explain most of the existing GDP per capita gap with the United States (72 and 89 per cent respectively). In Spain, Sweden and Finland it explains about a quarter of the gap. For the rest – France, the Netherlands, and Norway – labour utilization explains more than 100 per cent of the gap. This means that there is a gap in GDP per capita even when productivity is higher than in the United States.

This result highlights the importance of labour utilization as a determinant of relative GDP per capita, but only when by labour utilization we mean more than the rate of unemployment. The labour force participation rate or the demographic structure itself play a bigger role in explaining differences in GDP per capita than the rate of unemployment. Consequently, any analysis of economic "efficiency" should first take into consideration labour productivity, and then focus on the unemployment rate, the participation rate and hours of work. When using hours of work as complementary information, we run the risk of considering "inefficient" choices made by individuals and society about the distribution of their time between market work, leisure and other activities. The same problem, although less conspicuous, arises when dealing with labour force participation rates, as, among other things, the participation rate reflects a choice between market and non-market production.

Labour Market Capacity[6]

In addition to serving as an indicator of labor-market performance and national well-being, the unemployment rate has also come to serve as the principal measure of labour market capacity. At both a conceptual and a practical level, however, measuring labor market capacity is challenging. The "full capacity" of a labour market, for example, almost certainly expands significantly during major wars, such as World War II, when governments use command and control to mobilize workers. Even when capacity seems to depend entirely on individual decisions, defining "full capacity" can prove elusive since social norms certainly determine the acceptable length of a work day and influence the participation or hours of paid work performed by children, women, and the elderly. By working to change social norms through legislation –against child labour or in favor of early retirement, for example– governments can directly affect labour market capacity. Even social norms that evolve largely independently of government policy, such as the enormous rise in the share of women engaged in paid work, have important implications for the definition and measurement of "full capacity" in the labor market.

In the practice of macroeconomic policymaking, however, measuring labour market capacity has focused almost entirely on the narrow task of identifying the lowest rate of unemployment consistent with a stable (low) inflation rate. In this respect, perhaps the most important practical problem facing macroeconomic policymakers at the turn of the century stems from the repeated breakdown of the long-posited inverse relationship between unemployment and inflation, a relationship that has guided macroeconomic

[6] This section draws on the chapter prepared for the final report by John Schmidt, team leader of the labour market capacity team,

policy at least since the publication of A.W. Phillips (1958) work establishing what would later be called the "Phillips curve."

In an earlier period –during the oil shocks of the 1970s– the Phillips trade-off broke down, as high unemployment coexisted with high and rising inflation. At the end of the 1990s, however, the challenge to the traditional trade-off has come from the opposite direction. In the second half of the 1990s and into the early part of this decade, in the United States and several European economies, low unemployment rates have coincided with low and even falling rates of inflation. This latest, almost entirely unexpected, challenge to the Phillips curve raises fundamental questions about the usefulness for macroeconomic policy of traditional thinking about the Phillips curve and the related notion of a NAIRU (non-accelerating inflation rate of unemployment).

The Failure of the Phillips Curve and the NAIRU

Independent of any theoretical merit, the experience of the advanced economies in the 1990s calls into serious question the usefulness of the NAIRU concept as a guide for macroeconomic policy. Part of the practical difficulty is that, even to the extent that the NAIRU theory is true –that is, even if inflation will spiral out-of-control if the unemployment rate falls below the NAIRU– estimating the NAIRU is difficult. Advocates of the NAIRU concede that while economists often speak of the NAIRU as a particular level of unemployment (say, 6 per cent) or, more commonly, as a narrow range (5.5-6.0 per cent), statistical estimates of the NAIRU suggest a much wider range. Staiger, Stock, and Watson (1997), for example, calculated that a 95 per cent confidence-interval for the US NAIRU in the mid-1990s would include unemployment rates from 4.3 per cent (a boom) to 7.3 per cent (a significant recession). Another problem with using estimates of the NAIRU as a practical guide to policy is that, at least recently, NAIRU advocates have argued that the NAIRU is best viewed as "time-varying." A time-varying NAIRU may resolve some of the empirical difficulties when unemployment falls below the NAIRU and inflation remains relatively stable, this is because the NAIRU has fallen, too. In the end, however, a time-varying NAIRU with a wide confidence interval is of little practical use to macroeconomic policymakers who want to use the unemployment rate as an indicator of labour market capacity.

In the 1980s, and especially in the 1990s, low unemployment rates did not trigger high –let alone accelerating– inflation rates. In retrospect, we can see clearly that if policymakers believed that earlier inflation-unemployment trade-offs held or, worse, if they believed in the existence of a NAIRU at 5.5-6 per cent, most of the robust economic expansion of the second half of the 1990s might have been cut-off after about 1996. In fact, through a good part of the 1990s expansion, most macroeconomic policymakers held firm to their belief that there was a NAIRU and that it held at around 5.5-6 per cent. Only a series of positive shocks (low oil prices, for example), minor policy errors, and a cautious wait-and-see attitude allowed macroeconomic policy to tolerate an unemployment rate below what most policymakers thought of as sustainable.[7] For our

[7] Just before the East Asian financial crisis in 1997, for example, the Federal Reserve Board had begun to raise interest rates in order to cool the economy "preemptively" (inflation had not accelerated noticeably).

purposes, the main lesson in all of this is that, over the last two business cycles at least, the unemployment rate has not served as a reliable indicator of labor-market capacity.

Why the Phillips Curve and NAIRU have failed

In this section, we identify the factors that have led to the recent "flattening" of the inflation-unemployment trade-off and to the failure of the NAIRU as useful tool for policy. We consider two distinct sets of explanations for these recent developments. The first involve changes in the underlying structure of the economy that affect the inflation process *at any given level of labour supply*. The second set of explanations, which are the main focus of the rest of the chapter, are *changes in labour supply* that are not captured by changes in the unemployment rate. In both cases, the unemployment rate plays a diminishing role in the economic processes that trigger inflation, making the unemployment rate a less reliable single-indicator of labor-market capacity.

Recent research on the US expansion of the 1990s has emphasized several "structural" explanations for the coexistence of low unemployment and low inflation. The explanations are structural in the sense that changes in the underlying economy allow a lower inflation rate at any given level of labor supply, whether the available labor supply is measured by the unemployment rate or by some other measure. Here, we discuss three of the most important hypothesized structural changes: an acceleration in productivity growth; an increase in price competition; and a rise in worker insecurity.[8]

The three preceding factors –accelerating productivity, increasing competition, and rising job insecurity– may well account for part of the economy's recent ability to maintain both low unemployment and low inflation. All three involve changes in the way the economy converts wage increases into price increases at a given level of labor supply, lowering the inflationary tendencies associated with any given level of tightness in the labor market. These developments, however, are only part of the story. As the economy expanded over the 1990s, new supplies of labor came on line even as real wages grew no faster than the average productivity level. Sources of this greater supply included: population growth, through both natural population increases and immigration; rising labor-force-participation rates for women; an increase in the average number of weeks worked per year; an increase in the average number of hours worked per week; and improvements in the "effective" labor supply in the form of a rising average skill level of the work force.

Developing Alternative Measures of Labor Supply and Labor-Market Capacity

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Fearing that higher interest rates in the United States would compound East Asia's problems, the Fed reversed itself and began to lower interest rates. If the East Asia crisis had not intervened, the Fed might well have succeeded in raising the unemployment rate back to the 5.5-6% range, missing out on the sub-5% unemployment rates that held through much of the next three years.

[8] For discussion of these and other issues, see Blinder and Yellen (2000) and Bluestone and Harrison (2001).

Our discussion of labour market capacity has focused, so far, on the inadequacy of the unemployment rate as a stand-alone measure of potential labour supply and, by extension, of actual labour market tightness. Our review of the sources of labor supply in the United States and other OECD countries, especially our decomposition of the sources of the extra hours of work supplied to the US economy during the expansion of the 1990s, has highlighted two fundamental shortcomings of the unemployment rate. The first is that the unemployment ignores entirely the issue of hours. A decomposition of potential labour supply demonstrates that incumbent workers can be as important a source of additional hours of work as the unemployed. Moreover, since even the unemployed differ in the amount of hours that they are willing to provide if employed, the unemployment rate is, at best, an imperfect proxy of the labour supply of the unemployed. The second conceptual limitation of the unemployment rate is that it ignores hours supplied by those currently not in the labor force, including school leavers, women returning to work after periods outside the paid workforce, recent immigrants, and others. Our decomposition and our other analysis indicate that, in most OECD countries, workers from outside the labor force are consistently the single most important source of additional hours of work.[9]

Successful efforts to develop alternative measures of labour market capacity to complement the unemployment rate should, logically, concentrate on addressing these two major shortcomings of the unemployment rate. But developing alternative indicators of the labour market capacity along these lines is not easy. The unemployment rate has its problems, but it also has the advantage that it is conceptually simple and straightforward to measure in practice. In this section of the paper, we review the major practical and conceptual problems involved in attempting to overcome the main deficiencies of the unemployment rate. We first examine the issue of measuring hours of work, both actual hours worked and individuals' preferred hours or work. We then analyze issues surrounding the measurement of flows between labour markets states, especially from "not in the labour force" directly into employment, the particular transition that our decomposition identified as the most important source of labor supply in practice. With respect to both hours and flows, we concentrate on practical problems involved in measuring the underlying concepts of interests. In both cases, however, practical measurement issues frequently give rise to more fundamental conceptual questions.

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[9] A third fundamental flaw of the unemployment rate is, as we noted earlier, that it does not take into account skills, whether of the currently unemployed, employed, or those not in the labor force. Since more skilled workers likely represent a greater "effective" supply of labor, this is a potentially important deficiency. Given the considerable complexity involved in measuring labor quality; the large conceptual differences between the measurement of hours and flows between labor-market states, on the one hand, and measurement of labor quality, on the other; and the relative paucity of research on this area of "effective" labor supply, we leave the discussion of remedying this third shortcoming of the unemployment rate to future research. In the context of labor-market performance, rather than capacity, Haveman, Buron, and Bershadker (2001) have proposed a "foregone potential earnings" measure that calculates the difference between a person's actual hours worked and a hypothetical 52-week, 40-hours-per week year, and then weights this by their estimated earnings based on their human capital. This kind of indicator, which would be difficult to integrate into our decomposition and related discussion, is one possible way to address concerns of labor "quality."

Measuring hours

The three most common sources for estimates of hours worked in the economy are establishment surveys, household surveys, and time-use surveys. Unfortunately, the three types of surveys often give very different pictures of the total and the average hours worked.[10] Establishment surveys ask employers about the average hours worked *per job* in their workplaces. Establishment data will show an increase in average hours if overtime hours increase, or, a decrease in average hours if the share of part-time workers goes up. Such establishment data can provide valuable information on the way employers have organized work, for example, how they have divided work between full- and part-time workers. Establishment-based data, however, cannot say anything about the average number of hours worked *per person* or *per household*. Imagine, for example, that two firms each add a part-time job, both of which are filled by the same person. Average hours *per job* would decline in the establishment survey, even as average hours *per worker* increased.[11]

Hours per person or per household are closer than hours per job to the idea of labor supply that interests us here. Household surveys, which ask individuals about their actual or usual hours worked per week and sometimes about their actual number of weeks worked in the preceding year, are therefore better sources of information on hours worked for our purposes. Household surveys, nevertheless, have potential problems of their own. Some critics of household surveys argue that the relatively long recall period (a week or longer) leads respondents to overstate systematically their actual hours worked. Moreover, some say, the size of the overstatement appears to be increasing overtime (see, for example, Robinson and Bostrom, 1994).[12] High non-response rates are another potential problem with household surveys. Some evidence suggests that the recent increase in telemarketing and other unsolicited telephone calls may be driving up the nonresponse rates to non-commercial surveys, relative to rates in the past when telemarketing was less common (see, for example, van Leeuwen and de Leeuw, 1999). The "busiest" individuals, particularly those away from home and at work, may be the least likely to respond to surveys, leading household surveys to underestimate hours work. More worryingly, interference from telemarketers may lead the size of the underestimate to be growing overtime, as "busier" workers increasingly refuse participation in telephone surveys out of frustration over telemarketing calls.

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[10] For a powerful example of the differences in hours derived from these different sources, see the controversy around Schor's (1991), *The Overworked American.* Schor, who relied primarily on household surveys, showed a large rise between 1970 and 1990 in average hours worked in the United States. Critics, who relied primarily on time-use surveys and diaries, argued that average hours did not increase over the period (see, among others, Robinson and Bostrom, 1994). In our view, the rise in weeks worked per year – which is captured in household surveys, but not in time-use surveys and diaries– goes a long way toward resolving this controversy, largely in the favor of Schor.

[11] Here, we only need to assume that hours in the two part-time jobs sum to more than the national average, which includes some non-zero share of part-time jobs.

[12] The overstatement of hours is relative to data on actual hours worked from time-use surveys and diaries, to which we will turn next.

On their face, time-use diaries, which typically ask respondents to keep detailed track of their time for one day or up to about one week,[13] would appear to be the ideal source of data on hours worked per person. Time-use diaries, for example, explicitly address potential problems with recall bias, generally by asking respondents to keep track of their time as spend it. Time-use studies, however, are not completely satisfactory either; for many purposes, in fact, they may be less suitable than household surveys. First, because of the significant effort required to participate in them, time-use diaries have even higher rates of nonresponse than standard household surveys; nonresponse by "busy" people is likely to be even more serious with time-use diaries than it is with household surveys. Second, even if time-use diaries were more accurate in their description of how people spent their day or their week, isolated, sporadically administered, time-use surveys would miss much of the increase in hours in countries such as the United States, where most of the rise in hours reflects increases in the number of weeks per year, rather than an increase in the average number of hours per week.[14] Third, sporadically administered time-use surveys also provide little or no opportunity to control for business-cycle-induced changes in hours worked.[15] Finally, given the relatively high cost of implementing time-use surveys relative to questionnaire-based household and employer surveys, time-use surveys tend to be fielded irregularly and to much smaller samples than are usually involved in standard surveys.

Independent of the particular survey method used to measure hours worked, several conceptual problems further complicate the job. Changes in work organization, particularly changes related to the rise in computer-technology and low-cost telecommunications, have blurred the traditional divisions of time and space separating work and nonwork activities.[16] For example, how should employers, householders, or time-use diary keepers classify working through lunch, or work-related phone calls made by cell-phone during the commute home, or checking work email from home over the weekend? Non-market work, such as house cleaning or child and elder care, also raise difficult questions about potential "labor supply" available for productive economic activity. If women, who disproportionately undertake non-market work, enter the paid workforce, how should we (or should we?) treat the hours of non-market work that they give up? For the moment, these important questions seem beyond our immediate capability to address.

None of the three main sources of data on hours are perfect and none can fully address some of the fundamental changes in the nature of work and nonwork activities

[13] Some time-use studies ask for a detailed account of how time was spent over a short recall period, typically one day.

[14] A standardized time-diary, administered systematically over time (say, at the same time or times throughout the year) would, at the aggregate level, capture increases in weeks as well as hours.

[15] Schor emphasized this point in defense of criticisms of her 1991 book.

[16] For a fuller discussion, see Stevenson (2002).

that are taking place throughout the OECD countries (though time-use surveys may come closest on this last count). For most of our purposes, however, household-survey based information is probably the most useful, especially given the lack of consistent data over time from time-use surveys. Ideally, though, economists should recognize the strengths of each survey type and use all three measures to track the development of hours over time.

Measuring preferences for hours

So far, our discussion of hours has dealt only with actual hours worked, not whether actual hours worked match workers' underlying desired hours of working time. Preferences about working time lie at the heart of the definition of labor supply and are, arguably, even more important in determining labor-market capacity than are actual hours worked. Measuring workers' preferred number of hours, however, is even trickier than measuring their actual working time (see Benimadhu, 1987; Stevenson, 2002; and Tijdens, 2002). The most straightforward approach has been to ask workers how many hours they actually worked in the preceding week and then to ask how many hours they would like to have worked in that week. Survey questions of this nature usually leave unstated the specifics of the world where workers get their "preferred" number of hours. Presumably, the preferred hours would be paid (whether greater or smaller) at the current rate. But, other aspects of the circumstances where the worker has his or her preferred hours are left unspecified: would a worker prefer more hours, if child-care were available? Or the bus ran later? Or the employer provided health insurance for part-time workers?[17]

Given these conceptual difficulties, the most practical way forward may be to continue to investigate the determination of preferences for hours, while limiting the policy applications of this research until greater consensus on measuring preferences emerges. In the short term, however, the existing research suggests two potentially fruitful paths for labor-market-capacity indicators that incorporate elements of preferences. The first, already widely accepted, entails counting part-time workers who would like to work full-time, but can't for lack of work, in broad measures of unemployment (see, for example, the US Bureau of Labor Statistics "U-" series of unemployment measures).

The second approach, which is still more theoretical, involves using employed and unemployed workers' answers to their preferred hours work to calculate an economy-wide preferred hours capacity measure. While such an approach is promising, problems remain. If workers *say* that they would like to work fewer hours than they are, should we lower the capacity of the economy to reflect this, given that their actual behavior in the labor market suggests that, preferences aside, they are, in fact, willing to supply the extra

[17] Knowing exactly what workers hold constant and what they change when answering questions about preferred hours is particularly difficult, because they're preferences are, themselves, determined by what they believe to be fixed or changeable about the world in which they live and work (see, Stevenson, 2002). Workers also recognize that it is established norms for working hours and job organization often make it difficult to realize, in practice, their truly preferred hours.

hours. Another practical limitation is that such approaches have generally been limited to the existing labor force, with no corresponding questions about preferences for those outside the labor force, where we know the majority of additional hours of work actually originate.

TABLE 3
Average monthly transition rate among labor-market states, January 1980-July 1989
(Percent of total in final state)

Status in first month	Status in second month			
	NILF	Unem.	Part-time	Full-time
(a) Men				
NILF	91.1	18.3	9.2	0.9
Unemployed	2.5	51.1	5.0	1.0
Part-time	3.3	10.3	58.0	3.6
Full-time	3.0	20.3	27.8	94.5
(b) Women				
NILF	92.9	30.2	7.9	1.5
Unemployed	1.9	46.2	2.5	0.9
Part-time	3.1	10.9	69.3	7.3
Full-time	2.0	12.7	20.3	90.3

Notes: Analysis of Williams (1995), Table 1. NILF is "not in labor force."

Measuring flows

As we noted earlier, a second conceptual limitation of the unemployment rate is that it says nothing about the potential hours of work supplied by those currently not in the labor force. As we have seen, young entrants to the labor force, recent immigrants, women returning to paid work, and others entering employment directly from outside the labor force are, in fact, the largest source of additional hours of work as the economy expands. In this section, we review issues surrounding the measurement of flows between labor-markets states. Such flow or transition analysis can shed important light on the dynamic nature of the labor-market, something that is often lost in discussions of the more static unemployment rate.

Economists have emphasized the importance of gross labor-market flows and transitions between labor-markets states since at least the 1960s.[18] The standard approach has been to divide the population into three mutually exclusive labor-market states, employed, unemployed, and not-in-the-labour-force (with each state defined according to the International Labor Organization's criteria) and then to compare changes in individuals' status between two discrete periods (usually a month, a quarter, or a year). Researchers typically then use this information on transitions across labor-market states to construct matrices where the rows show the individual's labour market status in an initial month and the columns show the status of the same individual in the next month.[19] The cell entries show for each of the second-month states, where those workers were in the preceding month, based on an analysis of data from the US Current Population Survey (CPS) over the period January 1980-July 1989. (Given our concern with hours, the matrix in Table 3 lists four labour market states, rather than the more standard three: the table divides the employment state into "full-time" and "part-time" work.) For example, over this period, on average, for men, about 3.6 per cent of this month's full-time workers were part-time in the preceding month; about 1.0 per cent were unemployed; and about the same share (0.9 per cent) were not-in-the-labor force. For women, almost 7.3 per cent of this month's full-timers were part-time a month earlier; only 0.9 per cent were unemployed and 1.5 per cent were not in the labor force.

The flow analysis based on US data in Table 3 reinforces many of the earlier conclusions from our decomposition and other analyses. The transition matrix establishes that one of the most important sources of full-time workers in the United States is incumbent (part-time) workers. In addition, more male workers and far more female

[18] See, for example, Mincer (1966), Marston (1976), Clark and Summers (1979), Abowd and Zellner (1985), and Blanchard and Diamond (1990, 1992).

[19] Table 10 takes one of three possible forms for this kind of transition matrix. Table 10 shows all changes as a share of the final month's distribution of labor-market states. This emphasizes where individuals "come from." Another way of representing the data is as a share of the initial month's distribution, emphasizing where individuals "go to." A final way to present the data are in absolute numbers in each cell, which gives a much clearer picture of the relative size of flows across states.

workers enter full-time work directly from outside the labor force than do so from unemployment. Workers who were initially outside the paid labor force are a particularly important source of part-time workers. About 9.2 per cent of part-time men and 7.9 per cent of part-time women were not in the labour force in the preceding month. We do not have comparable transition matrices all the OECD countries, but ILO data show that, as in the United States, previously unemployed workers generally account for half or less of the flows into employment from one year to the next.

As with the measurement of hours, however, measuring labour market transitions presents a number of practical and conceptual problems. The most serious problem concerns the difficult process of tracking individuals from one period to the next. The US transitions matrix in Table 3, for example, uses monthly data from the CPS. The CPS data, however, typically allow only about a 95 per cent "match rate" for individuals from one month to the next. Unfortunately, this 5 per cent mismatch rate is large relative to many of the transitions of interest. The share of this month's full-time workers who were unemployed last month, for example, is only about 1 per cent. Moreover, the mismatches are probably correlated with exactly the phenomena of interest in most transition analyses. Individuals are probably more likely to disappear from the CPS sample because they change location to start a new job or because they lose their current job and move elsewhere in response. To the extent that mismatches are correlated with flows, flow analysis could provide a biased account of labor-market dynamics. Improved tracking is certainly possible, but can raise survey costs substantially.[20]

Major Recommendations for Improved Labour Market Statistics Arising from the Project

As noted earlier in the paper, the specific objectives of this second project were to improve the use of labor market statistics as policy tools and social indicators through 1) the downplaying of the official unemployment rate as a measure of labor market performance, capacity, and well-being through the identification of a new set of core labor market statistics; 2) the development of new indicators to complement the underemployment rate; and 3) the development of new single and composite indicators for the measurement of labor market capacity, performance, and well-being.

This section of the paper puts forward the major recommendations for new labour market indicators in the areas of labour market performance and labour market capacity. The final report will also include recommendations for indicators in the area of labour market well-being.

Labour Market Performance Indicators

[20] For a book-length analysis of flows, see Schettkat (1996); Schmitt (2002) has a briefer, more recent, discussion.

As noted in the previous section, the unemployment rate *per se* is a poor index of economic performance, as it only reflects, and not very well, the capacity of an economic system to use one of its factors of production, labor, without taking into consideration its efficiency in transforming labor into goods and services. *Output per hour* represents an excellent measure of economic efficiency or performance. Differences in output per hour levels across OECD countries account for around half of the differences in GDP per capita. Differences in the annual hours of work, and labour force participation rate also contribute more to GDP per capita differences than the unemployment rate.

The unemployment rate is certainly a useful measure of labour market performance, but it is only an incomplete or partial measure. For a more complete or comprehensive measure of labor market performance, we argued that the unemployment rate should be complemented with information on: hours of work, degree of involvement of the population in the labour market, efficiency of matching between the skills of the worker and the skills required by the job, efficiency of the market filling the existing vacancies, and degree of concentration of unemployment in specific population groups or regions. We propose the following specific measures or complementary indexes to capture this information.

- To deal with the problems of differences in hours of work, out of the different indexes explored, we propose the use of an unemployment rate or labour underutilization rate based on hours that reflects the underutilized hour of involuntary part-time workers, that is a *part-time preference corrected unemployment rate based on hours*. In this index, involuntary part-time workers are considered part-time unemployed. Efforts should be made to improve the quality of the data on involuntary part-time work. It is important to know how many additional hours, if any, all part-time workers would like and are able to work, but just if they want to work full-time.

- To deal with the problem of skill-based underemployment, we propose the utilization of an *index of* "*over-qualification*", defined as the percentage of workers with skills/educational attainment higher than the skills/educational attainment needed for their positions. In this respect too, we lack data with the required quality, so, once again, efforts should be made to improve the quality of existing data in this area.

- To capture the problem of differences in the degree of labor force participation we proposed the use of the *employment rate* and *female employment rate*, in order to capture the gender dimension.

- To take account of problems related with the demand side, we propose that more attention be paid to data on vacancies. We are aware of the shortcomings of these data, and the difficulties of generating quality data on vacancies. Nevertheless, we believe it is crucial to the evaluation of the labour market performance to take into consideration the relation between

vacancies and unemployment as measured by the *index of vacancies per unemployed*.

- Last, the unemployment rate is an aggregate measure so a given unemployment rate can hide very different situations in terms of duration of unemployment, the concentration of unemployment in certain groups of the population according to sex, age, education, or concentration of unemployment in certain regions of the country. Therefore in order to improve the information supplied by the unemployment rate it is important to consider along with the simple unemployment rate other indexes reflecting the distribution of unemployment. We propose consideration of: (a) *% of long term unemployment*. (b) *Female unemployment rate*, (c) coefficient of variation of the *regional unemployment* rate.

Labour Market Capacity Indicators

The recent macroeconomic history of the United States and much of the OECD suggests that the unemployment rate has become an increasingly less reliable indicator of labour market capacity. In particular, use of the unemployment rate in the context of empirical models of a "NAIRU" appears to have failed comprehensively at the end of the 1990s. In the United States and throughout most of Europe, unemployment rates fell –and remained for extended periods– below consensus estimates of the NAIRU without any sign of even moderate, let alone accelerating inflation.

We believe that the main explanation for the declining relevance of the unemployment rate as an indicator of labour market tightness has to do with the indicator's failure to capture the many and varied sources of labor supply in contemporary economies. A simple decomposition of the additional hours of work supplied in the United States during the 1990s, for example, shows that only a relatively small portion of the extra hours came from previously unemployed workers. Population growth, new immigrants, rising female-labor-force participation, and longer hours by incumbent workers –all of which lie outside the boundaries of unemployment– all supplied at least as many new hours of work to the economy in the 1990s as the unemployed did.

Our analysis suggests that new measures of labour market capacity that are capable of complementing the unemployment rate as an indicator of labour market tightness should focus on two shortcomings of the unemployment rate. First, new measures should break with the binary nature of the unemployment rate –workers are either employed or not, unemployed or not– and concentrate on the number of hours workers currently provide and that workers and non-workers could potentially provide. Second, new measures should look beyond the relatively static pool of the unemployed. Analyses of labour market flows and transitions show large and complex dynamics even over periods as short as a month. If most new hours do not come from the unemployed, measures of labour market tightness must incorporate these other sources of hours.

Based on our analysis, we recommend a broad change in thinking. When economists, policy makers, and the press discuss labour market capacity, they should place a much greater emphasis on hours, rather than individuals, and on the whole of the working-age population including incumbent workers and those not in the labor force by standard definitions. Most economists and policy-makers are already aware of the serious limitations of the unemployment rate discussed here. What makes the introduction of these broader themes into public discussions of labour market capacity are reasonable alternatives to the standardized unemployment rate. As a first step toward correcting for this deficiency of alternative indicators, we suggest increased research, official creation, and greater diffusion of a series of new and evolving indicators of labour market capacity.

First, we believe that the public debate on labour market capacity would benefit greatly from the creation and dissemination of official hours decompositions along the lines suggested in this paper. In the short-run, the particular components of the decomposition would depend on existing national data availability. In the medium- and long-term as experience with the decomposition increased, the ILO could play a role in homogenizing the hours decomposition, along the lines of what the group has done so successfully already with the unemployment rate.

A second way to emphasize the importance of hours rather than individuals would be to develop an official, hours-based unemployment rate, which would use potential hours, rather than a headcount, to calculate an unemployment rate.[21] Our discussion of the practical and conceptual difficulties involved in measuring hours of worked underscored some of the difficulties that would be involved in producing such an indicator. Agreeing on how to handle workers' preferences for hours in an objective "official" hours-based unemployment rate would be particularly challenging. Nevertheless, almost all statistical agencies in developed economies should be in a position to calculate a crude hours-based unemployment rate, based on simple average hours for standard full- and part-time workers, involuntarily part-time workers, and data on the typical number of hours supplied by unemployed workers who find work. Once these "official" (or, perhaps, in the short-term experimental "official") hours-based unemployment rates were up and running, national statistical agencies could work together, through the ILO, to refine and standardize techniques.

A third important complement to the unemployment rate would be the development, improvement, and regular dissemination of transition matrices (along the lines of our Table 3). The statistical agencies that produce such tables should highlight both the important insights into the dynamics of labor supply, especially the role that both incumbent workers and those outside the labor force play in supply extra hours to the economy as it expands. In the short-run, statistical agencies could caution consumers of the data about potential problems stemming from sample attrition; in the medium- and long-term, however, the agencies could push for necessary improvements in survey design that would allow better tracking of individuals over time.

[21] See Richard Dennis (2001), Barret (2001), and Stevenson (2002).

Alternative measures of labour market tightness that capture the importance of hours-worked and the multiple sources of potential labor, rather than just individuals' static employment status, could complement the standard unemployment rate as a measure of labor-market capacity. The unemployment rate has a long and useful history as a measure of capacity, and will remain an important measure of labour market capacity long into the future. If policy-makers are to monitor and shape the evolving economy, however, they will need new and improved statistical tools that capture the complexity and diversity of labor supply in the new and evolving economy.

Conclusion

This paper has provided a synthesis of a major international research project funded by the Rockefeller and Ford Foundations on the construction of a new architecture and indicators for labour market statistics. Probably the moat important recommendation arising from our work is that much more attention needs to be paid to hours in the measurement of both labour market capacity and labour market performance.

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