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## Unemployment and unemployment compensation from a global perspective

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## Unemployment and Unemployment Compensation from a Global Perspective

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## **ABSTRACT**

The purpose of this paper is to summarize the presence and importance of Unemployment Compensation in the world today. Summary measures are developed built-up from country-specific detail, and aggregated for the major regions of the world. The paper also summarizes key details about the measurement of unemployment in labor force surveys. After all, it is the volume of unemployment that is crucial in assessing the performance of UC programs: how capable is a country's UC program in providing short term protection to its citizens against the loss of earnings and income due to unemployment?

The paper reaches three main conclusions. First, unemployment rates vary widely across major geographic regions; for instance, low unemployment is a notable feature of Asian economies. Second, nearly half of the world's population (47 percent) resides in countries where UC programs are not available. Third, even where UC is present, the number of beneficiaries relative to total unemployment is often very low. In the countries where reciprocity could be assessed for this paper, UC recipients averaged less than one person in five among the unemployed. The combined effects of not having UC programs and low reciprocity in many countries with UC means that most of the world's unemployed are effectively beyond the reach of these programs. This implies widespread reliance upon coping mechanisms by affected individuals as well as added financial burdens for the other social programs that serve the unemployed.

## ZUSAMMENFASSUNG

Das vorliegende Papier bietet einen Überblick über die derzeitige Verbreitung und Bedeutung von Arbeitslosenunterstützung in der Welt. Anhand von länderspezifischen Daten werden aggregierte Maßzahlen entwickelt und nach Großregionen zusammengefasst. Zugleich werden auch Schlüsselcharakteristika der Messung von Arbeitslosigkeit in Arbeitskräfteerhebungen dargestellt. Letztendlich ist das Ausmaß der Arbeitslosigkeit ausschlaggebend für die Beurteilung der Leistungsfähigkeit von Programmen zur Unterstützung von Arbeitslosen: Inwieweit ist das System der Arbeitslosenunterstützung eines Landes in der Lage, die Bürger kurzfristig vor Verdienstaufschlägen und Einkommensverlusten infolge von Arbeitslosigkeit zu schützen?

Aus den Untersuchungen ergeben sich drei wesentliche Schlussfolgerungen: Zum einen fallen die Arbeitslosenraten in den verschiedenen Regionen der Welt sehr unterschiedlich aus; asiatische Wirtschaftssysteme zeichnen sich z.B. durch eine geringe Arbeitslosigkeit aus. Zum zweiten lebt fast die Hälfte der Weltbevölkerung (47 Prozent) in Ländern, in denen es gar keine Programme zur Unterstützung von Arbeitslosen gibt. Zum dritten profitiert aber selbst dort, wo eine Arbeitslosenunterstützung existiert, meist nur ein kleiner Teil der Arbeitslosen davon – in den Ländern, in denen für diese Untersuchung die entsprechenden Daten zur Verfügung standen, war es im Durchschnitt weniger als ein Fünftel von ihnen. Zusammengenommen ergibt sich aus der Nichtexistenz einer Arbeitslosenunterstützung in vielen Ländern bzw. aus dem geringen Anteil von Leistungsempfängern dort, wo entsprechende Systeme existieren, dass für den Großteil der Arbeitslosen in der Welt praktisch keinerlei Arbeitslosenunterstützungsprogramme greifen. Das hat zur Folge, dass die Betroffenen weithin auf andere Bewältigungsmechanismen angewiesen sind und zur finanziellen Belastung anderer Sozialprogramme beitragen, die Leistungen für Arbeitslose erbringen.

## **Table of Contents**

Introduction	2
1 Countries, Regions, Labour Force Surveys and Unemployment Compensation	3
2 The Presence of Labour Force Surveys	9
3 The Presence of Unemployment Compensation Programs	11
4 Unemployment Compensation Benefit Payments	14
4.1 The Unemployment Rate	17
4.2 UC Reciprocity Rates	18
4.3 Replacement Rates	21
4.4 UC Generosity	22
5 Conclusions	23



## **Introduction**

Throughout the world, labor markets account for the largest share of income derived from current production, particularly in developed economies where compensation to labor represents more than half and often two-thirds of Gross Domestic Product (GDP). Hence, the level of unemployment provides important information not only about the efficiency of the labor market but also the macroeconomy. Indeed, international research focuses on the level of unemployment in comparing the performance of labor markets across countries. Yet, unemployment continues to be an ongoing challenge for any economy irrespective of the stage of development. Besides cyclical fluctuations, various one-time events such as natural disasters and financial crises can occasion large, short-term increases in unemployment. In addition, insecurity of employment is becoming an important characteristic of labor markets because of greater global interdependence. As the impact of globalization increases, the cyclical risks for individual economies may become more coincident.

Unemployment compensation (UC) programs provide temporary, partial replacement for unemployment-related reductions in earnings in a labor market characterized by short-term volatility in labor demand. Not only do cash benefits help stabilize the income of individuals and households but they also act as automatic stabilizers in the overall economy. On the other hand, conventional wisdom attributes high unemployment to inflexible and regulated labor markets. In the current discussion of the relative performance of European and U.S. labor markets, the impact of generous UC programs is cited as a cause of higher unemployment in Europe. While the empirical evidence does not support a general proposition of a negative impact of labor market inflexibility on unemployment performance, institutional rigidity does matter.<sup>1</sup>

Transatlantic comparisons reappear constantly in the dialogue which surrounds the debate on UC. As a result, there is now much greater awareness of the complexities of labor market transitions, and of UC programs. But how prevalent are these programs in a global setting? The purpose of this paper is to summarize the presence and

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<sup>1</sup> See Stephen Nickell and Richard Layard, "Labor Market Institutions and Economic Performance," in O. Ashenfelter and D. Card, eds., Handbook of Labor Economics, Volume 3, (North-Holland: Elsevier B. V., 1999), pp. 3029-84; and Andrea Bassanini and Romain Duval, Employment Patterns in OECD Countries:



importance of UC in the world today. Because of the availability of relevant data for most countries, one can develop summary measures, built-up from country-specific detail, aggregate these measures for the major regions of the world, and provide a global summary. Since the unemployed are the relevant group for UC programs, the paper also summarizes key details about the measurement of unemployment in labor force surveys. After all, it is the volume of unemployment that is crucial in assessing the performance of UC programs: how capable is a country's UC program in providing short term protection to its citizens against the loss of earnings and income due to unemployment?

The paper reaches three main conclusions. First, unemployment rates vary widely across major geographic regions; for instance, low unemployment is a notable feature of Asian economies. Second, nearly half of the world's population (47 percent) resides in countries where UC programs are not available. Third, even where UC is present, the number of beneficiaries relative to total unemployment is often very low. In the countries where reciprocity could be assessed for this paper, UC recipients averaged less than one person in five among the unemployed. The combined effects of not having UC programs and low reciprocity in many countries with UC means that most of the world's unemployed are effectively beyond the reach of these programs. This implies widespread reliance upon coping mechanisms by affected individuals as well as added financial burdens for the other social programs that serve the unemployed.

## **1. Countries, Regions, Labor Force Surveys and Unemployment Compensation**

Table 1 summarizes the distribution of the world's population as of 1999. Countries are arranged into eight regions based mainly on geographic location. Each of the 150 included countries had a population of 1.0 million or more, and represented 99 percent of the world's population.<sup>2</sup> Currently, there are 30 member-countries of the Organisation for Economic Co-operation and Development (OECD). For this paper, 14 countries from western Europe and six English-speaking countries are classified in a single group termed "OECD-20." The other ten OECD member-countries are distributed

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Reassessing the Role of Policies and Institutions, OECD Social Employment and Migration Working Papers, (Paris: OECD, 2006).

into their respective geographic areas.<sup>3</sup> While seven of the eight regions have from 10 to 22 countries, Sub-Saharan Africa has 42. The population of East and South Asia at 3,297 million dominates the geographic distribution: 56 percent of the worldwide total. Regional populations exceeded 600 million in only two other regions: OECD-20 and Sub-Saharan Africa.

The middle columns of the table identify the number of countries that conduct a labor force survey on a regular basis. The 79 countries, slightly more than half of the 150, had a total population of 5,004 million in 1999: 84.6 percent of the worldwide total. Because countries with large populations are more likely to support labor force surveys, more than five-sixths of all persons worldwide reside in countries with such surveys.<sup>4</sup>

The final columns of Table 1 summarize the prevalence of unemployment compensation (UC) by region. In 2006, there were 65 UC programs with nearly universal presence in the countries of three regions: OECD-20, Central and Eastern Europe (CEE), and the successor states of the former Soviet Union (FSU). Of these 48 countries, 46 have UC with Kazakhstan and Tajikistan as the only exceptions. Across the remaining 102 countries, just 19 had UC with small numbers in four of five regions, (none in the Central America-Caribbean region). Again, the presence of UC is more common in larger countries. Thus, while the 65 countries with UC comprise 43 percent of the 150 countries, their combined population of 3,137 million represented 53 percent of the world's population in 1999.

The implementation of labor force surveys and UC programs follow legislative authorizations to finance their activities; usually budget allocations for the former and payroll taxes for the latter. Examples exist of countries that have enacted authorizing legislation but have not subsequently provided financial support for the survey/UC

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<sup>2</sup> Two countries, Cuba and North Korea, are excluded because their official ideologies do not admit the possibility of unemployment. If the minimum population size threshold were reduced to 0.2 million, another 19 countries would be included, but their combined populations would total just 6.9 million.

<sup>3</sup> The Czech Republic, Hungary, Poland and the Slovak Republic are included in Central and Eastern Europe. Japan and Korea are classified in East and South Asia. Turkey and Mexico are respectively included in North Africa and the Middle East, and Central America and the Caribbean. Iceland and Luxembourg are excluded because their populations are less than one million.

<sup>4</sup> Since China and India constitute such large shares of the world's population, 21 and 17 percent respectively in 1999, their treatment influences this outcome. India undertakes periodic labor force surveys of all major regions, while China concentrates on urban areas. Systematic measurement of employment and unemployment occurs for about 30 percent of the Chinese labor force.

programs. Explicit decision rules are followed in assigning a “Yes” status to both in Table 1. For labor force surveys, the rule requires a country to publish several years of survey results between 1990 and 2004, either in statistical yearbooks or on the International Labour Organisation (or other) website. The only two countries from Sub-Saharan Africa that meet this publication criterion are Botswana and South Africa.<sup>5</sup>

For UC, the decision rule requires either published information on payment activities or evidence of a modification to the original statute.<sup>6</sup> In other words, to be classified as a “Yes,” an initial authorization of UC needs to be followed by definite evidence of actual implementation. Because this evidence is not present for Bangladesh and Venezuela, they are classified as not having UC. A similar negative classification applies to labor force surveys in Armenia, Bosnia, Malawi and Nigeria.

It is crucial to know what fraction of the unemployed collect benefits in order to assess the effectiveness of UC in meeting the income support needs of the unemployed. Not all unemployed individuals are eligible to receive benefits. In most countries, benefits are not paid or are delayed and/or reduced for persons who voluntarily leave jobs and for persons discharged by their employers for misconduct.<sup>7</sup> Also, a record of substantial recent work experience is typically required. Availability for work, active work search and non-refusal of suitable work are common requirements for continuing benefit eligibility. Most commonly, UC benefits are paid to experienced workers who have lost jobs through no fault of their own and are able and available for work. Benefits are also subject to maximum payment periods after which recipients are said to “exhaust” their eligibility. Renewed eligibility is achieved only after a new period of employment.

Because of these factors, most UC programs have a recipiency rate (weekly beneficiaries as a ratio to weekly unemployment) below unity. At the same time, low recipiency rates (say below 0.20) imply few families receive income support payments so that UC benefits exert only a small effect in stabilizing the overall economy. Hence, it is

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<sup>5</sup> Eight other countries from this region reported one to three years of LFS data between 1990 and 2003 on the International Labour Organisation (ILO) website: Cameroon, Lesotho, Madagascar, Namibia, Rwanda, Tanzania, Uganda and Zimbabwe.

<sup>6</sup> Several key statutes appear in Social Security Programs Throughout the World, which is published jointly by the Social Security Association (SSA) and the International Social Security Association (ISSA) every second year. The current four-volume regional format was introduced in 2002.

<sup>7</sup> These details are highly varied across countries. A disqualification may be imposed for a minimum period or for the full unemployment spell, a so-called durational disqualification.

important to know the number of recipients relative to total unemployment. The latter is best estimated on a continuous basis using a labor force survey. As shown in Table 1, almost 85 percent of the world's population resides in countries that support labor force surveys. In countries where UC is present, the number of recipients can be measured relative to total unemployment and changes in both can be followed.

The presence or absence of labor force surveys and of UC in individual countries can be described as two yes-no situations with four possible outcomes. Table 2 presents data for the 150 countries from the eight geographic regions in four separate panels using this two-by-two categorization. Countries with both a labor force survey (LFS) and UC are found in Panel A (55 countries), those with a LFS but no UC in Panel B (24 countries), those with UC but no LFS in Panel C (10 countries), and those with neither UC nor an LFS in Panel D (61 countries).

Many readers would expect Panel A as typical: both a LFS and UC. The combined populations of these countries were 3,072 million in 1999 and their total labor forces averaged 1,016 million during 1995-1999. The combined labor forces of countries from two regions (OECD-20 and East and South Asia) exceeded 300 million while other regional totals were 102 million or less.

Aggregate unemployment in Panel A totaled 74.7 million and the average unemployment rate was 7.3 percent. Six of the eight regional averages fall into a range between 7.8 and 12.6 percent, all higher than the overall average. On the other hand, the Asian rate of 3.2 percent is less than half of the average. Moreover, the very high rate shown for Sub-Saharan Africa is based just on one country, South Africa.

Panel A shows that 26.41 million received UC benefits during 1995-1999. As indicated in the column headings, these benefit data reflect experiences of 49 of the 55 countries included in Panel A. Assembling the UC data is a major challenge and information from six, generally smaller countries, has not yet been acquired.<sup>8</sup>

The aggregate reciprocity proportion across all regions is 0.37. The highest proportions are exhibited by OECD-20 and CEE countries: 0.60 and 0.47, respectively. Very low reciprocity is present in North Africa-Middle East, with an average of 0.03

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<sup>8</sup> Thailand with a population of 60 million in 1999 only commenced benefit payments in 2004. The other five were generally small, with a combined population of 66 million in 1999, including Algeria with 30 million.

across four countries (Egypt, Iran, Israel and Turkey). Across the 49 countries, those from the OECD-20 region accounted for 16.01 million, more than 60 percent, of the 26.41 million UC beneficiaries.

Large countries strongly influence the regional averages displayed in the final column of Table 2. For example, the reciprocity rate in the United States was 0.31 during 1995-1999. When the United States is removed from the OECD-20 group, reciprocity increases from 0.60 to 0.70. Similarly, a reciprocity rate of 0.27 in Brazil is much higher than the average of 0.07 for the other three South American countries (Argentina, Chile and Uruguay). Conversely, Israel with a reciprocity rate of 0.52 is simply too small to have an important influence on the overall average of 0.03 for the North Africa-Middle East region. During 1995-1999 in countries with both an LFS and a UC program, approximately two out of every five unemployed persons received UC benefits.

Panel B vividly illustrates that a large segment of the world's population (1,932 million or 33 percent) resides in countries where a LFS is conducted but UC does not exist. Asian countries dominate this panel. Besides India with a population of 998 million in 1999, five other countries (Bangladesh, Indonesia, Pakistan, the Philippines and Viet Nam) had populations between 74 and 207 million. The countries from other regions in Panel B are generally small with a combined population of 254 million across all fourteen. Mexico and Colombia were the only two non-Asian countries with total populations of more than 25 million (97 million and 42 million, respectively, in 1999).

As in Panel A, the average unemployment rate for the Asian countries in Panel B is quite low at 3.7 percent. Because Asian countries represent such a large share of the total population in Panel B (86 percent), their average unemployment rate dominates in the panel's overall unemployment rate of 4.4 percent. Total unemployment in Panel B (31.6 million) is only 42 percent of the total in Panel A.

Note that total unemployment in Panels A and B combined exceeded 100 million in 1995-1999. Since by construction there are no UC recipients in the Panel B countries, the total number of UC recipients in the 79 countries with a labor force survey represents exactly 25 percent of total unemployment in these countries.

From a global perspective, many of the countries in Panel B are middle-income and could be candidates for establishing UC. In fact, three Asian countries introduced

UC programs over the past ten years (Korea, Taiwan and Thailand) while two countries (Sri Lanka and Viet Nam) may establish programs in the next few years.

Panel C shows that most countries with UC, but no LFS (9 of 10), are from the CEE and FSU regions. These countries are generally small: only Uzbekistan had a population of more than 12 million in 1999. Details on UC beneficiaries are assembled for two of these countries: Azerbaijan and Mauritius. Both exhibit low reciprocity relative to “official” estimates of unemployment. Because these countries do not support a LFS, it is difficult to assess the share of unemployed persons receiving benefits. Recipients are a low fraction of official unemployment, however, and would probably be an even lower fraction of LFS unemployment if there were LFS measures.<sup>9</sup>

Within the global context of unemployment and unemployment protection, the countries in Panel C are a small component. Their combined population of 65 million accounted for 1.1 percent of world population in 1999 and 2.1 percent of the population of the 65 countries with UC. About 96-98 percent of all UC recipients are probably from the 49 countries that underlie the totals displayed in Panel A of Table 2.

Panel D shows that 61 countries, approximately 40 percent of the 150, have neither a LFS nor a UC program.<sup>10</sup> On average, these are small countries and their combined population of 844 million represented 14 percent of the worldwide total in 1999. The 39 countries from Sub-Saharan Africa account for about 70 percent of the total population in Panel D. Many are low-income countries with a population-weighted average per-capita GDP of \$1,752 in 1999, about one-fourth of the worldwide average of \$6,870 for that year.

From Tables 1 and 2 it is clear that labor force surveys and unemployment compensation exhibit considerable variation in their prevalence across the eight regions of the world. The remainder of this paper undertakes statistical (regression) analyses of the prevalence and importance of UC programs within the 150 countries.

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<sup>9</sup> In both Azerbaijan and Mauritius, UC recipients averaged less than 10 percent of official unemployment during 1995-1999.

<sup>10</sup> Recall that the convention used here requires that data from the country’s LFS be on the ILO web site for several years between 1990 and 2004.

## 2. The Presence of Labor Force Surveys

As noted, labor force surveys (LFS) are present in just over half (79) of the 150 countries. They are more common among countries with high per capita income than those with low income. For the top-fifth of the countries ranked by income, 28 of 30 support a LFS. For the bottom-fifth, only one country (Cambodia) supported a LFS with survey results first published in 2000.<sup>11</sup> The regression analysis to explain their presence across the 150 countries utilizes income as a central explanatory variable.

Countries with large populations may have greater need for information from a LFS as well as larger resources to support a survey than smaller countries. For the 150 countries the mean population in 1999 was 39.4 million. The range, however, extended from the minimum cutoff of 1.0 million up to China and India with populations of 1,254 million and 998 million, respectively, in 1999. The regression analysis explores the effect of relative population size (population divided by 39.4 million) on the presence of a LFS in individual countries.

The summary detail in Tables 1 and 2 indicate wide regional variation in the presence of LFS. Two of 42 countries from Sub-Saharan Africa support a LFS while all from the OECD-20 group have a LFS. The present analysis tests for regional variation using 0-1 regional categorical (also termed “dummy”) variables.

Table 3 summarizes the findings of four regression equations: two use just county-specific income and population as explanatory variables; the other two equations also include regional categorical variables. In all four equations, the dependent variable is a 0-1 variable that equals 1 when a LFS is present. Equation [1] explains about 30 percent of the variation with relative income and relative population both making positive and significant contributions to the explained variation. Of the two, relative income is the more significant variable with a *t*-ratio of 7.7 compared to 2.9 for relative population. This suggests that higher-income and larger countries are more likely to support a labor force survey.

Equation [2] tests for nonlinearity in the effects of both income and population. The measurement for both uses reciprocals (the overall world average divided by the

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<sup>11</sup> Income is measured on a purchasing power parity (PPP) basis and country estimates for 1999 appear in the World Bank's World Development Indicators 2001.

country-specific variable). This functional form explains a larger share of total variation (adjusted- $R^2$  of 0.401 compared to 0.304) and both variables are significant. Again, high income and large populations are linked to a higher probability of having a LFS, with income making the larger contribution to explained variation.

Equations [3] and [4] repeat the functional forms of [1] and [2], respectively, but add regional categorical variables. The coefficients for three regional dummies are negative (the Former Soviet Union, North Africa-Middle East and Sub-Saharan Africa) while the dummy for South America has a positive coefficient. The regional categorical variables are generally significant (7 of 8 with  $t$ -ratios above 2.0), and as a group they add noticeably to the explained variation. Controlling for income and population, labor force surveys are less likely in the former three regions and more likely in South America. While the goodness-of-fit in equations [3] and [4] is better than in equations [1] and [2], their adjusted- $R^2$ s of 0.52-0.53 indicate that much of the variation in LFS presence across the 150 countries remains unexplained.

Note also that the adjusted- $R^2$  in equation [4] is not higher than in [3]. Adding regional dummy variables eliminates the previous superiority of the nonlinear functional form, that is, equation [2] versus equation [1]. One pattern that does not change is the greater importance of income vis-à-vis population in contributing to explained variation. The  $t$ -ratios for income are more than twice the  $t$ -ratios for population in both [3] and [4]. But, adding regional dummy variables does reduce the size and significance of the coefficients for both income and population.

The regression results are used to make projections of the likelihood of a LFS for each individual country. The method employed is to note the number of correct versus incorrect projections: A correct projection would exceed 0.5 when a LFS is present and be less than 0.5 when a LFS is absent. Equation [2] makes 33 incorrect projections while equation [4] makes 27 errors. The improvement of equation [4] over [2] occurs in the FSU and North Africa-Middle East regions where the combined number of errors decreases from 16 to nine. These are two regions where the regional dummy variables enter significantly in equation [4]. Thus the improvement in predictions related to the addition of the region dummies is as anticipated. Still, projection errors are made in 27 countries or 18 percent of the total.



Although the presence of a LFS is statistically linked to income, population, and geographic region across the 150 countries, the ability of the regressions in Table 3 to accurately identify the presence of a LFS in individual countries encounters serious shortcomings. Hence, efforts to find additional determinants might be productive.

### **3. The Presence of Unemployment Compensation Programs**

In terms of the prevalence of unemployment compensation (UC), Table 1 shows strong contrasts across the eight regions of the world. The quantitative analysis of the presence of UC emphasizes the importance of country-specific income, population and geographic region. Table 4 displays eight multiple regression equations, each explaining a 0-1 categorical variable where 1 indicates the presence of UC in 2004.

All eight regression equations show that income (per-capita GDP) is strongly and positively associated with the likelihood of a country having UC. Higher income increases the likelihood of UC and, of the eight regression coefficients for income; the smallest *t*-ratio is 4.3 in equation [8]. Population size also has a uniformly positive effect, but only four of eight coefficients are statistically significant.<sup>12</sup> As before, relative income and relative population are tested, measured both directly and in inverse form. Unlike the results in Table 3, however, for each pair in Table 4 where alternative functional forms are tested, the regression with income and population entering directly displays higher explanatory power than the inverse formulation; for example, 0.632 in equation [3] compared to 0.483 for equation [4].

Some illustrative calculations emphasize the association between income and the likelihood of UC. For a country with average income in 1999 (\$6,870) and average population (39.4 million), equation [1] projects the likelihood of UC as 0.42. With income twice the worldwide average, however, the probability is computed to be 0.66, but only 0.30 for income at half the worldwide average. Hence, per-capita GDP is strongly associated with the likelihood of having UC.

The remaining regressions in Table 4 also show the strong effects of the regional categorical variables. Countries from the CEE and FSU regions exhibit an increased likelihood of UC with coefficients that are very large, ranging from 0.462 to 0.741 across

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<sup>12</sup> Four of eight coefficients have a *t*-ratio of 2.0 or larger.

equations [3] to [6] inclusive. While the regional dummy coefficients for South America are generally positive and those for Central America-Caribbean are generally negative, the size of the coefficients are much smaller and not always significant.

The addition of the regional dummy variables causes a large increase in the adjusted-R<sup>2</sup>s; for example, 0.632 in equation [3] versus 0.308 in equation [1]. While the goodness-of-fit of the equations is improved with the inclusion of these dummy variables, particularly for the CEE and FSU regions, there is little effect on the coefficients for income and population.

The improved fit of equations [3] and [4] relative to [1] and [2] is vividly illustrated when the equations are used to project the likelihood of having UC. The criterion for accuracy is that a projected probability of 0.50 or higher should be observed if UC is present in a country but the projected probability should be below 0.50 if it is absent. When equation [1] is used for the projections, it makes 39 prediction errors for the 150 countries. Most errors (34 of 39) are projections of no UC when it is actually present. For the combined CEE and FSU regions, 22 errors are made. These countries were much more likely to have UC than would be projected on the basis of their income and population.

When equation [3] is used to make projections, it makes the correct prediction for 135 (90 percent) of the 150 countries. It is accurate for all but two CEE and FSU countries (Kazakhstan and Tajikistan), the two that do not have UC. It makes only two errors in Sub-Saharan Africa (Mauritius and South Africa) and one in South America (Ecuador), the latter three countries all with UC.

The largest number of predicted errors is made for countries from the North Africa-Middle East region. Five with UC are projected not to have it (Algeria, Egypt, Iran, Tunisia and Turkey) while two without UC (Kuwait and the United Arab Emirates) are projected to have it. Singapore is also projected to have UC when it does not exist. Thus while income, region, and (to a lesser extent) population are important predictors of the presence of UC, there are some notable errors. Notice that many of the errors are made for countries with large Moslem populations.

Unemployment compensation is a long-standing social insurance program in many countries. In 1949, 22 of these countries already had UC. Nineteen were in the

OECD-20 group (all but Portugal) while the other three countries were Chile, Japan and South Africa. Table 4 displays the results of regression equations that examine the determinants of adopting UC between 1950 and 2004, equations [5] through [8] inclusive. The 22 countries with UC in 1949 are removed from the overall total of 150 leaving 128 countries of which 43 introduced UC during these 55 years. Again, relative income and relative population are key explanatory variables in these regressions.

Relative income is highly significant in explaining the adoption of UC, but in equations [5] and [6] the dummy for the CEE and FSU regions has the highest *t*-ratio of all the variables. These 28 countries accounted for 26 of the 43 adoptions that occurred between 1950 and 2004. Thus country income and region are both important for understanding the pattern of UC adoptions during the period from 1950 to 2004.

Since the CEE and FSU countries comprise such a large share of the UC adoptions, they are removed from the data to check for stability of results across the remaining 100 countries. In both equations [7] and [8] income continues to be highly significant and some effects (with opposite signs) are found for the South American and Central American-Caribbean regional dummies. The 17 non-CEE-FSU countries that adopted UC between 1950 and 2004 are mainly high-income countries.

The principal conclusion from the regression results in Table 4 is that not only are income and geographic region both important determinants of the presence of UC in 2004 but also important in the adoption of UC between 1950 and 2004. The geographic region where the regressions were least accurate in projecting the presence of UC was North Africa and the Middle East. Using equation [3] to project the presence of UC in 2004, errors were made in seven of these 17 countries. Across the other seven regions, the number of projection errors ranged from zero to three. For these seven regions, relative income and regional dummies were the principal determinants of the presence of UC in individual constituent countries.

The remainder of the paper examines the actuarial costs of providing UC benefits using data for a large sample of countries. The approach is quantitative and comparative, and the exposition is relatively non-technical.

#### 4. Unemployment Compensation Benefit Payments

The presence of UC in a country does not necessarily imply that it plays a major role in providing short-run income support to unemployed workers and their families. In examining the costs of providing UC benefit payments, this section looks at the determinants of three separate cost components.<sup>13</sup> As might be expected, the analysis finds wide variation in UC program costs with systematic contrasts across the world's major regions.

A useful actuarial framework for examining the costs of providing UC benefit payments emphasizes three factors: the underlying unemployment rate; the reciprocity rate (UC beneficiaries as a proportion of all unemployed persons); and the replacement rate (weekly benefits as a proportion of average weekly wages). As the level of each of these factors is increased, the greater is the stabilizing effects of UC benefit payments but, at the same time, the cost of UC benefit payments is higher<sup>14</sup> and the disincentive effects in the labor market are larger. It is the combination of the three factors that determine UC costs as a percent of total payroll. Cost rates for some countries exceed 4.0 percent of payroll while cost rates fall below 0.5 percent of payroll in other countries.

In an economy where UC benefit payments are made weekly, annual benefit expenditures can be expressed as:

$$(1) \text{ TBen} = \text{AWBen} \times \text{NBen} \times 52$$

where,

TBen = total annual benefit payments,

AWBen = average weekly benefits,

NBen = the average weekly number of beneficiaries and 52 converts weekly benefit payments to an annual benefit flow.

The right-hand terms in (1) can be rewritten as:

$$(1a) \text{ TBen} = (\text{RRate} \times \text{AWW}) \times ((\text{NBen}/\text{Unemp}) \times (\text{LF} \times \text{URate})) \times 52$$

where,

AWW = average weekly wage,

RRate = replacement rate (average weekly benefits as a ratio to AWW),

Unemp = average weekly number unemployed,

LF = the labor force

URate = unemployment rate (unemployment as a proportion of the labor force).

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<sup>13</sup> The discussion does not extend to issues of UC financing and taxes.

Note that the replacement rate in (1a) measures benefit payments relative to the economy-wide average weekly wage. Since the incidence of unemployment is generally higher among low-skilled workers, the average weekly wage of beneficiaries will be lower than the overall average weekly wage causing the replacement rate for beneficiaries in (1a) to be understated.<sup>15</sup> On the other hand, the replacement rate in (1a) is the relevant replacement rate for measuring UC costs, as will become apparent.

A convenient metric for scaling the costs of UC is annual wage and salary payments. This can be expressed as:

$$(2) \text{ Wages} = \text{Emp} \times \text{AWW} \times 52$$

where,

Wages = total annual wages or the wage bill,

Emp = annual average employment and

AWW = average weekly wage.

This expression for the annual wage bill can be rewritten as:

$$(2a) \text{ Wages} = \text{LF} \times (1 - \text{URate}) \times \text{AWW} \times 52$$

Equation (2a) makes the obvious point that higher unemployment reduces the wage bill because it reduces employment.

Dividing (1a) by (2a), and eliminating common terms from the numerator and the denominator, yields an expression for UC benefit costs measured as a fraction of the wage bill:

$$(3) \text{ TBen/Wages} = \text{RRate} \times (\text{NBen/Unemp}) \times \text{URate}/(1 - \text{URate}).$$

This benefit cost rate can be expressed as a fraction or as a percentage depending on how the unemployment rate is measured. The analysis of this paper uses percentages.

The left hand side of expression (3) is the cost of UC benefit payments expressed as a fraction (or percentage) of the wage bill. This cost rate has three determinants: the replacement rate; the reciprocity rate; and the unemployment rate. Equation (3) explicitly shows the double effect of unemployment on the UC cost rate. Higher unemployment

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<sup>14</sup> A derivation of the actuarial cost equation is given in Chapter 2 of Wayne Vroman and Vera Brusentsev, *Unemployment Compensation Throughout the World: A Comparative Analysis*, (Kalamazoo, MI: W.E. Upjohn Institute, 2005).

<sup>15</sup> RRate in (1a) could be expressed as the replacement rate for beneficiaries times the ratio of their weekly wage to the overall weekly wage. In U.S. data, the weekly wage of UI beneficiaries usually ranges between 80 to 90 percent of the overall weekly wage. This alternative representation would have the advantage of showing an average replacement rate more directly relevant to labor supply decisions of beneficiaries.

raises UC benefit costs because it raises benefit outlays (the numerator in equation (3)) and because it reduces the wage bill. The latter effect is captured by the denominator in the final right-hand term  $(1 - \text{URate})$  and should not be overlooked.

Of the three UC cost factors identified in equation (3), the unemployment rate is largely beyond the control of national policy makers, particularly in the short run, as it reflects a myriad of domestic and international economic determinants. The reciprocity rate and the replacement rate, however, can be controlled by the choices a country makes regarding its UC legislative statutes, administrative procedures and operations. For a given unemployment rate, having a low reciprocity rate and a low replacement rate would contribute to lower UC costs contemporaneously reducing the stabilizing impact of benefit payments both for families with unemployed members and the macroeconomy.

The three factors that determine the UC benefit cost rate all vary widely from one country to the next. Figure 1 displays summary data that vividly illustrates this point. It shows the mean, the standard deviation and the coefficient of variation (CV)<sup>16</sup> for the unemployment rate, the reciprocity rate and the replacement rate across a sample of 49 countries. The underlying data are five-year averages during 1995-1999; each country is weighted equally in the calculations.

Larger CVs indicate wider relative variability in the data. For the three cost factors in Figure 1, the CV for the reciprocity rate (0.85) is clearly the largest while the CV for the replacement rate (0.46) is the smallest. For these countries, the UC reciprocity rate is the cost factor that displays the greatest relative variability. Notice that these countries encompass most of the world's major economies.

Figure 1. Averages and Variability of UC Cost Factors for 49 Countries, 1995-1999

	Unemployment Rate	Reciprocity Rate	Replacement Rate
Mean	9.55	0.50	0.32
Standard Deviation	5.88	0.42	0.15
Coeff. of Variation	0.62	0.85	0.46

<sup>16</sup> The coefficient of variation (CV) is the ratio of the standard deviation to the mean. It reflects the dispersal around the central tendency.

When the elements of equation (3) are combined for these 49 countries, the mean UC cost rate averages 1.73 percent of payroll and the standard deviation is 1.82 percent, yielding a CV of 1.05. All three cost factors as summarized in Figure 1 contribute to the wide variation in UC costs.

Given that three elements determined UC costs, each are examined separately for the 1995-1999 period in the following discussion.

#### **4.1 The Unemployment Rate**

Eight equations in Table 5 examine selected determinants of cross-country variation in unemployment rates. Seven equations focus on the full set of 79 countries that conduct labor force surveys and whose regional composition was displayed earlier in Table 1. Equation [1] examines the effects of country-specific income and population size which have very limited explanatory power, an adjusted-R<sup>2</sup> of only 0.093. Equations [2]-[4] add the share of employment in agriculture and the wage and salary employment share, singly and combined. While this improves the goodness-of-fit, the adjusted-R<sup>2</sup> in equation [4] is only 0.225.<sup>17</sup> Because relative population size makes such an insignificant contribution in equations [2]-[4], it is excluded from later regressions. Country-specific income, in contrast enters with negative coefficients that are significant in all equations. Across the 79 countries, those with the highest income have significantly lower unemployment rates than others. For countries with income at twice the worldwide average, the unemployment rate is some 2.5 to 3.5 percentage points lower than for countries with income at the worldwide average.

Equation [5] adds three regional dummy variables; only two are significant. It is not surprising that the dummy variable for Asia is negative and significant. Recall that in Table 2 the regression results indicate that unemployment rates are 6 to 7 percentage points lower than in other countries. More surprisingly, however, are the large and significant regional effects for Latin American and Caribbean countries. The point estimates suggest that unemployment rates in these two regions are lower by 3.8 to 6.6 percentage points. The results are robust whether the agricultural employment share, or

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<sup>17</sup> Equations (2)-(4) have fewer than 79 observations due to the lack of data for the agricultural employment share (one country) and the wage and salary share (three countries).

the wage and salary employment share is used in the analysis. When both of these employment share measures are used as explanatory variables as in equation [8], collinearity becomes a problem: this collinearity causes both to have smaller coefficients and *t*-ratios that are just above 1.0.

It is obvious that the regression results in Table 5 all have modest explanatory power. The highest adjusted- $R^2$  in the table is only 0.389. If any of these equations were used to project 1995-1999 average unemployment rates for individual countries, the average error would exceed 4.0 percentage points.

The final equation to be noted, equation [6], is based on just the 49 countries that have data on UC benefit costs as well as having an LFS. The results are similar to those of equation [5] with country-specific income and the agricultural employment share entering negatively and the dummy for Asian countries being negative and significant.

To summarize, the results in Table 5 are preliminary. Given these initial findings, more research on the determinants of country-level unemployment rates is needed.<sup>18</sup> Additional variables that could be considered in the future would include supply-side characteristics of the labor market, for example, an indicator of educational attainment, and perhaps an indicator of recent macroeconomic growth performance. While the regressions in Table 5 display uniformly modest explanatory power, relative income and variables that reflect the mix of employment (agricultural and/or wage and salary shares) are consistently significant. The Asian regional dummy variable also displays a uniformly significant coefficient. Among the Asian countries supporting a LFS, the unemployment rate is about 6.0 to 7.0 percentage points lower than any other region of the world.

## **4.2 UC Reciprocity Rates**

Table 6 displays seven regression equations that examine UC reciprocity rates during 1995-1999 across a set of 51 countries. The first two equations utilize just relative income and relative population as explanatory variables. Of the two regressors, income exhibits a strong positive association with reciprocity while population size is consistently

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<sup>18</sup> See Bassanini and Duval (2006) op. cit., for an analysis of unemployment rates in 20 OECD countries.



insignificant in its effect. The formulation where these two enter directly has greater explanatory power than the nonlinear formulation; that is, equation [1] versus [2].

Next, several different specifications using regional dummy variables are tested. Equations [3] and [4] in Table 6 display results using dummy variables for OECD-20 and CEE countries. The inclusion of these variables raises the adjusted-R<sup>2</sup>s to nearly 0.60. Compared to the other countries, reciprocity during 1995-1999 was significantly higher in the OECD-20 and CEE countries: this is indicated by the positive coefficients on these dummy variables. Note that in equations [3] and [4], relative income does not make a significant contribution to explained variation. Its coefficient in [3] is roughly one fourth of its size in [1] while it is reduced proportionately more in [4] compared to [2]. Relative population remains insignificant in [3] and [4].

Equation [5] utilizes a slightly different arrangement of the countries from the high-reciprocity regions. The four countries from southern Europe are combined with the CEE countries while the remaining 16 of the OECD-20 are considered as a group. The adjusted-R<sup>2</sup> is now 0.668. The improvement in the goodness-of-fit of [5] over [3] reflects the fact that for three sub-regions within the OECD-20 countries, the unweighted average reciprocity rates were close to unity.<sup>19</sup> For the four countries from southern Europe, the average was much lower at 0.502, similar to the average for nine CEE countries (0.446) and the all-country average of 0.483. For all other regions, the unweighted average reciprocity rates during 1995-1999 ranged between 0.03 and 0.24. Outside the OECD-20 and CEE regions, reciprocity is consistently lower than the all-country average.

The dummy variables utilized in equations [3] to [5] inclusive show the average association with reciprocity for countries from the indicated regions. Of course, individual countries within each region deviate considerably from their regional average. The United States, for example, has a reciprocity rate much lower than the other five English-speaking countries. Equation [6] uses the same specification as [5] but excludes the United States. Note how the adjusted-R<sup>2</sup> increases from 0.668 to 0.737 with the removal of this single data point. Because the United States has the largest negative

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<sup>19</sup> The three sub-regions and simple averages of their reciprocity rates are as follows: western Europe (six countries, average 0.949), Scandinavia (four countries, average 1.042) and English-speaking (six countries, average 0.913).

residual of all countries in equation [5], its removal reduces the error sum of squares by more than one fifth in [6] compared to [5].<sup>20</sup>

For two countries (Moldova and Russia) information on reciprocity was available while replacement rate data were not available. To keep the analysis of reciprocity fully comparable with later analysis of replacement rates, these two countries are removed from the sample and the reciprocity rate regression is reestimated. The results appear as equation [7] in Table 6, results very similar to those in equation [5] in terms of the coefficients and the overall goodness-of-fit.

Note in the bottom of Table 6 that the overall mean of reciprocity is close to 0.50. From the regressions with regional dummy variables, however, we know that reciprocity is very high in countries from three sub-regions of the OECD-20 (all but southern Europe). Reciprocity is close to the overall average in countries from southern Europe and the CEE region, but below-average in countries from all other regions, including the FSU countries. Thus the adjusted-R<sup>2</sup>s almost doubles when regional dummies are added, as in equations [3]-[7].

The equations in Table 6 do not include controls for key UC statutory provisions and administrative activities that are known to affect reciprocity. Among these, at least four can be identified as potentially important determinants of reciprocity: prior work experience requirements for eligibility;<sup>21</sup> the linkage between base earnings and potential benefit duration; maximum potential benefit duration; and the statutes and administration practices affecting continuing eligibility. Each of these can vary from one country to the next. For instance, the linkage between base earnings and potential benefit duration can mean that a given pattern of work experience and earnings will imply different potential UC entitlements from one country to the next. The net effect of these four factors certainly influences reciprocity rates in individual countries. While the authors recognize this variation, it has not been addressed in this analysis.

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<sup>20</sup> Average reciprocity in the United States during 1995-1999 was 0.31 compared to a projection of 1.01. The error sum of squares in equation [5] was 2.68 compared to 2.11 in [6].

<sup>21</sup> Many of the important statutory provisions related to UC eligibility are summarized in Social Security Programs Throughout the World, various issues.

### 4.3 Replacement Rates

The determinants of UC replacement rates are presented in Table 7 for the 49 countries where data have been assembled. For these countries, the average replacement rate during 1995-1999 was 0.325. Recall that replacement rates exhibit much less variation across countries when compared to reciprocity rates (standard deviations of 0.15 and 0.42 respectively in Figure 1). This is also demonstrated in the small standard errors of estimate in the bottom row of Table 7 which range from 0.119 to 0.132 vis-à-vis their counterparts in Table 6 which range from 0.211 to 0.364.

The results for equations [1] and [2] of Table 7 use relative income and relative population to explain replacement rates. In both equations, relative income is significant, but relative population approaches significance only in the nonlinear formulation. Less than 25 percent of the variation is explained in the two equations.

Several combinations of regional dummy variables are tested that improve the goodness-of-fit, but the highest adjusted-R<sup>2</sup>s in Table 7 do not exceed 0.40. In equations [3] and [4] dummy variables are included for three sub-regions of the OECD-20 countries: western Europe, Scandinavia and English-speaking countries. Note that the nonlinear formulation has the higher adjusted-R<sup>2</sup> (0.372 versus 0.327) and that relative income and relative population are marginally significant in [3], [4] and [5].

Replacement rates are above-average in both western European countries and Scandinavia.<sup>22</sup> In contrast, the coefficient of the dummy variable for English-speaking countries is consistently negative, although it is not significant. Thus while average reciprocity rates for these three sub-regions of the OECD-20 are very similar,<sup>23</sup> their average replacement rates are not the same, with western European and Scandinavian countries exhibiting higher averages.

The replacement rate in the United States is similar to the average for the other English-speaking countries. The projection error for the United States in equation [4] is 0.015 whereas the standard error for the equation is 0.119. This same point is made by refitting the regression equation with the United States removed from the data. The

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<sup>22</sup> The countries classified as western Europe are Austria, Belgium, France, Germany, the Netherlands and Switzerland.

<sup>23</sup> For example, a single regional dummy variable for the three sub-regions is used in equations [5]-[7] of Table 6.

adjusted-R<sup>2</sup> and the standard error in equation [5] of Table 7 are practically identical to their counterparts in equation [4].

As with the earlier analysis of reciprocity rates, the equations in Table 7 do not incorporate any important UC statutory determinants of replacement rates. For instance, the statutory replacement rate and the level of the maximum weekly (or monthly) benefit (as a ratio to the average wage) are both known to exert a significant effect on actual replacement rates across the various states in the United States. Benefit offsets due to receipt of other transfers and the presence of earnings also can be important. To date, the statutory influences on replacement rates have not been examined.

#### 4.4 UC Generosity

Each country has a wide choice in determining its reciprocity rate and its replacement rate. Different combinations of these two cost components can be selected to yield a given cost per unit of unemployment. As shown elsewhere, the reciprocity rate multiplied by the replacement rate can be termed a generosity index.<sup>24</sup> For instance, from the perspective of program costs, the product of a reciprocity rate of 0.50 and a replacement rate of 0.50 is equivalent to the product of a reciprocity rate of 1.00 and a replacement rate of 0.25. Both combinations yield a generosity index of 0.25.

Table 8 shows regression results across the 49 countries where the reciprocity rate and the replacement rate are available and, hence, a generosity index can be calculated. Equations [1] and [2] utilize just relative income and relative population as arguments. Income is significant but population is not. The goodness-of-fit of the nonlinear formulation is inferior to the linear formulation.

Equations [3]-[5] display results of including regional dummy variables. These were selected after several different specifications were fitted. When the regional dummies are added, the adjusted-R<sup>2</sup>s almost double; and the coefficients of all the included dummy variables are positive. Note how the effect of income becomes completely insignificant when regional dummies are included; that is, the income coefficients in [3]-[5] have *t*-ratios of less than 1.0. It is the regional dummy variables that have significant effects in these equations.

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<sup>24</sup> Chapter 2 in Vroman and Brusentsev (2005), *op. cit.*

Note the pattern of the regional dummy coefficients. Those for western Europe and Scandinavia are largest: between 0.42 and 0.44. Compared to the excluded regions, generosity in these countries is higher by more than 0.40. The next largest dummy coefficient is for the English-speaking countries: between 0.19 and 0.22. The dummy coefficients for southern Europe and CEE countries fall into the range between 0.08 and 0.14 range. This implies that the OECD-20 countries and CEE countries are the ones with above-average generosity. Within the 29 countries from the OECD-20 and CEE regions, however, there are distinct differences. Across the whole group of 49 countries, the most generous UC programs are found in western Europe and Scandinavia.

Chart 1 provides a graphic display of the generosity indices with countries sorted by region, by sub-region within the OECD-20, and then alphabetically within each group. The first country in the chart is Austria from western Europe. Note the high generosity indices of western Europe and Scandinavia. Within these two sub-regions, the very high generosity of the Netherlands and Sweden are also apparent. Across the full group of OECD-20 countries, the first 14 all have generosity indices above 0.20 with only the United Kingdom, the United States and three of four from southern Europe fall below the 0.20 threshold.

Several outlier countries within individual regions are also apparent. Particularly noteworthy for high generosity within their regions and sub-regions are Portugal, Japan, Israel and Brazil. Another clear contrast is that between the CEE countries and the FSU countries. All of the former nine have generosity indices of 0.05 or higher while none of the latter five has an index as high as 0.05. Chart 1 vividly illustrates that UC benefit generosity is highly varied within the 49 countries for which data have been assembled.

## **5. Conclusions**

This paper followed an empirical approach in examining the presence of labor force surveys and unemployment compensation from a global perspective. The analysis utilized a sample of 150 countries that represented 99 percent of the world's population in 1999. Nearly 85 percent of the world's population resided in countries with a labor force survey and more than 50 percent lived in countries with UC. Income (per-capita GDP) was strongly associated with the presence of labor force surveys and UC in these

countries. Large regional contrasts were also documented. UC was practically universal in three geographic regions: OECD-20, CEE and the FSU. Of the 48 countries from these three regions, 46 have UC. In contrast, only two of 42 countries from Sub-Saharan Africa and no country of the 11 from Central America and the Caribbean have UC.

The paper also examined important elements that determine the cost of UC benefit payments for a large sample of countries. Wide and systematic contrasts were documented for unemployment rates, reciprocity rates and replacement rates: the three factors that determine the costs of UC benefit payments as a percent of payroll. Regression analysis of each of these factors found that the lowest explanation (in terms of the adjusted-R<sup>2</sup>) was achieved in the analysis of the unemployment rate. No adjusted-R<sup>2</sup> in Table 5 exceeded 0.40. Unemployment rates were found to positively associated with the share of wage and salary employment in a country, but negatively associated with country-specific income. A similar association was found between unemployment rates and the share of agricultural employment. Overall, unemployment was low in Asian countries.

The highest reciprocity rates were found in three sub-regions of the OECD-20 region: western Europe, Scandinavia and English-speaking countries; all with averages above 0.90 during 1995-1999. The highest replacement rates were found in two of the same three regions: western Europe and Scandinavia. Southern Europe and CEE countries held the next highest rank in terms of reciprocity rates. Countries from other regions generally exhibited much lower reciprocity rates as well as generally lower replacement rates.

During 1995-1999 unemployment totaled about 106 million for the 79 countries with labor force surveys. The number of UC beneficiaries in the same period was approximately 26 million. Across the major regions, UC was most effective in providing unemployment protection in OECD-20 countries, particularly those from western Europe and Scandinavia. Reciprocity and generosity were also above-average in CEE countries. For most countries elsewhere in the world, the unemployed rely upon coping mechanisms as UC is absent or UC programs have very low reciprocity rates when they are present.

As a final observation, there were contrasting results regarding the importance of income in the various regression analyses. When the analysis focused on all 150

countries (Tables 3 and 4), the effect of income was consistently significant, but when the analysis was restricted to countries with UC (Tables 6, 7 and 8) this was not the case. Separate effects of income and geographic region often could not be identified in the latter regressions even though relative income variation across these roughly 50 countries was about the same as for the full set of 150 countries.<sup>25</sup>

Recall, however, that significant regional effects were found in all six tables of regression results. Regional contrasts could be identified even within the smaller sample of about 50 countries with data on UC benefit payments. This may suggest that countries are strongly influenced by neighboring countries in the provision of UC programs even when there are reasonably large income differences among neighbors.

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<sup>25</sup> The mean and standard deviation of 1999 relative income were 1.06 and 1.15 for the full set of 150 countries. For the set of 49 countries with data on UC benefit payments, the mean and standard deviation were 2.19 and 1.24 respectively.

Table 1. Countries and Populations by Major Geographic Areas, 1999

Region	Independent Countries		Countries with Labor Force Surveys		Countries with Unemployment Compensation	
	Number	Population	Number	Population	Number	Population
OECD-20	20	718	20	718	20	718
Cent. and E. Europe	12	120	10	113	12	120
Former Soviet Union	16	290	7	212	14	269
East and South Asia	22	3297	16	3195	6	1517
N. Africa and M. East	17	358	7	263	6	235
Sub-Saharan Africa	42	639	2	44	2	43
South America	10	339	10	339	5	235
C. America and Carib.	11	152	7	120	0	0
Total	150	5913	79	5004	65	3137

Source: Data assembled by the author. Sources include the World Development Report, the ILO website and individual country publications. Each country had a population of at least 1.0 million persons in 1999. Population in millions.



Table 2. Labor Force Surveys and Unemployment Compensation Programs by Region

	Number	Population	Labor Force	Unemployment	U Rate Percent	UC Recipients - a	UC Recip. Rate - a
Panel A. Countries with Labor Force Survey and UC Program							
OECD-20	20	718	339.3	26.6	7.8	16.01	0.60
Cent. and E. Europe	10	113	50.4	5.5	11.0	2.31	0.47
Former Soviet Union	7	212	102.1	11.0	10.8	2.12	0.20
East and South Asia	6	1517	342.3	11.0	3.2	3.79	0.39
N. Africa and M. East	6	235	70.4	8.8	12.6	0.21	0.03
Sub-Saharan Africa	1	42	12.4	2.8	22.3	0.17	0.06
South America	5	235	98.9	8.8	8.9	1.79	0.21
C. America and Carib.	0	-	-	-	-	-	-
Total	55	3072	1015.8	74.7	7.3	26.41	0.37
Panel B. Countries with Labor Force Survey but No UC Program							
OECD-20	0	-	-	-	-	-	-
Cent. and E. Europe	0	-	-	-	-	-	-
Former Soviet Union	0	-	-	-	-	-	-
East and South Asia	10	1678	629.7	23.3	3.7	-	-
N. Africa and M. East	1	28	9.7	1.2	12.3	-	-
Sub-Saharan Africa	1	2	0.5	0.1	19.1	-	-
South America	5	104	41.4	5.0	12.0	-	-
C. America and Carib.	7	120	45.4	2.1	4.6	-	-
Total	24	1932	726.8	31.6	4.4	-	-
Panel C. Countries with UC Programs but Not a Labor Force Survey				Panel D. Countries with Neither UC Nor a Labor Force Survey			
	Number	Population		Number	Population		
OECD-20	0	-		0	-		
Cent. and E. Europe	2	7		0	-		
Former Soviet Union	7	57		2	21		
East and South Asia	0	-		6	102		
N. Africa and M. East	0	-		10	95		
Sub-Saharan Africa	1	1		39	594		
South America	0	-		0	-		
C. America and Carib.	0	-		4	32		
Total	10	65		61	844		

Source: Data assembled by the author. Labor force data mainly from the ILO website.

Unemployment compensation data assembled primarily from individual country sources.

Labor force, unemployment and UC recipients in millions, averages 1995-1999. Population in 1999.

a - UC data from 49 countries with a combined labor force of 963 million, 95 percent of the total in Panel A.

Table 3. Regressions Explaining the Presence of Labor Force Surveys

Explanatory Variables	[1]	[2]	[3]	[4]
Constant	0.256 [5.4]	0.895 [17.7]	0.563 [8.3]	0.937 [17.9]
Relative Income	0.229 [7.7]		0.132 [4.5]	
Inverse Relative Income		-0.01249 [9.6]		-0.00765 [4.6]
Relative Population	0.029 [2.9]		0.018 [2.1]	
Inverse Relative Population		-0.000325 [3.6]		-0.000170 [2.0]
Dummy - FSU Countries			-0.210 [2.1]	-0.317 [3.2]
Dummy - N Africa - Middle East			-0.316 [3.3]	-0.396 [4.2]
Dummy - Sub-Saharan Africa			-0.556 [6.8]	-0.448 [4.6]
Dummy - South America			0.305 [2.5]	0.162 [1.4]
Descriptive Statistics				
Sample Size	150	150	150	150
Mean	0.527	0.527	0.527	0.527
Adjusted R <sup>2</sup>	0.304	0.401	0.526	0.521
Standard Error	0.418	0.388	0.345	0.347

Source: Regressions based on a set of 150 countries, all with a population of at least 1.0 million in 1999. Country income measured as PPP-adjusted per capita GDP in 1999 in thousands, divided by the worldwide average of \$6.870. Relative population is 1999 population in millions divided by the average for the sample of 39.42 million.

Beneath each coefficient is the absolute value of its t ratio.

Table 4. Regressions Explaining the Presence of Unemployment Compensation (UC) Programs

Explanatory Variables	UC in	UC in	UC in	UC in	Adopt UC	Adopt UC	Adopt UC	Adopt UC
	2004	2004	2004	2004	1950-2004	1950-2004	1950-2004	1950-2004
	[1]	[2]	[3]	[4]	[5]	[6]	a	a
	[7]	[8]						
Constant	0.169 [3.6]	0.719 [13.1]	0.003 [0.1]	0.653 [12.0]	0.005 [0.1]	0.380 [6.1]	-0.008 [0.2]	0.395 [5.9]
Relative Income	0.241 [8.2]		0.264 [12.2]		0.217 [5.4]		0.237 [5.3]	
Inverse Relative Income		-0.01088 [7.7]		-0.00997 [7.9]		-0.00577 [4.5]		-0.00583 [4.3]
Relative Population	0.0096 [1.0]		0.0164 [2.2]		0.0181 [2.4]		0.0184 [2.3]	
Inverse Relative Population		-0.00016 [1.6]		-0.00018 [2.1]		-0.00008 [1.1]		-0.00013 [1.4]
Dummy - CEE-FSU Countries			0.705 [10.8]	0.462 [5.9]	0.741 [10.8]	0.649 [8.5]	a	a
Dummy - South America			0.248 [2.5]	-0.030 [0.2]	0.239 [2.2]	0.136 [1.1]	0.235 [2.1]	0.128 [1.0]
Dummy - Central America Caribbean			-0.189 [2.0]	-0.447 [3.9]	-0.159 [1.6]	-0.269 [2.5]	-0.160 [1.5]	-0.266 [2.4]
Descriptive Statistics								
Sample Size	150	150	150	150	128	128	100	100
Mean	0.433	0.433	0.433	0.433	0.336	0.336	0.170	0.170
Adjusted R <sup>2</sup>	0.308	0.282	0.632	0.483	0.573	0.533	0.279	0.195
Standard Error	0.414	0.421	0.302	0.357	0.310	0.324	0.321	0.339

Source: Regressions based on a set of 150 countries, all with a population of at least 1.0 million in 1999. Country income and population measured as in Table 3. Equations [5]-[8] based on 128 countries that did not have a UC program in 1949. Beneath each coefficient is the absolute value of its t ratio.  
a - Countries from the CEE and FSU regions excluded.

Table 5. Regressions Explaining Unemployment Rates in Countries with Labor Force Surveys, 1995-1999

Explanatory Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Constant	12.057 [11.1]	16.846 [9.8]	2.739 [1.1]	6.266 [1.4]	21.889 [8.9]	20.634 [5.1]	8.341 [3.0]	13.995 [2.5]
Relative Income	-1.139 [2.2]	-2.490 [4.0]	-2.663 [4.4]	-2.741 [4.4]	-3.664 [5.0]	-3.358 [2.9]	-3.427 [4.4]	-3.514 [4.3]
Relative Population	-0.350 [2.5]	-0.165 [1.2]	-0.306 [0.7]	-0.251 [0.6]				
Agricultural Employment Share		-16.358 [3.5]		-5.581 [1.0]	-16.031 [3.4]	-19.700 [2.2]		-8.065 [1.2]
Wage and Salary Employment Share			16.600 [4.0]	12.939 [2.3]			14.074 [3.0]	8.068 [1.2]
Dummy - CEE-FSU Countries					-2.410 [1.4]	-1.329 [0.6]	-3.137 [1.7]	-2.478 [1.2]
Dummy - Asian Countries					-7.225 [4.2]	-5.854 [2.3]	-6.510 [3.9]	-6.200 [3.6]
Dummy - Latin America-Caribbean					-6.598 [3.6]	-3.843 [1.2]	-4.206 [2.5]	-4.927 [2.6]
Descriptive Statistics								
Sample Size	79	78	76	75	78	49	76	75
Mean	9.641	9.558	9.582	9.495	9.558	9.550	9.582	9.495
Adjusted R <sup>2</sup>	0.093	0.210	0.232	0.225	0.389	0.204	0.352	0.343
Standard Error	5.585	5.205	4.803	4.813	4.575	5.240	4.415	4.432

Source: Regressions based on 79 countries with labor force survey results for 1995-1999.

Country income and population measured as in Table 3. Geographic coverage of dummy variables given in the text. Beneath each coefficient is the absolute value of its t ratio.

Table 6. Regressions Explaining Reciprocity Rates in UC Programs, 1995-1999

Explanatory Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Constant	0.014 [0.2]	0.745 [8.9]	0.062 [0.7]	0.208 [2.0]	0.123 [1.5]	0.067 [0.9]	0.127 [1.4]
Relative Income	0.218 [5.9]		0.053 [1.0]		0.009 [0.2]	0.041 [1.0]	0.007 [0.1]
Inverse Relative Income		-0.04436 [4.2]		-0.00868 [0.9]			
Relative Population	0.0031 [0.3]		0.0070 [0.8]		0.0060 [0.8]	0.0116 [1.6]	0.0057 [0.7]
Inverse Relative Population		-0.00008 [0.5]		-0.00005 [0.4]			
Dummy - OECD-20 Countries			0.620 [4.7]	0.670 [6.5]			
Dummy - OECD-20 Ex. Southern Europe					0.799 [6.3]	0.786 [6.9]	0.803 [5.8]
Dummy - CEE Countries			0.311 [2.9]	0.275 [2.5]			
Dummy - CEE and Southern Europe					0.322 [3.7]	0.320 [4.1]	0.322 [3.6]
Descriptive Statistics							
Sample Size	51	51	51	51	51	50	49
Mean	0.483	0.483	0.483	0.483	0.483	0.487	0.497
Adjusted R <sup>2</sup>	0.398	0.248	0.596	0.591	0.668	0.737	0.658
Standard Error	0.325	0.364	0.266	0.268	0.242	0.211	0.246

Source: Regressions based on a set of 51 countries with data on UC reciprocity during 1995-1999. Country income and population measured as in Table 3. Geographic coverage of dummy variables given in the text. Equation [6] excluded the United States. Equation [7] excludes Russia and Moldova. Beneath each coefficient is the absolute value of its t ratio.

Table 7. Regressions Explaining Replacement Rates in UC Programs, 1995-1999

Explanatory Variables	[1]	[2]	[3]	[4]	[5]
Constant	0.202 [5.1]	0.428 [13.5]	0.213 [5.0]	0.383 [9.6]	0.383 [9.5]
Relative Income	0.059 [3.9]		0.049 [2.1]		
Inverse Relative Income		-0.01550 [3.5]		-0.01146 [2.5]	-0.01145 [2.5]
Relative Population	-0.0043 [1.0]		-0.0036 [0.9]		
Inverse Relative Population		-0.00010 [1.8]		-0.00009 [1.8]	-0.00009 [1.8]
Dummy - Western European Countries			0.105 [1.4]	0.142 [2.5]	0.143 [2.4]
Dummy - Scandinavian Countries			0.097 [1.2]	0.151 [2.3]	0.151 [2.2]
Dummy - English Speaking Countries			-0.085 [1.2]	-0.053 [0.9]	-0.056 [0.9]
Descriptive Statistics					
Sample Size	49	49	49	49	48
Mean	0.325	0.325	0.325	0.325	0.325
Adjusted R <sup>2</sup>	0.243	0.231	0.327	0.372	0.370
Standard Error	0.131	0.132	0.123	0.119	0.120

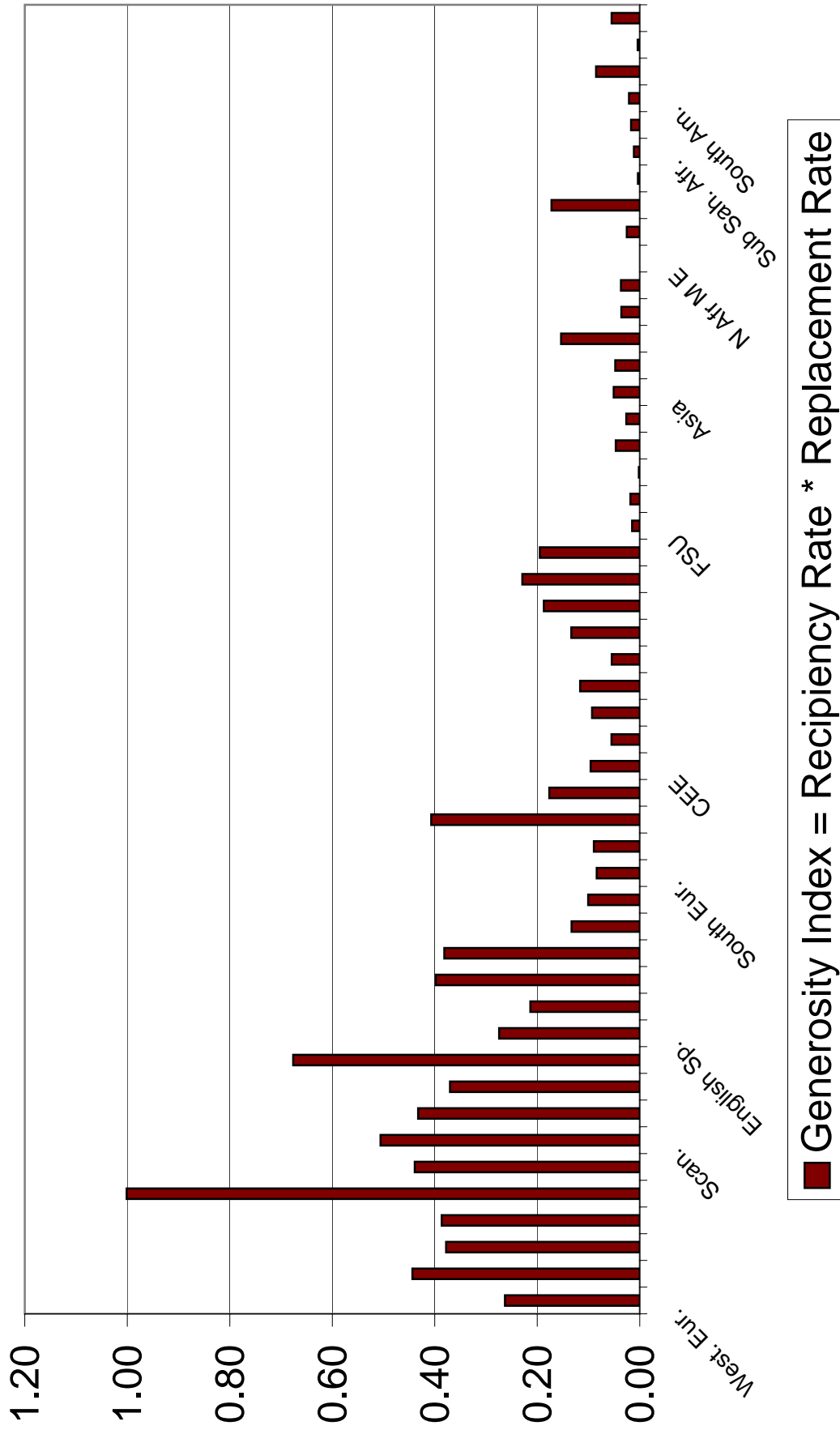
Source: Regressions based on a set of 49 countries with data on replacement rates during 1995-1999. Country income and population measured as in Table 3. Geographic coverage of the dummy variables given in the text. Equation [5] excludes the United States. Beneath each coefficient is the absolute value of its t ratio.

Table 8. Regressions Explaining Generosity of UC Programs, 1995-1999

Explanatory Variables	[1]	[2]	[3]	[4]	[5]
Constant	-0.037 [0.8]	0.318 [7.3]	0.034 [0.7]	0.073 [1.4]	0.076 [1.5]
Relative Income	0.103 [5.1]		0.006 [0.2]		
Inverse Relative Income		-0.02307 [3.9]		-0.00400 [0.8]	-0.00422 [0.8]
Relative Population	-0.0022 [0.4]		-0.0008 [0.2]		
Inverse Relative Population		-0.00006 [0.7]		-0.00001 [0.1]	-0.00001 [0.2]
Dummy - Western European Countries			0.429 [5.3]	0.420 [6.5]	0.418 [6.5]
Dummy - Scandinavian Countries			0.437 [5.0]	0.430 [5.9]	0.429 [6.0]
Dummy - English Speaking Countries			0.196 [2.5]	0.186 [2.9]	0.215 [3.2]
Dummy - Southern Europe			0.140 [1.9]	0.127 [1.8]	0.125 [1.8]
Dummy - CEE Countries			0.087 [1.7]	0.082 [1.7]	0.082 [1.7]
Descriptive Statistics					
Sample Size	49	49	49	49	48
Mean	0.186	0.186	0.186	0.186	0.188
Adjusted R <sup>2</sup>	0.379	0.222	0.643	0.647	0.661
Standard Error	0.165	0.180	0.122	0.121	0.120

Source: Regressions based on a set of 49 countries with data on benefit generosity during 1995-1999. Country income and population measured as in Table 3. Geographic coverage of the dummy variables given in the text. Equation [5] excludes the United States. Beneath each coefficient is the absolute value of its t ratio.

Chart 1. Generosity Indices, 1995-1999





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