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A Comparison of Income, Expenditures, and Home Market Value Distributions Using Luxembourg Income Study Data from the 1990's

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A COMPARISON OF INCOME, EXPENDITURES, AND HOME MARKET VALUE DISTRIBUTIONS USING LUXEMBOURG INCOME STUDY DATA FROM THE 1990'S

(Augmented with select data from the U.S. Consumer Expenditure Survey)

by

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Abstract

The purpose of this paper is to review recent data made available through the Luxembourg Income Study (LIS) that include expenditures and asset valuations. The LIS data are augmented with comparable data from the U.S. Consumer Expenditure Survey. The surveys with expenditure data are reviewed in terms of collection units and variable definitions. Inequality statistics are produced and compared using income, expenditures, and market value of owned home. Rankings of countries by income and expenditure inequality are similar but not the same across the countries studied. Suggestions are made for the LIS to improve the expenditure data available following the COICOPS framework.

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D3 Distribution
D6 Welfare Economics

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I. Introduction

A. Motivation

In the 2001 Canberra Group report on household income statistics, a consumption-based approach is followed in defining income. The Group noted, "A positive resource flow (in money, goods or services) is considered as contributing towards economic well-being if it increases the recipient's potential to consume or save, and a negative flow reduces well-being if it reduces the capacity to consume or save" (p. 4). Income is most often considered to be the best (or least bad) measure of this resource flow, proxing individual welfare or utility. After stating this, the Group emphasized that both consumption and wealth are important complementary measures of economic well-being. The theory is that the more one consumes the greater the economic well-being. Consumption reflects how individuals live as opposed their potential to consume as better measured by income. However, greater wealth can also be viewed as reflecting greater economic well-being. Wealth or accumulation can provide for future consumption as well as make it possible for an individual to gain access to credit to finance current consumption.

A guide describing how income, expenditure, and wealth concepts can be brought together in an integrated way is presented in the Canberra Report (2001). Much of this work was based on discussions during the last Canberra Group meeting in Luxembourg in May 2000. These discussions revolved around interest in the creation of a study group similar to the Canberra Group that would focus on expenditures and net worth, not only for national statistics, but also for cross-national comparisons and to serve as guidelines for data collection. The importance of data comparability and access were highlighted. However at that time, no new study group was formed. Yet, discussions continued in various venues. For example, in the autumn of 2001, a meeting of experts convened at the International Labour Organization (ILO) to review the current ILO recommendations concerning income and consumer expenditures for official statistical office purposes and the collection of these data (Young (2001) & ILO (2003)). The final product of this group is to be a guide on household budget surveys; however, accessibility to neither micro level data nor comparability is aims of this study. From these and related meetings and discussions, it appears that the wish, hope, and dream of many researchers are that multi-country comparable data are available for

expenditures and wealth, as data are currently available for income. This idea has also been supported for the U.S. in particular. Nordhaus (2002) recommended that the U.S. Bureau of Economic Analysis "should develop a full set of linked national economic accounts that include production, income, consumption, accumulation, and wealth" (p. 17). The Australia Bureau of Statistics (McLennan (1995)) has also published a report which provides a framework of household, income, consumption, saving and wealth.

At the present time, there exist several projects that include cross-national data from household expenditure surveys we focus on three of these. Data access is a goal of each. Data comparability is a goal, achieved or aimed for, for two. The three projects include the HEIDE data base created by researchers working with the World Bank (created by Ackland et al. 1997 and under the direction of Milanovic 2002), the Multinational Household Expenditure Study (MHES) project out of Australia (Ironmonger (2002)), and the Luxembourg Income Study (LIS).

The HEIDE data base includes data from several transition countries for only one year in each country's transition period, and has been made as comparable as possible using a format created by the World Bank team. Data are available for Rural Armenia, Urban Armenia (Yerevan), Bulgaria, Estonia, Hungary, Kyrgyz Republic, Poland, Russia, and Slovakia in the 1997 data file. Latvia has since been added using the same structure. Data files are accessible through the internet (http://worldbank.org/research/inequality/data.htm).

The MHES was founded to serve the needs of researchers world-wide interested in money expenditures by households. To meet this goal, the project provides available micro level household survey data from four developed countries (i.e., Australia, Canada, the U.K. and the U.S.). Several years of data can be accessed for each country. An aim of the project is to include such data from many countries. The data are those that country statistical offices make available for use by researchers and are quite detailed in nature. The principal research center is located at the University of Melbourne, Australia, under the direction of Duncan Ironmonger. Future subsidiary researcher centers of the MHES will be located in Colchester and Halifax, and will be managed by co-directors Jonathan Gershuny and Andy Harvey, respectively. To gain access to the data, researchers must apply for associate status Once researchers have become research associates of the MHES project, micro level data files are

sent to the researchers on CD ROM.

The Luxembourg Income Study (LIS) includes micro level household expenditure data for 23 countries and some for several years. Detailed expenditure data are not available, only total aggregate expenditures for each household and/or for specific commodity aggregates like housing, transportation, or child care. Not all countries provide the same level of detail. Like for the MHES, researchers must apply to use the LIS data. Once the researcher has been granted access to LIS, computer statistical programs can be sent by email to the LIS and run using the data in the LIS files. Results are returned by email. Direct data access is not provided.

Evaluating each of these projects regarding data access and comparability across countries and across time for expenditure and wealth data, none of the three projects meets all of these objectives. The HEIDE project is the only once of the three that includes comparable household expenditure survey micro level data, but for transition countries only, and for only one year. Variables indicating the ownership of durable goods are in the HEIDE data files as well as information on whether the household owns a store, etc. or is self-employed. Although the MHES data in current form are not comparable, some preliminary work has been done to make them as comparable as possible using the Classification of Individual Consumption by Purpose (COICOP) system[3] (Ironmonger (2002)), however an ultimate goal of the project is that the data will be comparable across the countries. The variables indicating ownership of durable goods are included in the individual country data as is information about self-employment. The value of one's owned home is also included in most files. A drawback of the MHES is that only four countries are currently included and again the data are not comparable across countries.

The LIS includes data for the largest number of countries when compared to the other two projects and the data are easily accessible once contact with LIS has been made. Expenditures are available for more countries than are wealth data. For now, the only wealth data available are the value of owned home for the most part. Another advantage of the LIS

3 COICOP is part of the 1993 System of National Accounts. Eurostat uses this system in their production of harmonized expenditure tabulations. Smith and Schmidt (2001, 2002) are applying COICOP to U.S. Consumer Price Index categories and the U.S. Consumer Expenditure Survey.

is that many researchers around the world are familiar with the LIS through their use of the income files. Although LIS does not require expenditure or asset valuations be submitted as part of the income data file, country representatives to the LIS are encouraged to provide these as part of the data file if they are available. The LIS has done a fine job making income data fairly comparable cross-nationally. However, a major drawback of the LIS for expenditure analysis is that no attempt has been made to make these data comparable across country data sets. The wealth variable, value of owned home, appears to be quite comparable across the country data sets.

The foci of this study are the LIS data. These data were selected for examination and analysis due to their general accessibility and the large number of countries represented with household expenditure and wealth data. However, as we show in this paper, the information about the LIS expenditure data are lacking in several important ways. First and foremost they are lacking in terms of comparability, but also in terms of the information about the data included on the LIS web site. In this study, we examine recent household expenditure and home value data in the LIS. Then we use these data in inequality analysis. Finally we make recommendations for improving the LIS expenditure and wealth data if they continue to be a part of the LIS "family" of products. The approach taken in this study is strictly empirical. Included in the discussion and implications for future work are issues regarding the use of expenditure data for economic well-being analysis with a review of concepts and definitions. For this study, no attempt is made to explain differences across the countries in other than variable definitional terms. As far as we know, this is the first examination of the household expenditure data in the LIS.

B. Outline of Paper

The remainder of the paper in divided into several sections. In section two we describe the methods including the data and analysis measures. Next, we present the results for inequality and welfare. In section four, a review of issues to consider when creating a set of comparable expenditure data files are outlined with recommendations for LIS with regard to expenditure and wealth data.

C. Other Related Work

While the Canberra Group was focusing its attention primarily on income in their meetings from 1996 to 2000, other researchers had been and still are focusing on expenditures as a measure of economic well-being cross-nationally. For a list of projects using expenditure data see Appendix A. Their focus has been comparability across countries and data access. In another World Bank project, the Living Standards Measurement Survey (LSMS), a fairly comparable survey instrument has been sued to collect expenditure, as well as other, data from households in many countries, mostly in developing countries and some transition countries. Although many of these data are comparable, not all are available to outside researchers (World Bank (2002)). Some problems that have been outlined recently as well as a review of past critiques can be found in Pyatt (2003).

The World Bank and Inter-American Development Bank are coordinating a project known as the household survey initiative. The project is named Improvement of Surveys and the Measurement of Living Conditions in Latin America and the Caribbean (MECOVI). Within this project is an initiative "to develop an organized, documented, and standardized data bank composed by household surveys executed within the ISLC/MDCOVI Program and by household surveys executed independently from this program." The MECOVI web site, and the Household Surveys Data Bank Initiative can be found at http://www.iadb.org/sds/POV/site_19_e.htm.

Eurostat has made a major contribution to the issue of data comparability. That organization provides guidelines and technical support to European Union (EU) member countries to collect harmonized household expenditure data, but does not conduct its own survey across all countries. Rather, individual countries continue to conduct their own household surveys, as before the harmonization effort began. The harmonized data are made available by Eurostat in tabulated form (Wirtz (2002)). For micro-level data, researchers need to obtain data from the individual member countries' statistical offices or by working with others that have access to these data.

Household expenditures are also being used by an international team of researchers

participating in a broader project, the Demand Patterns and Employment Growth (DEMPATEM) project funded by the European Commission Directorate General for Employment and Social Affairs (Schmitt (2002a, 2002b)). Two primary goals of the study are: to produce basic aggregated tables of household consumption patterns across a range of consumption categories and types of households, and to use the data for detailed, internationally comparable, modeling of household-level consumption. The DEMPATEM project design is to be consistent as possible across the countries. Categories of consumption have been identified. A challenge for the team is that some of the household survey data do not include information on consumption, only expenditures. Household survey data for 1997 from five European countries (i.e., France, Germany, the Netherlands, Spain, and the United Kingdom) plus the U.S. are being used (Schmitt (2002b)). Whether the resulting comparable data will be made available to researchers at large is not known.

II. Methodology and Data

Income, expenditure, and market value of owned home is analyzed. Data are from the Luxembourg Income study (LIS) with additional data from the U.S. Consumer Expenditure Survey. Basic statistical analyses are conducted, along with inequality and welfare analyses. The primary objective is to compare income and expenditure well-being across countries. Total expenditures are first considered followed by an examination of housing and food expenditures as these represent two of the primary commodities in the budgets of most households and for living in general. Total expenditures net of those for housing are also examined.

A. Methodology and Measurement

A common approach used in the analysis of the economic well-being of a household is measuring their standard of living. The level of consumption or income, and their distribution over households is an indication of households' well-being and their standard of living to a certain extent. Measuring living standards can be done in a straightforward manner by providing single measures. The theoretical approach behind the use of summary measures comes from the use of social welfare functions outlined in Atkinson (1970) and summarized in Deaton (2000). Following their approach, we describe the basic framework in the analysis of social welfare that leads us to the interpretation of summary measures used in

this paper.

Assume *x* is our measure of living standards, then

$$W = F(x_1, x_2 .... x_n) \text{ --}$$

will be the value of social welfare, where $F' > 0$ and *n* is the population size. *W* can be thought of as a summary measures that translates a distribution into a single number that provides information regarding welfare and its distribution. Social welfare functions can be transferred into a measure of inequality. For example,

$W = \mu * (1 - In)$, where μ is the mean of *x* and *In* is the measure of inequality. In this case several properties will hold. Besides satisfying the Pigou-Dalton condition (transfer from poor to rich should increase the inequality measure), they are invariant to population replication and permutations—social welfare depends on welfare levels in the society, not on who has which welfare level--(symmetry or anonymity), and are mean independent (do not change due to scalar multiplication). The coefficient of variation, the Gini coefficient and the Theil measure are among some of the measures that belong to this family. The social welfare approach to inequality measurement is important, because it precludes us from making a judgment regarding welfare based on inequality measures alone.

For the statistical analysis, means and medians are produced (results not shown). The distributional/inequality analyses include the production of Lorenz curves (not shown), decile ratios (not shown), and summary measures of inequality including the Gini and three Theil measures, and the decile ratio. The decile ratio is used to place less emphasis on the extremes of the distributions. The Gini and Theil measures are used as checks on each other as the measures differ in their sensitivity to variations in income, expenditure, or market value in different parts of the distributions. The Gini is most sensitive around the mode. The Theil mean log-deviation is most sensitive to variations at the lower end of the distribution. The Theil entropy and half the coefficient of variation squared are more sensitive to variations in the upper end with the latter measure the more sensitive of the two. Welfare is examined using Generalized Lorenz Curves (results not shown) and Sen's Welfare Index (*SWI=mean*(1-Gini)*) for the countries for which the PPP conversion is made.

B. Data Sources

The Luxembourg Income Study (LIS) is described in terms of coverage and data access. Specific LIS data used for this study are described in detail along with the criteria for selection. The U.S. Consumer Expenditure Survey (CE) Interview is used for the expenditure and home market value analyses. A brief description of this survey is included for comparison to the surveys covered in the LIS.

Multi-country income, expenditures, and home market values are currently available through the Luxembourg Income Study (LIS). Currently household micro-data from 29 countries are included in the LIS, many with several years of data, all with income data but not all with expenditure or market value data. For the most part, national statistical office surveys or research institute data bases serve as the original sources of the data. Country representative and LIS staff work together to make the income and demographic data as comparable across countries as possible. To use the LIS data base, a researcher must sign a pledge of confidentiality and promise to submit any papers resulting from using these data to the LIS working paper series. The raw data cannot be directly accessed. Computer code to access the data is sent to Luxembourg via the internet and statistical output is sent back to the user.

As noted earlier, unlike for income, LIS does not provide guidelines regarding the definition of expenditures or market value. LIS takes whatever the countries provide and includes value for these variables in the country files. Expenditures and market value of one's owned residence are included in many of the LIS data files. Twenty-three countries have thus far provided data for at least one expenditure category with 58 data files in all, and 19 have provided market value data with 32 data files. The availability of expenditure and market value data for the LIS based countries is noted in Table 1. As noted in the table some data became available since the analysis was completed/ The U.S. data file in the LIS is from the Current Population Survey (CPS) and only includes income. To examine expenditures for the U.S., the basic LIS data file is augmented with expenditure and market value data from the U.S. Consumer Expenditure Survey (CE). With regard to data selection for this study, the criteria were that the data are from the 1990s and that expenditure data are included.

Up to eight categories of expenditures are included in a single LIS data file. The market value of property may also be included. Expenditure categories include total, food, housing, apparel/clothing, transportation, medical out-of-pocket, education, and child care expenditures. The market value for owned residences and all property are asset variables. Table 2 lists the countries and years for which specific expenditure and/or market value data are available. As seen in Table 2 and summarized in Table 3, not all countries provide total expenditure or market value data. Switzerland is the only country that provides the market value of all owned property. All the others with market value data refer strictly to owned residence. Five countries, Hungary, Israel, Italy, Spain and R.O.C. Taiwan include data for total expenditures and market value of owned residence over several years represented by 10 data sets. Recently, (November, 2003) Russia joined this group and additional datasets became available bringing the total to 13.

In the LIS, Mexico has provided the most extensive expenditure data with expenditures for all the categories in the last three of six waves. (Since country data is available for different years across countries, throughout the paper we will refer to them as waves). Childcare expenditures are included in only the last three survey years. The R.O.C. Taiwan includes expenditure data for four waves. France, Germany, Poland and the United Kingdom have provided expenditure data for three waves. The other countries have provided expenditure data for one or two waves only.

For this study, as noted earlier, we selected countries with data primarily from the mid- to later 1990's in order to have the most recent expenditure data available. The most recent data are for Mexico (1998) and the oldest data are for Spain (1990). The analytical investigation is restricted to countries in the LIS with a minimum of disposal personal income (referred to as income from henceforth), total expenditure, and housing expenditure data (this excluded Italy from the analysis). Housing expenditures are primary to this analysis as owner-occupied housing is treated differently in the country data files. We wanted to be able to control for this difference in the analysis. Wealth data are not available in the LIS (but may become available in a few years with the launch of a new project-the Luxembourg Wealth Study), but the market value of owned home is. While the market value provides us with no information concerning home equity (defined as the market value of the primary

residence less any outstanding mortgage debt of the property), we use market value as an indication of potential wealth. Wealth can be used to finance consumption as noted earlier. For a discussion of the role and wealth and consumption, see for example Carroll and Samwick (1997), Attanzsio (1998), and Wolff (2002). For a discussion on measuring wealth, see Juster, Smith, and Stafford (1999), Juster, Lupton, and Cao (2002) and Kennickell, Starr-McCluer, and Suden (1997). Most of the data with expenditure information are from household budget or expenditure surveys. As a result, we applied the housing expenditure restriction since the definition of housing is sufficiently different across surveys. In some cases owner-occupied housing is valued in terms of the value of the flow of services using some type of imputed rents, while in other actual spending outlays are used to define housing. (Based on the definitions in the LIS, it appears that food is also defined rather differently but the differences are likely minor relative to those for housing.) Total expenditures are examined with and without housing expenditures.

Table 4 lists the data sources for this study, including those from LIS and the augment U.S. expenditure file. The U.S. CE data are collected from April 1997 through March 1998 and refer primarily to expenditures made in 1997 (three month prior to the interview reference periods are used for most expenditure items). Data from 2001 are available from the CE but 1997 data were selected for the study to compare expenditure and income results. As noted earlier, the more recent U.S. income data in the LIS are from the 1997 Current Population Survey.

The CE Quarterly Interview is sponsored by the Bureau of Labor Statistics (BLS), U.S. Department of Labor and is used to collect data over a 12-month period with a personal interview being conducted once every three months. The Interview is designed to obtain data on the types of expenditures consumer units are expected to recall for a period for three months or longer. These include relatively large expenditures and those that occur on a fairly regular basis. The Interview survey also obtains data on expenditures incurred on trips. The survey collects detailed data on an estimated 60 to 70 percent of total household expenditures. Global estimates are obtained for food and other selected items, accounting for an additional 20-25 percent of total expenditures. Along with expenditure data, demographic, income and net worth information about the consumer unit is collected. For this analysis,

expenditures are annualized by multiplying the quarterly expenditure data by four. Income data collected in the survey are collected to refer to the previous 12 months from the beginning of the month of the survey. Market values of the owned home are as of the time of the interview. When data are missing, values are imputed for expenditures and sometimes for demographics but no imputation is applied to the income data. The value of owned residence is imputed when missing. Flags are included in the data file indicating the type of missing value and the imputation procedure used. For this study, internal BLS data are used although the data are available in public use form with restrictions for confidentiality imposed (e.g., top coding).

C. The LIS "Position" with Regard to Expenditure Data

An important point to be made is that, unlike income data, the expenditure data are not comparable across the countries in the LIS. According to the web site (Variable Definition file),

> These [expenditure] variables have taken a backseat to income. If they are present on the file [submitted for comparable income data] or if there are components available for making them, LIS includes them. If the original file doesn't have a "total expenditures" variable or doesn't have clear schemata of the component variables, then LIS doesn't provide "total expenditure".

This means that different definitions of expenditures can result for the LIS country files. In some cases consumption expenditures are provided and in others expenditures as outlays of spending are provided. This is important to note as research has found that seemingly similar, but in fact varying definitions of expenditures may give rise to differences in poverty measures when there are no real differences in well-being (See Lanjouw and Lanjouw (2001) for an example and suggestions for alleviating or minimizing this problem, also see Gibson, et al (2003)).The market value of the household's primary residence is in the LIS and appears to be comparable across the countries. For this study, an attempt is made to make U.S. CE household expenditures comparable using one of the LIS expenditure definitions, outlays.

The most recent country expenditure data are available for the mid-1990's with one

exception. The most recent Spanish data are for 1990. The expenditure and income data that we use from the LIS are for the following nine countries: France, Hungary, Israel, Mexico, Poland, R.O.C. Taiwan, Russia, Spain, and the United Kingdom (UK). Among these, the market value of owned home is available for Hungary, Israel, and Spain. As noted earlier, for the U.S. the income data are from the LIS and expenditure and market value data are from the CE.

D. Analysis Variables

The definitions given in the LIS data files are used as a starting point for the analyses. For the analysis of income, we use disposable person income (DPI) as defined in the LIS. This variable is assumed consistently defined by LIS across all the countries. DPI is defined as gross income minus taxes and mandatory contributions. Near cash benefits are included. These include all forms of transfers that are, in a strict sense, in-kind payments (i.e., they are tied to a specific requirement such as school attendance) but have a cash equivalent value equal or nearly equal to the market value, including near cash housing benefits. In-kind earnings are not included in DPI. These would include home production or in-kind income as a substitute for income, and would only be food commodities, homegrown food, board, or housing received as pay. Also not included in DPI are employer luncheon vouchers, education vouchers, medical benefits, etc. as these are counted as voluntary supplements to cash wages.

For the U.S., an additional income analysis is conducted using the CE data. For this analysis, disposable personal income is used, defined as FINCATAX in the CE data file. The only near cash benefit in CE income is the cash value of food stamps. The CE income analysis is restricted to what the BLS refers to as complete income reporters. The additional analysis is conducted since researchers using the CE data often restrict their samples to only include complete income reporters when examining expenditures for relative to incomes and when including income as an explanatory variable in expenditure models.

According to the BLS, the distinction between complete and incomplete income reporters is based, in general, on whether the respondent provides values for major sources of income, such as wages and salaries, self-employment income, and Social Security income. Even complete income reporters may not provide a full accounting of all income from all

sources. The current practice within the BLS is to designate as invalid, across the board zero income reporting, and count this consumer unit as an incomplete income reporter. About 81 percent of sampled consumer units in the 1997 data file are considered complete income reporters. (We further restrict the complete income reporters for the inequality analysis to consumer units with positive values of income. About 80 percent of all households are represented.) Using data from an earlier year, Garner and Blanciforti (1994) examined CE income data to determine how well the BLS definition of complete income reporter reflects income completeness in the survey. Using 1987 CE Interview data, approximately 87 percent of all consumer units were complete income reporters using the BLS definition but only 69 percent were complete income reporters when a stricter definition of completeness was applied. For the stricter definition, a consumer unit was a complete reporter only when incomes across all consumer unit members were coded with valid responses only, and at least one non-zero amount was included among the set of valid responses. Another requirement was that for income that is not member specific, (e.g., unemployment compensation, public assistance or welfare, interest income) consumer unit level information also had to have valid responses for the consumer unit to be considered a complete income reporter. It is expected that income report completeness is even more of a problem with the more recent data than the earlier data and one should be cautious in restricting any CE sample to complete income reporters only and then make statements about the total population. Some researchers have attempted to deal with this through population ratio adjustment.

For some countries, the market value of owned residence definition was provided in the LIS information on the web site but in most cases it was not. The variable is defined in the CE data file with the following question: "About how much do you think this property would sell for on today's market?" When not specified in the LIS, we assume that the market value of owned home is self-explanatory and that market value of owned residence means just that. Flags are included in the data file to indicate if imputation is used.

The definitions of the expenditure variables differ across surveys in the LIS and for the CE. Table 5 includes for each country in our study, the year of the survey and the variable definitions or other information available in the LIS. At this time we have made no attempt to contact the individuals who provided the LIS expenditure data for more specific variable

definitions. As seen from the table, the most complete definitions are for total expenditures with less complete for housing and food. Although the variables are present in the LIS file, virtually no definitions are given for apparel/clothing, transportation, medical out-of-pocket, education, or childcare. Summary variables available in the U.S. CE data file are identified for most of the categories. When summary variables are not available, they can be created from detailed data such as for childcare. Flags do not exist in the LIS data file so we are not sure if the data are as reported or if some of the data were imputed. For the CE, hot deck imputation was used when expenditure data were missing.

When defined in the LIS, expenditures are identified as 'spending' or 'consumption expenditures'. Spending appears to refer to outlays or out-of-pocket expenditures. Consumption expenditures include imputed rents for at least owned housing. It is not clear from the data documentation if the costs associated with owning a home are included in total or housing expenditures. To avoid double counting, these should not be counted when a consumption approach is used. For Israel, imputed values are included for owned vehicles. Based on the LIS documentation, 'total consumption expenditures' are available for Israel, R.O.C. Taiwan, and with some modifications, for Spain. For all other countries, spending or outlays-defined-expenditures are used. With regard to Spain, the total expenditure definition indicates that the following are excluded: self-provision, self-sufficiency, in-kind salaries, and imputed rents. However, the housing expenditure definition includes imputed rents for owner-occupants but it is not clear how housing expenditures for owners would be subtracted from the total to create a total consumption expenditure definition. As detailed data are available from the U.S. CE, different definitions of expenditures are possible. However, for this study, we use an outlays definition. A consumption-based approach could have been applied by replacing the expenditures associated with owning a home with the reported rental equivalence in the data file.

Table 6 includes a list of the countries and years for which we conduct our analysis. LIS or CE variables names are noted. For most of the data sources, a zero value could represent actual zero income, expenditures, or market values, or a zero could represent a missing value. Zero and missing values are distinguishable in the Hungarian file only. In the U.S. CE data, all cases have positive values for total expenditures. Zeros are possible for the

sub-components given that these were constructed as sums of monthly valuations in the CE data file. Missing values and zeroes can be distinguished in the underlying data by the flags. The footnote to the table denotes which data sources and variables include zeros, missing, and negative values.

Original LIS samples sizes and sample sizes for the income, expenditure, and market value analyses are presented in Table 7 for each of the data sets. Since we were unable to distinguish zeroes from missing values for most data sets, we restricted the data such that all cases with zero values were dropped. This is the same procedure followed by LIS. The procedure was done separately for income, expenditures, and market value using the LIS data. For the CE, the same sample is used for all the expenditure analyses. For the income analysis, no cases were dropped from the original sample for Israel or R.O.C. Taiwan. All other countries experience slight drops in sample size with 96 percent or more of all cases with non-zero income values. Cases were dropped for the expenditure analysis due to zero or missing values for total or housing expenditures, and for food expenditures when the data were available. From 97 to almost a 100 percent of the original sample cases have usable expenditure data. The exceptions are France and Russia. About 85 percent of the original sample has non-zero or non-missing values for expenditures for France, while only 68 percent for Russia. The largest reductions for these countries are because zero or missing values are present for housing expenditures. Since these two countries appear to use an outlays approach to define expenditures, it is possible that these households do not have housing expenditures and own their homes outright without additional related housing expenditures. This issue requires further investigation.

For several of the LIS countries, the sum of the expenditure component values is greater than the total expenditure (TOTEXP) value. This occurs for Hungary, Mexico, Poland, Spain, and the United Kingdom. When this happened we replaced the total in the data file with the sum of the components for the total before conducting the statistical analysis. All other values remained the same. The countries for which this resulted are listed in Table 8 with the number of cases affected. The Spanish data file is most affected with 18.3 percent of the total expenditure values replaced by the sums. As noted earlier, the difference in the total and sum for Spain appears to be related to the treatment of owner-

occupied housing in the total versus housing expenditure variables. The housing expenditure includes an imputed value for service flows from owner-occupied housing. This is excluded in the total variable. The documentation for the other countries is not sufficient to hypothesize the reason for the difference between the sum and total expenditures in the file.

Market values were available for four of the data sets: Hungary, Israel, Spain and the U.S.-CE. For Spain and the U.S. market values were only reported for owners and the values were greater than zero. Values were also only reported for homeowners in the Hungarian data file, however, a small percentage of cases were dropped as market values were recorded as zero. For Israel, market values were recorded for both renters and owners; a large percentage of the market values are zeroes. These could refer to renters, but again; zero values were dropped for the analysis.

E. Time Period

The time period for which the data refer are noted in the tables for each country. For the U.S. CE Interview, expenditure data are collected quarterly but are annualized for this study, as noted earlier. Each quarter of data is assumed to be independent, as is done for official BLS publications. For the other countries, expenditure as well as income data may be collected weekly and then annualized or collected for two weeks but with reference periods of a year, or the data may be collected with longer or shorter reference periods. LIS has made the best effort so the wave years refer as closely as possible to the reference period and not the collection period. For the analysis, all variable values have been converted to annual values by the country representatives, LIS staff, or us.

F. Analysis Unit

The unit of analysis is important since the primary concern of welfare analysis is the individual. However, since individuals do not function in a vacuum, household or family data are most often used in assessing the well-being of individuals. For this study, survey units are defined as households or consuming units for the countries in this study. For all but the U.S. income file from the CPS, the household is basically defined as a group of people who share expenditures in some way. Specific definitions are provided in the LIS data base for all of the countries expect for France, Russia, and Mexico. The U.S. CPS household is based on

whether household members live and eat together. The household definitions are presented in the Appendix. A consumer unit rather than a household is the survey unit for the U.S. CE definition. The definition of a consumer unit for the U.S. is quite similar to a household as defined for the LIS surveys other than the CPS. For the U.S. CE, members must share some expenditures. Persons living away from home at the time of the interview are treated differently in the different surveys. Whether domestics are counted among household members also differs by country.

G. Population Coverage

For all but Israel, the total country is covered by the survey. Only urban localities are sampled in Israel. The national non-institutionalized population is covered for each country.

H. Adjustment for Household Size

For the analysis, we make a adjustments to household income, expenditures, and market values to account for the differences in adults and children and household size using an equivalence scale. The household welfare measures are obtained by dividing household values by the square root of family size (Ruggles (1990)). This is the scale often used with the LIS data (see, for example, Atkinson, Rainwater, and Smeeding (1995); Buhmann et al. (1988)). For a discussion on equivalence scales, see Citro and Michael, ed. (1995).

I. Population Weighting

For the analysis, population distributions are analyzed. Person weights are used to produce the population distributions, the focus of the analysis.

J. Currency Unit Conversion

For the welfare analysis, final consumption expenditure price indexes and Purchasing Power Parities (PPPs) for consumption are applied to income, expenditures, and market value to convert the national currencies into U.S. dollars for 1996. Specifically, country year data was divided by the country PPP to eliminate the differences in price levels between the country and the United States (U.S. PPP=1). Then a price index was used to obtain U.S. 1996 dollars (PI(96)). The data sources for these are OECD publications (1999, 2001). Price index data are not available in these publications for Israel, R.O.C. Taiwan, or Russia. In addition, PPPs are not available for R.O.C. Taiwan. PPP information for the three countries

is available from the Penn World Tables 6.1 (Heston et al (2002)).

K. Treatment of Outliers for Income Analysis

Researchers using the LIS often use a procedure to adjust for outliers in the income distributions when the summary measures are used. The procedure is described in Gottschalk and Smeeding (1997). Only for the income analysis are outliers recoded. This is done so that the results can be compared to those of other researchers who have used the LIS data for income inequality analyses. Values below the one percentile value of the income distributions are recoded to equal one percent of the equivalized mean. Values above the 99th percentile value are recoded to equal 10 times the unequivalized median.

III. Empirical Results

A. Inequality Results

In Figures 1 and 2, we present rankings of the countries in our study by income and expenditure distributions. Table 9 summaries results from Tables 10 through 12 with rankings of countries using the Gini coefficient. Other statistics are shown in Tables 10 through 12 and are discussed later in this section. The summary table includes the countries ranked by inequality in disposable personal income, total expenditures, total net of housing expenditures, housing and food expenditures, and for those countries with data, by market value of owned residence. For the U.S., results are presented for income using the CPS LIS data and data for complete income reporters as defined in the CE and for the full CE weighted sample. In general, countries with more equal distributions along one dimension also have more equal distributions along the other dimensions. However, there are exceptions and these are noted below. Income and total expenditures and income and total expenditures net of housing are discussed first followed by housing and food expenditures, and then market values.

A.1 Income, Total Expenditures, and Total Expenditures Net of Housing

The Gini coefficient is used for ranking the countries in Figures 1a and 1b for DPI and total expenditures and Figures 2a and 2b for DPI and total expenditures net of housing. Summary rankings are presented for these three measures in Table 9. Details for income are

presented in Tables 10a and 10b. Details for total expenditures and total expenditures net of housing are presented in Tables 11a and 11b. As seen in Figures 1a and 1b and the tables, R.O.C. Taiwan exhibits the greatest equality and Mexico the least when DPI and total expenditures are examined. Russia and the U.S. follow as the countries with the next most unequal distributions of income. Russia also follows as having the next most unequal distribution of total expenditures. The U.S. ranking relative to the other countries is the same regardless if the CPS data from the LIS are used or if after tax income for complete income reporters or for the full CE sample is used. However, the U.S. CPS income distribution from the LIS is more equal than the income distribution using CE data. The United Kingdom remains in the sixth most equal position with both income and expenditures. All the other countries' rankings change as one moves from using income to total expenditures (also see Table 9). All of the remaining countries did not move by more than two places with the exception of Poland. Poland has the seventh most equal income distribution but is third in the total expenditure ranking.

In every case but Spain, income inequality is greater than total expenditure inequality; however, the difference is marginal (income Gini=0.302 and expenditure Gini=0.303) but statistically significant. The difference between income and expenditure inequality for France is also only marginal but again the difference is statistically significant.

The finding that income inequality is greater than expenditure (and in some cases consumption) inequality has been reported by researchers examining data from several countries. For example, Johnson and Shipp (1997) reported this relationship for the U.S., Pendakur (1998) for Canada, and Barret, Crossley, and Worswich (2000) for Australia. Wodon (1999) reported the relationship for Bangladesh and Deaton and Paxton (1994) for Taiwan. In contrast, researchers have reported income inequality to be less than expenditure inequality for Portugal (Gouveia and Tavares (1995)), Spain (Sastre (1999)), and the United Kingdom (Deaton and Paxson (1994), Goodman and Webb (1995)). Unlike earlier studies using United Kingdom data (e.g., Deaton and Paxson (1994), Goodman and Webb (1996)), the results of this study show income inequality to be greater than expenditure inequality. Differences across the studies and their rankings relative to each other are likely related to differences in the definition of expenditures but could also be related to the equivalence scale

and inequality measure (see Garner, Sastre, and Ruiz-Castillo (2002)).

When expenditures do not include those for housing, the expenditure rankings mostly remain the same as for total expenditures. The main exceptions are Poland, Hungary, and Israel (see Figures 2a and 2b, and Tables 9, 11a, and 11b). Poland's expenditure distribution of these expenditures is more equal than that of Hungary. The reverse is the case with total expenditures. Israeli total expenditures net of housing are more unequal than those of the U.S.

A.2 Disposable Personal Income

Table 10a and 10b include more detailed income inequality statistics for the countries. Results in Table 10a are for the full income sample. Table 10b includes the results based on adjusting the data for outliers using the procedure of Gottschalk and Smeeding (1997). The rankings across countries using the different measures remain essentially the same with and without top and bottom coding with one notable exception. The exception is that now Poland has now become fourth among the countries with the most equal income distribution from its earlier rank of seventh.

For all the countries, recoding the income outliers makes income more equal when measured by all the other summary inequality statistics with the exception of the mean log-deviation. Recoding results in a 66 percent increase in the mean log deviation index for Poland and 8.6 percent increase for the United Kingdom. The US CPS based mean log-deviation measure increased by less than one percent. These results might suggest that relatively more observations in the lower end of the countries' distributions are being recoded and thus are becoming more concentrated than those in the lower ends of the distributions of the other countries.

A.3 Housing Expenditures

Housing expenditure inequality statistics are presented in Table 11c and summarized in Table 9. As seen in these tables, it is clear that when the well-being of a country is based on housing expenditures alone, ranking can vary dramatically. For example, using the ranking based on the Gini coefficient, these results reveal that the most equal distribution of housing expenditures are for Israel, following by Hungary and R.O.C. Taiwan, countries with

equal Gini indexes (G=0.306). When disposable income, total expenditures, and total expenditures net of housing are used as the well-being measures, Israel ranked among the countries with greater inequality. Taiwan almost holds it position as having the most equal distribution of expenditures regardless of the measure used. The most unequal housing expenditure distributions are found for Mexico followed by Poland and Russia. The differences across countries with regard to housing expenditure inequality are likely related not only to differences across countries in their owned versus rental markets, but also how housing expenditures are defined. When imputed rents are included for owner occupied housing as opposed to out-of-pocket expenditures, differences in inequality would be expected within a country and across countries in terms of their relative rankings.

A4. Food Expenditures

Again, Taiwan exhibits the most equal distribution when based on food expenditures (see Table 11d for specifics and Table 9 for a summary). Next come Poland and Spain. When it comes to food expenditures, Russia has the most unequal distribution followed by Mexico The remaining country results are similar to those for total expenditures with the exception of Hungary with fairly unequal food expenditures. Differences across countries may result depending on whether the value of home consumption for own consumption is included in the food expenditure. When these are included, food expenditure inequality is expected to be less than then they are not included.

A5. Market Value of Residence

Market value of owned residences is available for only four of the countries in our study: Spain, Hungary, Israel, and for the United States using the CE (Table 12). For the CE, two sets of results are presented, first for the full sample and then for the complete income reporters. The complete income reporter results are presented so that they can be compared to the complete income report results for income and expenditures. For the market value inequality analysis, only those observations with positive values are included. As noted earlier, market value is used here to assess potential housing wealth. With greater wealth, households can often borrow for consumption. Home equity data would be needed to determine the actual housing wealth holdings of a population. Such data are not available in the LIS. However, outstanding mortgage debt is available in the CE data file, although we do

not use it for this comparison.[4] It is likely that the surveys similar to the CE from other countries collect this information as well. For countries with large outstanding housing mortgages, the market value of one's primary residence is not a good proxy for potential wealth.

Table 12 includes the details of the market value of owned residence inequality analysis and Table 9 includes a summary of the ranking across countries using the Gini coefficient. Of the four countries in this part of the study, Israel exhibits the greatest equality and Hungary the least. Spanish market values are more equal than those in the United States. For Israel and Spain, the sample percentage of households reporting market values is the same as the percentage that are homeowners, over 70 percent. For Hungary and the U.S. some homeowners did not report market values. Based on the sample sizes presented in Table 12, home ownership is much more likely in Hungary, Israel, and Spain than it is in the U.S. About 61 percent of the sample units in the CE had market values, although about 63 percent of the total population of consumer units owns their homes.

B. Welfare Results

The Generalized Lorenz Curves (plots not shown but available from the authors) reveal that income welfare is greater than total expenditure welfare for Hungary. For the other countries included in the welfare analysis, total expenditure welfare is greater. In contrast, income welfare is greater than expenditure welfare when housing expenditures are deducted from the total for all countries except for Mexico and marginally for Poland.

The Sen Index (SI) results are consistent with those from the Generalized Lorenz Curves and are presented in Table 13. All index values are presented in 1996 U.S. dollars and are converted using PPPs and the relevant price indexes [adjusted SI=country SI/(PPP*PI96), where PI96=(xxyr/96yr)*100]. Data are weighted and the unit of analysis is welfare per equivalent adult. Again, Hungary exhibits greater income welfare than total expenditure welfare within country while France, Poland, Mexico, Spain, and the United

4 Based on published data (Bureau of Labor Statistics (1999)), in 1997, 59 percent of all owners in the U.S. have mortgages and 57 percent of the average expenditures of owners are for mortgage interest payments and other charges. This does not include the expenditures for reductions in mortgage payments, unlike the definition used for this study. Also not included in mortgage and other charge expenditures but included in total owner housing expenditures are property taxes, expenditures for maintenance and repairs, property

Kingdom exhibit greater welfare when total expenditures are used for the LIS countries with both income and expenditures. When income welfare based on the CPS is compared to total expenditure welfare based on the CE, income welfare is greater than expenditure welfare for the U.S. When income welfare is from the CE, expenditure welfare is greater.

Only Mexico has greater welfare based on total expenditures net of housing as compared to welfare based on income, the same result found with the Generalized Lorenz Curve analysis. The results are again marginal for Poland but when the Sen Index is used, income welfare is slightly greater than total expenditure net of housing welfare.

When ranking the countries by welfare, we find that the United States has the greatest income welfare, followed by France, the United Kingdom, Spain, Hungary, Poland and Mexico. Expenditure welfare is greatest in the United States, followed by France, the United Kingdom, Spain, Hungary, Poland, and Mexico.

Welfare can also be compared based on the distribution and level of expenditures for certain commodities (also see Table 13). For this study, we examine food and housing as additional proxies for welfare. A comparison of welfare indexes based on food and housing expenditures reveals greater welfare using food expenditure as opposed to housing expenditures for all the countries except the United States. For Poland the magnitude of the difference in welfare is almost four times, while for other countries like the United Kingdom, the difference is marginal. For the United States, housing welfare is almost four times that of food welfare.

Although the analysis is much more limited for this study, the market values of the primary residence in the countries is also compared. Welfare based on market values is more meaningful for a country when a large proportion of the country owns homes without mortgages or other property liens. Among these, the U.S. has the higher welfare value, followed by Spain and Hungary.

IV. Discussion and Recommendations for LIS

Desirable characteristics of multi-country data bases are that the data are

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insurance and other charges.

representative of the entire country, variables are comparably defined, and data are readily accessible. Although various researchers have made their comparable data available to others, the most often cited data are from the LIS. However, as noted above, the LIS has limited expenditure data and there is no attempt to use a comparable expenditure definition across the surveys. In reviewing the LIS data and using them in combination with detailed expenditure data from the U.S. Consumer Expenditure Survey, particular issues are highlighted. Although the data are quite usable, for example for inequality analysis, the interpretation of one's results is dependent on the definition of expenditure used and whether all the people in a country are presented. Recommendations for future entries of expenditure data in the LIS and for other researchers creating multi-country data files with aims of data comparability are made.

Basic among desirable characteristics of a multi-country data set include data comparability, in terms of variable definitions and data collection. Since most household surveys with expenditure and wealth data are conducted for specific reasons for country statistical offices, it is unlikely that the exact same rules will be used to collect the data. However, providing specific information regarding data collection, population coverage, and collection units would be most useful. For example, are people living in both urban and rural areas included in the sample? Does the population include some people living in institutional settings? How is the household, family, or consuming unit defined? Is this different when income, expenditures, and wealth data are collected? How are these units determined? Are college students living away from home included in the parents' household or are they counted as separate consuming units? How are others living away from home for lengthy periods of time (e.g., military) treated? Are foreign nationals in the sample? How are expenditures treated when made outside of the country of residence by analysis/collection unit?

In terms of variable definitions, much progress has been made. The COICOPS provides a structure for comparability, as do the National Accounts. There has been much discussion in Europe and some in the U.S. regarding structure and there appears to be a preference for COICOPs. The LIS could request that countries provide expenditure data in a format that is consistent with COICOPs. The forthcoming ILO guidelines (Young 2001), the

Canberra Report (2001), the Eurostat (1997) recommendations, and the Australian Bureau of Statistics (McLennan 1995) could prove useful as examples to follow. Each of these documents focuses on definitions and the collection of expenditure data in particular.

When focusing on expenditures, what is to be measured? Outlays, something like outlays, or consumption? What is consumption and what are expenditures? How are insurance, gambling, gifts given/received, cash transfer as an expenditure but not consumption for this household treated? Would installment debt or interest paid be an expenditure or consumption? What is the expenditure? Is it a transaction or a payment (installment and all)? Particular attention would be required for the presentation of expenditures and related information with regard to vehicles and other durables. For example, would the expenditures for vehicles be net of trade-in values (sales)? Would the full purchase price or the out-of-pocket amount be used when it is financed? For owner occupied housing, a preference for a flow of services definition would be consistent with COICOPs however a country may not provide such measures. In lieu of this, information could be made available concerning the characteristics of the rental and owned housing units in order that the researcher could impute an implicit rental value for owner occupied housing. Issue of reimbursements for health insurance or overpayments for utilities also need to be considered. The variable descriptions need to specify whether food, housing, and other commodities are subsidized, how are they subsidized and whether they are valued. If the focus is consumption, then researchers need to be able to distinguish between goods and services consumed by the household from those purchased to be given to others. The receipt of goods and services into the household would also count towards a household's consumption. The value of home production for own consumption would be included as well. Again if one is actually interested in consumption rather than expenditures, is national spending for government provided benefits included in the data file?

For wealth data, information is needed not only in terms of the value of a property but also the debt or liability associated with that property.

Flags would be useful to identify whether data are missing or whether a zero value is actually zero. Information about bottom and top coding, truncation, outliers, imputations, and allocations would also provide researchers with useful information to conduct their analysis.

If LIS decides to provide guidelines for its data providers, more detailed specifications would of course be needed. The goal here has been to point out issues to consider. If the expenditure data remain a part of LIS, it would be most desirable to have consistency across the survey definitions as much as possible, as with income.

References

Ackland, Robert, Jeanine Braithwaite, Mark Foley, Thesia I. Garner, Christiaan Grootaert, Branko Milanovic, Gi-Taik Oh, Sandor Sipos, Sasoun Tsirounian, and Yvonne Ying, *Housing Expenditure and Income Data for Transitional Economies (HEIDE): Variable List*, 1997. Data have been added from Latvia since 1997 and are available through the World Bank web site: http://worldbank.org/research/inequality/data.htm.

Atkinson, Anthony B., "On the Measurement of Inequality", *Journal of Economic Theory* 2(3), pp. 244-63, 1970.

Atkinson, Anthony B., Lee Rainwater, and Timothy M. Smeeding, *Income Distributions in OECD Countries, Evidence from the Luxembourg Income Study*, Organization for Economic Co-operation and Development, Paris, 1995.

Attanasio, Orazio and James Banks, "Trends in Household Saving: A Tale of Two Countries," *The Institute for Fiscal Studies Working Paper*, 98/15, UK, 1998.

Barret, G.F., Crossley, T.F. and C. Worswick, "Demographic Trends and Consumption Inequality in Australia between 1975 and 1993," *Review of Income and Wealth* 46, pp. 437-456, 2000.

Buhmann, B., Lee Rainwater, G. Schmaus, Timothy M. Smeeding, "Equivalence Scales, Well-being, Inequality and Poverty: Sensitivity Estimates Across Ten Countries Using the Luxembourg Income Study (LIS) Database," *Review of Income and Wealth* 34, pp. 115-142, 1988.

Bureau of Labor Statistics, *Consumer Expenditure Survey, 1996-97, Report 935*, U.S. Department of Labor, Bureau of Labor Statistics, U.S. Government Printing Office, Washington, D.C., 1999.

Canberra Report, *Expert Group on Household Income Statistics: Final Report and Recommendations*, Ottawa, 2001

Carroll, Christopher D. and Andrew A. Samwich, "The Nature of Precautionary Wealth," *Journal of Monetary Economics* 40, pp. 41-71, 1997.

Citro, Constance and R. Michael, eds. *Measuring Poverty: A New Approach*, National Academy Press, Washington, D.C., 1995.

Consumer Expenditure Survey- Bureau of Labor Statistics website https://www.bls.gov/cex/home.htm

Deaton, Angus, *The Analysis of Household Surveys: A Microeconometric Approach to Development Policy*, The Johns Hopkins University Press, 2000.

Deaton, Angus and Chris Paxson, "Intertemporal Choice and Inequality," *Journal of Political Economy,* 102(3), pp. 437-467, 1994.

Del Rio, Coral, and Javier Ruiz-Castillo, "Intermediate Inequality and Welfare. The Case of Spain, 1980-81 to 1990-91," *Review of Income and Wealth* series 47(2), pp. 221-238, 2001.

De Vos, Klaas, and M.Asghar Zaidi, “Equivalence Scale Sensitivity of Poverty Statistics for the Member States of the European Community,” *Review of Income and Wealth* series 43(3), pp. 319-333, 1997.

Eurostat, *Household Budget Surveys in the EU, Methodology and Recommendations for Harmonization*, Statistical Office of the European Communities, 1997.

Garner, Thesia I., "Consumer Expenditures and Inequality: An Analysis Based on Decomposition of the Gini Coefficient," *The Review of Economics and Statistics* 75(1), pp. 134-38, 1993.

Garner, Thesia I., “Changing Welfare in a Changing World?: Income and Expenditure Distributions in the Czech and Slovak Republics,” Chapter 13 in *The Distribution of Welfare and Household Production: International Perspectives (Aldi Hagenaars Memorial Volume)*, edited by Stephen P. Jenkins, Arie Kapteyn, and Bernard van Praag, Cambridge University Press, Cambridge, UK, pp. 286-317, 1998.

Garner, Thesia I. and Laura A. Blanciforti, "Household Income Reporting: An Analysis of U.S. Consumer Expenditure Survey Data," *Journal of Official Statistics*, 10(1), 1994.

Garner, Thesia I, Martina Lubyova and Katherine Terrell, “Changes in Expenditure and Income Inequality in the Czech and Slovak Republics, 1989 vs. 1992 (an Examination of the Micro Data),” in *Czech Republic and Economic Transition in Eastern Europe*, edited by Jan Svejnar, Academic Press, Inc., Orlando, Florida, 1995.

Garner, Thesia I., Javier Ruiz-Castillo, and Mercedes Sastre, "The Influence of Demographic and Household Specific Price Indices on Consumption Based Inequality and Welfare: A Comparison of Spain and the United States", *Southern Economic Journal*, 70(1), pp 22-48, 2003.

Gibson, John, Jikun Huang and Scott Rozelle, "Improving Estimates of Inequality and Poverty from Urban China's Household Income and Expenditure Survey," *Review of Income and Wealth,* 49(1), pp. 53-68, 2003.

Goodman, Alissa and Steven Webb, "The Distribution of UK Household Expenditure, 1979-92." *Institute for Fiscal Studies, Inequality and Living Standards Publications*, Ref. Commentary 49, London, 1995.

Gottschalk, Peter and Timothy M. Smeeding, "Cross-National Comparisons of Earnings and Income Inequality, *Journal of Economic Literature* 35, pp. 633-687, 1997.

Gouveia, Miguel and José Tavares, "The Distribution of Household Income and Expenditure in Portugal: 1980 and 1990," *Review of Income and Wealth,* 41(1), pp. 1-17, 1995.

Hagenaars, A.J.M., Klaas de Vos, and M.A. Zaidi, *Poverty Statistics in the Late 1980s: Research Based on Micro-Data,* Luxembourg: Office for Official Publications of the European Communities, 1994.

Heston, A., Robert Summers, and Bettina Aten, *Penn World Table Version 6*.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002.

ILO, *Report II: Household income and expenditure statistics*, International Labour Office,

Geneva, 2003.

Ironmonger, Duncan, personal communication about the Multinational Household Expenditures Study (MHES) via email June 14 and August 4, 2002 and http://www.economics.unimelb.edu.au/dept/household/HRDhome.htm

Johnson, David, "Using Expenditures to Measure the Standard of Living in the United States: Does It Make a Difference?" paper prepared for the conference on "What has happened to the quality of life in American and other advanced industrialized nations?" Jerome Levy Economics Institute of Bard College, 2001.

Johnson, David and Stephanie Shipp, "Trends in Inequality in Consumption-Expenditures: The U.S. from 1960 to 1993," *Review of Income and Wealth*, 43, pp. 133-152, 1997.

Juster, F. Thomas, Joseph P. Lupton, and Honggao Cao" Ensuring Time-Series Consistency in Estimates of Income and Wealth," paper prepared for presentation at the International Association for Research in Income and Wealth, Stockholm, Sweden, August 18-24, 2002.

Juster, F. Thomas, James P. Smith, and Frank Stafford, "The Measurement and Structure of Household Wealth," *Labour Economics*, 6, pp. 253-275, 1999.

Kennickell, A.G., M. Starr-McCluer, and A.E. Sunden, "Family Finances in the U.S.: Recent Evidence from the Survey of Consumer Finances," *Federal Reserve Bulletin* 1, pp. 1-23, 1997.

Lanjouw, Jean O. and Peter Lanjouw, "How to Compare apples and Oranges: Poverty Measurement Based on Different Definitions of Consumption" *Review of Income and Wealth*

47(1), pp. 25-42, 2001.

McLennan, W., *A Provisional Framework for Household Income, Consumption, Saving, and Wealth,* Australian Bureau of Statistics, Canberra, Catalogue No. 6549.0, 1995.

Milanovic, Branko, personal communication about the World Bank Household Expenditure and Income Data for the Transitional Economies (HEIDE) data base via email June 11, 2002.

Nordhaus, William D., "Recommendations to the Bureau of Economic Analysis On Improving the National Economic Accounts," *Survey of Current Business,* pp.8-19.

Organization for Economic Co-operation and Development (OECD), *PPPs and Real Expenditures 1996,* Paris, 1999.

Organization for Economic Co-operation and Development (OECD), *National Accounts of OECD Countries*, Vol. 1, Paris, 2001.

Pendakur, K., "Changes in Canadian Family Income and Family Consumption Inequality between 1978 and 1992," *Review of Income and Wealth,* 44, pp. 259-283, 1998.

Pyatt, G., "Development and the Distribution of Living Standards: A Critique of the Evolving Data Base," *Review of Income and Wealth,* 49, pp. 333-358, 2003.

Ruggles Patricia**,** *Drawing the Line-Alternative Poverty Measures and Their Implications for Public Policy,* The Urban Institute Press, Washington, D.C. 1990.

Sastre, Mercedes, “Los ingresos y los gastos en las Encuestas de Presupuestos Familiares. Ensayos sobre desigualdad y bienestar.” Ph.D. dissertation, Universidad Complutense, Madrid, 1995.

Schmitt, John, email communication with Thesia I. Garner, June 11, 2002a.

Schmitt, John, “Estimating Household Consumption Expenditure in the United States Using the Interview and Diary Portions of the 1997 Consumer Expenditure Survey,” paper prepared for the Demand Patterns and Employment Growth (DEMPATEM) project meeting, Madrid, July 5-6, 2002b.

Smith, Dale A. and Mary Lynn Schmidt, “Determining a Market Basket Structure for the U.S. Consumer Price Index Based on the International Standard Classification of Individual Consumption by Purpose (COICOP), paper presented at the Joint Statistical Meetings, Atlanta, Georgia, August 5, 2001 (paper available from the authors at the Bureau of Labor Statistics, Washington, D.C.).

Smith, Dale A. and Mary Lynn Schmidt, “Developing a Core Classification System for U.S. Personal Consumption Data,” paper presented at the Joint Statistical Meetings, New York, New York, August 14, 2002 (paper available from the authors at the Bureau of Labor Statistics, Washington, D.C.).

Wirtz, Christine, personal communication about the Eurostat tabulated expenditure data via email June 12, 2002.

Wodon, Quentin T., ”Between Group Inequality and Targeted Transfers,” *Review of Income and Wealth*, 45(1), pp. 21-40, 1999.

Wolff, Edward N. *Retirement Insecurity: The Income Shortfalls Awaiting the Soon-to-Retire*, Economic Policy Institute, Washington, D.C., 2002.

World Bank, *Description of the LSMS Household Surveys*, http://www.worldbank.org/lsms/guide/describe.html, 2002.

Young, Sylvester, Bureau of Statistics, International Labour Office, Geneva, Switzerland, meetings October 22-25, 2001.

Table 1. Country Surveys in the Luxembourg Income Study with Expenditures and/or Market Value of Property Data

Country	Year	Survey Name	At Least One Expenditure	Market Value**
Australia	**1989**	Australian Income and Housing Survey	X	X
	1994			X
	1994*	Austrian European Community Household Panel (ECHP)	X	
Austria	**1995**	Austrian Microcensus	X	
	1997*	Austrian European Community Household Panel (ECHP)	X	
Belgium	**1985**	Panel Survey of the Centre for Social Policy	X	
	1988		X	
	1992		X	
	1997		X	X
Canada	**1991**	Survey of Consumer Finances (1991)		X
Denmark	**1987**	Income Tax Survey		X
	1992			X
	1995			X
	1997			X
Estonia	**2000**	Household Budget Survey	X	
Finland	**1991**	Income Distribution Survey	X	
France	**1984**	Family Budget Survey	X	
	1989		X	
	1994		X	
Germany	**1973**	Income and Consumer Survey (EVS)	X	
	1978		X	
	1983		X	
	1981	The German Transfer Survey (Transferumfrage)		X
	2000*	Socio-Economic Panel (GSOEP)	X	
Hungary	**1991**	Hungarian Household Panel	X	X
	1994		X	X
	1999*	Tarki Household Monitor Survey	X	X
Israel	**1979**	Family Expenditure Survey		X
	1992		X	X
	1997		X	X
Italy	**1991**	Survey on Household Income and Wealth (SHIW)	X	X
	1995	L'Indagine Campionaria sui Bilanci delle Famiglie Italiane	X	X
	2000*		X	X
Luxembourg	**1997***	Panel Socio-Economique	X	
	2000*	na	X	X
Mexico	**1984**	National Household Survey on Income and Expenditure	X	
	1989	(Encuesta Nacional de Ingresos y Gastos de los Hogares)	X	
	1992		X	
	1994		X	
	1996		X	
	1998		X	
Netherlands	**1983**	Additional Enquiry on the Use of (Public) Services (AVO)		X
	1991	Socio-Economic Panel (SEP)		X
	1994			X
Norway	**1979**	Income and Property Distribution Survey		X
Poland	**1986**	Household Budget Survey	X	
	1995		X	
	1999		X	
R.O.C.	**1981**	Survey of Personal Income Distribution (Taiwan Area)	X	X
Taiwan	**1986**		X	X
	1991		X	X
	1995		X	
Romania	**1995***	Romania Integrated Household Survey (RIHS)	X	
	1997*		X	
Russia	**1992**	Russian Longitudinal Monitoring Survey	X	
	1995		X	
	2000*		X	X
Slovenia	**1997***	Household Budget Survey (HBS)	X	
	1999*		X	
Spain	**1980**	Expenditure and Income Survey	X	
	1990		X	X
Sweden	**1975**	Income Distribution Survey (Inkomstfördelningsundersokningen)	X	
	1981			X
	2000*		X	
Switzerland	**1992**	Swiss Poverty Survey	X	X
United	**1986**	The Family Expenditure Survey	X	
Kingdom	**1991**	na	X	
	1994*	Family Resources Survey (FRS)	X	X
	1995	The Family Expenditure Survey	X	
	1999*	Family Resources Survey (FRS)	X	
United	**1979**	March Current Population Survey		X
States	**1997**		X	

* Data became available since the analysis was completed.

**NOTE: Market value for owned residence for all countries but Switzerland. For Switzerland, refers to all owned property.

na- Not available

***Data recently available but not included in our study includes: Estonia (00), Hungary (99), Italy(00), Romania (95,97), Russia (00), Slovenia (97,99)

Table 2. Country Data in the Luxembourg Income Study with Expenditures and/or Market Value of Property

		Expenditures								Market Value	
Country	Year	Total	Food	Housing	Apparel/ Clothing	Trans- port	Medical Out-of- Pocket	Education	Child Care	Own Residence	All Owned Property
Australia	1989			X						X	
	1994									X	
Austria	1994*			X							
	1995			X					X		
	1997*			X							
Belgium	1985		X		X	X					
	1988		X		X						
	1992			X							
	1997								X	X	
Canada	1991									X	
Denmark	1987									X	
	1992									X	
	1995									X	
	1997									X	
Estonia	2000*	X	X	X	X	X	X	X			
Finland	1991			X							
France	1984	X	X	X	X	X					
	1989	X	X	X	X	X					
	1994	X	X	X	X	X	X	X	X		
Germany	1973	X	X	X	X	X					
	1978	X	X	X	X	X					
	1981									X	
	1983	X	X	X	X	X					
	2000*		X								
Hungary	1991	X	X	X						X	
	1994	X	X	X						X	
	1999*	X	X	X	X	X	X			X	
Israel	1979									X	
	1992	X	X	X	X	X				X	
	1997	X	X	X	X	X				X	
Italy	1991	X	X							X	
	1995	X	X							X	
	2000*	X	X	X						X	
Luxembourg	1997*		X	X						X	
	2000*		X	X							
Mexico	1984	X	X	X	X	X	X	X			
	1989	X	X	X	X	X	X	X			
	1992	X	X	X	X	X	X	X			
	1994	X	X	X	X	X	X	X	X		
	1996	X	X	X	X	X	X	X	X		
	1998	X	X	X	X	X	X	X	X		
Netherlands	1983									X	
	1991									X	
	1994									X	
Norway	1979									X	
Poland	1986	X	X	X	X	X					
	1995	X	X	X	X	X	X	X			
	1999	X	X	X	X	X	X	X			
R.O.C.	1981	X	X	X	X	X				X	
Taiwan	1986	X	X	X	X	X				X	
	1991	X	X	X	X	X				X	
	1995	X	X	X	X	X	X	X			
Romania	1995*	X	X	X	X	X	X	X			
	1997*	X	X	X	X	X	X	X			
Russia	1992	X	X	X	X	X					
	1995	X	X	X	X	X	X				
	2000*	X	X	X	X	X	X		X	X	
Slovenia	1997*	X	X	X	X	X	X	X			
	1999*	X	X	X	X	X	X	X			
Spain	1980	X	X	X	X	X					
	1990	X	X	X	X	X				X	
Sweden	1975	X									
	1981									X	
	2000*			X					X		
Switzerland	1992			X			X				X
United	1986	X	X	X	X	X					
Kingdon	1991	X	X	X	X	X					
	1994*			X	X	X		X	X	X	
	1995	X	X	X	X	X	X		X		
	1999*			X				X	X		
United States	1979									X	
	1997						X				

LIS datasets with no expenditure or wealth data for these years: Australia(81,85), Austria (87), Canada (71,75,81,87,94,97,98), Finland (87,95,00), France(79,81), Germany(84,89,94), Israel (86), Italy (86), Netherlands (87), Norway(86,91,95) Poland (92,00), Sweden (67, 87, 92, 95), Switzerland (82), United Kingdom (69, 74,79), United States (69, 74, 86, 91,92,94,96).

Countries with no data for these variables: Czech Republic (92,96), Ireland (87), Luxembourg (85, 91, 94), Slovak Republic(92,96).

* Data became available since the analysis was completed.

Table 3. Data sets with Expenditure and Market Value of Residence Data		
Category		**Number of Data Sets**
Total Expenditures		41
Expenditures for:		
	Food	45
	Housing	50
	Apparel/clothing	38
	Transportation	37
	Medical out-of-pocket	21
	Education	17
	Child Care	11
Market Value		
	Owned residence	31
	All property owned	1
Total expenditures and Market Value of Owned Residence		13

Table 4. Data Sources for Study

Luxembourg Income Study	Year	Survey Name
France	1994	Family Budget Survey
Hungary	1994	Hungarian Household Panel
Israel	1997	Family Expenditure Survey
Mexico	1998	National Household Survey on Income and Expenditure (Encuesta Nacional de Ingresos y Gastos de los Hogares)
Poland	1995	Household Budget Survey
R.O.C. Taiwan	1995	Survey of Personal Income Distribution, Taiwan Area
Russia	1995	Russian Longitudinal Monitoring Survey
Spain	1990	Expenditure and Income Survey
United Kingdom	1995	The Family Expenditure Survey
United States	1997	March Current Population Survey
Other		
United States	1997	Consumer Expenditure Interview Survey

Table 5. Expenditure Variable Definitions by Country

Luxembourg Income Study

	YEAR		TOTEXP	HOUSEXP	FOODEXP	APPEXP	TRANEXP	MEDEXP	EDUCEXP	CHCAREXP
France	1994		totexp	housexp	foodexp					
Hungary	1994	*12	monthly amount spending all in all	monthly portion of household utilities + monthly rent for flat or house+monthly installment of credit used to buy flat or home	how much spending on food					
Israel	1997		total consumption expenditure=total outlays of the household on the purchase of goods or services as well as imputed consumption on housing and vehicles *(the purchase of which is defined as investment and not as consumption). Payments sometimes include also interest, transportation or installation payments. The full amount of purchase of a commodity is recorded on the day of its receipt, even though only part of its cost has been paid; as a consequence, advance payments on account of goods or services not yet supplied or payments of debts on account of a commodity already in possession of the household, are not considered as consumption expenditure but as an increase in savings.	rent+housing consumption of owned	foodexp		includes imputed rents for vehicles			
Mexico	1998		no documentation	no documentation	no documentation					

Poland	1995	*12	comment includes all major categories of expenditure except taxes (v11). Includes food, spirits and tobacco, clothing and shoes, dwelling costs, home furnishings, health care, personal hygiene, education, culture sport and recreation, transport and communications, other spending and expenditures	cost of dwelling maintenance	food
R.O.C. Taiwan	1995		total consumption expenditure	compute housexp = (rent and water charges) +(fuel and lighting) comment here we diverge from Taiwan formula, which includes furniture and family and facilities and household operations; our formula includes rent (including imputed rent of self-owned which is present as non-property income in v9) and utilities.	compute foodexp = food+ beverage + tobacco; comment standard Taiwan formula includes tobacco
Russia	1995		totexpr6	rent and utilities expense	compute foodexp = dairyr6+meatr6+fishr6+potator6+breadr6+eggsr6+fatr6+fruitsr6+sugarr6+vegetr6+ofoodr6+alcohlr6+eatoutr6
Spain	1990		Gastos' file CEPF total family monetary expenditure excludes self-provision, self- sufficiency, in-kind salaries, and imputed rent.	Includes gross rent, rent attributed in case of ownership, electricity and heating bills.	(excludes alcoholic drinks and tobacco)
United Kingdom	1995		p550tp	rent+mortgage and interest payment+water +regular housing payments as for repairs and maintenance	p518t

Consumer Expenditure Interview Survey (definitions for this study)

		total expenditure outlays	housing expenditure outlays	food at home	apparel	transport outlays	medical oop	education	child care
United States	1998	transaction costs, including excise and sales taxes, and outlays for mortgaged homes and financed vehicles for goods and services acquired during the interview reference period. Includes expenditures for gifts given but excludes purchases or portions of purchases directly assignable to business purposes. Excludes periodic credit on installment payments on goods or services already acquired except for vehicles. For owned home, includes reduction in principal payment, mortgage interest, property taxes. Meals and rent as pay included. (possible to replace owner costs with rental equivalence.)	expenditures for owned and rented dwellings and lodging away from home. For owned homes, mortgage principal reduction, interest, and property taxes. Other expenditures include rents, homeowner and rental insurance, fire and extended coverage insurance, maintenance and repairs, utilities, fuels and public services.	for this study, food at home	all apparel, including accessories, and footwear; also other apparel produces and services including repairs, jewelry and watches, making clothing	vehicle purchases (net outlays) plus financing charges, gasoline and motor oil, maintenance and repairs, vehicle insurance, public transport, vehicle rental, leases, licenses, and other charges	health insurance, medical services and supplies, drugs	tuition and fees, textbooks, supplies and equipment for public and private nursery schools, elementary and high schools, colleges and universities, and other schools	baby-sitting; day care, nursery school, and preschool tuition

Table 6. Variables across Surveys: Identification of positives, zeroes and missing values.

	Year	Income	Total	Food	House	Clothing	Transportation	Out of Pocket Medical	Education	Child Care	Market Value of Home
Luxembourg Income Study											
		DPI	**TOTEXP**	**FOODEXP**	**HOUSEXP**	**APPEXP**	**TRANEXP**	**MEDEXP**	**EDUCEXP**	**CHCAREXP**	**v10**
France	1994	0 (1)	miss	0 and miss	0 and miss	0 and miss	0 and miss	0 and miss	0 and miss	0 and miss	na
Hungary	1994	0 and miss	>0 and miss	0 and miss	0	na	na	na	na	na	0 and miss
Israel	1997	>0	> 0	0	> 0	0	0	na	na	na	0*
Mexico	1998	0	>0	0	0	0	0	0	0	0	na
Poland	1995	0(1)	> 0	>0	0	0	0	0	0	na	na
ROC-Taiwan	1995	>0	> 0	0	> 0	0	0	0	0	na	na
Russia	1995	0(1)	0	0	0	0	0 and miss	>0 and miss	na	na	na
Spain	1990	0(1)	0	0	0	0	0	na	na	na	miss**
UK	1995	0(1)	>0	0	0 and miss(1)	0	0(1)	0	na	+	na
US	1997	0(1)	na	na	na	na	na	na	na	na	na
Consumer Expenditure Interview Survey (Internal BLS data)(2)											
		FINCATAX	**outlays**	**ZFOODHOM**	**outlays**	**ZAPPAREL**	**ETRANPRT**	**ZHEALTH**	**ZEDUCATN**	**(3)**	**PROPVALX(4)**
US	1997	CIR	>0	0	0	0	0	0	0		miss

Note: For countries with nonmissing values zeroes may indicate missing.
(na) - data not available
0 - includes zeroes
miss - includes missing
> 0 - includes values greater than zero only
CIR-Complete Income Reporters: Provide values for major sources of income:wages and salaries, self-employment income and Social Security Income. Across-the-board zero income reporting is treated as incomplete reporting.
(1)- includes negative values
(2)-available in the public use file
(3)-can be created from microdata
(4)-IF OWNYB ='100'
***-zeroes are renter**
****-all missing are renters**

Table 7. Sample Size

	France	Hungary	Israel	Mexico	Poland	ROC-Taiwan	Russia	Spain	United Kingdom	United States		
Sample Size	**1994**	**1994**	**1997**	**1998**	**1995**	**1995**	**1995**	**1990**	**1995**	**1997-CPS**	**1997(CE-CIR)**	**1997 (CE)**
Overall	11294	1992	5230	10952	32009	14706	3518	21153	6797	50320	17846	22213
Income Analysis*	11289	1929	5230	10889	31985	14706	3373	21102	6794	50069	17846	19635
Negative cases	3	na	na	na	423	na	1	2	44	64		
Expenditure Analysis	9573	1942	5225	10869	31948	14705	2402	21041	6741	na	17846	22018
Cases dropped due to zero or missing (in this order)												
HOUSEXP	1714	38	na	18	61	na	1093	2	48	na	na	55
TOTEXP	na	10	na	na	na	na	na	na	na	na	na	0
FOODEXP	7	2	5	65	na	1	23	110	8	na	na	139
NETHOUS												1
Market Value gt 0	na	1435	3689	na	na	na	na	16622	na	na	10905	13641
Cases dropped due to zeroes	na	43	1541	na	na	na	na	na	na	na	na	na
	9573	1942	5225	10869	31948		2402	21041	6741			

*It is impossible to distinguish between actual zero incomes and missing values in all LIS datasets we use, except for Hungary. As a result we exclude all zero incomes.

Note: na-not applicable

CE-CIR-Complete Income Reporters and restriction that DPI>0

**Market Value for CE-CIR restricted to DPI >0 sample

Table 8. Country Data Sets with Total Expenditure Edit		
Country	**Number of Cases with Sum of Expenditures > TOTEXP**	**% of expenditure analysis cases**
Hungary	259	13.3
Mexico	8	0.1
Poland	22	0.1
Spain	3861	18.3
United Kingdom	641	9.5

Table 9. Ranking of Countries by Inequality Using the Gini Coefficient and Income, Expenditures, and Market Value (most equal=1)						
	Ranking by					
Country	**Disposable Personal Income**	**Total Expenditures**	**Net of Housing Expenditures**	**Housing Expenditures**	**Food Expenditures**	**Market Value of Residence**
R.O.C. Taiwan	1	1	1	2-3	1	NA
France	2	4	4	5-6	5	NA
Spain	3	5	5	8	3	2
Hungary	4	2	3	2-3	9	5
Israel	5	7	9	1	7-8	1
United Kingdom	6	6	6	4	4	NA
Poland	7	3	2	10	2	NA
United States - LIS	8	NA	NA	NA	NA	NA
United States - CE CIR	9	8	7	5-6	7-8	3
United States - CE	11	9	8	7	6	4
Russia	10	10	10	9	11	NA
Mexico	12	11	11	11	10	NA

NA: data not available

Table 10a. Income Inequality measures for chosen countries without top and bottom coding.

	France		Hungary		Israel		Mexico		Poland		Taiwan		Russia		Spain		United Kingdom		United States (1997)				
	1994	(1)	1994	(1)	1997	(1)	1998	(1)	1995	(1)	1995	(1)	1995	(1)	1990	(1)	1995	(1)	CPS	(1)	CE	(1)	CE CIR
Gini	0.290	0.003	0.325	0.002	0.337	0.004	0.515	0.007	0.348 (0.311)	0.003	0.267	0.002	0.451	0.006	0.302	0.003	0.347	0.005	0.374	0.002	0.439	0.003	0.407
I(0):Mean log-deviation	0.142	0.003	0.186	0.000	0.201	0.006	0.493	0.015	0.142 (0.176)	0.004	0.116	0.002	0.386	0.011	0.161	0.004	0.209	0.007	0.259	0.003	0.454	0.007	0.327
I(1):Theil entropy	0.153	0.005	0.193	0.001	0.197	0.009	0.530	0.028	0.234 (0.191)	0.008	0.123	0.003	0.363	0.013	0.162	0.008	0.215	0.009	0.254	0.003	0.340	0.006	0.290
I(2): 1/2 SCV	0.221	0.020	0.286	0.004	0.269	0.035	1.300	0.288	0.458 (0.337)	0.040	0.156	0.008	0.525	0.032	0.233	0.040	0.300	0.026	0.362	0.008	0.441	0.017	0.387
Decile ratio/10	0.354	0.040	0.419	0.003	0.486	0.013	1.155	0.038	0.404 (0.380)	0.003	0.338	0.003	0.939	0.039	0.396	0.005	0.457	0.007	0.557	0.006	1.188	0.042	0.778
Sample Size	11289		1929		5230		10889		31985 (31562)		14706		3373		21102		6794		50069		19366		17846

France 1994-data on taxes are incomplete

Poland 1995-data on taxes are incomplete

*It is impossible to distinguish between actual zero incomes and missing values in all LIS datasets we use, except for Hungary.

As a result we exclude all zero incomes.

(1)-Standard Deviation of 200 Bootstraps

Table 10b. Income Inequality measures for chosen countries with top and bottom coding.

	France		Hungary		Israel		Mexico		Poland		Taiwan		Russia		Spain		United Kingdom		United States (1997)				
	1994	(1)	1994	(1)	1997	(1)	1998	(1)	1995	(1)	1995	(1)	1995	(1)	1990	(1)	1995	(1)	CPS	(1)	CE	(1)	CE CIR
Gini	0.288	0.003	0.323	0.008	0.336	0.004	0.494	0.004	0.320 (0.306)	0.002	0.266	0.002	0.447	0.006	0.300	0.003	0.344	0.004	0.372	0.002	0.439	0.003	0.407
I(0):Mean log-deviation	0.142	0.003	0.183	0.010	0.198	0.005	0.452	0.008	0.235 (0.169)	0.003	0.115	0.002	0.380	0.010	0.158	0.003	0.227	0.006	0.260	0.003	0.443	0.006	0.324
I(1):Theil entropy	0.148	0.004	0.185	0.011	0.192	0.006	0.437	0.009	0.193 (0.173)	0.003	0.121	0.003	0.352	0.011	0.154	0.004	0.207	0.007	0.251	0.003	0.337	0.004	0.289
I(2): 1/2 SCV	0.198	0.012	0.240	0.023	0.243	0.016	0.647	0.018	0.256 (0.240)	0.008	0.149	0.005	0.483	0.022	0.187	0.009	0.267	0.015	0.352	0.007	0.429	0.009	0.385
Decile ratio/10	0.354	0.004	0.419	0.023	0.486	0.013	1.155	0.038	0.404 (0.380)	0.003	0.338	0.003	0.939	0.039	0.396	0.005	0.457	0.007	0.557	0.006	1.188	0.036	0.778
Sample Size	11289		1929		5230		10889		31985 (31562)		14706		3373		21102		6794		50069		19366		17846

France 1994-data on taxes are incomplete

Poland 1995-data on taxes are incomplete

*It is impossible to distinguish between actual zero incomes and missing values in all LIS datasets we use, except for Hungary.

As a result we exclude all zero incomes.

(1)-Standard Deviation of 200 Bootstraps

Table 11. Expenditure inequality measures for chosen countries (no zeroes) *.

11a. Total Expenditures

	France		Hungary		Israel		Mexico		Poland		ROC-Taiwan		Russia		Spain		United Kingdom		United States			
	1994	(1)	1994	(1)	1997	(1)	1998	(1)	1995	(1)	1995	(1)	1995	(1)	1990	(1)	1995	(1)	1997 (CE)	(1)	1997 (CE-CIR)	(1)
Gini	0.288	0.003	0.242	0.005	0.336	0.004	0.452	0.006	0.283	0.002	0.236	0.002	0.418	0.011	0.303	0.003	0.312	0.004	0.354	0.002	0.349	0.002
I(0):Mean log-deviation	0.139	0.003	0.111	0.008	0.186	0.005	0.354	0.009	0.133	0.003	0.089	0.002	0.302	0.016	0.154	0.003	0.163	0.004	0.214	0.003	0.208	0.003
I(1):Theil entropy	0.140	0.003	0.100	0.004	0.194	0.007	0.384	0.013	0.154	0.006	0.097	0.019	0.345	0.027	0.157	0.004	0.164	0.004	0.220	0.004	0.211	0.003
I(2): 1/2 SCV	0.170	0.008	0.112	0.007	0.255	0.021	0.657	0.046	0.263	0.030	0.126	0.003	0.657	0.092	0.201	0.011	0.202	0.008	0.299	0.010	0.277	0.007
Decile ratio/10	0.381	0.005	0.300	0.007	0.467	0.009	0.770	0.026	0.328	0.002	0.290	0.003	0.622	0.021	0.413	0.005	0.434	0.007	0.523	0.008	0.510	0.063
Sample Size	9573		1942		5225		10869		31948		14705		2402		21041		6741		22018		17759	

11b. Total net of housing expenditures

	France		Hungary		Israel		Mexico		Poland		Taiwan		Russia		Spain		United Kingdom		United States			
	1994	(1)	1994	(1)	1997	(1)	1998	(1)	1995	(1)	1995	(1)	1995	(1)	1990	(1)	1995	(1)	1997 (CE)	(1)	1997 (CE-CIR)	(1)
Gini	0.315	0.003	0.302	0.007	0.391	0.005	0.455	0.007	0.291	0.002	0.247	0.002	0.430	0.012	0.336	0.003	0.361	0.004	0.385	0.002	0.375	0.003
I(0):Mean log-deviation	0.170	0.003	0.192		0.263	0.007	0.362	0.011	0.141	0.003	0.098	0.002	0.326	0.018	0.198	0.003	0.247	0.005	0.260	0.003	0.247	0.003
I(1):Theil entropy	0.167	0.004	0.154	0.007	0.262	0.010	0.389	0.015	0.162	0.005	0.108	0.002	0.365	0.029	0.191	0.005	0.222	0.006	0.265	0.005	0.249	0.004
I(2): 1/2 SCV	0.202	0.009	0.175		0.356	0.033	0.668	0.054	0.275	0.028	0.147	0.004	0.705	0.100	0.248	0.015	0.270	0.011	0.386	0.016	0.350	0.010
Decile ratio/10	0.437	0.008	0.398	0.017	0.681	0.018	0.798	0.025	0.346	0.003	0.304	0.003	0.659	0.027	0.541	0.007	0.653	0.016	0.624	0.085	0.600	0.091
Sample Size	9573		1941		5225		10869		31948		14705		2402		21041		6741		22018		17759	

11c. House Expenditures

	France		Hungary		Israel		Mexico		Poland		Taiwan		Russia		Spain		United Kingdom		United States			
	1994	(1)	1994	(1)	1997	(1)	1998	(1)	1995	(1)	1995	(1)	1995	(1)	1990	(1)	1995	(1)	1997 (CE)	(1)	1997 (CE-CIR)	(1)
Gini	0.396	0.004	0.306	0.007	0.252	0.004	0.545	0.008	0.488	0.006	0.306	0.002	0.446	0.015	0.430	0.006	0.324	0.004	0.398	0.002	0.396	0.002
I(0):Mean log-deviation	0.293	0.006	0.258	0.020	0.120	0.004	0.543	0.016	0.461	0.011	0.157	0.002	0.388	0.025	0.323	0.008	0.184		0.287	0.003	0.284	0.004
I(1):Theil entropy	0.278	0.008	0.166	0.009	0.116	0.006	0.619	0.032	0.503	0.040	0.161	0.003	0.405	0.053	0.352	0.015	0.181	0.007	0.283	0.004	0.278	0.004
I(2): 1/2 SCV	0.396	0.032	0.190	0.018	0.145	0.018	1.618	0.284	2.029	0.920	0.211	0.006	0.924	0.339	0.588	0.056	0.232		0.409	0.013	0.390	0.013
Decile ratio/10	0.768	0.019	0.447	0.022	0.296	0.006	1.222	0.046	1.055	0.013	0.415	0.005	0.824	0.042	0.672	0.014	0.472	0.008	0.641	0.010	0.639	0.012
Sample Size	9573		1942		5225		10869		31948		14705		2402		21041		6739		22018		17759	

11d. Food Expenditures

	France		Hungary		Israel		Mexico		Poland		Taiwan		Russia		Spain		United Kingdom		United States			
	1994	(1)	1994	(1)	1997	(1)	1998	(1)	1995	(1)	1995	(1)	1995	(1)	1990	(1)	1995	(1)	1997 (CE)	(1)	1997 (CE-CIR)	(1)
Gini	0.260	0.003	0.321	0.006	0.276	0.003	0.348	0.004	0.191	0.001	0.166	0.001	0.398	0.007	0.253	0.002	0.256	0.003	0.273	0.002	0.276	0.002
I(0):Mean log-deviation	0.122	0.003	0.325		0.136	0.003	0.221	0.005	0.061	0.001	0.045	0.001	0.300	0.010	0.119	0.003	0.117	0.002	0.133	0.002	0.136	0.002
I(1):Theil entropy	0.115	0.003	0.176	0.008	0.125	0.003	0.206	0.005	0.061	0.001	0.046	0.001	0.269	0.010	0.108	0.002	0.107	0.002	0.130	0.003	0.133	0.003
I(2): 1/2 SCV	0.130	0.005	0.184		0.133	0.004	0.254	0.012	0.069	0.004	0.056	0.001	0.329	0.018	0.122	0.003	0.115	0.003	0.160	0.007	0.164	0.007
Decile ratio/10	0.339	0.005	0.500	0.015	0.384	0.008	0.528	0.012	0.240	0.001	0.220	0.001	0.745	0.028	0.334	0.004	0.345	0.006	0.350	0.004	0.363	0.007
Sample Size	9573		1939		5225		10869		31948		14705		2402		21041		6741		22018		17759	

*** If sum of expenditures > total expenditures then total expenditures=sum of expenditures.The following number of changes were made:**
Spain-3861; UK-641; Hungary-259; Poland-22; Russia-86; Mexico-8.
Additional cases excluded from sample: UK-2 (negative House Expenditures); Hungary-1(=0 Total Net of House);
Hungary-3(missing Food Expenditures).

Note: SCV- Squared Coefficient of Variation
(1)-Standard Deviation of 200 Bootstraps

Table 12. Market Value of Home Inequality Measures with standard deviation of 200 bootstraps for chosen countries (no zeroes)*.

Home Market Value	LIS Data						United States			
	Hungary		Israel		Spain		full sample		CIR sample	
	1994	SD of 200 Bootstraps	1997	SD of 200 Bootstraps	1990	SD of 200 Bootstraps	1997	SD of 200 Bootstraps	1997	SD of 200 Bootstraps
Gini	0.429	0.011	0.343	0.005	0.390	0.004	0.410	0.003	0.407	0.004
I(0):Mean log-deviation	0.345	0.019	0.205	0.006	0.280	0.006	0.340	0.006	0.333	0.007
I(1):Theil entropy	0.338	0.024	0.205	0.007	0.271	0.008	0.300	0.006	0.294	0.006
I(2): 1/2SCV	0.520	0.074	0.262	0.012	0.387	0.027	0.419	0.014	0.400	0.015
Decile ratio/10	0.760	0.057	0.484	0.021	0.650	0.011	0.778	0.017	0.759	0.018
Sample Size (Mkt val)	1435		3689		16622		13641		10905	
Percent of Sample Size	72.04%		70.54%		78.58%		61.41%		61.11%	
Homeowners:										
Sample Size	1583		3689		16622		14008		11247	
Percent of Sample Size	79.50%		70.54%		78.58%		63.06%		63.02%	

SCV-Squared Coefficient of Variation; SD-standard deviation

Note:* Zero values are excluded because v10-market value of owned home variable in Israel-includes both renters and homeowners, hence lots of zeroes; in Hungary- includes only homeowners, but with zeroes; in Spain- includes only homeowners with v10 gt 0

CIR-Complete Income Reporters

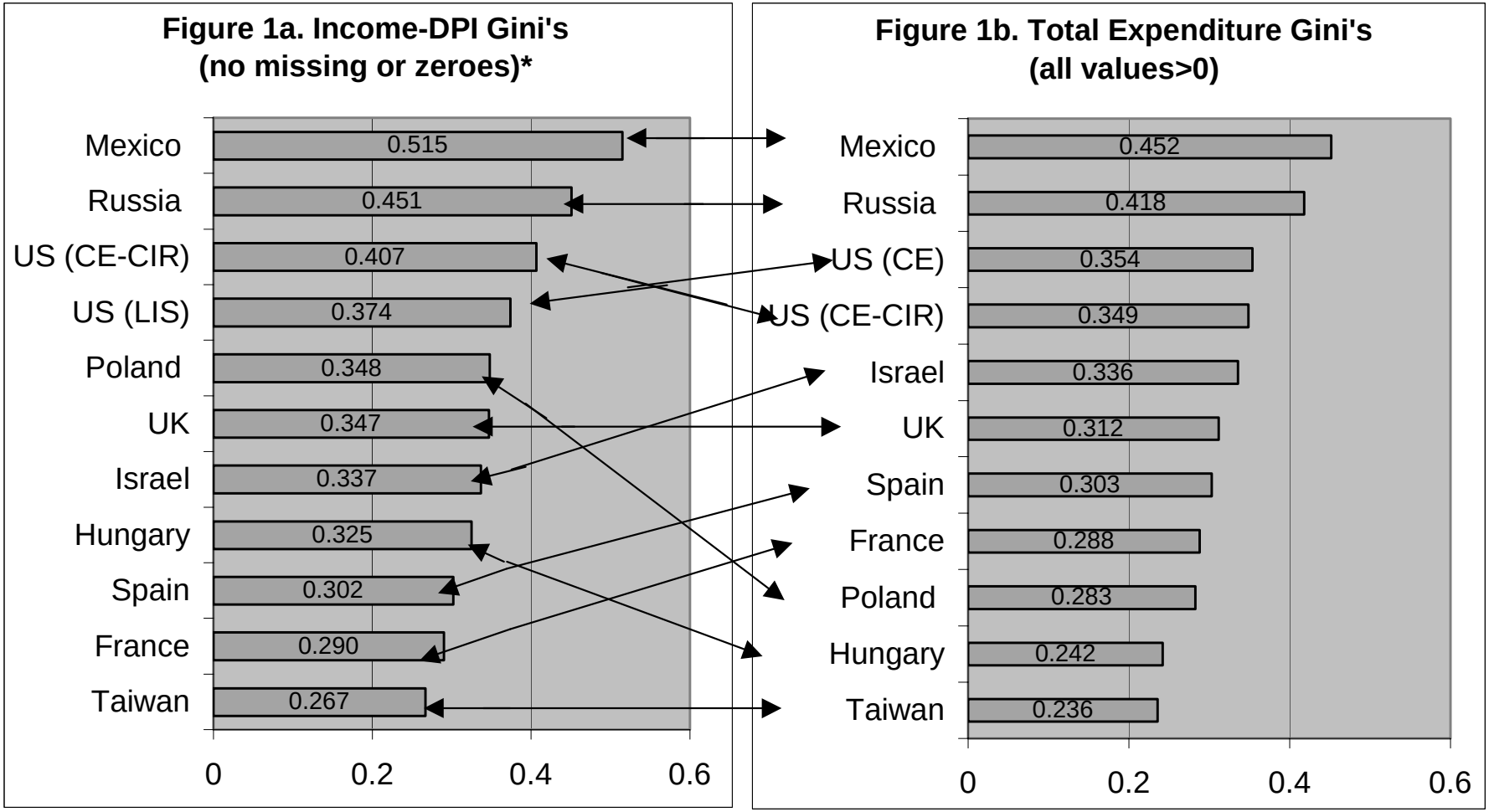
CIR Sample for U.S. restricted to DPI>0 and CIR=1

Table 13. Sen's Welfare Index per equivalent adult for chosen countries by region in 1996 USD - PPP adjusted.*

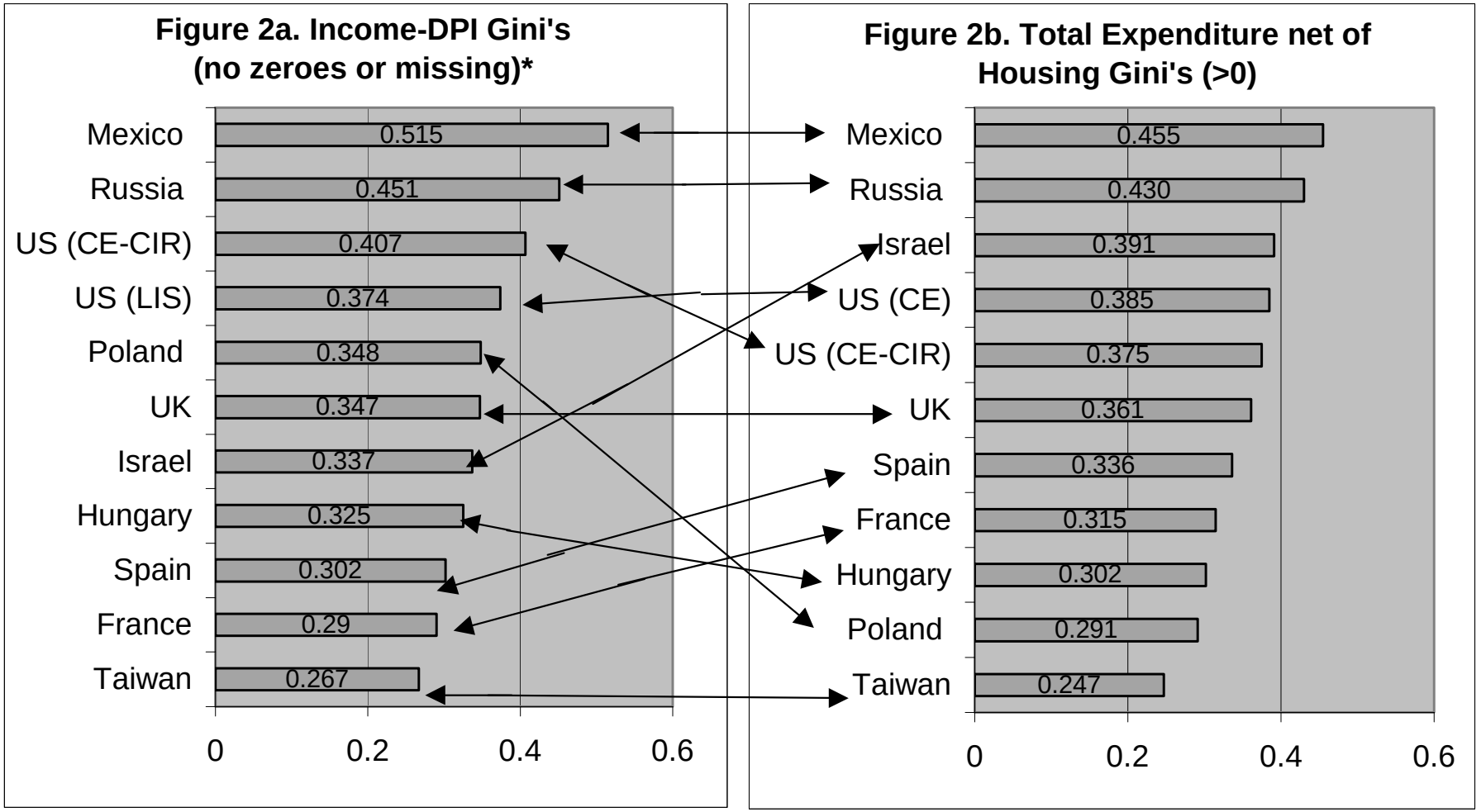
	France	Spain	United Kingdom	Hungary	Poland	Mexico	United States		
	1994	1990	1995	1994	1995	1998	1997	1997 (CE)	1997 (CE-CIR)
Income	$11,229	$7,740	$10,437	$4,626	$3,368	$2,199	$15,473	$12,408	$13,992
Expenditures:									
Total	$12,507	$9,639	$10,828	$4,130	$3,952	$2,875		$13,732	$14,234
Net of Housing	$9,280	$6,967	$8,141	$2,625	$3,301	$2,273		$8,574	$9,081
Housing	$2,427	$1,902	$2,027	$1,171	$438	$490		$4,404	$4,426
Food	$2,768	$2,517	$2,188	$1,603	$1,714	$1,073		$1,692	$1,679
Home Value		$26,704		$19,014				$41,299	$41,045

Note: All zeroes are dropped since unable to distinguish between missing and actual zeroes.
CIR-Complete Income Reporters
Market home value only for those with positive values.

* For Israel, Russia, and Taiwan PPPs from the Penn World Tables were used in a given year.
Due to doubts regarding the comparability of adjustments we have omitted them from the welfare analysis.
Results are available from the authors upon request.



*It is impossible to distinguish between actual zero incomes and missing values in all LIS datasets we use, except for Hungary. As a result we exclude all zero incomes.



*It is impossible to distinguish between actual zero incomes and missing values in all LIS datasets we use, except for Hungary. As a result we exclude all zero incomes.

APPENDICES

Appendix A

Much work using expenditures as a measure of economic well-being has been conducted, though most studies have focused on individual countries. Examples of these studies follow. For Canada see Pendakur (1988). For Australia, see Barrett, Crossley, and Worswick (2000). For Portugal, see Goodman and Webb (1995). For Spain, see Del Rio and Ruiz-Castillo (2001), Sastre (1999) and Gouveia and Tavares (1995). For the UK, see Deaton and Paxson (1994). For the U.S., see Cutler and Katz (1992), Garner (1993), and Johnson and Shipp (1997). For the Czech and Slovak Republics, see Garner (1998) and Garner et al (1995). For developing countries, see Woden (1999) concerning Bangladesh, and Deaton and Paxon (1994) for Taiwan, De Vos and Zaidi (1997) examined household budget data in their study of poverty in member states of the European Community. Garner, Ruiz-Castillo, and Sastres (2002) use expenditure data to compare inequality in Spain and the U.S.

Appendix B

Definition of Household

> ***Hungary.*** A household is composed of all persons living under the same roof, sharing income and expenditures.
>
> ***Israel.*** A group of person sharing the same dwelling most days of the week and having a common budget of expenditures on food. A household includes members who are soldiers or children studying in boarding schools.
>
> ***Poland.*** A household includes a single or unrelated person, or two or more persons that are related to each other and also unrelated people living together and (at least partly) sharing their incomes. Two or more families living together but not sharing their incomes are treated as different households. Persons absent due to work-related reasons are considered members of a household as far as they contribute to the household budget. Children attending school and living in dormitories or boarding schools, persons in military service/installations, in prison, nursing homes, etc., are not

considered as members of the household. Persons sharing a house/apartment are considered as members of separate households. Servants/domestic personnel are neither considered as members of the household they are working for, nor as a separate household. Also students temporarily living in the household are not considered as members.

Spain. A household is considered to be a group of persons sharing a dwelling (or part of it) and sharing a common budget. The definition does not include independent households living in institutions, even if they have expenditure autonomy. A person is considered a member of the household if he or she does not live in another dwelling and: (1) is present in the dwelling at least the day of the interview; (2) is economically dependent of the household budget; (3) is present at the dwelling at least three months within the six months before the interview took place (three of the 12 previous months the person is considered to be the head of the household). Persons fulfilling the first and second condition, although usually staying at another dwelling, are considered to be members of the household. Exceptions are guests (contributing or not to the household budget) and domestic workers.

United Kingdom. A household comprises one person living alone or a group of people living at the same address having meals prepared together and with common housekeeping. Resident domestic servants are included. Members of the household are not necessarily related by blood or marriage.

United States (CE). A consumer unit (not a household) comprises either: all members of a particular household who are related by blood, marriage, adoption, or other legal arrangements; a person living alone or sharing a household with others or living as a roomer in a private home or lodging house or in permanent living quarters in a hotel or lodging house or in permanent living quarters in a hotel or motel, but who is financially independent; or two or more persons living together who use their incomes to make joint expenditure decisions. The three major expense categories, housing, food, and other living expenses determine financial independence.

To be considered financially independent, at least two of the three major expense categories have to be provided entirely, or in part, by the respondent.

United States (CPS). A household consists of all the persons who occupy a house, an apartment, or other group of rooms, or a room, which constitutes a housing unit. A group of rooms or a single room is regarded as a housing unit when it is occupied as a separate living quarters that is, when the occupants do not live and eat with any other person in the structure, and when there is direct access from the outside or through a common hall. The count of households excludes persons living in group quarters, such as rooming houses, military barracks, and institutions. Inmates of institutions (mental hospitals, rest homes, correctional institutions, etc.) are not included in the survey.

Appendix Table 1. Total Expenditures

	France	Hungary	Israel	Mexico	Poland	ROC-Taiwan	Russia	Spain	United Kingdom	United States
	1994	1994	1997	1998	1995	1995	1995	1990	1995	1997 (CE-CIR)
Income and Total Expenditures	0.642	0.538	0.839	0.688	0.504	0.659	0.453	0.446	0.557	0.659
Income and Market Value >0		0.247	0.451					0.333		0.479
Income and Market Value (1)		0.262	0.419					0.261		0.488
Total Expenditures and Market Value >0		0.306	0.500					0.398		0.532
Total Expenditures and Market Value (1)		0.290	0.471					0.314		0.530

(1)-includes homeowners with positve market value and renters with zeroes.
CIR- Complete Income Reporters