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The Levy Institute Measure of Economic Well-Being, France, 1989 and 2000

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Abstract

We construct estimates of the Levy Institute Measure of Economic Well-Being for France for the years 1989 and 2000. We also estimate the standard measure of disposable cash income (DI) from the same data sources. We analyze overall trends in the level and distribution of household well-being using both measures for France as a whole and for subgroups of the French population. The average French household experienced a slower rate of growth in LIMEW than DI over the period. A substantial portion of the growth in well-being for the middle quintile was a result of increases in net government expenditures and income from wealth. We also found that the well-being of families headed by single females relative to married couples deteriorated much more, while the well-being of households headed by the elderly relative to households headed by the nonelderly improved much more than indicated by the standard measure of disposable income. The conventional measure indicates that a steep decline in economic inequality took place between 1989 and 2000, while our measure indicates no such change. We argue that these outcomes can be traced to the difference in the treatment of the role of wealth in shaping economic inequality. Our measure also indicates that, on balance, government expenditures and taxes did not have an inequality-reducing effect in France for both years. This is, again, contrary to conventional wisdom.

Keywords: Levy Institute Measure of Economic Well-being (LIMEW); France; Economic Well-Being; Economic Inequality; Household Income Measures

JEL Classifications: D31, D63, P17

1 INTRODUCTION

This paper describes the construction of the Levy Institute Measure of Economic Well-Being (LIMEW) for France. We will also analyze the level and distribution of economic well-being using the LIMEW, as well as the conventional measures. This is particularly interesting because the LIMEW is a more comprehensive measure of households' command over resources than the conventional measures of disposable income. LIMEW includes estimates of public consumption and household production, components that are excluded in most available measures of economic well-being. It also includes estimates of long-run benefits from the ownership of wealth (other than homes) in the form of an imputed lifetime annuity, a procedure that, in our view, is superior to considering only current income from assets.

No single survey on households provides the information required to construct the LIMEW. As a result, our approach was to use the *Enquéte Budget de Famille* (BDF) as the basic sample and supplement it with data from a variety of sources.[1] An overview of the estimation process is provided in Table 1. The details are discussed in the subsequent sections and the appendices.

2 COMPONENTS OF LIMEW

The LIMEW is constructed as the sum of the following components (see Table 1): base money income (line 10); income from wealth (lines 12 through 17); net government expenditures (both cash and noncash transfers and public consumption, net of taxes, lines 18 through 24); and household production (line 26).

Base money income is defined as gross money income (MI) *less* the sum of property income (interest, dividends, and rents) and government cash transfers (e.g., basic state pension). The rationale for deducting these two items at this stage is to avoid double-counting because we do include our own estimates of government transfers and income from wealth (as discussed below). Earnings make up the overwhelming portion of base money income. The remainder consists of occupational pensions and other small items.

[1] The data files used in the study are described in detail later in the paper.

The second component is imputed income from the household's wealth holdings. MI includes property income, the sum of interest, dividends, and rent. From our perspective, this is an incomplete measure of the economic well-being derived from the ownership of assets. Owner-occupied housing yields services to their owners over many years, thereby freeing up resources otherwise spent on housing. Financial assets can, under normal conditions, be a source of economic security in addition to property-type income.

In measuring the economic well-being from wealth holdings, it is useful to distinguish between owner-occupied homes and other forms of wealth (Wolff and Zacharias 2009). Housing is a universal need and homeownership frees the owner from the obligation of paying rent, leaving an equivalent amount of resources for consumption and asset accumulation. Hence, benefits from owner-occupied housing are reckoned in terms of the replacement cost of the services derived from it (i.e., a rental equivalent).[2] We estimate the benefits from nonhome assets (real estate excluding homes, liquid assets, and financial assets) using a lifetime annuity method.[3] We calculate an annuity based on a given amount of wealth, an interest rate, and life expectancy. The annuity is the same for the remaining life of the wealth holder and the terminal wealth is assumed to be zero (in the case of households with multiple adults, we use the maximum of the life expectancy of the head of household and spouse in the annuity formula). Moreover, in our method, we account for differences in portfolio composition across households. Instead of using a single interest rate for all assets, we use a weighted average of asset-specific and historic real rates of return,[4] where the weights are the proportions of the different assets in a household's total nonhome assets. The burden of liabilities is also captured by an analogous procedure that annuitizes the value of debt, with the rate of inflation playing the role of the interest rate in the procedure.

The third component is net government expenditures—the difference between government expenditures incurred on behalf of households and taxes paid by households (Wolff

[2] This is consistent with the approach adopted in the US national accounts.

[3] This method gives a better indication of resource availability on a sustainable basis over the expected lifetime than the standard bond-coupon method. The latter simply applies a uniform interest rate to the value of nonhome wealth. It thereby assumes away differences in overall rates of return for individual households ascribable to differences in household portfolios. It also assumes that the amount of wealth remains unchanged over the expected (conditional) lifetime of the wealth holder.

[4] The rate of return used in our procedure is real total return (the sum of the change in capital value and income from the asset, adjusted for inflation). For example, for stocks, the total real return would be the inflation-adjusted sum of the change in stock prices plus dividend yields.

and Zacharias 2007). Our approach to determine expenditures and taxes is based on the social-accounting approach (Hicks 1946; Lakin 2002: 43-6). Government expenditures included in the LIMEW are cash transfers, noncash transfers, and public consumption. Government cash transfers are treated as part of the money income of the recipients. In the case of government noncash transfers, our approach is to distribute the appropriate actual cost incurred by the government among recipients of the benefit.[5] A potential alternative method of valuation is the so-called fungible-value method that is based on the argument that the income value for the recipient of a given noncash transfer is, on average, less than the actual cost incurred by the government in providing that benefit (see, for example, Canberra Group 2001: 24, 65). This valuation method involves estimating how much the household could have paid for the medical benefit, after meeting its expenditures on basic items such as food and clothing, with the maximum payment for the medical benefit set equal to the average cost incurred by the government.

We do not use the fungible-value approach because of its implication that recipients with income below the minimum threshold receive no benefit from the service (like healthcare). This implication is inconsistent with our goal of measuring the household's access to or command over products. Further, unlike the social-accounting method, the fungible-value method would not yield the actual total government expenditure when aggregated across recipients. Such a feature is incompatible with our goal of estimating net government expenditures using a consistent methodology.

The other type of government expenditure that we include in the LIMEW is public consumption. We begin with a detailed functional classification of government expenditures. We then exclude certain items because they fail to satisfy the general criterion of increasing the household's access to goods or services. These items generally form part of the social overhead (e.g., national defense) and do not lend themselves to a market substitute. Other expenditures, such as transportation, are allocated only in part to households because part of the expenditure is also incurred on behalf of the business sector. The household sector's share in such expenditures can be estimated on the basis of information regarding its utilization (for example, miles driven

[5] In the case of medical benefits, the relevant cost is the "insurance value" differentiated by risk classes.

by households and businesses). The remaining expenditures (such as health) are allocated fully to households.

In the second stage, the expenditures for each functional category are distributed among households. The distribution procedures followed by us build on earlier studies employing the government-cost approach (e.g., Ruggles and Higgins 1981; Wolff and Zacharias 2007). Some expenditures, such as education, highways, and water and sewerage, are distributed on the basis of estimated patterns of utilization or consumption, while others such as public health, fire, and police are distributed equally among the relevant population.

The third part of net government expenditures is taxes. Our objective is to determine the actual tax payments made by households, consistent with the government-cost approach. In general, therefore, we do not consider tax incidence in our analysis. Taxes consist of personal income taxes, property taxes, payroll taxes (employee portion), and consumption taxes. Taxes on corporate profits, on business-owned property, and on other businesses, as well as nontax payments, are not allocated to the household sector because they are paid directly by the business sector.

The fourth component of LIMEW is the imputed value of household production. Three broad categories of unpaid activities are included in the definition of household production: (1) core production activities, such as cooking and cleaning; (2) procurement activities, such as shopping for groceries and for clothing; and (3) care activities, such as caring for babies and reading to children. These activities are considered as "production," since they can be assigned, generally, to third parties apart from the person who performs them, although third parties are *not* always a perfect substitute for the person, especially for the third activity.

Our strategy for imputing the value of household production is to value the amount of time spent by individuals on the basis of its replacement cost as indicated by the average earnings of domestic servants or household employees (Kuznets, Epstein, and Jenks 1941: 432-433; Landefeld and McCulla 2000). Research suggests that there are significant differences among households in the quality and composition of the "outputs" of household production, as well as the efficiency of housework (National Research Council 2005: ch. 3). The differentials are correlated with household-level characteristics (such as wealth) and characteristics of household members (such as the influence of parental education on childrearing practices). Therefore, we modify the replacement-cost procedure and apply to the average replacement cost a discount or premium that depends on how the individual (whose time is being valued) ranks in

terms of a performance index. Ideally, the performance index should account for all the factors relevant in determining differentials in household production and the weights of the factors should be derived from a full-fledged multivariate analysis. Given the absence of such research findings, we incorporated three key factors that affect efficiency and quality differentials—household income, educational attainment, and time availability—with equal weights attached to each.

3 ESTIMATING LIMEW

The estimation procedure consists of two main steps. In the first step, a core synthetic microdata file is created that contains the various sources of money income, various components of household wealth, and time spent on household production activities. This step involves the statistical matching of an income and demographic survey with a wealth survey and a time use survey. In the next step, information from a variety of sources (administrative data, national accounts, etc.) are utilized, in conjunction with the variables contained in the income survey to create estimates of government transfers, taxes, public consumption, and household production.

3.1 Statistical Matching

The surveys are combined to create the core synthetic file using constrained statistical matching. The basic idea behind the technique is to transfer information from one survey (the "donor file") to another (the "recipient file"). Such information is not contained in the recipient file but is necessary for research purposes. Each individual record in the recipient file is matched with a record in the donor file, where a match represents a similar record, based on several common variables in both files. The variables are hierarchically organized to create matching cells for the matching procedure. Some of these variables are used as strata variables, i.e., categorical variables that we consider to be of the greatest importance in designing the match and which we therefore use to restrict the records that can be matched between the two files. For example, if we use sex and employment status as strata variables, this would mean that we would match only individuals of the same sex and employment status. Within the strata, we use a number of common variables of secondary importance as match variables.

The matching is performed on the basis of the estimated propensity scores derived from the strata and match variables. For every recipient in the recipient file, an observation in the

donor file is matched with the same or nearest neighbor values of propensity scores. In this match, a penalty weight is assigned to the distance function according to the size and ranking of the coefficients of strata variables. The quality of match is evaluated by comparing the marginal and joint distributions of the variable of interest in the donor file and the statistically matched file (Kum and Masterson 2010).

3.1.1 Matching Wealth Surveys

The matching unit for the wealth match (and the unit of analysis for the LIMEW) is the household. The basic sample for the 1989 and 2000 LIMEW estimates are the public-use files for 1989–1990 and 2000–01 rounds of the *Enquête Budget de Famille* (BDF), produced by the Institute National de la Statistique et des Études Économiques' (INSEE). The BDF files have records for 9,038 and 10,305 households, respectively, in 1989 and 2000. The source data for household wealth are the 1992 *Enquête sur les Actifs Financiers* (EAF) for 1989 and the 2003-2004 *Enquête Patrimoine* (PAT) for 2000. The public-use version of the files contained, respectively, 9,530 and 9,692 households in 1989 and 2000.

Several of the income and wealth variables in the wealth surveys were processed before matching to convert categorical variables into continuous values. In these cases, we replaced those above the median category with a random draw from a Pareto distribution within the record's category range and those below the median category with a random draw from a uniform distribution. Some of the key variables of interest to us also had missing values in the wealth surveys.[6] We dealt with this problem by using the method of multiple imputation with chained equations. This resulted in creating five replicates for each original household record.

In order to perform a successful match, the candidate data sets must be well-aligned in the strata variables used in the match procedure. For the wealth match, strata variables are homeownership, age of the household head, educational achievement of the household head, family type and household income. Since the recipient and donor files are representative samples and not too far apart in time, we can expect them to be well-aligned. This expectation was borne out for most of the key demographic variables used in our matching procedure. A more significant problem was the inadequate alignment of household income in the surveys. For

[6] Variables with missing values were: home ownership, dwelling type, household income class, home value, and most of the asset value variables.

the 1989 match, we found that the lower and higher ends of the income distribution made up a smaller proportion of the wealth sample (EAF) than in the sample of the income and demographic survey (BDF). The opposite pattern was prevalent for the 2000 match because the the upper and lower income categories are over-represented in the PAT, while the middle income categories are under-represented, with respect to the BDF (see appendix A for details).

Overall, the quality of the matches was good. It has its limitations, especially in terms of the income categories (due, once again, to the mismatch of the income variables in the two surveys that we noted above). But the overall distribution is transferred with remarkable accuracy, and the distributions within even small subgroups are transferred with good precision (see appendix A for details).

3.1.2 Matching Time Use Surveys

The source data for time spent on household production activities was the 1985 and 1999 rounds of the *Enquête Emploi du Temps* (EDT) also carried out by INSEE. While for the wealth match the matching unit is the household, for the time use match we use individuals. We use individual records from the public-use files for both surveys, excluding those living in group quarters or in the armed forces. Since the EDT covers individuals 15 years old and above, we discard younger individuals from the BDF file. After the exclusions, the number of individuals in the time-use surveys for 1985 and 1999 were, respectively 16,047 and 15,446. The 1999 EDT had missing values for household income, which we replaced by the method of multiple imputation with hot-decking. The records from the time use surveys were matched to 19,293 BDF individual records in 1989 and 20,664 in 2005.

For the time use match, the strata variables are sex, parental status, employment status, marital status, and spouse's employment status. The alignment between the two sources of data (i.e., BDF and time use survey) was generally very good in both years, except some misalignment for marital status in 1989 (the proportion of married individuals was higher in the BDF) and for parental status in 2000 (the proportion of parents was smaller in the BDF). Just as we found in the case of matches with wealth data, the quality of the matches with time use data was good. And, in a similar vein, some limitations also should be noted, especially in terms of the marital and parental status categories due to the data misalignment problems noted above. However, even in these cases, the actual deviations between the matched and original data were quite small in terms of summary measures. The overall distribution is carried over from the

donor to the recipient file with a great deal of accuracy, and the distributions within even small subgroups, such as female parent employees, are transferred fairly precisely (see appendix B for details).

3.2 Income from Wealth

We divide net worth into five classes of assets and two types of liabilities. The asset classes are primary residence, other real estate net of debt and business equity, liquid assets, financial assets, and retirement assets. The first asset is represented by the gross value of owner-occupied housing. The second component consists mainly of equity in real estate (other than the principal residence), equity in businesses, and nonfinancial assets (excluding consumer durables). Liquid assets comprise mainly of cash and demand deposits; time and savings deposits; and, retirement demand-saving accounts. Financial assets are made up principally of government bonds, corporate bonds, foreign bonds, other financial securities, corporate stock and mutual funds. Information on defined-benefit retirement assets was available only in the 1992 wealth survey; we include it in our wealth calculations for 1989. However, because they were a small part of net worth in 1992 (under 3 percent) it is unlikely that their omission in the later year would render any notable bias to our estimates. Liabilities consist of: (a) mortgage debt (including equity loans and lines of credit) on owner-occupied housing; and, (b) all other debt such as auto and credit card loans (exclusive of mortgages on other property, which are subtracted from the value of that property in the second asset class).

Income from wealth is divided into two components, which are estimated using different methods. The income from home wealth component is calculated by taking the share of imputed rent (from the national accounts)[7] proportional to the household's share of national holdings of primary residential housing and subtracting the annuitized value of mortgages on the primary residence. We calculated the income from nonhome wealth component by annuitizing the household's nonhome asset holdings with separate rates of return for each asset type and subtracting the annuitized value of other debt. The total real rate of return of every other wealth component is the average of annual rates over a relatively long period of time, varying from 42

[7] The amount of imputed rent for 1989 and 2000 were, respectively, €54.2 and €102.3 billion. These amounts were found in the series "Imputed rentals for housing (COICOP)" published by Eurostat and available online at: http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database. Accessed on November 24, 2010. We are grateful to Ramzi Hadji for providing us with the estimates.

to 47 years, depending on the asset (see Table 2 for details). The total rates of return data we use are inclusive of both the capital gains and the income generated by the assets. The average rates of return by asset type were estimated mostly from the data on asset holdings and interest rates published by *La banque de France*, unless otherwise noted.[8] The annual nominal rates of return were also used to adjust for the discrepancy between the years of the wealth surveys and BDF. The calculation for income from wealth is:

$$p \equiv m + a$$
$$m = \left(M \frac{h}{H} \right) - \left(d \frac{r_d}{1-(1+r_d)^{-t}} \right)$$
$$a = \sum_j w_j \frac{r_j}{1-(1+r_j)^{-t}}$$
$$t = f(\text{age, sex})$$

In which p is income from wealth, m is imputed rent, d is mortgage debt, a is annuity, M is aggregate imputed rent, h is gross value of home, H is aggregate value of homes, w is nonhome net worth component, r is rate of return, and t is remaining years of life. The data for the remaining years of life were derived from *Espérance de vie par age et region* tables published by the INSEE for 1989 and 2000.[9]

As noted above (section 3.1.1), the 1989 BDF was matched to the 1992 wealth survey. The amounts of wealth reported in the survey was "deflated" to 1989 levels, using the nominal rates of return for the intervening years. A similar procedure was also carried out for the match between the 2000 BDF and 2004 wealth survey. The annuity calculations described above were carried out after making the adjustments.

Table 3 shows the average values for the major assets and debts, as well as the estimated income from each (values are in 2000 PPP dollars).[10] Looking at the stocks first, we can see that

[8] See the notes to Table 2. We are grateful to Georges Menahem for providing some of the information required for these estimates.
[9] We are grateful to Ramzi Hadji for providing us with the data.
[10] All monetary values in this report are in 2000 PPP dollars. We converted the nominal amounts in 1989 to Euros using the commonly used rate of 6.56 francs per euro. The nominal euro amounts were then converted into "real" 2000 amounts with the aid of the implicit deflator for actual individual consumption (inflation factor of 1.201). Values for both years were converted into 2000 PPP dollars using the PPP for actual individual consumption (at the rate of 0.8846 Euros per dollar).

average net worth rose by 41 percent as assets grew and debts declined. Nonhome assets increased significantly faster than homes, resulting in a fall in the latter's share in total assets from 53 to 48 percent between 1989 and 2000. The coverage of financial assets is much more detailed in the 2004 survey as compared to the 1994 survey. An unknown part of the portfolio shift could be due to this factor. Income from wealth also rose, albeit at a much faster rate of 63 percent. Turning to flows, we can see that income from wealth also rose, albeit at a much faster rate than net worth (63 versus 41 percent). Reflecting the change in the composition of stocks, the split between income from home and nonhome wealth also underwent a change over the period as the share of the latter rose from 50 to 55 percent between 1989 and 2000.

3.3 Government Transfers

Government transfers are categorized into cash benefits and in-kind benefits. The BDF contains household-level data on amount of cash transfers and individual-level data on program participation. We group the available cash transfer categories according to the eligibility rules of the programs.[11] We align weighted sums for cash transfer items with national accounts from The OECD Social Expenditure Database (SOCX), which has been developed by OECD in order to provide internationally comparable statistics on public and mandatory and voluntary private social expenditure at program level.[12] The SOCX covers 33 OECD countries and Estonia for the period 1980-2007 including France.[13]

Total cash transfers per household went up by 21 percent from $8,595 to $10,383 between 1989 and 2000 (Table 4). Old-age cash benefits made up over a half of total cash transfers in 1989 and about 58 percent in 2000, reflecting their relatively faster growth of 34

[11]The level of detail available in the BDF regarding cash transfers improved considerably between 1989 and 2000. In 1989, we have only three variables to measure cash transfers: The first cash transfer variable contains transfer amounts of unemployment and early retirement benefit programs. The second cash transfer variable contains transfer amounts associated with old age programs including retirement pensions, supplementary fund, minimum old age assistance to elderly, veteran's pension, and victim of war disablement pension. The third variable summarizes all other cash transfer programs including family allowances, maternity and parental leave, incapacity and sickness benefits, housing benefits, and other social assistance. In 2000, we have 24 variables to measure cash benefits which we grouped into seven categories including old age benefits, survivors' benefits, incapacity and sickness benefits, family allowances, maternity and parental leave, unemployment benefits and housing benefits.

[12] Our alignment procedure is simply to scale up the totals in the microdata to the benchmark aggregates. No attempt was made to account for under-reporting or mis-reporting.

[13] The OECD Social Expenditure (SOCX) contains disaggregated data for each program. Using the disaggregated data, we exclude lump sum benefits, specific benefits to government employees, grants and subsidies to employers. Also we do not include expenditures for temporary jobs for unemployed and youth in our alignment as these transfers will likely be reported as salary income in BDF data and including them would result double counting.

percent. On the other hand, the second largest cash benefits program, viz., unemployment compensation, saw a decline in its share of total cash transfers (13 to 10 percent), because it actually declined by roughly 6 percent between 1989 and 2000. Expenditures on active labor market programs constitute a relatively small part of cash transfers and its share in total cash transfers remained stable at 3 percent between the two years.[14]

Other cash transfers including survivors' benefits, incapacity and sickness benefits, family allowances, maternity and parental leave, and housing expenditures are bundled into one variable in BDF 1989. As a result, we aligned the total value of this variable in the BDF to the combined expenditures for these transfer items in the SOCX for 1989. BDF 2000, on the other hand, do have separate variables for each of these transfer items and expenditures for these transfer items were aligned separately. Other cash transfers increased in tandem with overall cash transfers over the period and constituted roughly 30 percent of all government cash transfers in both years.

In-kind benefits include residential care for old age and disabled, daycare services for families with children, and health expenditures for the whole population. Health care is the second largest transfer program after old-age cash benefits with the cost of $4,742 per household in 2000, up from $4,107 in 1989, a 16 percent increase. However, health care expenditures grew at a slightly slower pace than the rest of government transfers, as its share in government transfers reduced from 31 to 30 percent. We assigned health expenditures to individuals in the BDF using risk classes defined by sex and age. Our estimates of average costs are based on the estimated share of each risk class in total healthcare expenditures. The latter were obtained from the estimates for 1992 and 1997 developed by the IRDES (*Institut de recherche en économie de la santé*).[15] The average cost to the government in each risk class is assigned to each individual in the risk class. The total health expenditures for the household are scaled in such a manner so that when aggregated across all households, the resulting sum will be identical to the total health expenditures in SOCX data.

[14] Active labor market programs include job training, youth measures, and measures for disabled. While active labor programs are listed as cash transfers in SOCX, corresponding variables for amounts received in BDF are not available. As a result, we distribute the total expenditures equally to individuals who are recipients of these programs, i.e. those who seek for a job, participate in job training programs, unemployed youth and working age disabled.

[15] We are grateful to Georges Menahem for providing us with the estimates of average costs of health service by risk class (details are available at: http://www.irdes.fr/Publications/Rapports2001/rap1345.pdf). Age categories for risk groups are those below 2, between age 2 and 9, between age 10 and 19, ten year intervals until age 80, and 80 and above.

In-kind benefits other than health care constituted only about 4 percent of overall spending on transfers and 10 percent of total in-kind benefits. We distributed each of these transfer items on an equal per capita basis to the beneficiaries of relevant cash benefits. The beneficiaries of old-age noncash expenditures were assumed to be recipients of old age cash expenditures. These benefits include residential care and other benefits that target the old age population. The average noncash expenditures on old-age declined sharply between 1989 and 2000 by 61 percent. The beneficiaries of expenditures on the disabled are assumed to be recipients of incapacity and sickness benefits. Just as for old-age noncash benefits, in-kind benefits for the disabled include residential care and other services. Analogous to the noncash expenditures for the elderly, noncash expenditures on the disabled also declined, though at a lower extent of 38 percent between 1989 and 2000. Finally, the beneficiaries of expenditures on families (for daycare and other services) are assumed to be recipients of family noncash benefits. Unlike other categories of noncash benefits, those for families increased dramatically (from a low base of $75 in 1989) by nearly six-fold.

Total government transfers per household went up by 20 percent from $13,175 to $15,798 between 1989 and 2000. The proportions of cash and noncash transfers remained fairly stable, with cash benefits accounting for roughly two-thirds and in-kind benefits for about one-third of total transfers.

3.4 Taxes

We take payroll taxes (employee portion), income taxes, property taxes (on immovable property), and consumption taxes into our accounting of economic well-being.

We used the information provided by the OECD on the French payroll tax system and the annual earnings reported by individuals in the BDF to estimate the employee-portion of payroll taxes.[16] The tax parameters are shown in Table 5. Payroll taxes are usually deducted at source from paychecks or cash benefits. We first calculate the taxable income and then simulate the payroll tax burden of each individual in the BDF using the tax parameters for each year. The parameters are those applicable to non-managers. Managers have a different contribution scheme for retirement. Similarly, the contribution scheme for the self-employed is also different

[16] Annual earnings reported in BDF are net of payroll taxes. We use the tax parameters in order to calculate gross earnings as well as payroll taxes.

from non-managers. However, because information on the separate schemes for managers and self-employed were not available in our source data, we used the available scheme (i.e., for non-managers) for both these groups. The first 19,099 Euros of annual earnings was taxed at a 17.99 percent and the amount between 19,099 and 57,297 Euros was taxed at a 10.89 percent in 1989. Earnings between 57,297 and 76,396 Euros were taxes at 8.97 percent and any earnings above 76,396 were taxed at 6 percent, indicating the regressive nature of payroll taxes. Both rates and allowances went up dramatically in 2000. The first 26,892 Euros of annual earnings was taxes at 21.20 percent while amount between 26,893 and 80,676 Euros was taxed at 17.05 percent in 2000. Consecutively, earnings between 80,676 and 107,568 Euros were taxes at 12.05 percent and any earnings above 107,568 were taxed at 8.45 percent, indicating that payroll taxes became a larger source of tax revenues for France.

Income taxes were derived from the information reported by the respondents in the BDF.[17] In 1989, the amount of last payment and the number of installments paid were reported by the respondents. We multiplied the amount of last payment and the number of installments paid to obtain the total amount of income taxes paid by the household over the year. In 2000, only the amount of last payment was reported. The lack of information about the number of installments does not affect the amount of income taxes included in the LIMEW because we align income taxes to an annual benchmark amount from the national accounts (see below).

Income taxes and payroll taxes in the BDF were aligned to their respective macroeconomic benchmarks in 1989. However, in 2000, we aligned the combined total of income and payroll taxes to its macroeconomic benchmark. Our source for the macroeconomic benchmarks was the OECD Revenue Statistics, *Comparative Tables*.[18] The reason behind combining the income and payroll taxes was that two types of taxes, CSG (*Contribution Sociale Généralisée*) and CRDS (*Contribution au Remboursement de la Dette Socialewere*), were present only in 2000. In the *Comparative Tables*, these taxes are categorized as income taxes and there is no separate total available for them. However, the marginal payroll tax rates that we used for our estimation in the BDF are inclusive of the contributions to the CSG and CRDS.

[17] In contrast, the income tax amounts in the U.S. LIMEW files are those imputed by the Census Bureau using a tax model.

[18] The data is available online at: http://stats.oecd.org/Index.aspx, under: Public Sector, Taxation and Market Regulation > Taxation> Revenue Statistics> Comparative tables> National currency, millions. Accessed on May 18, 2011. The relevant series are: for income taxes, "Taxes on income, profits and capital gains—individuals"(series 1100); and, for payroll taxes, they are the sum of "Social security contributions—individuals"(series 2100) and "Social security contributions—self-employed"(series 2300).

Furthermore, the income tax amount reported by the respondents in the BDF cannot be separated into the CSG/CRDS portion and the rest. In 2000, the combined total of payroll and income taxes in the BDF was 78 percent of their macroeconomic benchmark, while in 1989 it was 73 percent.

Property taxes paid on the main residence are reported by the respondents in the BDF. We aligned the total in the BDF with the total taxes paid by households on immovable property. The latter was obtained from the OECD Revenue Statistics, *Comparative Tables*.[19] In 2000, aggregate property taxes in the BDF were 84 percent of their macroeconomic benchmark, while in 1989 it was 42 percent.

The alignment of payroll, income and property taxes in the BDF with their respective macroeconomic aggregates was accomplished by distributing the discrepancy between the BDF and the macroeconomic aggregates according to the proportion of the BDF aggregate accounted for by each tax unit.

Consumption taxes consist of value-added taxes and other (excise etc.) taxes. We estimated value-added taxes on the basis of expenditures of various types (food, medicines etc.) reported by the respondents in the BDF and statutory tax rates.[20] The tax rates used in the calculations are shown in Table 6, Panel A. The rates were based on the method employed in Forgeot and Starzec (2003). In addition to the value-added tax, there are a number of other indirect taxes on consumption items, especially gasoline, alcohol and tobacco. For these taxes we applied the ratios of other indirect taxes to the TVA by household disposable income decile as indicated in Table 6 (Panel B) below. We did not align consumption taxes with any independent benchmark because such a benchmark was not available.

Table 7 presents our estimates of taxes using the BDF data and the benchmarks from the OECD. On the average, total taxes increased by 42 percent (after adjusting for inflation) from 1989 to reach a level of approximately $13,000 (in 2000 PPP $) in 2000. The structure of taxes remained roughly constant over the period, with income and payroll taxes accounting for nearly 60 percent of total taxes and consumption taxes making up about 35 percent. The remainder consisted of property taxes.

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[19] The data is available online at: http://stats.oecd.org/Index.aspx, under: Public Sector, Taxation and Market Regulation > Taxation> Revenue Statistics> Comparative tables> National currency, millions. Accessed on May 18, 2011. The relevant series is "Recurrent taxes on immovable property—Households" (series 4110).

[20] Denote C as the consumption expenditure and $t$as the tax rate. The amount of tax, T, is calculated as: $T = [C(1+t) - C]/(1+t)$.

3.5 Public Consumption

Our valuation of public consumption is based on the government cost method which equates the amount of income associated with a given public consumption expenditure to the average expenditure that the government incurs for the beneficiary. Estimates of public consumption were constructed in three steps: (1) obtaining total expenditures by function, subfunction, and sub-subfunction[21]; (2) allocating total expenditures between the household sector and other sectors of the economy; and (3) distributing expenditures allocated to the household sector among individual households.

The expenditure definition that we employed for France is the same as that for the U.S., viz., consumption expenditures and gross investment of general government. However, estimates based on this definition were not readily available by function and subfunction for France, forcing us to make some assumptions. Our starting point was the General Government Accounts compiled as part of the National Accounts by the OECD.[22] We calculated, for 1989 and 2000, total (i.e., across all functions) consumption expenditures and gross investment of general government as the sum of employee compensation (GD1P), intermediate consumption (GKIR), gross capital formation (GP5P), and consumption of fixed capital (GP2P) (the series identifiers in the OECD database are shown in parentheses). Ideally, we would have liked a breakdown of these expenditures by function and subfunction for both years; but, unfortunately such data were not available. Our method of getting around this problem differed across the years.

To obtain the 2000 estimates, we calculated the sum of employee compensation (DICG), intermediate consumption (P2CG), and gross capital formation (P5CG) for ten separate functions (the transaction identifiers in the OECD database are shown in parentheses).[23] Estimates of consumption of fixed capital were not available by function in the database. Therefore, we assumed that aggregate consumption of fixed capital (i.e., total across all

[21] For the United States, this step also involved obtaining expenditure by the level of government (federal vs. state and local) and the distribution of state and local expenditures by state, function and subfunction. A comparable procedure could not be carried out for France because of the unavailability of data. However, we did take into some amount of regional disparities in the distribution of education expenditures, as discussed later.

[22] The data are available at http://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE11 (table titled "Main aggregates of general government," Dataset 12.)

[23] The data are available at http://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE11 (table titled "Government expenditures by function," Dataset 11.)

functions) was distributed across functions in the same manner as the sum of employee compensation, intermediate consumption and gross capital formation.[24] This assumption allowed us to obtain the functional breakdown of government consumption expenditures and gross investment.

As mentioned above, the aggregate amount of government consumption expenditures and gross investment for 1989 were calculated from the OECD database. However, functional breakdown of aggregate expenditure were not available for 1989 in the database. Therefore, we estimated the functional breakdown from the National Accounts for France published by the United Nations Statistics Division.[25] However, it should be noted that the functional breakdown published by the U.N. was of government consumption expenditures. In effect, we assumed that the functional breakdown of government consumption expenditures and gross investment in 1989 was the same as that of government consumption expenditures.

For estimating public consumption in a manner comparable to the United States, we needed a finer breakdown of some of the expenditures according to their purpose. We needed to ascertain the expenditures on fire protection and police services—subfunctions of the function "Public order and safety". The expenditures on transportation, agriculture, environment, communication, and energy—subfunctions of the function "Economic Affairs"—had to be estimated separately. Furthermore, within the subfunction of transportation, separate expenditures for road, air, rail and public transit (sub-subfunctions of transportation) were needed. All the amounts required for the detailed subfunctions and sub-subfunctions were estimated from the state budgets of the respective years.[26] The only exceptions were the expenditures on rail and public transit, which were obtained from the 2000 edition of *Comptes des Transports*.[27]

We also needed separate estimates for expenditures on education by level—subfunctions of the function "Education". We calculated the shares of first, second and third levels of education in total education expenditures from the 1989 and 2000 editions of *Repères et*

[24] Aggregate consumption of fixed capital was under 10 percent of total government consumption expenditures and gross investment in 2000.
[25] The data can be downloaded interactively from: http://unstats.un.org/unsd/snaama/Introduction.asp.
[26] We are grateful to Ramzi Hadji for providing us with the estimates from the French budget. The budget documents are available at: http://www.budget.gouv.fr
[27] We did not use the budget for rail and public transit because the only expenditures to be included for them were capital expenditures, given that they are considered as "enterprise functions" rather than functions of general government. (For "enterprise functions" only capital expenditures are included in the expenditures of general government.) The budgets did report capital expenditures for these functions separately.

Références Statistique.[28] These shares were then used to divide the aggregate education expenditure we obtained from the UN and OECD data among the three levels of education.

Once we determined the expenditures by function, we proceeded to allocate the expenditures between the household sector and other sectors.[29] The methodology followed here was similar to that of employed for the United States (Wolff and Zacharias 2007). Two types of assumptions are made here. The first concerns the designation of government expenditures incurred for a particular purpose as not expanding the consumption possibilities of the household sector at all or expand the consumption possibilities of only the household sector. We assumed that the expenditures on general public service, defense, and "other public order and safety "(for example, courts, prisons, etc.) do not expand the amenities available to the households. On the other hand, the expenditures for certain other purposes, such as education, were assumed to be incurred solely on behalf of households.

Intermediate cases are those expenditures that provide services that potentially serve both households and other economic actors (such as businesses or government agencies). The second set of assumptions was made to deal with them. We allocated a portion of these expenditures to the household sector on the basis of assumptions regarding the sector's "cost-responsibility." For example, in the case of expenditures on roads, we assumed that the household sector's share was equal to the share of passenger vehicles in total vehicle miles travelled by all (passenger and non-passenger) vehicles.

The estimates of the functional breakdown of government consumption expenditures and gross investment resulting from the procedure described above are shown in Table 8. Overall, about $170 billion out of a total of $303 billion government consumption and gross investment expenditures were allocated to the household sector in 2000. In our parlance, aggregate public consumption is the amount allocated to the household sector. As a percentage of total expenditures, aggregate public consumption was stable at around 55 percent in 1989 and 2000. Average public consumption (i.e., public consumption per household) grew by 13 percent from 1989 to reach a level of roughly $6,200 in 2000. The distribution of public consumption across the major functions remained fairly constant between the two years (last two columns of Table 8). As in most industrialized countries, education accounts for the lion's share in France (around

[28] We are grateful to Ramzi Hadji for providing us with the estimates.
[29] We are grateful to Ramzi Hadji for providing us with the estimates used in allocating expenditures between the household and other sectors.

60 percent in 2000). This is followed by housing and community services (about 14 percent), economic affairs (about 11 percent), recreation, culture and religion (about 10 percent), and public order and safety (about 5 percent).

The final step in estimating public consumption consists of distributing the expenditures allocated to the household sector among individual households. We attempted to follow the same principles of direct usage and cost responsibility that were employed in splitting total government expenditures between the household and non-household sector. Continuing with the example of roads, we distributed the expenditures allocated to the household sector according to the vehicle miles driven by households. Because the BDF do not include all the information required to make judgments regarding the usage of public services, a number of assumptions had to be made in distributing public consumption among individual households.

The full set of assumptions made regarding the allocation and distribution of public expenditures are presented in Table 9. Sources of data used in deriving the assumptions are also presented in the notes to the Table.

3.6 Valuation of Household Production

As discussed in section 2, we include three broad categories of unpaid activities in the definition of household production: (1) core production activities; (2) procurement activities; and (3) care activities (care of household members). After matching the time use surveys to the BDF in the two benchmark years, we calculate the "performance index", an average of normalized years of education, household income, and time available for each person. We multiply this index by the minimum wage in each benchmark year and use the greater of that result and the minimum wage as the effective wage for household production.[30] We then multiply the effective wage by the hours of household production to produce the value of household production for each person in the household, and then add up the total for each household.

Table 10 shows the per-household values of hours and value of household production. The average value of household production declined among the French households between

[30] The minimum hourly gross wage was $6.13 and $7.25, respectively, in 1989 and 2000 (in 2000 PPP $). We departed from the U.S. methodology of using the average wage for domestic workers in our calculations because the French labor force survey data provides only (net) monthly wages of domestic workers. No information was available on hours worked. This information was deemed to be inadequate to calculate a reliable hourly replacement cost measure.

1989 and 2000 by 3.5 percent. It appears that this was solely due to the sharp decline of 15 percent in the hours spent annually on household production. As shown in the final line of the table, the implicit unit value of household production (value of household production per household by divided by hours of household production per household) actually increased over the period by nearly 14 percent, reflecting the growth in the hourly replacement wage.

4 RESULTS

We now compare LIMEW with the standard measures of economic well-being used in most academic and official studies: disposable income (DI), that is, gross money income minus income and the employee-portion of payroll taxes (see e.g. Council for Employment, Income and Social Cohesion, 2006; OECD 2008).[31] This measure could be constructed in a straightforward fashion as a byproduct of the estimation of LIMEW (see Table 1). However, unlike in LIMEW, the income and payroll taxes were not aligned to their corresponding national accounts aggregates in our estimate of disposable. This is consistent with the standard practice.

Base money income—the amount of income left after deducting government cash transfers and property income from gross money income—is identical in LIMEW and DI. It consists mostly of income from employment. Government cash transfers are also included in both measures, though the amounts in DI are not aligned to their corresponding national accounts aggregates. As discussed before, LIMEW includes imputed income from the household's wealth holdings whereas DI includes current property income. Another important difference between the two measures stems from the fact that the LIMEW includes imputed values of noncash transfers (most importantly, health), public consumption, and household production. The definition of household tax burden is also broader in LIMEW as it includes consumption and property taxes. As we would expect, these differences between the two measures matter substantially for the picture of economic well-being in France during the 1990s. We now turn to compare and contrast the findings based on the alternative measures and explore the proximate sources of their divergence or convergence.

[31] All the results reported here exclude households with negative DI. We decided to drop these households from the analysis because the 1989 BDF file contains some records with what appears to be abnormally large values for income tax payments. The percentage of households with negative DI was 3.1 in 1989 and 0.1 in 2000.

4.1 Overall Population

We start by comparing LIMEW and DI for the overall population (Table 11). As we noted before, all monetary magnitudes are expressed in 2000 PPP dollars. The median value of LIMEW for all households was $45,641 in 1989 and increased to $52,382 in 2000, an increase of nearly 15 percent. Not surprisingly, the median value of DI was much lower at $21,113 in 1989 and $25,229 in 2000, indicating a faster rate of increase than LIMEW at about 20 percent. The median values adjusted by the current, conventional OECD equivalence scale (square root of household size) are shown in Panel B of the table. They also indicate the same pattern: DI values were much lower in both years and the rate of growth was higher for DI. A comparison between the standard measure of overall economic growth, per capita GDP, and measures of personal economic well-being is shown in Panel C of the table. The estimates suggest that the latter grew conspicuously faster than GDP over the period. It is also notable that the average per capita value of LIMEW was higher than per capita GDP in 2000. This is probably a reflection of the inclusion of the value of household production in the LIMEW and its omission in the GDP. Growth in household economic well-being was accompanied by a modest increase (about 100 hours) in the median annual hours of market work (employment) performed by households (Panel D). However, the median values of hours spent on household production and total work (market plus housework) declined over the period by 334 and 663 hours, respectively.

The composition of LIMEW and DI for the overall population is shown in Table 12. Panel A presents mean values of each component. Just as we observed for the median values, the mean values of DI for both years were substantially below that of LIMEW (less than half). This is reflected in the much lower share of base money income in LIMEW compared to DI (Panel B). Among the other components, income from wealth in DI (consisting of current property income) was only about 15 percent of its counterpart in LIMEW (imputed rent and annuitized value of nonhome wealth). As shown in Panel B, the percentage share of this component in the overall measure was also a great deal higher in LIMEW than in DI. Furthermore, while the relative weight of income from wealth remained roughly stable in DI (around 5 percent), its weight in LIMEW increased notably from 12 to 17 percent from 1989 to 2000. Net government expenditures—expenditures incurred for the households less taxes paid by households—were much larger in absolute size in LIMEW than in DI because expenditures on public services and noncash benefits outstripped consumption and property tax payments.

However, the discrepancy in the percentage share of net government expenditures in the measures was considerably smaller than the discrepancy in the share of income from wealth. The share of net government expenditures in LIMEW remained constant at 13 percent in LIMEW, while it declined from 11 to 10 percent between 1989 and 2000 in DI. As shown in the table, the value of household production made up a sizeable portion of LIMEW, although its share in LIMEW declined from 34 percent in 1989 to 28 percent in 2000, reflecting the sharp drop in the annual hours spent on household production by household.

The estimates presented in Panel C provide an accounting breakdown of the growth in DI and LIMEW between 1989 and 2000 among its constituent components. The average values of LIMEW and DI in 2000 were, respectively, 17 and 21 percent higher than in 1989. Given the fairly large size of base money income in the measures, it is not surprising to find that it accounted for 90 percent of the growth in DI and 54 percent of the growth in LIMEW. Income from wealth contributed 45 percent of the growth in LIMEW but only 10 percent of the growth in DI. The much greater role of income from wealth as a driver of growth in LIMEW than in DI is consistent with what we observed earlier regarding the divergence in the share of income from wealth in the two measures. The percentage-point contribution of net government expenditures to growth was nearly zero. Consistent with our finding of a fall in the share and value of household production in LIMEW, this component subtracted 0.7 percentage points from the overall growth in LIMEW. In sum, therefore, it appears that the major difference between the two measures consists of the relative contributions to growth made by income from wealth and base money income. The latter was the principal driver of growth in DI with former playing a small, supporting role; in contrast, in the LIMEW, they both play major, though unequal, roles.

4.2 "Middle-Class" Economic Well-Being

We now turn to a closer look at the third quintile of the LIMEW distribution and compare it to its counterpart in the DI distribution. The change in the mean value of the third quintile's well-being is a reasonable approximation of the change in the overall median well-being that we discussed earlier. Unlike the latter, the former can be decomposed exactly into its constituent parts and such a breakdown can offer some insights about the factors affecting the well-being of the average household (e.g. improved labor market conditions that might be reflected in higher earnings as distinct from increase in government expenditures on public services that might be

reflected in higher net government expenditures).The middle quintile is often defined as the "middle class," and we follow that convention here.[32]

Similar to our finding for the whole population, the average value of DI was only under 50 percent of LIMEW for the middle quintile (Table 13, Panel A). The difference in size is responsible for the much lower share of base money income in LIMEW compared to DI (Panel B). Turning to the other components, we found that income from wealth in DI amounted to only about 10 percent of its counterpart in LIMEW in 1989 and 14 percent in 2000—an outcome that is parallel to what was found for the overall population. In relative terms too, the share of income from wealth in DI is much lower than in LIMEW for the middle quintile, as it was for the overall population (Table 13, Panel B). However, the increase in the share of income from wealth in LIMEW between 1989 and 2000 that we observed for the population appears to have bypassed the middle quintile because the share of income from wealth in its average LIMEW showed only very little change.

The discrepancy between the two measures in the absolute size of net government expenditures for the middle quintile was much smaller than it was for the overall population, though the amount in LIMEW was still higher than in DI by about 41 to 43 percent (depending on the year). Thus, our finding that, for the overall population, expenditures on public services and noncash benefits surpassed consumption and property tax payments also held true for the middle class. As a share of overall economic well-being, net government expenditures were larger for the middle class than for the overall population. The discrepancy between the overall population and middle class was particularly notable for the DI measure. This is because cash transfers accounted for a much larger proportion of the DI of the middle class than it did for the overall population (40 versus 33 percent in 2000) while taxes took a smaller bite out of middle class DI than for the overall population (19 versus 23 percent in 2000). No such difference between the middle class and the overall population was observed in the LIMEW distribution as net government expenditures constituted a similar percentage of LIMEW (13 to 17 percent) in both instances. As shown in the table (Panel B), the value of household production made up a considerable portion of LIMEW, although its share in LIMEW declined from 35 to 32 percent

[32] In general, the household's rank in the distribution will not be the same across the two measures and hence the households classified as middle class will not be the same across the measures.

between 1989 and 2000 as a result of the decrease in the hours spent on household production by household.

Our estimates showed that the average values of LIMEW and DI for their respective middle quintiles in 2000 were, respectively, 15 and 20 percent higher than in 1989 (Panel C). These growth rates are practically identical to what was observed earlier for the change in the median values for the overall population. Base money income accounted for 78 percent of the growth in DI and 62 percent of the growth in LIMEW, proportions that are not too different from what we observed for the overall population. A key difference between the overall population and middle quintile can be found in the contribution of income from wealth to the growth in LIMEW. For the overall population, income from wealth contributed 45 percent of the growth while for the middle quintile it was only 23 percent. For DI middle quintile, we observe that income from wealth contributed similarly around 10 percent of the growth in DI for the overall population as well as for the middle quintile.

The percentage-point contribution of net government expenditures to growth was quite small in the two measures and somewhat larger (especially in the case of DI) than we found for the overall population. The finding regarding household production offers a contrast. For the overall population, we found that this component subtracted 0.7 percentage points from the overall growth in LIMEW while for the middle quintile it added 1.0 percentage points. All told, the LIMEW suggests that income from wealth played a much greater role than indicated by DI and net government expenditures played a much smaller role than indicated by DI in promoting middle class well-being over the period.

4.3 Subgroup Disparities

We next turn to examine disparities among households divided into distinct subgroups based on selected characteristics of the head of the household ("reference person"). The selected characteristics are far from exhaustive and our purpose here is to focus on those that are most frequently employed in understanding subgroup disparities. In each instance, we contrast the findings based on LIMEW and DI.

4.3.1 Differences by Marital Status

We first consider disparities between families[33] differentiated by marital status of the reference person. The estimates of the mean values of LIMEW, its components and DI are shown in Table 14. Supplementary information is provided in Figure 1.

In 1989, families headed by a single female had an average LIMEW that was 82 percent of the average LIMEW for married couple families; the corresponding statistic for families headed by a single male was much lower at 70 percent (Panel B). The relative economic well-being of single-female headed families fell sharply to 70 percent (a fall of 12 percentage points) in 2000; the single-males also suffered the same fate, though their extent of deterioration relative to married couples was quite modest at only 1 percentage point. According to the DI measure, the single females and single males had average values that were, respectively, 75 and 83 percent of the married couples. The estimates of DI for 2000 showed deterioration for single females as their relative DI slipped by 11 percentage points; single males registered a somewhat smaller loss of 1 percentage point in their relative DI.

We now take a closer look at the proximate factors behind the worsening gap in LIMEW between married couples and single females. The four major components of LIMEW are base income (consisting mainly of labor earnings), income from wealth, net government expenditures and household production (see Panel C and Figure 1). In 1989, the gap in base income between the two groups slightly was below the gap in LIMEW. However, in 2000, the gap in base income was only under two-thirds (65 percent) of the difference in LIMEW. To a large extent, this is a reflection of the relatively low labor income of single females and the fact that the married couple households have higher number of earners. On average, single females received only slightly less than 60 percent of the average base income of married couples. The gap in income from wealth was also favored of married couples and the share of this component in the total difference in LIMEW increased notably from 21 to 37 percent between 1989 and 2000. In fact, single females suffered an absolute decline (roughly $600) in their average income from wealth, which, as a percentage of married couples' income from wealth, sank from 68 to 35 percent between 1989 and 2000. As one would expect, the average value of household production was higher for married couples than single females; but, the gap between the two

[33] We exclude households with only one person and households with only unrelated individuals from the definition of "family".

groups in household production did not widen as much as the gap in LIMEW. As a result, the share of household production in the difference in LIMEW between the groups declined from 51 to 34 percent between 1989 and 2000.

Net government expenditure is the only major component of LIMEW for which single females had a higher average than married couples and, therefore, helped to shrink the shortfall in the other components faced by single females. Unfortunately, the extent of contribution made by net government expenditures toward this end declined between 1989 and 2000. This is reflected in the decline in the share of the component in the total difference in LIMEW between the two groups from -71 percent to -36 percent. The main factor behind this was the shift of transfers in favor of married couples: from helping to narrow the gap faced by single females by 6 percent in 1989, it actually contributed to widen the gap by 13 percent in 2000. Underlying this shift was an absolute decline in the amount of transfers (about $830) received by single females. In sum, the estimates suggests that the deterioration in the relative economic well-being of single females between 1989 and 2000 was driven mainly by their growing disadvantage in income from wealth and the unfavorable shift in government transfers.

4.3.2 Differences by Age Group

We next examine the differences in economic well-being of household headed by persons 65 years and older ("elderly") and household headed by persons less than 65 years old ("nonelderly"). The estimates of the mean values of LIMEW, its components and DI are shown in Table 15. Supplementary information is provided in Figure 2.

In 1989, the average LIMEW of the elderly was 73 percent of the average LIMEW of the nonelderly; in 2000, the corresponding statistic was 89 percent (Panel A). A dramatic improvement occurred during the 1990s in the relative economic well-being of the elderly as measured by the LIMEW. The DI measure also indicates improvement over the period, though the extent of improvement was smaller than in LIMEW. The average DI of the elderly rose from 67 percent of the nonelderly in 1989 to 72 percent in 2000. Thus, the elderly-nonelderly gap shrank by 16 percentage points according to LIMEW and only 5 percentage points according to DI.

Among the four major components of LIMEW, the biggest gap was in base income (consisting mainly of labor earnings). This is quite understandable in light of the very low level of labor market participation among the elderly. The gap in base income between the two

groups exceeded the gap in LIMEW in both years by a large margin (see Panel B and Figure 2). However, the share of base income in the difference in LIMEW between the groups was much higher in 2000 than 1989, reflecting both the larger gap in base and the smaller gap in LIMEW in 2000. Due to the higher average number of children and adults among the nonelderly, the average value of hours spent on household production and the value of household production were also higher for them than the elderly. In contrast to base income, the lead of the nonelderly in household production was lower in 2000 than 1989 as their lead in average annual hours declined. Income from wealth was much higher, on the average, for the elderly in both years as a result of their higher average wealth holdings as well as their lower life expectancy which tends to increase the annuitized value of nonhome wealth. As a share of the gap in LIMEW, the gap in income from wealth was only 23 percent in 1989 but 109 percent in 2000. This is partly a reflection of the widening gap in income from wealth between the two groups: the ratio of average income from wealth of the elderly to the nonelderly was 1.64 and 1.83 in 1989 and 2000, respectively.

Net government expenditure was skewed in favor of the elderly even more so than income from wealth and the disparity became wider during the 1990s. On the average, the elderly received a little below four dollars for every dollar received by the nonelderly in 1989; but, they received nearly eight dollars in 2000. The growing gap was also reflected in the substantial increase in the share of the gap in net government expenditure in the difference in LIMEW between the two groups from 67 to 298 percent between 1989 and 2000. Government transfers became increasingly skewed in favor of the elderly and served as the main factor behind the substantial rise in net government expenditures for the elderly vis-à-vis the nonelderly: the share of the gap in transfers in the gap in LIMEW between the two groups increased from 42 to 224 percent between 1989 and 2000.[34] All told, the estimates indicate that the improvement in the economic well-being of the elderly relative to the nonelderly between 1989 and 2000 was mostly a result of expanding government transfers and income from wealth that offset a larger chunk of the gap in base income.

[34] The elderly to nonelderly ratio in average transfers was 1.52 in 1989 and 2.13 in 2000.

4.3.3 Differences by Level of Education

We now focus on the disparities in economic well-being among households headed by persons of varying educational attainment. The following levels of education were used in our analysis: less than high school graduate; high school graduate; some college-level education; and college graduate. To make these categories comparable with the United States, we used the International Standard Classification of Education (ISCED) produced by UNESCO. We mapped our usual U.S. educational attainment categories (less than a high school diploma, high school graduate, some college, college graduate) onto the ISCED for the United States.[35] Then we took the corresponding categories in the French ISCED[36] and applied them to the educational attainment questions in the 1989 and 2001 BDF surveys for France to produce the educational attainment variable. The estimates of the mean values of LIMEW, its components and DI for these educational categories are shown in Table 16. Supplementary information is provided in Figure 3.

The hierarchy of the mean values of LIMEW and DI among the educational groups as one would expect a priori: rising from those with less than high school education to college graduates. In 2000, the average LIMEW of those who did not complete high school was only 67 percent of the average LIMEW of college graduates; the average LIMEW of high school graduates and those with some college education were around 78 percent of college graduates (Panel B). The average LIMEW of each educational group grew pretty much in tandem with one another between 1989 and 2000. According to the DI measure, the disparities among the educational groups were larger, with the least educated receiving only 50 percent of the average DI of college graduates in 2000, while high school graduates and those with some college received, respectively, 66 and 76 percent. Disparities in DI among the educational groups also widened between 1989 and 2000, mainly reflecting the worsening gap in base income between college graduates and the less educated groups.

Apart from net government expenditures, the other three major components of LIMEW—base income, income from wealth and household production—were skewed in favor of the college graduates. For the bottom two educational groups, the shortfall in base income

[35] Downloaded from "http://www.uis.unesco.org/Education/ISCEDMappings/Documents/North America and Western Europe/USA_ISCED_mapping.xls," on June 24, 2011.
[36] Downloaded from "http://www.uis.unesco.org/Education/ISCEDMappings/Documents/North America and Western Europe/France_ISCED_mapping.xls," on June 24, 2011.

was greater than the total gap in LIMEW with respect to college graduates in both years, while for those with some college it was 75 and 83 percent of the difference in LIMEW in 1989 and 2000, respectively (Panel D and Figure 3). The base income of college graduates grew much faster than the lesser educated groups over the period with the exception of those with some college education. The ratios of the other groups' average base income to the average base income of college graduates fell: From 0.33 to 0.28 for those without a high school degree, from 0.59 to 0.57 for those with a high school degree, whereas the ratio went up from 0.69 to 0.71 for those with some college education (Panel B). Apparently, the severity of the decline was inversely related to the level of educational attainment. Income from wealth accounted for a much smaller portion of the gap in LIMEW with respect to college graduates, but, the disparity in income from wealth was much larger than the disparity in base income. In 2000, the ratio of average income from wealth of those without a high school degree to college graduates was only 0.53; the other two groups fared only slightly better in this respect, with ratios of 0.54 (high school graduates) and 0.57 (those with some college). Household production had a share of about 9 to 14 percent of the total difference in LIMEW with respect to college graduates for the three less educated groups in 2000, partly reflecting the relatively smaller disparities in this component among the groups (Panel D).

The gaps in base income, income from wealth, and household production faced by the three less educated groups with respect to college graduates were offset to some extent by net government expenditures. As a share of the total difference in LIMEW with college graduates, net government expenditures were rather high at -84 and -73 percent (in 2000), respectively, for those without a high school degree and high school graduates; they were considerably smaller (-39 percent) for those with some college education (Panel D). Among the four groups, the two least educated groups received more in government expenditure than what they paid in taxes, those with some college were roughly even, and college graduates paid more in taxes than what they received in government expenditures. The average amount of taxes paid by those without a high school degree was only 34 percent of the average of college graduates and the averages for the other two groups were higher at 57 percent (high school graduates) and 70 percent (those with some college) in 2000 (Panel B).

4.4 Inequality

4.4.1 Quintile Shares and Quintile Composition

We begin with a discussion of the shares of aggregate LIMEW received by each quintile and compare the findings to the quintile shares of DI. It should be noted that the quintiles for each measure are defined with respect to that measure's distribution so that, in general, a given quintile of LIMEW and DI will consist of different households. Our estimates for 1989 and 2000 are shown in Table 17.

The shares received by the quintiles were remarkably similar in 2000 for LIMEW and DI. The bottom 20 percent of households in the LIMEW distribution received 7.1 percent of total LIMEW in 2000 whereas households in the next quintile received 12.5 percent. The middle, fourth, and top quintiles of the LIMEW distribution received respectively, 17.6, 23.6, and 39.2 percent. However, in 1989, the quintile shares were quite different between the measures for the bottom and top quintiles. The bottom quintile in the DI distribution received a share of only 5.2 percent while the same quintile in the LIMEW distribution received a share of 7 percent that was the same as that the quintiles in both distributions received in 2000. For the top quintile, the share was 40.9 percent in the DI distribution and 38.3 percent in the LIMEW distribution. Thus, the bottom quintile of the DI distribution gained and the top quintile lost its share of aggregate income between 1989 and 2000, while the top quintile gained 1 percent share in the LIMEW distribution.

The composition of LIMEW by quintiles in 1989 and 2000 are shown in Table 18. Base income was the largest item in both years for all quintiles. In 2000, it constituted 51 percent for the bottom quintile, 43 for the second quintile, 42 percent for the third quintile and 41 percent for the next two quintiles. This represented a large increase from 1989 for the bottom two quintiles when the share of base income in their LIMEW was 41 and 36 percent, respectively, for the bottom and second quintile. The change was in contrast to the top three quintiles where the share of base income showed little or no change between two years.

As a share of LIMEW, income from wealth stayed in the rather narrow range of 10 to 14 percent across the quintiles in 1989. The situation in 2000 was quite different with the share rising substantially for the top quintile by 10 percentage points to reach a level of 24 percent. For the bottom quintile, income from wealth grew in tandem with the rest of their LIMEW and its share stayed at 10 percent in both years. The share of income from wealth in LIMEW

registered only modest gains for the second and third quintiles, while the fourth quintile saw a 3 percentage point gain from 11 to 14 percent.

On average, government expenditures for households outweighed household tax payments in all quintiles in both years. In 1989 the share of net government expenditures in LIMEW was around 14 percent for the whole population and declined to 12 percent in 2000. The bottom quintile's ranking among quintiles in terms of the share of net government expenditures in LIMEW was highest in both years. There was a decline of 2 percentage points (18 to 16 percent) in the share of net government expenditures for the second quintile between 1989 and 2000; a similar decline could also be observed for the top quintile (from 11 to 8 percent). Both the third and fourth quintiles had a share of 14 percent in 2000, which was a one percentage point decline for the third quintile and a one percentage point increase for the fourth quintile.

As a share of LIMEW, the value of household production fell precipitously for the bottom quintile from 29 percent in 1989 to 20 percent in 2000. This was mainly a reflection of 33 percent decline in the hours that they spent on household production over the period. As we observed before (Table 13), hours of household production declined for the overall population between 1989 and 2000. The top four quintiles also displayed the same tendency and as a result the share of household production in their LIMEW also declined, although the extent of the decline was not as dramatic as for the bottom quintile. In 1989, the share of household production for the top four quintiles were in the range of 33 to 35 percent, while in 1989, the range was 27 to 32 percent.

In summary, shares of the bottom two quintiles in aggregate LIMEW remained fairly stable, the next two quintiles experienced a slight decline in the shares, and the top quintile improved its share between 1989 and 2000. Growth in base income was the principal factor driving the growth in well-being for all quintiles. However, its relative weight in accounting for growth was higher for the bottom two quintiles, as evident in the notable increase in the share of base income in LIMEW. Income from wealth increased much faster than the rest of LIMEW for the top quintile and its share in their LIMEW rose substantially. As a share of LIMEW, household production fell for all quintiles, mirroring the decline in the hours spent on household production between 1989 and 2000.

4.4.2 Did Inequality Fall in France over the 1990s?

Estimates of the Gini coefficient for 1989 and 2000 are shown in Table 19. Overall inequality in LIMEW showed little change between the two years. In sharp contrast, the DI measure showed a major decline in inequality. The dissimilarity in the change in inequality also holds for the subset of households that are family households—households of 2 or more persons in which the members are related by blood, marriage/cohabitation or adoption. The divergence between the two measures was starker after the standard equivalence scale adjustment (square root of household size), with the inequality in LIMEW among all households showing an increase of 1.7 Gini points and DI showing a decline of 3.3 Gini points.

For all households, the Gini coefficient for LIMEW and DI were, respectively, 32.3 and 32.8 in 2000, an increase of 0.6 Gini points for LIMEW but a decrease of 3.1 Gini points for DI from 1989. Adjusting the measures by family size lowered the measured level of inequality. The decline was larger for LIMEW because the amounts of certain components of LIMEW, e.g., public education, health, household production, etc., accruing to individual households are directly related to the number of persons in the household. Once household economic well-being is adjusted for household size, the larger households do not appear to be as well-off as before. This is also the main reason for the lower level of inequality when we restrict our attention only to family households, which by definition can only include households of 2 or more persons.

To better understand the differences in the level of inequality in LIMEW and DI, we also conducted a decomposition analysis. In the decomposition, the Gini coefficient is expressed as the weighted sum of the concentration coefficients of each component (e.g., base income) and the weights are the income shares: $G = \sum_{i=1}^{n} k_i s_i$, where G is the Gini coefficient of the measure (say LIMEW), k_i is the concentration coefficient of an individual component of LIMEW (say income from wealth), and s_i is the share of the individual component in aggregate LIMEW (see, Kakwani 1977). The results of the decomposition are shown in Table 20.

The level of inequality in DI can be seen as resulting from two counteracting influences: the positive and large contribution to inequality stemming from base income (primarily consisting of earnings), which exceeded the total amount of inequality in both years, and the negative contribution to inequality due to net government expenditures. In contrast, base income accounts only for roughly 38 percent of the total inequality in LIMEW in 2000, primarily because of the inclusion of household production, which accounts for roughly 28 percent of total

inequality in LIMEW. The share of base income in total inequality tends to be lower in LIMEW also because income from wealth is reckoned as imputed rent plus annuitized value of nonhome wealth in LIMEW rather than as actual property income in DI. Our approach entailed a much larger share of income from wealth in total economic well-being as well as in total inequality. The overall level of inequality is thus the result of the counteracting influences of the positive contributions made by base income, income from wealth, and household production on the one hand, and the negative contribution made by net government expenditures on the other.

The interplay between the components in determining the change in inequality between 1989 and 2000 are displayed in Figure 4. The contribution of base income to inequality declined in both DI and LIMEW, though the extent of the decline was much larger in DI. As indicated by the declining concentration coefficients (Table 20), the distribution of base income became less unequal across both distributions and this was the main factor behind its lower contribution to inequality in 2000 relative to 1989. Contribution made by net government expenditures to inequality also declined in both measures, though, just as with base income, the fall was more pronounced for DI. The inequality in LIMEW was lowered further from its 1989 level by the decline in the contribution made by household production, mirroring mainly the fall in its share of LIMEW that we discussed before. The downward pull on inequality in LIMEW exerted by base income, net government expenditures and household production were offset almost entirely by the notable increase in the contribution made to inequality by income from wealth. In contrast, contribution of income from wealth to inequality hardly changed at all in DI. In turn, the surge in the contribution of income from wealth to inequality in LIMEW between 1989 and 2000 was due to the rise in its income share and its more unequal distribution across the rungs of LIMEW. The latter is reflected in the sharp increase in its concentration coefficient. It also echoes our earlier observation regarding the rising share of income from wealth in the LIMEW of the top quintile. A comparison with the DI measure shows that the concentration coefficient of income from wealth hardly changed over the period and there was only a meager increase in its income share.

It is worthwhile to examine the role of net government expenditures in the inequality in the two measures a little closer because of the usual importance to attached to it as an index of the redistributive effect of government social expenditures and taxation. There was a sharp contrast between DI and LIMEW in this respect. On balance, net government expenditures had an inequality-reducing effect in DI and an inequality-enhancing effect in LIMEW in both 1989

and 2000. For instance, in 2000, net government expenditures added 2.2 Gini points to the inequality in LIMEW, while it subtracted 8.7 Gini points from the inequality in DI.

Since the major portion of the inequality reduction associated with net government expenditures was due to taxes, particularly direct (income and payroll) taxes, it stands to reason that a major part of the difference is attributable to the variation across measures in the distributional impact of taxes (see Figure 5). The lower redistributive impact of taxes in LIMEW was due to the fact the latter includes household production and, to a lesser extent, imputed rent and the annuitized value of nonhome wealth. Both household production and imputed income from wealth are, obviously, not subject to taxation. Their inclusion in LIMEW therefore tends to lower the concentration coefficient of taxes in LIMEW relative to DI (e.g., the concentration coefficient of direct taxes in LIMEW and DI were, respectively, 0.28 and 0.48 in 2000). The inclusion also has the effect of lowering the share of taxes in the overall measure (e.g., the share of direct taxes in LIMEW and DI were, respectively, -0.14 and -0.23 in 2000). In addition to the effect of direct taxes, it also turned out that the inequality-reducing effects of indirect taxes (consumption and property taxes) in LIMEW were not large enough to offset the inequality-enhancing effects of public consumption and noncash transfers.

5 CONCLUSION

In this paper, we constructed and analyzed the level and distribution of economic well-being in France for 1989 and 2000, using the LIMEW as well as the standard measure of disposable income (DI). The LIMEW is a more comprehensive measure of households' command over resources than DI, which is defined as gross money income less direct taxes paid by the households (income taxes and the employee-portion of payroll taxes). Our measure includes a broader estimate of government benefits because we went beyond the DI definition of cash transfers and incorporated government expenditures on noncash benefits (mainly health), and a variety of public services that directly serve the households (e.g. infrastructure, public safety, and public education). We also include in our measure, the value of hours spent on household production, a component that is excluded in DI. Further, we include estimates of long-run benefits from the ownership of wealth (other than homes) in the form of an imputed lifetime annuity, a procedure that, in our view, is superior to considering only current income from assets. We constructed LIMEW and DI for a representative sample of the French population,

and compared and contrasted the measures for the overall population as well as several subpopulations and income groups. Our findings, in general, suggest that the alternative measures differ considerably regarding the picture they offer regarding the level and distribution of well-being in France.

Between 1989 and 2000, the gain in economic well-being enjoyed by the average French household was only 15 percent according to LIMEW, while it was 20 percent according to the DI measure. At least part of the explanation for the slower growth in LIMEW lies in the difference in size: the median value of DI was less than half of the median value of LIMEW in both years. Apart from the differing rates of change, the sources of change in the economic well-being of the middle quintile appeared to be quite different across the measures. Income from wealth accounted for a substantial portion of the total growth in middle-class LIMEW, while most of the growth in the middle quintile of DI was due to the growth in base income (consisting mainly of labor income). Net government expenditures contributed more to the growth in middle class DI than it did for LIMEW. The LIMEW thus suggests that the government played a smaller role in promoting middle-class well-being.

Several important aspects of disparities among population subgroups were also revealed by the LIMEW. The economic well-being of families headed by single females had worsened much more than suggested by the standard DI measure. Income from wealth and government transfers received by the families headed by single females declined absolutely between 1989 and 2000. Our measure also revealed that there was much greater improvement in the well-being of elderly households relative to nonelderly households than indicated by DI. The ratio of elderly to nonelderly average LIMEW shrank by 16 percentage points according to LIMEW and only 5 percentage points according to the corresponding DI statistic. Expanding government transfers and income from wealth that offset a larger chunk of the gap in base income accounted for much of the measured improvement in the relative LIMEW of the elderly. Unlike DI, the LIMEW did not indicate that the growth in economic well-being of households headed by college graduates outstripped the growth experienced by households headed by lesser educated individuals. The relatively faster growth of DI for college graduates was mainly a reflection of the faster growth of their labor income. However, because LIMEW includes a broader definition of government expenditures and household production, the changes in the gaps in these components also influence relative economic well-being. As it turned out, the changes in these

gaps were favorable to the lesser educated households and those changes helped them to overcome the disadvantage stemming from their relatively lower base income.

The LIMEW offered a starkly different picture from DI regarding the change in inequality over the period. In particular, there was practically no change in Gini coefficient for LIMEW while that for DI fell steeply by nearly 3 Gini points. It is indeed on the basis of the latter measure that France has often been characterized by conventional analyses as a country that has experienced declining inequality over the 1990s (see, e.g., OECD 2008: 286). Our decomposition analysis revealed that this "stylized fact" is crucially dependent on neglecting the role of wealth inequality in shaping economic inequality. By our reckoning, the share of income from wealth in overall well-being, especially for those at the top rungs of the LIMEW distribution increased sharply over the period. In fact, it was the higher contribution of income from wealth to inequality in 2000 compared to 1989 that offset the lower contributions of base income and net government expenditures. The difference in the portion of inequality accounted for by income from wealth between LIMEW and DI stems from the fact that DI do not adequately reflect the advantages from wealth ownership, while LIMEW attempts to account for it in the form of an imputed rent and the annuitized value of nonhome wealth.

Our estimates also indicated that there was a sharp difference between LIMEW and DI in terms of the redistributive effect of government social expenditures and taxation. On balance, government expenditures and taxes had an inequality-reducing effect in DI and an inequality-enhancing effect in LIMEW in both 1989 and 2000. The main reason behind the finding is the lower redistributive impact of taxes in LIMEW because it includes household production and, to a lesser extent, imputed rent and the annuitized value of nonhome wealth. Both household production and imputed income from wealth are, obviously, not subject to taxation. In addition to the effect of direct taxes, it also turned out that the inequality-reducing effects of indirect taxes (consumption and property taxes) in LIMEW were not large enough to offset the inequality-enhancing effects of public consumption and noncash transfers.

Several of the findings reported here deserve further scrutiny, a task that we expect to undertake in future work. For example, it would be instructive to examine the trends in France in relation to the trends in the U.S. over the same period, a task that we attempt to perform in a forthcoming companion paper. An unavoidable part of constructing measures of economic well-being is that one needs to choose among assumptions that are arguably equally tenable. For example, it could be argued that the imputed return on home equity is a better measure of the

advantage of homeownership than the imputed rent, our chosen assumption. Indeed, whether alternative assumptions would make any substantive difference in terms of the major findings regarding the level and distribution of economic well-being can only be ascertained via sensitivity analysis. Given the additively decomposable nature of LIMEW, such sensitivity analyses are relatively easier to conduct within our framework.

REFERENCES

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

Council for Employment, Income and Social Cohesion (CERC). 2006. *Times of Change: France 1993-2005*. Paris: Conseil de l'Emploi, des Revenus et de la Cohésion Sociale.

Forgeot, Gérard, and Christophe Starzec. 2003. "L'impact redistributif des impôts indirects en France." Économie Publique 13-2003/2.

Hicks, Ursula K. 1946. "The Terminology of Tax Analysis." *The Economic Journal* 56(221): 38-50.

Kakwani, Nanak C. 1977. "Applications of Lorenz Curves in Economic Analysis." *Econometrica* 45(3): 719-727.

Kum, Hyunsub, and Thomas Neal Masterson. 2010. "Statistical matching using propensity scores: Theory and application to the analysis of the distribution of income and wealth." *Journal of Economic and Social Measurement* 35(3): 177-196.

Kuznets, Simon, Lillian Epstein, and Elizabeth Jenks. 1941. *National Income and Its Composition*, 1919-1938. New York: National Bureau of Economic Research.

Lakin, Caroline. 2002. "The Effects of Taxes and Benefits on Household Income, 2000-01." Social Analysis and Reporting Division, Office for National Statistics, UK Available at: http://www.statistics.gov.uk/.

Landefeld, J Steven, and Stephanie H McCulla. 2000. "Accounting for Nonmarket Household Production within a National Accounts Framework." *Review of Income and Wealth* 46(3): 289-307.

National Research Council. 2005. *Beyond the Market: Designing Nonmarket Accounts for the United States. Panel to Study the Design of Nonmarket Accounts.* K.G. Abraham and C. Mackie (eds.), Committee on National Statistics, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Organization for Economic Cooperation and Development (OECD). 2008. *Growing Unequal? Income Distribution and Poverty in OECD Countries*. Paris: OECD.

Ruggles, P., and M. O'Higgins. 1981. "The distribution of public expenditure among households in the United States." *Review of Income and Wealth* 27(2): 137.

Wolff, Edward N., and Ajit Zacharias. 2007. "The Distributional Consequences of Government Spending and Taxation in the US, 1989 and 2000." *Review of Income and Wealth* 53(4): 692-715.

Wolff, Edward N., and Ajit. Zacharias. (2009). "Household wealth and the measurement of economic well-being in the United States." *Journal of Economic Inequality* 7 (2), 83-115.

TABLES AND FIGURES

Table 1: Estimation of LIMEW for France: Overview

Line no.	Item	Source
1	Money income net of payroll taxes (employee portion)	BDF
2	*Plus:*	
3	Payroll taxes (employee portion)	BDF and tax simulation
4	*Equals:*	
5	Gross Money Income (MI)	
6	*Less:*	
7	Government cash transfers	BDF
8	Property income	BDF
9	*Equals:*	
10	Base money income	BDF
11	*Plus:*	
12	Imputed rent on homes	Statistical matching of BDF and wealth survey; and, national accounts
13	*Plus:*	
14	Annuitized value of nonhome assets	Statistical matching of FRS and wealth survey; and, supplementary information on life expectancy and rates of return
15	*Less:*	
16	Annuitized value of debt	
17	*Plus:*	
18	Government cash and noncash transfers	BDF and OECD SOCEX Database
19	Public consumption	BDF, national accounts and supplementary information
20	*Less:*	
21	Income taxes	BDF, OECD Revenue Statistics, supplementary information, and tax simulation
22	Payroll taxes (employee portion)	
23	Property taxes	
24	Consumption taxes	BDF and tax simulation
25	*Plus:*	
26	Value of household production	Statistical matching of BDF and time-use survey
27	*Equals:*	
28	LIMEW	

Key: BDF = *Enquête Budget de Famille*; SOCEX = Social Expenditure Database.

Table 2: Long term rates of return (percent)

	Nominal	Real	Period
Real estate and business	8.09	3.05	1960-2007
Liquid assets	4.19	-0.77	1965-2007
Financial assets	5.02	0.12	1960-2007
Retirement assets	5.02	0.12	1960-2007
Mortgage debt	0.00	-4.66	1960-2007
Other debt	0.00	-4.66	1960-2007
Inflation rate (CPI-108 cities)	4.89		1960-2007
	5.00		1965-2007

Notes: **Real rate of return** = (1+Nominal rate)/(1+Inflation rate)-1

Real estate and business: *Calculated as the average of changes in financial net worth of unincorporated business ("Entrepreneurs individuelles")*. The data for France is available only from 1978. For the earlier period, we assumed that the French rate of return was equal to the average over the same period in the US rate of return (7.5%, as compared to 8.7% for the French data over the period 1978-2007), calculated from the Flow of Funds data published by the Federal Reserve. It should be noted that our preferred measure (and the measure used in our U.S. estimates) of rate of return is the ratio of holding gains to equity in unincorporated business. However, the required information was not available for France.

Liquid assets: *Weighted average of interest rates on checking and time/saving deposits*. Checking deposits are assumed to earn no interest. Interest rate on time and saving deposits was calculated as the average on a variety of time and saving accounts: *Livret A et bleu*, *Livret d'épargne Populaire*, *Livret de développment durable Codevi*, *Compte d'épargne logement*, *Plan dépargne logement*, PEL *taux hors prime d'Eat*, time deposits less than 2 years, and time deposits of 2 or more years. No data was available on interest rates before 1966. From 1966 onwards, data availability varies across accounts, with some of them available throughout the period (e.g. *Livret A et bleu*), while some others are available only from mid-90s (e.g. time deposits of 2 or more years). In order to calculate the average of interest rate on checking and time/saving deposits we needed information on the share of each asset in their combined total. Information on the aggregate value of checking and time/saving accounts held by the household sector is available from 1977 onwards. We assumed that the shares between 1965 and 1977 were equal to their 1977 values. Using these shares as weights, we calculated the average interest rate on liquid assets for the period 1966 to 2007. We assumed that the average interest rate in 1965 was the same as in 1966.

Financial assets: *Weighted average of rate of return on (1) stocks; (2) French government bonds; and (3) mutual fund shares*. Weights are based on historical shares of each type of asset in total of all three. The value of mutual fund shares was calculated as the sum of Titre OPCVM monétaire (SICAV+ FCP), Titre OPCVM Généraux, and Titre de fonds d'investissemnt divers. Because data on asset values were available only from 1977, we assumed that the weights during the period 1960-1977 were the same as those in 1977. The rate of return on stocks is simply the year-over-year change in the index of stock prices. Unfortunately, a consistent index was not available for France for the entire period. For the years from 1988 onward, the CAC40 index is available but, for the previous years, the index is calculated from the sample of 180 shares on the Paris exchange. Because the levels are not comparable across the two indices, there was a problem in calculating the percentage change in 1988 over 1987. We approximated this change based on change in the series "Value of an investment in stocks, dividends reinvested (€, basis 2000)", adjusted by the change in the CPI. (The series is available in "Séries longues 1800-2009" available at http://www.cgedd.developpement-durable.gouv.fr/rubrique.php3?id_rubrique=137). The rate of return on bonds was assumed to be equal to the yield on 10-year government bonds. Finally, the rate of return on mutual funds shares was assumed to be equal to the weighted average of the rates of return on stocks and

bonds. The data on stock market index and bond yields were obtained from the *International Financial Statistics* CD-ROM published by the International Monetary Fund.

Retirement assets: *Same as financial assets.* Applies only to 1989.

Debts: Debts are assumed to have a zero nominal rate of "return" and a real rate of "return" that depends only on the rate of inflation.

Inflation rate: Calculated from the CPI (108 Cities). The data on the CPI was taken from the *International Financial Statistics* CD-ROM published by the International Monetary Fund.

Table 3: Components of Net Worth and Income from Wealth (average values in 2000 PPP dollars), 1989 and 2000

	Flows		Stocks		Percent change, 1989-2000	
	1989	**2000**	**1989**	**2000**	**Flows**	**Stocks**
Homes	3,716	4,715	69,611	86,934	26.9	24.9
Real estate and business	1,426	3,293	34,305	52,947	130.9	54.3
Liquid and financial assets[1]	1,236	2,281	28,215	41,955	84.6	48.7
Mortgage debt	160	188	10,025	9,868	17.3	-1.6
Other debt	27	34	1,738	1,731	24.3	-0.4
Net worth	6,190	10,067	120,367	170,237	62.6	41.4
Home equity[2]	3,555	4,527	59,586	77,066	27.3	29.3
Nonhome wealth[3]	2,635	5,540	60,782	93,170	110.3	53.3

Notes: (1) This category also includes a small amount of retirement assets in 1989. (2) Value of homes less mortgage debt. (3) Sum of nonhome assets minus other debt.

Table 4: Government transfers, 1989 and 2000 (all monetary amounts are in 2000 PPP $)

	Average per household		Share (percent)		Percent change,
	1989	2000	1989	2000	1989-2000
Cash transfers	**8,595**	**10,383**	**65.2**	**65.7**	**20.8**
Old age	4,517	6,056	34.3	38.3	34.1
Unemployment	1,140	1,075	8.7	6.8	-5.7
Active labor market programs	239	288	1.8	1.8	20.6
Other[1]	2,699	2,964	20.5	18.8	9.8
Survivors' benefits		704		4.5	
Incapacity and sickness		803		5.1	
Family allowances		669		4.2	
Maternity and parental benefits		223		1.4	
Housing		565		3.6	
Noncash transfers	**4,579**	**5,415**	**34.8**	**34.3**	**18.2**
Old age	69	27	0.5	0.2	-60.8
Disabled	329	202	2.5	1.3	-38.4
Family benefits	75	443	0.6	2.8	493.4
Health	4,107	4,742	31.2	30.0	15.5
Total Transfers	**13,175**	**15,798**	**100.0**	**100.0**	**19.9**

***Notes*:** (1) The components of other cash transfers are not separately identified in 1989.

***Source*:** Authors' estimates based on the BDF and OECD SOCX Database. See text for details.

Table 5: Payroll tax parameters

YEAR	Marginal rate (percent)	Base (in Euros)	
		Lower threshold	Upper threshold
1989	17.99	0	19,099
	10.89	19,099	57,297
	8.97	57,297	76,396
	6.00	76,396	n/a
2000	21.20	0	26,892
	17.05	26,892	80,676
	12.05	80,676	107,568
	8.45	107,568	n/a

Note: n/a indicates "not applicable"

Source: *OECD Tax Database* (www.oecd.org/ctp/taxdatabase), Employee social security contribution rates and related provisions (Table III.1), accessed on May 19, 2011.

Table 6: Consumption tax parameters

A. Value Added Tax Rates by Product Type, 1989 and 2000

	Value Added Tax Rates (%)	
Products	**1989**	**2000**
Cereals	5.5	5.5
Vegetables	5.5	5.5
Fruits	5.5	5.5
Meat, poultry, fish	5.5	5.5
Milk, cheese, eggs	5.5	5.5
Fats	18.6	19.6
Sugar and other	18.6	19.6
Wine	18.6	19.6
Liqueur	18.6	19.6
Beer	18.6	19.6
Non-alcoholic drink	5.5	5.5
Coffee, tea	5.5	5.5
Products for baby	18.6	
Dietetics products	18.6	
Other alimentary products	18.6	19.6
Meal outside house	18.6	19.6
Clothing	18.6	19.6
Heating	18.6	19.6
Solid combustible	18.6	19.6
Wood, coal	18.6	
Electricity	18.6	19.6
Gas	18.6	19.6
Butane	18.6	
Piece of furniture	18.6	19.6
Housing linen	18.6	19.6
Freezer	18.6	19.6
Washing machine	18.6	
Other big electric appliance	18.6	19.6
Electric appliance	18.6	19.6
Other home article	18.6	19.6
Do-it-yourself	18.6	19.6
Cleaning products	18.6	19.6
House equipment	18.6	
House		
Health	18.6	19.6
Car	28	19.6
Motor bike	28	19.6
Bike		19.6
Fuel	18.6	19.6
Other car expenditures	18.6	19.6
Public means of conveyance	5.5	5.5
Plane and boat expend	5.5	
Communication	18.6	19.6
Transport and communication		

Television, radio	18.6	19.6
Camera	28	19.6
Record	18.6	19.6
Computer		19.6
Other		19.6
Sport article	18.6	19.6
Caravan	18.6	
Boat	18.6	
Amusement	5.5	5.5
Book	5.5	5.5
Newspaper	5.5	5.5
Typewriter	18.6	
Garden equipment	18.6	19.6
Garden furniture	18.6	
School	18.6	19.6
Tobacco	28	19.6
Package tour		19.6
Animals		19.6
Other goods and services	18.6	19.6

B. Other indirect taxes

Decile	TVA	Other	Ratio
1	65.8%	34.2%	0.520
2	65.5%	34.5%	0.527
3	65.4%	34.6%	0.529
4	65.3%	34.7%	0.531
5	65.5%	34.5%	0.527
6	65.1%	34.9%	0.536
7	67.0%	33.0%	0.493
8	67.5%	32.5%	0.481
9	69.7%	30.3%	0.435
10	71.7%	28.3%	0.395
Total	66.9%	33.1%	0.495

Note: The deciles are defined with respect to household disposable money income.

Source: Authors' calculations based on "*Tableau 11 : Structure de la fiscalité indirecte par décile de niveau de vie (en %)*" in Forgeot and Starzec (2003).

Table 7: Taxes by type of tax, 1989 and 2000 (in 2000 PPP dollars)

	1989	2000	Percent change, 1989-2000	Share (percent)	
				1989	2000
Income and payroll taxes	5,322	7,630	43.4	58.1	58.7
Income	2,048			22.4	
Payroll	3,274			35.7	
Property	533	821	53.9	5.8	6.3
Consumption	3,308	4,556	37.7	36.1	35.0
Total	**9,163**	**13,006**	**41.9**	**100.0**	**100.0**

Note: Income and payroll taxes could not be separated in 2000. See text for discussion.

Table 8: **Government consumption expenditures and gross investment, 1989 and 2000 (in millions of 2000 PPP $)**

Function, subfunction and sub-subfunction	Amount		Allocated amount		Household share (in percent)		Share in total allocated amount (in percent)	
	1989	2000	1989	2000	1989	2000	1989	2000
General public services	**40,720**	**65,699**	**0**	**0**	**0.0**	**0.0**	**0.0**	**0.0**
Defense	**51,064**	**35,445**	**0**	**0**	**0.0**	**0.0**	**0.0**	**0.0**
Public order and safety	**14,313**	**19,892**	**4,933**	**5,516**	**34.5**	**27.7**	**3.9**	**3.3**
Police services	7,125	10,597	3,562	5,299	50.0	50.0	2.8	3.1
Fire-protection services	2,740	434	1,370	217	50.0	50.0	1.1	0.1
Other	4,448	8,860	0	0	0.0	0.0	0.0	0.0
Economic affairs	**19,475**	**29,599**	**13,004**	**19,487**	**66.8**	**65.8**	**10.3**	**11.5**
Transportation	7,224	12,510	5,053	9,029	69.9	72.2	4.0	5.3
Road	5,300	7,099	3,710	4,827	70.0	68.0	2.9	2.8
Water	284	774	284	774	100.0	100.0	0.2	0.5
Air	1,094	1,806	547	813	50.0	45.0	0.4	0.5
Rail	101	1,440	67	1,224	66.0	85.0	0.1	0.7
Public transit	445	1,392	445	1,392	100.0	100.0	0.4	0.8
Communication	1,013	1,785	1,013	1,785	100.0	100.0	0.8	1.1
Agriculture	3,271	4,565	2,682	2,374	82.0	52.0	2.1	1.4
Energy	2,773	3,860	1,137	1,621	41.0	42.0	0.9	1.0
Other economic affairs	5,194	6,879	3,120	4,678	60.1	68.0	2.5	2.8
Environment	**-**	**10,662**	**-**	**2,666**	**-**	**25.0**	**-**	**1.6**
Housing and community amenities	**19,993**	**23,736**	**19,993**	**23,736**	**100.0**	**100.0**	**15.8**	**14.0**
Education	**79,080**	**101,774**	**79,080**	**101,774**	**100.0**	**100.0**	**62.4**	**60.0**
First level	24,981	31,407	24,981	31,407	100.0	100.0	19.7	18.5
Second level	41,055	51,275	41,055	51,275	100.0	100.0	32.4	30.3
Third level	13,044	19,092	13,044	19,092	100.0	100.0	10.3	11.3
Recreation, culture and religion	**9,807**	**16,319**	**9,807**	**16,319**	**100.0**	**100.0**	**7.7**	**9.6**
TOTAL	**234,452**	**303,127**	**126,817**	**169,497**	**54.1**	**55.9**	**100.0**	**100.0**

Note: "-" indicates not available.
Expenditures on the environment were not reported separately in 1989. According to the classification in 1989, such expenditures would have been included under "housing and community services" (e.g., sanitation expenditures) and under "economic affairs" (e.g. pollution abatement). We were able to identify a small amount of pollution control and abatement expenditures from the 1989 budget documents ($272 million) and have included it under "other economic affairs" for that year.
Source: OECD, UN, and State budgets. See text for details.

Table 9: **Allocation and distribution assumptions, 1989 and 2000**

	Allocation	Distribution
General public services	None	N.A.
Defense	None	N.A.
Public order and safety		
Police services	50%[1]	Population[5]
Fire-protection services	50%[1]	Population[5]
Other	None	N.A.
Economic affairs		
Transportation		
Road	Share of passenger vehicles in total miles travelled[2]	Kilometers driven by household income decile[6]
Water	All	Deciles of consumption expenditure[7]
Air	Share of passenger air traffic in total air traffic[2]	Kilometers travelled by household income decile[6]
Rail	Share of train traffic for passengers in total train traffic[2]	Kilometers travelled by household income decile[6]
Public transit	All	Kilometers travelled by household income decile[6]
Communication	All	
Agriculture	Share of family farms in total farms[3]	Deciles of farm size[8]
Energy	Share of household energy consumption in total energy consumption[4]	Deciles of energy expenditures[8]
Other economic affairs	All	Half by population and half by deciles of consumption expenditures[9]
Environment	Share of household sector in total pollution (CO2 emission)[4]	Deciles of polluting expenditures[10]
Housing and community amenities	All	10% by population, 60% by renters with income less than the median income of renters, 30% by polluting expenditures[11]
Education		
First level	All	Students in public educational institutions[12]
Second level	All	Students in public educational institutions[12]
Third level	All	Students in public educational institutions[12]
Recreation, culture and religion	All	Population[5]

Notes:

1. Arbitrary assumption of equal division between the household sector and other sectors; applies also to the United States.
2. *Mémento de statistiques des transports* (Handbook of Transport Statistics). Available at: http://www.statistiques.equipement.gouv.fr/index.php3 in the section "Transports."
3. Census of Agriculture, 1988 and 2000.
4. Available at: http://www.statistiques.equipement.gouv.fr/index.php3 in the section "Énergie."
5. BDF.
6. 1989: *Enquête transport et communication 1994* (INSEE); 2000: *Enquête nationale transports et déplacements 2008* (SOeS, INRETS and INSEE). The total amount for each decile was divided equally among the households designated as users in the decile. A household is considered as a "user" of road transportation if they owned an automobile or incurred any expenditure on road transportation. Users of rail transportation, air transportation and public transit are identified by whether they reported any expenditure on these modes of transportation. (We are grateful to Ramzi Hadji for providing us with the estimates from the surveys.)
7. *BDF*. There were too few households in the sample with expenditures on water transportation. Therefore, we used all consumption expenditures. The total amount for each decile was divided equally among the households in the decile.
8. *BDF*. The total amount for each decile was divided equally among the households in the decile.
9. *BDF*. Some of these (e.g., regulation of food safety) may benefit all equally and some of these (e.g. promotion of particular lines of commerce) may benefit the better-off more. Unfortunately, the French data does not allow us to make more detailed breakdown of this function. The total amount for each decile was divided equally among the households in the decile.
10. *BDF*. Polluting expenditures were defined as the sum of household expenditures on food and drink, alcoholic beverages, clothing, water, energy, transportation, household furnishings, drugs and medical supplies, entertainment, personal care products, and tobacco. The total amount for each decile was divided equally among the households in the decile.
11. *BDF*. The functions listed under this category include housing development, community development, and a host of sanitation services and utilities. Unfortunately, the French data does not allow a more detailed function and therefore we were forced to make some arbitrary assumptions. We picked renters in the bottom half of the income distribution of renter households. According to Ditch et al. (2001), roughly 50% of the renter households in France lived in social housing during the period under study here (primarily Habitat à Loyer Modéré – Moderate Rent Habitation). Ditch J., A. Lewis and S. Wilcox (2001), "Social housing, tenure and housing: an international review", Department for work and pensions. In-house report 83.
12. *BDF and administrative data*. Roughly 15 to 20 percent of students did not attend public educational institutions in the years of our study. We utilized administrative data on regionally differentiated (by "zones") enrollment rates by level of education to select students attending public educational institutions (*Repères et références statistques de l'enseignement 2002*). A random selection procedure was carried out to ensure that the proportion of students assumed to be attending public educational institutions among all individuals in the relevant age group in the BDF would be identical to the enrollment rate obtained from the administrative data. Unfortunately, public expenditure data on education disaggregated by region ("zone") was not available. Therefore, we assigned the national per-pupil average to each student assumed to be attending a public educational institution. As indicated in the table, separate averages were used for each level of education. (We are grateful to Ramzi Hadji for providing us with the estimates of student enrollment from the administrative data.)

Table 10: **Value of household production (in 2000 PPP $) and annual hours of household production, 1989 and 2000 (Mean values per household)**

	1989	2000	Percent change, 1989-2000
Hours	2,237	1,901	-15.0
Value	17,449	16,845	-3.5
Implicit unit value	7.8	8.9	13.6

Note: Implicit unit value (in 2000 PPP $) is the value of household production divided by the hours of household production.

Table 11: Economic Well-Being and Work, 1989–2000 (in 2000 PPP $, except for hours)

	1989	2000	1989-2000, Percent change
A. Median values for households			
LIMEW	45,641	52,382	14.8
DI	21,113	25,229	19.5
B. Median values for households adjusted by the equivalence scale			
Equivalent LIMEW	29,315	34,127	16.4
Equivalent DI	10,253	14,787	44.2
C. Real per capita amounts			
GDP	19,691	21,914	11.3
LIMEW (mean value)	19,105	24,688	29.2
DI (mean value)	9,060	12,162	34.2
D. Median values of annual hours of work by households			
Market work	2,093	1,759	-15.9
Housework	4,121	3,484	-15.5
Total work	29,315	34,127	16.4

Table 12: Components of Economic Well-Being, 1989 and 2000

	1989		2000	
	DI	**LIMEW**	**DI**	**LIMEW**
A. Mean values (in 2000 PPP US$)				
Base money income	20,390	20,390	25,025	25,025
Income from wealth	919	6,191	1,419	10,070
Cash transfers	7,759	8,615	9,505	10,104
Income and payroll taxes	-4,976	-6,861	-6,707	-8,572
Noncash transfers	.	4,827	.	5,705
Consumption and property taxes	.	-5,113	.	-6,071
Public consumption	.	5,548	.	6,241
Household production	.	17,195	.	16,835
Total	**24,093**	**50,794**	**29,243**	**59,337**
Addendum:				
Net government expenditures	2,784	7,017	2,798	7,407
Hours of household production		2,222		1,899
	1989		**2000**	
B. Percent share	**DI**	**LIMEW**	**DI**	**LIMEW**
Base money income	85	40	86	42
Income from wealth	4	12	5	17
Cash transfers	32	17	33	17
Income and payroll taxes	-21	-14	-23	-14
Noncash transfers		10		10
Consumption and property taxes		-10		-10
Public consumption		11		11
Household production		34		28
Total	**100**	**100**	**100**	**100**
Addendum:				
Net government expenditures	12	14	10	12

C. Contribution to Growth in LIMEW mean value by component (in percentage points)

	DI	**LIMEW**
Base money income	19.2	9.1
Income from wealth	2.1	7.6
Cash transfers	7.2	2.9
Income and payroll taxes	-7.2	-3.4
Noncash transfers		1.7
Consumption and property taxes		-1.9
Public consumption		1.4
Household production		-0.7
Total	**21.4**	**16.8**
Addendum:		
Net government expenditures	0.1	0.8

Table 13: Components of Economic Well-Being for Middle-Class Households, 1989 and 2000

	1989		2000	
	DI	**LIMEW**	**DI**	**LIMEW**
A. Mean values (in 2000 PPP US$)				
Base money income	15,801	17,630	19,059	21,765
Income from wealth	482	4,939	940	6,488
Cash transfers	8,675	8,867	10,200	10,262
Income and payroll taxes	-3,804	-5,998	-4,885	-7,434
Noncash transfers	.	4,993	.	5,837
Consumption and property taxes	.	-5,121	.	-5,942
Public consumption	.	4,222	.	4,778
Household production	.	16,116	.	16,584
Total	**21,154**	**45,646**	**25,314**	**52,339**
Addendum:				
Net government expenditures	4,871	6,962	5,316	7,502
Hours of household production	2370	2317	2071	2043

	1989		2000	
B. Percent share	**DI**	**LIMEW**	**DI**	**LIMEW**
Base money income	75	39	75	42
Income from wealth	2	11	4	12
Cash transfers	41	19	40	20
Income and payroll taxes	-18	-13	-19	-14
Noncash transfers		11		11
Consumption and property taxes		-11		-11
Public consumption		9		9
Household production		35		32
Total	100	100	100	100
Addendum:				
Net government expenditures	23	15	21	14

C. Contribution to Growth in LIMEW mean value by component (in percentage points)

	DI	**LIMEW**
Base money income	15.4	9.1
Income from wealth	2.2	3.4
Cash transfers	7.2	3.1
Income and payroll taxes	-5.1	-3.1
Noncash transfers		1.8
Consumption and property taxes		-1.8
Public consumption		1.2
Household production		1.0
Total	**19.7**	**14.7**
Addendum:		
Net government expenditures	2.1	1.2

Table 14: Disparities by Marital Status, 1989 and 2000

A. Mean values (2000 PPP US $)

	1989			2000		
	Married couple	**Single female**	**Single male**	**Married couple**	**Single female**	**Single male**
Base Income	25,973	14,840	18,651	32,045	17,974	26,467
Income from wealth	7,303	4,942	6,092	12,458	4,357	6,799
Home wealth	4,306	2,792	3,166	5,602	2,456	2,702
Nonhome wealth	2,997	2,150	2,927	6,856	1,901	4,097
Net government expenditures	6,861	14,813	7,578	7,055	14,829	5,497
Transfers	14,997	15,676	13,063	17,748	14,846	15,436
Public consumption	6,678	7,783	5,531	7,549	9,701	6,761
Taxes	-14,813	-8,647	-11,015	-18,242	-9,718	-16,700
Household production	21,616	15,919	11,194	21,831	14,495	11,750
LIMEW	**61,753**	**50,514**	**43,516**	**73,389**	**51,656**	**50,514**
Addendum:						
Disposable income	28,575	21,542	23,783	35,362	22,745	28,875
Annual hours of household production	2,725	2,239	1,504	2,410	1,821	1,326

B. Ratios to married couple's mean values

	1989			2000		
	Married couple	**Single female**	**Single male**	**Married couple**	**Single female**	**Single male**
Base Income	1.00	0.57	0.72	1.00	0.56	0.83
Income from wealth	1.00	0.68	0.83	1.00	0.35	0.55
Home wealth	1.00	0.65	0.74	1.00	0.44	0.48
Nonhome wealth	1.00	0.72	0.98	1.00	0.28	0.60
Net government expenditures	1.00	2.16	1.10	1.00	2.10	0.78
Transfers	1.00	1.05	0.87	1.00	0.84	0.87
Public consumption	1.00	1.17	0.83	1.00	1.29	0.90
Taxes	1.00	0.58	0.74	1.00	0.53	0.92
Household production	1.00	0.74	0.52	1.00	0.66	0.54
LIMEW	**1.00**	**0.82**	**0.70**	**1.00**	**0.70**	**0.69**
Addendum:						
Disposable income	1.00	0.75	0.83	1.00	0.64	0.82
Annual hours of household production	1.00	0.82	0.55	1.00	0.76	0.55

Table 14 (*continued*)

C. Gaps in LIMEW by component, between married couple and single female (married couple minus single female)

	Amount (in 2000 PPP US$)		Percent share	
	1989	**2000**	**1989**	**2000**
Base Income	11,133	14,071	99	65
Income from wealth	2,361	8,101	21	37
Home wealth	1,514	3,147	13	14
Nonhome wealth	848	4,954	8	23
Net government expenditures	-7,952	-7,775	-71	-36
Transfers	-680	2,901	-6	13
Public consumption	-1,106	-2,152	-10	-10
Taxes	-6,166	-8,524	-55	-39
Household production	5,697	7,336	51	34
LIMEW	**11,240**	**21,733**	**100**	**100**

Table 15: Disparities between the Elderly and Nonelderly Households

A. Mean values in 2000 PPP US $

	1989		2000		Elderly/ Nonelderly	
	Nonelderly	Elderly	Nonelderly	Elderly	1989	2000
Base Income	26,465	2,023	32,990	2,216	0.08	0.07
Income from wealth	5,343	8,756	8,294	15,157	1.64	1.83
Home wealth	3,553	3,566	4,245	5,336	1.01	1.26
Nonhome wealth	1,790	5,190	4,049	9,821	2.86	2.42
Net government expenditures	4,519	14,570	2,536	21,357	3.65	7.99
Transfers	11,897	18,114	12,138	26,323	1.52	2.13
Public consumption	6,808	1,741	7,806	1,762	0.26	0.23
Taxes	-14,186	-5,285	-17,407	-6,728	0.38	0.39
Household production	18,189	14,190	17,153	15,923	0.77	0.93
LIMEW	**54,517**	**39,538**	**60,973**	**54,653**	**0.73**	**0.89**
Addendum:						
Disposable income	26,293	17,442	31,519	22,725	0.67	0.72
Annual hours of household production	2,295	1,999	1,947	1,762	0.87	0.90

B. Gaps in LIMEW by component, between nonelderly and elderly (nonelderly minus elderly)

	Amount (in 2000 PPP US$)		Percent share	
	1989	2000	1989	2000
Base Income	24,442	30,774	163	487
Income from wealth	-3,412	-6,863	-23	-109
Home wealth	-13	-1,091	0	-17
Nonhome wealth	-3,400	-5,773	-23	-91
Net government expenditures	-10,051	-18,820	-67	-298
Transfers	-6,216	-14,185	-42	-224
Public consumption	5,066	6,043	34	96
Taxes	-8,901	-10,679	-59	-169
Household production	3,999	1,229	27	19
LIMEW	**14,978**	**6,320**	**100**	**100**

Table 16: Disparities by Level of Education

A. Mean values in 2000 PPP US $

	1989				2000			
	Less than HS	**High School**	**Some College**	**College**	**Less than HS**	**High School**	**Some College**	**College**
Base Income	13,777	25,072	29,259	42,247	13,664	28,335	35,119	49,429
Income from wealth	5,540	5,859	7,382	11,553	9,022	9,222	9,759	17,030
Home wealth	3,097	3,704	4,099	5,936	4,231	4,651	4,701	5,144
Nonhome wealth	2,443	2,154	3,284	5,617	4,791	4,571	5,057	11,886
Net government expenditures	10,444	5,120	799	-4,971	14,410	5,720	-349	-7,128
Transfers	14,623	12,220	10,622	12,554	18,558	14,013	12,686	13,570
Public consumption	4,743	6,603	5,795	6,919	5,217	7,352	6,304	6,882
Taxes	-8,923	-13,703	-15,618	-24,445	-9,364	-15,645	-19,338	-27,580
Household production	15,687	18,434	17,387	23,335	15,782	17,498	16,660	19,161
LIMEW	**45,447**	**54,485**	**54,826**	**72,163**	**52,878**	**60,776**	**61,189**	**78,493**
Addendum:								
Disposable income	20,401	25,980	29,101	39,475	23,031	30,104	34,561	45,617
Annual hours of household production	2,240	2,281	1,930	2,121	1,908	1,983	1,784	1,732

B. Ratios to the mean values of college graduates

	1989				2000			
	Less than HS	**High School**	**Some College**	**College**	**Less than HS**	**High School**	**Some College**	**College**
Base Income	0.33	0.59	0.69	1.00	0.28	0.57	0.71	1.00
Income from wealth	0.48	0.51	0.64	1.00	0.53	0.54	0.57	1.00
Home wealth	0.52	0.62	0.69	1.00	0.82	0.90	0.91	1.00
Nonhome wealth	0.43	0.38	0.58	1.00	0.40	0.38	0.43	1.00
Net government expenditures	-2.10	-1.03	-0.16	1.00	-2.02	-0.80	0.05	1.00
Transfers	1.16	0.97	0.85	1.00	1.37	1.03	0.93	1.00
Public consumption	0.69	0.95	0.84	1.00	0.76	1.07	0.92	1.00
Taxes	0.37	0.56	0.64	1.00	0.34	0.57	0.70	1.00
Household production	0.67	0.79	0.75	1.00	0.82	0.91	0.87	1.00
LIMEW	**0.63**	**0.76**	**0.76**	**1.00**	0.67	0.77	0.78	1.00
Addendum:								
Disposable income	0.52	0.66	0.74	1.00	0.50	0.66	0.76	1.00

Table 16 (*continued*)

C. Gaps (in 2000 PPP US $) in LIMEW by component, between college graduates and others (college graduates *minus* other)

	1989			2000		
	Less than HS	**High School**	**Some College**	**Less than HS**	**High School**	**Some College**
Base Income	28,470	17,174	12,988	35,765	21,094	14,310
Income from wealth	6,013	5,695	4,171	8,008	7,808	7,271
Home wealth	2,839	2,232	1,838	914	493	443
Nonhome wealth	3,174	3,463	2,333	7,095	7,315	6,828
Net government expenditures	-15,415	-10,092	-5,770	-21,538	-12,848	-6,779
Transfers	-2,069	334	1,932	-4,988	-443	884
Public consumption	2,176	317	1,125	1,666	-470	579
Taxes	-15,522	-10,742	-8,827	-18,215	-11,935	-8,242
Household production	7,648	4,900	5,948	3,379	1,663	2,501
LIMEW	**26,716**	**17,678**	**17,337**	**25,614**	**17,717**	**17,304**

D. Percentage share of each component in the gap in LIMEW between college graduates and others (college graduates *minus* other)

	1989			2000		
	Less than HS	**High School**	**Some College**	**Less than HS**	**High School**	**Some College**
Base Income	107	97	75	140	119	83
Income from wealth	23	32	24	31	44	42
Home wealth	11	13	11	4	3	3
Nonhome wealth	12	20	13	28	41	39
Net government expenditures	-58	-57	-33	-84	-73	-39
Transfers	-8	2	11	-19	-3	5
Public consumption	8	2	6	7	-3	3
Taxes	-58	-61	-51	-71	-67	-48
Household production	29	28	34	13	9	14
LIMEW	**100**	**100**	**100**	**100**	**100**	**100**

Table 17: Quintile Shares in LIMEW and DI, 1989 and 2000

A. Shares (percent)	Quintile 1	2	3	4	5
1989					
LIMEW	7.0	12.4	18.0	24.3	38.3
DI	5.2	11.7	17.6	24.6	40.9
2000					
LIMEW	7.1	12.5	17.6	23.6	39.2
DI	7.1	12.2	17.3	23.6	39.8
B. Change in shares (percentage points), 1989 to 2000	**Quintile**				
	1	**2**	**3**	**4**	**5**
LIMEW	0.1	0.1	-0.3	-0.7	0.9
DI	1.9	0.4	-0.2	-1.0	-1.1

Note: The quintiles of each measure are defined with respect to itself.

Table 18: Composition of LIMEW by Quintile, 1989 and 2000

	Base income	Income from wealth	Net government expenditures	Household production	Total	Average LIMEW (2000 PPP US$)
			1989			
Bottom	41	10	20	29	100	17,756
Second	36	11	18	35	100	31,517
Third	39	11	15	35	100	45,646
Fourth	41	11	13	34	100	61,722
Top	41	14	11	33	100	97,288
All	40	12	14	34	100	50,794
			2000			
Bottom	51	10	19	20	100	20,949
Second	43	12	16	29	100	37,092
Third	42	12	14	32	100	52,339
Fourth	41	14	14	31	100	70,034
Top	41	24	8	27	100	116,261
All	42	17	12	28	100	59,337
			Change in share (percentage point), 1989 to 2000			
Bottom	10	0	-1	-9	0.0	
Second	7	1	-2	-6	0.0	
Third	3	2	-1	-4	0.0	
Fourth	0	3	1	-4	0.0	
Top	0	10	-3	-7	0.0	
All	2	5	-1	-5	0.0	

Table 19: Economic inequality (Gini coefficient x 100), 1989 and 2000

	1989	2000	Change, 1989 to 2000
A. All households			
LIMEW	31.6	32.3	0.6
DI	35.9	32.8	-3.1
Equivalent			
LIMEW	23.9	25.7	1.7
Equivalent DI	32.1	28.8	-3.3
B. Family households			
LIMEW	25.1	25.8	0.7
DI	31.9	28.4	-3.5
Equivalent			
LIMEW	21.6	23.4	1.8
Equivalent DI	31.2	27.6	-3.7

Table 20: Decomposition of Inequality by Source and Measure

	1989			2000			
	Concentration coefficient	**Income share**	**Contribution to inequality**	**Concentration coefficient**	**Income share**	**Contribution to inequality**	**Change in contribution, 1989 to 2000**
LIMEW							
Base income	0.330	0.401	0.133	0.294	0.422	0.124	-0.009
Income from wealth	0.389	0.122	0.047	0.501	0.170	0.085	0.038
Cash transfers	0.203	0.170	0.034	0.171	0.170	0.029	-0.005
Income and payroll taxes	0.305	-0.135	-0.041	0.282	-0.144	-0.041	0.000
Noncash transfers	0.187	0.095	0.018	0.209	0.096	0.020	0.002
Consumption and property taxes	0.177	-0.101	-0.018	0.200	-0.102	-0.020	-0.003
Public consumption	0.324	0.109	0.035	0.320	0.105	0.034	-0.002
Household production	0.319	0.339	0.108	0.324	0.284	0.092	-0.016
Total		**1.000**	**0.316**		**1.000**	**0.323**	**0.006**
Addendum: Net government expenditures		*0.138*	*0.029*		*0.125*	*0.022*	*-0.007*
DI							
Base income	0.476	0.846	0.403	0.456	0.856	0.391	-0.012
Income from wealth	0.526	0.038	0.020	0.506	0.049	0.025	0.004
Cash transfers	0.091	0.322	0.029	0.071	0.325	0.023	-0.006
Income and payroll taxes	0.451	-0.207	-0.093	0.478	-0.229	-0.110	-0.017
Total		**1.000**	**0.359**		**1.000**	**0.328**	**-0.031**
Addendum: Net government expenditures		*0.116*	*-0.064*		*0.096*	*-0.087*	*-0.023*

Figure 1: Share of each component in the total difference in LIMEW between married couples and single females (in percent)

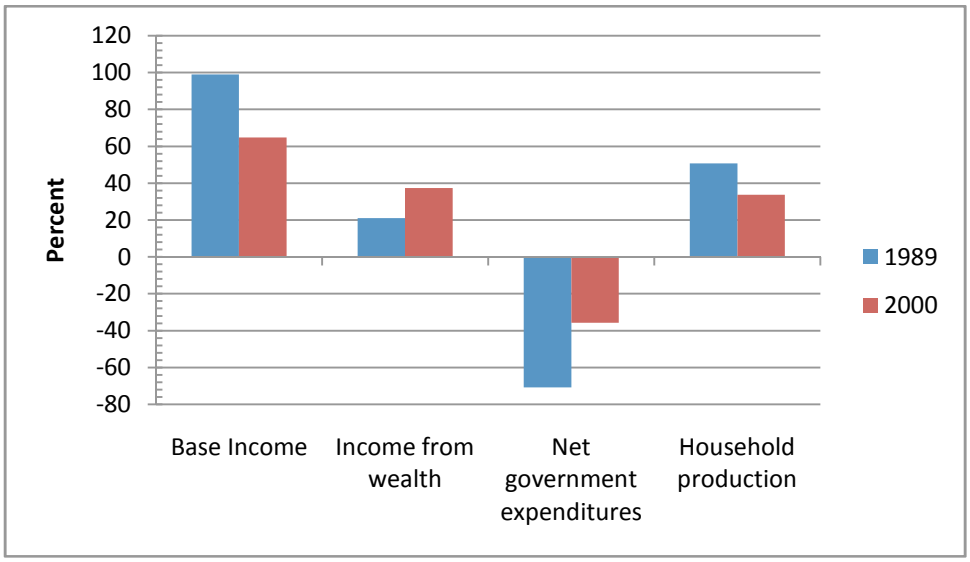


Figure 2: Share of each component in the total difference in LIMEW between nonelderly and elderly (in percent)

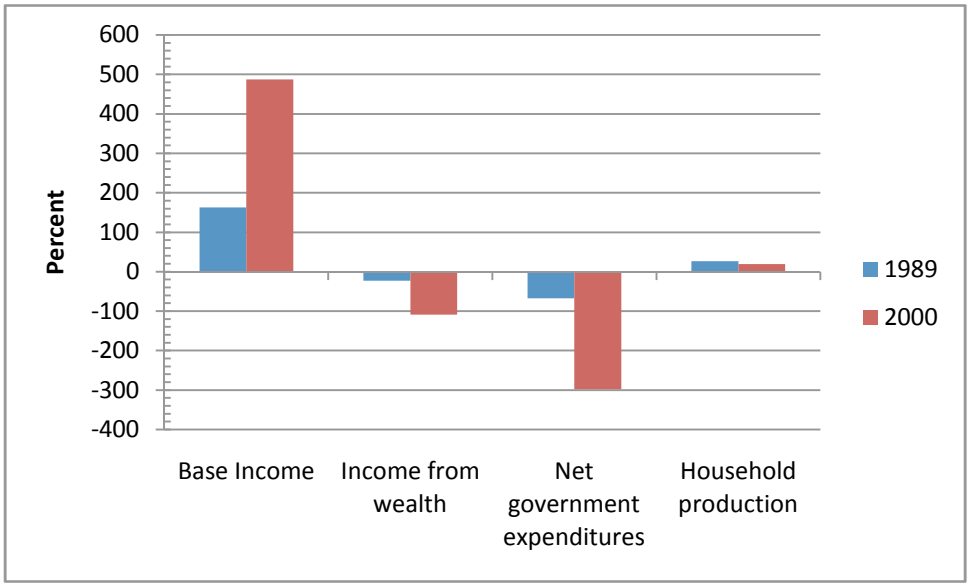
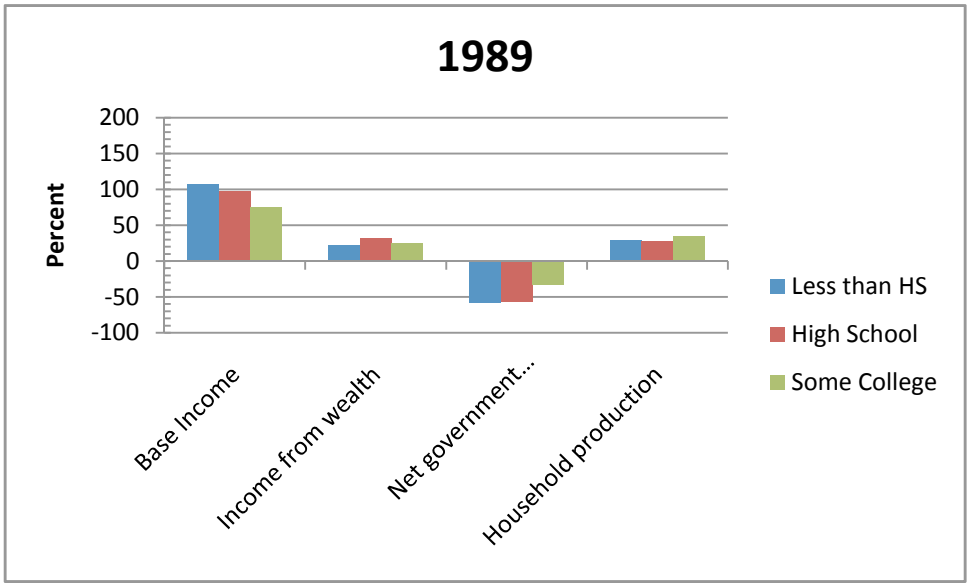


Figure 3: Share of each component in the total difference in LIMEW between college graduates and others (in percent)



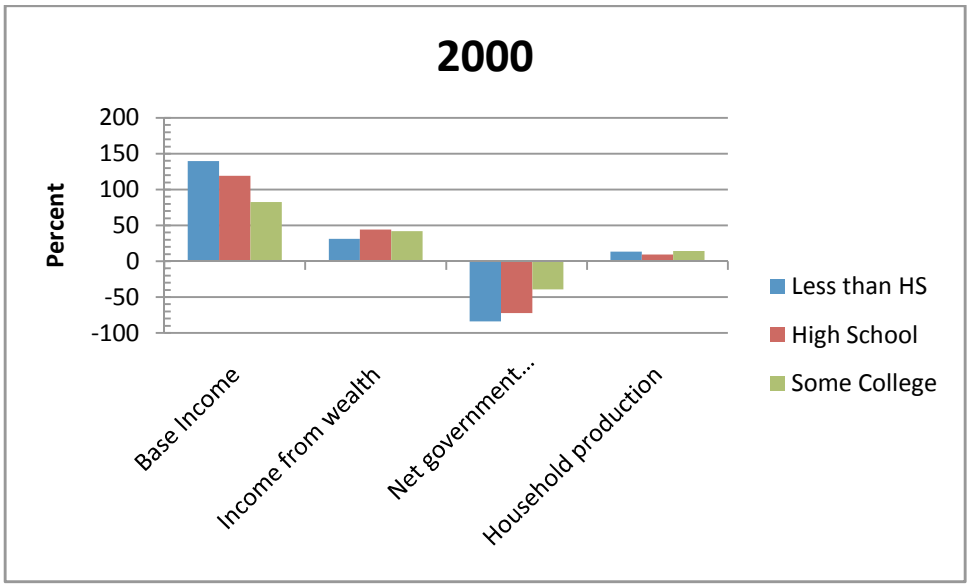


Figure 4: Contribution to the Change in the Gini Coefficient of LIMEW and DI (Gini points), 1989 to 2000

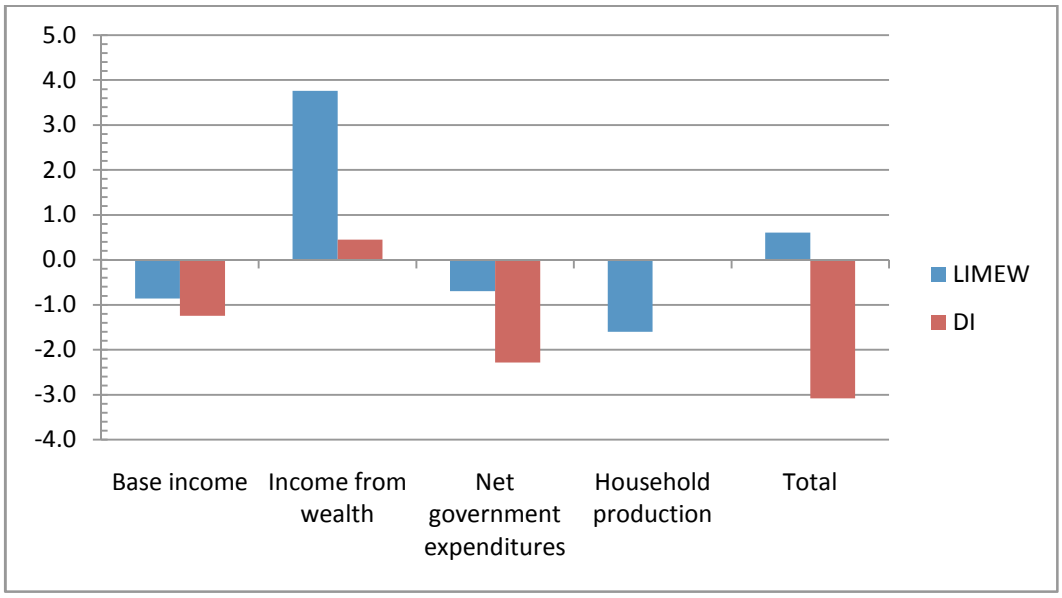
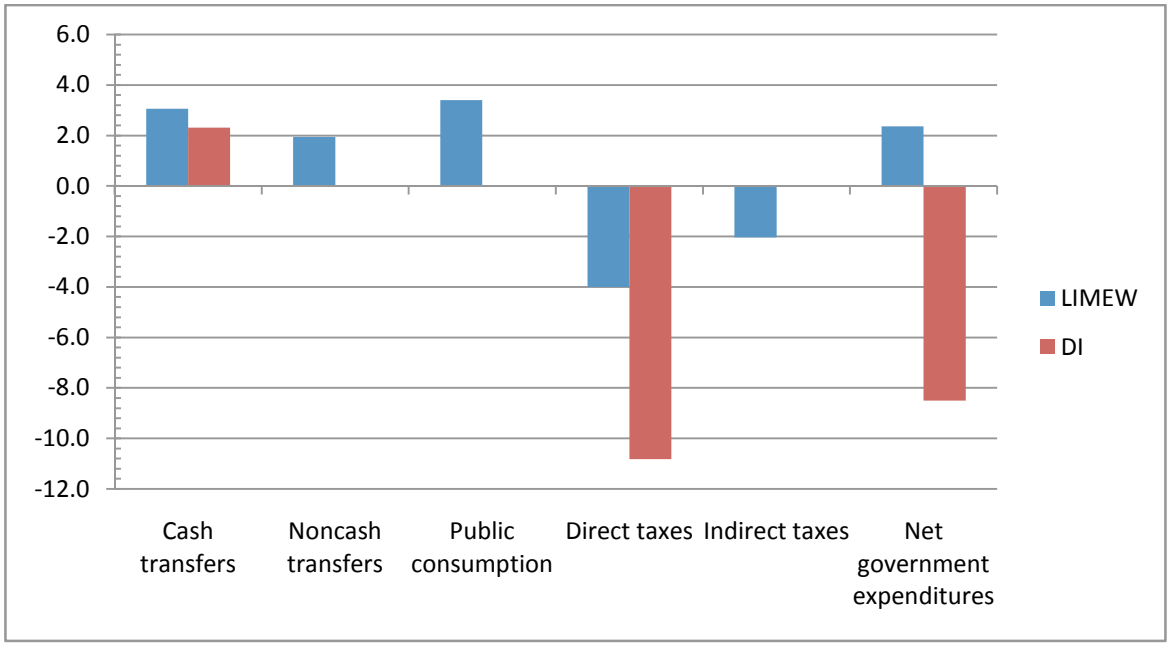


Figure 5: Contribution of Government Expenditures and Taxes on the Gini Coefficient of LIMEW and DI (Gini points), 2000



APPENDIX A: STATISTICAL MATCHES WITH WEALTH DATA

This appendix and the next describe the construction of synthetic datasets created for use in estimation of the LIMEW for France for the years 1989 and 2000. The process used is propensity score statistical matching, which is described in Kum and Masterson (2010).

A.1 1989

Data and Alignment

The matching unit for the wealth match (and the unit of analysis for the LIMEW) is the household. The source data sets for the wealth match for the 1989 French LIMEW estimates are the 1989-90 BDF and the 1992 EAF. The 1989-90 BDF is used since it has income data for 1989. The 1989-90 BDF file has records for 24,595 individuals in 9,038 households. These records represent 54,658,197 individuals in 21,201,890 French households after weighting. The 1992 EAF contains 9,530 household records. Many of the wealth and income variables were categorical. In these cases, we replaced those above the median category with a random draw from a Pareto distribution within the record's category range. We dealt with the missing values in the data with the method of multiple imputation with chained equations.[37] We created five implicates for each record for a total of 47,650 records. This translates to 22,145,405 households when weighted. In order to perform a successful match, the candidate data sets must be well aligned in the strata variables used in the match procedure.[38] For the 1989 French wealth match, strata variables are homeownership, age of the household head, educational achievement of the household head, family type and household income. Table A.1 compares the distribution of households by these five variables in the two data sets. Since both surveys are regionally representative samples carried out three years apart, we can expect them to be reasonably well aligned.

The largest differences between the two surveys are in terms of income category, with those at the lower and higher ends of the household income distribution making up a smaller proportion of the EAF sample than of the BDF, while those in the middle income categories make up a larger proportion. These misalignments can make matching a challenge, because it ensures that, for example some households with less than 50,000 Francs annual income in the

[37] Variables with missing values were: home ownership, dwelling type, household income class, home value, and most of the asset value variables.

[38] Statistical matching is done first within subsets of the two data sets defined by key variables, which are referred to as strata variables.

BDF will be matched with households in the middle income categories in the EAF, thereby slightly exaggerating the wealth profile of the lower end of the income distribution (corresponding effects can be expected at the upper end of the income distribution). The other strata variables are better aligned, with home ownership and family type having one percent or less difference between the surveys. The former is especially significant for the wealth match, of course, since home ownership constitutes a major proportion of most households' assets.

Match QC

Turning to the results of the match, we first look to the distribution of matched records by matching round in Table A.2. Earlier rounds occur in the most detailed cells (Round 1 occurs within cells that incorporate all five strata variables). The majority of the matches usually happen in the earliest rounds, but generally a much greater percentage than in this case. Only 92% of the records are matched in the first five rounds. This demonstrates the effect of the misalignment noted above. This fact means that although most of the wealth records will be assigned to records that are similar in age, education, family type, home ownership and income to their donor records, a great many will be mismatched in one or more of these dimensions. In all, twenty-two rounds of matching were required to match every donor record. The final round includes all those recipient records for which no match could be found. In the latter case, each recipient record was assigned the average value from the corresponding subcell in the donor data set for each variable. Table A.3 provides a comparison of the distribution of net worth in the EAF and the matched file. The p75/p50 and p90/p50 ratios are quite close, but the others are not as good. It appears that the bottom tail of the wealth distribution in the matched file is somewhat thinner than in the EAF. For example, p10 for net worth in the matched file is 285F, while it is 1,304F in the EAF. The Gini coefficient is quite close, 0.681 in the matched file, compared to 0.677 in the EAF.

Examination of the quality of the match within population sub-groups shows generally good results. Figure A.1 displays ratios of mean net worth between the matched file and the EAF for the five strata variables. With one exception, the ratios of mean net worth within sub-categories of the five strata variables are all within 10% of unity. The fourth income group (from 100,000 to 130,000 Francs in household income) has 15% lower net worth in the matched file than in the EAF. Table A.4 has the actual numbers, and we can see that this represents a substantial difference of 79,000F. The median net worth for this group in the matched file is

18% smaller than that of the EAF, though this difference is less than 63,000F. The second group in the homeowner panel of Figure A.1 is homeowners. We can see that they have 3.2% smaller net worth in the matched file than in the EAF. We see in Table A.4 that this translates to 30,000F less average net worth for homeowners in the matched file. The corresponding difference in medians is 8,000F. Those households with elderly heads have 6% lower mean net worth in the matched file than in the EAF. Consulting Table A.4, we see that this means 40,000F smaller net worth, while their median net worth is 9.5% lower than in the EAF (a 39,000F difference). For judging the accuracy of the match in preserving the distribution of wealth by sub-groups, Table A.4 displays the ratios of mean and median values for the strata variables' categories. The renter-owner ratios of mean and median values are well-carried over, while the ratios for the elder/non-elder ratio are as well. The ratios by household income group are surprisingly well reproduced in the match file, considering the misalignment in this variable. The rest of the ratios' values in the EAF are reasonably well represented in the match file. The extent to which the match file reproduces the distribution of net worth within matching cells is demonstrated in Figure A.2.[39] We can see that, although the tails are attenuated somewhat, the distribution is well preserved in the matching process, even at this level of detail.

Overall, the quality of the match is good. It has its limitations, especially in terms of household income. But the overall distribution is transferred with remarkable accuracy, and the distribution within even small sub-groups is transferred with good precision.

A.2 2000

Data and Alignment

The source data sets for the wealth match for the 2000 LIMEW estimates for France are the 2000 BDF and the 2004 PAT. The 2000 BDF is used since it has income and demographic data for 2000. The 2000 BDF file contains records for 25,803 individuals in 10,305 households. These records represent 59,450,271 individuals in 24,525,505 French households after weighting. Missing values have been replaced using the method of multiple imputation with chained equations.40 This resulted in five replicates for each original observation for a total of 129,015 individual records and 51,525 household records. The 2004 PAT contains 9,692 household records. When the weights are appropriately adjusted, the records in the PAT

[39] Household income and educational achievement are excluded for the sake of clarity of the plot.
[40] Variables with missing values were educational attainment and occupational category.

represent 24,737,820 households. As for the EAF 1992, many of the asset and income values were categorical and so were transformed using the Pareto distribution in the manner described above. Again, missing values were replaced using the method of multiple imputation with chained equations.41 This process produced five implicates for each original record, resulting in a total of 48,460 records. The strata variables for this wealth match are homeownership, age, family type, household income and education. Table A.5 shows the distribution of households by these five variables in the two data sets. Both surveys are regionally representative samples carried four years apart, we can expect them to be reasonably well aligned.

We see that as with the 1989 wealth match, the distribution of household income is fairly poorly aligned. In this case, however, the upper and lower income categories are over-represented in the PAT, while the middle income categories are under-represented, with respect to the BDF. The distribution of the other strata variables is very close in the two surveys, within one percent in all cases but family type. In the latter case, married couples are 1.9% more prevalent in the BDF than the PAT, while male-headed households are 1.3% less prevalent in the PAT. These misalignments carry the cautions mentioned above in terms of what we can expect from the match quality along these dimensions, at least.

Match QC

The match itself required twenty rounds of matching to complete and was 85 percent done after the first round (see Table A.6). This is a good sign, as so many records were matched within one of 162 very detailed matching cells (formed by combinations of all five strata variables). After five rounds, over 95% of the records were matched. These characteristics of the matching process indicate that the quality of the match should be good. Table A.7 shows that this is in fact the case. The distribution of net worth has been fairly well-preserved. Percentile ratios are closely carried over. The differences in the ratios between the matched file and the PAT are due to the lower half of the distribution in the matched file having larger values than the PAT and vice versa for the upper half of the distribution. For example, the p10 value for net worth in the matched file is €375, as opposed to €354 in the PAT file, while the p90 is €348,645 and €349,089 in the match file and the Pat, respectively. The Gini coefficients are, nonetheless, almost identical.

[41] Variables with missing values were occupational category, dwelling type and nearly all of the financial variables.

Figure A.3 shows the ratio of mean net worth in the matched file to the PAT by strata variable categories. As we can see, net worth has been fairly well reproduced in the match file, with generally small variations between the matched file and the PAT. In most cases the differences are within 5%. Exceptions include male-headed households, with 7.2% lower net worth in the matched file, elders with 7% greater net worth, renters with 9.7% greater net worth in the matched file, and household heads with less than a baccalaureate, with 5.8% greater net worth. The greatest differences are by household income category. Households with between €10,000 and €20,000 in household income per year have 7.4% lower net worth in the matched file, while those with between €30,000 and €60,000 and greater than €60,000 in household income per year have 10.3% and 17.8% greater net worth in the matched file, respectively. These relatively large differences are due to the misalignment in household income categories between the two files noted above.

The comparison of mean and median net worth by strata variable categories is found in Table A.8. The ratios of mean net worth by category are very similar between the PAT and the matched file. The most notable difference is the ratio between non-elder and elder mean household net worth. While the means in the matched file differ considerably from the PAT, the relative position of the non-elders vis-à-vis elders is preserved. The matched file to PAT ratios in median values are somewhat more concerning. Non-elders have 13% lower median net worth in the matched file (a €8,400 difference), while households between €10,000 and €20,000 in household income per year have 27% lower median net worth (€8,800). However, the ratios of non-elder to elder median net worth are close enough and the ratios of the individual income categories to the highest category are well reproduced in the matched file.

Finally, Figure A.4 shows the distribution of log net worth within collapsed matching cells (by family type, homeownership, and age). The distributions have been carried over very well. The most obvious difference is that the lower tails of the distributions haven't been carried over completely in some of the larger cells (for example, non-elder renter married couples). The bulk of the distribution is quite well carried over, however.

Overall, the match has provided us with a fair representation of the original distribution of wealth in the PAT. The differences we observe are small enough not to affect the outcome of the final analysis of the LIMEW greatly.

A.3 Tables

Table A.1: Alignment of Strata Variables for 1989 Wealth Match

	BDF 1989	EAF 1992	Diff (%)
Households	21,201,890	22,145,485	4.45%
HH Income Category			
<50,000F	16.35%	15.17%	-1.18%
50,000-75,000 F	13.24%	16.99%	3.75%
75,000-100,000 F	12.93%	15.86%	2.93%
100,000-130,000 F	15.06%	16.53%	1.47%
130,000-200,000 F	24.21%	20.63%	-3.58%
>= 200,000 F	18.21%	14.81%	-3.40%
Home ownership			
Renter	44.52%	45.57%	1.05%
Owner	55.48%	54.43%	-1.05%
Family Type			
Married Couple	65.54%	65.74%	0.20%
Female Head	23.71%	22.98%	-0.73%
Male Head	10.74%	11.28%	0.54%
Age Category			
Nonelder	75.41%	73.64%	-1.77%
Elder	24.59%	26.36%	1.77%
Age Category			
Less than 35	22.50%	20.34%	-2.16%
35 to 44	21.08%	21.44%	0.36%
45 to 54	15.22%	16.35%	1.13%
55 to 64	16.61%	15.51%	-1.10%
65 and older	24.59%	26.36%	1.77%
Educational Attainment			
Less than BAC	26.54%	24.09%	-2.45%
BAC	59.73%	61.69%	1.96%
More than BAC	13.73%	14.23%	0.50%

Table A.2: Distribution of Matched Records by Matching Round, 1989 Wealth Match

Matching Round	Records Matched	Percent	Cumulative Percent
1	17,739,636	83.7	83.7
2	477,146	2.3	85.9
3	268400	1.3	87.2
4	321913	1.5	88.7
5	624,181	2.9	91.6
6	128956	0.6	92.2
7	78142	0.4	92.6
8	61835	0.3	92.9
9	234760	1.1	94.0
10	12051	0.1	94.1
11	648176	3.1	97.1
12	3982	0.0	97.2
13	62,811	0.3	97.5
14	51,217	0.24	97.7
15	11,124	0.05	97.7
16	82,827	0.39	98.1
17	4,356	0.02	98.2
18	10,184	0.05	98.2
19	4,140	0.02	98.2
20	19,976	0.09	98.3
21	3,947	0.02	98.3
22	356,077	1.68	100.0
Total	21,205,837	100.0	

Table A.3: Distribution of Net Worth in 1992 EAF and Matched File

	p90/p10	p90/p50	p50/p10	p75/p25	p75/p50	p50/p25	Gini
Match	4979.45	4.88	1021.31	25.97	2.56	10.16	0.681
EAF	1108.89	4.83	229.60	22.40	2.53	8.87	0.677

Table A.4: Mean and Median Net Worth by Strata Variable, 1992 EAF and Matched File

Average Net Worth

	EAF1992	Match	Ratio			
Asset1	338,982	336,387	99.23%			
Asset2	169,960	165,774	97.54%			
Asset3	103,525	101,147	97.70%			
Asset4	21,646	21,090	97.43%			
Asset5	14,489	14,108	97.37%			
Debt1	49,860	48,446	97.16%			
Debt2	8,326	8,399	100.88%			
Networth	590,417	581,660	98.52%			
					EAF1992	**Match**
renter	160,263	159,278	99.39%	**ren/own**	0.169	0.173
homeowner	950,537	920,567	96.85%			
non-elder	561,165	565,304	100.74%	**non/eld**	0.835	0.895
elder	672,142	631,813	94.00%			
MC	706,390	694,513	98.32%			
FH	362,526	363,688	100.32%	**fh/mc**	0.513	0.524
MH	378,856	374,287	98.79%	**mh/mc**	0.536	0.539
LT BAC	348,102	373,980	107.43%	**ltBAC/gtBAC**	0.335	0.375
BAC	581,608	578,480	99.46%	**BAC/gtBAC**	0.560	0.580
GT BAC	1,038,878	997,030	95.97%			
Less than 50K	235,667	256,977	109.04%	**lt 50k**	0.156	0.197
50K to 75K	297,237	323,337	108.78%	**50-75k**	0.197	0.248
75K to 100K	395,661	383,635	96.96%	**75-100k**	0.262	0.294
100K to 130K	521,959	442,518	84.78%	**100-130k**	0.345	0.340
130K to 200K	636,620	592,127	93.01%	**130-200k**	0.421	0.454
200K or more	1,511,029	1,302,947	86.23%			

Median Net Worth

	EAF1992	Match	Ratio			
Asset1	175,000	175,000	100.00%			
Asset2	0	0				
Asset3	44,332	42,637	96.18%			
Asset4	0	0				
Asset5	0	0				
Debt1	0	0				
Debt2	0	0				
Networth	299,392	291,074	97.22%			
					EAF1992	**Match**
renter	30,936	30,660	99.11%	**ren/own**	0.049	0.050
homeowner	633,302	612,812	96.76%			
non-elder	262,321	271,824	103.62%	**non/eld**	0.646	0.740
elder	405,827	367,279	90.50%			
MC	413,935	407,236	98.38%			
FH	112,214	106,244	94.68%	**fh/mc**	0.271	0.261
MH	121,317	132,088	108.88%	**mh/mc**	0.293	0.324
LT BAC	139,508	150,893	108.16%	**ltBAC/gtBAC**	0.288	0.406
BAC	350,718	358,847	102.32%	**BAC/gtBAC**	0.724	0.966
GT BAC	484,654	371,615	76.68%			
Less than 50K	44,009	44,640	101.43%	**lt 50k**	0.046	0.057
50K to 75K	109,691	140,000	127.63%	**50-75k**	0.114	0.179
75K to 100K	223,971	205,644	91.82%	**75-100k**	0.233	0.262
100K to 130K	348,414	285,243	81.87%	**100-130k**	0.363	0.364
130K to 200K	444,889	403,634	90.73%	**130-200k**	0.464	0.515
200K or more	959,759	783,938	81.68%			

Table A.5: Alignment of Strata Variables for 2000 Wealth Match

	BDF 2001	PAT 2004	Diff (%)
Households	24,525,505	24,737,820	0.87%
HH Income Category			
Less than 10K	10.58%	16.41%	5.83%
10K to 20K	30.54%	30.84%	0.30%
20K to 30K	25.64%	22.47%	-3.17%
30K to 60K	27.87%	20.03%	-7.84%
60K or more	5.37%	10.25%	4.88%
Home ownership			
Renter	45.19%	44.28%	-0.91%
Owner	54.81%	55.72%	0.91%
Family Type			
Married Couple	63.41%	61.55%	-1.86%
Female Head	24.29%	24.85%	0.56%
Male Head	12.30%	13.60%	1.30%
Age Category			
Nonelder	74.12%	73.11%	-1.01%
Elder	25.88%	26.89%	1.01%
Age Category			
Less than 35	19.95%	19.13%	-0.82%
35 to 44	20.35%	19.65%	-0.70%
45 to 54	20.11%	19.53%	-0.58%
55 to 64	13.71%	14.81%	1.10%
65 and older	25.88%	26.89%	1.01%
Educational Attainment			
Less than BAC	21.09%	20.82%	-0.27%
BAC	69.88%	70.17%	0.29%
More than BAC	9.03%	9.01%	-0.02%

Table A.6: Distribution of Matched Records by Matching Round, 2000 Wealth Match

Matching Round	Records Matched	Percent	Cumulative Percent
1	20,775,605	84.7	84.7
2	305,639	1.3	86.0
3	157,082	0.6	86.6
4	150,318	0.6	87.2
5	2,012,298	8.2	95.4
6	2,020	0.0	95.4
7	80,449	0.3	95.8
8	291,313	1.2	96.9
9	123,398	0.5	97.4
10	136,370	0.6	98.0
11	33,933	0.1	98.1
12	26,201	0.1	98.2
13	10,617	0.0	98.3
14	116,646	0.5	98.8
15	40,731	0.2	98.9
16	14,570	0.1	99.0
17	44,778	0.2	99.2
18	20,072	0.1	99.3
19	21,901	0.1	99.3
20	161,564	0.7	100.0
Total	24,525,505	100.0	

Table A.7: Distribution of Net Worth in 2004 PAT and Matched File

	p90/p10	p90/p50	p50/p10	p75/p25	p75/p50	p50/p25	Gini
Match	929.72	4.63	200.87	28.32	2.42	11.71	0.6786
PAT	986.13	4.56	216.45	29.12	2.40	12.14	0.6788

Table A.8: Mean and Median Net Worth by Strata Variable, 2004 PAT and Matched File

Average Net Worth

	PAT2004	Match	Ratio			
Asset1	78,008	76,899	98.58%			
Asset2	47,240	46,840	99.15%			
Asset3	13,615	13,456	98.83%			
Asset4	23,937	23,657	98.83%			
Debt1	9,693	8,729	90.05%			
Debt2	1,536	1,531	99.67%			
Networth	151,570	150,592	99.35%			
					PAT2004	**Match**
renter	37,265	40,886	109.72%	**ren/own**	0.154	0.170
homeowner	242,418	241,059	99.44%			
non-elder	147,887	142,819	96.57%	**non/eld**	0.915	0.826
elder	161,583	172,854	106.98%			
MC	193,378	189,387	97.94%			
FH	81,190	82,815	102.00%	**fh/mc**	0.420	0.437
MH	90,944	84,426	92.83%	**mh/mc**	0.470	0.446
LT BAC	88,565	93,699	105.80%	**ltBAC/gtBAC**	0.522	0.533
BAC	167,921	164,502	97.96%	**BAC/gtBAC**	0.989	0.936
GT BAC	169,789	175,842	103.57%			
Less than 10K	52,678	52,720	100.08%	**lt 10k**	0.104	0.089
10K to 20K	79,192	73,352	92.63%	**10-20k**	0.157	0.123
20K to 30K	117,851	113,046	95.92%	**20-30k**	0.233	0.190
30K to 60K	200,613	221,258	110.29%	**30-60k**	0.397	0.371
60K or more	505,600	595,656	117.81%	**60k or more**	1.000	1.000

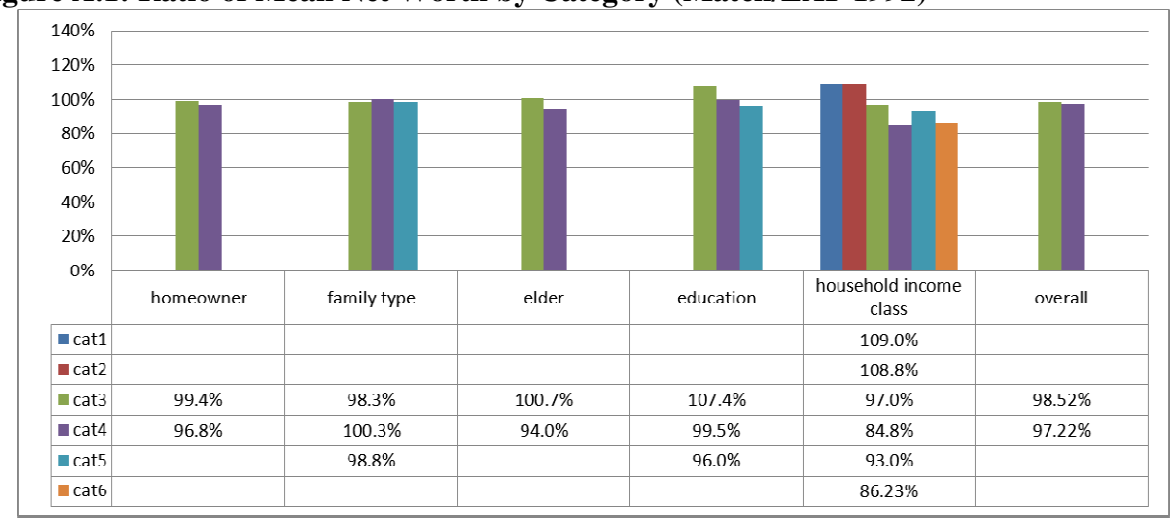
Median Net Worth

	PAT2004	Match	Ratio
Asset1	37,984	32,471	85.49%
Asset2	0	0	
Asset3	4,815	4,890	101.56%
Asset4	1,888	1,962	103.92%
Debt1	0	0	
Debt2	0	0	
Networth	76,623	75,327	98.31%

					PAT2004	Match
renter	4,612	5,140	111.45%	**ren/own**	0.030	0.033
homeowner	155,229	155,244	100.01%			
non-elder	66,642	58,228	87.37%	**non/eld**	0.649	0.514
elder	102,677	113,385	110.43%			
MC	114,906	109,644	95.42%			
FH	23,547	26,378	112.02%	**fh/mc**	0.205	0.241
MH	20,084	19,381	96.50%	**mh/mc**	0.175	0.177
LT BAC	33,825	47,569	140.63%	**ltBAC/gtBAC**	0.380	0.511
BAC	88,071	82,880	94.11%	**BAC/gtBAC**	0.988	0.890
GT BAC	89,108	93,111	104.49%			
Less than 10K	6,485	5,778	89.10%	**lt 10k**	0.022	0.018
10K to 20K	31,974	23,197	72.55%	**10-20k**	0.108	0.074
20K to 30K	82,774	73,195	88.43%	**20-30k**	0.280	0.234
30K to 60K	141,141	147,248	104.33%	**30-60k**	0.477	0.471
60K or more	295,876	312,454	105.60%	**60k or more**	1.000	1.000

A.4 Figures

Figure A.1: Ratio of Mean Net Worth by Category (Match/EAF 1992)



	homeowner	family type	elder	education	household income class	overall
cat1					109.0%	
cat2					108.8%	
cat3	99.4%	98.3%	100.7%	107.4%	97.0%	98.52%
cat4	96.8%	100.3%	94.0%	99.5%	84.8%	97.22%
cat5		98.8%		96.0%	93.0%	
cat6					86.23%	

Figure A.2: Net Worth by Matching Cells, 1992 EAF and Matched File

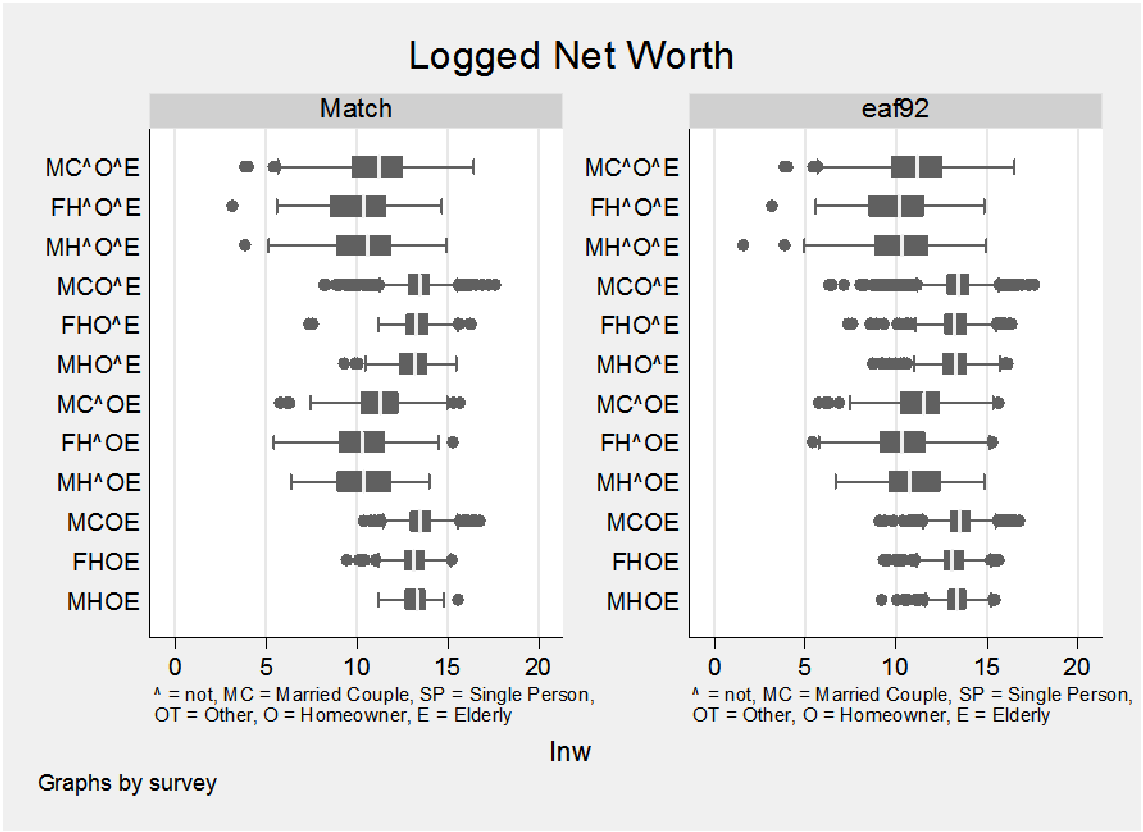
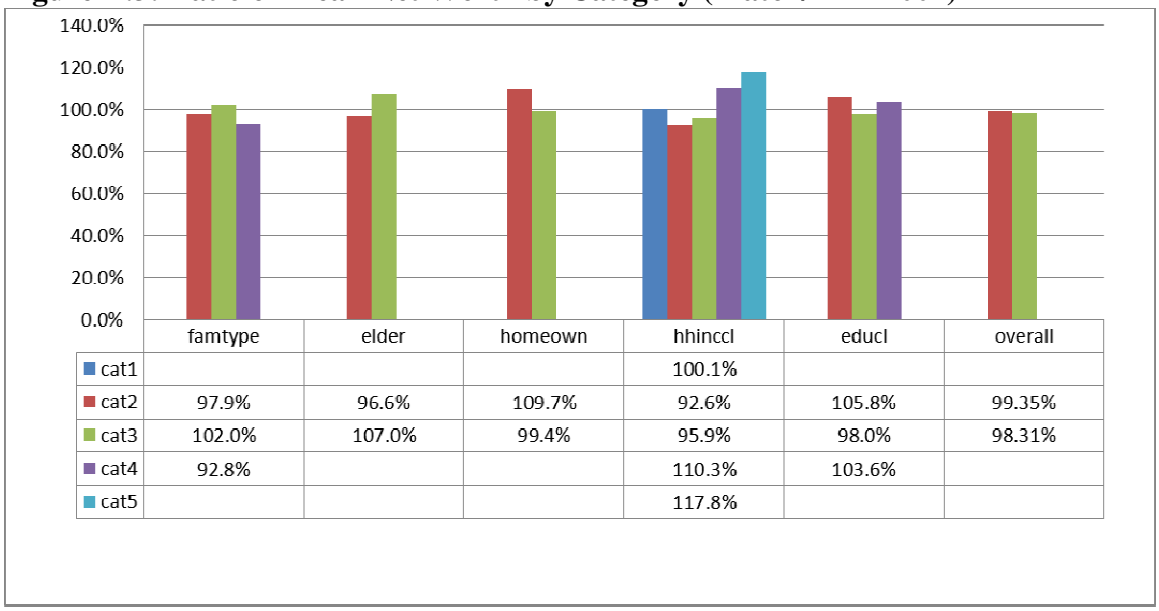
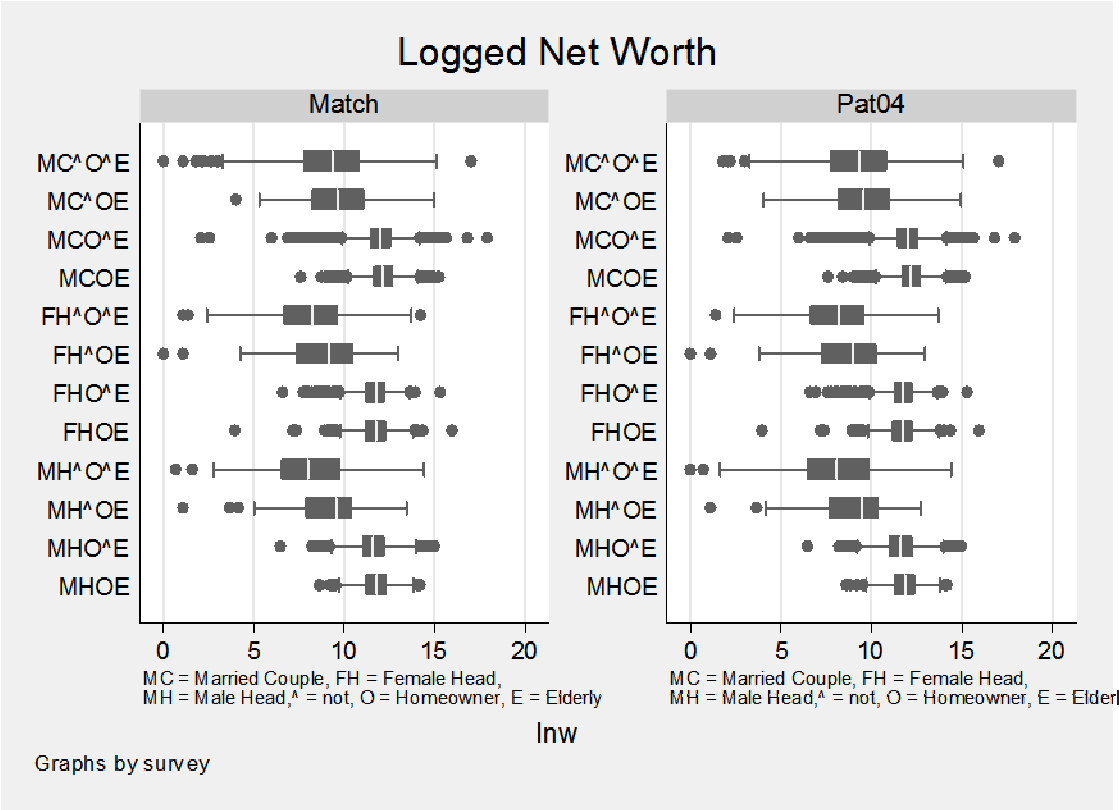


Figure A.3: Ratio of Mean Net Worth by Category (Match/PAT 2004)



	famtype	elder	homeown	hhincci	educl	overall
cat1				100.1%		
cat2	97.9%	96.6%	109.7%	92.6%	105.8%	99.35%
cat3	102.0%	107.0%	99.4%	95.9%	98.0%	98.31%
cat4	92.8%			110.3%	103.6%	
cat5				117.8%		

Figure A.4: Net Worth by Matching Cells, 2004 PAT and Matched File



APPENDIX B: STATISTICAL MATCHES WITH TIME USE DATA

B.1 1989

Data and Alignment

The source data sets for the time use match for the 1989 LIMEW estimates are the 1989-90 BDF and the 1998 EDT. We use individual records from the 1989-90 BDF file, excluding those living in group quarters or in the Armed Forces. Since the EDT covers individuals 15 years old and above, we discard younger individuals from the BDF file. This leaves 19,293 records, which represents 43,496,343 individuals when weighted. The EDT file includes time use data for 16,047 individuals, representing 43,183,035 individuals when weighted.

For the time use match, the strata variables are sex, parental status, employment status, marital status, and spouse's employment status. While for the wealth match the matching unit is the household, for the time use match we use individuals. Table B.1 compares the distribution of individuals by these variables in the two data sets. We see that the distribution of individuals by sex is very closely aligned in the two surveys. The next closest match is by labor force status, with more employed persons in the EDT. Parental status is also well-aligned. However, the portion of married individuals is much higher in the BDF. Spouse's labor force status, on the other hand, is relatively close (among those with spouses). Clearly marital status is the most troubling in terms of alignment and we can expect there to be some discrepancy between the matched file and the EDT in this variable.

Match QC

Turning to the results of the match, we first look to the distribution of matched records by matching round in Table B.2. The bulk of the matches, 92%, occur in the first round, ensuring as high-quality a match as possible. Table B.3 provides a closer comparison of the distribution of weekly hours of household production in the EDT and the matched file. The percentile ratios are almost all equivalent. P75 is slightly off between the matched file (35.93 hours) and the EDT (35.58 hours), a very small difference. The Gini coefficient is extremely close, 0.4875 in the matched file, compared to 0.4866 in the EDT.

Examination of the quality of the match within population sub-groups shows generally good results. Figure B.1 displays ratios of mean weekly hours of household production between the matched file and the EDT for the five strata variables. When not equal, the ratios of mean weekly hours of household production within sub-categories of the strata variables are all within

5% of unity. Unmarried individuals and those individuals whose spouse is not working have weekly hours that are 5% lower and higher, respectively, in the matched file than in the EDT.

Table B.4 has the actual numbers, and we can see that these differences amount to one hour a week in each case. However, notice that the median weekly hours of household production for unmarried individuals in the matched file is two hours lower than that of the EDT, for a difference of 13%. The median weekly hours for those not working is one hour lower in the matched file, a difference of 4%. All other means and medians in the matched file perfectly mirror the EDT. The extent to which the match file reproduces the distribution of weekly hours of household production within collapsed matching cells is demonstrated in Figure B.2.[42] We can see very little difference between the matched file and the EDT. Thus the distribution of household production is well preserved in the matching process, even at this level of detail.

Overall, the quality of the match is very good. The overall distribution is transferred with remarkable accuracy, and the distributions within sub-groups, such as female non-parent employees, are transferred with good precision. Even in the case of marital status, the transfer of weekly hours of household production is quite precise.

B.2 2000

Data and Alignment

The source data sets for the time use match for the 2000 LIMEW estimates are the 2000 BDF and the 1999 EDT. We use individual records from the 2000 BDF file, excluding those living in group quarters or in the Armed Forces. Since the EDT covers individuals 15 years old and above, we discard younger individuals from the BDF file. This leaves 103,320 records, which represents 47,659,195 individuals when weighted. The EDT file includes time use data for 15,466 individuals, corresponding to 47,302,220 individuals when weighted. Due to missing values,[43] we used multiple imputation with chained equations on the 1999 EDT. For the time use match, the strata variables are sex, parental status, employment status, marital status, and spouse's employment status. While for the wealth match the matching unit is the household, for the time use match we use individuals.

[42] Marital status and spouse's employment status are excluded for the sake of clarity of the plot.
[43] The one variable with missing values was household income.

Table B.5 compares the distribution of individuals by these variables in the two data sets. Since the two surveys were carried out just one year apart, we can expect them to be well-aligned. We see that the distribution of individuals by sex is only slightly different in the two surveys. Parents are much less prevalent in the BDF than in the EDT (by 7.5%). The employed are slightly under-represented by 2.1%, in the EDT relative to the BDF. The portion of married individuals is lower in the EDT, by 1.8%. The difference in spouse's labor force status is quite small (0.4%). The difference in parental status, possibly reflecting different sampling frames, is the greatest cause for concern in terms of the potential match quality, but the alignment overall is good.

Match QC

Table B.6 shows the distribution of matched records by matching round. The fact that only seven rounds were required to complete the match is a promising sign for the quality of the match. Indeed, 90.8 percent of records were matched in the first round of matching. The overall distribution of weekly hours of household production in the matched file is very close to that in the EDT, based on the percentile ratios and Gini coefficients displayed in Table B.7. Only the p90/p50 ratio is off, by very little. The Gini coefficient is off by only 0.01 Gini points. Figure B.3 displays ratios of mean weekly hours of household production by the strata variables, as well as household income and education. In terms of the strata variables, the match looks very good for each one. With one exception the matched file exactly reproduces the EDT. Non-parents have 6% greater average weekly hours of household production in the match file. In terms of household income and education, the differences are greater, but still mostly within 10%. The lowest household income category is the farthest off, 18% lower in the matched file than in the EDT, while the highest income category and those with greater than baccalaureates had 13% and 12% greater weekly hours of household production, respectively, in the matched file than in the EDT.

Table B.8 gives us a closer look at the numbers behind Figure B.3, showing the mean and median weekly hours of household production by the strata variables, plus education and household income. Here we can see that the 6% difference in mean weekly hours for non-parents translates to one hour per week, as do the differences by education and income for the most part. The exceptions are for those households with less than €10,000 (four hours less) and more than €50,000 and greater than baccalaureate (two hours more). The ratios by strata variables are correspondingly well reproduced in the matched file. As we can see, the ratios of

matched to EDT medians are unity for all the strata variable categories except non-parents. For the latter the difference is 7%, but still only a one hour difference. The differences for non-strata variables are again larger, with those with less than a baccalaureate registering two hours less per week and those with greater than a baccalaureate one more at the median in the matched file, while those in households with less than €10,000 incomes have six fewer, those in households with €10,000 to €20,000 two fewer, and those with €20,000 to €30,000 and greater than €50,000 two more hours of household production. The ratios of household income categories to the highest category are thus not well-retained in the matched file.

Finally, Figure B.4 displays the distributions of household production weekly hours in collapsed matching cells (by sex, parent and employment status). There are few noticeable differences between the EDT and the matched file, indicating that even within cells, there has been good transference of the distributions of household production. In many of the cells the upper tail has not been well-transferred.

In summary the reproduction of the weekly hours of household production in the EDT in the matched file is very good. The remaining differences are small, and do not greatly impact the final LIMEW estimates for France.

B.3 Tables

Table B.1: Alignment of Strata Variables for 1989 Time Use Match

	BDF1989	EDT1985	Diff (%)
Individuals	43,511,114	43,183,035	-0.75%
Sex			
Female	52.58%	52.15%	-0.43%
Male	47.42%	47.85%	0.43%
Parental Status			
No	72.43%	71.61%	-0.82%
Yes	27.57%	28.39%	0.82%
Labor Force Status			
Not employed	50.89%	50.36%	-0.53%
Employed	49.11%	49.64%	0.53%
Spouse			
No	36.58%	44.43%	7.85%
Yes	63.42%	55.57%	-7.85%
Spouse's Labor Force Status			
Spouse not employed	41.19%	40.35%	-0.84%
Spouse employed	58.81%	59.65%	0.84%

Table B.2: Distribution of Matched Records by Matching Round, 1989 Time Use Match

Matching Round	Records Matched	Percent	Cumulative Percent
1	40,060,981	92.2	92.2
2	19,518	0.0	92.2
3	2821934	6.5	98.7
4	113,828	0.3	99.0
5	116,908	0.3	99.3
6	229801	0.5	99.8
7	53704	0.1	99.9
8	37472	0.1	100.0
Total	43,454,146	100.0	

Table B.3: Distribution of Weekly Hours of Household Production in 1985 EDT and Matched File

	p90/p10	p90/p50	p50/p10	p75/p25	p75/p50	p50/p25	Gini
EDT	17.600	2.667	6.600	4.692	1.848	2.538	0.4866
IMP	17.600	2.667	6.600	4.738	1.867	2.538	0.4875

Table B.4: Mean and Median Household Production Weekly Hours, 1985 EDT and Matched File

Mean Values of Household Production

	EdT85	Match	Ratio			
Care	16.0	16.0	100.0%			
Procurement	2.8	2.8	100.0%			
Core	2.9	2.9	100.0%			
Total	22.0	22.0	100.0%			
					EdT85	**Match**
Female	32.0	32.0	100.0%	**F/M**	2.909	2.909
Male	11.0	11.0	100.0%			
Unmarried	19.0	18.0	94.7%	**S/M**	0.826	0.750
Married	23.0	24.0	104.3%			
Non-parent	20.0	20.0	100.0%	**NP/P**	0.741	0.741
Parent	27.0	27.0	100.0%			
Not Working	27.0	27.0	100.0%	**NW/W**	1.588	1.588
Working	17.0	17.0	100.0%			
No Spouse	19.0	18.0	94.7%	**NoSp/SpW**	0.950	0.857
Spouse Not Workin	20.0	21.0	105.0%	**NoSp/SpNW**	0.731	0.692
Spouse Working	26.0	26.0	100.0%			

Median Values of Household Production

	EdT85	Match	Ratio			
Care	11.0	11.0	100.0%			
Procurement	0.6	0.6	100.0%			
Core	0.0	0.0				
Total	17.0	17.0	100.0%			
					EdT85	**Match**
Female	30.0	30.0	100.0%	**F/M**	4.286	4.286
Male	7.0	7.0	100.0%			
Unmarried	15.0	13.0	86.7%	**S/M**	0.833	0.684
Married	18.0	19.0	105.6%			
Non-parent	15.0	15.0	100.0%	**NP/P**	0.682	0.682
Parent	22.0	22.0	100.0%			
Not Working	24.0	23.0	95.8%	**NW/W**	2.000	1.917
Working	12.0	12.0	100.0%			
No Spouse	15.0	13.0	86.7%	**NoSp/SpW**	1.000	0.867
Spouse Not Workin	15.0	15.0	100.0%	**NoSp/SpNW**	0.714	0.619
Spouse Working	21.0	21.0	100.0%			

Table B.5: Alignment of Strata Variables for 2000 Time Use Match

	BDF 2001	EdT 1999	diff (%)
Individuals	47,659,195	47,302,220	-0.75%
Sex			
Female	52.29%	51.90%	-0.39%
Male	47.71%	48.10%	0.39%
Parental Status			
No	69.23%	61.73%	-7.50%
Yes	30.77%	38.27%	7.50%
Labor Force Status			
Not employed	50.10%	52.23%	2.13%
Employed	49.90%	47.77%	-2.13%
Spouse			
No	36.04%	37.89%	1.85%
Yes	63.96%	62.11%	-1.85%
Spouse's Labor Force Status			
Spouse not employed	43.04%	42.63%	-0.41%
Spouse employed	56.96%	57.37%	0.41%

Table B.6: Distribution of Matched Records by Matching Round, 2000 Time Use Match

Matching Round	Records Matched	Percent	Cumulative Percent
1	43,273,229	90.8	90.8
2	808,810	1.7	92.5
3	2,504,740	5.3	97.8
4	52,069	0.1	97.9
5	705,783	1.5	99.4
6	233,510	0.5	99.9
7	67,233	0.1	100.0
Total	47,645,374	100.0	

Table B.7: Distribution of Weekly Hours of Household Production in 1999 EDT and Matched File

	p90/p10	p90/p50	p50/p10	p75/p25	p75/p50	p50/p25	Gini
EDT1999	.	3.08	.	8.67	2.00	4.33	0.5084
MATCH	.	3.00	.	8.67	2.00	4.33	0.5085

Table B.8: Mean and Median Household Production Weekly Hours, 1999 EDT and Matched File

Mean Values of Household Production

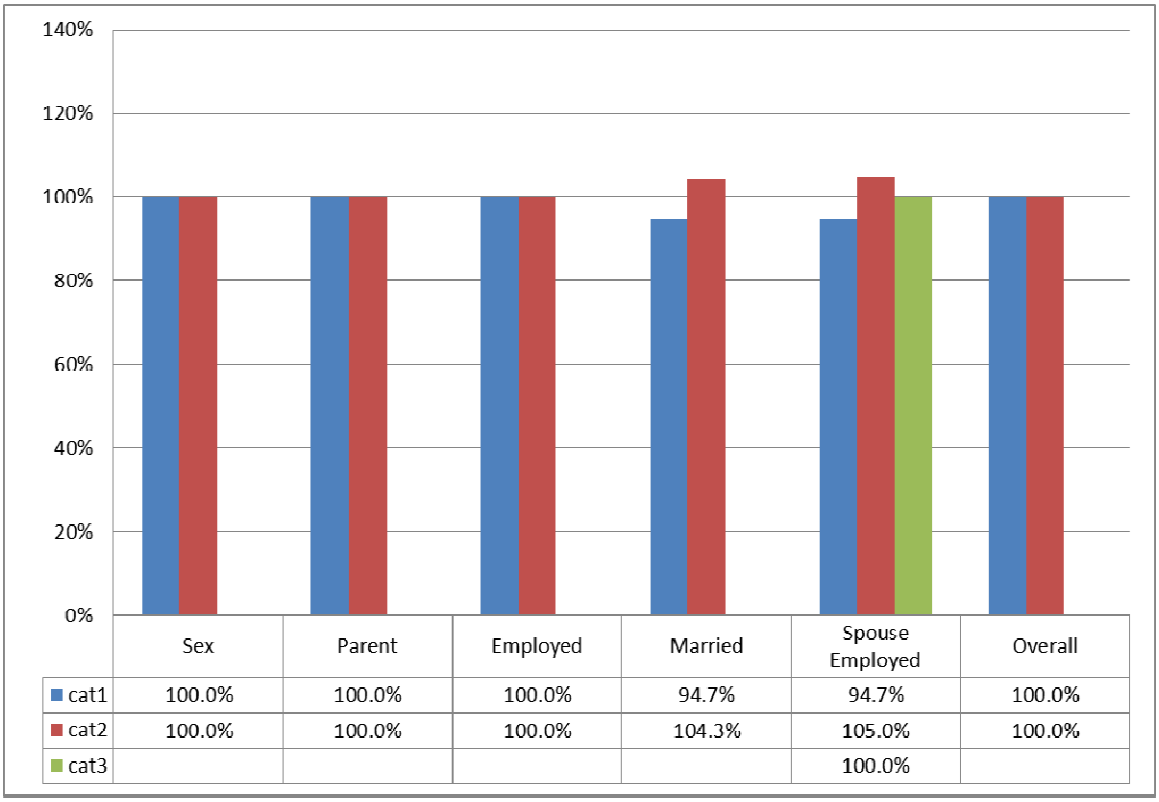
	EDT1999	Match	Ratio			
Care	14.0	14.0	100.0%			
Procurement	3.6	3.6	100.0%			
Core	2.2	2.2	100.0%			
Total	20.0	20.0	100.0%			
					EDT1999	Match
Not married	15.0	15.0	100.0%	S/M	0.682	0.682
Married	22.0	22.0	100.0%			
Non-parent	17.0	18.0	105.9%	NP/P	0.708	0.750
Parent	24.0	24.0	100.0%			
Female	28.0	28.0	100.0%	F/M	2.545	2.545
Male	11.0	11.0	100.0%			
Not Working	23.0	23.0	100.0%	NW/W	1.438	1.438
Working	16.0	16.0	100.0%			
No Spouse	15.0	15.0	100.0%	NoSp/SpW	0.714	0.714
Not Working	21.0	21.0	100.0%	NoSp/SpNW	0.652	0.652
Working	23.0	23.0	100.0%			
LT BAC	21.0	20.0	95.2%	LT BAC/GTB	1.235	1.053
BAC	20.0	19.0	95.0%	BAC/GTB	1.176	1.000
GT BAC	17.0	19.0	111.8%			
<€10,000	22.0	18.0	81.8%	lt€10k/ge€50k	1.375	1.000
€10,000-19,999	21.0	20.0	95.2%	€10-20k/ge€50k	1.313	1.111
€20,000-29,999	20.0	20.0	100.0%	€20-30k/ge€50k	1.250	1.111
€30,000-49,999	18.0	19.0	105.6%	€30-50k/ge€50k	1.125	1.056
>=€50,000	16.0	18.0	112.5%			

Median Values of Household Production

	EDT1999	Match	Ratio			
Care	9.3	9.3	100.0%			
Procurement	0.0	0.0				
Core	0.0	0.0				
Total	15.0	15.0	100.0%			
					EDT1999	Match
Not married	11.0	11.0	100.0%	S/M	0.611	0.611
Married	18.0	18.0	100.0%			
Non-parent	13.0	14.0	107.7%	NP/P	0.650	0.700
Parent	20.0	20.0	100.0%			
Female	26.0	26.0	100.0%	F/M	3.714	3.714
Male	7.0	7.0	100.0%			
Not Working	20.0	20.0	100.0%	NW/W	1.667	1.667
Working	12.0	12.0	100.0%			
No Spouse	11.0	11.0	100.0%	NoSp/SpW	0.611	0.611
Not Working	18.0	18.0	100.0%	NoSp/SpNW	0.611	0.611
Working	18.0	18.0	100.0%			
LT BAC	18.0	16.0	88.9%	LT BAC/GTB	1.385	1.143
BAC	15.0	15.0	100.0%	BAC/GTB	1.154	1.071
GT BAC	13.0	14.0	107.7%			
<€10,000	20.0	14.0	70.0%	lt€10k/ge€50k	1.250	0.778
€10,000-19,999	18.0	16.0	88.9%	€10-20k/ge€50k	1.125	0.889
€20,000-29,999	14.0	16.0	114.3%	€20-30k/ge€50k	0.875	0.889
€30,000-49,999	14.0	14.0	100.0%	€30-50k/ge€50k	0.875	0.778
>=€50,000	11.0	13.0	118.2%			

B.4 Figures

Figure B.1: Ratio of Mean HH Production by Category (Match/EDT 1985)



	Sex	Parent	Employed	Married	Spouse Employed	Overall
cat1	100.0%	100.0%	100.0%	94.7%	94.7%	100.0%
cat2	100.0%	100.0%	100.0%	104.3%	105.0%	100.0%
cat3					100.0%	

Figure B.2: Household Production by Matching Cells, 1985 EDT and Matched File

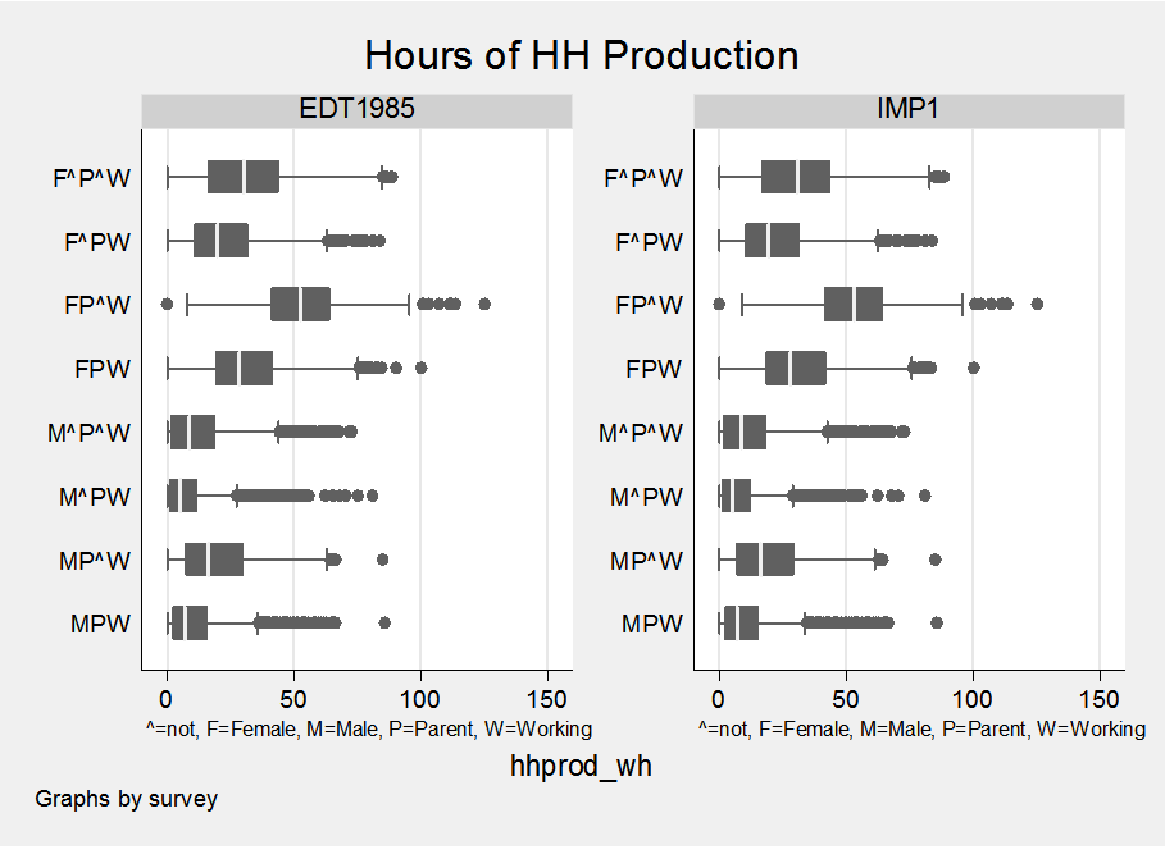
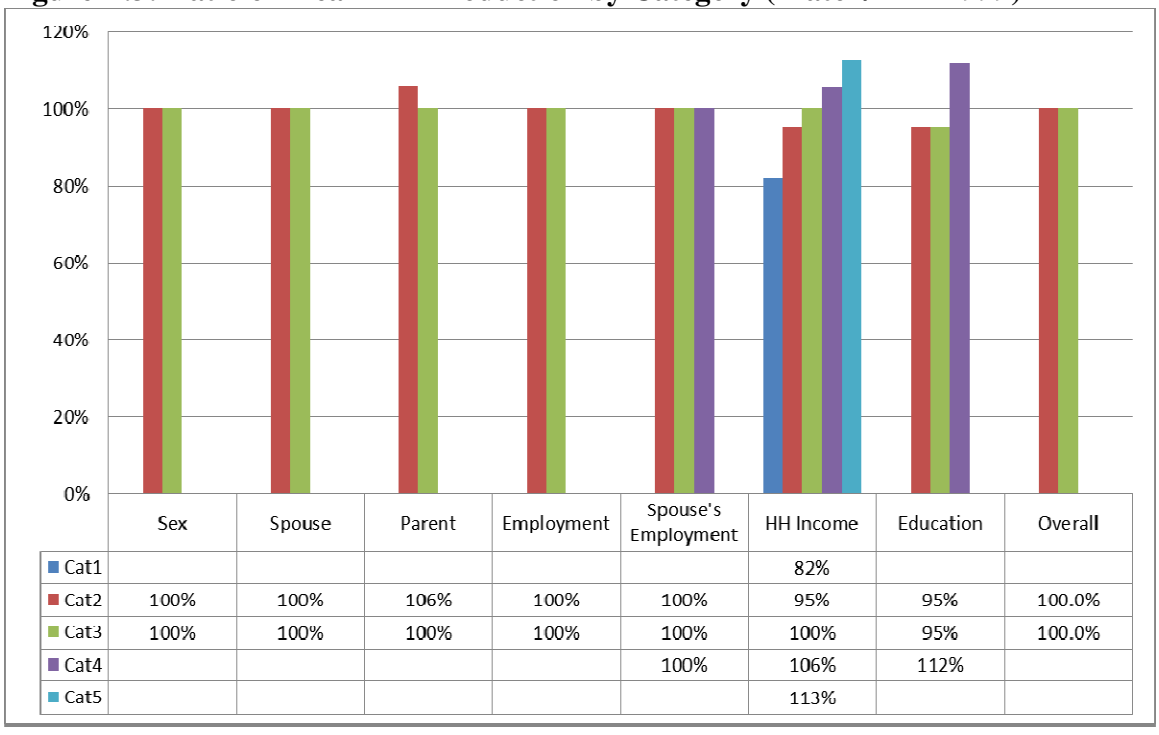


Figure B.3: Ratio of Mean HH Production by Category (Match/EDT 1999)



	Sex	Spouse	Parent	Employment	Spouse's Employment	HH Income	Education	Overall
Cat1						82%		
Cat2	100%	100%	106%	100%	100%	95%	95%	100.0%
Cat3	100%	100%	100%	100%	100%	100%	95%	100.0%
Cat4					100%	106%	112%	
Cat5						113%		

Figure B.4: Household Production by Matching Cells, 1999 EDT and Matched File