Joint distribution of income, consumption and wealth

Keywords: statistical matching, EU-SILC, HBS, HFCS, saving rates

1. INTRODUCTION

Income, consumption and wealth are three key dimensions that determine the economic well-being of people and households. Data on these three dimensions are collected through three different household surveys:

- Income: The European Union Statistics on Income and Living Conditions (EU-SILC, Eurostat) collecting annual microdata on income, poverty, social exclusion and living conditions.

- Consumption: The Household Budget Survey (HBS, Eurostat, every 5- years) focusing on households' expenditure on goods and services, giving a picture of living conditions.

- Wealth: The Household Finance and Consumption Survey (HFCS, ECB) collecting every 3 years information on assets and liabilities of households in the Euro area, together with some data on income and consumption.

In recent years, the European Commission and National Statistical Institutes have stressed the need to bring these social dimensions on par with macroeconomic indicators. In addition, it was suggested to join the three variables income, consumption and wealth (ICW) in a single micro dataset. Harmonised EU statistics covering the distributional aspects of households' income, consumption and wealth (ICW) in a joint data set could help to reach the goals of the European Union's economic governance framework monitoring economic trends in EU countries. It could further contribute to the impact analysis of fiscal policies.

2. METHODS

Statistical matching methods were used to join consumption data from the Household Budget Survey (HBS) to the EU-SILC micro data. In a second step, micro data from the Household Finance and Consumption Survey (HFCS) can be joint to produce a common distribution of income, consumption and wealth variables. In previous experiments, results produced by different matching methods (random hot-deck, rank hot-deck, distance hot-deck, conditional mean, mixed approach) had been compared. The random hot-deck method turned out to be well suited in most cases, while being the least demanding in terms of computational resources. Like any of the non-parametric methods, that do not require additional information, it has the drawback of relying on the Conditional Independence Assumption (CIA) though. Fréchet bounds (for contingency tables) can only partly relax the CIA. Thus, it should be kept in mind that indicators based on the joint ICW micro data set are purely experimental at this stage.

3. RESULTS

The comparison of the original distribution of total consumption in the HBS data set with the matched data shows good results for most countries (Figure 1). Preliminary results are displayed for four exemplary countries in the following figures.

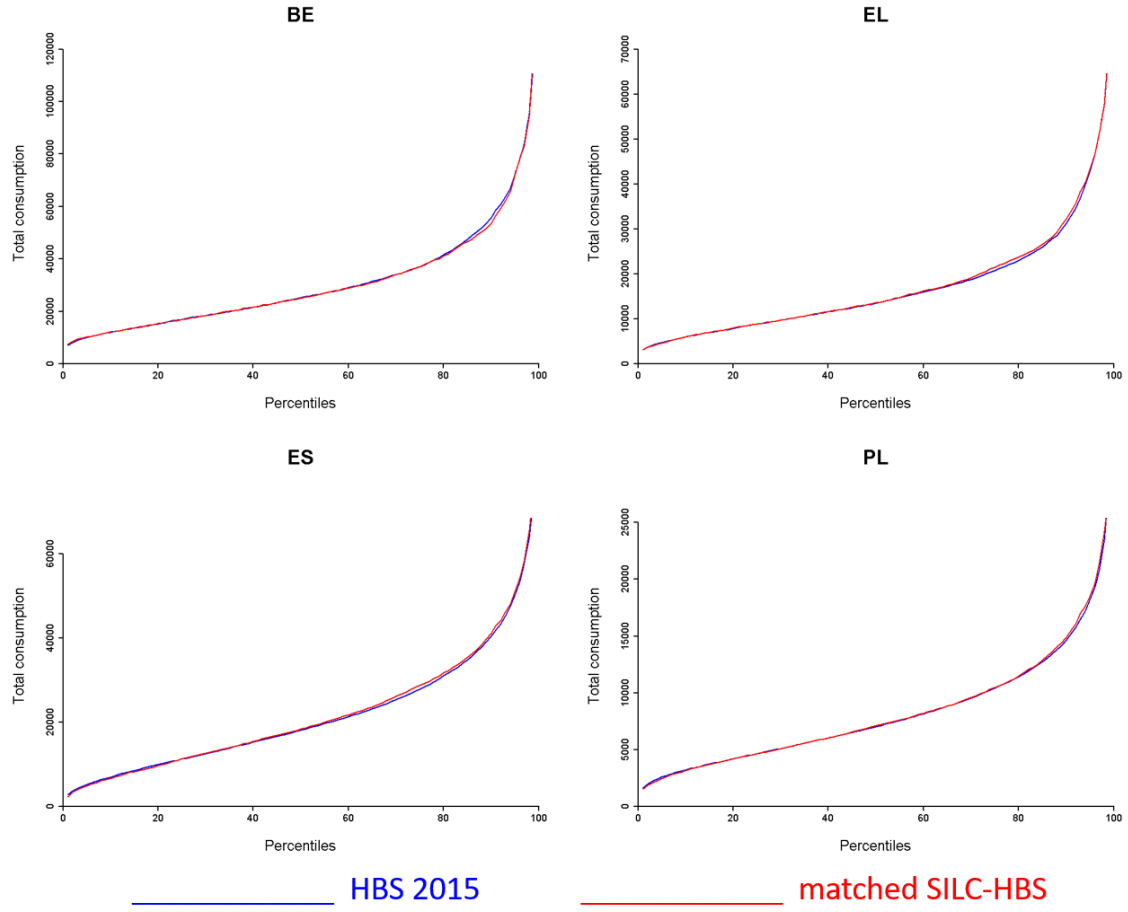

Figure 1. Comparison of total consumption percentiles from original HBS 2015 data and the matched SILC-HBS dataset for Belgium (BE), Greece (EL), Spain (ES) and Poland (PL).

The resulting joint distribution of income and consumption data allows, among other analysis, the calculation of saving rates. Figure 2 shows an increase of median saving rates from 2010 to 2015 for Poland and Belgium, and to a lesser extent Spain. Saving rates decreased slightly in Greece. Even more informative is the distribution of median saving rates for households in different income percentiles (Figure 3) and with different household characteristics (Figure 4).

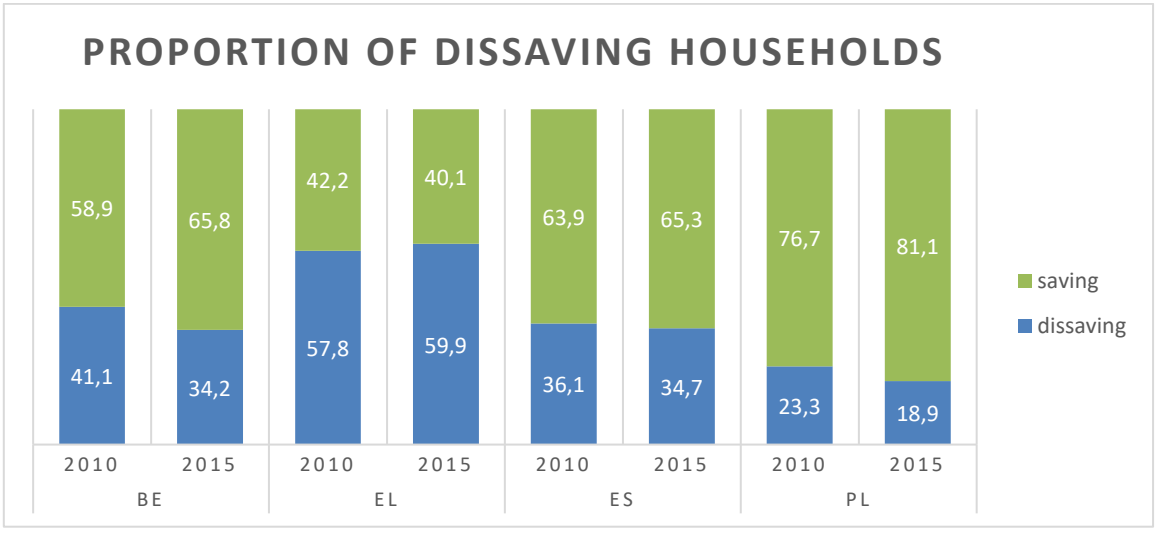

Figure 2. Proportion of dissaving households in 2010 and 2015.

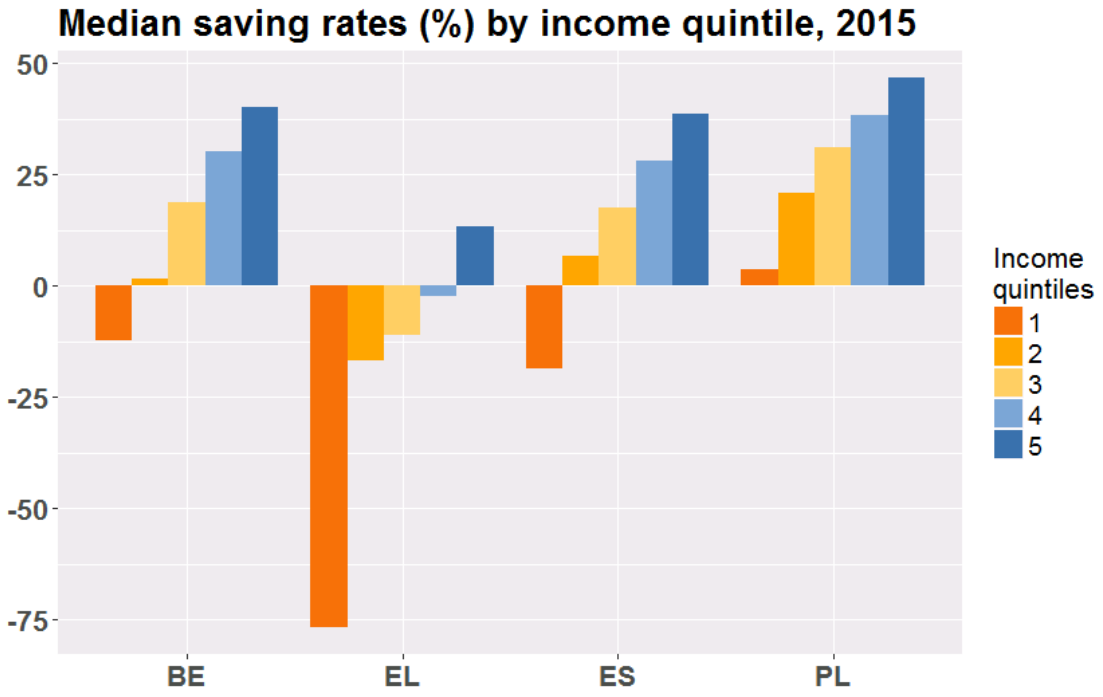

Figure 3. Median saving rates by income quintiles of households (2015).

The preliminary results of 2015 data show negative saving rates for the 20 % lowest income households in Belgium, Spain and most importantly Greece. In Greece, only the 20 % households with highest income are able to save. All countries show strong differences in saving rates between income quintiles. A clear pattern can also be observed for the median saving rates by household type: Households with more adults are better able to save. In Greece and Spain, the presence of children in the household lowers the saving rates.

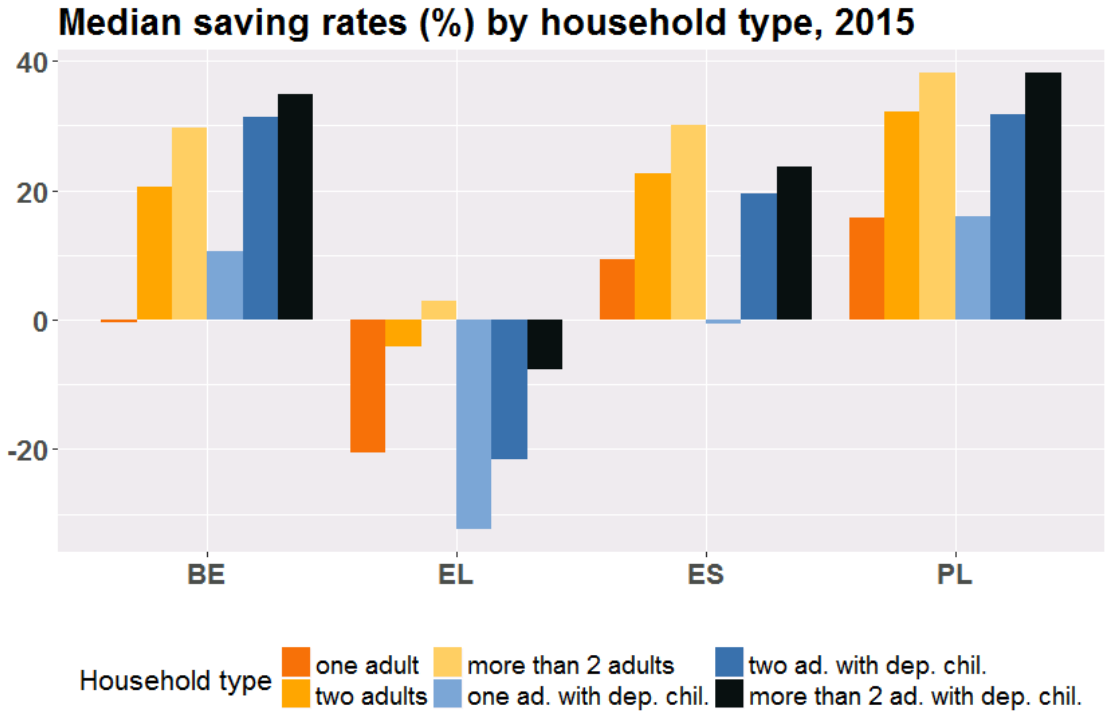

Figure 4. Median saving rates by household type (2015).

4. CONCLUSIONS

Statistical matching is relying on strong assumptions, thus products based on this method can only qualify as experimental. However, it is the only possibility, which is currently available, to produce joint micro datasets of income, consumption and wealth for households in all EU countries. The analysis of a joint distribution of income, consumption and wealth data complements classic poverty indicators that rely merely on one of the three dimensions of economic well-being. Indicators based on the joint micro dataset also enhance the knowledge on economic trends gained through macro economic analysis. Most importantly, they shed light onto the household perspective at different levels of the distribution and may thus help to assess the impact of social and fiscal policies.

First results produced using the random hot-deck method look promising in terms of quality. Exemplary indicators presented here for four countries show large differences in saving rates not only between countries, but most importantly within national populations. The comparison of median saving rates between the two reference years 2010 and 2015 show increases for some and decreases for few countries. Further indicators and countries will be presented in the full paper.