The Hidden Poor: Solving Time Poverty through Redistribution of Household Production

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Abstract

In this policy brief we start by presenting the LIMTIP estimates for the United States from 2005 to 2023 calcualted based on the statistically matched ATUS and ASEC data. Next, we implement redistribution simulations to explore the potential of redistributing household production time shares, among working-age household members, to reduce time deficits faced by individuals and households. Our simulations include three scenarios based on equality, equity and opportunity costs principles. We focus on housheolds where redistribution could be effective that is hosuheolds with atleast two working age individuals such there is atleast one time poor and one time-non poor individual and cases where total household time surplus is greater than the aggregate time defeict in the household. We find that xxxx

Keyword: Time Poverty, Income Poverty, Redistribution , household production, care work, gender equality, LIMTIP, Time Poverty, Income Poverty, Redistribution , household production, care work, gender equality, LIMTIP

1 Introduction

Redistribution of household production, which includes unpaid caregiving and domestic chores, has been identified as an important tool to achieve gender equality. The incorporation of the 3R (recognizition, reduction adn redistribution) strategy as a target in the United Nations sustainable development goals, is a testament to the decades of activism and advocacy emphasizing that gender inequality on this front cannot be justified in the name of "private family matter" rather is a matter of public policy. While household members share household production work, eveidence shows that it is mostly undertaken by girls and women globally (). While redistribution of household production responsibilities from women to men is important intrsinsically for human rights and fairness concerns, it is also instrumental in achieving gender equality in labor market outcomes (Bruyn-Hundt, 1996; Elso, 2017; Esquivel, 2016). Studies have demonstrated that gender gaps in the workforce and the unequal sharing of household responsibilities can severely impede economic growth and development (Berik et al., 2009; Duflo, 2012; Elson, 2009). Yet, difficult questions remain about public policies and collective actions that would reduce inequality, especially in poorer countries with constrained fiscal capacity,widespread absence of formal wage labor and weak welfare states. Moreover, in patrirachal contexts, cultural barriers restrict redistribution of household production, particularly unpaid care work from women to men and to the public and private spheres. While in some developed countries such as Norway and Sweden, public policies have been able to promote gender -equitable sharing of household production, for eg: paid paternity leaves in addition to paid maternity leaves , such policies seem to have attained limited attention and success in other countries.

In the case of the US, issues related to lack of public prpovisioning of care infrastructure and services, widespread existence of childcare deserts, lack of paid parental leave laws among others have gained momentum. In 2021, the value of unpaid household work in the U.S. amounted to $600 billion, constituting approximately 2.6% of the GDP (Reinhard et al. 2023). Moreover, like most other countries, we observe gender disparity in sharing of household work such that women disproportionately shoulder the burden. According to the 2018 American Time Use Survey, among adults aged 15 and older, women on average spent 5.7 hours per day on unpaid household and care work, compared with 3.6 hours for men. In other words, women spent 37 percent more time on unpaid household and care work than men (Hess et al., 2020). Additionally, the U.S. falls behind many OECD countries in effective childcare policies, spending only 0.4% of GDP on early childhood education and care (ECEC), compared to the OECD average of 0.8% (OECD, 2020). Notably, the U.S. lacks federal laws granting paid parental leave, setting it apart from other OECD nations. Around 51% of the U.S. population resides in childcare deserts, defined as census tracts with more than 50 children under the age of 5 and either no childcare providers or significantly limited options, resulting in a severe shortage of licensed child care slots (Malik et al., 2018). In the above setting, care demand falls onto households, partculalrly women. This in turn restricts care providers allocation of time to other activities including employment, leisure, socializing and self care. Time-trade off are crucial in determining individual's well-being. While some hosuheolds may be able to

outsource some of these care needs, other income-constraint hosueholds may not be able to. Over the last two decades, there has been growing interest in studying time and income poverty and in developing their linkages (Levy studies). Time constraints that stem from the overlapping domains of paid and unpaid work are of central concern to the debates surrounding economic development and gender equality. In this backdrop, we develop a novel measure of poverty for the U.S. that incorporates time deficits, known as the Levy Institute Measure of Time and Income Poverty (LIMTIP). Given the persisting lack of publicly provided care, affordable child and elderly care, and limited paid parental leave benefits in the U.S, the topic of time poverty due to household production has been drawing attention. The associated time deficits constrain people's time allocation in a range of activities, in turn affecting their overall well-being, productivity, labor market participation, and earnings. The consequences are particularly serious for women due to the disproportionate burden of household responsibilities they bear, which are closely intertwined with labor market and well-being outcomes. Standard measures of poverty fail to capture hardships caused by time deficits and thereby do not provide a complete picture for effective poverty-alleviation and welfare programs. Understanding the incidence of time poverty that individuals face and how that may have implications for the study of poverty, gender equality and overall development is therefore important.

2 LIMTIP: A New Measure of Time Poverty for the United States

- Describe the LIMTIP measure and how it is constructed: Methods paper
- Brief description of the LIMTIP measure and the Hidden Poor in the US. Small section

Poverty is a multidimensional concept that goes beyond the simple notion of lack of income. In addition to income, poverty can be understood as a lack of access to resources, including time. The LIMTIP is a metric that incorporates in addition to income poverty, aspects of time poverty. Time poverty refers to a scenarion wherein people may not have any time left after engaging in activities that are essential for taking care of the household, its members, self-care, and paid work (!leisure also?). As with any other measures of poverty, it is necessary to identify a threshold to determine if given the resources available to a person or household, they should be classified as poor or non-poor. In the case of time, all individuals have the same amount of time available to them i.e 24 hours in a day, therefore, thinking about a threshold is less intuitive. Instead, the approach used for the construction of the LIMTIP has been to identify the time balance people would potentially face after considering the necessary time spent on essential activities and household responsabilities. In this framework, people with a negative balance are considered time-poor and households with atleast one person with a time deficit is considered time poor. We express the weekly time balance of individual i in household j, X_{ij}, as:

$$X_{ij} = 168 - M - \alpha_{ij} R_j - D^0_{ij}(L_{ij} + T_{ij}) \tag{1}$$

Table 1: **Four-way classification, LIMTIP**

Four-way classification, LIMTIP	Individual	Household
Income Poor, Time Poor	3.46	6.03
Income Poor, Time Nonpoor	11.94	9.75
Income Nonpoor, Time Poor	21.71	39.39
Income Nonpoor, Time Nonpoor	62.89	44.83
Time poor (1+3)	25.17	45.42
LIMTIP poor (1+2)	15.40	15.78
N		

where 168 is the number of hours in a week, M is the sum of personal care and non-substitutable household production requirements, R_j is the required time of household production that a family j needs to maintain the household, α_{ij} is the share of individual i in the household production requirements. To account for required time due to working, the eq-bal also includes D_{ij}, a dummy variable that takes a value of 1 if the person is employed and zero otherwise. Thus, for those employed, one also accounts for hours of employment L_{ij} , the hours of commuting T_{ij}.

To construct this measure, we need a dataset that contains information on individuals' time use, in addition to standard information required for poverty analysis. The main source of information for time use comes from the American Time Use Survey (ATUS), which only provides information for a single person in the household and a single day. We understook a statitical matching procedure to combine time use data from ATUS with the Annual Social and Economic Supplements (ASEC) survey data. This is essential to construct a synthetic dataset that contains information on time use for all household members, which in turn will allow us to impute all required variables for eq-bal.

Using the the matched data we then construct income and time poverty estimates for the United States for the years 2005 to 2022.

The LIMTIP is finally measured as:

$$P_j^L* = P_j^O - p_j * X_j \tag{2}$$

where p_j is the price (!add more details on this?) at which time deficits of household j are monetized. The underlying idea is that if we were to monetize the time deficits of individuals and add those to the offical income poverty thresholds (P_j^O), we get an adjusted poverty line - LIMTIP (P_j^L). The LIMTIP estimates can be classified into four braod categories: Income poor,time poor, (ii)Income poor, time non-poor; (iii) Income non-poor, time poor; and (iv) Income non-poor, time non-poor. In Table 1 we present the distribution of individuals and households across the four-way classification of LIMTIP, averaged out across years: 2005 to 2022.

The estimation of LIMTIP also helps us calculate the number of hidden poor, i.e time poor indivuals who are left outside the scope of official income poverty estimates. The difference between the

LIMTIP measure of poverty and the official poverty estimates give us the number of hidden poor.

In Figure 1 we present time trend from 2005 to 2023 of time poverty estimates, the offical income poverty trend, and the LIMTIP poverty trend. We observe that the official poverty estimates shows a slight rising trend between 2005 to 2014 and then starts to decline. When we adjust for time deficits, as expected our LIMTIP estimates shows a higher level of poverty across all years, around 3-5 percentage points higher. For the LIMTIP poverty estimates, we also observe that the pandemic years show steep decline from 13.8 % in 2020 to 10% in 2022 before rising back to the pre-pandemic level of around 15%.

Moreover, it is notable that time poverty peaked around the Great Recession and Covid-19 pandemic recession. While time poverty rate has remained more or less stable until 2019, it fell slightly in 2020 before rising again between 2020 to 2023. In the latest year, 2023, nearly 3.5 percent of individuals are hidden poor.

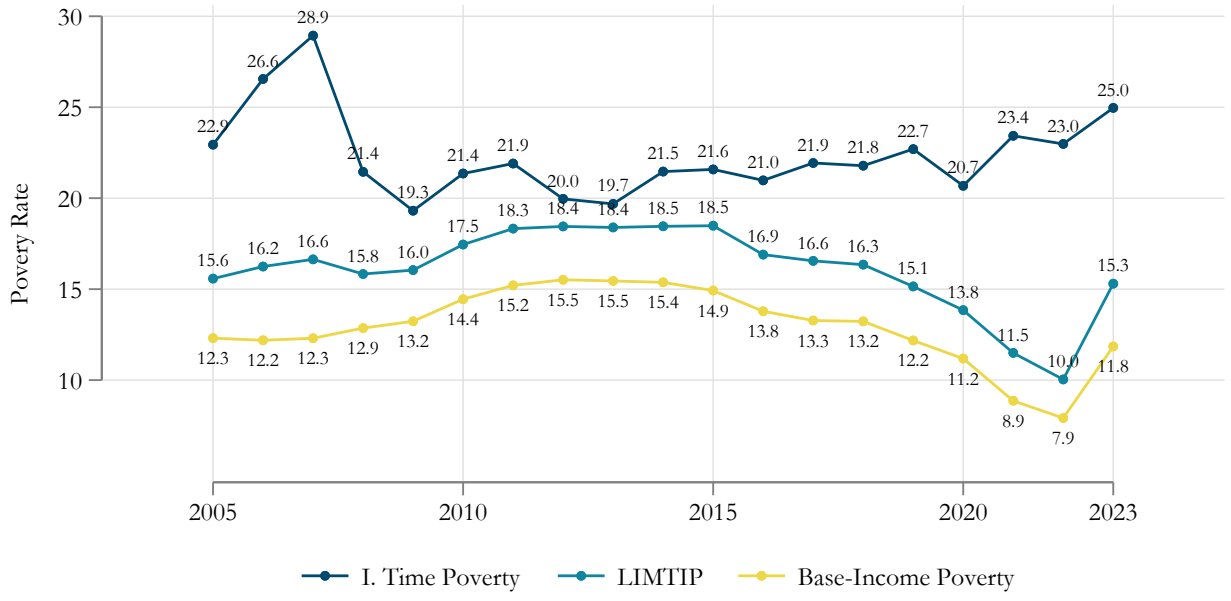


Figure 1: Trends of Time, Income and Limtip Poverty in the U.S.

In the next section, we focus on the subsample that can potentially be brought out of poverty.

3 Identifying the Problem

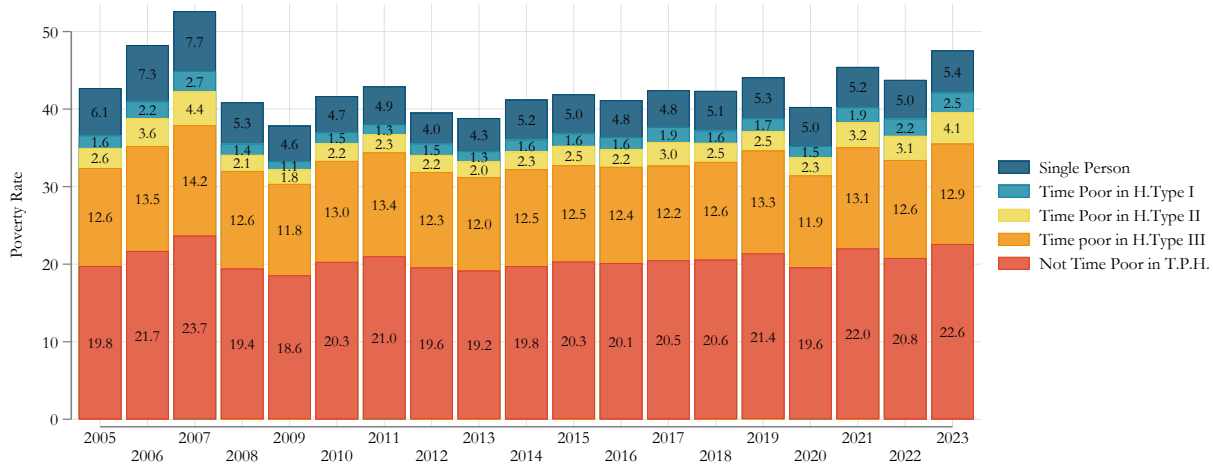
One of the strategies that could help reduce the problem of time poverty, and thereby the incidence of hidden poor, is the redistribution of household production responsibilities across all capable (!add footnote on capable!) members in the household. At best, household members with time surpluses could take on more household responsabilities, reducing the burden of those with time deficits, and potentially bringing out household out of poverty. At worst, the redistribution could make the time deficits more equal among the household members, even if the household remains time poor.

Before we start analyzing the potential that redistribution could have in reducing time poverty, we must first identify the households where redistribution is possible and desirable. Specifically, we exclude from the analysis households that are not time poor, even if such households could potentially benefit from redistribution, reducing the gaps of time surpluses among household members and even resulting in more gender-equitable sharing of household work. From the sample of individuals living in a time poor household we classify them into five different groups:

- Single: These are time poor individuals that live in a household where they are the only working-age person. In this case, redistribution is not possible, and thus are excluded from the analysis.
- Time Poor living in H. Type I: These are time poor individuals who live in households where all working-age members are time poor. While redistribution is possible, and may help in reducing the time deficits of individuals, and even allow some to transition out of time poverty, the household will remain time poor in any redistributional scenario.
- Time Poor living in H. Type II: These are time poor individuals who live in households where there are non-time poor individuals. However, the combined time surpluses is insufficient to lift the household out of time poverty.
- Time Poor living in H. Type III: These are time poor individuals who live in households where there is enough time surplus to lift the household out of time poverty. Redistribution in these households can lift all working members of the household out of time poverty.
- Non Time poor living in a time poor household: This last group consists of individuals with time surpluses living in a time poor household. The goal of the redistribution scenarios is to allocate household responsabilities in such a way that these invididuals can help lift other household members out of time poverty. However, it is also possible that some of these individuals may end up experiencing time poverty in the redistribution scenarios. (!present this info in a table across columns: Red possibile or not and efficient or not/or what outcome it brings in, by hhtype)

Figure 2 provides a visual representation of the classification of individuals living in time poor households. As it can be observed, across years, about 40% of individuals were living in a time poor household. While this share shows a sharp increase between 2005 and 2007, it has remained stable from 2008 onwards, with a small increase across years. There is an additional 4-5% of individuals who are time poor but redistribution is not possible. From the rest, about 15% of individuals constitute our main group of analysis, i.e., those living in households where redistribution is possible and some individuals could benefit from it. The remaining 20% are individuals who are not time poor but live in a time poor household.[!check stats!]

In the next section, we discuss three redistribution scenarios wherein household responsabilities can redistributed across working-age members, under different criteria. Nevertheless, we should keep in mind that we will only be analyzing the impact of redistribution on time poor households with at least 2 working-age members.



Note: T.P.H.= Time Poor Household, H.Type I : All working age members are time poor, H.Type II: There are Non-time poor individuals Living in the HH, but time surplus is insufficient to Lift HH out of Time poverty, H.Type III: There is enough time surplus to lift HH out of time poverty.

Figure 2: Time Poverty classification, across time

4 Redistribution Scenarios

- Here we would describe the three redistribution scenarios we have developed. This would be "realistic" scenarios.
- Describe the scenarios and the assumptions behind them.

Intrahousehold redistribution can potentially reduce time deficits and bring households out of poverty. We construct three redistrubution scenarios based on different guiding principles. The extent of the reduction would depend on the principle that we use in distributing household responsibilities among the members. First, we use the simple egalitarianism principle that involves an equal division of total household productiom time among all working age members. Second, we redistribute conditional on the time available to people. Finally, in the thord scenario, we redsitribute based on the opportunity cost of time for people.

We outline the methods used for implementing the scenarios, with the detailed explanation of some aspects below.

4.1 Distribution Rules for Household Production

Alternative values of α_{ij} indicate how household production requirements, net of the portion met by household members that are not of working age or are physically unable to take on more work, are shared among working-age people in the household. The three scenarios/principles are:

4.1.1 Equal Shares Scenario

The procedure for the equal shares scenario is relatively simple. The shares of those in the redistribution simulation in this scenario are simply:

$$\alpha_{ij}^{E} = 1/I_j * (1 - \alpha_j^{nw'}) \tag{3}$$

where α_{ij} represents the redistributed share of individual i; I^j denote the number of working-age persons in household j and $\alpha_j^{nw'}$ represents the share of non-working group, hence $(1 - \alpha_j^{nw'})$ representing the available redistributable share. We count the number of people in the redistribution simulation in each household and then assign them the appropriate fraction (1 for households with one person in the simulation, ½ for households with two people in the simulation, and so on) and apply that fraction to the redistributable share of required household production time. This scenraio overlooks time equity, i.e redistributes without taking into consideration the time available to individuals.

4.1.2 Time Available Scenario

The time available scenario is based on equity such that the redistrubted shares are based on the time that is available after setting aside the time for personal maintenance requirements and income generation. In other words, the household members should split up the required household production time based on the time each one has available, i.e based on an equity criteria. The time available (Z_{ij}) is defined as the time left over after the minimum personal maintenance and time spent on income generation (including commuting time) have been subtracted from the total weekly hours. To calculate the shares for each individual based on this principle, we first calculate the time available for each individual, then add up the total among the household for those individuals that have positive time available. Next, we divide each individual's time available by the total and apply that fraction to the redistributable share of household production time. For those individuals that have negative time available we set their shares to zero in this simulation.

$$\alpha_{ij}^{A} = (Z_{ij} / \sum Z_{ij})(1 - \alpha_j^{nw'}), if Z_{ij} > 0, \tag{4}$$

$$\alpha_{ij}^{A} = 0, if Z_{ij} < 0 \tag{5}$$

4.1.3 Opportunity Cost Scenario

The third possibility is based on the idea of opportunity costs along marginalist lines. The sharing rule depends on the relative actual (potential) wage. For example, if there are only two working-age adults, say husband and wife, and if the husband's wage is twice as much as the wife, the wife's share would be two-thirds and the husband's share would be one-third. We use the actual or

shadow wage for the employed and the potential wage for the nonemployed. Redistribution takes place based on the following equation:

$$\alpha_{ij}^{O} = (1/I_j - 1) * (1 - w_{ij}/w_{ij})(1 - \alpha_j^{nw'}) \tag{6}$$

For this simulation, we first imputed wages for all of those not currently working for pay using a two-stage Heckman selection model (Heckman 1979), also known as the Heckit procedure (see details below). We them used the imputed wages of those that are not currently working for pay and the actual wages of those that are working to divide up the redistributable share of required household production. (!ask FRA)

As the share of required household production needs to be inversely proportional to the individual's share of the sum of wages, we subtract their share of this sum from one. To ensure that the resulting shares sum up to unity, we divide by the number of individuals in the simulation minus one. We then apply this share to the redistributable share of required household production as in previous steps.

In order to impute wages for those not currently employed, we first impute the likeliest industry and occupation for each individual using a multinomial probit procedure. Industry and occupation are regressed on age, age squared, sex, race, education, and geographic region on all those in the working age population (18-64). The likelihood for each industry and occupation is then predicted for everyone, using the results of the multinomial probit. Then each individual not currently working for wages is assigned the industry and occupation corresponding to the xxxx/ largest predicted likelihoods for that individual.

Next, we move on to the first stage of the Heckit procedure, a probit estimation of a dummy variable for being employed in wage work (paid):

$$P(paid = 1|X) = F(X\beta) \tag{7}$$

where F is the cumulative density function of a normal distribution. The vector of explanatory variables, , comprises the individual's age, sex, race, disability, number of kids across age groups (0 to 5, 6 to 14, 15-17), presence of spouse and spouse's age, education and employment status education. The regression is run on the universe of all eligible adults separately by age (divided into four categories: 18 to 30 years old; 31 to 45 years old; and 46 to 64 years old) and sex. The Mills ratio, , is calculated for all individuals using the results of the first stage regression:

$$\lambda = f(X\beta)/F(X\beta) \tag{8}$$

where and are, respectively, the probability and cumulative density function of a normal distribution, and β is the vector of estimated coefficients from the probit model. The second stage is an ordinary least squares (OLS) estimate of the log of hourly wage:

$$lnw = (\gamma_2 * Z^w) + (\theta_2 \lambda) + \mu \tag{9}$$

This regression is run only on those that are actually employed for pay (!FRA). The vector of explanatory variables, [], includes age, sex, race, education, geographical region, disability, industry, occupation, presence of spouse, spouse's employment status, and, finally, , the Mills ratio calculated in the first stage. Inclusion of the Mills ratio corrects for the selection bias induced by limiting the regression to those in paid employment. The imputed log of wage is predicted for those not working for wages from the results of the regression, with industry and occupation replaced by the industries and occupations assigned in the previous step.

We simulate each of the above principles of redistribution and recalculate individual and household time and income poverty using the LIMTP framework described above.

- Next, we provide an assessment of the different principles in terms of how far they improve the position of women and how much such improvements are congruent with the betterment of the economic well-being of their families. In the subsequent section, we compare and contrast the joint distribution of time and income poverty among families and individuals that would result from each principle.

5 Results

As described in the previous section, we consider three scenarios to analyze the impact that redistribution could have on time poverty, focusing on individuals living in time poor households with at least two working-age members. In this section, we present the results of the redistribution scenarios and discuss the implications for time poverty and the incidence of hidden poor. Since most of the results across time are similar, we focus on providing results that average the impacts of redistribution across all years.

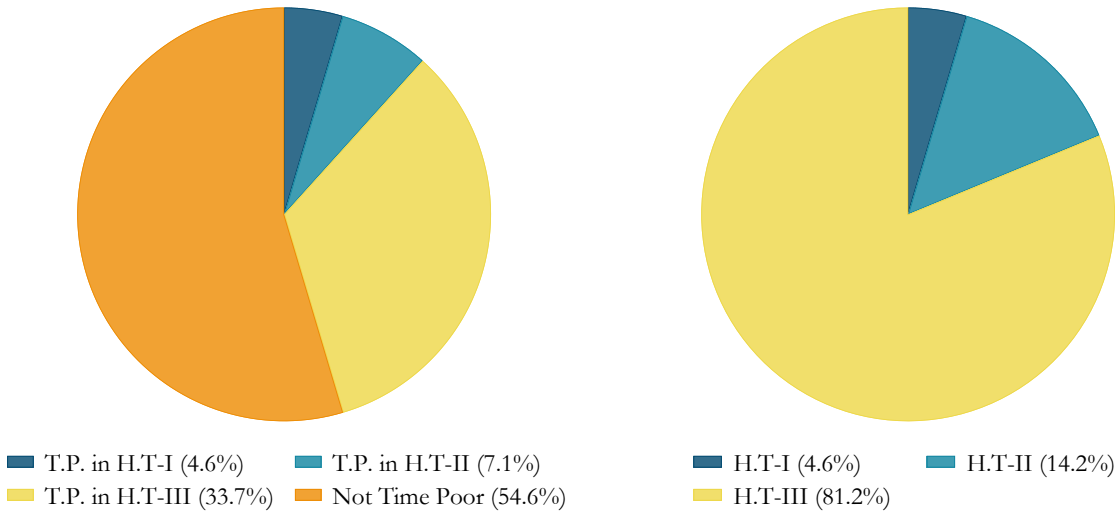
5.1 Redistribution Scenarios and Time Poverty: General Results

Figure 3 provides the distribution of individuals, and their households by type. Figure 3a shows that 54.6% individuals live in time poor households are not time poor themselves. These are the individuals that could help lift other household members out of time poverty, by taking on more household responsibilities.

From the rest, 4.6% live in households where everyone is time poor, 7.1% live in households with at least one not-time-poor individual, but with insufficient time surplus to lift the household out of time poverty, and 33.7% live in households where there is enough time surplus to lift every household member out of poverty.

In terms of household structure, Figure 3b shows 81.2% of the households could exit from time poverty, but the remaining 18.8% cannot do so, even if all working-age members were to take on

more household responsibilities. Nevertheless, it may be possible to reduce the time deficits of some individuals in these households.



(a) Individuals

(b) Households

Note: H.Type I : All working age members are time poor, H.Type II: There are Non-time poor individuals Living in the HH, but time surplus is insufficient to Lift HH out of Time poverty, H.Type III: There is enough time surplus to lift HH out of time poverty.

Figure 3: Distribution of individuals by type

To understand the impact of redistribution simulation on these groups, across the three diferent scenarios, we will focus on transition rates (i.e the share of individuals who can exit or enter time poverty as a result of redistribution simulation). We will focus on individual experiences first. For individuals who are currently not time poor, the statistic of interest would be the likelihood that they fall into time poverty, whereas for time poor individuals, we will consider their porverty exit rate.(!check rate vs probabilities/lilekhood)

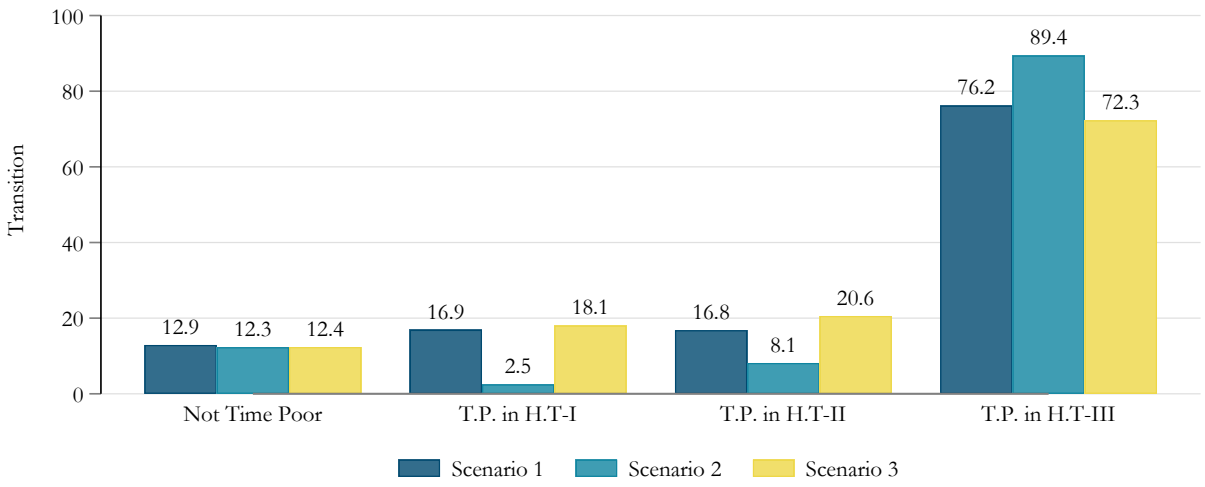


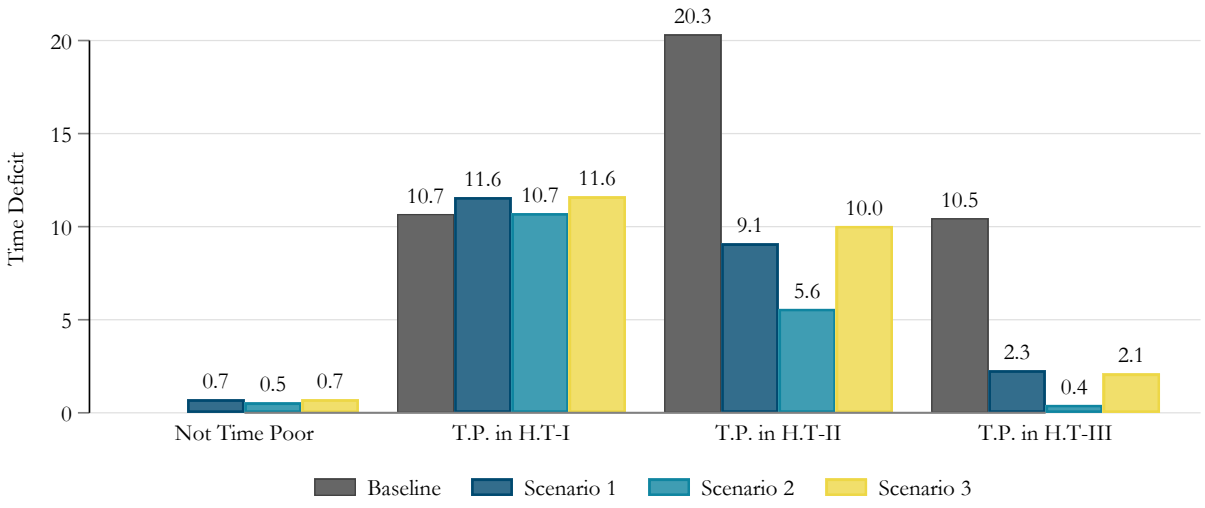
Figure 4: Transition probabilities by Redistribution Scenario

As observed in Figure 4, because all the redistribution scenarios are designed to redistribute household production responsibilities, without avoiding putting some individuals in time poverty, we observe that 12.3-12.9% of non time poor individuals will fall into time poverty across scenarios. While these probabilities is considerably similar across scenarios, its may not be the case that the same individuals are affected (see Figure 7 and Figure 8).

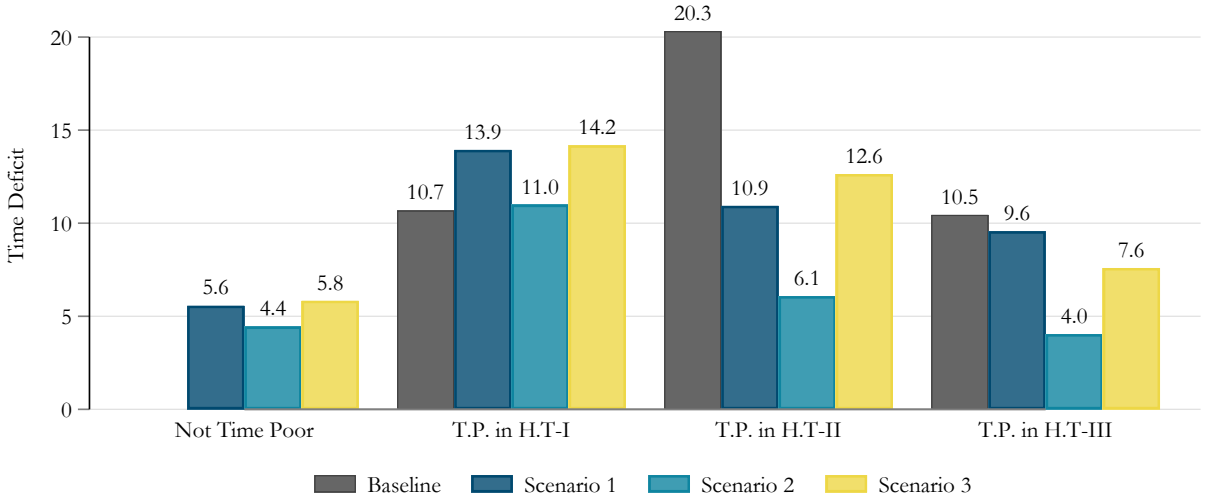
In terms of time deficits, the average time deficits that non-time poor individuals face is quite small, just around 0.7 hours. (!check with FRA unit hrs?) However, those who become time poor, their time deficits increase to around 4.4-5.8hrs per week. Interestingly, the Time availability Scenario (Scenario 2) has the lowest impact in terms of time deficits for this subgroup.

For the rest of the categories, we observe that there are substantially more heterogeneity on the impact of time povery across the different Scenarios. For individuals in households where all members are time poor, the equal share and opportunity cost scenarios suggest that up to 17%-18% of individuals could exist time poverty, with only a 2.5% exit rate under the time availability scenario.

While such case may suggest an improvement on the quality of life of some individuals, the redistribution scenarios also have implications in terms of time deficits other household members face. As shown in Figure 5a, average time deficit increase in roughly 1 hour for scenarios 1 and 3. However, as shown in Figure 5b, the time deficit for those who remain time poor increase in just over 3hrs. In general, while the availability scenario has smallest impact on transition rates, it also has the smallest impact in terms of time deficits, for those who remain time poor.



(a) Average Time Deficits



(b) Average Time Deficits (Excluding Zeros)

Figure 5: Time Deficits across Scenarios

The next group of interest are those individual living in households that cannot exit time poverty, but could reduce time deficits for some of their members (Household Type II). Interestingly, the poverty exit rates for these individuals are ver similar as for the previous group, with the time availability scenario having the lowest impact at 8.1%. In contrast, when we pay attention to the time deficits, its the equal share scenario that has the largest impact on time deficit.

At baseline, individuals in this group had in average a time deficit of 20hrs per week. Under Scenarios 1 and 3, the average deficit reduces to 9hrs and 10hrs respectively. However, under Scenario 2, it reduces to only 5.6hrs a week. While the time availability scenario is not as effective

in reducing time poverty, it may appear it is the most fair, as it redistributes both the gains and losses of time allocation more equally across household members.

The last group of interest are those individuals living in households where redistribution could lift all members out of time poverty. In this case, all redistribution scenarios do an excellent job at reducing time poverty, with exit rates of 72-89%. In contrast with the two previous cases, the time availability scenario has the largest impact reducing time poverty, with an exit rate of 89%. In terms of time deficits, given the success the redistribution scenarios have in reducing time poverty, the average time deficits is reduced to 0.4-2.3hrs per week. However, for those who remain time poor, the impacts in terms of time deficits are much smaller, with scenario 2 still representing the most efficient, reducing the deficit to just 4hrs per week.

As it would be expected, this reduction in individual time poverty also has an impact at the household. While non of the households Type I or II are able exit time poverty, as shown in Figure 6, between 65-87% of households Type III are able to exit time poverty, with Scenario 2 being the best at reducing time poverty.

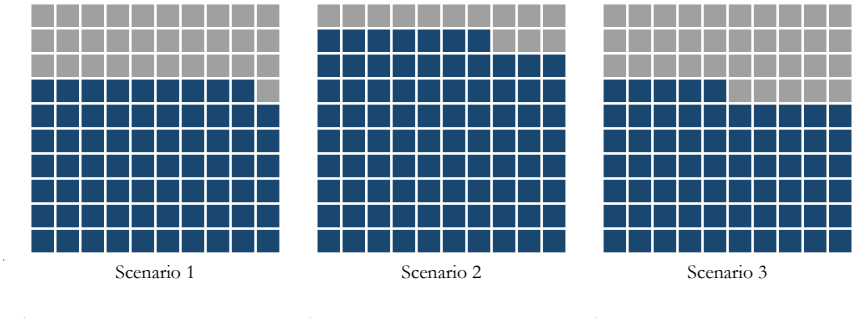


Figure 6: Transition probabilities for households

5.2 Redistribution Scenarios and Time Poverty: Heterogeneity

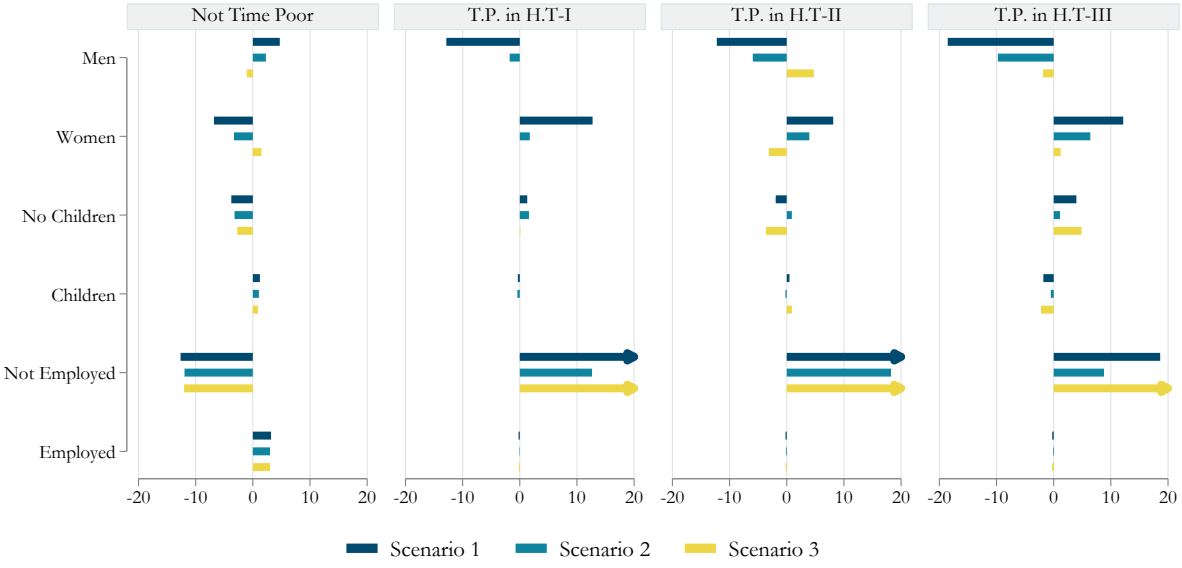
As suggested earlier, not all individuals were affected in the same way by the redistribution scenarios. For example, groups who are traditionally more vulnerable to time poverty, are also the most likely to benefit from intra household redistribution of responsabilities. To explore this further, in this section we present how the poverty transition rates varies across different groups of individuals. Figure 7 and Figure 8 present the difference between the group specific transition rate compares to the overall transition rate.

Under Scenarios 1 and 2, men have a higher probability of falling into time poverty compared to women, with a lower probability of exiting time poverty. This is particularly pronouced among individuals living in type-III households. Interestingly, Scenario 3, which is based on opportunity costs, shows the opposite pattern. Although we have shown that all scenarios help reduce time poverty, the opportunity cost scenario seem to attenuate the effect by perpetuating the gender roles

tied to earning potentials.

A second characteristics that tends to drive differences in time poverty is related to the presence of Children. In our results, however, their presence has mixed impact oon tn transition rates. Under all scenarios, not time poor individuals living in households with children are more like to fall into time poverty. However having children also increases the chances of exiting time poverty in Household Type II, while reducing it in Household Type III. The time availability scenario is the only case where the results are consistent across all household types, with children increasing the probability of falling into time poverty, but decreasing the probability of exiting time poverty.

The last group of interst considered in Figure 7 is based on employment status. Since time poverty is closely related to the time spent on paid work, we should emphasize that the share of time poor individuals among the not employed is much smaller compared to the employed. Because of this, the unemployed have an almost 0% probability of falling into time poverty, and those who are time poor, are far more likely exit time poverty. Among the employed, while they are somewhat more likely to fall into time poverty than average, there are almost no singificant differences in any other scenario.



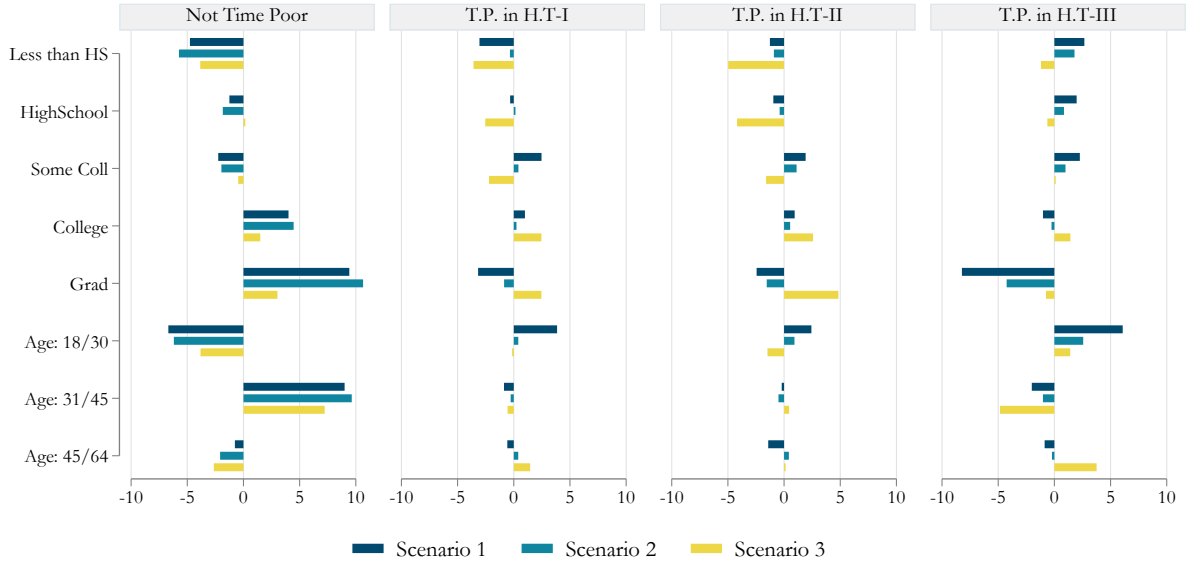
Note: The figure presents the difference between the group specific transition rate and the overall transition rate.

Figure 7: Transition probabilities Heterogeneity: Gender, Employment Status and Children Presence

In terms of education and age (see Figure 8) the patterns are less clear. Among non time poor individuals, those with higher levels of education seem to be the most likely to fall into time poverty. This pattern is observed for all scenarios, with but with a smaller impact under the opportunity cost scenario.

For time poor individuals, the patterns are less clear. When redistribution is driven by oppotunity cost, higher levels of education increase the probability of exiting time poverty. However, the magnitude of the diferences is small for type III households. For Scenarios 1 and 2, we can only observe some patterns for individuals living in type III households, where higher education reduce, rather than increase, the probability of exiting time poverty.

Finally, in terms of age, both the youngest and oldest individuals are less likely to fall into poverty, while also being the more likely to exit time poverty. This patterns may be a reflection that individuals in the age group 30-45 are most likely to be in the labor market, and thus are less flexible in terms of time allocation, and thus are less likely to be affected by the redistribution scenarios.



Note: The figure presents the difference between the group specific transition rate and the overall transition rate.

Figure 8: Transition probabilities Heterogeneity: Education and Age

5.3 Changes in LIMTIP: The hidden poor

WHile the discussion above provides a detailed picture of the potential impact that redistribution could have on time poverty, it is equally important to understand changes in terms of Adjusted LIMTIP estimates.

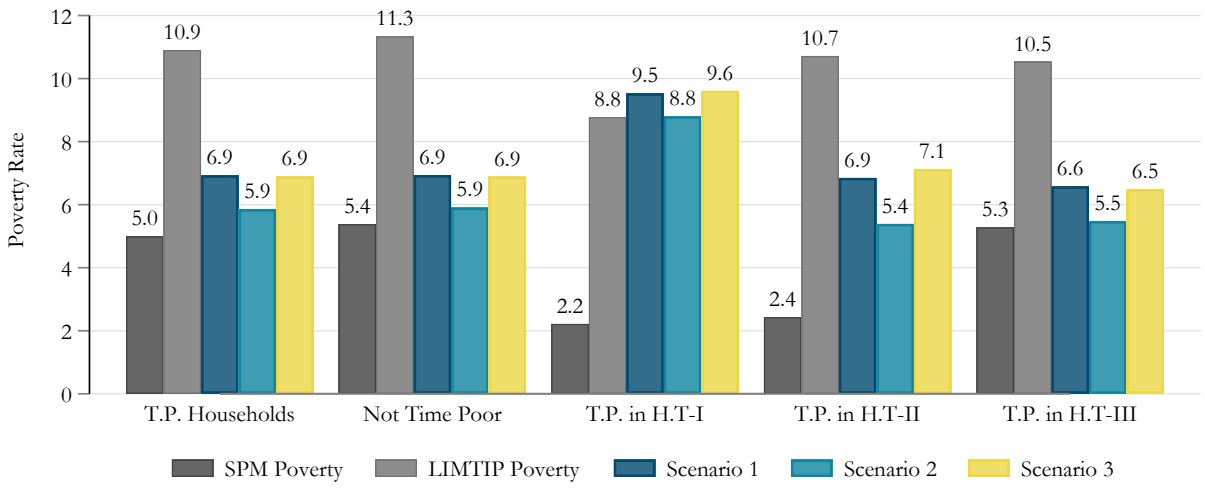


Figure 9: Changes in LIMTIP estimates across redistribution scenarios

In Figure 9 we present the poverty rates across the different redistribution scenarios, for the sample of households that we identify to be time poor. The first thing to consider here is that the incidence of official poverty and LIMTIP poverty in the sample is lower than the one observed in the general population (Figure 1). This is expected, since our sample of interested is restricted to time poor households, who are more likely to have members working, and hence less likely to be income poor.

Even in this sample we observe a large difference between the official poverty estimates and the LIMTIP estimates. While the official poverty estimates are around 5%, the LIMTIP estimates poverty to be closer to 11%, showing that 6% of the individuals in the sample are hidden poor. Given the success of the redistribution scenarios in reducing time poverty, we observe that the LIMTIP estimates are also reduced, with the time availability scenario showing the largest reduction in poverty rates, practically eliminating the incidence of hidden poor in the sample.

However, a detailed look across individuals suggests that such large improvements are not uniform across all groups. In households where all individuals are time poor, the redistribution scenarios worsen the poverty rates, albeit the impact is small. This happens because the aggregated time deficit of the household increases as some individuals who exit time poverty status. For households with some potential to reduce aggregated time deficits (H.Type II), we observe that the share of the hidden poor is greatly reduced from 8% to 3 to 5%.

6 Policy implications

7 Conclusion

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