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Chapter 2

DISCRETIONARY TIME AND FREELY DISPOSABLE TIME: TWO NEW INTEGRATED INDICATORS OF WELFARE, POVERTY AND FREEDOMS

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ABSTRACT

The economics of life are ruled by time, money, their exchange rate and how much of it is needed to satisfy the basic needs of the household. Discretionary Time (DT) and Freely Disposable Time (FDT) are two newly developed conceptually equivalent but methodologically different social indicators that integrate these time and money elements into a single metric. Both indicators express how much time the productive members of a household have left after fulfilling the basic needs (of food, shelter, care, sleep, consumables etc.) of themselves and their dependents. This chapter discusses (1) the principles of DT and FDT assessment and some outcomes in various countries, (2) the linkages of DT and FDT with freedoms, potential income, development, poverty and happiness, (3) the caveats that may be identified in these linkages and (4) indicator choice in relation to mono-dimensional, pure time and money indicators of welfare and poverty.

1. INTRODUCTION

Poverty is often said to be a multi-dimensional phenomenon. Indicators of poverty then usually take the form of some addition of all 'life satisfactions'. Equating poverty with lack of 'total' well-being robs the term poverty of its primary, economic meaning, however, and does not add anything to the well-being or happiness concepts. In this chapter, we keep the concepts of poverty and welfare in their original, primarily economic domain. We may then find that empirically, poverty and welfare correlate with objective and subjective well-being and happiness in many cases, but not in others.

This does not imply that poverty and welfare are purely mono-dimensional concepts, as if they only depend on monetary factors such as income or expenditure. Our point of departure

is that a household with a low income per capita with all its able members needing 10 hours per day to earn that income is much worse off, also in economic terms, than a household with the same low income per capita but needing only 5 hours per day of work by its able members. The latter household has not only much more time to raise the children, acquire knowledge or build social capital, but usually also to raise its income if needed, e.g. by working some hours per day more.

This insight has been the source of inspiration for a family of combined time/money indicators that we will present in the next section. Within that group, we will focus on two indicators that may be called TIMs (Time Integrated with Money), defined as indicators that express the time and money aspects of livelihoods into a single time metric. The basic idea that underlies both TIMs is that:

- The productive household members have to supply their own basic needs plus those of their dependents (e.g. food, care and a roof for the children).
- These basic needs can be written in time or money terms.
- The average wage rate determines how much time per day the productive household members have to spend on the monetary basic needs. For instance, if five hours of work deliver 100 dollars, a need of 100 dollars is equivalent to a need of five hours of work.
- This determines the total time per day needed to supply the basic needs.
- 24 hours minus that amount can be called 'Surplus Time' (ST).

'Freely Disposable Time' (FDT) and 'Discretionary Time' (DT) are two methodologies to make ST operational. As we will show later, the DT and FDT methodologies differ sufficiently to retain the separate terms here besides the general ST.

ST is the time not dictated by the necessities of life. ST is not spare time, free time or leisure time. Leisure is only one of the things you can do with surplus time. In fact, most people prefer to work part of their surplus time, e.g. in order to acquire luxury goods or send a child to college. This illustrates what is in fact the great and direct relevance of ST: surplus time is the time you can have preferences about. ST is freedoms. Though differently in any local context, it can be used to acquire luxuries but also for investments in the farm or the community, for education, for braiding your hair.

As will be discussed in later sections, it is likely that ST will correlate with well-being to some degree. This does not imply that people will always feel what their ST in fact is. Many people in Western societies have much ST but feel time-pressured nevertheless; see Goodin et al. (2008) on the 'time pressure illusion' and Gershuny (2005) on being busy as a status symbol.

The ST concept is applicable to the rich and the poor alike, and may therefore be used to set a poverty line. The fundamental poverty line is when ST = 0, meaning that people need all they can do, i.e. all the time they have and all the cash they can generate with it, to satisfy their basic needs. At this level, people are trapped in poverty, with neither time nor cash left to invest in the future. Reardon and Vosti (1995) have proposed the term 'investment poor' for households that avail of only a little more than bare basic needs satisfaction, assuming that they will spend this little surplus on expanded consumption rather than investment (in

knowledge, soil and water conservation, social capital etc.) In ST terms, an ST of, say, 2 h/day may be set as the 'investment poverty line'.

Having a very high income, on the other hand, implies that the acquisition of basic needs requires only very little time spent on income generation. Yet, everybody has only 24 hours per day and needs some 10 of those for basic sleep, self-care and leisure. All very high incomes will therefore congregate in a range between, say, 13 and 14 h/day of surplus time, while the relatively poor will be assessed in a broad area between ST = 0 and, say, 6 h/day. As Goodin et al. (2008: 3) put it, the time metric is egalitarian, and expresses the decreasing marginal utility of income.

Against this background, the objective of this chapter is to document, illustrate, test and discuss the meaning of a metric of Surplus Time. The chapter is structured as follows. Section 2 gives a brief overview of the history and members of the family of combined time/money indicators. Sections 3 and 4 then present the FDT and DT methodologies to assess the ST indicator. In Section 5, we study ST properties through the outcomes of various behaviors of a simplified example household, and Section 6 compares these to what a number of monetary indicators say about the same behaviors. Section 7 then moves to empirical outcomes of DT and FDT applications, comparing the rich and the poor, in the West and the developing world. On that basis, Section 8 supplies an analysis of the meaning surplus time, discussing its connotation of freedoms and development capacity and its linkages with potential income and well-being, taking special care to unearth the caveats present in these relationships. Section 9 broadens this discussion to also include monetary indicators of poverty and welfare. Section 10 is the general conclusion.

2. THE FAMILY OF COMBINED TIME/MONEY METRICS

The 'Freely Disposable Time' (FDT) or 'Discretionary Time' (DT) concepts and methodologies belong to a recently sprouted family of social indicators that combine time and money flows. This section supplies a brief overview.

Origins: Becker (1965) and Vickery (1977)

Becker (1965) proposed that a household's resources could be measured by its 'full income', defined as what it could earn by devoting all its time to income-generation activities and activities directly necessary to sustain these activities, such as a minimum of sleep. Becker's method has been criticized for failing to take into account that paid work to fill all these hours may be locally unavailable (Folbre, 2004). Vickery (1977) followed subtler course, calculating a combined money/time poverty spectrum. People with little spare time have a higher income poverty line than people who have more time available to compensate low income by searching for bargains, cook food from fresh ingredients, etc.; see Douthitt (2000) for an update.

Land-Time Budget Analysis

From within the rural development and farming systems tradition, Giampietro (2004) developed 'land-time budget analysis' to assess the performance of the time and land budgets that people have available. Starting point of the analysis is the total number of hours per year available in the studied group (society, village, household). Various categories resembling basic needs are then subtracted, such as the time needed for sleep, leisure, education and chores, the total time of the non-productive household members, and the time needed to farm for auto-consumption, pay taxes and buy agricultural inputs. The time left can be used to produce cash, either on or off farm. How much 'net disposable cash' this can be depends on a parallel system for the availability of land.

Land-time budget analysis does not offer a coherent system of data categories and calculation rules, which hampers application in empirical cases (Pastore et al., 1999; Gomiero and Giampietro, 2001; Grünbühel and Schandl, 2005; Hobbes, 2005). For instance, food needs are either not (Giampietro, 2004: 396) or fully (Pastore et al., 1999) subtracted from net disposable cash. Yet, Giampietro's principles have been a major source of inspiration for developing FDT (Hobbes et al., in press).

Paired Money/Time Indicators

Vickery's (1977) idea has recently been carried forward in the form of paired money/time indicators, exemplified by Bardasi and Wodon (2009) on Guinea and Burchardt (2008) on the UK. Bardasi and Wodon (2009) focus their analysis on people who are time as well as consumption poor, i.e. those who work long hours out of necessity to make basic ends meet. Burchardt (2008) defines 'free time' as 24 hours/day minus time spent on sleep, personal care, paid work and unpaid work. The analysis of households then takes place on the two-dimensional plane defined by the axes of disposable income and free time, e.g. distinguishing between people with low pay and few obligations of unpaid work, people with low pay but many obligations, and so on.

Integrated Time/Money Indicators: TIMs

All methods described above use a wage rate to convert money and time. Burchardt (2008), for instance, applies the income per hour to set the slope of the various income/free time combinations that households have available. Bardasi and Wodon (2009) apply the income per hour to assess if households would hit the income poverty line if they would work a decent number of hours per day. Both paired indicator approaches refrain, however, from using the income per hour to calculate a single metric in which time is integrated with money. This reluctance has reasons. Paired indicators maintain more detail on time and money separately, enabling for instance to distinguish income-poverty caused by a low wage rate from income-poverty caused by working only few hours. On the other hand, the two-dimensional character of paired indicators makes them cumbersome in comparative work. It is noteworthy that both Burchardt (2008) and Bardasi and Wodon (2009) discuss single-

country cases, contrary to the cross-country comparisons made with the integrated indicators DT and FDT.

Welfare indicators that have Time Integrated with Money (TIMs) may be designed in many variants, e.g. with or without basic needs and with either time or money as the outcome variable. Becker's (1965) 'potential income' that includes basic needs and takes money as its outcome variable is probably the earliest TIM. We will re-encounter potential income in the Discussion but focus here on DT, designed by Goodin et al. (2008), and FDT, designed by Hobbes et al. (in press).

As said in the Introduction, DT and FDT are conceptually equivalent, both referring to the time not used for basic needs (surplus time; ST). They were developed independently from each other, originating from time and welfare studies and from rural development studies, respectively. As a result, many differences between DT and FDT show up on the lower, methodological level. First, DT has been constructed for industrialized countries and FDT for the developing world. With that, the DT assessment method gives more attention to tax and welfare regimes, less attention to multiple livelihoods including subsistence, and less attention to non-child dependents (e.g. elderly or HIV/AIDS patients). Second, DT was developed as a system to interpret national statistics while the FDT framework was constructed through and for field-level work, paying more attention to mastering livelihood complexities and less to handling dataset complexities. Third, contrary to the DT methodology, the FDT framework keeps temporary or chronic deficiencies on separate categories (food, sleep, care, goods etc.) explicit until the very last moment before everything is collapsed into the single FDT indicator. Fourth, the DT approach ignores non-wage income components and consequently leaves people with only such income (e.g. people on welfare) out of the sample Goodin et al., 2008: 137). Finally, the DT and FDT methodologies differ in their approach to basic needs. In the DT system, they are largely relative, e.g. setting the income poverty line as 50 percent of the median income in a country. In the FDT system, basic needs are largely absolute, e.g. the FAO food calories standard. This requires more empirical work but makes FDT independent from national statistics and more open to explore scenarios such as the impact of changing prices, the addition of a child or sick to a household or the acquisition of a solar heater that frees female time from firewood gathering. The two methodologies will be described in the next sections.

3. THE FREELY DISPOSABLE TIME (FDT) SYSTEM

FDT assessment uses primary data on incomes, time use and expenditures, gathered through the FDT framework. The full framework can be found in Hobbes et al. (in press). It can handle different basic needs per household member, subsistence production, temporary or chronic deficits in basic needs, and all income elements such as wages, farm profits, remittances and 'time gifts' such as help from neighbors.

The composition of a household is important for FDT. A young child or sick person, for instance, adds to the household's basic needs but its freely disposable time does not make a relevant difference for the household. Therefore, the FDT assessment focuses on the productive adults (PAs), with the other members of the household present in the analysis in the form of adding to the basic needs that these PAs have to provide. Non-PA members may

sometimes help out, e.g. doing chores; this is added as gifts or aid to the PAs' account. Hobbes et al. (in press) differentiate between male and female household members in terms of basic needs but the calculations then take the household as a whole, averaging over its PAs, hence (as yet) non-gendered.

As said, basic needs are largely absolute in the FDT system. For their field study in India, Hobbes et al. (in press) used a list based on literature and field observations, displayed in Table 1. Note that income-generation activities have no basic need; the necessary net income of the household can be calculated by adding all basic needs that require money inputs.

Table 1. Categories of activities and basic needs to be provided by the productive adults (PAs) of the households in the India case study of Hobbes et al. (in press). Basic needs are mainly guesstimates based on local informants and secondary sources. Cash is expressed in US$ per day (1 US$ = 40 INR = 0.7 euro). Care basic needs exclude care that can be given simultaneously with cooking, chores etc.

Activities and needs provided by PA	Basic needs in Indian case study
Physical inactivity (h/d)	8 per PA
Leisure (h/d)	2 per PA
Self care (h/d)	0.75 per PA female, 0.4 for PA male
Care (h/d)	1 for non-active elderly, plus 2 if 1 or 2 children, 3 if 3 or 4 children
Chores (h/d)	1 for small, 1.5 for average, 2 for big household
Cooking (h/d)	1.5 for small/average, 2.5 for big household
Food	1200 kcal/d for 0-4years, 1700 kcal/d for 4-8years, 2000 kcal/d for 8-12 years, 1967 kcal/d for PA female, 2540 kcal/d for PA male, etc. (FAO)
Water consumption	15 liter/d for small, 24 for average, 36 for big household
Fuel for cooking	10 GJ/cap/y
Shopping (h/d)	0.3 per household
School for PAs (h/d)	0
School for dependents ($/y)	10 per child of primary school age
Non-caloric consumption ($/d)	between 0.05 and 0.16 per household, depending on composition
Durable goods renewal /depreciation ($/y)	18 for small, 19 for average, 20 for big household (guesstimate)
Saving and investment	0
Income generation	0
Interest/rents/gifts paid ($/y)	32 per household (guesstimate)
House taxes, mortgage, rent, renewal ($/d)	0.03 per household (no taxes, only building materials)
Community work (h/d)	0.2 per household
Religious activities (h/d)	0.1 per PA

The FDT framework is organized by categories of 'things' that people spend time and/or money on (e.g. Table 1). Many of those have a basic need component. This classification can be adapted to fit local situations and research aims, as long as the whole remains consistent

and exhaustive. Then, based on household-level time use, cash flow and basic needs data, a *time for the basic need* and a *time deficit or (more often) a time surplus* are generated for each category. The basic formula is that the time equivalent of any activity is calculated as the time spent on it plus the cash spent on it divided by the income per hour.

Keeping the time deficits and surpluses separate helps to identify chronic problems (deficits) of households. It also gives insight into how households may use temporary deficits to create more working time in periods of harvest, exams, disaster or sickness. Basic needs would not be basic needs if deficits could continue for a long time, however. In the longer run and in a principled outlook, therefore, ST is the aggregate of all surpluses minus all deficits. Hobbes et al. (in press) also provide a shortcut method of ST assessment that jumps over the separate calculations of deficits and surpluses. This comes close to the DT methodology described below.

4. THE DISCRETIONARY TIME (DT) SYSTEM

The DT system is designed to work with secondary data, such as national time use surveys, income distribution surveys and tax records. The full system is found in Goodin et al. (2008: 271-325). The great budgetary advantage of using available statistics comes at a certain cost. Many countries, especially in the developing world, lack the necessary statistics. Furthermore, DT system parameters can only be those that happen to be included in the statistics, hence excluding all sorts of phenomena that would appear to be relevant for people's real surplus time, such as informal, non-wage and subsistence incomes, mutual aid and time gifts. Another example concerns people's health status. Chronically ill adults constitute a burden rather than an asset for a household's surplus time, but the DT system can only distinguish between age brackets and not whether adults are productive or not. On the other hand, the DT system includes algorithms that allocate household-level burdens such as childcare cost to the individual household members, so that DT outcomes can be specified by type of adult, e.g. women in dual-earning households.

The DT system distinguishes only four time/money categories: personal care (including sleep), unpaid household labor (chores, childcare, cooking etc.), paid work/income, supplemented by spare time (see below). Within the paid work/income category, many further specifications are made, however, e.g. travel time, alimony and pension incomes, and contributions of spouses to child care cost. Basic needs in the categories are relative, extracted from the same time and money survey datasets as used for the DT assessment as a whole. For personal care, the basic need is set as 80 percent of the median in the sample. For unpaid household labor, the basic need is set as 50 percent of the median, corrected for the number of children. The necessary net income (income poverty line) is 50 percent of the median net income.

Like the FDT system, the DT assessment is organized by the categories. The first step is to establish the basic needs ('necessary times') for personal care and unpaid household labor. The next step is by far the most detailed one. It concerns the calculation of the necessary time of men and women in paid labor, which depends on travel times, childcare cost, contributions of spouses to this cost, household type, taxes and transfers, non-labor income components such as alimonies, the necessary net income and, in order to convert money into time, the

hourly wage rate. Discretionary time (DT) per day is 24 minus the three necessary times. The DT system also looks at the actual times spent in the categories. This however is needed only in order to establish 'spare time' defined as 24 minus the actual times in the other three categories. Goodin et al. (2008) then define the difference between DT and spare time as the 'time pressure illusion' mentioned in the Introduction.

5. SURPLUS TIME (ST) PROPERTIES ILLUSTRATED BY A HYPOTHETICAL HOUSEHOLD

This section gives a numerical example to illustrate the principles and properties of the ST concept, by means of the ST outcomes of various behavioral alternatives of a hypothetical single-actor household living a life of only six categories on which the actor spends time and/or money. These outcomes are then compared to those of some monetary welfare indicators. We have chosen for the FDT method to operationalize ST because of its adequacy in scenarios such as these. In order to illustrate principles as clearly as possible, all complexities have been avoided (hence, basic needs in purely time or money, income as a constant net wage rate, no subsistence production etc.).

Table 2 shows the FDT assessment. Each overarching column focuses on a different profile ('strategy') of how this actor spends his/her time and income. Within each profile, four columns summarize the FDT assessment. The first shows the basic needs (BN) on all categories. The second and third columns depict the time (EXh) and money (EX$) expenditures of the actor on these categories. These three together with the wage rate determine the equivalent time needed to satisfy the basic needs, calculated as the time needed plus the money needed divided by the wage rate. TSUR then is the surplus time, i.e. the equivalent time left after the basic needs have been fulfilled. The total of the time surpluses equals FDT for each profile.

The category of personal care (including sleep, self-care and leisure) has a basic need of 10 h/day. In the initial profile (first overarching column), the actor spends 14 h/day on this category, meaning that this category contains 4 h/day of surplus time. The basic need to keep the household in order is 2 h/day and the actor's time expenditure on chores and care is indeed 2 h/day. Consequently, this category contains no surplus. There is no basic need for labor. Labor time is always cancelled out, irrespective of wage and hours worked, by the cash received for it (= EX$ with a minus sign). Following the basic formula, working 8 hours per day at a wage rate of 1 $/h has a time equivalent of (8 h/day) – (8 $/day) / (1$/h) = 0 h/day. The cash earned is spent on other categories, e.g. to buy food, and then makes FDT visible there if the actor spends more on it than the basic need. In the first profile, the actor spends 5 $/day on food which, at the wage of 1 $/h, is equivalent to 5 hours of work. The basic need of the food category is 4 $/day. Thus, out of the 5 hours time/cash integrated time, 4 h/day is needed to satisfy the basic need and 1 h/day is surplus time (TSUR). Further, we see that the actor spends his/her remaining 3 $/day on other goods, which is equivalent to 3 h/day of time/cash integrated time. With a basic need of other goods of 2 $/day (for lighting, heating, clothes etc.), 1 h/day is FDT. All cash now being spent, nothing goes to the savings category. Adding up all time surpluses, FDT is 6 h/day. What the actor apparently does in this profile is to spend much of this freedom (4 out of the 6 hours) on leisure.

Table 2. Freely disposable time (FDT) profiles of a hypothetical single-person household. Only six cash/time categories are distinguished. The overarching columns denote various behavioral profiles of the actor. For each profile, the columns show the basic needs (BN), the empirical behavior in time and cash expenditures (EXh and EX$) and the resulting time/cash integrated time surpluses (Tsur) per day. FDT equals the sum of the surpluses. For comparison with FDT, the last four rows mention monetary indicators. The poverty line equals the cost of basic needs. The last row is income above the poverty line.

	Initial profile				Savings strategy				Household appliances				Result of investment				Price crisis				Time crisis			
	BN	EXh	EX$	TSUR (h)	BN	EXh	EX$	TSUR (h)	BN	EXh	EX$	TSUR (h)	BN	EXh	EX$	TSUR (h)	BN	EXh	EX$	TSUR (h)	BN	EXh	EX$	TSUR (h)
Personal care	10h	14	0	4	10h	10	0	0	10h	13	0	3	10h	14	0	4	10h	10	0	0	10h	8	0	-2
Chores/care	2h	2	0	0	2h	2	0	0	1h	2	0	1	2h	2	0	0	2h	2	0	0	8h	8	0	0
Paid labor	0	8	-8	0	0	12	-12	0	0	9	-9	0	0	8	-16	0	0	12	-12	0	0	8	-8	0
Food	4$	0	5	1	4$	0	4	0	4$	0	5	1	4$	0	5	0.5	10$	0	10	0	4$	0	5	1
Other goods	2$	0	3	1	2$	0	2	0	2$	0	4	2	2$	0	10	4	2$	0	2	0	2$	0	3	1
Saving/inv.	0	0	0	0	0	0	6	6	0	0	0	0	0	0	1	0.5	0	0	0	0	0	0	0	0
TOTALS		24	0	6		24	0	6		24	0	7		24	0	9		24	0	0		24	0	0
FDT (h/d)			6				6				7				9				0				0	
Unpaid time in FDT			4				0				4				4				0				-2	
Spare time			4				0				3				4				0				-2	
Income ($/d)			8				12				9				16				12				8	
Expend. ($/d)			8				6				9				16				12				8	
Poverty line ($/d)			6				6				6				6				12				6	
Income above PL ($/d)			2				6				3				10				0				2	

What could this actor do alternatively with this FDT? By way of example, the next profile in Table 2 shows the effect of a rigorous savings strategy in which the actor has given up all above-basic sleep, leisure, food and consumables and puts all FDT to work for the savings/investment category. Assuming a sufficient local labor demand to maintain the wage rate of 1 $/h, the actor now works for 12 h/day (24 minus the basic needs for personal care and chores), bringing in 12 $/day. This is the 'full income' as defined by Becker (1965). Out of the 12 $/day, 4 $/day is again needed for the basic needs of food and 2 $/day for other goods. The remaining 6 $/day, equivalent to (6 $/day) / (1 $/h) = 6 h/day of FDT, is in the savings category. Note that all the while, the FDT total has stayed the same 6 h/day. In the FDT method, the actor is not assessed as better off (higher FDT) when working more hours. Neither is the actor assessed as poorer when foregoing luxuries in order to save, invest or leisure. He does get a higher FDT, however, when wages rise compared to basic need prices, or when investments begin to pay off, as the next two profiles show.

The third profile in Table 2 depicts a situation after the actor has decided to buy time-saving household appliances from the savings. The basic need of the chores and care has now dropped to 1 h/day. Consequently, FDT rises to 7 h/day. The actor may decide, as people often do, to maintain the hours worked on chores (EXh), but now to have the house in conspicuously tip-top condition. If the actor then also decides to retain one of the extra working hours, he/she can spend the extra 1 $/day for instance on consumer goods.

Alternatively, the actor may decide to invest the savings in some 'deep', out-of-poverty strategy, e.g. through vocational training or, if he/she is a farmer, hiring labor for building terraces for a higher yield or a new crop. In the fourth profile, we assume that as a result of this investment, the actor's wage rate has risen to 2 $/h. Bringing the sleep, self-care, leisure, chores and labor time back to the initial levels, the actor now earns 16 $/day, out of which he/she spends 1 extra $/day on food, which now costs only 0.5 h/day of FDT due to the doubled wage rate. Of the remaining 11 $/day, the actor spends 10 on other goods, leaving 1 $/day (0.5 h/day) for savings. FDT stands at 9 h/day.

Real poverty, as said, is when FDT = 0. In Table 2 real poverty has been simulated in two ways. One is a price crisis in which the cost of the basic food basket has jumped to 10 $/day. The second is a time crisis in which the chores and care basic need has jumped to 8 hours per day because the actor has been charged with the care of and AIDS patient. The fifth profile illustrates the price crisis. The only option left for the actor is to work maximum hours, 12 per day in this case, for bare survival, spending all time and generated income on basic needs. FDT now is zero, with the actor trapped in poverty without any freedoms left to invest in an escape.

The time crisis is depicted in the last profile. The actor has decided to keep up the little bits of above-basic food and goods and therefore needs to continue working for 8 hours per day. The result is a deficit in the time for sleep, self-care and leisure. This way, the actor is systematically undermining his/her basic health and social functioning. Poverty erodes people's health in many ways, and this is one of them. Other poverty scenarios could be added to Table 2, e.g. showing how declining natural resources (forest, soils) necessitate people to search longer for firewood (creating an increasing basic time need in the chores category) and reduce agricultural yields for the same labor hours, creating a decreasing return to labor (wage rate). The general conclusion may be clear, however, namely that FDT, as any other well-designed ST system, captures the basic features of all livelihood profiles.

6. ST Properties Versus Those of Pure Time and Money Indicators

The outcomes of the FDT assessment may be compared with those of pure time and money indicators in the same profiles. The lower rows of Table 2 are designed for that purpose.

The first two rows below FDT are 'unpaid time in FDT' and 'spare time'. The former is obviously not a pure time measure because it contains FDT. It has been taken up however to support the discussion of the underemployment caveat of ST indicators in Section 8. 'Unpaid time in FDT' is defined as the hours during which people do other things than paid labor in their FDT. Quantitatively in the terms of Table 2, it is 24 hours per day minus basic hours for personal care, minus basic hours for chores and care minus actual hours in paid labor. The next row, 'spare time', is defined in Goodin et al. (2008: 52) as 24 hours per day minus the actual times spent in paid labor, unpaid household labor and personal care. These coincide with the actual time spent on paid labor and chores/care and the basic time needed for personal care in Table 2 because we assume that above basic personal care is leisure time. Spare time is a measure of how busy people are. With spare time at zero, the only things you do are sleep, brush your teeth and be busy with unpaid (household) and/or paid (market) work. The difference between spare time and FDT is what Goodin et al. (2008) call the time pressure illusion.

Incidentally because of the many simplifications implicit in Table 2, spare time and unpaid time in FDT often come out the same. Conceptually however, spare time is the pure time measure and the focus of the discussion here. The salient point in the spare time outcomes in Table 2 is the two ways to have zero spare time. One way is to freely choose for long working hours ('savings strategy' profile). The other is to be forced into working all possible hours in order to supply basic needs (price and time crisis profiles). The one actor is looking with pride at a growing bank account. The other is looking at hopelessness. This phenomenon of having the same indicator outcome while being so different in livelihood terms is caused by that spare time does not take the money aspect into account. Note that FDT does differentiate between the two types of profile.

Income and expenditure, shown in the next rows of Table 2, are the most widely used welfare indicators. The first point to note is that the actor that moves from the initial profile to the savings strategy (profile 2) is assessed as better off than before according to the income indicator but worse off than before according to the expenditure indicator (*cf.* Van Campenhout 2006: 410). It could be argued that this discrepancy, caused as it is by the extreme strategy choice, will be rare in the real world and no fundamental problem. This is different for the last two profiles. In the price crisis and time crisis cases, both monetary indicators assess the actor as equal or even better off than in the initial profile, while the FDT outcomes show that the actor is fully trapped in poverty. The crises force the actor to work all possible hours but the raised basic needs swallow all or nearly all of the increased income.

The anomaly that rising incomes and expenditures can coincide with increasing poverty is largely removed when the cost of basic needs are entered into the picture, e.g. subtracting the cost of basic needs from the actual income. The cost of basic needs in the profiles of Table 2 is 6 $/day, except in the price crisis profile where it is 12 $/day. The bottom line of Table 2 gives the incomes above this cost-of-basic-needs (CBN) poverty line. This indicator

stands at zero in the price crisis case, in accordance with FDT. The monetary indicator has picked up the monetary crisis well. It does not pick up the effect the *time* crisis however (last column), where the CBN indicator stands at the same level as in the initial profile even though life of the actor has drastically turned to the worse and FDT stands at zero.

We can conclude that in this analysis,

(1) When changes of income, expenditure and working hours are free choices as in the first two profiles, the pure time and money indicators change with them but not FDT. In FDT terms, these free choices are only different ways of doing with FDT what one prefers to do, without changing FDT itself.
(2) Time-saving acquisitions (profile 3) always improve FDT but are recorded by the pure money and time indicators only insofar the acquisitions lead to more working hours (as in Table 2) or to more leisure hours, respectively.
(3) Financial livelihood progress, e.g. the improved wage rate compared to local prices as in profile 4, is always picked up by FDT and the monetary indicators but not by the time indicators if time use of the household does not change with it. (And if people would increase their working hours because they now like the work better, spare time would even decrease.)
(4) Livelihood crises plunging people into real poverty can be fully misinterpreted by the income and expenditure indicators. This improves if cost of basic needs is subtracted from income or expenditure. Still then however, a 'time crisis' due to chronic sickness, natural resource degradation or any other cause will often be missed by monetary indicators. Time indicators do pick up this type of crisis. FDT duly records both.

Summarizing, it shows that in this analysis, FDT (as any other well-designed ST indicator) tends to ignore changes in household behaviors that are their free choice. It properly reports real progress due to improved time-saving and money-making efficiencies, however. Besides, describes real poverty due to both deteriorating wages compared to prices and heavier time burdens. Pure time and money indicators often pick up changes that are arguably less relevant because they mainly express preferences, and often miss out on relevant changes, e.g. moving into poverty, that are not expressed primarily in their own area of measurement (time or money, respectively).

We may add at this point that ST indicators do have their disadvantages, limitations and caveats too. These will be discussed in Sections 8 and 9.

7. Results of First DT and FDT Applications

This section gives a short overview of the first empirical applications of the ST concept, in order to supply a basic feel of typical outcomes and also to prove that Discretionary time (DT) and Freely disposable time (FDT) are not only applicable on hypothetical households but robust methodologies that can handle real-world complexities. As a primer, we start out with a non-ST study, namely the paired time/money indicator work of Burchardt (2008) on the UK.

Using relative poverty lines of 60 percent of the medians, Burchardt (2008) finds that some 10 percent of the adults is time poor, some 20 percent is income poor and about 2 percent are both. The households of the latter group (which we would denote as having an ST of around zero) contain some 7 percent of the children. Of special interest to the general ST caveat that will be discussed in the next section, Burchardt also studies the paired time-and-money *capabilities* of households. These are defined as all income/free time combinations that households have if they would allocate their free time differently, e.g. by doing less or more paid work. She finds some 2 percent of the households as being in time and money capability poverty, i.e. time poor and money poor *and* unable to improve their situation by more efficient time allocation. In our terms, this would be expressed as that not only their actual but also their potential ST lies around zero. This, we could say, is not only real poverty but the real poverty trap. Burchardt (2008: 78-80) also discusses two examples of actual versus potential time-money positions. One is from a dual earner household that could earn some 10 percent more but more efficient time allocation between the spouses. The second is a lone mother that keeps much more free time than needed in view of her obligations and accepts that her income is only some 40 percent of what she could earn. In fact, she lives below the income poverty line without however being disabled or stating to be looking for work. Burchardt does not provide an explanation; the mother might have some unknown disability or may have been afraid to report non-legal work and income.

Based on time and income surveys, Goodin et al. (2008) report on DT outcomes in Australia, the US, Germany, France, Sweden and Finland. Overall in these countries, it is found that ST is around 11.5 hours per day. Average spare time being found at around 4.7 hours per day, people have some 7 hours per day of 'time pressure illusion', as Goodin et al. put it. The largest differences found in ST are between dual earners without children that command 13.0 hours per day of surplus time (with Sweden highest at ST = 13.6) and lone mothers with children that stand at an average surplus time of 8.4 hours per day (with the US lowest at ST = 6.8). These figures concern averages over the groups, hence with all incomes and child numbers included. Separate households will of course show more extremes.

Hobbes et al. (in press) give fieldwork-based FDT outcomes of separate households with complex livelihoods in peri-urban Kashimpur village, close to Calcutta (India) and three households in the Netherlands. Surplus time in the Indian households varies between ST = 5.4 and ST = 10.8 hours per day. The Dutch outcomes vary between ST = 2.3 for a lone mother with three children and a minimum wage and ST = 10.5 hours per day for a middle-class household with three children and an *au pair* helper.

The DT and FDT outcomes allow for some comparison. First of all it may be noted that the ranges of surplus times in the Western societies overlap with those in India. The lowest ST is found in the Netherlands, the surplus times of the ST-poorest households in Kashimpur lie close to that of the lone mothers in the US and the middle class in the West have much in common with the best-off in Kashimpur. The ST indicator is not only egalitarian between the rich and the poor but also between the West and the South.

In the FDT study, the *au pair* helper makes a difference of 1.7 hours per day of surplus time in the Dutch middle-class household. This resonates with the great attention given to childcare regimes in Goodin et al. (2008). Possibilities for one-to-one DT/FDT comparisons are limited because Goodin et al.'s outcomes represent group averages. The group that should be closest to Hobbes et al.'s (in press) middle-class household with three children is Goodin et al.'s (2008: 89) 'German couples with children', which stands at a mean ST of 11.2 hours

per adult per day. The three children in the FDT example being higher than the average number of children in the German group, the best comparison is with the FDT case in which the third child is compensated for by the *au pair* help. This ST is 10.5 hours per adult per day. In other words, even though the two methodologies are different as discussed in Section 2, the results do not seem dissimilar, which may strengthen confidence in both methods.

Goodin et al. (2008: 92) contains group data on lone parents, as remarked already. No comparison is possible with the lone parent example of Hobbes et al. (in press) that has an ST = 2.3 hours per day because that concerns a minimum-wage extreme. Burchardt (2008: 27, 69) shows, however, that figures around ST = 0 for lone parents appear quite possible in Western societies. One of her examples is a lone parent with two children and a moderately low wage rate, who is assessed as below both the time-poverty line and the money-poverty line in the paired indicator graph.

8. Denotation and Connotation: ST Metric Validity and Caveats

What does it mean to have much or little Surplus Time (ST)? It serves at this point to make a difference between a metric's *denotation*, i.e. what it is really meant to 'be' or fully represent, and the metric's *connotations*, i.e. the phenomena it can usually be assumed to correlate with. For the income metric, for instance, its denotation can be something like the net inflow of liquid or liquefiable goods into a household, which is then usually assumed to correlate with its connotations of having enough consumer goods, ability to save, welfare or well-being. Logically however, these connotations depend on more than income only. In order to buy consumer goods, or instance, local markets and social norms come into play. And in order to augment one's well-being with these goods, actors need knowledge and institutions.

The upshot of the distinction between denotation and connotation lies in the degree of severity of caveats. A denotation caveat is true invalidity. For instance, calling 'income' only the net cash flows of households that have substantial subsistence production (e.g. growing all their own rice as many Asian farmers do) disables the whole metric. The same would hold if we would say that ST measures a households' freedoms while in fact households would have substantial freedoms left even of ST = 0, or households with the same ST would enjoy substantially different levels of freedoms.

Connotation caveats on the other hand, are to be looked at differently. We all know that income and well-being correlate to some extent but not in any one-to-one manner, as if the relatively poor cannot live a full life and rich people cannot be unhappy. Stating that over and over as a caveat of the income measure does not make much sense. Connotation caveats are most relevant to identify when common sense tends to leave us unaware of them. One example is the connotation of ST with potential income. The logic of this connotation is strong, because ST denotes the time you are free to act with, hence including going all-out to the labor market and maximize income (see the second profile in Table 2). Contexts of underemployment or legal regulations may preclude this, however, implying substantial mismatches between ST and potential income. This then is a hidden, and therewith relevant, connotation caveat of ST.

Denotation: Surplus Time = Freedoms Time

Surplus time, by definition, is the time you have left after fulfilling the basic needs you have to fulfill. It represents people's freedom to enjoy the present or to invest in the future (*cf.* Alkire, 2006: 246) and indeed appears to operationalize much of Sen's (1999) seminal freedoms concept. "ST = Freedoms" is therefore the shortcut denotation of ST, visible also in the subtitles of the DT and FDT publications. We should continue to bear in mind, however, that ST in fact is freedom *time*, and it depends on the local situation to what degree freedom time can be transformed into actual freedoms. In prison or *purdah*, you have much ST but few freedoms. In general, ST does not denote the full array of freedoms including political participation, full self-realization and so on.

This being said, the denotation of ST as freedoms remains a very strong one. Let us take as a radical example of a household in which the parents, in spite of a relatively low wage rate, have chosen to have five children. It may well be that the parents can make ends meet only by devoting all their time to satisfy the household's basic needs. In other words, they will be assessed with ST = 0. Are they poor? Their income level may not be dramatically low, and in Africa, for instance, they may even be locally considered rich (five children! and all basic needs supplied!). Are they unhappy? Probably they are when having again risen at night to console the baby but on the whole, they may feel quite satisfied with the situation they have chosen for. All the while, it remains true that their freedoms are zero. They have no choice but to continue with what they are doing, no resilience against any disaster or deterioration in their economic context, no capacity to engage in any other livelihood strategy. In other words, FDT = 0 still means freedoms = 0. That is why Hobbes et al. (in press) strongly emphasize that for any household, ST is "the basis for its adaptive capacity, its capacity to invest and the negative of its vulnerability." How this basis works out in any context depends much on that context, but more ST is always more freedoms and more development capacity. Hobbes (2010: 167) extends this idea to an FDT-based community-level indicator of development capacity.

Any caveat in this "ST = freedoms time" denotation, as said, is a basic one. Is there one, especially one that common sense would not readily identify? The answer may be approached by noting that people may display inefficiencies in time use, in the sense that an alternative behavior would give them more free time. An example that may often occur is Burchardt's (2008) household that could have 10 percent more income with a more efficient time allocation. Goodin et al. (2008: 11) mention a hypothetical but probably often occurring example of a corporate lawyer spending one hour per day on cleaning her house instead of hiring a helper at a lower wage rate than her own. Goodin et al. add that this brings no validity problem to their DT measure. They are right if and insofar the inefficient behaviors take place within people's suplus time. In the FDT system, for instance, these choices become visible in people's FDT profile, without affecting the FDT level itself (see Table 2). Inefficient behaviors in the provision of *basic needs* do affect ST, however. In the lawyer example, if this house cleaning is part of basic cleaning, her behavior gives her less ST than she would have had by hiring a helper. Does that undermine ST validity? Not if the behavior is not a free choice, e.g. if she is afraid of helpers. Her actual, reduced ST then exactly represents the reduced freedoms she has due to her inflexibility. If her cleaning is a free choice however, her freedoms are in fact higher than her ST level displays, because she now has some freedoms hidden in her non-ST time for basic needs provision. Many other

examples may be given, e.g. a household preferring to supply all basic child care by itself in spite of available cheap daycare, or a farmer desiring to be independent and preferring a low-productive subsistence crop over an available cash crop for which he could have bought more food. In general, people's total 'freedom time' is their FDT as assessed *plus* the time effect of freely chosen inefficiencies in basic needs provision, and the latter component will often differ from zero. This could be called the Preferred Inefficiencies in Basic Needs Provision caveat in ST.

By definition, households may always remove these inefficiencies and create more ST. Also, the ST assessor may try to remove the inefficiencies on paper, e.g. calculating how much ST the corporate lawyer would have if she would hire a helper. This is in fact what Burchardt (2008) does when calculating her time-money capability graph of all possible time-money allocations of a household. A 'corrected' or 'potential' ST with the preferred inefficiencies in basic needs provision removed would theoretically be a superior measure, because of the certainty that actors cannot create more ST than this. As remarked already, a *potential ST* at the zero level is a stronger poverty trap indicator than actual ST at that level. In order to calculate potential ST however, we would need to know what inefficiencies in basic needs provision reduce ST to what extent, and whether these are really free preferences. Going after these questions will probably only pay off when pursuing specific questions such as the effect of subsistence versus cash crops or the happiness that may come with less materialistic lifestyles, or when studying specific groups such as, say, the Amish or lone parents who may feel locked out of the labor market (Burchardt 2008: 80). Our proposal, therefore, is to always stay alert on the fact that households will often have some possibilities to fine-tune choices in their basic needs provision and with that to enlarge their ST, but accept plain, actual ST as a good enough indicator in the majority of cases. This is analogous to accepting plain income or expenditure as good enough monetary indicators, even though we know that people are often not efficient income maximizers (Ellis, 2000) or consumption optimizers (Linssen et al., 2010).

Connotation 1. Connecting ST with Welfare and Potential Income

As said in the Introduction, we here regard poverty and welfare as primarily economic concepts, different from multi-dimensional well-being or happiness. Poverty and welfare are more than income, however, since money and time interplay strongly in the economics of daily life. This has inspired both the DT and FDT variants of the ST concept. Now is the time to look back and ask: does Surplus Time indeed measure poverty and welfare? Can we indeed say that households with more ST are better off than households with less ST, not only in terms of freedoms but also in terms of poverty and welfare? In general, of course, the answer will tend to be affirmative, since ST is the time people may freely choose to do paid work, as they often will. Finding general correlations does not subtract from exceptions, however, as we already saw in the five-children family example.

The real caveat to search here is when exceptions are unexpected and systematic, and this concerns underemployment the 'potential income' interpretation of ST. Potential income is what people could earn by devoting all their ST to paid labor. The step from actual to potential income requires an estimation of the wage rate that people would earn during the hours not worked at present. These hours are usually less than their ST because people

usually work at least some of their ST. In other words, the estimation regards the unpaid hours in ST. In Table 2, these are the 3 to 4 hours per day in several profiles. Would people earn the same wage rate as for the hours they currently work? The local context is decisive here. For female part-time workers in the UK, for instance, the wage rate of the extra hours will tend to be higher than of the current ones (Burchard, 2008: 65). In contexts of chronic underemployment, however, as in many of the lagging economies of Sub-Sahara Africa, the reverse may well be true. People may work a few hours per day for a reasonable return (e.g. on the farm) but then continue working for much lower rates, e.g. as laborer. Hobbes et al. (2007) describe a case from Vietnam where people first fully exploit their most profitable land use option and then cascade down to other land use types with ever lower returns. This will create low income rates overall and with that, a low calculated ST. In order to estimate the potential income that people could earn if they would decide to work all these ST hours, the lowest wage rate of the local cascade should of course be taken for the extra hours.

Underemployment can be more severe than this, however. Income-generating options to fill the presently non-worked hours may simply be *absent*. In that case, there is nothing to do with ST that generates income. This underemployment caveat differs much from the preceding one. Preferred inefficiencies in basic needs provision only result in a generally slightly too pessimistic ST figure. Severe underemployment results in a strongly over-optimistic ST interpretation in a specific type of context. In situations of severe underemployment, either the DT or FDT indicator should be joined with a monetary measure or the assessment should follow the paired time/money strategy. Both ways, severely underemployed households can be identified.

Connotation 2. Connecting ST with Well-Being and Happiness

Would ST correlate with subjective well-being and happiness? The general logic is that it should, since surplus time, by definition, allows people to pursue the things they prefer to do or have, e.g. do paid work for luxuries, leisure or bake one's own bread. There are few data available that combine ST with happiness (well-being, life satisfaction). Goodin et al. (2008: 58), report on a study that combined DT with life satisfaction in Germany, and in which DT has a stronger correlation than spare time with life satisfaction and an equal strength as household income. The overall explanation of variance remains relatively low, probably because well-being will always depend on more than time and money, e.g. including health, quality of relationships and relative positions with respect to the neighbors and the past. The first two profiles in Table 2, for instance, have the same ST but differ in income, sleep and self-care, savings and food. What creates more well-being depends on the actor's preferences for these factors. It remains quite likely, however, that all these households with FDT at 6 or 7 have a higher well-being than those with ST = 0 (last two profiles). Note also that spare time is not likely to be a good indicator of well-being in this Table; the second profile has a spare time of zero but since this is free choice, well-being may be unaffected or even higher than in the initial profile with 4 hours of spare time per day.

At this point, it serves to briefly go back to the general 'preferred inefficiencies of basic needs provision' caveat of ST. If people prefer basic needs provision activities that are not fully ST-maximizing, this has different consequences for the interpretation of ST. If they would remove these preferred inefficiencies in order to maximize ST, their ST would rise

indeed. Their freedoms would remain the same, because they only shift freedoms from the basic needs provision to the non-basic, ST time compartment. Their potential income would increase. Finally, assuming that their preferences are consistent with their well-being, their well-being would be reduced. In this case, more ST does not mean more well-being.

9. INDICATOR CHOICE

This section explores some issues of indicator choice in research and statistics, structured along a line of ST 'versus' monetary indicators. We first look at the purely scientific merits and then move a broader picture.

GDP per capita is a well-known monetary indicator of wealth. GDP is often criticized from an ecological point of view. What does the GDP of a country mean if the country is at the same time accumulating waste, depleting its resources and overfishing the ocean? Many proposals have been made to establish a corrected, 'sustainable GDP' (e.g. De Groot, 1992: 242). At this point, we may note that exactly the same issue can be raised against the ST or income indicators. What does the ST or income of a farming household mean if that household is at the same time accumulating toxic substances, mining its soil and over-exploiting the village forest? The basic rule appears to be that many validity issues pertaining to monetary indicators also pertain to integrated time/money indicators, and *vice versa*. People may not be ST maximizers but neither income maximizers, and like potential ST, potential income may be the theoretically superior indicator. The income value of ST has its perfect mirror in the time value of freely disposable income. How much time can money buy? Can local contexts also display over-employment, with many people unable to work less for less income (Goodin et al., 2008)?

Therefore, any discussion on the scientific pros and cons of integrated time/money versus purely monetary indicators should focus on where these indicators really differ rather than on what they have in common, and be strongly tied to the research aim. Based on the findings in the present paper, the following general observations may be relevant.

(1) Simply because they are new, time/money integrated indicators can open up new avenues of looking at societies, households and development, e.g. connected with welfare regimes, environmental degradation, class formation, well-being, poverty traps, unpaid work, gender, HIV/AIDS and many other issues.
(2) Probably, all indicators have their own specific interpretation caveats apart from the ones they have in common. As discussed for ST, for instance, this is its interpretation towards potential income in contexts of severe underemployment. Yet the possibility to at least approach potential income is a relative strength of ST (and the paired indicators), because monetary indicators lack this possibility.
(3) Around ST = 0, there are no ST interpretation uncertainties because there is no ST. In that range, therefore, interpretation uncertainties cannot outweigh the intrinsic power of the integrated ST metric compared to one-dimensional time or money indicators. ST = 0 may well be a uniquely valid universal poverty line.
(4) More ST will quite often mean more potential income and well-being, but certainly not always, as discussed. The freedoms and development potential denotation of

FDT appears to be quite straightforward however, also in the sense that within each local context and for each household, more ST always means more freedoms and more development capacity.

Any decision on what will be the focal indicators of research and statistics – ST, monetary indicators, paired indicators or any mix – will involve trade-offs. Data needs of integrated or paired metrics, requiring as they do information on time use as well as cash flows, will be higher than of mono-dimensional indicators such as income. Moreover, needs of comparability should be considered. If these are relatively low, it may serve to maintain more intra-group detail and keep time and money outcomes separate in a paired rather than an integrated indicator.

Indicator choice can also be subject of studies expressly designed for the purpose. Within the ST concept, for instance, FDT and DT have not yet been subject to systematic comparison. One strategy here could be to look how far the FDT framework can come in the interpretation of national surveys compared to DT, and the other way around, looking how the DT framework can come in field research compared to FDT. Within the broader MIT group other concepts than ST may be tried out, and nothing stands in the way of assessing a wide array of indicators (e.g. monetary, ST, paired indicators and subjective well-being) in a single, integrated data gathering effort, and then compare their cost, reliability, cross-correlations, linkages with context, caveats and validity towards broader concepts such as chronic and temporal poverty, subjective potential income, investments and other future-oriented behaviours, happiness and others.

10. CONCLUSION

This chapter has introduced two methods (DT and FDT) to integrate the time and money aspects of livelihoods into a single metric. This indicator, called Surplus Time (ST), is defined as the time that people have left after fulfilling the basic needs that they need to supply for themselves and their dependents. Basic needs comprise physiological needs, food, shelter and care needs, social obligations, basic consumer goods and so on. ST is the freedom that people have to engage, within the range of their agency and options available in the local context, in activities that generate above-basic consumables, in physical or social investments for the future, in above-basic caregiving or leisure. An ST of zero hours per day implies that people need all their time to satisfy their household's basic time and money needs and are trapped in work for bare survival; ST = 0 is the poverty line. A somewhat higher ST (e.g. 2 hours per day) may be necessary for households to invest in out-of-poverty strategies.

In the FDT ('Freely Disposable Time') methodology, the actual income rate of the household is used to convert money into time needs for each category that the household spends time and/or money on. Households can have deficits or surpluses on each category, expressed in hours per day. The total of surpluses minus deficits is ST. Independent from FDT, Goodin et al. (2008) have developed the DT ('Discretionary Time') methodology. Different from FDT, DT takes basic needs as largely relative, does not distinguish between separate time surpluses and deficits and is more geared to work with survey statistics in developed countries.

The FDT framework has been applied to complex livelihoods of peri-urban farming households in India, and some cases from the Netherlands. In India, ST was assessed as between 5.4 and 10.8 hours per day. In the Netherlands, a middle-class household with three small children was found to have ST = 8.8 hours per day, while a minimum-wage lone mother with three small children stood at ST = 2.3 hours per day. The DT framework has been applied on survey datasets from five developed societies and found ST to be 11.5 hours per day on average. The cases in which FDT and DT outcome could be compared (middle-class households with children in Western Europe) showed good similarity with ST at 10.5 and 11.2 hours per day, respectively.

Being a single quantitative measure, ST is suitable for comparative and monitoring purposes, comprising the whole rage of rich and poor, rural and urban. Its methodologies also allows for scenario studies, e.g. on the effects of different livelihood strategies, the effects of macro-level shifts in prices, wages, tax or welfare regimes, and the effects of micro-level changes e.g. children being born, HIV/AIDS spreading, soils degrading, wells drilled close to homes, or solar cookers supplanting firewood gathering. Other ST applications may work the other causal way around, e.g. studying the effect of changes of ST on investments in education, social capital, business initiatives or land quality.

ST expressing as it does people's freedoms to engage in any activity available and allowed in their context, can be expected to correlate well with potential income and well-being. Several caveats should be kept in mind, however. The most basic one is that people may have preferences that lead to inefficiencies in the provision of their basic needs. In these cases, people have some freedoms 'hidden' in their non-ST time, and people may in fact have more freedoms and a higher potential income than suggested by their ST. Apart form this general caveat (which is acceptable in most cases in our view), the interpretation of what the value of ST is to households always requires caution. First of all, the local context (markets, regulations, social norms) determines what people can actually do with their freely disposable time. Contexts of severe underemployment represent a real caveat here, especially when ST is interpreted towards potential income. Adding an income indicator is advisable here.

Several issues of metric validity are shared or mirrored between ST and monetary indicators. For instance, both ST and income may be environmentally unsustainable, and households may not be fully maximizing their ST or income. A number of relative strengths of ST appear to stand out. They are its capacity to shed a new light on persistent problems, its capacity to capture time burdens of households, its openness to assess potential incomes in contexts without severe underemployment, its possible connection with well-being and its straightforward interpretation as a metric of freedoms. Finally, ST = 0 may be a very robust universal poverty line.

Final decisions of indicator choice involved many practical and scientific arguments, as discussed in the preceding section. Major reasons to adopt ST or some likewise integrated time/money metric are its strong validity to gauge what may be called real poverty, its (cautious) connections with potential incomes and actual well-being and its straightforward interpretation as people's freedom of choice. This freedom is a prime value in itself and also a key element in the development capacity of any person, household or community.

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