



6

Some Effects of Basic Income on Economic Variables

Meghnad Desai and Ana Helena Palermo

Introduction

In this chapter, we address the potential consequences of the introduction of a Basic Income on some aspects of the economy. Our objective is to offer a theoretical-analytical framework to discuss the potential effects of Basic Income on a set of variables. We specify two forms of Basic Income, which differ in relation to the financing mechanism. Our conclusion is that the economic effects of a Basic Income will strongly depend on the mechanism that finances it.

Further, these economic effects will also depend on the level of the Basic Income. We elaborate three categories of Basic Income in relation to the amount paid. These different quantities of Basic Income lead to different effects on the amount of paid work done by the recipients as well as the unpaid creative work that they may choose to perform in their 'leisure time'. The first level of Basic Income is a 'partial' Basic Income, which is not enough to release an individual from dependence on full-time employment to meet basic needs, and so requires people to participate fully in the formal labour market. The second category is the 'freedom-enhancing' Basic

M. Desai
London School of Economics, London, UK

A. H. Palermo (✉)
University of Freiburg, Freiburg im Breisgau, Germany

Income, which enables citizens to achieve their basic needs without needing full-time employment. With this income, individuals can invest less time in paid work, but labour income is still required in order to survive. The last type is the 'emancipatory' Basic Income, which permits people to choose whether they would like to participate in the formal labour market or not. With such a Basic Income, if an individual chooses to invest time in the labour market, it is not because she or he needs it to survive, but rather because it expresses an individual preference for the investment of a certain number of hours in this kind of activity. The emancipatory level of Basic Income is defended by many activists, who would like people to be able to say 'no' to paid work and to plan their use of time in accordance with their genuine preferences without being biased by survival concerns.

All these levels are individually and contextually defined. A certain Basic Income may be emancipatory for one individual, but partial for another. The effect will also depend on the level of prices in the region in which a person lives, and on personal preferences, which in turn will depend on many other social, cultural, political and gender aspects.

In much discussion about the economic effects of Basic Income, the notion that if you give people more money then they will immediately do less paid work (in the limit not at all) plays an important role. This view implies that people work solely to achieve a target income or consumption and ignores the non-pecuniary aspects of paid work. People are also guided by non-pecuniary motivations, which may be independent of the amount of income they receive. Besides, someone's target level of income may be changed by the need for new consumption goods or by changes in tastes or family size. Besides, not all work that is essential for the maintenance of individual and social welfare is paid. Unpaid work can be found within many activities which are essential for social and economic development, like cooking, cleaning, child care, and care for the elderly—mostly performed by women—and in voluntary activities in the neighbourhood, in the local political party, or with the children's school. Therefore, when we model individual economic behaviour, we assume that time not spent on paid work is not just used for leisure, but also for unpaid work. We specify a variable called unpaid time to represent the sum of both leisure time and time spent on unpaid work. We discuss the effects of the two types of Basic Income financing on consumption and on this unpaid time. We also assess their effects at the aggregated level, on aggregate consumption, on Gross Domestic Product (GDP), and on income distribution.

The remainder of the chapter is organised as follows. In the next section, we present each Basic Income financing mechanism and the individual

utility maximisation problem that we use in our evaluation. Then, in the third section, the economic effects of the two financing mechanisms are discussed. In the last section, we draw final conclusions and make recommendations for further research.

For readers comfortable with mathematical expressions of economic realities, asterisks in the text alert the reader to the presence of relevant equations in the appendix.

Modelling Different Funding Mechanisms

When we analyse different Basic Income proposals, we discover various ways through which Basic Income could be financed: money creation, and different forms of taxation, such as consumption taxes, Value Added Tax (VAT), income taxes, capital taxes, resource taxes, robot taxes, and taxation on financial transactions. However, it is important to note that ‘in most of the cases, the funding is part of the general income tax scheme’ (Van Parijs and Vanderborcht 2017: 287) and that ‘because of various privileges granted to income from capital, taxing personal income has increasingly become close to equivalent to taxing labour’ (Van Parijs and Vanderborcht 2017: 134). Aware of this phenomenon, the economist James Meade (1989) suggested that the state itself should become ‘the beneficial owner of a part of the country’s income-generating capital resources’ and should use ‘the income earned on this capital wealth to finance the payment of a social dividend to all citizens’ (Meade 1989: 28). Others have suggested less radical methods, such as the public ownership of natural resources and the use of revenues derived from these, and from such other resources as intellectual property, for the payment of a dividend.

No financing scheme guarantees the sustainability of a Basic Income scheme. However, finance based on income tax seems to be among the most viable forms, and most detailed proposals include such taxation in their design. A dividend financed by sources external to labour income appears to be the second most frequently suggested method for financing a Basic Income, and among those sources we might count capital, robots, natural resources taxes, and the proceeds from state-owned funds. Therefore, in this chapter we focus on two generic forms of financing, one directly dependent on labour income, and another which is external and independent of labour income.

The first financing scheme that we analyse is an income tax scheme. A Basic Income financed by an income tax can be treated theoretically

as if it was a Negative Income Tax (NIT) as both Basic Income and NIT are analytically equivalent (Barr 2004: 233), as ‘the ultimate effect on the individual’s disposable income would be virtually the same’ (Yunker 2013: 205). However, that is where the similarity ends. NIT involves lower total transfers than Basic Income (Tondani 2009: 247): but Basic Income has an epistemological advantage (Tondani 2009: 254) as it ‘is a citizenship entitlement, not a welfare handout to the needy’ (Desai 1998: 123), it is paid to all upfront, and it is not received as a fiscal credit *ex-post*, as NIT is (Suplicy 2000). And administratively there is a significant difference. NIT is administratively complicated to implement, as it involves a different calculation for each individual, with the amount paid depending on earned income; and because administration involves both employers and the government, the result is ‘administrative complexity, incentives and disincentives of various kinds, bureaucratic intrusion, and stigma’ (Torry 2017: 3).

As a significant context for the discussion that follows it is important to be aware that poverty traps—which can be defined as the situation in which more impoverished individuals or households face higher marginal tax rates than others in higher income brackets because of implicit taxes on their benefits (Barr 2004: 225)—are not necessarily extinguished by unconditional incomes. To enable poorer households to escape from poverty traps it is essential to design a Basic Income scheme in which the net benefits are higher for the lower income deciles than in a conditional system: otherwise, all that might be happening would be a change from implicit to explicit taxation. In this sense, the analysis of the interplay between the taxation system and the Basic Income paid is important to evaluate if poorer households are to be better off and poverty traps are to be diminished. One method of helping to achieve this would be to revise current benefits systems so that benefits are withdrawn more slowly (Barr 2004: 240).

The exercise that we do in this chapter abstracts from the existence of means-tested and other kinds of benefits in the ‘before Basic Income’ scenario. Our initial scenario represents a pre-existent income taxation system with a tax allowance and with no income redistribution.

Basic Income Financed by Flat Income Tax*

We assume that if a Basic Income is to be implemented, it will demand an additional tax burden on labour income, and in this case we assume a flat tax rate, without a tax allowance, meaning that individuals would pay the same additional proportion of taxation, independently of their income

level. We also assume that income from paid employment might suffer an adjustment after the introduction of Basic Income, because of the additional income tax. So, the only difference between the taxation system before and after Basic Income is the additional flat tax, which is introduced to enable the financing of a Basic Income. With this model, we do not imply that a flat income tax is the only way to finance a Basic Income. The additional tax could also be formed, for example, by progressive marginal tax rates. We choose the flat tax schedule to illustrate an example in which every individual in the income distribution would have the same additional marginal explicit tax burden. However, if the flat tax is calculated together with the Basic Income, then the average income tax will form a progressive schedule.

Household Income*

Incomes of households both before and after Basic Income will depend on the income levels of those who belong to households and on the taxes on this income. Before Basic Income, total household income will be the sum of the incomes of each member of the household minus the income tax paid by each member of the household. After Basic Income, the total household income will be a result of the sum of the Basic Income paid for each member plus the sum of the adjusted incomes of each member minus the paid income tax.

Required Tax*

The amount of tax collected for the introduction of a Basic Income is, in this case, the difference between the total tax revenue under a Basic Income scheme and the tax revenue without it. The amount of extra tax collected will depend on how individuals react to the introduction of Basic Income, that is, on how they adjust their income when faced with an additional tax burden. If the adjusted incomes do not differ from the previous ones, then the tax collected for Basic Income will depend solely on the flat income tax rate. If adjusted incomes do differ, then the aggregated amount collected by the flat tax might be lower or higher than the aggregated amount needed to pay the Basic Income for all individuals, depending on how the levels of adjusted and previous incomes are different from each other. So, depending on how individuals react, this Basic Income system may be neutral, or might result in a deficit or a surplus in the government's budget. However, note

that even if some individuals do work fewer hours, it will still be unlikely that households' incomes after Basic Income will be less than before.

Basic Income Financed by Sources External to Labour Income

The second financing mechanism is a source for the Basic Income which is external to labour income. Here we assume that a Basic Income in the form of a social dividend is paid to residents based on taxes levied on the use of natural resources, on revenues of state-owned funds, or on the taxation of capital: for instance, in the form of robot taxes. The central point here is that financing is not directly dependent on taxation of labour income and is, therefore, external to it. One of the fundamental ideas here is the decoupling of income and work: that one has the right to a certain amount of income independently of time invested in paid work. This argument is reinforced when we observe developments such as the digitalisation of the economy and new dynamics in the labour markets that lead to increasing job insecurity and exclude an increasing number of individuals from the social protection provided by formal and secure employment. Besides, the proceeds of production have increasingly been accrued to capital rather than to labour in the last few decades, and there is an argument for redistributing some of those proceeds. Because financing of the Basic Incomes is external in this case, we just add the Basic Income to the individual's budget.*

The Individual Utility Maximisation Problem*

A significant issue is Basic Income's effect on consumption and hours worked. In standard economics, the behaviour of an individual (or household) concerning consumption and work is modelled in terms of utility maximisation. This is an approach that is widely used by economic theorists as well as policymakers.

We can model the situations of the two funding mechanisms for Basic Income. The initial position, before Basic Income, is income taxation and no redistribution of income. If Basic Incomes are to be funded by income tax, then the situation after Basic Income contains Basic Income and an additional flat income tax. If funding is to be external, then the situation modelled contains Basic Income and only the original income tax. In all three cases, an individual divides time between paid working time and unpaid time.

We make a standard assumption that an individual's demand for a specific good is a function of the individual's affinity to this good, the price of the good, available income, and a subsistence level for the good: that is, we assume that no-one can derive 'utility' from consuming a good unless the amount of the good is above a bare minimum. We assume that there are two goods, consumption and unpaid time. Minimal levels of both have to be reached, and after that an individual might wish to substitute one good for the other. The available income is defined by paid working time multiplied by the wage level and discounted by the taxation, plus the Basic Income. If for an individual their Basic Income does not enable consumption at subsistence level, then we would expect them to invest time in paid work until the required amount of income has been achieved, and only after that will choices be made between consumption and unpaid time.

We find from our equations that the total amount of both consumption and unpaid time are dependent on the subsistence amounts of consumption and unpaid time, and on individuals' affinities to each of consumption and unpaid time, and that each of the two goods is negatively related to the subsistence amount of the other. We also find that Basic Income has positive effects on both consumption and unpaid time.

Potential Effects of the Different Financing Mechanisms

Consumption and Unpaid Time (Individual Level)*

In the case of an emancipatory Basic Income, the subsistence level of consumption equals the Basic Income. In this scenario, we find that consumption beyond the subsistence level will depend on the preferred allocation of time to paid work. We also find that the amount of unpaid time is independent of Basic Income under this assumption. So, in this situation, the total level of unpaid time would be defined by the amount of it required for subsistence, plus a discretionary amount, determined by individual affinities. An emancipatory Basic Income would give to a person full access to subsistence needs, so the trade-off between consumption and unpaid time would be independent of Basic Income in this case. However, if this Basic Income was to be funded from extra income tax, then the additional tax burden would have a potentially negative effect on both unpaid time and consumption, depending on how individuals decide to adjust their income.

With an externally funded Basic Income, no additional negative effect would be expected.

There are two other levels of Basic Income, which are interesting for the discussion on consumption. With a 'partial' Basic Income, if an individual invests their total available time in paid work, then the resulting labour income together with taxation and the Basic Income will either be lower than subsistence consumption or will manage to reach it. The Basic Income is called 'partial' because it helps an individual to come closer to or to reach subsistence consumption, but it is not high enough to enable the individual to trade-off, even partially, between unpaid time and consumption.

Concerning this 'partial' Basic Income, the effects of the two financing mechanisms would not differ from each other, because in this scenario individuals would invest the total amount of available time in paid work independent on the amount of taxation, as they are dependent on labour income to achieve minimum consumption or to come as close to it as possible. Nevertheless, in the case of labour income tax-financed Basic Income, the taxation would be higher than in the externally financed one, meaning that, for the same level of Basic Income, with the income tax-financed scheme the disposable income (—income available to an individual or household after taxation and income redistribution) would be lower than with external funding for the Basic Income.

Additional to the 'emancipatory' and 'partial' Basic Income levels is the 'freedom-enhancing' Basic Income, which enables an individual to trade-off at least some of their time between employment and unpaid time. In this case, if labour income, minus taxation, plus Basic Income exceeds the minimum consumption, and the Basic Income is lower than minimum consumption, then the paid work time will be the result of total time less minimum unpaid time and a discretionary amount of unpaid time. This discretionary amount represents the additional amount of unpaid time an individual could win with this Basic Income, if it is a preference of theirs. Another option would be to increase consumption, adding a discretionary amount to it.

As for this 'freedom-enhancing' Basic Income, the internally and externally financed Basic Incomes differ concerning their effect on paid work time. Since with this Basic Income, an individual begins to trade-off at least partially among consumption and unpaid time, there is the possibility that the extra taxation of the internally financed Basic Income will have a negative effect on labour supply, that is, on paid work time. Anyway, with this Basic Income, individuals will have the possibility of working less, if this is their preference. That means that even the externally financed Basic Income

might, in this scenario, result in a decrease in labour supply, because the ‘freedom-enhancing’ payment enables those who want to decrease paid work time to do so. The internally financed Basic Income might generate an even stronger disincentive effect because of its larger tax burden.

Consumption and GDP (Aggregate Level)

The step from an individual to an aggregated evaluation of results can follow different logics. An economist who dedicated much attention to this issue was Lawrence R. Klein, who in 1948 set himself ‘the objective of obtaining from the marginal conditions of utility maximisation, with demand functions that are linear in relative prices and income, a “true” index of the cost of living’ (Klein and Rubin 1947; Visco 2014: 613): that is, of scaling up the logic from an individual to a society. However, at the beginning of the 1990s, Klein again discussed the relation between micro and macro, and defended the idea that macroeconomics stands on its own as a subject and cannot be derived from microeconomic general equilibrium systems (Klein and Park 1993; Visco 2014: 614), apparently questioning the perspective that he earlier presented. This means that he had rejected the assumption of a representative agent, had found deficiencies in aggregation methods based on the assumption of a representative individual, and had called attention to variations among groups of agents.

Following this line of thinking, we take account of variations among income levels, and we do not make use of the representative agent assumption to discuss the potential effects of a Basic Income on aggregated consumption. Instead, we use the concept of the marginal propensity to consume (mpc). This is the ratio between the marginal increase in consumption and the marginal increase in income, and it measures how consumption increases in response to an increase in income. If we assume, for instance, that individuals with different income levels have the same mpc, then the aggregate additional effect of an income tax-financed Basic Income scheme on consumption compared to the initial situation would be zero. However, if we assume that mpc declines with income—that is, if people consume less in proportion to their income as their income rises—then we would expect that the aggregated effect would be positive. This is because we can assume that if an income tax-financed Basic Income were to be implemented then some income would be transferred from individuals in higher income brackets to individuals in lower income brackets. If the latter had a higher propensity to consume than the former, then we would expect aggregated consumption to increase in this case.

The variation of mpc among income levels is an issue that has been extensively discussed. There is evidence that propensity to consume is lower for households at higher income brackets (Corrales and Meijia 2009; Duesenberry 1949; Frank 2008; Dynan et al. 2004). For instance, the Roosevelt Institute studied macroeconomic effects of three versions of unconditional cash transfers (Nikiforos et al. 2017). One of their results is that ‘even when the policy is tax- rather than debt-financed, there is an increase in output, employment, prices, and wages, because the households that pay more in taxes than they receive in cash assistance have a low propensity to consume, and those that receive more in assistance than they pay in taxes have a high propensity to consume’ (Nikiforos et al. 2017: 3). Therefore, one may expect that the aggregated effect of the Basic Income scenario compared to the before Basic Income scenario will be positive in relation to aggregated consumption and, therefore, the level of GDP. However, there is no evidence for an increase in GDP growth rates in the medium to long term. One question that remains in the income tax-financed Basic Income scenario is how individuals would adjust income after the introduction of the new taxation and the Basic Income. The effects on consumption would to some extent depend on these adjustments and on the direction that they took for each income level.

For a Basic Income paid for externally, the income of every individual would rise by the same absolute amount, the amount of the introduced Basic Income. As this Basic Income would be externally financed, there would be no negative effects on income for any of the income levels: so the effect on aggregated consumption would depend on how individuals in different income levels reacted. It is to be expected that aggregated consumption would increase, as discussed above. So, in this scenario, we would expect only positive effects on aggregated consumption and GDP.

Income Distribution and Poverty Alleviation

The effects of Basic Income on consumption and GDP will affect income distribution. When evaluating income distribution, we need to know who the net winners would be, and who the net losers, in relation to the two Basic Income policies. Here we use the Gini coefficient: a measure of inequality that we can use in the absence of the kinds of specific data that other inequality indices require. Furthermore, for the sake of this exercise, we assume that all other factors like time allocated to paid work and unpaid time remain constant for everyone.

With a Basic Income funded by income tax, the Gini coefficient for income inequality would decrease because there would be redistribution from higher incomes to lower ones, so the distance between them would diminish. As for the externally funded Basic Income, here the Gini coefficient would remain unchanged, because the increase in income would be equal for all income classes, not affecting the distance among them. Here it is important to note that these conclusions are based on a one factor model, which accounts for labour income, and which abstracts from capital income.

Poverty reduction can be better understood with the use of the income distributions in Figs. 6.1 and 6.2, in which disposable income stands for the

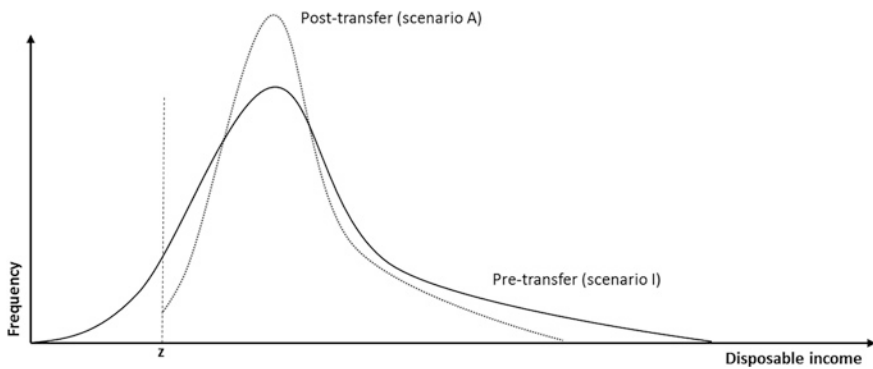


Fig. 6.1 Income distribution in the initial scenario and with a basic income funded by income tax (Graph constructed by the author, Ana Helena Palermo. For the method, see Creedy [1996]. Scenario I is the initial situation; scenario A is the Basic Income scheme funded by income tax)

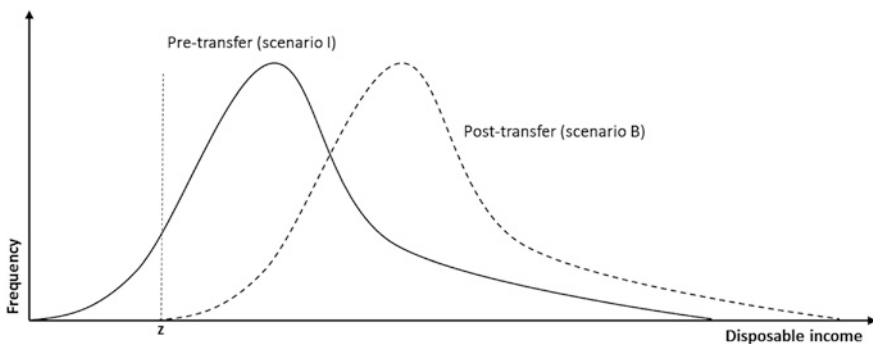


Fig. 6.2 Income distribution in the initial scenario and with a basic income funded externally (Graph constructed by the author, Ana Helena Palermo. For the method, see Creedy [1996]. Scenario I is the initial situation; scenario B is the Basic Income that is externally funded)

income available to an individual or household after taxation and income redistribution, and frequency stands for the number of individuals or households with a certain level of disposable income.

Figure 6.1 shows the Basic Income funded by income tax (post-transfer, scenario A), and Fig. 6.2 the Basic Income funded externally (post-transfer, scenario B). With the Basic Incomes, no individual has an income below the level of the Basic Income—point z on the horizontal axis—so there are no points on the Basic Income scheme curves to the left of z . Therefore, if z is set above a socially defined poverty line, poverty would be eliminated.

In Figs. 6.1 and 6.2, we can see that distribution post-transfer would be different for the two post-transfer scenarios. For a Basic Income funded by labour income tax, the form of the curve would change, as the relative positions among income earners would change. The effect is a compression of the income distribution by reducing the numbers of individuals in both tails (that is, the standard deviation (σ) decreases). For the externally funded Basic Income, the curve would remain the same shape but would shift to the right as a consequence of the additional amount of disposable income, which would be the same for all individuals.

This exercise is just an estimation of what could be the effects of both Basic Incomes on income distribution. We are aware of its limitations. One of them is the exclusion of the potential effects of Basic Income on the time allocation of each individual, which in turn would also affect the income distribution. The aim here is to give an illustrative example of how one might conceptualise the interaction between different Basic Income schemes and possible changes in the income distribution. We also wanted to emphasise the fact that the effects of Basic Income on distribution might differ considerably for different funding methods.

Final Remarks

This chapter has aimed to discuss the effects of two stylised types of Basic Income on selected economic variables. Writing about the economic effects of Basic Income in a general way is a challenging task. Many of the critical economic effects will depend on contextual particularities, which were not considered in this chapter. To these particularities belong the political system, the institutional environment, existing social benefits, and how those benefits might be or might not be substituted or adapted if an unconditional Basic Income were to be introduced. Further, social,

cultural and ethical values would also play an essential role in how Basic Income might affect economic outcomes. Aware of the importance of these factors, we have focused on the development of a theoretical-analytical approach that is potentially helpful for the evaluation of the effects of different types of unconditional Basic Incomes in different political contexts. Therefore, we hope that our analytical approach is helpful to those who are evaluating specific programs or designing concrete reform proposals.

Among our suggestions for further research is the inclusion of variables such as money and capital stock into the models that we have presented here, and also a theory of the evolution of these variables (Klein 1965; Visco 2014: 613). Also, the analysis of models in which other agents such as firms and banks are included might be helpful for further insights on economic effects. Another suggestion for improvement concerns the methods through which welfare can be measured. The meaning of welfare and its measurement in economics has generally been narrowly connected to a pecuniary understanding of well-being, a logic which emphasizes indices like GDP and the Gini coefficient. Other components of wellbeing like 'health, employment satisfaction, close personal relationships, religious faith, and active community participation' (Jordan 2010: 2) would also play a very important role in relation to life satisfaction, and could be both found in the time spent at paid work and in unpaid activities. The indices commonly used in economics to discuss well-being should be accompanied by these other components.

Mathematical Appendix

Basic Income Financed by Flat Income Tax

Taxation

The income taxation before the Basic Income is implemented is represented by Eq. (6.1), in which income taxation begins when a threshold (\bar{y}_1) has been reached. The marginal tax rate is represented by τ_1 and is modelled as a flat tax to simplify our analysis. We do not ask what this tax is used for, and we abstract from possible benefits and redistribution. We assume that if a Basic Income is to be implemented, it will require an additional tax, which is represented in the second equation by τ_2 . This term stands for a flat

tax rate, without a tax allowance, meaning that individuals would pay the same additional proportion of taxation independently of their income level. y represents the gross income level in the ‘before Basic Income’ scenario, and \hat{y} represents the gross adjusted income level in the ‘after Basic Income scenario’.

(a) Before Basic Income:

$$\tau(y) = \tau_1(y - \bar{y}_1) \quad \text{Income tax function before Basic Income if } y > \bar{y}_1 \quad (6.1)$$

$$\text{If } y \leq \bar{y}_1, \tau(y) = 0$$

$$\tau_1 > 0$$

\bar{y}_1 is the level at which the tax rate starts.

(b) After Basic Income:

$$T(\hat{y}) = \tau_1(\hat{y} - \bar{y}_1) + \tau_2\hat{y} \quad \text{Income tax function after Basic Income if } y > \bar{y}_1 \quad (6.2)$$

$$T(\hat{y}) = \tau_2\hat{y} \quad \text{Income tax function after Basic Income if } y \leq \bar{y}_1 \quad (6.3)$$

Household Income

Before Basic Income (Eq. 6.4), total household income will be a sum of the income of each member (i) of the household (j) minus the income tax paid by each member of the household. After Basic Income (Eq. 6.5) the total household income will be a result of the sum of the Basic Income (z) paid for each member plus the sum of the adjusted income of each member minus the paid income tax.

(a) Before Basic Income:

$$y_j = \sum_{i=1}^{I_{ij}} \left(y_{ij} - \tau(y_{ij}) \right) \quad (6.4)$$

(b) After Basic Income:

$$\hat{y}_j = \sum_{i=1}^{I_{ij}} z_{ij} + \sum_{i=1}^{I_{ij}} \left(\hat{y}_{ij} - T(\hat{y}_{ij}) \right) \quad (6.5)$$

Required Tax

For the discussion on the effects of the introduction of a Basic Income, it is essential to understand the Basic Income's connections to income, tax revenues, and time invested in paid work. Equation 6.6 gives the tax collected from person i in household j before the Basic Income, Eq. 6.7 the tax collected after the Basic Income.

$$\tau(y_{ij}) = \tau_1(y_{ij} - \bar{y}_1) \quad (6.6)$$

$$T(\hat{y}_{ij}) = \tau_1(\hat{y}_{ij} - \bar{y}_1) + \tau_2(\hat{y}_{ij}) \quad (6.7)$$

$T(y) - \tau(y)$ is the difference between the total tax revenue under a Basic Income system and a system without it. Equation 6.8 shows that this amount will depend on how individuals react to the introduction of Basic Income, that is, on how they adjust their income when faced with an additional tax burden. If the adjusted income does not differ from the previous one, then the level of Basic Income will depend solely on the additional flat income tax rate (τ_2). If they differ, the amount collected by the flat tax may be lower or higher than the Basic Income, depending on how the level of adjusted and previous income is different from another. The total amount of the extra tax collected is represented by ZN

$$ZN = T(y) - \tau(y) = \sum_j \sum_i \{\tau_1(\hat{y}_{ij} - y_{ij})\} + \sum_j \sum_i \tau_2(\hat{y}_{ij}) \quad (6.8)$$

However, note that if some individuals work fewer hours:

$$\hat{y}_{ij} < y_{ij} \text{ for some } ij \quad (6.9)$$

It will still be unlikely that households' incomes after Basic Income will be less than before it:

$$\sum_i (\hat{y}_{ij} + z_{ij}) < \sum_i y_{ij} \quad (6.10)$$

If $\hat{y}_{ij} = y_{ij}$, then ZN simplifies to:

$$ZN = \sum_j \sum_i \tau_2(\hat{y}_{ij}) \quad (6.11)$$

The Individual Utility Maximisation Problem

Here we depict the model that we use to discuss the individual income for each of the two types of Basic Income. The income for each will depend on different variables. As the basis for the utility maximisation problem of individuals and households we use a Stone-Geary-Klein-Rubin (SGKR) utility function, which describes individuals' demand for a specific good as a function of individuals' affinities to this good, the price of this good, available income, and a subsistence level for this good. The specification of a subsistence level is unique to this particular function. The idea is that no one can derive 'utility' from a good unless it is above the bare minimum. This is an idea very much in tune with the logic behind Basic Income. This is why the SGKR function suits our purpose.

In our case, there are two goods, consumption (c) and unpaid time (u) (Palermo Kuss and Neumärker 2018). In Eq. 6.12, the affinities to each of them are represented respectively by α and β . The subsistence levels of each of these goods are c_{sub} and u_{sub} . The available income (budget constraint) is defined by paid working time (h) times the wage (w) discounted by the taxation (τ or T) plus the Basic Income (z), where applicable.

We include in the model a budget constraint for each scenario and one time constraint. The first budget constraint (I) represents the before Basic Income scenario, in which there is initial income taxation and no redistribution of income (Eq. 6.14). The second budget constraint (A) represents the after Basic Income scenario, in which an additional flat income tax finances the Basic Income (Eq. 6.15), and a third one (B) represents the after Basic Income scenario with the initial income taxation and an exogenously financed Basic Income (Eq. 6.16). The time constraint is represented by Eq. 6.13 and states that the total time (t) is equal to paid working time (h) plus unpaid time (u). Carrying out the maximisation exercise yields a clear result concerning consumption and unpaid time.

$$\max U(c, u) = (c - c_{sub})^\alpha \cdot (u - u_{sub})^\beta \quad (6.12)$$

such that

$$t = h + u \quad (6.13)$$

$$c = hw - \tau \quad (\text{Budget constraint I}) \quad (6.14)$$

$$c = hw - T + z \quad (\text{Budget constraint A}) \quad (6.15)$$

$$c = hw - \tau + z \quad (\text{Budget constraint B}) \quad (6.16)$$

$$c^* = \frac{\beta}{(\alpha + \beta)} c_{sub} + \frac{\alpha}{(\alpha + \beta)} (z - \tau + (t - u_{sub})w) \quad (6.17)$$

$$u^* = \frac{\alpha}{(\alpha + \beta)} u_{sub} + \frac{\beta}{(\alpha + \beta)} \left(t + \frac{z - \tau - c_{sub}}{w} \right) \quad (6.18)$$

Solving the maximisation problem, we get the optimal amounts for both consumption (c^*) and unpaid time (u^*) (see Eqs. 6.17 and 6.18). These are each dependent on the subsistence amounts of consumption and unpaid time, respectively. However, each of them is negatively related to the subsistence amount of the other. The Basic Income has a positive effect on both consumption and unpaid time.

We can interpret these Eqs. (6.17 and 6.18) for each of the three budget constraints (I, A, B). In the case of budget constraint I , $z=0$, as there is no Basic Income, and the taxation is indeed equal to τ . In the case of A , $z > 0$ and the taxation is equal to T , which is $>\tau$. This higher taxation has negative effects on both consumption and unpaid time according to the schedules presented by both equations. The intensity of this effect for each depends on the affinities α and β . However, this higher taxation does not affect the subsistence levels of consumption and unpaid time. Therefore, if the level of subsistence consumption has still not been achieved, the taxation would not have a negative effect on consumption. In scenario B, we have an exogenously financed Basic Income. Therefore, income taxation remains the same as in I , and $z > 0$. In this case, the Basic Income would also have a positive effect on consumption and unpaid time, also depending on the affinities, but without the negative effect of extra taxation, as this would remain the same because this Basic Income is externally financed.

Discussing Potential Effects of Each Mechanism

To discuss the potential aggregated effects of the different types of Basic Income presented above, we assume that the subsistence level of consumption equals the Basic Income ($c_{sub} = z$). This means that we are discussing the effect of the third type of Basic Income level mentioned in the introduction, the ‘emancipatory’ one. This assumption enables the generation of strong, simple results.

Assuming that $c_{sub} = z$, the schedules for c^* and u^* simplify to:

$$c^* = z + \frac{\alpha}{(\alpha + \beta)}((t - u_{sub})w - \tau) \tag{6.19}$$

$$u^* = \frac{\alpha}{(\alpha + \beta)}u_{sub} + \frac{\beta}{(\alpha + \beta)}\left(t - \frac{\tau}{w}\right) \tag{6.20}$$

Equation (6.19) shows that with an emancipatory Basic Income, the optimal consumption level would be dependent on the Basic Income plus the preferred allocation of time to paid work, which would result in an additional amount of consumption. Equation (6.20), which determines the optimal amount of unpaid time, is independent of Basic Income (z). So, in this situation, the level of unpaid time would be dependent only on the necessary time for subsistence plus a discretionary amount, determined by individual affinities. These results make it clear that an emancipatory Basic Income would provide a person with access to subsistence needs, and the trade-off between consumption and unpaid time would be independent of Basic Income in this case. Still, the extra tax burden that we find in budget constraint A would have a potentially negative effect on both consumption and unpaid time. For budget constraint B , no extra negative effect would be expected.

There are two other levels of Basic Income. A Basic Income is defined as a ‘partial’ Basic Income if an individual invests their total available time in paid work, and the resulting labour income together with taxation and the Basic Income is lower than the subsistence consumption or just manages to reach it:

$$\text{If } hw - \tau + z \leq c_{sub} \tag{6.21}$$

$$\text{Then, } h = t - u_{sub} \tag{6.22}$$

The other Basic Income is the ‘freedom-enhancing’ Basic Income, which enables an individual to trade-off at least some of their time between employment and unpaid time. This is described as follows:

$$\text{If } hw - \tau + z > c_{sub} \tag{6.23}$$

and

$$z < c_{sub} \tag{6.24}$$

$$\text{Then, } h = t - u_{sub} - u_{dis} \tag{6.25}$$

References

- Barr, N. A. (2004). *The economics of the welfare state* (4th ed.). Oxford: Oxford University Press.
- Corrales, J. P., & Mejia, W. B. (2009). The relevance of Duesenberry consumption theory: An applied case to Latin America. *Revista De Economía Del Caribe*, No. 4 (July). http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S2011-21062009000200002. Accessed 5 Mar 2019.
- Creedy, J. (1996). Comparing tax and transfer systems: Poverty, inequality and target efficiency. *Economica, New Series*, 63(250), S163–S174.
- Desai, M. (1998). A Basic Income proposal. In R. Skidelsky (Ed.), *The state of the future* (pp. 103–132). London: Social Market Foundation.
- Duesenberry, J. S. (1949). *Income, saving, and the theory of consumer behavior*. Cambridge, MA: Harvard University Press.
- Dynan, K. E., Skinner, J., & Zeldes, S. P. (2004). Do the rich save more? *Journal of Political Economy*, 112(2), 397–444.
- Frank, R. H. (2008). Context is more important than Keynes realized. In G. Piga & L. Pecchi (Eds.), *Revisiting Keynes: Economic possibilities for our grandchildren* (pp. 143–150). Cambridge, MA: MIT Press.
- Jordan, B. (2010). Basic Income and social value. *Basic Income Studies*, 5(2). <https://doi.org/10.2202/1932-0183.1140>.
- Klein, L. R. (1965). Stocks and flows in the theory of interest. In F. H. Hahn & F. P. R. Brechling (Eds.), *The theory of interest rates* (pp. 136–151). London: Macmillan.
- Klein, L. R., & Park, J. Y. (1993). Economic forecasting at high-frequency intervals. *Journal of Forecasting*, 12(3–4), 301–319.
- Klein, L. R., & Rubin, H. (1947). A constant-utility index of the cost of living. *The Review of Economic Studies*, 15(2), 84–87.
- Meade, J. E. (1989). *Agathotopia: The economics of partnership*. Aberdeen: Aberdeen University Press.
- Nikiforos, M., Steinbaum, M., & Zezza, G. (2017). *Modelling the macroeconomic effects of a Universal Basic Income*. Roosevelt Institute. <http://rooseveltinstitute.org/modeling-macroeconomic-effects-ubi/>. Accessed 26 Jan 2019.
- Palermo Kuss, A. H., & Neumärker, K. J. B. (2018). Modelling the time allocation effects of Basic Income. *Basic Income Studies*, 13(2), 283. <https://doi.org/10.1515/bis-2018-0006>.
- Suplicy, E. M. (2000). *Um diálogo com Milton Friedman sobre o Imposto de Renda Negativo*. <https://basicincome.org/bien/pdf/2000Suplicy2.pdf>. Accessed 26 Jan 2019.
- Tondani, D. (2009). Universal Basic Income and Negative Income Tax: Two different ways of thinking redistribution. *The Journal of Socio-Economics*, 38(2), 246–255.

- Torry, M. (2017). *A variety of indicators evaluated for two implementation methods for a citizen's basic income* (Euromod Working Paper EM 12/17). <https://www.iser.essex.ac.uk/research/publications/working-papers/euromod/em12-17.pdf>. Accessed 26 Jan 2019.
- Van Parijs, P., & Vanderborght, Y. (2017). *Basic Income: A radical proposal for a free society and a sane economy*. Cambridge, MA: Harvard University Press.
- Visco, I. (2014). Lawrence R. Klein: Macroeconomics, econometrics and economic policy. *Journal of Policy Modeling*, 36(4), 605–628.
- Yunker, J. A. (2013). The Basic Income Guarantee: A general equilibrium evaluation. *Basic Income Studies*, 8(2), 203–233. <https://doi.org/10.1515/bis-2013-0014>.