

Unemployment insurance savings schemes: insights from behavioural economics

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Abstract

The introduction of individual savings accounts into the system of social security may be an innovative way to reorganise the European social security systems. These savings schemes may not only provide income security and facilitate redistribution over the life course, but may also encourage individuals to take more responsibility. In this way, social security savings schemes may overcome the traditional trade-off between the benefits of insurance in terms of increased income security and the costs of insurance due to moral hazard behaviour.

This paper focuses on proposals for and implications of *unemployment insurance savings schemes*. Basically, these savings schemes extend the principle of compulsory saving for retirement to precautionary saving to buffer against negative income shocks related to unemployment. In such a system, workers are required to save a fraction of their monthly income in special accounts. When an employee loses his job and becomes unemployed, he would not receive social security benefits but instead withdraw an amount equal to the unemployment insurance benefits from his personal account.

The purpose of this paper is to examine the assumptions underpinning the theoretical analyses of unemployment insurance savings schemes. Several previous studies assessed theoretically the implications of such reforms and generally argue that replacing unemployment insurance by individual savings schemes improves the incentives to search for a job substantially. It is therefore expected that these reforms result in considerably shorter unemployment spells and lower unemployment levels. These implications are derived from a rational choice approach, assuming rational forward-looking agents. Using recent insights from behavioural economics and economic psychology, we assess the limitations of these previous theoretical analyses and incorporate more realistic assumptions about human behaviour in the analysis. In particular, if we assume myopic rather than forward-looking individuals, the implications of this modernisation strategy are substantially different from those derived in the existing literature on this issue. In the paper we demonstrate that some of the assumptions made in these studies, although useful to construct a simple theory, may be inappropriate for designing policy. We conclude with some general policy suggestions for future unemployment insurance systems.

1. Introduction

The central objective of unemployment insurance (UI) is to insure individuals against income drops as a result of a job loss. Besides the welfare gain of increased income security, however, unemployment insurance also involves costs related to adverse incentive effects: UI may decrease the effort of unemployed individuals to search for a new job and may increase the wage that job seekers are willing to accept (i.e. the reservation wage). Both of these moral hazard effects lengthen the duration of the unemployment and therefore lead to an increase in the societal costs of the UI system. The crucial policy question is, thus, how labour market incentives can be improved while maintaining a sufficient level of income security.

The introduction of individual savings schemes into the system of social security may be an innovative way to reorganise the European social security systems, as such a reform may help to overcome the trade-off between insurance benefits in terms of increased income security and insurance costs due to moral hazard behaviour. In such a system, instead of paying unemployment insurance premiums while employed and receiving unemployment benefits while unemployed, employees are required to make monthly contributions to special individual savings accounts and unemployed individuals are allowed to withdraw from these accounts. The main rationale for this reform of the UI system is to mitigate the adverse incentives produced by unemployment insurance benefits (e.g. Feldstein & Altman, 2007; e.g. Orszag & Snower, 1997). It is argued that in the current system individuals are penalized for being employed (through taxes), while they are rewarded for being unemployed (through unemployment benefits): this discourages job search, promotes unemployment and decreases employment. Conversely, in the unemployment accounts system, individuals take into account the costs of unemployment: since they withdraw their own savings, they have a stronger incentive to search for a job.

The discussion on the design of an optimal unemployment insurance scheme has mainly focused on improving this incentives by changing the level (e.g. Baily, 1978; Chetty, 2008), duration (Davidson & Woodbury, 1997) and structure of unemployment benefits (e.g. Hopenhayn & Nicolini, 1997; e.g. Shavell & Weiss, 1979; Shimer & Werning, 2008). In these previous studies, it was assumed that moral hazard can only be reduced by decreasing the level of income insurance. Proposals for unemployment insurance savings schemes, however, do not imply a reduction in the level of insurance per se, since individuals are allowed to withdraw an amount that is equal to the current benefit level and account balances may be negative. A unique feature of the reform proposals is thus that unemployment insurance savings accounts improve incentives while maintaining the level of income security.

The main purpose of this paper is to examine the assumptions underpinning the theoretical analyses of unemployment insurance savings schemes. Several previous studies assessed theoretically the effects of unemployment savings accounts and conclude that these reforms result in considerably shorter unemployment spells and lower unemployment levels. However, all these studies derived predictions from a standard rational choice approach. In particular, standard exponential discounting models are used to describe the behaviour of (unemployed) individuals: these models assume 'time-consistent' preferences and forward-looking behaviour. A substantial amount of empirical evidence points out that the assumption of time-consistent preferences is invalid (see for a review: Frederick, Loewenstein, & O'Donoghue, 2002). Using recent insights from behavioural economics and economic psychology, we assess the limitations of these previous theoretical analyses and incorporate

more realistic assumptions about human behaviour in the analysis. We argue that hyperbolic discounting models provide an alternative approach to describe job search behaviour.

The remainder of the paper is structured as follows. Section 2 reviews the literature on unemployment insurance savings schemes. Next, in section 3 we discuss the behavioural economics literature on the time-inconsistent preferences and hyperbolic discounting models. We apply these insights to job search behaviour and assess the behavioural impact of unemployment insurance savings schemes in section 4. In addition, we discuss several general policy suggestions for future unemployment insurance systems. The final section concludes.

2. Savings schemes for unemployment: a review

2.1 Proposals

Comprehensive reforms

Orszag and Snower (1997) were one of the first to propose a comprehensive reform of the system of social security based on individual savings accounts. Their proposal entails the introduction of four “welfare accounts” for everyone: an unemployment account, a retirement account, a human capital account and a health account. People are required to make mandatory contributions to these accounts instead of paying the general premiums and taxes. The government sets minimal contribution rates and maximum withdrawal amounts. People are however allowed to contribute more to the accounts than the specified minimum and employers are also encouraged to make additional contributions. An important feature of this system is that the four individual accounts are interconnected: when the balance of one account (for instance, the unemployment account) reaches a certain minimum level, funds are transferred from the other accounts. It also works the other way around: when one account level attains a specified ceiling, money is transferred from this account to other accounts. The idea is that this kind of redistribution leads to less labour market distortions.

Fölster (1999; 2001) also examines the option of organising social insurance through individual savings accounts. He argues that insurance against risks and life-cycle redistribution are the main objectives of social insurance and that these objectives may be attained more efficiently by replacing social insurance by individual savings accounts. Fölster (2001) discusses a proposal for social insurance savings accounts (SISA) in which mandatory contributions into individual accounts replace insurance premiums. This system involves two important insurance elements. Firstly, it provides life-time income insurance: those individuals who have saved too little at retirement age will still be entitled to basic pension benefits. Secondly, the scheme offers liquidity insurance: even when the account balance is negative, individuals are allowed to make withdrawals.

Unemployment insurance savings accounts

Feldstein and Altman (1998; 2007) discuss a proposal to introduce an unemployment benefit system based on individual savings in the US. According to this system, individuals are required to save a fraction of their monthly income in an Unemployment Insurance Savings Account (UISA) up to a specified maximum amount. If a worker loses his job and would be eligible for unemployment benefits under the current social security system, he does not receive unemployment benefits but instead he is allowed to withdraw an amount that is equal to the current UI benefits from his personal UISA. If, however, the funds are insufficient, the state lends the necessary amount and thereby provides liquidity insurance. At retirement age,

the accounts are merged into pension accounts or, in case the balance is negative, the government cancels the debt. They discuss five alternative proposals which vary with respect to the size of the saving base, to what extent the height of the ceiling depends on past unemployment experience and whether or not the employers pay the first weeks of unemployment. Orszag and Snower (2002) discuss a similar proposal.

Stiglitz and Yun (2005) propose an ‘integrated lifetime insurance’, which is based on individual savings. The main focus of their study is an unemployment system which is integrated with retirement insurance. Their proposal is based on the perspective that, in general, individuals should be able to bear the risks arising from (short-term) unemployment, as the loss in life-time income caused by such risks is relatively small. They therefore propose to integrate unemployment insurance with pension schemes: when one becomes unemployed, one withdraws ‘benefits’ from the retirement accounts and in this way maintains liquidity. If the losses from unemployment are substantial, the individual should not bear the complete burden and unemployment insurance may be optimal. To cover this, the government bails out those individuals who have been subject to various, long-term unemployment shocks. Their paper investigates the “optimal mix of the two types of unemployment benefits – tax-funded UI benefits and pension-funded borrowing (a form of self-insurance)” (Stiglitz & Yun, 2005, p.2039).

General features

The described proposals for social security savings schemes have several features in common. Firstly, individuals make mandatory contributions to individual savings accounts instead of paying premiums and taxes to finance insurance. These accounts are integrated in pension schemes and the accumulated savings become available after retirement. Secondly, when individuals would be eligible for (unemployment) benefits, they are allowed to withdraw an amount up to the current unemployment insurance benefits. These withdrawals replace (part) of the insurance benefits. Thirdly, the unemployment insurance savings accounts involve some insurance elements. The schemes provide liquidity insurance by allowing individuals to have negative account balances. So even when individuals have not accumulated enough savings to finance unemployment, income support can still be provided through this credit facility. In addition, the system provides a form of life-time income insurance, as those who enter retirement with a negative account balance do not have to repay their debt and are still entitled to basic retirement benefits. These two insurance elements induce moral hazard problems: individuals have an incentive to maximize their withdrawals and to minimize their contributions. In fact, this moral hazard problem is an important reason to restrict withdrawals and to make the monthly savings into the unemployment insurance accounts mandatory.

2.2 Assessment

Several studies have assessed the impact of the unemployment insurance savings schemes: some analyses are based on theoretical models, while others make use of empirical data and simulation techniques. Bovenberg and Sorensen (2004) and Stiglitz and Yun (2005) examined the welfare and behavioural effects of this reform theoretically. Bovenberg and Sorensen (2004) make use of a 2-period model: in the first period, individuals have a probability to become unemployed, and in the second period everyone holds a job. They demonstrate that the reform may involve substantial efficiency gains, which decreases with the proportion of low-income individuals in the economy and with the overall duration of unemployment. Stiglitz and Yun (2005) consider under which conditions the integration of unemployment insurance with pension schemes is welfare improving. In their theoretical analysis, individuals are assumed to live infinite periods and are subject to one unemployment shock. While

unemployed, the agent chooses either not to search or to search, the latter decision leading to immediate reemployment. According to their analysis, replacing unemployment benefits by individual savings is more likely to enhance the level of welfare when risk aversion is lower, search elasticity is higher and the unemployment risk is lower.

Feldstein and Altman (1998; 2007) emphasise that the feasibility of the proposal is highly dependent on the extent to which unemployment is concentrated in a small group of the population. If this is in fact the case, the group that is unemployed for a large part of the life course would end the working life with negative account balances and would be provided income insurance. This group would then face the same adverse incentive effects as under the current system. They make use of US panel data (PSID) to demonstrate the potential effectiveness of savings schemes for unemployment. They found that the fraction of the individuals with a negative balance is about 5.3 and that 93.2 per cent of the individuals in the sample never had a negative account balance. Furthermore, effects of the unemployment accounts system have been simulated covering a 25-year period. This analysis indicates that almost all individuals (between 93 and 94.8 per cent) have positive balances at retirement and therefore internalize the costs of unemployment: “the evidence that most individuals have positive balance accounts and that they end their career with positive balance accounts shows that (assuming they understand this likelihood) they generally face the cost of unemployment and would have little incentive for behaviour that would increase either the frequency or duration of unemployment” (Feldstein and Altman, 1998, p.). These results thus suggest that the UISA system will improve the labour market incentives considerably. However, the empirical analysis indicates that the shift from the unemployment insurance system to the unemployment savings accounts system affects the income level of the lowest income group negatively, while the other groups are net gainers.

Sorensen, Hansen and Bovenberg (2006; see also Bovenberg et al., 2008), using Danish data, perform several simulations. The results indicate that the reform would increase the inequality of lifetime income, although overall the impact on income distribution may be limited. In addition, the study shows that introducing unemployment savings schemes results in a Pareto improvement: it has a positive impact on the government budget, the welfare of those with positive balances increases and the welfare of individuals who end their working life with a negative account balance are unaffected. The analysis of Brown, Orszag and Snower (2006; see also Orszag & Snower, 2006) is based on a simplified, two-period model in which job search effort depends on the difference between the value of being employed and the value of being unemployed. Since this difference is affected by the institutional features of the social security system, the introduction of the unemployment accounts system will have implications for search and work effort. By making use of data from several European countries, they calibrate the model and this reform has major implications for the unemployment rates in these countries: the drop in unemployment rates varies from 34.4 per cent in Italy to 50.9 per cent in Germany. The results of this study thus point out that the effects of introducing unemployment savings accounts are enormous.

3. Intertemporal choice: insights from behavioural economics

3.1 Incentives of savings schemes

In order to assess the behavioural impact of the introduction of unemployment savings schemes, we should examine the incentives provided by these schemes. The main presumption underlying the previous analyses is that this reform will reduce moral hazard in insurance: individuals will completely internalize the costs of unemployment because they withdraw their own savings to finance unemployment, rather than relying on unemployment benefits. The system mitigates the adverse incentives, while maintaining the same level of insurance as under the current system. The level and potential duration of income support, as well as the eligibility criteria remain unchanged in the new system. What, then, exactly is the incentive produced by the UI system based on savings accounts? When a worker becomes unemployed, he withdraws from his individual account an amount of savings, which become available at retirement. In effect, the longer the duration of the unemployment spell(s) and the more frequent an individual is unemployed during his working life, the lower the level of wealth available at retirement age. The assumption is that individuals will search more intensively for a job and become less choosy in selecting a job offer, as a longer duration of unemployment implies a decline of the 'retirement bonus'.

The effectiveness of this incentive depends crucially on whether individuals expect or believe that they will end their working life with a positive balance. Because the savings system provides lifetime income insurance, the incentives for people who expect to have a negative terminal account balance are the same under the current benefit system as under the saving system. As discussed above, this issue is addressed by Feldstein and Altman (1998; 2007). They show that it is likely that a rather small proportion of the individuals would end their working life with a negative balance and therefore argue that the reform improves the incentives for a large majority of the population. However, demonstrating that most individuals will have a positive terminal balance ex post, does not imply that they believe or expect ex ante that they will have a positive terminal account balance. In fact, individuals are subject to a wide range of income risks (due to unemployment, disability etcetera) and the income level during the working life may be very uncertain. This implies that the size of the expected retirement bonus is ex ante very uncertain.

Furthermore, if individuals expect that they will receive a retirement bonus for avoiding unemployment, the weight attached to this future payoff determines whether this incentive is effective. Like many other choices we make during our lives, such as how much to save for retirement and how much education to obtain, the decision how much to search for and whether to accept a job offer involves evaluations between present and future costs and benefits. Because individual savings schemes change the payoff structure of searching for a job and avoiding unemployment, it can be expected that the reform affects this intertemporal choice. To assess the impact of unemployment savings accounts, the fundamental question therefore is how the additional future gain of job search (i.e. the retirement bonus) is valued. How should we model intertemporal decision making?

3.2 Exponential versus hyperbolic discounting

As in the standard economic literature, the previously discussed studies assumed that individuals have well-defined preferences, and try to maximize life-time utility according to (a variant of) the following intertemporal utility function¹:

¹ In some studies, 2-period models are used rather than this multi-period model.

$$U^t(u_t, u_{t+1}, \dots, u_T) = \sum_{\tau=t}^T \delta^{\tau-t} u_{\tau}$$

where t denotes the time period, u_t represents the instantaneous utility in period t and δ is the discount factor ($0 < \delta \leq 1$), indicating the individual's time preference. In this model, individuals discount utility exponentially. This specific feature implies that individuals have time-consistent preferences, which means that "[a] person feels the same about a given trade-off no matter when she is asked" (Rabin, 1998). Basically, the preference for A at some future time 't' over B at time 't + x', implies a preference for A over B for all values of t.

However, common sense and empirical evidence suggest that preferences are time-inconsistent. As Thaler (1981) argues, some people may prefer one apple today to two apples tomorrow, but no one prefers 'one apple in one year' to 'two apples in one year plus one day'. If the discount rate is constant, as is the case in exponential discounting models, then both choices are (formally) the same. People have time-inconsistent preferences if they initially opt for the 'two apples in one year plus one day' option, but prefer 'one apple today' when a year has passed. Their current plans and preferences are inconsistent with their future plans and preferences. Evidence from a wide range of laboratory experiments (Frederick et al., 2002) supports the perspective that individual time preferences are dynamically inconsistent. Particularly, experiments point out that discounting is a decreasing function of time: discounting is steeper in the immediate future than in the more distant future. For instance, Thaler (1981) found that the median subject is indifferent between \$15 now and \$20 in one month and between \$15 now and \$100 in ten years. The former implies an annual discount rate of over 300 per cent, while the latter implies an annual discount rate of about 19 per cent.

In order to incorporate time-inconsistent preferences (and other anomalies of the standard model), several alternative models have been proposed, varying from hyperbolic discounting models, to dual-self models (Fudenberg & Levine, 2006; Thaler & Shefrin, 1981) and models of temptation (Gul & Pesendorfer, 2001). Here we focus on (quasi-)hyperbolic discounting models because these types of models have been examined in most of the applied research and, as we will demonstrate, can be used to derive predictions on labour market behaviour. Based on the work of Strotz (1956) and Phelps and Pollak (1968), Laibson (1997) proposes the following quasi-hyperbolic discounting model (hyperbolic discounting models hereafter):

$$U^t(u_t, u_{t+1}, \dots, u_T) = \delta^t u_t + \beta \sum_{\tau=t+1}^T \delta^{\tau-t} u_{\tau}$$

The difference between the exponential discounting model and this model is the introduction of the β parameter ($0 < \beta \leq 1$), which indicates a preference for immediate gratification. When β is equal to one, the model is identical to the standard exponential model. However, when this parameter is below one, the discount rate is decreasing between the current period and the next period, but from then on it is constant as in the standard model. Such a (β, δ) model captures the idea of time-inconsistent preferences.

In hyperbolic discounting models, individuals have present-biased preferences or are 'myopic' since the individual attaches extra weight to current utility over future utility. "We procrastinate on tasks such as mowing the lawn that involve immediate costs and delayed rewards and do soon things such as seeing a movie that involve immediate rewards and delayed costs" (Rabin, 1998, pp., p.38). As examined by O'Donoghue and Rabin (1999), the timing of activities depends on whether the activity involves immediate costs and delayed rewards (an investment activity) or entails immediate rewards and delayed costs (a leisure activity). In general, people have a tendency to postpone the first type of activities (labelled as

the ‘mañana effect’ by Strotz (1956)) and to ‘preproperate’ (that is, do soon) the second type of activities.

An important implication of this type of models is that individuals have self-control problems. “We would ‘like’ to behave in one manner, but instead we ‘choose’ to behave in another. In particular, we tend to pursue immediate gratification in a way that we ourselves do not appreciate in the long run” (O’Donoghue & Rabin, 2000, p. 233). Although individuals may be unwilling to engage in an investment activity in the present or near future, they may be willing and planning to do so in the more distant future. However, as time passes and the future becomes the present, the person prefers to abandon the original plan and tends to procrastinate. In the end, people end up continuing to postpone the activity until the next period. In the hyperbolic discounting literature, the assumptions concerning an individual’s beliefs about future behaviour and self-control problems play a central role. Strotz (1956) discusses two distinct cases: ‘sophisticates’ predict their future behaviour in the correct way and are fully aware of their self-control problems, whereas ‘naives’ believe they will behave as planned and are completely unaware of their self-control problems. It should be noted that sophistication does not always imply better outcomes in terms of well-being (see O’Donoghue & Rabin, 1999). O’Donoghue and Rabin (2001) argue that both cases may be too extreme and therefore develop a model of partial naiveté, in which individuals are aware of their self-control problems, but underestimate the degree. An important implication is that (partially) sophisticated people know they will have self-control problems in the future and are willing to constrain future choices, even if this involves costs. Mechanisms or instruments which restrict the possibilities of ‘future selves’ to pursue immediate gratification – labelled as commitment devices in the behavioural economics literature – are valued by sophisticated agents as such instruments can raise their long-run welfare² (e.g. Strotz, 1956; Laibson, 1997).

3.3 Empirical evidence

In addition to evidence from numerous experimental studies, findings from field data provide support for the hyperbolic discounting model. Many studies examined whether the model can help to explain saving and consumption behaviour. The implications for saving and consumption behaviour are particularly interesting, since saving involves a trade-off between immediate costs (a decrease in current consumption) and delayed rewards (an increase in future consumption). Laibson (1997) argues that the hyperbolic discounting model can explain some important empirical puzzles in the consumption-savings literature that are left unsolved by the standard models. One of these puzzles is the well-established finding that consumption tracks income closely, which is inconsistent with the prediction derived from the standard model (that is, the Permanent Income Hypothesis) that consumption in a certain period is independent of the income received during that period. According to Laibson (1997), hyperbolic consumers make use of illiquid assets, like housing wealth, savings bonds and deposit certificates, as a (imperfect) commitment device. Such assets “have the same property as the goose that laid golden eggs. The asset promises to generate substantial benefits in the long run, but these benefits are difficult, if not impossible to realize immediately” (Laibson, 1997, p.445). When individuals know that they will have self-control problems in the future and will over-consume, they will try to tie the hands of their future selves by allocating a substantial amount of savings to illiquid assets. This implies that people are not able to

² Ashraf et al. (2006) refer in this context to an episode of Homer’s *Odyssey*. The sophisticated Odysseus is aware that he will not be able resist the alluring songs of the sirens and therefore commands his men to tie him to the mast.

smooth consumption, even if they hold a considerable level of wealth. Angeletos et al. (2001) calibrate both exponential and hyperbolic models and demonstrate that the latter type of model better matches the data. In the same vein, Laibson, Repetto and Tobacman (2007) estimate a hyperbolic discounting model. The results reject the exponential discounting model and the estimates indicate an annual discount rate of about 40 per cent for the short-run and a 4.3 per cent annualized discount rate for the long-term. The hyperbolic discounting model can explain why households hold relatively low levels of liquid wealth, why households have so much credit card debt and why consumption tracks income rather closely. Basically, people invest much in illiquid wealth and subsequently make use of credit cards to smooth consumption.

While the aforementioned empirical research discuss the implications for consumption and saving behaviour, various studies focus on the role and availability of commitment devices. An important prediction of the hyperbolic discounting model is that individuals are willing to restrict future choices to mitigate future self-control problems. Thaler and Benartzi (2004) exploited this prediction (and other insights from behavioural economics) and designed a savings scheme which provides employees the option to commit themselves now to save more in the future (when they get a pay raise). The results point out that introducing such a commitment device increase savings considerably. Ashraf et al. (2006) designed a commitment savings product for a Philippine bank and also concluded that such a product has a large positive effect on saving rates. Besides the impact of commitment devices on saving behaviour, several studies point out that defaults (i.e. standard options, automatic enrolments) significantly affect saving behavior (Choi, Laibson, Madrian, & Metrick, 2003; Madrian & Shea, 2001). These findings are hard to reconcile with standard economic theory but can be explained by hyperbolic discounting models.

Moreover, empirical findings outside the saving domain provide support for the hyperbolic discounting model. Findings on health club attendance (DellaVigna & Malmendier, 2006), quitting smoking (Gruber & Koszegi, 2001), contract design in consumer markets (DellaVigna & Malmendier, 2004) and effects of (self-imposed) deadlines for homework assignments (Ariely & Wertenbroch, 2002) also are in line with the predictions of the hyperbolic discounting model. Finally, evidence from neuroscience is consistent with a model in which individuals have (β, δ) -preferences. Making use of fMRI (functional magnetic resonance imaging) scans, McClure et al. (2004) find that different types of intertemporal decisions activate different parts of the brain. On the one hand, when choices involve immediate rewards certain parts of the limbic system (the ' β areas'), which are related to impulsive behaviour, are activated. On the other hand, intertemporal choices - regardless of the delay of the rewards - activate the posterior parietal cortex and the lateral prefrontal cortex (the ' δ areas'), parts of the brain that are associated with planning and higher level cognitive processes. Moreover, the choice made by the subjects (between a smaller immediate reward and a larger delayed reward) is related to the level of activity in the two conflicting parts of the brain: the ' β areas' seem to win when subjects opt for the immediate rewards, while the ' δ areas' are relatively more activated when they select the long-term options.

3.4 Policy implications

These insights from behavioural economics can be used to derive several implications for public policy. First of all, a distinction should be made between models that describe behaviour and models that describe welfare (Bernheim & Rangel, 2005). Within the standard economic framework, the same models are used for both positive and normative analyses. Hyperbolic discounting models describe individual choices and behaviour but may not

provide a useful measure of individual long-run welfare. In order to perform a normative assessment, the adoption of a certain perspective is required. Following O'Donoghue and Rabin (1999; 2001) we apply the criterion of long-run welfare, which boils down to the exponential discounting model. In such an approach, exponential discounting models describe how individuals can maximize long-run welfare. In other words, hyperbolic discounting models describe how people behave, whereas exponential discounting models describe how people should behave. By providing the 'right' incentives, public policy should thus aim to enhance long-run welfare. For instance, if the level of saving is considered to be too low from a long-run perspective, incentives should be provided to encourage saving. Hyperbolic discounting models provide insights in the type of incentives that can be expected to be effective. Because people have present-biased preferences, long-term incentives may be rather ineffective. Conversely, short-term incentives, which may seem insignificant from a standard approach, can be very effective. Setting defaults, an important tool of the 'Libertarian Paternalist' (Thaler & Sunstein, 2003), may have considerable behavioural effects. This can be explained by the fact that deviating from such a default involves (relatively small) immediate costs. Finally, as discussed above, commitment devices can help individuals to stick to their plans for the future, thereby enhancing their welfare in the long-run. In the next section, we will apply these insights to job search behaviour, assess the behavioural impact of unemployment insurance savings schemes and identify several alternative policy options for the system of unemployment insurance.

4. Job search and savings schemes

4.1 Search intensity and job acceptance

In job search models, individuals choose the amount of job search effort and the reservation wage in order to maximize the present value of lifetime utility. Basically, the job search process involves two separate decisions (Burdett & Mortensen, 1978; Mortensen, 1986). First, the worker chooses the level of job search effort, which is positively related to the job arrival rate. Second, when the job seeker has received a job offer, he decides whether or not to accept the job. The unemployed individual will decline the offer when the wage is below his reservation wage. This second decision involves comparing delayed payoff streams: accept a job and receive the offered wage in the future or reject the offer and wait for a better job. In this decision, the long-term discount rate is important, while it can be expected that the present-bias may not effect this decision to a large extent. It should be noted that the job acceptance decision may in fact not be the most interesting one from a public policy perspective as the unemployment duration is much less influenced by the reservation wage than by the job arrival rate. Empirical evidence indicates that most job offers are accepted (Devine & Kiefer, 1991; Eckstein & van den Berg, 2007). In contrast to the reservation wage decision, the choice on search intensity is principally a choice between immediate costs - looking for job openings, contacting employers, going to job interviews - and future rewards in terms of better job opportunities. Hence, searching for a job is a kind of investment activity which involves short-term costs and long-term rewards. Hyperbolic discounting models predict that individuals procrastinate such activities and search less than they wish to do from a long-run perspective. This is in line with the empirical finding that the unemployed spend a small amount of time on job search activities: Baron and Mellow (1979) find that job seekers spend on average 7 hours a week on job search and Krueger and Mueller (2008) show that the unemployed individuals devote on average 41 minutes per day on search activities.

The question whether unemployed job seekers are exponential or hyperbolic discounters is addressed in the studies of DellaVigna and Paserman (2005) and Paserman (2008). Both studies exploit the theoretical argument that impatience (measured by the discount rate) affects job search behaviour of exponential and hyperbolic individuals differently. Impatience affects both types of decisions in the job search process. Firstly, individuals who are more impatient attach a lower value to future payoffs and therefore search less intensively, resulting in a longer duration of unemployment. Secondly, more impatient individuals have, *ceteris paribus*, lower reservation wages, which implies a shorter unemployment spell. Hence, the theoretical effect of impatience on unemployment duration is ambiguous. DellaVigna and Paserman (2005) and Paserman (2008) argue that, if job seekers are hyperbolic discounters, the degree of impatience affects only the search effort decision: higher impatience implies more procrastination of job search activities and thus a lower level of search effort. On the other hand, for the exponential discounter, the degree of impatience affects not only the search effort decision but also the reservation wage decision. To be specific, the discount rate of exponential discounters is negatively related to the level of search and (strongly) negatively related to the reservation wage. The empirical results of DellaVigna and Paserman (2005) and Paserman (2008) reject the hypothesis derived from the exponential discounting model and provide support for the hyperbolic discounting model. Furthermore, Paserman (2008) performs a structural estimation which he uses to evaluate several policy options. The results point out that the effects of certain reforms of the unemployment insurance system depend critically on whether we assume exponential or hyperbolic discounters.

4.2 Effects of unemployment savings schemes

What are the policy implications of these theoretical and empirical findings? Most studies on unemployment insurance savings accounts stress that the reform will mainly affect middle and higher income groups. It is likely that lower income individuals end their working life with a negative or low account balance and therefore this groups will not internalize the costs of unemployment. For those who expect to have a negative terminal account balance, the incentives are the same under the current system as under the savings accounts system.

Conversely, the unemployment savings schemes provide an incentive to individuals who expect that they end their working career with a positive balance: the lower the frequency and the shorter the duration of unemployment, the higher the bonus available after retirement. An important question in this respect is the perception of the individual of how ‘distant’ retirement is. Empirical evidence shows that a large part of employees do hardly any planning for retirement and have not tried to determine how much they have to save for (a pleasant) retirement (e.g. Lusardi, 1999, 2001; e.g. Yakoboski & Dickemper, 1997). Lusardi (2001), for instance, shows that about one third of the Health and Retirement Study respondents have “hardly thought” about retirement. This figure is particularly striking, as the respondents are older workers who will retire within the next five to ten years. The empirical phenomenon that people procrastinate saving and planning for retirement is consistent with the hyperbolic discounting model. In fact, this is one of the main reasons to introduce mandatory retirement schemes: “The principal rationale for such mandatory programs is that some individuals lack the foresight to save for their retirement years” (Feldstein, 1985, p. 303).

Hence, for the most part of the working life the period after retirement can be considered as the (far) distant future. How will this long-term incentive provided by unemployment insurance savings schemes affect the search intensity and job acceptance decision? Firstly, since the search intensity decision is mainly influenced by short-term costs and benefits and unemployment insurance savings schemes provide a long-term incentive to increase job

search effort, it is unlikely that the reform increases search intensity significantly. Secondly, the job acceptance decision is based on the evaluation of different future income streams, and therefore it can be expected that the reform influences this decision. However, the effect is probably rather small because short-term payoffs are relatively more important than long-term payoffs, and the 'costs' of unemployment may be rather small compared to the total lifetime income. In addition, as noted above, the job acceptance decision affects unemployment duration to a smaller extent than the search effort decision. Affecting payoffs in the distant future, by introducing a retirement bonus which is dependent on the lifetime unemployment duration, may have no significant effect on job search effort and little effect on the job acceptance decision. It can therefore be expected that the effect on the level of unemployment and unemployment duration is rather small.

When workers are approaching the retirement age, the distant future effects become near future effects. The workers who have accumulated a sufficient amount of savings will be entitled to a substantial retirement bonus. This retirement bonus may encourage workers to retire early. To finance early retirement, the older workers can use their private non-contractual savings, which they no longer need during their normal retirement years. Hyperbolic discounters have a preference for instant gratification and therefore have a tendency to retire early. As a result, the effect of this - for older workers - short-term incentive produced by savings schemes may be substantial. A wide range of empirical studies point out that a higher level of pension wealth may induce people to retire early (Bloemen, 2008; Buetler, O., & Teppa, 2005; Munnell, Triest, & Jivan, 2004; Samwick, 1998). Given that the retirement bonus increases the level of pension wealth, it is likely that the reform will stimulate early retirement - particularly among higher income groups. Hence, the impact of the reform on labor supply incentives is not unambiguously positive: for the lower income groups, the incentives remain unchanged, while for the higher income individuals there may be positive effects in terms of a decrease in the frequency and duration of unemployment, as well as negative effects in terms of an increase in the probability of early retirement. Whether the positive effects outweigh the negative effects is not clear a priori.

Of course, the incentive to retire early is a result of mandatory contributions to the savings accounts. An alternative would be to rely on voluntary savings (see Bovenberg, Hansen, & Sorensen, 2008). However, when people have hyperbolic time preferences and exhibit self-control problems, it can be expected that they procrastinate saving. Basically, the cost of saving and thus of self-insurance are high for individuals with present-biased preferences. This is consistent with the finding that a large part of the unemployed hold very low levels of liquid wealth: "median liquid wealth net of unsecured debt is only \$128, suggesting that many individuals may not be in a position to smooth consumption while employed" (Chetty, 2008, p.196). Empirical evidence shows that consumption of unemployed individuals is highly sensitive to the level of cash on hand, indicating liquidity constraints (Bloemen & Stanca, 2005; Browning & Crossley, 2001). Interestingly, the authors proposing unemployment insurance savings schemes seem to acknowledge that individuals are myopic. For instance, Feldstein (2005, p.4) notes:

"The primary reason for social insurance programs is that some individuals would not act in their own interest, saving far too little for their retirement, for health care after they are no longer working, or to finance consumption when they are unemployed".

In a later study, Bovenberg et al. (2008, p.76) argue:

"In addition to moral hazard, lack of self control and myopia are other reasons for making saving mandatory".

Although previous studies take into account that people are myopic for designing policy (i.e. mandatory savings instead of voluntary savings accounts), when evaluating the behavioural impact of the reform, exponential forward-looking individuals are assumed.

4.3 Alternative policy options

According to the hyperbolic discounting model, short-term costs and benefits are particularly relevant in intertemporal decision making. Reemployment bonuses may therefore be effective instruments to decrease the length of the unemployment spell: such an immediate cash benefit compensates for the immediate search costs and may lead to an increase in the level of search activity. Paserman (2008) found that introducing a reemployment bonus has a substantial effect on the behaviour of both the exponential and the hyperbolic discounters. Empirical research indicates that reemployment bonuses reduce unemployment duration significantly, but may also lead to a substantial deadweight loss (Fredriksson & Holmlund, 2006; Meyer, 1996). The benefits in terms of a decrease in unemployment duration may therefore not offset the societal costs of the program.

Hyperbolic discounting models suggest that introducing commitment devices is an effective way to encourage welfare-enhancing activities. In order to encourage job search, a system of search effort monitoring combined with benefits sanctions can be introduced as a commitment device. The government (a public employment agency) monitors job search behaviour of the unemployed and imposes sanctions when the search requirements are not met. The threat of a benefit cut functions as a commitment device: not exerting (enough) job search effort has direct consequences for the level of benefits. The literature on the effects of monitoring job search effort of the unemployed is of recent origin. Most empirical studies are not able to identify the specific impact of increased monitoring, as most unemployment insurance reforms combine an increase in the intensity of monitoring with job assistance programs (e.g. Meyer, 1995). Several recent empirical studies aimed to identify the specific impact of intensified monitoring. For instance, Klepinger et al. (2002) found that intensified monitoring reduces the duration of unemployment significantly. Furthermore, the results of Lalive et al. (2006) show that the threat and enforcement of a benefit sanction increase the exit rate out of unemployment. In addition, Abbring et al. (2005), using Dutch administrative data, found that potential sanctions raise the transition probability from unemployment to employment. The results of McVicar (2008) also indicate that unemployment duration and job entry rates are significantly affected by the intensity of monitoring. Moreover, Boone et al. (2007) show that monitoring cum sanctions leads to a welfare improvement, and that monitoring is a better alternative in terms of welfare than imposing time limits on the duration of benefits. The findings of Paserman (2008) are particularly interesting in this respect. The results point out that, for both exponential and hyperbolic discounters, monitoring of search effort leads to a large drop in the duration of the unemployment spell. A remarkable finding is that more intensified monitoring decreases the welfare of exponential discounters, whereas it increases (the long-run) welfare of hyperbolic discounters. Although most of the recent empirical work suggests that intensified monitoring has considerable behavioural effects, there are some exceptions. For example, Ashenfelter et al. (2005), who made use of randomized trials, found no significant effect of intensified monitoring on the duration of unemployment. However, because the examined changes in monitoring intensity were only minor and the sample size in this study is rather small, the probability of finding a significant impact of the experimental reforms is relatively small. In addition, Van den Berg and Van der Klaauw (2006) stress that it should be taken into account that more stringent monitoring may increase formal search activities but may also reduce informal search activities, which are not monitored.

5. Conclusion and discussion

Introducing individual savings accounts may be an innovative way to reform the social security system. Several previous studies assessed theoretically the implications of such reforms and generally argue that replacing unemployment insurance by individual savings schemes leads to substantial improvements of labour market incentives. It is therefore expected that these reforms result in considerably shorter unemployment spells and lower unemployment levels. These implications are derived from a rational choice approach, assuming rational forward-looking agents.

Using recent insights from behavioural economics, we assessed the limitations of these previous theoretical analyses and incorporate more realistic assumptions about human behaviour in the analysis. If we assume hyperbolic discounters instead of exponential discounters, the implications of this modernisation strategy are substantially different from those derived in the existing literature on this issue. The incentives produced by the reform to find employment are long-term incentives, which may be rather ineffective. However, the savings scheme may increase the level of pension wealth, thereby inducing early retirement. Thus, the impact on labour supply incentives is not unambiguously positive.

In contrast to exponential discounting models, hyperbolic discounting models emphasize the relevance of short-term incentives and commitment devices. Rather than implementing an unemployment scheme that provides long-term incentives to find a job, it would be more effective to introduce immediate reemployment bonuses and, as a commitment device, to intensify monitoring of job search effort. In general, recent empirical evidence supports that the introduction of reemployment bonuses and more stringent monitoring of job search substantially reduces the duration of unemployment. An important area for future research would be to assess how to develop an 'optimal' monitoring program.

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