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1. Introduction

Okun's well-known argument about the trade-off between equity and efficiency stresses the adverse economic effects of benefit systems. According to this argument (unemployment) benefit expenditures are thrown in a leaky bucket because the welfare loss of those who pay the premiums is larger than the welfare gain of those who benefit from unemployment insurance or welfare benefits. Means tested benefits have created unemployment traps for many unemployed workers in Europe, as net gains from taking up employment are marginal or even negative. Adverse labor supply effects, a high level of long-term unemployment and labor market sclerosis are also part of this welfare loss and these are prominent features of most European labor markets. In addition to this most policy makers feel the need to increase labor force participation to guarantee the future sustainability of the government budget, given the projected higher share of elderly in the population.

In an attempt to reverse the negative economic impact of existing unemployment benefit systems and increase labor force participation, most European governments have put forward reform proposals. In most countries attempts to change the benefit level and duration, entitlement conditions, job search and acceptance conditions or other institutional characteristics of social benefit schemes have met with rising popular and political discontent. Except for The Netherlands and Great Britain progress has been very slow (Smith (1999)).

In this paper we investigate individual savings accounts as a possible alternative route to address Okun's trade-off (Okun (1975)) and increase labor force participation in Europe. We address both theoretical implications and the practical feasibility of individual accounts, given the current structure of public unemployment benefit schemes in Europe.

The idea to replace or supplement public unemployment insurance schemes with individual unemployment accounts recently received considerable attention in the international literature (Orszag and Snower (1997a, 1997b) and Feldstein and Altman (1998)). In some countries, for example Singapore, individual accounts are already used to finance unemployment benefits and the Dutch government has advocated the idea in moderate terms[1] (Tweede Kamer (1996-1997), see also Van der Ploeg (1996) and Van Wijnbergen (1996) for supportive views of the idea).

Under individual savings accounts, sometimes popularly referred to as 'backpacks', workers accumulate capital from compulsory contributions paid from their wages. Unemployment benefits are paid to individual workers from these accounts and if a positive balance remains when the worker retires, it may be added to the individual's old age pension. An element of risk solidarity based on public insurance will remain, as a negative balance will be forgiven when the worker retires (or possibly prior to retirement as a specific policy measure to promote labor force participation).

An important advantage of this reform strategy for unemployment benefit systems is that existing institutional characteristics of unemployment insurance schemes, notably the benefit level and duration, can remain unchanged. On other hand we will see that Okun's trade-off remains and that individual accounts, while significantly improving labor market incentives, reduce risk-solidarity among workers. However this does not automatically imply that workers with a high unemployment probability will be worse off or in other words, that those who need unemployment benefits most would be hurt most severely by the introduction of individual

[1] The Social and Economic Council, a tripartite advisory council of the Dutch government, however rejected the idea based on arguments discussed in this paper (SER (1997), p. 269-270).

accounts. As the benefit level and duration do not need to change, changes in the income distribution, in terms of lifetime income, will depend on the exact structure of the new benefit system, how to deal with negative account balances and what exactly will be the impact of improved labor market incentives. Still, the reduction in risk-solidarity is an important aspect, given the prominence of equity and solidarity in the social choice function of European societies.

Furthermore the idea of individual accounts fits in very well with some important socio-economic trends in Europe, such as the increasing demand for individual options and responsibilities, as well as individualization, i.e. the strive for economic independence.

We discuss the theoretical pros and cons that have been raised in the literature. To this we add a discussion of the effect of individual accounts on labor market dynamics. We focus on the question to what extent individual accounts contribute to the process of structural adjustment from unproductive to productive jobs that is part of job creation and destruction cycles. In this respect it is important to realize that unemployment has an important economic function. Unemployment, up to a certain level, is unavoidable because of labor market frictions, and it is a necessary precondition for the labor market to function well.

In addition we discuss a number of practica1 issues that need to be addressed when considering individual unemployment accounts as an altemative to the public unemployment benefit systems present in Europe. Such issues are the way to maintain risk solidarity, ways to calculate the workers' mandatory contributions, implementation issues, and consequences for the income distribution, among others. We also present a simple framework to assess whether individual accounts are a realistic and favorable option for institutional reform of public unemployment insurance schemes[2]. Three considerations are centra1 in any assessment of benefit system reform proposals namely, i) the nature of the program (i.e. universal versus targeted coverage), ii) a liberal or a tight 'gatekeeper' function, and iii) incentives for reintegration (passive versus active).

In the next section we discuss the main characteristics and merits of individual accounts as presented in the intemational literature. In section three we contribute to this literature by analyzing individual accounts form the point of view of the flow approach to the labor market to address dynamic labor market issues. We also analyze a number of practica1 issues that are likely to arise when implementing individual accounts in the existing institutional framework, and we discuss some feasible modifications to the basic model presented in Section 2. We use our assessment framework to analyze whether integrating individual accounts in the unemployment benefit systems common in Europe would be beneficial in terms of efficiency and labor market participation. A discussion of the most prominent pros and cons concludes this article.

[2] Our approach to social insurance focuses on monetary incentives. Unemployed benefit recipients respond significantly to changes in benefit level, punitive sanctions or other monetary incentives (see for example Van den Berg (1990) and Van der Klaauw (2000)). We assume that job search intensity and job acceptance decisions of unemployed workers are dominated by rational, financial considerations. From sociological and psychological literature it is well know however that other motives are also relevant for labor market decisions, such as social status and self esteem derived from formal employment (Clark and Oswald (1994)).

2. Unemployment benefits through individual accounts

Feldstein and Altman (1998) and Orszag and Snower (1997a, 1997b) have explored some theoretical and empirical characteristics of different types of individual accounts. We discuss the implications of the idea based on the bare bones model of Feldstein and Altman. It is assumed that guidelines for withdrawing money from the accounts, such as the benefit level and duration are set by the govemment, as well as the fixed mandatory contributions to the individual accounts. In fact, it is assumed that a particular unemployment insurance system is transformed into a system of individual accounts without any change in entitlement rules, benefit level, duration and other institutional characteristics. Many variations are conceivable, but throughout this paper we will use the Feldstein-Altman model outlined in Table 1 as our frame of reference[3].

The most significant advantage of this way to finance unemployment benefits is that it generates better incentives for workers to prevent unemployment and to strive for rapid outflow from unemployment than traditional public unemployment insurance schemes. Under individual accounts risk solidarity cannot and will not be eliminated completely, as we will see.

The static calculations of the impact of individual accounts for the United States indicate that with a high saving base more than 5 percent of the workers has a negative account balance when they retire, and almost 7 percent has a negative account balance at some moment during their career (Feldstein and Altman (1998)). A quarter of these workers stil1 have a positive account balance when they withdraw from the labor market, die or retire. One out of every four unemployment spells ends with a negative account balance for the worker involved. Eighty percent of these workers have a negative account balance at the end of their career. Feldstein and Altman estimate that individual accounts will improve incentives for half of the number of weeks that unemployment benefits are paid and for half of the number of unemployment spells.

In countries such as Australia, Chile and Singapore, pensions are financed by means of individual accounts. In other countries there is a public debate whether the existing public social security systems with defined benefits should be replaced by individual accounts with defined contributions (see Orszag et al. (1999)). This issue was one of the major controversies in the 2000 presidential election race in the United States. In Singapore individual accounts are used to finance benefits for different contingencies (Ministry of Economic Affairs (2000) and Connolly and Munro (1999)). There is one compulsory, individual savings account for workers, the Centra1 Provident Fund. Employers and employees each contribute 20 percent, depending on minimum and maximum contributions. Workers use their account to pay unemployment benefits, disability pensions, retirement-pensions and costs for health care. Within certain limits, workers can withdraw positive balances when they reach the age of 55. At retirement age all positive balances can be added to the retirement pension scheme. After the introduction of the system in 1955, rules for withdrawal have been relaxed. Workers are allowed to invest positive balances in private housing property, government bonds or stocks. Parents are also permitted to finance loans for their children's education from their account. Depending on the rate of return and individual choices that people make, the account balance can be higher or lower than the sum of the contributions.

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[3] Some of the variations one could think of are allowing employees to make additional contributions to their individual account, and introducing additional individual accounts for risks related to disability, health and retirement and investment in human capital. Several options on how to deal with negative balances are conceivable, an issue we will return to later. Most of these idea are discussed briefly in Orszag and Snower (1997b).

Table 1 — Characteristics of individual accounts

Contributions and withdrawals

- Every worker contributes a percentage of the gross wage (4 % in Feldstein and Altman's calculations) to a personal savings account. The saving base is equal to the current wage on which unemployment insurance premiums are based.
- Contributions are mandatory until a certain amount of capita1 has been accumulated. When this threshold leve1 of capita1 has been accumulated, contributions may be terminated.
- Unemployment benefits are paid from an individual savings account according to certain withdrawal rules set by the govemment.
- Positive balances are added to the worker's pension rights when the worker reaches retirement age or are bequested if the worker dies before he or she reaches retirement age.

Coverage

- Benefit duration and leve1 are identical to current unemployment insurance schemes.
- When the account balance is inadequate to pay unemployment benefits, the government pays the benefits and debits the workers account by the same amount.

Debit and credit balances

- The account balances can be invested into stocks and bonds according to the same rules that apply to investments for second pillar pensions*.
- When they start their contributions, workers have to choose a conservative investment strategy (low risk, low return on investment) or an offensive investment strategy (high risk, high return on investment), and they are not entitled to change this strategy.
- Positive account balances generate an interest rate corresponding to the chosen strategy.
- The government, charging the same interest rate, covers negative balances, which are forgiven when the worker retires or dies.

Fiscal matters

- Contributions and capita1 accumulations in the individual's savings account are tax-free.
- Payments drawn from the account when the worker becomes unemployed, retires or dies are taxed according to current tax laws.

* Feldstein and Altman indicate that it is natural for the govemment to implement strict rules for investing in unemployment savings accounts because the govemment eventually will have to finance negative account balances. Because the govemment in this way bears part of the unemployment risk, workers will make a different trade-off between risk and return on investment than they would have done otherwise.

Incentives, unemployment and labor force participation

The primary difference between individual accounts and collective unemployment insurance is that individual accounts in a sense contribute to a better functioning of the labor market. Advocates claim that individual accounts contribute to lower unemployment rates, more labor supply and higher labor force participation. Public unemployment insurance schemes influence the individual's labor supply decision because these schemes change the relative prices of leisure and hours worked. On the one hand the value of employment increases because the worker becomes entitled to unemployment benefits, which has a positive impact on labor force participation. On the other hand, workers have to contribute part of their wages to public unemployment insurance funds by paying premiums and hence they do not gain the full revenues from their labor. Workers will supply less hours of work if the substitution effect dominates the income effect. In that case unemployment insurance schemes are not neutral with respect to the individual labor supply and labor force participation decision and these schemes generate negative extemal effects. Under individual accounts workers will make a more neutral decision when allocating time over work and leisure because relative prices are less distorted, as workers pay for their own unemployment benefits (Feldstein and Altman (1998)). This will induce more hours worked, higher labor force participation and will therefore raise production[4].

Employees who have a positive balance and expect to maintain one have an incentive to avoid unemployment or limit the duration of unemployment as much as possible. Contrary, workers who have a persistent negative balance or who expect to have a negative balance at the time of retirement don't have this incentive. For these workers incentives are not better under a system of unemployment accounts than under a system of public unemployment insurance. If unemployment accounts are indeed to lower unemployment, taxes and premiums will be lower and this will improve the work incentives for unemployed workers. Because their net payment increases their job-search effort will be higher and they will be more likely to accept a job offer[5].

Collective unemployment insurance schemes raise the sensitivity of the unemployment rate to extemal economic shocks. According to Feldstein and Altman (1998) this contributes to the fact that contemporary unemployment schemes financed by premiums generate inefficiently high levels of short-term unemployment. Firms lay workers off when (expected) profits are disappointing and (re)-hire workers when business picks up again. In most European countries this mechanism of hiring-and-firing is limited by labor market regulation, but even than collective unemployment insurance schemes can contribute to seasonal unemployment and other forms of short-term unemployment (see for example for The Netherlands a study by Alessie et al. (1999)). Under a system of individual accounts this mechanism is limited because workers take into account the costs of short spells of unemployment.

Using a formal equilibrium model with overlapping generations, Orszag and Snower (1997b) show that not only the equilibrium unemployment rate is lower under a system of individual accounts, but also the impact of the benefit level on equilibrium unemployment is less. In other words: given equilibrium unemployment, a system of individual accounts allows for a higher benefit level than an unemployment insurance scheme. This would imply that countries that prefer relatively high replacement rates, such as Belgium, France, Germany, Sweden and The Netherlands, could limit the related negative labor supply effects through the introduction of individual unemployment accounts.

If individual accounts are indeed to lower equilibrium unemployment the total contributions to the individual accounts will be lower than the average unemployment insurance premiums paid under a public unemployment insurance scheme. This will lower labor costs and induce a rise in net wages, depending on the relative bargaining power of employers and unions. A smaller wedge (i.e. the difference between the wage bill and net wages) will raise both labor supply and demand and hence the level of employment will be higher.

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4 In an insider-outsider model, where productivity is endogenously determined, individual accounts will generate higher productivity (Orszag and Snower (1997b)). As the worker contributes part of his wage to a savings account that is his own he will take into account the costs of unemployment and hence increase his work effort to reduce the probability that he will be laid-off.

5 Orszag et al. (1999) draw attention to the costs of administrating individual unemployment accounts. High costs could lower the value of the accounts, which could diminish the positive effects on incentives.

Risk, solidarity and incomes

The trade-off between equity and efficiency is at the center of the public debate about benefit systems (Okun (1975)). Solidarity implies that good and bad risks are pooled, implying that workers with a high and a low lay-off probability pay the same unemployment insurance premium. The trade-off with efficiency arises because workers can shift part of the unemployment risk to the aggregate leve1 and have less incentives to control the costs of unemployment insurance. In fact they pass the costs of unemployment insurance to society. In this sense mora1 hazard is an important source of inefficiency in benefit systems.

Individual accounts deprive workers of the possibility to shift the unemployment risk to others. This inevitably implies that the risk solidarity incorporated in collective unemployment insurance schemes will be partly abandoned. Workers can use positive balances to supplement their individual old age pension. Under a system of collective unemployment insurance these means favor the entire pool of insured workers through the payment of uniform insurance premiums. In this way workers with a high unemployment risk receive a subsidy from workers with a low unemployment risk. Risk solidarity remains insofar workers with negative individual account balances can claim forgiveness of debts or if they are entitled to welfare benefits. The govemment will support unemployed workers who are without means because they can no longer finance their unemployment benefit from their individual account. Workers are aware of this however, and hence the possibility to shift part the unemployment risk and associated costs to society remains. Mora1 hazard does not disappear under a system of individual accounts. Therefore it is necessary that the contributions to the accounts are mandatory and to make withdrawals from the accounts conditional in order to assure that the individual accounts are put to use in the appropriate way.

Individual accounts imply a shift of the equity-efficiency trade-off towards efficiency, but equity, i.e. risk solidarity, does not vanish. It is important to note however, that in the continental European tradition many observers will find the reduction of risk solidarity a high price to pay for the efficiency gains. The fact that risk-solidarity has such substantial weight in the social choice function of European societies, should be given proper consideration when actually designing a proposal to introduce some form of individual accounts.

We mentioned before that to some extent risk risk-solidarity has to be maintained when benefits are provided through individual accounts. This can be done via ex ante redistribution where the government redistributes wealth between individual accounts of high and low income workers by taxing workers with substantial positive account balances and subsidizing workers with smal1 or negative account balances. Another option is ex post redistribution by allowing negative account balances (see Table 1). Workers facing a negative balance can borrow from the state against the market interest rate. Solidarity arises because negative balances are forgiven at retirement age. A disadvantage is that some workers could face large negative balances early in their career and could be locked into this situation for the rest of their working life, thereby introducing a new type of unemployment trap. This will limit the positive incentive effects of individual accounts. One way to meet this problem is to convert the unemployment benefit into a welfare benefit from the moment on that the worker's individual account is exhausted. Because in genera1 the welfare benefit is lower than the unemployment insurance benefit, this will limit the accumulation of negative balances. Negative balances can be precluded if welfare benefits are not debited from the individual's account but instead are funded from genera1 tax revenues. In this model an unemployed worker is entitled to public welfare benefits once his individual account is exhausted and there is no option to accumulate negative account balances and continue to receive higher unemployment benefits, as in the Feldstein-Altman proposal outlined before.

Individual accounts effect the income distribution in three ways: contributions, accumulated wealth at the moment of retirement and the adjustment of the genera1 payroll tax rate[6]. For workers who have experienced no spells of unemployment during their career, the net present value of their contributions and payout is zero; all contributions are accumulated and added to their pension scheme. These workers will benefit from the introduction of individual accounts because the tax revenues needed to support workers with high unemployment risks and hence smal1 or negative account balances are less than the premiums paid for public unemployment insurance. Workers with a negative balance at the end of their career will grow worse because the lower payroll tax rates do not compensate the contributions they have made to their accounts. These are two extreme cases. In genera1 workers who experience frequent and long spells of unemployment will contribute more to their accounts during their career than workers who have a low unemployment risk. Feldstein and Altman show however that the effects would be smal1 for most households in the United States[7].

Summing up, based on theoretical and empirical considerations the advocates of individual accounts conclude that such an unemployment benefit system can lead to a lower unemployment rate and shorter average unemployment duration, lower wage costs and a higher level of employment and labor force participation than customary publicly financed benefit schemes. The gains are expected to outweigh the costs of benefits needed to support unemployed workers with smal1 or negative account balances. In addition, the cited authors expect higher returns to investments in human capital, an issue we will address later. The price paid is a reduction of risk solidarity.

3. Individual accounts versus traditional pubic unemployment benefit systems

In this section we analyze in what format individual accounts could be part of institutional reforms of conventional public benefit systems. We have mentioned some options to limit the loss of risk solidarity associated with individual accounts. In this section we will discuss other practica1 modifications and implementation issues that will need to be addressed under a system of individual unemployment accounts. In the following we will evaluate individual accounts using an assessment framework. We pay special attention to the reintegration function of the unemployment benefit system and the impact of individual accounts on labor market dynamics, as this aspect has been ignored in the literature so far.

At present, most European countries have an unemployment benefit system that consists of a temporary unemployment insurance benefit and, if necessary a subsequent welfare benefit. Workers who become unemployed are usually entitled to some form of unemployment insurance. Often this is a compulsory public insurance with benefit levels and duration based on past contributions and employment record. Contributions are usually linked to wages and paid by employers and employees. In most countries employers and employees are represented in

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[6] We do not take into account changes in wages and prices of other production factors.

[7] Their calculations show that breadwinners at the lower end of the income distributions grow worse 95 dollars in net present value, over a period of 25 years. Workers in the 10-20 percent range of the income distribution benefit 22 dollars and workers in the upper end of the income distribution gain 468 dollars. These changes in discounted eamings are remarkably small.

bodies that administer unemployment insurance schemes, in some countries they are also involved in supervision. When entitlement to unemployment insurance benefits expires unemployed workers become entitled to means-tested welfare benefits. Usually welfare benefits are paid at the subsistence level, they are flat rate and the benefit duration is unlimited. In most countries there is a genera1 social assistance scheme, but Germany, France and Spain have a special means-tested unemployment assistance program'. Welfare benefits are mostly tax-financed[9].

An assessment framework for benefit systems and reform

The aim of social benefit schemes is to protect people from the financial consequences of unemployment, disability, retirement and other social risks. Additionally the benefit system aims to prevent these contingencies and if possible to reintegrate workers in the labor market. Proposals to reform the benefit system should help to secure these two main goals". Three considerations are centra1 in the assessment of benefit system reform proposals such as individual accounts: coverage, entitlement rules (the 'gatekeeper' function) and reintegration.

The first consideration relates to the coverage and scope of a particular reform proposal. The key question here is who is entitled to the benefit. In policy discussions this issue is often addressed as a choice between universal and targeted policies. The advantage of targeted policies is that they directly address a particular social risk of a narrowly defined group, but a disadvantage is that people, who a priori do not belong to the target group, have an incentive to adjust their behavior to fit the criteria of the target group. Other adverse behavioral effects of targeted policies are also common. The Eamed Income Tax Credit is an example of a targeted (tax) policy, aimed to increase labor supply of low-wage workers. The tax credit decreases as the worker's income rises, the so-called phase-out range. The high implicit marginal tax rate in the phase out range of the tax credit induces workers to invest less in their human capital. Furthermore the relative prices of labor are distorted. The scope of universal policies is much wider so more people are entitled to a particular benefit and hence there are less incentives for adverse behavioral changes. Universal policies however suffer from a large deadweight loss: many of those who are entitled to the benefit or subsidy do not really need it. A good example is a genera1 tax credit for workers aiming to increase labor supply and unemployment outflow". This measure does not cause labor market distortions, but given the govemment's budget constraint the leve1 of the tax credit has to be limited due to the wide scope of the measure, and as a result the impact on labor supply and unemployment outflow will be limited. A sensible middle course with respect to the coverage and scope of benefit systems is to aim for measures as generally as possible with the smallest deadweigtht loss.

Once the scope and corresponding entitlement criteria of a benefit scheme have been determined, it has to be considered how to verify and enforce these. Applications have to be

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[8] The difference between the social assistance scheme for unemployed workers and for persons without prior employment usually relates to the type of means-testing, which is typically less tight for unemployment assistance benefits.

[9] There are some deviations from this general description of unemployment protection in Europe, most notably (Schmidt and Reissert (1996)): i) In The Netherlands, Denmark and Sweden the unemployment insurance fund is supplemented form genera1 tax-revenues; ii) In the United Kingdom the genera1 social-insurance system receives a cross-subsidy from the unemployment insurance fund, and iii) In Denmark and Sweden contributions to unemployment insurance are flat rate although benefits are income-related.

[10] Obviously efficiency and feasibility should also be considered.

[11] This was the objective of the general tax credit for workers included in the Dutch tax reform package that will become effective in 2001.

evaluated and entitlement decisions have to be taken. This gatekeeper fùnction determines who will be granted a particular benefit and what the benefit leve1 and duration will be. Strict enforcement of the entitlement criteria implies that there is a limited probability that persons who are not entitled to the provision stil1 are awarded one. This can be considered an error of the first kind (Hazeu (1980)). On the other hand, strict enforcement of entitlement criteria increases the probability of an error of the second kind, namely persons who do not qualify although they are fully entitled[12]. When entitlement policies are generous the reverse will happen and the costs will rise because a significant number of persons who are not entitled will in fact be granted a certain benefit. Generally speaking, the gatekeeper function is more important and should be stricter when the policy mix relies heavily on targeted policies because than persons will be more inclined to pretend that they meet the criteria when in fact they do not. To minimize the combination of errors of the first- and second kind, the entitlement criteria must be tested in such a way that the distinctive characteristics of the test are as substantial as possible. One major problem however is that usually those who want to be awarded a certain social provision are better informed about their actual characteristics than the gatekeepers. Improving the distinctive characteristics implies that this information asymmetry must be reduced, but this can be costly.

Designing the entitlement criteria and the scope and determining whether potential beneficiaries are in fact entitled to a benefit or subsidy does not conclude the organization or the reform of benefit schemes. It is important that beneficiaries reintegrate in the regular labor market as soon as possible and benefit programs for unemployed workers, as well as disabled- and ill workers, should contribute to rapid reintegration. This is the third consideration in the assessment of benefit system reform proposals. There are many ways in which active involvement and comrnitment of unemployed workers to labor market reintegration can be promoted. Additionally, supervision of the workers' reintegration activities, including their job search activities, will be necessary. Outflow from unemployment can be promoted through proper incentives in the benefit system and complementaryactive labor market policies.

Evaluating individual accounts

Taking into account these considerations we discuss the labor market implications of implementing individual accounts. Starting from the characteristics mentioned in Table 1, a variant of individual unemployment accounts to replace the existing public unemployment benefit system could be as follows. Workers do no longer pay premiums for collective unemployment insurance, but instead mandatory contribute a percentage of their taxable income to their individually owned unemployment accounts. When laid off a worker receives an unemployment benefit paid form his individual account. Unemployed workers who accept a job, are committed to supplement their account balance up to the minimum leve1 required. How long it will take to replenish the individual account obviously depends on the duration of the unemployment spell. When the worker reaches retirement age, positive balances may be transferred to the worker's private pension scheme.

The characteristics of existing unemployment insurance do not change: benefit leve1 and duration, eligibility rules, job search requirements and job acceptance criteria remain the same under individual accounts. The saving base for the worker's individual account contributions is identical to the current taxable income for unemployment insurance premiums. The employer's contribution to unemployment insurance premiums will be abolished. Gross wages can be

[12] The concepts of errors of the first and second kind originate from statistical theory. This theory also indicates that attempts to reduce errors of the first kind automatically imply a rise in errors of the second kind.

raised correspondingly to keep net wages and the employer's wage bill unchanged. In this scenario the unemployment and social assistance schemes, remain unchanged. Hence individual accounts are to change the funding of benefits currently paid by the public unemployment insurance scheme.

Workers make mandatory contributions to their individual account. This commitment expires if enough means have been accurnulated to finance the unemployment benefits to which the worker is entitled. This implies that the minimum account balance will be different depending on the benefit level and the maximum benefit duration in a particular country. Belgian workers, who are entitled to quite high unemployment benefits and unlimited benefit duration, will face higher minimum account balances that their Italian colleagues who are entitled to a maximum of 6 months of relatively low unemployment benefits. In some countries, such as France, The Netherlands and Germany, the maximum benefit duration depends on the individual's employment record and hence the worker's minimum account balance should rise during his career. For workers with smal1 unemployment probabilities these rules might be too rigid. It is worth considering a smaller income and employment record related component to determine a worker's minimum account balance, and to make it partly dependent on past withdrawals. If we assume there is a positive relation between a worker's unemployment record and his current unemployment risk, this would imply that workers with high unemployment probabilities face higher mandatory minimum account balances.

Even if we adopt this variant it is conceivable that some workers cannot finance the unemployment benefit they are entitled to from their individual account. One possible solution is for the government to grant them a loan to pay their benefits, as proposed by Feldstein and Altman (1998). There are several options for repayment. The simplest form is for the worker to start repaying the loan from the moment he has found employment or shortly after. Only after the loan has been repaid the worker can start accumulating funds in his individual account again. Risk solidarity can be maintained in this scheme by transferring funds from workers with positive account balances that exceed the minimum applicable to them, to workers with negative balances[13].

Although under individual accounts public unemployment insurance does no longer exist, contributions will need to be mandatory, as mentioned before. If there would be no mandatory contributions and the govemment would assume workers to make sufficient vohmtary contributions to their unemployment accounts, problems would arise if workers are laid off and it turns out that they are not able to finance their unemployment benefits. Because the government would in some way support these workers, most likely by granting them welfare benefits, some workers have an incentive not to make sufficient contribution to their accounts. This would make the system of individual accounts unsustainable.

Several modifications are conceivable for the system of individual accounts outlined above. One option is partial implementation. In countries where employers pay part (Germany, Belgium, The Netherlands, Denmark, Spain) or all (Italy) of the unemployment insurance premiums the employers' contributions to unemployment insurance could be (partly)

[13] We assume here that the current rules for unemployment insurance benefits apply. However, if we relax this constraint, more options become available to prevent workers from accumulating large negative balances. One option is to convert the wage related unemployment benefit into a subsistence level benefit at the moment the account balance of the worker involved tums negative. In this case negative balances will accumulate slower. Negative balances can be precluded when at the moment the account balance tums negative, the unemployment benefit is converted into a tax funded public welfare benefit. Ceteris paribus this would imply higher average tax rates and lower mandatory contributions.

maintained. Workers contribute less to their individual account and they withdraw less when they receive unemployment benefits as part of the benefits would be funded from unemployment insurance funds, which are funded from employers' contributions, similar to the present situation under public unemployment insurance. In countries where the govemment covers most of the costs, for example Sweden, a similar partial introduction could be obtained by combining the introduction of individual accounts with lower government contributions to the collective unemployment funds and lower income taxes.

Van der Ploeg (1996) suggests maintaining public unemployment insurance and supplementing it with benefits from individual accounts. In this way he intends to uphold risk solidarity between workers with a high and a low lay-off probability. Note however that if the contributions to the individual accounts are mandatory and if necessary will be used to finance supplements to regular unemployment benefits, this stil1 implies a reduction of the risk solidarity. If contributions are voluntary, then there is no improvement of the incentive structure to increase unemployment outflow. As a transition scheme though, a strong argument can be made in favor of partial or supplementary forms of individual accounts, as the reduction of risk solidarity that is inevitably linked to a full scale switch form public unemployment insurance to individual accounts, seems hardly attainable given politica1 preferences in Europe.

If we evaluate the idea of individual accounts using the assessment framework introduced before, a few aspects are noteworthy. Individual accounts can be interpreted as a form of universal policies because the system does not discriminate between certain groups of workers. A system of individual accounts induces little adverse behavioral changes and hence limits the mora1 hazard problem. As mentioned before, an important disadvantage is the decrease in risk solidarity, as workers with a high unemployment probability will have to contribute more to their accounts than workers with a low unemployment probability. The impact of the shift from equity to efficiency depends on the scope of the individual account scheme and on how much redistribution the govemment will impose between individnal accounts of low-risk workers and high-risk workers. Although individual accounts can be considered a universal instead of a targeted policy, the system does not have the inefficiency disadvantages that characterize many other universal social policies because the nature of the scheme induces workers to intemalize the costs of unemployment. The worker's behavior is directed in a way that is socially optimal, so the deadweight loss is limited.

Under individual accounts the gatekeeper function remains important because the state will guarantee a subsistence income for workers who have negative balances and because negative balances are forgiven at retirement age. It seems reasonable to expect however that the positive incentives for workers generated by the system will diminish the importance of the gatekeeper function. For example workers are more likely to accept jobs that they would have rejected as being 'unsuitable employment' under a public unemployment insurance system. To put it differently, there is little reason for the potential beneficiary to exploit the information asymmetry with respect to the gatekeeper, so the distinctive characteristics can be substantial at little cost.

Individual accounts are expected to have the strongest impact on the reintegration objective of the benefit system because improving outflow from unemployment is a major objective of the scheme. Apart from the positive impact on unemployment outflow generated by better incentives, individual accounts can contribute to reintegration through active labor market policies. Under the present public unemployment insurance system it is mainly the govemment's budget that benefits from rapid unemployment outflow. The govemment has an inventive to initiate active labor market policies such as training programs, wage subsidies and training jobs. These programs are quite costly and their impact is sometimes disputable (see Van der Klaauw (2000)). Under individual accounts workers pay their own unemployment benefits, so they have an incentive to invest in activities that raise their unemployment outflow probability. Both Orszag and Snower (1997b) and Feldstein and Altman (1998) propose that workers should be allowed to use their individual unemployment accounts to invest in vocational training, forma1 courses or job search counseling. Wage subsidies can also be employed to overcome the gap between the legal minimum wage and the worker's productivity. In a sense, unemployment benefits are used to promote outflow from unemployment.

It is also conceivable that employed workers are allowed to use their individual accounts to invest in their human capita1 to improve their employability and reduce their unemployment probability. Under a system of individual accounts workers have an even greater incentive to maintain and increase their skills, keep up with new (technological) developments and make sure that they are able to apply their knowledge flexibly. Workers, who foresee that their current job might become unproductive in the future, can use their account balances to invest in their human capita1 to prepare for a job or career shift. For workers who are laid off or become disabled, the possibility to use their individual accounts for human capita1 investments, can make them decide not to withdraw benefits from their accounts so they can invest more in activities that facilitate their return to the labor market. People who have been outside the labor force for a long period of time, possibly because they had to take care of young children, could use their individual accounts for similar purposes.

In section 2 we explained why individual accounts are likely to induce lower average tax- and premium (contribution) levels. However, to determine the effect of individual accounts on labor supply decisions we need to take marginal tax rates into account. Low-skilled workers with a high lay-off probability, mostly employed in shrinking industries, face a high risk of long unemployment spells. These workers will have a high implicit marginal tax rate once their individual accounts are exhausted. They could even become subject to a poverty or unemployment trap because additional income from working more hours or taking up employment will be needed to balance or supplement their individual accounts. These workers won't be able to supplement their retirement pensions from their account balances, at least not in the short run. This could prevent them from accepting a job offer or from working more hours and make them decide to be satisfied with the minimum state pension they will be entitled to after retirement. The risk that workers with negative or marginal individual account balances will come to face an unemployment or poverty trap is more likely to arise for older workers. On the other side there are high skilled privileged workers in expanding industries with low unemployment probabilities. Implicit marginal tax rates will decrease for these workers and this will give them an incentive, if allowed, for additional contributions to their individual accounts to obtain higher retirement pensions. This mechanism could lead to a new type of labor market segregation. Once again this stresses the argument to preserve some form of risk solidarity and to enforce redistribution between individual accounts.

Obviously the institutional setting of the benefit system will change dramatically if the current system of public unemployment insurance would be replaced by or supplemented with individual accounts. If the system is fully funded banks, pension funds and possibly insurance companies are likely to administer the unemployment accounts, as they possess the appropriate infrastructure and knowledge. Under a full-scale implementation the public unemployment insurance funds would become superfluous.

In principle the institutions that administer the current unemployment insurance benefit scheme could continue to exist because the benefit rules and, which is important, the gatekeeper function remain. The administrative bodies could be downsized, with correspondingly lower costs, if the positive effects of individual accounts indeed generate lower unemployment.

Benefit systems also effect the relation between unions, employers' organizations and the government. In corporatist countries such as Germany, as well as for example France and Spain, unions and employers' organizations play an important role in the administration of public unemployment insurance schemes. Apart from the issue whether unions would agree with a system of individual accounts, such a benefit system could reduce their influence and power. In The Netherlands part of unions' and employer organizations' influence arises from their involvement in the design and implementation of active labor market policies. These policies are partly financed from unemployment insurance premiums, so under a system of individual accounts they will have to be funded from altemative sources. Workers would probably want more influence on the way public reintegration means are used. It is also conceivable that these means are transferred to the individual accounts to give workers individual control over means to fund active labor market programs when they are unemployed.

On the other hand, unions could gain influence, as collective labor agreements are likely to become more important. The benefit system can be integrated into existing fringe benefits for workers if employers contribute to the individual accounts. This would become part of employer-union (wage) negotiations, and hence the scope of union influence becomes wider[14].

We mentioned in the introduction that individual accounts fit in very well with socio-economie trends in Europe, such as (economic) individualization, and the demand for more individual options and responsibilities. Individualization has increased the demand for individual options in many areas, including social protection. These trends are also observable in collective labor agreements (CLA's). More and more unions and employers opt for so called 'menu CLA's', which provide workers with options regarding hours worked, annual leave, training and, notably, pension rights. Finally, we note that to the extent that the substantial rise in welfare in the past decades has reduced workers' risk-aversion, individual accounts provide a possible way to accommodate to this situation. The nature of individual accounts comes close to these social-economic trends, and hence can be expected to appeal to a substantial part of the working population.

Labor market flows and individual accounts

An important aim of benefit systems is to protect workers from social risks. However unemployment benefits also serve an important macro-economie efficiency goal, sometimes labeled the 'irrigation function' (Korpi (1985), see also Den Butter and Kock (1998)). In this view there is a positive relation between unemployment benefit schemes and economic efficiency because a lack of unemployment protection could hamper a dynamic economic development. Increased intemational competition, stronger product market dynamics and fundamental technological change are expected to raise job insecurity, job-to-job changes and labor market dynamics, stressing the relevance of the irrigation function. Partly due to unemployment benefits, workers are not forced to accept or hold on to inefficient jobs and slow down the process of job creation and job destruction. Temporary unemployment might be unavoidable in this process of job moving and structural change.

[14] In this respect it is important that the individual accounts to be strictly personal en not to be linked to a particular employer because this could hamper labor market mobility. In the past similar problems occurred when workers suffered reductions in their pension claims due to frequent job movements during their career.

Introducing individual accounts will have consequences for labor market flows and hence labor market dynamics and it is therefore interesting to evaluate what impact such a benefit system is likely to have on the irrigation function of unemployment benefits. This can be seen as supplementary to the framework discussed before. By analyzing the various labor market transitions we can get a picture of the labor market dynamics.

Workers who have been laid off will be more willing to accept a job because they bear the full costs of their unemployment benefits. Workers who foresee their lay-off will have a stronger incentive than under a system of public unemployment insurance to start searching for a job while stil1 employed. Individual accounts are therefore likely to decrease the inflow into unemployment and increase the outflow from unemployment. This can be regarded beneficial, provided that there are no negative consequences for the quality of the job-worker match. Increased outflow from unemployment can take place at the expense of efficient labor allocation if these workers, pushed by continued withdrawals from their individual accounts, accept jobs with lower productivity than what they could have achieved had they continued their job search.

The same applies if the worker who will be laid off accepts a low productivity job to prevent unemployment and withdrawals from his individual account, while continued job search, possibly while receiving unemployment benefits, might have resulted in finding a job with a higher productivity and wage. Through these mechanisms and because workers might hold on to unproductive jobs to prevent withdrawals from their individual accounts, the irrigation function might be hampered. This will limit labor market dynamics and might hamper the process of structural labor market adjustment.

As mentioned before, under a system of individual accounts workers who are laid off will search harder for a job and are more likely to accept a job offer because continued unemployment reduces their individual account balances. However, unemployed workers could just as well give up their entitlement to unemployment benefits in order to save money from their accounts. Although these workers could stil1 be searching for jobs, they are not registered as unemployed workers. Formally, they are outside the labor force and they can obtain their means of living from relatives or other sources. There is no reason why this shift of labor market flows should hamper structnral adjustment at the labor market.

In addition to a lay-off, outflow from employment can take place because workers voluntarily quit their job. Usually these workers are not entitled to unemployment insurance benefits. Under a system of individual accounts it will be even more unlikely that workers prefer voluntary unemployment and claim unemployment benefits to finance job search. Whatever the reason of unemployment, lay-off or quit, non-employed workers are not able to make contributions to their individual accounts, which will raise the costs of non-employment. Under a system of individual accounts on-the-job search is likely to be the most prominent source of labor market dynamics, even more than under the present public benefit system.

On the other hand, workers have stronger incentives to withdraw from the labor market temporarily to receive education and training if they are allowed to finance these activities from their individual account. Workers could use their individual accounts to finance training and education to prepare for a career shift or a promotion. Another option is to integrate individual accounts with additional matemity leave or recent developments in labor relations and fringe benefits, such as sabbatical- and care leave.

We can conclude that a system of individual accounts performs well when evaluated according to the framework presented here, in particular when it is to be introduced partially and gradually. The price paid is a loss of risk solidarity. This issue is of major importance and deserved special attention, given politica1 preferences and a tradition of risk sharing among workers in Europe. Viewed from the perspective of the irrigation function of unemployment benefits, the pros slightly seem to outweigh the cons.

4. Concluding remarks

This paper adds to the existing literature on individual accounts i) a discussion of the impact on labor market dynamics and ten 'irrigation function' of the benefit system, and ii) a discussion of issues that need to be addressed when individual accounts are to be implemented in public benefit systems like those currently present in Europe, such as risk solidarity, leve1 of contributions, and institutional issues, among others.

The main economic rationale to replace or supplement public unemployment insurance schemes with a system of individual accounts is based on Okun's well-known argument about the trade-off between equity and efficiency (Okun (1975)). His argument is that transfer payments for social benefits end up in a 'leaky bucket' because the welfare loss of those who pay the social premiums is larger than the welfare gains of the benefit recipients. The bucket's leak is due to the fact that premiums and taxes distort incentives, causing macroeconomic inefficiencies such as high and persistent unemployment rates, a large share of long-tenn unemployment and lower labor force participation. In this paper we analyzed individual accounts from the perspective of employers, employees and labor market efficiency[15].

Through a number of mechanisms individual accounts are expected to lower unemployment. A system of individual accounts reduces the disincentives caused by collective unemployment insurance as workers take into account the costs of unemployment. Worker's search effort and job acceptance probability will increase, which will lower average unemployment duration and the unemployment rate. Although individual accounts are primarily aimed to increase unemployment outflow, it can be expected that unemployment inflow will also slow down. The (shadow) price of unemployment and leisure will rise as the revenues from employment are higher, which will cause labor force participation to rise, both in terms of hours worked and persons.

On the other side there is a risk that workers accept an inefficient job to prevent eating into their capita1 although it rnight be better to continue searching for a more productive job. For the same reason they could hold on to an existing, less productive job. This has an adverse impact on macroeconomic efficiency and hamper the process of structural adjustment. Individual accounts however enable workers to invest in maintaining and expanding their human capital. This will enhance their flexibility to adapt to changing labor market conditions and improve their capacity to switch jobs or careers if necessary. Under a system of individual accounts, the irrigation function of unemployment benefits could be supplemented with active labor market policies.

In brief individual accounts are expected to improve incentives and hence increase ex ante utility. The reverse is that a system of individual accounts could increase inequality among

[15] There are also macro-economie issues involved. See for a brief discussion of the impact on savings, economic structure and the govemment budget Kock and Den Butter (2000).

workers with a high and a low probability of (long-term) unemployment. A substantial part of the risk solidarity incorporated in public benefit schemes, vanishes. Risk solidarity involves the danger of mora1 hazard and this can only be reduced by splitting up the uniform pool of insured into smaller pools with different risk profiles and premiums. Experience rating is one way to do so: premiums are being positively related to past claims. In the United States experience rating is present in unemployment insurance, in most European countries it is not, although policy proposals to introduce experience rating are common. Another way to reduce mora1 hazard is to grant insured persons the option to leave the public insurance scheme and obtain private insurance. 'Opting out' introduces a form of competition in social insurance. Here the reverse is that the problem of adverse selection arises. Insurers will try to select clients with the lowest probability that the contingency arises and in fact these clients are most likely to opt out of the public scheme. The trade-off between mora1 hazard and adverse selection is at the core of every public benefit system (Bovenberg (2000)). In a way, under individual accounts, this trade-off is evaded because there is no insurance mechanism involved. Every worker bears his own unemployment risk by accumulating private savings to pay for personal unemployment benefits. Risks cannot be shifted and mora1 hazard is limited because the worker must carry the financial consequences of such behavior, as unemployment benefits are withdrawn from his personal account. Adverse selection is not an issue here because there is no risk pooling, as under a system of public unemployment insurance. It is important to note that since there is no insurance principle involved, the gains that risk adverse individuals get from insurance are also partly lost.

Still, the trade-off between equity and efficiency is present also under a system of individual accounts, because negative balances will be forgiven when a worker retires. Furthermore it seems sensible to have some form of compensation for workers that come to face substantial negative balances early in their career, to prevent them from being locked-in in this situation. Given the present structure of benefit systems in Europe it would seem convenient to grant these workers tax financed unemployment or social assistance benefits. For these workers and for workers who expect to have negative balances when they retire, mora1 hazard behavior remains favorable. The issue of eligibility, the gatekeeper's role, will remain an important part of benefit policy, even under individual accounts. As long as positive account balances at the end of their career seem realistic, workers will however reveal at least part of their hidden personal characteristics, such as their job search intensity or employability, because the costs of unjustly claimed benefits are their own. The gatekeeper can use this information so it may be expected that mora1 hazard can be contested more easily.

The idea of individual unemployment savings accounts offers the possibility to lower unemployment and raise labor force participation while maintaining present social rights. Despite some important disadvantages, notably the reduction of risk solidarity (equity), the idea offers an interesting option to limit the adverse incentives of public unemployment insurance schemes. For European countries, some of them struggling with benefit system reforms, individual accounts deserve serious attention as this form of institutional innovation addresses the key problem of their benefit systems: low outflow from unemployment and a high leve1 of (hidden) inactivity. Individual accounts could also make a contribution to accommodating the social benefit system to the social-economic trends of individualization, and the demand for more individual options and responsibilities. Finally, an advantage is that individual accounts can be incorporated in the present benefit system in a gradual and flexible way.

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