

Economic and Social Security
in the Twenty-First Century,
with attention to Europe ¹

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February 2000

¹A contribution and introduction to the Year 2000 special issue of the *Scandinavian Economic Journal*, initially submitted as an extension of Drèze (1999), but revised as per helpful suggestions of two anonymous referees who recommended a non-technical exposition and the inclusion of some topics in sections 3.3, 4 and 5.

Abstract

A partly heuristic attempt at exploring long-run policies aimed at a second-best compromise between *ex ante* risk-sharing efficiency and *ex post* productive efficiency. Wage subsidies for low-skilled workers financed by taxes on high wages are advocated, together with improved risk sharing between capital and labour, between generations and between the countries belonging to EMU. The scope of the advocated policies is limited by considerations of moral hazard, time consistency and fiscal competition. Also, estimates of some key economic parameters remain very imprecise. Several avenues of further research are identified.

JEL Classification: D80, H20, E60

Keywords: Social insurance, moral hazard, fiscal competition, intergenerational risk sharing, international risk sharing.

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1 Looking Ahead

1.1 The *ex ante* viewpoint

The *Scandinavian Journal of Economics* invites us to look ahead into a future that is unusually distant from the viewpoint of standard economic thinking. The brief is particularly challenging when emphasis is placed on coping with uncertainty: the future tends to become more uncertain, the farther ahead we look. Looking into the 21st Century is very different from looking at a stationary state.

There is however a saving grace. As we look into a more distant future, we become more and more concerned with as yet unborn individuals, or with young individuals whose future characteristics and opportunities remain largely unknown. For that group of young or unborn individuals, the natural goal of alleviating future uncertainties can be fostered through mutual insurance. A system whereby the lucky ones who will do well tomorrow help out those who will do poorly enhances *ex ante* the prospective welfare of *all*, at a gain of overall efficiency. In contrast, when the lucky ones of today are taxed to help out the less fortunate, the transfers are seen as redistributive, needing justification on ethical rather than on efficiency grounds.

The *ex ante* viewpoint was initially introduced in a pioneering contribution by William Vickrey (1945), further extended by John Harsanyi (1953) and James Mirrlees (1971). Under the name “veil of ignorance”, it was built into the foundations of *A Theory of Justice* by John Rawls (1971). It is also the viewpoint underlying the present essay.

As spelled out in section 3, the *ex ante* viewpoint suggests a high degree of *ex post* equality, driven by considerations of risk-sharing efficiency. But *ex post* equalising transfers raise issues of moral hazard, productive

efficiency, time consistency, fiscal competition a.s.o.. Reconciling the two conflicting efficiency motivations brings us in the realm of second-best analysis, beset with the difficulties of modeling distortions, designing and implementing suitable policies or turning qualitative prescriptions into quantified decisions. By necessity, my discussion of so many issues will remain general, with some attention to identifying research priorities.

Application of the *ex ante* viewpoint calls for defining the proper reference group. Logically, that group consists of all economic agents apt to participate in a common program. Traditionally, such a group is identified with the citizens (to be) of a given country. I will argue in section 2 that reasoning at the world level would be meaningful; but that goal remains unrealistic. There is however an intermediate level, namely that of the European Union. I will start at the more familiar national level, then move on the EU level. Given the long-run perspective, it is then relevant to anticipate some consequences of further economic integration and to take enlargement prospects into account.

1.2 Long-run economic uncertainties

Although the topic of this special issue is “social security”, I refer in my title to “*economic and social* security”. The basic concern of most households lies with their income prospects, as related in the first place to employment prospects, and subsidiarily (by default) to replacement incomes. We regard today both employment and social security – the Welfare State – as problematic: unemployment is too high and not abating significantly; social security is too costly, yet not fully effective; also European integration is seen as a threat to the Welfare State, through fiscal competition. The natural human quest for economic security, as a basis for the attainment of deeper goals (building a family, a home, a network of relationships, . . .), is thus threatened today on two fronts: the

perspective of finding or keeping a job yielding a stable income, and the perspective of relying on a solvent social security system for a substitute income in case of need.

The uncertainties with which I shall be concerned are those surrounding the real incomes of individuals and families. These uncertainties arise mainly from two sources, which it is helpful to separate logically, even if the distinction is often blurred in concrete instances. One source concerns a person's ability, and determination, to earn an income through the supply of labour services. Individuals are born with endowments of characteristics (health, intelligence, skills, emotional stability, will-power...) which are relevant to performance on the labour market. A person's native endowment is a matter of luck, even though there are significant statistical regularities. Births do not occur in a vacuum, but rather in a social setting where the individual characteristics develop more or less felicitously depending upon surroundings. As a life unfolds, chance intervenes repeatedly. A person may opt for a training which later developments reward or not. A professional career may start in a sector, or in a firm, later crowned with success or again stricken with failure. The statistical distributions of relative labour incomes summarise the outcomes of these life histories.

The chance events include specific contingencies, like illness, premature death or other circumstances keeping a person out of the labour force. To the extent that these circumstances are observable, they are typically covered by contingency-related programs, which are an essential component of existing safety nets. To minimise dispersion, I ignore that kind of uncertainties in the present paper (except for remark 4 in section 3.2 below), and concentrate on lifetime earnings.

Another source of income uncertainties is of a macroeconomic nature.

It is captured by the growth rates of national incomes per capita. Looking back at the 20th century, these growth rates have varied substantially, both across countries over the whole century, and over time within the century for individual countries. As we look ahead today into successive decades of the 21st century, there is considerable uncertainty about the prospective growth rates of national incomes.

The two sources of uncertainty correspond to individual risks, that affect individuals but not aggregates, and macroeconomic or aggregate risks, that society must bear. The former correspond roughly to the place of an individual worker within the distribution of labour incomes. The latter concern the properties, especially the location, of the whole distribution. Using the standard description of future uncertainties by an event tree, the latter concern event-dependent *overall shifts* in the distribution of labour incomes; the former concern event-dependent *individual places* in event-dependent income distributions. A detailed modeling of these uncertainties is complex, and I shall streamline. It is however helpful to distinguish successive levels of aggregation, and to reflect their on their quantitative significance. The following features stand out.

(i) The variability due to an individuals' place in the distribution of disposable incomes, as measured by the ratio of the 90-th to the 10-th percentile, has a country median in the EU of 3.4; it ranges from 2.6 (Finland) to 4.4 (Spain), still well below the US figure (5.9), but somewhat above the Eastern Europe figures which range from 2.6 (Hungary) to 3.3 (Estonia).¹ Individual uncertainties are thus substantial. In particular, the income prospects of low-skilled workers have deteriorated over the past decade in industrialised countries, under the joint influence of

¹See Atkinson (1995b, p. 47) and Atkinson and Micklewright (1992, p.103); the data mostly refer to the mid-eighties; the trend since then has been one of increasing inequality.

globalisation and skill-biased technological progress.²

(ii) The labour share is not trended and hovers around 70%. Thus the average value for EU15 in 1998 was 68%, with values ranging from 60% in Ireland to 75% in Portugal. (It is 72% in the US and 73% in JAPAN.)³ Still variations over time in individual European countries (but not the US) have often been as high as 10 percentage points within a decade or two.

(iii) GDP per capita, adjusted for purchasing power and expressed in percentages of the EU15 average, range from 68% in Greece and Portugal to 112 % in Belgium or Austria and 116% in Denmark (Luxembourg is an outlier at 164%); they reach 65% in the Czech Republic and Slovenia, but less than 30% in Bulgaria, Latvia, Lithuania and Romania.⁴

(iv) National incomes typically grow at positive rates, that are however subject to sizable long-run uncertainties. In the EU15, it has been estimated that some 45% of medium-term income risks could be eliminated through mutual insurance.⁵

I shall accordingly be concerned successively with the uncertainty affecting individual incomes at a point in (future) time (section 3, extended to the EU dimension in section 4), with national macroeconomic uncertainties (section 5), and with the prospects for international risk sharing within the EU (section 6).

²This development takes the form of increased income inequality in the US, of persistent unemployment of low-skilled workers in Europe; see Drèze and Sneessens (1994), or Feenstra (1997) for recent references.

³See *European Economy*, 65, pp. 292-93. The precision of these figures is imperfect; compare *ibidem*, 60, pp.164-65 and 63, pp. 276-77.

⁴Without the purchasing power adjustment, incomes per capita in the last four countries average a mere 10% of the EU15 level.

⁵See Forni and Reichlin (1999).

2 Sharing Risks

To set the stage for my discussion of economic security, I record concisely some properties of efficient risk sharing among a set of agents maximising expected utility.

Let a set of n individuals $i = 1 \cdots n$ each be endowed with a given risky prospect – say a random wealth level y^i with S alternative values $y_s^i, s = 1 \cdots S$, corresponding to alternative “states of the world” of respective probabilities $\pi_s \geq 0, \sum_s \pi_s = 1$. The preferences of agent i are represented by the state-independent cardinal utility function $U_i(y^i)$, with absolute and relative risk aversion functions $R_A^i = \frac{-U_i''}{U_i'}$ and $R_R^i = y^i R_A^i$; the corresponding risk-tolerance functions are $T_A^i = \frac{1}{R_A^i}, T_R^i = \frac{1}{R_R^i}$. Aggregate risk tolerance is $T_A = \sum_i T_A^i$ and average relative risk aversion is usefully measured by the harmonic mean $\hat{R}_R = \frac{\sum_i y^i}{\sum_i (\frac{y^i}{R_R^i})} = \frac{Y}{T_A}$.

An efficient mutual insurance scheme calls for pooling all the individual risks and letting each individual receive a share z_s^i of the aggregate wealth $Y_s = \sum_i y_s^i, s = 1 \cdots S$. Efficiency further requires that marginal shares $\beta_s^i = \frac{dz_s^i}{dY_s}, \sum_i \beta_s^i = 1$, be proportional to risk tolerances. For $z_s = (z_s^1 \cdots z_s^n)$, two alternative formulations are

$$\beta_s^i = \frac{T_A^i(z_s^i)}{T_A(z_s)} = \frac{\hat{R}_R(z_s)}{R_R^i(z_s^i)} \cdot \frac{y_s^i}{Y_s}. \quad (2.1)$$

The special case of linear sharing rules, where $z_s^i = \alpha^i + \beta^i Y_s, \sum_i \alpha^i = 0, \sum_i \beta^i = 1$, provides an instructive benchmark, popularised through the CAPM.⁶ Relatively risk-tolerant individuals will have relatively high

⁶The benchmark is a first approximation, exact when individual utilities are quadratic or negative exponential, or again when individual relative risk aversions are constant and common; see, e.g; Eeckhoudt and Gollier (1992).

marginal coefficients β^i and correlatively low (possibly negative) fixed wealth components α^i .⁷

There exists a system of prices q_s for unit insurance contracts on the occurrence of Y_s , given by the formula

$$q_s = \pi_s \left[1 - \frac{Y_s - \bar{Y}}{T_A} \right], \quad \sum_s q_s = 1, \quad \sum_s q_s Y_s = \bar{Y} - \frac{\sigma_Y^2}{T_A} = \bar{Y} - \hat{R}_R \frac{\sigma_Y^2}{\bar{Y}}. \quad (2.2)$$

The aggregate risk premium $\bar{Y} - \sum_s q_s Y_s = \hat{R}_R \frac{\sigma_Y^2}{\bar{Y}}$ is thus proportional to average relative risk aversion and inversely proportional to aggregate (expected) wealth. The latter feature underscores the desirability of maximising the wealth base over which risks are shared. *In principle, risks should be pooled and shared worldwide and over the infinite future.*

I add for further reference (in section 6) that an efficient linear risk-sharing arrangement can always be implemented in two stages. Let $P : \{P_1 \cdots P_k\}$ define a partition of the set $I = \{1 \cdots n\}$ of agents. The subset of agents P_j has aggregate endowment $Y^j = \sum_{i \in P_j} y^i$ and aggregate absolute risk tolerance $T_A^j = \sum_{i \in P_j} T_A^i$. Let the k subsets $P_j, j = 1 \cdots k$, organise a risk exchange, resulting in shares $Z_s^j = A^j + B^j Y_s$, with $B^j = \frac{T_A^j}{T_A}$ and $A^j = \bar{Y}^j - \frac{\sigma_{Y^j Y}}{T_A} - B^j (\bar{Y} - \frac{\sigma_Y^2}{T_A})$. Let next the individual agents in P_j organise a risk exchange, resulting in shares $\hat{z}_s^i = \hat{\alpha}^i + \hat{\beta}^i Z_s^j$, with $\hat{\beta}^i = \frac{T_A^i}{T_A^j}$ and $\hat{\alpha}^i = \bar{y}^i - \frac{\sigma_{y^i Z^j}}{T_A^j} - \hat{\beta}^i (\bar{Z}^j - \frac{\sigma_{Z^j}^2}{T_A^j})$. Then, for each $i = 1 \cdots n$, for each $s = 1 \cdots S$, $\hat{z}_s^i = z_s^i$ as defined above. Thus, in particular, an efficient linear sharing of income risks among all citizens of a set of countries could be implemented through an efficient international sharing

⁷In the case of common constant relative risk aversion, $\bar{y}^i = \beta^i \bar{Y}$ so that $\alpha^i = (\beta^i \sigma_Y^2 - \sigma_{y^i Y})/T_A$; α^i is equal to the difference between the premium corresponding to the risk $\beta^i \sigma_Y^2$ borne by i and the risk $\sigma_{y^i Y}$ contributed by i .

of national income risks, coupled with efficient risk-sharing arrangements among citizens of each country separately.

3 Individual Risks: National Analysis

3.1 Social insurance

Individual risks concern the place of a future entrant to the labour market in the wage distribution. Individual risks are *by definition* uncorrelated with macroeconomic risks. If they could be exchanged on the market, no risk premium would be required.⁸ A risk averse individual would then be happy to exchange her uncertain lifetime income for its expected value. This is of course unrealistic for reasons of moral hazard and enforceability, compounded by adverse selection.

First, having exchanged her lifetime income for its expected value, the individual would have no incentive to perform well, and in particular could not convince the market that she will perform. She might then prefer to bear the risk and reap the benefits of effort, rather than selling at a loss to eliminate the uncertainty. Second, if the individual proves successful, she might be tempted to default on the insurance contract and keep to herself the excess of her income over the expected value; while she would insist on collecting the insurance if she fails. Thus she could not convince the market of her honesty, and might again prefer to bear the risk rather than selling at a loss. Because individuals differ in their unobservable motivations and honesty, an adverse selection problem arises.

⁸Some doubt on the realism of that conclusion is cast by the observation that “catastrophe bonds”, covering risks seemingly uncorrelated with market risks, yield a significant risk premium; see Froot (1999).

A compulsory social insurance scheme avoids the problem of enforceability (taxes are legally binding – up to evasion); it does not avoid the moral hazard problem, but mitigates it by taking out the adverse selection element. Social security design thus calls for a second-best compromise between risk-sharing efficiency and productive efficiency.

Some characterisation of the second-best compromise has been offered for alternative specifications of the source of moral hazard. *Ex post* taxes and transfers may distort *ex ante* decisions: about savings as in Varian (1980); about labour supply as in Eaton and Rosen (1980); about risk taking as in Sinn (1995) – to cite a few standard references. In Diamond, Helms and Mirrlees (1980), the labour-supply decision is made after the uncertainty is resolved, but remains distorted by an income tax. In all these contributions, wages or labour productivity are exogenous. A related contribution, Drèze and Gollier (1993), treats wages as endogenous but subject to policy intervention, and studies the trade-off between *ex ante* insurance through restricted wage flexibility, and *ex post* productive efficiency impaired by unemployment at downward rigid wages. Clearly, a realistic modeling of the social security design problem should include most of the elements listed above, and others still. For the long run, investment in education (see remark 3 below), or norms and habit formation matter.⁹ But modeling the diffused influence of the social security design on education, labour supply and effort in a lifetime framework with endogenous wage formation is hardly tractable.

Instead of modeling distortions explicitly, one can adopt a shortcut fruitfully exploited by Barro (1979) in a related context, and capture through (quadratic) convex functions of the transfers the global dead-weight costs of *ex post* redistribution – whether due to administrative

⁹Cf. Lindbeck *et al.* (1999).

costs, incentive effects on labour supply, effort, education...or fraud. This leads to define two reference wage levels, say y_0 and $y_1 > y_0$, and a policy whereby wages $y_s < y_0$ are subsidised and wages $y_s > y_1$ are taxed, while wages intermediate between y_0 and y_1 are neither taxed nor subsidised.¹⁰

The fact that the redistributive policy is costly explains why y_0 should be less than the mean wage $\bar{y}$ suggested by full insurance. From y_0 upward, the gain in risk-sharing efficiency is no longer sufficient to absorb the dead-weight costs of redistribution, which comes to a halt. Yet, the positive transfers at the low end must be financed. Positive prudence ($u''' > 0$), implied by diminishing absolute risk aversion, makes it efficient to concentrate the tax collection on the higher incomes, namely those exceeding y_1 .¹¹

A simple schedule of proportional subsidies or taxes would generate disposal incomes z_s defined by $(1 \geq \sigma > 0, 1 > \tau \geq 0)$:

$$\begin{aligned} z_s &= y_s + \sigma(y_0 - y_s) = (1 - \sigma)y_s + \sigma y_0 & \text{if } y_s < y_0 \\ &= y_s & \text{if } y_0 \leq y_s \leq y_1 \\ &= y_s - \tau(y_s - y_1) = (1 - \tau)y_s + \tau y_1 & \text{if } y_s > y_1. \end{aligned}$$

The reference wages should be such that the ratio of marginal utilities $\frac{u'(y_0)}{u'(y_1)}$ be equal to the ratio of the marginal cost of subsidies at y_0 to the marginal yield of taxes at y_1 , a ratio exceeding unity under distorting

¹⁰See the appendix to Drèze (1999); the quadratic utility assumption used there is unnecessary for the characterisation in the text. The non-linear feature also emerges in Varian (1980) or Drèze and Gollier (1993); it is not brought out in contributions that impose a linear tax structure.

¹¹This is at variance with the results obtained by Mirrlees (1971) under different modeling assumptions; see also the discussion in Varian (1980).

taxation.¹² The absolute levels (y_0, y_1) should be such that the program is self-financing, at the second-best subsidy and tax rates; these rates would normally be increasing in the degree of risk aversion of the hypothetical wage earner and decreasing in the convexity of the deadweight cost functions. To a first (gross) approximation, these rates might be equal to the ratio of relative risk aversion R_R to the sum of R_R and the corresponding measure of curvature for the deadweight cost functions (defined separately for the subsidies and taxes). These guidelines are also indicative of the parameters that must be estimated if one wishes to translate qualitative prescriptions into an actual social security design – an issue to which I return in section 3.3.

3.2 Implementation

The characterisation just outlined is no more than an abstract guideline. It serves as a reminder of two principles: (i) risk aversion and absence of private markets for insuring *ex ante* the uncertainties affecting future lifetime incomes provide a strong rationale for extensive transfers, aimed ideally at substantial *ex post* equality of incomes; (ii) administrative costs and moral hazard entail serious limitations on the effective prospects for such transfer policies; attention should be focussed on how to bypass or minimise these limitations. The following remarks do not aim at exhausting the topic.

Remark 1 The form of redistributive transfers emerging from section 3.1 is quite simple: negative (resp. positive) labour taxes on the differ-

¹²A marginal cost (resp. yield) equal to one plus (resp. minus) some “marginal cost of public funds” would lead to a ratio $\frac{u'(y_0)}{u'(y_1)}$ between 2 and 4; for plausible values of relative risk aversion (assumed constant), the ratio $\frac{y_0}{y_1}$, would fall between .7 and .9, implying a fairly high degree of *ex ante* insurance. See however section 3.3, in particular footnote 17.

ence between actual income y_s and a reference level y_0 (resp. $y_1 > y_0$). Implementing such transfers is a matter of routine for the positive labour taxes, but less familiar for the negative ones, up to the occasional (but spreading) recourse to employment subsidies. Negative (resp. positive) labour taxes should be understood relative to the actuarial value of associated benefits; thus, the negative taxes might simply take the form of reduced social insurance contribution on low wages, as suggested in Drèze and Sneessens (1994) and elsewhere. Negative labour taxes are described and strongly advocated in Phelps (1997, chapter 8), to which I refer readers.¹³ That proposal deserves more attention than it has received, as an alternative to minimum wages, earned-income tax credits, negative income taxes or participation incomes.¹⁴

Remark 2 In several of the contributions quoted above, the admissible tax structure is a combination of a proportional income or labour tax and a flat lump-sum transfer. A lump-sum transfer, unrelated to employment is called “social dividend” by Meade (1989) or “unconditional basic income” by Van Parijs (1992); it was named “demogrant” by George McGovern during the 1972 presidential campaign in the US. It is also advocated under the name “participation income” by Atkinson (1995), who opens the door to restricting eligibility to those who work (possibly outside the market sphere) or are involuntarily unemployed. The idea is to let wages clear the labour market, while reforming the tax system to pay an unconditional basic income to all. This also frees some (like single mothers of young children)¹⁵ from the need to work in

¹³Phleps advocates non-proportional negative labour taxes, but that refinement introduces only a second-order modification.

¹⁴I generally share the view expressed by Phelps (1997) that negative labour taxes are in principle more appealing than these alternatives. See also Solow (1998) and Van der Linden (2000).

¹⁵Cf. Blank (1996).

order to survive, and provides correct incentives to work all around; indeed, wages should measure marginal productivity¹⁶ and could be earned without giving up benefits. It lies beyond my purpose to discuss in detail these alternative measures, or others still. To repeat, reconciling income protection (insurance) with full employment and incentives while minimising deadweight costs is an elusive art; further investigations and experiments remain desirable.

Remark 3 It may be objected that, from a long-run viewpoint, the main distortion introduced by income protection policies comes from reduced incentives to invest in education. The point is well taken, but invites the comment that income protection, progressive taxation *and subsidised education* go hand in hand. As a general first principle, private decisions to invest in education are undistorted if the tax rate on the additional earnings associated with education is equal to the share of subsidies in the total investment cost. That principle remains valid whether the tax takes the form of reduced benefits (at the low end) or direct contributions (at the upper end). Its application may call for differentiating subsidy rates by types of education (e.g. vocational versus college, a.s.o.).

Remark 4 My discussion of individual risks has been couched in terms of income uncertainty, meaning labour-income uncertainty. A similar reasoning could be applied to *ex ante* choices about different forms of contingent income protection, like disability allowances versus unemployment benefits versus pension rights. The same principle of risk sharing would work in the direction of equalising the levels of all forms of income

¹⁶Minimum wages may result in overemployment of those not entitled to unemployment or welfare benefits, if their marginal product falls short of disutility of work. On the other hand, it remains doubtful that competitive wage formation would emerge naturally under the proposed scheme.

protection (up to the ancillary qualification that benefits tied to special circumstances might be adjusted to special needs). That principle is advocated for instance in Lindbeck *et al* (1994). I concur.

3.3 Political economy considerations

In section 3.1, I have presented the *ex ante* argument for social insurance. It rests on hypothetical reasoning, on a *gedankenexperiment*. But any program conceived today for the *ex ante* benefit of future generations could be voted down and repealed tomorrow, if it lacks *ex post* political support. There is a *time-consistency* issue. Thus, my hypothetical workers will know tomorrow where they stand in the wage distribution, and will evaluate accordingly the costs and benefits of the program. To use a “median voter” illustration, if the reference wage y_1 of section 3.1 were lower than the median, it would be in the interest of a majority to repeal the program, or at least to modify it so as to push y_1 up to the median. There is no logical difficulty in introducing into the formal analysis a *constraint* to the effect that, say, y_1 should be greater than or equal to median wage. That would be an instructive exercise.

More realistically, it must be recognised that a social security system is the outcome of a political decision-making process, hopefully guided by economic reasoning and quantitative empirical research, but still reflecting in the end political leadership and bargaining. Economic analysis supplies political decision-makers with some guidelines on desirable policies. Translating such guidelines into quantified policy instruments raises a serious accuracy problem. We do not have a sufficiently convincing model of the economy, nor sufficiently accurate estimates of several key parameters (elasticities of labour supply and demand, risk tolerances...),¹⁷ to propose a specific design with confidence that it is close

¹⁷Numerical estimates of relative risk aversion are revealing of our uncertainties.

to being *ex ante* second best. This is not to say that estimation is worthless. On the contrary, it says that experience should be sought and accumulated, so that we be less ignorant tomorrow than we are today. The quantitative design of a social insurance system is not yet reducible to economic calculation. It remains a major policy decision, that should be in the foreground of both public debate and scientific research.

4 Individual Risks: the European Dimension

I have mentioned in section 2 that efficient risk sharing calls for pooling all risks and sharing them on the basis of risk tolerances. An efficient national social security system aims at doing precisely that, for the nationals covered by the system. The logic of global pooling would seem to plead for setting up an integrated social security system at the EU level. That conclusion is unwarranted, however: section 3 concerns microeconomic risks, which are globally non-existent. There is no insurance gain from pooling non-existent risks.

Of course, one could claim that the reasoning of section 3 should be applied directly to the European level. That is, the “reference group” mentioned in section 1.1 should be the EU, not some member state. The hypothetical worker, whose *ex ante* preferences are considered behind the veil of ignorance, would then be modeled as having equal probabilities of landing in the shoes of any worker *in the EU*, rather than any worker *in a given member state*. Such an approach calls for equalising oppor-

Friend and Blume (1975), recently confirmed by Szpiro (1986), suggest values between 1 and 2; more recently, Blake (1996) provides estimates ranging between 8 and 48 (sic!) as the size of financial portfolios varies between £ 35.000 and £ 500. In footnote 12 above, I use values of 4 and 8, for indicative purposes.

tunities across the Union, in spite of the substantial differences in initial conditions between member states. From the analytical viewpoint, section 3 would stand – with a broadened domain of application: it would suggest guidelines for a Union-wide social-security system. In the short and medium run, this would result in substantial redistribution between member states, exactly the kind of transfers which the Union has refused so far, limiting itself instead to the targeted programs covered by the so-called “structural funds”. I do not discuss further that broad political problem; see however section 6 below.

There is another Union-wide issue related to individual risks, namely fiscal competition. The process of European integration carries the threat of depriving national member states from the ability to pursue autonomous social insurance policies. The argument to that effect is expounded, in particular, by Sinn (1990, 1998); see also Atkinson (1995b, chap. 14). From the long-run viewpoint adopted here, it does not help to remark that labour mobility remains limited in Europe today. First, *marginal* mobility is the more relevant phenomenon, and it is rising. Second, Europe may be expected to attain a high degree a labour market integration before the end of the twenty-first century. The issue of fiscal competition should thus be faced squarely.

In an integrated labour market, real net earnings at a given skill level should be approximately equalised across locations. To study the implications of labour taxes or subsidies, one must model wage formation, as done for instance in Wildasin (1991, 1995). One significant feature of such models is the following: a member country implementing a social insurance scheme which redistributes incomes from the high-skilled to the low-skilled induces at equilibrium a more compressed wage distribution *in the Union as a whole*, thereby reducing the cost of implementing similar policies in other member countries. *There is an externality*, not

captured by the first country, and apt to result in an insufficient degree of redistribution, at a non-cooperative (Nash) equilibrium. Superior equilibria require cooperation, either in the form of an integrated Union-wide social insurance scheme, or in the form of lump-sum or matching grants (some positive, some negative) from the Union to member states.

Sooner or later, the EU will have to face that thorny problem . Promoting efficiency on markets for private goods while accepting inefficiency in an area as important as social security would not make sense. In the meantime, specific labour taxes in individual member states are compatible with labour market integration - in the same way, *and subject to the same limitations* that, say, different mixes of direct and indirect taxes are compatible with economic integration. What matters to firms choosing their location is overall cost considerations. If one country adopts (relative to its neighbours) lower taxes on unskilled labour but higher taxes on skilled labour, it will attract firms which use more intensively unskilled labour. If the country's labour force is biased towards low skills, such a policy may be advisable; it is definitely compatible with equilibrium of an integrated labour market (with equalised net earnings at each skill level).

5 Macroeconomic Risks: National Analysis

The subject matter of section 3 was the uncertainty faced by a future entrant to the labour market about her position in the wage distribution at the time of entry. A static analysis is broadly suitable for that subject matter. Also, the zero sum property (through *ex ante* insurance) of the suggested policies leaves out the uncertainties affecting the overall wage distribution, i.e. the macroeconomic uncertainties, to which I turn now. The more interesting domestic issues concern risk sharing between capital

and labour on the one hand, between successive generations on the other hand. My concern bears on how they affect the lifetime earnings of individuals.

The main channel of risk sharing between capital and labour in advanced economies is the government budget. Let a government tax capital incomes and labour incomes, to finance public goods or services benefitting all citizens independently of their actual tax liabilities. *Fluctuations in the labour share* are reduced by the tax collections, thereby reducing the variability of real incomes (net of taxes but inclusive of public services). Given the size of the public sector in Europe, this channel is significant (though limited by fiscal competition for capital income taxation).

A more ambitious program of risk sharing between capital and labour would call for linking the tax rates on profits negatively, and the tax rates on labour incomes positively, to the labour share. With a labour share averaging, say 70% of national income and oscillating between 65% and 75%, the full stabilisation of the after-tax labour share would result from adjustments in the tax rates on profits (resp. labour) not exceeding 14 (resp. 7) percentage points. A practical difficulty would come from the fact that the capital share does not consist solely of profits but also of real estate income, rents of all kinds, incomes of self-employed and the like, all of which are subject to distinct tax regimes. I have not pursued further this matter, which is of limited long-run relevance given that the labour share is not trended. But I use this opportunity to raise the issue and invite further research.¹⁸

Intergenerational risk sharing is an interesting subject in its own

¹⁸In Drèze (1993), I have considered the related issue of linking labour taxes to the rate of unemployment.

rights. A seminal paper by Gordon and Varian (1988) develops a very natural idea. Living generations cannot participate in bearing risks that will materialise beyond their own horizon. But they can share with future generations the risks (as yet pending) that will be resolved during their own lifetime. This simply calls for making positive or negative additions to the capital stock which they bequeath to future generations – positive if the realisation is more favourable than expectations, negative otherwise, balanced on average (subject to a suitable risk premium). As this forward-shifting affects a growing number of future generations, the risks borne by each generation are spread increasingly thinly, and the associated risk premium falls *pari passu*. Asymptotically the risk premium could vanish.

Gordon and Varian illustrate the principle for an overlapping-generations economy where the (otherwise stationary) endowment of each generation is subject to a random shock. The successive shocks are i.i.d. with mean 0 and variance σ^2 . If each shock is spread evenly over n generations, then in steady state each generation shifts forward a fraction $\frac{n-1}{n}$ of its own shock and bears a risk equal to the average shock of itself and the preceding $n - 1$ generations, which has mean 0 and variance $\frac{\sigma^2}{n}$ (thanks to the independence assumption). Had the realisations been perfectly correlated, there would be no reduction in variance; realism lies somewhere inbetween.

Such a scheme requires public intervention, because private agents would find it difficult to finance a contemporaneous negative shock through bonds to be redeemed by their heirs.¹⁹ It is accordingly doubtful that private capital markets support an efficient intergenerational sharing of risks – as confirmed by the surprisingly high risk premia prevailing on

¹⁹In my home country Belgium, heirs have the standard option of rejecting an inheritance of negative net value.

these markets (the so-called “equity premium puzzle”).²⁰ The public sector does engage in some intergenerational burden sharing, for instance when financing wars. Here again, a time-consistency problem arises: a generation experiencing a favourable outcome may decide to keep the benefits to itself, putting the scheme in jeopardy.²¹ I have not investigated further this problem, which I bequeath to future researchers. It is an important problem, as we may be missing an opportunity to reduce risk premia significantly.

6 International Sharing of Macroeconomic Risks

6.1 New financial instruments

Everywhere in the world, social security, where it exists, is a national responsibility. In federal political entities, some responsibilities are delegated to member states, but a form of mutual insurance is typically present at the federal level. Social security improves risk sharing among the members of a nation; but these bear together the nation’s macroeconomic uncertainties. To a limited extent, international capital markets enable individuals to diversify the risks of their non-human wealth. The extent is limited because many assets are non-marketed (real estate, unincorporated businesses, ...). Where markets exist, few asset-holders own internationally diversified portfolios, see Baxter and Jehrman (1997).

As noted in section 2, international risk sharing could be achieved

²⁰See e.g. Kocherlakota (1996). It may be remarked that models with an infinitely-lived representative agent assume implicitly full intergenerational risk sharing.

²¹Kimball (1988) discusses in greater depth a simple example where time consistency appears plausible.

on a two-tier basis, with countries sharing macroeconomic risks between themselves in addition to organising a domestic social security. A simple way of implementing international risk sharing goes as follows: *each participating country issues perpetual bonds paying annual dividends proportional to the country's national income; countries exchange these bonds among themselves so as to end up with efficient portfolios.*²² The principle is straightforward. The implementation raises a number of issues which are better understood in the light of the explicit formula for efficient portfolios corresponding to linear sharing rules.

Linear sharing rules are efficient if all participants to the exchange have the same, constant relative risk aversion. I am here concerned with risk sharing among member countries, the upper tier of a two-tier arrangement. In part for simplicity of a tentative first exploration, in part for lack of good reasons to proceed otherwise, I assume in what follows that aggregate relative risk aversion is identical for all member countries and constant. The efficient portfolios are then easily characterised. Each country should hold a fraction of the pooled risks equal to its share of expected aggregate income, and a (positive or negative) safe asset (indexed bond) amounting to its specific risk premium (the difference between the risk premium corresponding to its share of the pool and the risk premium defined by the covariance of its own national income with the aggregate). Thus, each country would exchange its entire national income Y^j against a share of the aggregate income Y , namely a share given by $B^j = \frac{\bar{Y}^j}{\bar{Y}}$, and a transfer A^j representing a positive or negative risk premium.²³

²²This suggestion was formulated in 1997 independently by Drèze (1999) and (in a somewhat different guise) by Obstfeld and Peri (1998). An independent rationale for issuing such bonds, and an analysis of some of their properties, appears in Shiller (1993), whose work has influenced my own thinking in this area.

²³Whether a government should allocate the net yield of its portfolio to its overall

The first and foremost conclusion to be drawn is that such an exchange raises at the national level the same moral hazard problem which stands in the way of private insurance of individual income risks. Having transferred the entirety of its national income to a pool, of which it owns a small share, a country would have no incentive to pursue growth-promoting economic policies. The efficient risk-sharing arrangement is not feasible, on this ground of moral hazard. . . .

I do not think that we are ready to model formally the implications of mutual insurance for the choices of economic policies and ultimately for growth rates of national incomes. The analogy with individual expected utility maximisation is too remote. The only benchmark that I can think of is the record of federal nations, like the US, Canada, Germany, a.s.o.. Federal tax and benefit systems imply a form of mutual insurance among the member states. A standard reference figure for the US is that 30 to 35 percent of idiosyncratic shocks affecting value added in an individual state are absorbed by the federal tax-and-benefit system. In other words, there is a mutual insurance scheme pooling 30 to 35% of state incomes.²⁴ The literature on fiscal federalism does not allude to a serious moral hazard problem tied to this level of insurance.²⁵ Instead, it is commonly claimed that a comparable degree of mutual insurance would be desirable in the European Monetary Union, to alleviate the impact of idiosyncratic shocks. I shall accordingly be pragmatic and regard as realistic an arrangement whereby European countries issue bonds in-

budget, or earmark it for special purposes (like the social security budget), is for that government to decide, as part of its lower-tier risk allocation policy.

²⁴This proportion characterises gross risk pooling. Because the citizens of each state are affected by federal revenues and expenditures, which include 30% of the risks affecting all states, the extent of net risk pooling is lower (and not ascertained with full accuracy); see Fatás (1998) and references there.

²⁵See Persson and Tabellini (1996) for a positive discussion.

dexed on their own national incomes, to the tune of 30% of these incomes, and exchange such instruments among each other.

6.2 Open questions

Even under the pragmatic arrangement just described a number of questions must be faced.

(i) *Moral hazard* is a more pervasive issue than just growth policies. In an international context, exchange rates come in. One exception is the European Monetary Union with its single currency Euro. I propose aiming at a first risk-sharing arrangement as described above among the members of the EMU only. Otherwise, special precautions are needed, to prevent a national government from manipulating exchange rates to its benefit.²⁶ Also, idiosyncratic shocks can be met through real adjustments – from price flexibility to factor mobility. Mutual insurance reduces the incentives for these adjustments, thereby creating another moral hazard problem.

(ii) *Trade*. Should the indexed perpetuities be tradable and quoted on stock exchanges? A first reaction is affirmative, on the grounds that the new assets would enlarge the opportunity sets of private traders. Shiller (1993) makes his case for the creation of such bonds entirely on the basis of trading (hedging) opportunities for households and corporations.²⁷

²⁶Another moral hazard issue concerns income reporting. Clearly, common accounting standards should be followed by all participating countries, and should be monitored. This problem is largely resolved inside the European Union, which has adopted common accounting standards (SEC). Possibly, monitoring should be tightened. The problem is akin to that of monitoring accounts of firms traded on the stock exchange.

²⁷His case rests in particular on the observation that marketed assets account for a very small fraction of a country's GNP: in the US, which has the most developed set of financial markets, that fraction is only 7%, according to Shiller (1998). Shiller

There are however some dangers. First, trading on financial markets would enable governments to float additional issues, thereby creating the moral hazard problem mentioned above. Second, market prices for assets indexed on a country's national income could be interpreted by voters as measuring a government's performance; or politicians might anticipate such an interpretation, with the same consequences. Welfare enhancing policies like health care for the elderly, that do not affect national income positively, would then be penalised. And the excess volatility of financial markets would introduce noise in policy appraisal. All this is clearly undesirable.²⁸

These objections do not apply to market trading of the pooled security paying dividends indexed on the EMU aggregate income. Such a market would enlarge individual opportunities; it would also enable country governments to reallocate their portfolios between that security and other assets, at market prices.

(iii) *Pricing*. If EMU member countries were to exchange among themselves securities indexed on national incomes and not traded on financial markets, at what prices should the exchange take place? This is a genuine issue, which invites further research. The purpose of the scheme is to organise efficient sharing of long-term income risks, not to smooth short-run fluctuations. The problem in defining initial prices is to estimate for each country the ratio of its expected long-term income to the EMU aggregate, and the covariance between these two variables.

(1993) also addresses the question why the proposed securities have not been issued by the private sector. I am not surprised, given that indexed bonds are not issued privately either; see Drèze (1992, section 12) for an explanation.

²⁸Obstfeld and Peri (1998) argue that countries would feel motivated to pursue growth-enhancing policies so as to increase the market price at which they could float new bonds. I am reasoning for initial trades, limited to 30% of GDP.

That problem must be solved now for the existing members of EMU, then again for each new member. There are basically two approaches to the problem.

The first analyses historical data in the framework of a theoretical model of asset pricing. This is done by Shiller (1993, Table 4.1), who calculates the present value (in 1990) of perpetual claims to national incomes of 54 countries, by means of the “log-linearised present value model” of Campbell and Shiller (1988).²⁹ His analysis could be updated and replicated for EMU member countries.³⁰ Shiller’s 54 countries do not include East European candidates to E(M)U, however; due to lack of data and to structural transformation, the approach is not directly applicable to these countries.

A second approach would recognise that there is convergence in the EU. The member countries whose per capita incomes were much lower than the EU average 30 or 40 years ago grew faster than the average.³¹ This catching-up process is bound to slow down as convergence improves. Forecasting the ratio of expected income $\bar{Y}^j$ in country j to the EMU average $\bar{Y}$ amounts to forecasting country j ’s convergence (or lack thereof). A general model of long-run convergence could be estimated from regional data for a set of countries, and applied to new entrants from Eastern Europe. In its simplest form, such a model might assert that the percentage gap between per capita income in country j and in EMU is expected to close down at some fixed annual rate (like 1.5% or 2% per

²⁹This calculation includes a risk premium, which could be extracted to define the safe asset component of each country’s efficient portfolio.

³⁰Covariances with EMU aggregates will differ from covariances with world aggregates.

³¹The process is roughly comparable to that observed in the US over the past century; see Wildasin (1991, p. 767) and references there.

annum). Risk sharing would then call for transferring to the Union 30% (in my proposal) of the difference between *actual* and *predicted* convergence. The analytics of a specific scheme remain to be worked out, as this approach extends the simple portfolio formula of section 6.1 to treat the ratio $\frac{\bar{Y}^j}{\bar{Y}}$ as time dependent

The numbers suggest that a pragmatic approach might work.³² For current members of EMU, convergence is already substantial, and national incomes display high correlations. Thus for 8 of 11 EMU countries representing 97 % of aggregate EMU income, the historical correlations (R^2) between the annual growth rates (per capita) of Y^j and Y range between .7 and .9; the ratios $\frac{\bar{Y}^j}{\bar{Y}}$ could thus be estimated more precisely than the numerators and denominator separately. Using current values, averaged over a few years, for Y^j and Y might provide a tolerable approximation to $\frac{\bar{Y}^j}{\bar{Y}}$ for these 8 countries. This could be complemented by a generous treatment of the remaining 3 countries (Ireland, Luxembourg and Finland), which together account for a mere 3% of Y . Similarly, the aggregate income of Eastern European candidates is but a small percentage of the EMU aggregate.³³ The EMU members could thus provide insurance to these candidates at little exposure, and this would be desirable on two grounds: the uncertainty is high, and it is currently borne by the relatively poor.

³²It may be remarked that the estimation difficulties mentioned in the text could not be eluded by private agents participating in stock-exchange trading.

³³About 5%, at official exchange rates, for the 10 leading candidates combined; and the insurance would be limited to 30% of GDP.

7 Conclusions

In this paper, I have surveyed a number of issues related to economic and social security in the long run. Some general conclusions emerge, and a number of open problems stand out. I summarise these under two headings – individual then macroeconomic risks – distinguishing conclusions (C1, C2) and problems (P1, P2).

C.1 *Individual risks* – a person’s place in the wage distribution – loom large among the uncertainties surrounding the incomes of future entrants to the labour market. Income prospects for workers who will end up with low skills relative to market demand are a source of long-run concern, in Europe. Efficient risk sharing calls for wage subsidies at the low end of the wage distribution financed by labour taxes at the upper end, or some equivalent therefore. Such a policy goes beyond a safety net geared to individual contingencies, though these two forms of insurance should be integrated in a consistent design with related levels of income protection. The main limitation to *ex ante* insurance comes from incentives (moral hazard) and other distortions created by *ex post* transfers. Full income equality, to implement *ex ante* risk-sharing efficiency, and absence of distorting taxes and transfers, to implement *ex post* productive efficiency, define the two poles between which a second-best compromise must be sought.

P.1 The precise design of a second-best policy raises a number of problems that remain on the research agenda. One set of problems concerns the choice of instruments (wage subsidies, minimum wages, tax credits, participation income ...) apt to minimise distortions. A second set of problems concerns the estimation of parameters entering the definition of second-best policies (risk aversion, elasticity of labour supply, marginal costs of public transfers,...). A third set of problems concerns political

feasibility, in particular time consistency and fiscal competition in the EU. On all these fronts, there exist well-defined research challenges.

C.2 *Macroeconomic risks* raise the issue of organising efficient risk sharing along three dimensions: between capital and labour, across successive generations and among EU member countries. Given that the labour share is not trended, improved risk sharing between capital and labour concerns mostly temporary fluctuations, not the long run uncertainties on which this paper focusses. The prospects for improved intergenerational risk sharing are possibly more significant, though less well understood. They suggest a potential for lower risk premia. The international dimension is particularly significant for Eastern European countries aspiring to join the EU; their current income levels are relatively much lower, and there is substantial uncertainty about the rate at which their incomes will converge. A rather simple scheme would call for each EMU member country to issue bonds indexed on the country's nominal national income and to exchange these for a diversified portfolio of similar bonds issued by the other members. Such a scheme offers scope for improved international risk sharing. The extent to which this scheme could be implemented remains limited by moral hazard considerations.

P.2 The positive and normative analysis of intergenerational risk sharing deserves research attention. So does the prospect for improved international risk sharing through exchange of bonds indexed on national incomes. One important open question is the desirability, or not, of trading such bonds on stock exchanges. In the absence of market prices, the initial valuation of such bonds requires quantitative investigation.

I have been treading here uncharted territory. It takes an occasion like this millennium special issue to allow oneself airing such speculative ideas. I am grateful for the opportunity.

References

- [1] Atkinson, A.B. (1995), *Public Economics in Action*, Clarendon Press, Oxford.
- [2] Atkinson, A.B. (1995b), *Incomes and the Welfare State*, Cambridge University Press, Cambridge.
- [3] Atkinson, A.B. and J. Micklewright (1992), *Economic Transformation in Eastern Europe and the Distribution of Income*, Cambridge University Press, Cambridge, UK.
- [4] Barro, R.J (1979), “On the Determination of the Public Debt”, *Journal of Political Economy*, 87, 940-71.
- [5] Baxter, M. and U.J. Jehrman (1997), “The International Diversification Puzzle Is Worse Than You Think”, *American Economic Review*, 87, 1, 170-180.
- [6] Blake, D. (1996), “Efficiency, Risk Aversion and Portfolio Insurance: An Analysis of Financial Asset Portfolios Held by Investors in the United Kingdom”, *Economic Journal*, 106, 1175-92.
- [7] Blank, R.M. (1996)), “Labor Markets and Public Assistance Programs”, *NBER Reporter*, Fall 1996, 11-13.
- [8] Campbell, J. Y. and R.J. Shiller (1988), “Stock Prices, Earnings, and Expected Dividends”, *Journal of Finance*, 43, 661-76.
- [9] Diamond, P.H., Helms, L.J. and J.A. Mirrlees (1980), “Optimal Taxation in a Stochastic Economy”, *Journal of Public Economics*, 14, 1-29.

- [10] Drèze, J.H. (1992), *Money and Uncertainty: Inflation, Interest, Indexation*, Banca d'Italia, Lezioni Paolo Baffi di Moneta E Finanza, Edizioni Dell' Elefante, Roma.
- [11] Drèze, J.H. (1993), "Can Varying Social Insurance Contributions Improve Labour Market Efficiency?" in *Alternatives to Capitalism: The Economics of Partnership*, A.B. Atkinson, Ed., MacMillan, London.
- [12] Drèze, J.H. (1999), "Jobs and Economic Security in the 21st Century", in H. Löffler and E.W. Streissler, Eds, *Sozialpolitik und Ökologieprobleme der Zukunft*, 65-96, Österreichische Akademie der Wissenschaften, Wien.
- [13] Drèze, J.H. and C. Gollier (1993), "Risk Sharing on the Labour Market and Second-Best Wage Rigidities", *European Economic Review* 37, 1457-1482.
- [14] Drèze, J. H. and H. Sneessens (1994), "Technical Development, Competition from Low-Wage Economies and Low-Skilled Unemployment", *Swedish Economic Policy Review*, 1, 185-214.
- [15] Eaton, J. and H.S. Rosen (1980), "Labour Supply, Uncertainty, and Efficient taxation", *Journal of Public Economics*, 14, 357-64
- [16] Eeckhoudt, L. and C. Gollier (1992), *Risk: Evaluation, Management and Sharing*, Harvester Wheatsheaf, New York.
- [17] Fatás, A. (1998), "Does EMU Need a Fiscal Federation?", *Economic Policy* 26, 163-92.
- [18] Feenstra, R.C. (1997), "International Trade and Investment", *NBER Reporter*, Summer 1997, 1-10.

- [19] Forni, M. and L. Reichlin (1999), "Risk and Potential Insurance in Europe", *European Economic Review*, 43, 1237-56.
- [20] Friend, I. and M.E. Blume (1975), "The Demand for Risky Assets", *American Economic Review*, 65, 900-22.
- [21] Froot, K.A. (1999), "The Market for Catastrophe Risk: A Clinical Examination", NBER Working Paper 7286, Cambridge (Mass).
- [22] Gordon, R.H. and Varian (1988), "Intergenerational Risk Sharing", *Journal of Public Economics*, 37, 185-202.
- [23] Harsanyi, J.R. (1953), "Cardinal Utility in Welfare Economics and in the Theory of Risk Taking", *Journal of Political Economy*, 61, 434-35.
- [24] Kocherlakota, N.R. (1996), "The Equity Premium: it's Still a Puzzle", *Journal of Economic Literature*, XXXIV, 42-71.
- [25] Kimball, M.S. (1988), "Farmers' Cooperatives as Behavior Toward Risk", *American Economic Review*, 78, 224-232.
- [26] Lindbeck, A., Molander P., Persson T., Sandmo A., Swedenborg B. and N. Thygesen (1994) , *Turning Sweden Around*, MIT Press, Cambridge (Mass.).
- [27] Lindbeck, A., S. Nyberg and J.W. Weibull (1999), "Social Norms and Economic Incentives in the Welfare State", *Quarterly Journal of Economics*, 114(1), 1-35.
- [28] Meade, J.E. (1989), *Agathotopia: The Economics of Partnership*, Aberdeen University Press, Aberdeen.
- [29] Mirrlees, J.A. (1971), "An Exploration in the Theory of Optimum Taxation", *Review of Economic Studies*, 38, 175-208.

- [30] Obstfeld, M. and G. Peri (1998), "Regional Non-Adjustment and Fiscal Policy", *Economic Policy*, 26, 205-47.
- [31] Persson, T. and G. Tabellini (1996), "Fiscal Federal Constitutions: Risk Sharing and Redistribution", *Journal of Political Economy*, 104, 979-1009.
- [32] Phelps, E.S. (1997), *Rewarding Work: How to Restore Participation and Self-Support to Free Enterprise*, Harvard University Press, Cambridge (Mass).
- [33] Rawls, J. (1971), *A Theory of Justice*, Harvard University Press, Cambridge (Mass.).
- [34] Shiller, R.J. (1993), *Macro Markets: Creating Institutions for Managing Society's Largest Risks*, Clarendon Press, Oxford.
- [35] Shiller, R.J. (1998), "Institutions for Managing Risks to Living Standards", *NBER Reporter*, Spring, 17-20.
- [36] Sinn, H.W. (1990), "Tax Harmonization or Tax Competition in Europe", *European Economic Review*, 34, 489-504.
- [37] Sinn, H.W. (1995), "A Theory of the Welfare State", *Scandinavian Journal of Economics*, 97, 495-526.
- [38] Sinn, H.W. (1998), "European Integration and the Future of the Welfare State", *Swedish Economic Policy Review*, 5, 113-32.
- [39] Solow, R.M. (1998), *Work and Welfare*, Princeton University Press, Princeton.
- [40] Szpiro, G.G. (1986), "Measuring Risk Aversion: An Alternative Approach", *Review of Economic and Statistics*, LXVIII, 156-59.

- [41] Van der Linden, B. (2000), "Fighting Unemployment Without Worsening Poverty: Basic Income Versus Reductions of Social Security Contributions", forthcoming in W. Saverda, B. Nolan and C. Lucifora, Eds, *Policy Measures for Low Wage Employment in Europe*, Edward Elgar, Cheltenham.
- [42] Van Parijs, P. (1992), *Arguing for Basic Income*, Verso, London.
- [43] Varian, H.R. (1980), "Redistributive Taxation as Social Insurance", *Journal of Public Economics*, 14, 49-68.
- [44] Vickrey, W. (1945), "Measuring Marginal Utility by Reactions to Risk", *Econometrica*, 13, 215-36.
- [45] Wildasin, D.E. (1991), "Income Redistribution in a Common Labour Market", *American Economic Review*, 81, 757-74.
- [46] Wildasin, D.E. (1995), "Factor Mobility, Risk and Redistribution in the Welfare State", *Scandinavian Journal of Economics*, 97, 527-46.