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International Portability of Health-Cost Coverage: Concepts and Experience

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by

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July 2011

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Abstract

Social insurance and other arrangements for funding health-care benefits often establish long-term relationships, effectively providing insurance against lasting changes in an individual's health status, engaging in burden-smoothing over the life cycle, and entailing additional elements of redistribution. International portability regarding this type of cover is, therefore, difficult to establish, but at the same time rather important both for the individuals affected and for the health funds involved in any instance of an international change in work place or residence.

In this paper, full portability of health-cost cover is taken to mean that mobile individuals can, at a minimum, find comparable continuation of coverage under a different system and that this does not impose external costs or benefits on other members of the systems in the source and destination countries. Both of these aspects needs to be addressed in a meaningful portability framework for health systems, as lacking or incomplete portability may not only lead to significant losses in coverage for an individual who considers becoming mobile – which may impede mobility that is otherwise likely to be beneficial. It may also lead to financial losses, or windfall gains, for sources of health-cost funding which can ultimately lead to a detrimental process of risk segmentation across national health systems.

Against this background, even the most advanced sets of existing portability rules, such as those agreed upon multilaterally at the EU-level or laid down in bilateral agreements on social protection, appear to be untargeted, inconsistent and therefore potentially harmful, either for migrants or for health funds operated at both ends of the migration process, and hence for other individuals who are covered there. Here, we develop a conceptual framework which can be used to clarify the implications of mobility for various types of systems covering health costs and the requirements which have to be met to ensure full portability. We conclude that, when individuals move from one source of health-cost funding to another, compensating payments between health funds may be needed that are based on changes in expected net costs – i.e., expected health costs minus expected contributions, adjusted for health-cost inflation, wage growth, long-term (non-) sustainability and properly discounted over time – in both of the systems involved. Through illustrative simulations, we show that there may indeed be sufficient leeway for this approach to be operative under real-world conditions.

JEL Classification: F22, F55, H51, H73, J6

Keywords: Social insurance, health costs; migration, international portability; fiscal externalities, risk segmentation

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1 Introduction

The need for health care is a life-long risk, possibly materializing at any point during one's life cycle. Many health-insurance schemes or other institutions catering for this need are therefore offering, at least potentially, a life-long relationship. Possessing some kind of cover against this risk is also vitally important from an individual's perspective with the costs of health care at times amounting to a notable fraction of income. Indeed, in extreme cases, health costs incurred at the individual level can easily exceed one's current, or even life-time, income. In addition, expected health costs have a strong life-cycle dimension, *i.e.*, they are not flat over an individual's life cycle but typically increase at higher age by a considerable margin, while payments made by the individual to obtain health-cost cover often do not follow this profile.

Taken together, these aspects imply that all kinds of mobility of individuals almost necessarily raise a portability issue of some significance. This applies to changes in residence or occupational status which may trigger a switch between health funds located within a given country as well as to various forms of international migration involving moves between health systems operated in different countries. This paper mainly looks at the consequences of international mobility for how health benefits are provided and, more importantly, how they are funded, both from the perspective of the individuals affected and from the perspective of the funding bodies. Portability problems arising within countries are nevertheless of some interest for us, since they can be similar in their nature and since the rules applied to solving these problems may involve some lessons with respect to our main theme. An aspect which is peculiar about international mobility and portability in health care is that health-care benefits mostly consist of medical services which can be delivered most easily where individuals are currently staying. Health-cost funding can of course be provided across jurisdictional borders, but there are various scenarios in which shifting the relevant responsibilities should nevertheless be considered.

Systems of health care and health-cost funding are rather diverse across countries. In most countries, developed ones as well as more advanced developing ones, funding health-care benefits for the majority of the population is subject to mandatory arrangements. Funding institutions are strictly regulated and often run by the state, or benefits are provided in-kind by tax-financed public health services. Until very recently, the US offered one of the few exceptions, though a very prominent one, from any of these observations. There, private, employer-based insurance is effectively the dominant form of funding health care for working-age individuals and their families. In some other countries, private insurance plays an important role as well, either as a substitutional form of cover (based on differentiated membership rules in public systems, opt-out clauses, etc.) or as a source of supplementary provisions. Here, we will try to take care of this diversity, which

clearly adds to the complications of addressing the international portability of health-care benefits, concentrating on conceptual considerations that should be relevant under any specific arrangement, but illustrating our ideas mainly for public systems of health-cost funding.

Thus far, the economic aspects of international portability in the area of funding health-care benefits are largely unexplored, certainly with respect to publicly provided forms of cover. Important exemptions are given by Holzmann et al. (2005), Avato et al. (2009) or Holzmann and Koettl (2011), the latter providing an in-depth treatment of health care, while the former two are less specific, dealing with portability in social protection in a broader fashion. There are a limited number of reviews of the legal framework for access to health care in foreign countries (see, e.g., Sieveking 2007, Pieters and Schoukens 2009) and of potential repercussions of cross-border utilization of health services and international migration on national health systems (see, e.g., Sieveking 2000, Eichenhofer 2002 or Schulte 2003). There are also a few studies on international portability of social security and health care benefits focusing on rules applied in particular countries (e.g., Avato 2008a, 2008b) or at a regional level (e.g., Woolford 2009, Olivier 2009 or Makhema 2009). In addition, there is some amount of economic literature on portability in the context of "internal" mobility, i.e., with respect to switches between insurance providers within countries (see Dowd and Feldman 1992, Gruber and Madrian 1994, Pauly et al. 1999 or Rashad and Rapong 2006 for the US system of employer-sponsored private insurance; Meier 2005 or Baumann et al. 2008 for substitutional private health insurance in Germany; and probably other contributions we are not aware of for arrangements specific to other countries). To the best of our knowledge, however, practical arrangements regarding compensation for health costs incurred under foreign systems have never been analyzed regarding their appropriateness or even optimality. In this paper, we will thus build on the limited body of literature, examining the practical experience gathered under existing rules, and will attempt to develop a conceptual framework for designing appropriate portability arrangements under real-world conditions.

A number of current trends add to the significance of our theme. First, international mobility is continuously growing, the total number of international migrants is expected to reach 214 million people in 2010, almost three times as many as in 1965 (75 million; see Hatton and Williamson 2002 and UN 2009). Second, in developed countries and in a growing number of developing countries demographic change may place a notable strain on systems covering health costs,[1] forcing health funds and their public supervisors to

[1] At closer inspection, this strain may not only, even not mainly, be due to population ageing (see Zweifel et al. 1999 or Breyer et al. 2010). Rather, demographic pressure appears to be strongly reinforced by the cost-side effects of medical progress. Still, throughout the world the financial situation of schemes providing or funding health care is expected to deteriorate substantially in the next few decades.

consider more carefully the consequences of international mobility through both inward and outward migration for the financial viability of their schemes. Third, expected financial strain is triggering major changes in health-care systems and will continue to do so, with partial privatization or an introduction of elements of pre-funding being among the major options that remain in order to keep existing public schemes sustainable (see, e.g., Meier and Werding 2010). The portability of acquired rights in private or partially pre-funded schemes is certainly not less complicated than in public, unfunded schemes – even though the consequences of mobility across health funds have already been investigated more for the former than they have been for the latter.

It is important to note that young, healthy immigrants are usually considered a net asset for health systems of the countries receiving them, implying that health systems in sending countries incur a loss when these individuals emigrate. Things may be the other way round, if the migrants' health status is poor or if their age is higher. For instance, this latter scenario may apply to individuals who return home as pensioners, having worked abroad for a substantial fraction of their active life span. Against this background, our ambition is to shed more light on the effects of current portability regimes for health-care benefits and to provide insights as to how these effects could be managed more actively and more in line with the underlying economic and fiscal consequences of mobility.

The structure of the present paper is as follows. In Section 2, we will highlight two aspects that are very important for designing portability arrangements for health-cost cover, viz. the typical age-related profile of expected health costs as well as the various elements of insurance and redistribution that are, or can be, involved in actual schemes funding these costs. In Section 3, we will survey important parts of the international experience in establishing portability of health-care benefits and their funding across countries or within-country portability between health funds. We will then unfold a conceptual framework for portability of health-cost cover in Section 4 and discuss the policy implications of our approach in Section 5. Section 6 concludes, summarizing our main observations and ideas and pointing to issues that deserve further consideration.

2 Health-care benefits and portability: important aspects

Before we can move on to discussing portability arrangements, existing ones as well as conceptually more appropriate ones, we first need to demonstrate in more detail why portability is a potentially important issue with regard to health-cost funding. There are two features that we would specifically like to highlight. Firstly, the profile of average health costs over the life cycle, taking into account the differentiation of these costs by health status (Section 2.1), and second, all the elements of insurance and redistribution which

are typically combined, in differing bundles, in existing systems funding health costs (Section 2.2).

2.1 Typical life-cycle profiles of health costs

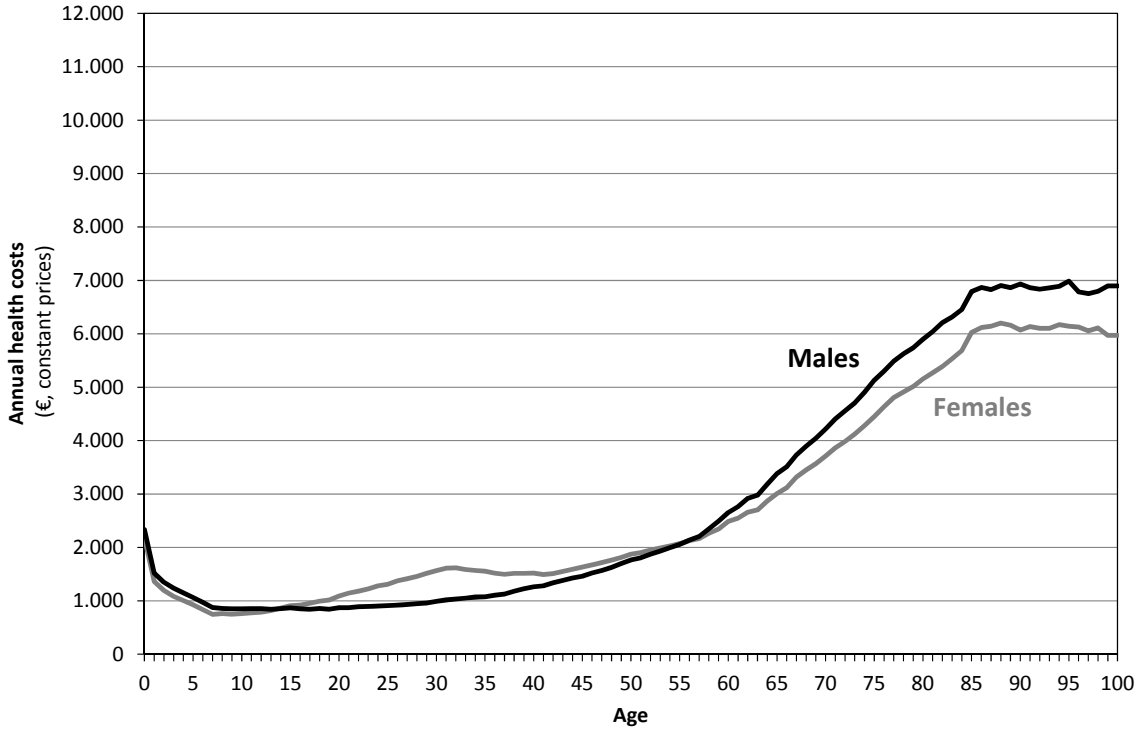
As a rule, average health costs are not flat over a given individual's life cycle. Instead, following relatively high costs in the year of birth and a longer period with rather low costs, they typically increase with age from about age 45 onwards, with an accelerating rate of increase after age 65. The increase tends to be steeper for males than for females, the latter often having higher health costs than males between age 15 and 55, but relatively lower health costs afterwards. For countries where the relevant data are available, these observations are almost universal. However, what may differ substantially across countries is the level of these profiles, with different amounts of (age-invariant) per-capita health costs or different shares in GDP spent on health reflecting huge differences in the cost, quality and efficiency of health services provided in each country.

To illustrate what we have just said about age-related trends in health costs, Figure 1 shows sample profiles based on average public health expenditure for males and females in countries of the EU-15, i.e., in the group of relatively rich countries that were EU members already before 2004. The data is taken from a background report by Przywara (2010, pp. 15–7), while the underlying national expenditure profiles are also shown in an official EU-level document (European Commission and EU Economic Policy Committee 2009, pp. 118–19). For the US, with their more fragmented system of health-cost coverage for individuals in different age brackets, data of this kind is less easy to come by (see, however, Herring and Pauly 2006 for some amount of relevant information).

Originally, the profiles displayed in Figure 1 were measured in terms of percentages of GDP per capita. Here, they are converted into nominal values using per-capita GDP in Germany in 2010. By and large, they should thus approximate health-cost profiles that are currently observed for the German Statutory Health Insurance,[2] a public scheme covering about 90 percent of the German population. Note, in any case, that they are meant to reflect profiles of *costs covered by public health insurance*, not total health costs, which is exactly what is needed to address the problems of portability that could arise in a scheme of this kind. Patients' co-payments, out-of pocket payments, etc. are irrelevant in this context. For those who have it, supplementary private insurance may call for separate considerations and calculations to become portable. But different types of cover should not be mixed up, as the implications for portability may differ.

[2] This is confirmed comparing them to corresponding data from official German sources (see, e.g., Werding 2007, Figure 4, or Werding and Hofmann 2008, Figure 3.3).

Figure 1: Life-cycle profile of health costs of males and females in an EU-15 country (calibrated to data for Germany, 2010)



Sources: Przywara (2010, Figure 7); own calculations.

It is also important to note that the age profiles shown here relate to *average, or expected, health costs*. They are thus the result of accidental fluctuations in annual health costs arising for a large number of individuals around an age-related upward trend. This upward trend, in turn, results from two components, viz. an increase in expected health costs for individuals who are basically in good health and a growing proportion of individuals whose health status has deteriorated, so that they incur higher costs. While conceptually clear, the differentiation of health costs by risk status is hard to pin down empirically due to, inter alia, a lack of sufficiently detailed data. In a paper on how to optimally insure changes in health status in a US-style context, Herring and Pauly (2006) exploit micro-data from the US Medical Expenditure Panel Survey (MEPS) to calibrate simulations regarding the cost effects of changes in health status, differentiating between just two types of risks, that is, "low risks" in good health on the one hand and a comprehensive class of "high risks" in poor health on the other. In their study, being a "high risk" is considered a transitory phenomenon, with several years of higher expected costs following when this has happened. To obtain a clearer distinction of risk categories, we will change this definition, focusing on changes to a high-risk status that lift individuals to a

higher time path of expected costs on a permanent basis. As we see it, there are thus still two broad risk classes that can be characterized as follows.

- "Low risks" are individuals who are basically healthy, but require some treatment time and again; on average, they experience a small increase in expected health costs as they become older.
- "High risks" are individuals who have developed conditions requiring more costly treatment more regularly, so that their expected health costs are permanently increased; also, this occurs for a growing share of individuals as people get older.

If appropriate data were available, more refined classifications might be useful. However, in order to discuss the impact of changes in health status on the portability of health-cost cover, a simple dichotomous structure is fully sufficient. It also allows us to adapt data and observations in Herring and Pauly (2006) to our setting and to split up average cost profiles in the German Statutory Health Insurance system into risk-specific cost profiles (following Baumann et al. 2008 who do the same with respect to health-cost profiles for German private health-insurance contracts).[3] The results obtained for males are shown in Figure 2.

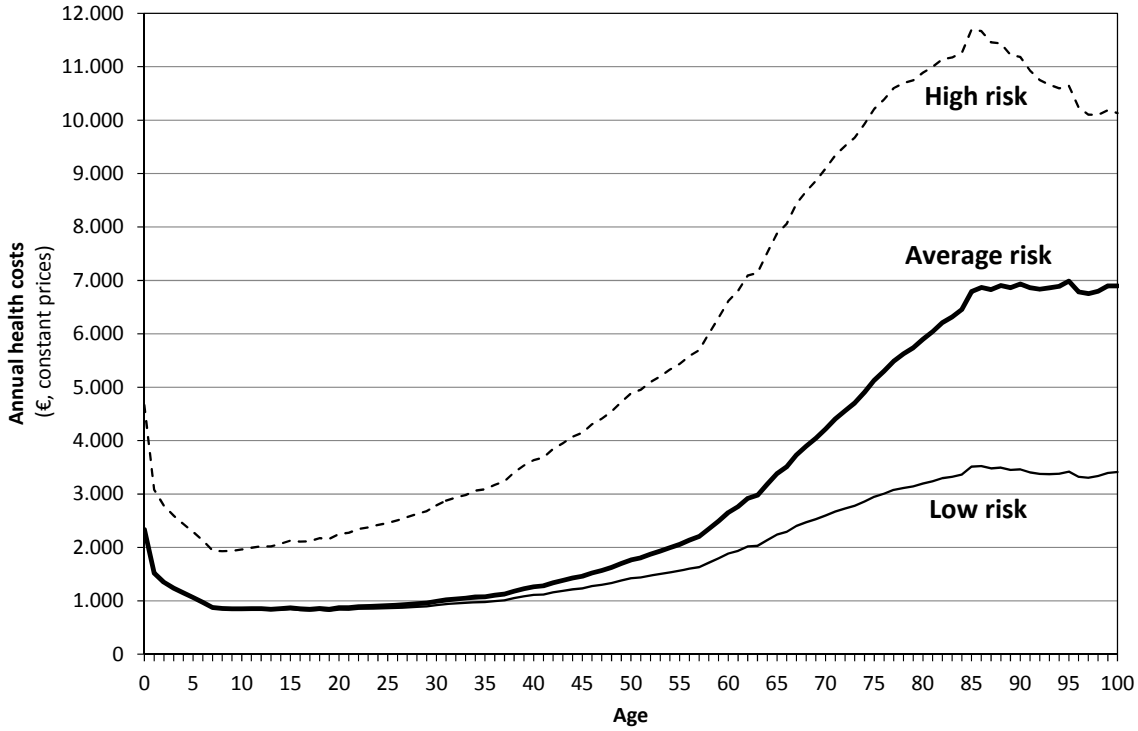
As a result of these calculations, expected health costs over the remaining life span are 2 to 3 times higher for high risks than for low risks at all ages. Note that individuals who are high risks in terms of increased annual health costs could be "low risks" in terms of prospective life-time health costs due to considerably shorter (contingent) life expectancies involved in our assumptions.[4] Also, expected life-time health costs of low risks reflect the fact that individuals in good health may become high risks with some probabil-

[3] See Baumann et al. (2008, pp. 300–2) for an in-depth discussion of information needed for this purpose. First of all, translating findings based on micro-data from Herring and Pauly (2006) to the present context rests on the assumption that all relevant structures are sufficiently similar across countries. Also, as the MEPS data only cover individuals from age 18 to 65, some of the trends showing up there need to be extrapolated at both ends of the age distribution. Specifically, we obtain the following calibrations.
  – *Transition probability from low-risk to high-risk status:* annual probabilities of a change in risk status within the next year are assumed to be *s*-shaped, going up from about .1 percent to about 3.5 percent over the entire life cycle; differentiation by gender does not appear to play a major role in this context.
  – *Mortality differential by risk status:* probabilities of dying before the next year are assumed to be 10 times higher at birth for high risks than for low risks; this differential declines at accelerating speed until age 45; afterwards the decline slows down, the relevant factor converging to 1.1 at age 99; again, there is no differentiation by gender.
  – *Cost differential by risk status:* health costs of high-risk males (in brackets: females) are assumed to be 3.5 (2.7) times higher than for low risks at age 64; this factor is symmetrically lower for younger and older individuals, being 2.0 (1.5) for individuals at birth, 3.0 (2.3) for individuals at age 100.

  These assumptions are all meant to be plausible but cannot be verified because of the limited data that are available on these aspects. Our following calculations are thus mainly illustrative. Still, we think them useful to demonstrate the implications of our ideas regarding portability of health care.

[4] Assumptions regarding the risk-specific mortality differential (see footnote 3) imply that life expectancy at birth is 65.3 for high-risk males and 79.4 for low-risk males, while it is 77.7 years for average risks.

Figure 2: Life-cycle profile of health costs of males in an EU-15 country, differentiated by risk status (calibrated to data for Germany, 2010)



Sources: Przywara (2010, Figure 7); own calculations.

ity at any point in time in the future. Together, these two effects could at least imply that the differentiation by risk status turns out to be immaterial for expected life-time health costs. However, our calculations suggest that this is not the case. The result is important because, to the extent that is realistic,[5] it has a direct impact on meaningful arrangements for making health care and health-cost cover portable across health funds and across countries.

Thus far, we have been looking at life-cycle profiles of health costs for a highly-developed country which has received a substantial amount of immigration over the last few decades (see, e.g., Geis et al. 2011). To a considerable extent, these migrants are

[5] The results in Herring and Pauly (2006) support the conclusion that, for individuals aged less than 65 and with a less sharp distinction of two risk classes than the one employed here, expected health costs for high risks exceed those of low risks. With simulations based on data from the US Health and Retirement Study (HRS), Sun et al. (2010) reach the opposite conclusion for individuals aged 65 and above (see also Webb and Zhivan 2010 for more details on their data and simulations). Potential reasons are that they may not be able to separate all individuals covered in the HRS into two risk classes, so that they effectively concentrate on a sub-group of high risks for which the cost differential vis-à-vis low risks is relatively small; or that they include costs for long-term care (which are less important for younger individuals and are not covered by the German Statutory Health Insurance scheme, hence not included in the health-cost profiles underlying our calculations). Considering the limitations of existing data, this issue clearly deserves further attention in future research for numerous reasons.

from less developed countries where health costs may follow a similar pattern, but are considerably lower on average. As portability arrangements will have to deal with such differences – for young people who migrate to a developed, high-cost country and probably also for older people returning home to a less developed, low-cost country once they have retired – we should also take a look at *health-cost profiles from a typical sending country*. Traditionally, the most important source countries for immigrants to Germany were Turkey and Yugoslavia, where the latter has now split up into a number of independent countries, Bosnia-Herzegovina, Croatia and Serbia being the biggest ones. While reliable, detailed data on health costs are not accessible for most non-EU countries, the fact that Slovenia is also part of former Yugoslavia and has entered the EU in 2004 may give us the opportunity to use comparable, good-quality from this country to provide another set of sample profiles of health costs accruing in countries where immigrants typically come from.[6]

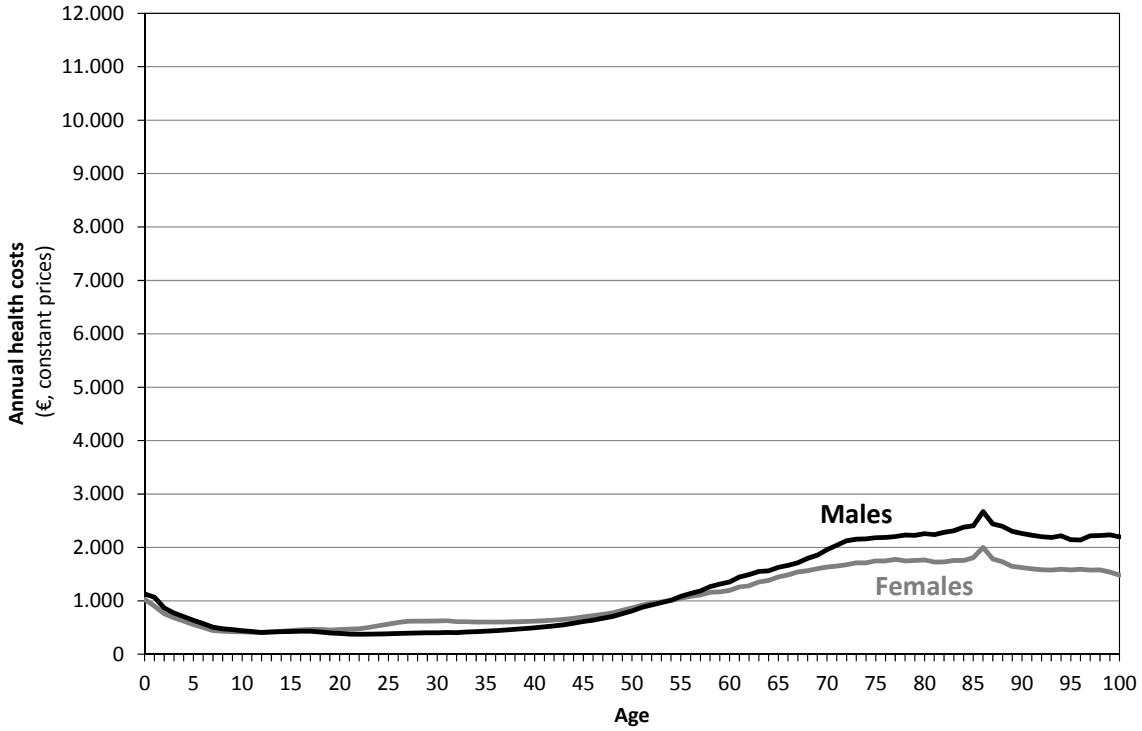
Figure 3 shows an approximation of age-related profiles of health costs covered by the Slovenian public health insurance scheme, as reconstructed from the calculations in Przywara (2010, pp. 15–7) regarding average public health expenditure in countries of the EU-12, i.e., in the countries that entered the European Union since 2004. Even when measured as a percentage of GDP per capita, average health costs in most EU-12 countries tend to be lower than in the EU-15 (see also European Commission and EU Economic Policy Committee 2009, p. 119). The difference becomes more pronounced when these profiles are converted into nominal values, using per-capita GDP in Slovenia in 2010 in the present case. Remember that these lower costs may reflect differences in cost, quality, and efficiency, while we are unable to disentangle the effects of each of these aspects.

In Figure 4, we split up the profile of average health costs for males obtained for Slovenia into risk-specific profiles, following the same procedures and using the same assumptions as in the case of Germany (since more specific information is again lacking). Later on, we will use these profiles and those reflecting health costs in Germany for further discussing portability problems related to health care for individuals migrating between similar pairs of countries.

An important aspect to keep in mind for an in-depth analysis of how to provide for portability of health-cost cover is that all figures displayed in this section show *cost profiles derived from a cross section*, i.e., profiles that relate to different individuals at dif-

[6] Clearly, data taken, say, from Turkey would be preferable in order to illustrate the consequences of international mobility between countries with different levels of health costs. It appears that, in terms of age-invariant averages, per-capita health costs in Turkey are still considerably lower than in Slovenia (cf. OECD 2011 for some amount of information on this point). To the best of our knowledge, however, break-downs by age or age groups do not exist for Turkey.

Figure 3: Life-cycle profile of health costs of males and females in an EU-12 country (calibrated to data for Slovenia, 2010)

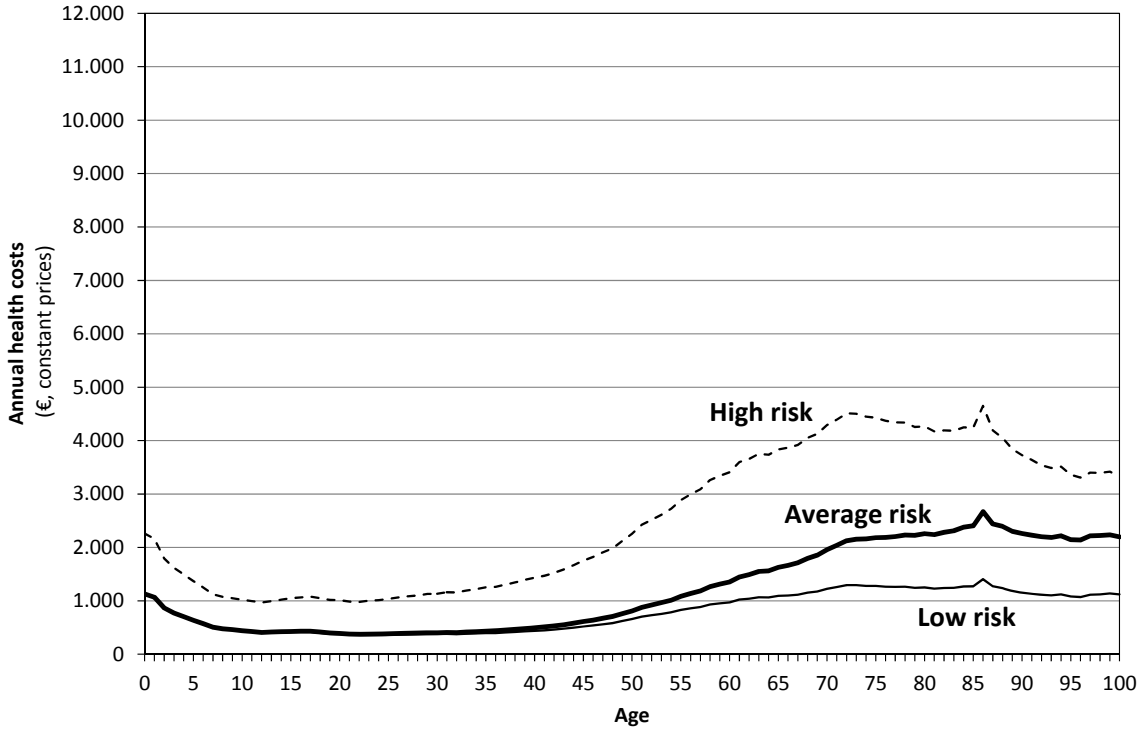


Sources: Przywara (2010, Figure 7); own calculations.

ferent ages in a particular year. In order to deal with expected health costs arising over individual life cycles in a truly longitudinal fashion, one also has to consider changes in health costs, and probably also changes in age-related health-cost profiles, over time. We will return to this issue in Section 4, when addressing cross-country differences in expected life-time health costs and their role for portability arrangements in more detail.

As we have tried to illustrate here using two stylized examples (again, see also European Commission and EU Economic Policy Committee 2009, pp. 118–19), the basic form of age-related health-cost profiles tends to be universal, while levels of costs may differ on absolute terms and, less so, as a share in GDP per capita or by similar relative yardsticks. Also, the way these costs are funded can be rather different across countries. Public health care or public health-insurance schemes are mostly financed from (earmarked) contributions or general tax revenues that vary with income (or other tax bases) and, for a given individual, could also be measured in terms of typical life-cycle profiles. Increasingly, public schemes also rely on lump-sum premiums that may not vary at all by income, age, gender or risk status. The structure of premiums collected in private health-

Figure 4: Life-cycle profile of health costs of males in an EU-12 country, differentiated by risk status (calibrated to data for Slovenia, 2010)



Sources: Przywara (2010, Figure 7); own calculations.

insurance schemes depends on the nature and duration of those contracts. Before we can discuss the consequences of these different regimes, we first have to take a closer look at the differences in health-cost cover across differing types of actual arrangements.

2.2 Cover for health costs: elements of insurance and redistribution

Health insurers and other institutions covering health costs are effectively providing quite a number of distinct services which need to be disentangled when discussing the problems involved in making cover for health costs portable across countries. Probably the most basic service of these institutions is that they act as specialized payment agencies collecting (and sometimes also checking) all invoices related to health services for their customers and reimbursing health-care providers for their efforts. Besides that, one can distinguish various further activities that are, or can be, carried out by existing health insurance schemes. We will divide them into a core set of *elements of insurance* and a number of additional *elements of redistribution*. The list of elements mentioned here is meant to be exhaustive in the sense that it incorporates, at least in a rough fashion, all types of services involved in actual arrangements. At the same time, depending on na-

tional traditions and national attitudes regarding risk-taking and redistribution, actual schemes may fail to comprise all of the elements listed here, even those considered to be core services.

a) Core elements of insurance

In addition to handling payments related to health services, covering health costs often involves one or more of the following elements of insurance:

- Cover for current health costs
- Insurance against prospective deterioration of one's health status
- Intertemporal burden smoothing

Cover for current health costs as the first of these elements effectively amounts to an insurance against accidental deviations in current, i.e. *annual, health costs* from the respective mean. Although it may be obscured by many other elements we are going to introduce and discuss here, it is part of any arrangement of health-cost funding we are aware of. To avoid various forms of moral hazard, insurance of this kind may be limited by co-payments or fixed deductibles, or insured individuals may have to make out-of-pocket payments for some types of services. Nonetheless, they are never exposed to the risk of paying for all their health costs in a given year without any limitation, or we would say that they have no cover for their health costs at all.

The second element, insurance against systematic changes in the individual time profile of expected health costs, is even more important for insured individuals, but it is also less wide-spread. In fact, it is conventional only in public health insurance or public health-care systems, while it is not included in most private health-insurance contracts. The reason is that this element requires absence of risk rating, as in most public schemes, or long-term contracts with clauses that inhibit regular risk re-assessment, which is in fact a rare exception rather than the rule in private arrangements.[7] If the second element is missing from a given system of health-cost coverage, individuals may end up paying risk-adjusted premiums following *risk-specific profiles* of expected health costs (see Figures 2 and 4). If the health-status risk is taken care of, and if there are no further elements of insurance or redistribution, annual premiums tend to correspond to the *average profile* of expected health costs (Figures 1 and 3). The upshot of this is that risk-specific annual premiums can become prohibitively high at higher ages. Older individuals may therefore drop out of private health insurance with annual risk rating, using public health insurance or public health-care systems as a fallback. If the latter is restricted by law, individuals

[7] German and Austrian private health insurance contracts appear to be the only major examples – due to common traditions in regulating this sector (see Baumann et al. 2008 for further details).

may be reluctant to buy private cover in the first place. By contrast, being covered by a public system usually entails the option of a life-long membership. Indeed, it typically offers full cover even for those who are born as high risks – a service that market-driven insurance would never provide.

The third element, intertemporal burden smoothing, typically builds on the second one, essentially shifting the financial burdens related to a given time profile of annual health costs across the life cycle. As a rule, it implies that premiums exceed expected current health costs for young individuals, while they fall short of expected current health costs for the old. Note that this type of "age-related redistribution" does not necessarily lead to interpersonal redistribution, as the present-value effects of these intertemporal shifts may cancel out over time. However, this is typically not the case in public systems where burden smoothing is mostly a by-product of age-invariant contribution rates or tax rates, sometimes complemented with special rules defining the tax base for contributions or taxes for workers and pensioners.[8] This element can be formally reflected in some amount of pre-funding for health cost of older individuals – an option which may become increasingly important in the course of demographic ageing. Thus far, however, most public schemes are unfunded, so that burden smoothing leads to implicit liabilities of public health funds vis-à-vis younger cohorts. In private health-insurance contracts offered by competing providers, burden smoothing actually requires a considerable degree of pre-funding, plus strict regulation with carefully designed funding rules (see Baumann et al. 2008). Again, arrangements of this kind are an exception rather than a rule.

The three elements considered thus far have in common that, in their pure form, they are all suited to increase the welfare of individuals covered in arrangements for funding health costs. In addition, whatever precise mechanisms apply, if health funds only provide these types of insurance, life-time premiums or contributions of each insured individual are linked to the cost profiles presented in Section 2.1 by actuarial calculations, even if they do not follow these profiles year by year. In reality, these elements of insurance are often mixed with one or more of the elements of redistribution that are discussed below, which renders the assessment on welfarist terms less unambiguous. Furthermore, such additional elements can entirely disconnect contributions from benefits at the individual level.

A further observation which is important with respect to the theme of this paper is that in systems incorporating the second and the third of the aforementioned elements, portability becomes an issue whenever individuals are willing to switch from one health

[8] Another approach is given by differentiated membership rules for workers and pensioners, as in the US. There, public provision for the majority of individuals sets in exactly when people retire, at least by the rules applied thus far.

fund to another. The reason is that these individuals are party to long-term relationships in which payments made by the individual, and services provided by their health funds, need no longer be balanced on an annual basis.

b) Additional elements of redistribution

Private systems of health-cost cover are basically confined by market forces to offering insurance in the above sense. In fact, they often limit their services to the first element. In public systems, however, a considerable amount of redistribution can be involved in how health costs are actually funded. Again, the various forms of redistribution can be condensed into three basic elements that are widespread and used in different intensities and combinations, though not universal:

- Income-related redistribution
- Non-contributory cover for dependents
- Intergenerational redistribution

Redistribution from rich to poor as another important element of many systems of health-cost funding reflects the fact that, in terms of normative convictions that a majority of people would subscribe to, health is often considered a major determinant of equal opportunities, or is subject to a kind of goods-specific egalitarianism. In any case, public health insurance or public health-care systems are typically designed to give everyone access to a comprehensive set of health services, regardless of individual abilities to pay for that. Usually, this is brought about by *income-related contributions or taxes* which are used to finance these schemes, while all of their members are entitled to receive a *uniform package of benefits*. As a result, individuals with higher income are paying substantially more than their expected health costs, while individuals with no income at all can effectively be free of charge.

A distinct type of redistribution involved in a number of public schemes is that children and non-working spouses of insured individuals may also have cover for their health costs without incurring any additional charges. This is more than a corollary to redistribution from rich to poor because, where it exists, it often arises from *special rules applying to all children or all dependents*, irrespective of the level income of their household. Discussing the normative background for this type of redistribution is beyond the scope of this paper. Providing non-contributory cover for children may make sense, however, in systems that are unfunded – or are actually funded by these children's future earnings capacities. It simply means that children are credited the health costs arising early in their life cycle, while they are expected to pay back this implicit loan later on, when they have entered their period of economic activity.

This leads to the last element of existing arrangements of health-cost funding which needs to be mentioned here, viz. *redistribution between subsequent generations*. This type of redistribution arises with some necessity if financial burdens through health costs are shifted intertemporally *in systems that are unfunded*, as is the vast majority of public health funds. In schemes of this kind, the present value of future benefit entitlements of each age cohort is typically lower than the present value of their contributions – by the margin between the market rate of interest and the internal rate of return of these schemes, where the latter is basically given by the rate of payroll growth or the growth rate of GDP, corrected for more than proportional increases in health costs. This difference is typically positive. It is needed to keep the systems' implicit liabilities on a sustainable time path when they are rolled over from one generation to the next one (see Sinn 2000 for an in-depth explanation using unfunded pension schemes as an example).

All of these elements of redistribution are potentially relevant for the portability of health-cost cover – at least, if the scheme to be left and the scheme to be entered differ in these regards. Redistribution generally implies that there is *no link between contributions and benefit entitlements at the individual level*. Nevertheless, redistribution towards poor people and families could be arranged for in such a way that the sum of all contributions of a given age cohort is equal to the sum of all health costs for the same group of individuals. In this sense, the life-cycle health-cost profiles shown above are still a relevant benchmark for assessing financial flows and financial obligations related to systems covering health costs. Things are different with respect to the intergenerational redistribution involved in unfunded schemes. Here, contributions collected from a given age cohort exceed corresponding health costs – at a rate which increases if the insured population is ageing. In this case, the intertemporal government budget constraint effectively constitutes the only binding limit for a sustainable amount of redistribution. Therefore, it also needs to be taken into account when addressing international portability of health-care funding with intergenerational redistribution.

Of course, preferences and majority views with respect to a desirable extent of redistribution in any of the dimensions considered here may differ substantially across countries. As a consequence, international agreements regarding the inclusion of redistributive features of national health systems in portability rules may be difficult to reach. The rules designed for this purpose could thus be designed to reflect any differences the elements of redistribution between national systems of health cost cover, or they could abstract as much as possible from these differences and concentrate on the portability of insurance elements. We will return to this issue in Chapters 4 and 5.

The things to keep in mind from the considerations made in this chapter are the following. First, average annual health costs are typically increasing with age. This age-

related trend is basically the result of two different effects. Health costs increase with age for individuals in good health. At the same time there is an increasing share of individuals in poor health, i.e., individuals who have developed conditions with lasting effects for the future time paths of their risk-specific health costs. Second, any arrangement for funding health costs which comprises more than coverage for expected annual health costs (rated by the risk-status of each individual) may lead to portability problems when individuals want to move to another source of health-cost funding. The various elements of redistribution typically render portability even more difficult than with systems that are mainly engaging in long-term insurance. Probably the most surprising observation is that, through more comprehensive forms of cover, public health insurance and public health-care systems are actually a lot more likely to give rise to portability issues than private insurance contracts are. At the same time, quantifying these problems is not easy because of the complicated bundles of insurance and redistribution which public systems effectively offer and because of the implicit, non-contractual nature of many aspects of (mandatory) membership in these systems.

3 Portability of health-care benefits: international experience

In an era of mobility, an increasing number of people are moving across countries for a variety of reasons: holidays, study, retirement, and most importantly for this paper, for work. This raises a number of important questions regarding the portability of social security entitlements across countries, including health-care benefits. For the most common types of international mobility and the most important directions of movements, arrangements have therefore been made to ensure at least some portability of health-care benefits and health-cost cover (see Section 3.1). Here, we will review examples of these arrangements to get an idea of what they are about, starting with the most elaborate set of rules in this area, viz. the EU-level framework for portability of health-care benefits for individuals moving around within the European Union. In addition, we will also look at arrangements between countries not covered by this framework, more developed ones that are typically receiving migrants seeking residence or work, and less developed ones where these migrants typically come from.

International arrangements for portability turn out to have limited economic content, so that the countries affected can never be sure whether they are winning or losing from in- and out-migration. Therefore, we also briefly review portability arrangements that apply to mobility within countries. In countries where private insurance with competing providers plays a considerable role for funding health care (or in countries with differentiated systems of public health-insurance), arrangements are needed for individuals who

are willing to switch between different health funds. As the rules applied in these cases could contribute to our understanding of meaningful approaches to designing international portability arrangements, we will explain and discuss a few examples of this kind as well (see Section 3.2).

3.1 Arrangements for portability of health-care benefits across countries

The customary instrument that is used for regulating portability of all kinds of social security benefits across countries are bilateral agreements. Regarding the portability of social security benefits, however, the European Union has created the "most advanced (and complex) ... system worldwide" (Holzmann et al. 2005, p. 7) building on a multilateral regime. The aim of both types of agreements "is to coordinate national social security law, not to create any form of supranational social security system" (Holzmann et al. 2005, p. 17). These agreements specifically attempt to facilitate international mobility by securing access to health services for individuals who are mobile internationally and to provide a framework for mutual compensation for the utilization of services under foreign health systems where this is thought to be required. They are based on administrative considerations rather than on economic ones, an obvious merit being that they are likely to save on transaction costs for the social security institutions involved, while they can be more or less favorable for migrants.

a) EU-level rules for portability within the European Union

Free mobility of workers between the EU member countries is one of the fundamental principles of European integration, dating back to 1957 when the process of integration started among a limited number of countries in Western Europe. The principle was suspended for workers from accession countries for a few years through transitional arrangements when the EU was enlarged to the South (in 1981 and 1986) and the East (in 2004 and 2007). However, with an eye on workers exercising their right to migrate freely within the EU, it was amended with EU-level rules regarding the coordination of national social protection law as early as in 1968 (Regulation (EEC) No. 1612/68). More recently, the focus has shifted from providing for the mobility of workers and their families to creating a framework for free mobility of all EU citizens across the entire union (Directive 2004/38/EC). To simplify EU law and enhance citizens' social protection when moving within the EU, modernized social security coordination rules (Regulations (EC) Nos 883/2004 and 987/2009) were developed and entered into force on 1 May 2010.

These provisions do not harmonize national social security systems, but instead provide for their coordination to make it easier for people exercising their right to move and to stay within EU member states. There are four main principles of coordination:

1) *The territorial rule*: a person is subject to the legislation of one country at a time so he or she only pays contributions in one country.
2) *Principle of equal treatment or non-discrimination*: a person has the same rights and obligations as the nationals of the country where he or she is covered.
3) *Principle of aggregation*: when benefits are claimed, previous periods of insurance, work or residence in other countries are taken into account if necessary.
4) *Principle of exportability*: if a person is entitled to a cash benefit from one country, he or she may generally receive it even when living in a different country.

In the first instance, the coordination provisions set rules to determine which member state's social security legislation applies in situations involving more than one member state. In accordance with the territorial rule, individuals are subject to the legislation of only one member state at a time, regardless of the number of states involved. As a general rule, individuals who are working in one member state are subject to the legislation of that state even if they reside in another state. There are, however, a few exceptions to this rule: posted workers, mariners and in the interest of the persons concerned. If individuals are working in more than one member state then the principle is to determine to what state they have the strongest links.[9] Individuals who are not working are subject to the legislation of their state of residence.[10] To obtain a residence permit, they usually have to

[9] The EU (2010) has set out criteria to determine this matter:
- A person working in more than one member state and residing in the state where they pursue a substantial part of their activity is subject to the legislation of their state of residence.
- A person working in more than one member state and being employed by various undertakings or employers in different member states are also subject to the legislation of their state of residence.
- A person whose state of residence does not correspond to the state in which they pursue a substantial part of their activity (in the case of an employed person) or to the centre of interest (in the case of a self-employed person), the following applies. Employed persons are subject to the legislation of the member state in which their employer is registered. Self-employed person are subject to the legislation of the member state in which the centre of interest of their activities is situated.
- A person who pursues both employed and a self-employed activity in different member states is subject to the legislation of the state where they undertake employed activity.
- Civil servants remain under the legislation of their administration.

[10] Article 11 of Regulation (EC) No 987/2009 sets out the elements for determining residence as follows:
"1. Where there is a difference of views between the institutions of two or more Member States about the determination of the residence of a person to whom the basic Regulation applies, these institutions shall establish by common agreement the centre of interests of the person concerned, based on an overall assessment of all available information relating to relevant facts, which may include, as appropriate:
(a) the duration and continuity of presence on the territory of the Member States concerned;
(b) the person's situation, including:
(i) the nature and the specific characteristics of any activity pursued, in particular the place where such activity is habitually pursued, the stability of the activity, and the duration of any work contract;
(ii) his family status and family ties;
(iii) the exercise of any non-remunerated activity;
(iv) in the case of students, the source of their income;

demonstrate that they have sufficient health-insurance cover, e.g. from their home country, even under the new rules for the mobility of EU citizens. However, the utilization of health services then falls under jurisdiction of the state they are living in.

An important implication of these rules is that *migrant workers* who settle in another EU country and take up a regular job there are *not* really subject to the coordinating law, as they are simply given access to social security institutions in their host countries. The same applies to members of their families who are living with these workers, provided that coverage for them is included in the relevant schemes. On the other hand, migrant workers' family members who stay at home (or live in another EU country) are subject to the EU-level rules to the extent that their benefit entitlements are derived from the workers' insurance. The rules also apply to (migrant) workers who retire and move to another country (or actually return home) as pensioners.[11] In addition, the coordination provisions warrant protection not only for migrant workers and the members of their families but for all EU citizens interacting with other member states. In this sense, the EU-level framework can also be used as a benchmark system defining the different types of mobility that can be addressed in international portability arrangements. Bilateral agreements and other (e.g., unilateral) rules for international portability of health-care benefits could then be examined regarding whether or not, and if so how, they are also providing for each of the cases covered inside the European union.

The wide variety of health-care benefits can be divided into two major categories of benefits: benefits in cash and benefits in kind. Benefits in cash are generally intended to replace an income which is suspended due to sickness. These are usually always paid in accordance with the legislation of the state where individuals are insured regardless of where they are residing or staying, and thus would normally be paid directly to the individuals. Benefits in kind include health care, medical treatment, medicines and hospitalization, certain benefits for persons reliant on care, as well as the direct payments intended to reimburse their costs. These benefits are usually provided in accordance with the legis-

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(v) his housing situation, in particular how permanent it is;

(vi) the Member State in which the person is deemed to reside for taxation purposes.

2. Where the consideration of the various criteria based on relevant facts as set out in paragraph 1 does not lead to agreement between the institutions concerned, the person's intention, as it appears from such facts and circumstances, especially the reasons that led the person to move, shall be considered to be decisive for establishing that person's actual place of residence."

[11] Under the EU-level framework, cover for health costs of pensioners who are mobile is provided by just one institution which is basically determined in accordance with where pension benefits are provided (see Articles 23–25 of Regulation (EC) No 883/2004):

– If a pensioner has pension entitlements in the current country of residence, health-cost cover will be provided from this country.
– In all other cases, the institution from the country will be responsible whose legislation the pensioner has been subject to for the longest period of time; if this does not lead to a clear result, the institution from the country will be responsible whose legislation the person was last subject to.

lation of the state in which individuals are residing or staying as if they are insured in that state (EU 2010).

Individuals staying *temporarily* in a different state from which they are insured, typically tourists or students, are entitled to all benefits in kind which become medically necessary during their stay provided they are insured under a statutory health-insurance scheme in their home state. The European Health-insurance Card (EHIC) has simplified the process of receiving medical assistance during a temporary stay within the EU or in Iceland, Liechtenstein, Norway and Switzerland. If medical assistance is received in a country that charges for health care, EHIC holders will be reimbursed either immediately, or after they have returned home. Otherwise, the institution providing assistance will be reimbursed by the card holders' insurance.

Frontier workers are employed or self-employed persons pursuing their occupation in a different member state from the one in which they reside and to which they return at least once a week. Frontier workers are insured in the state where they work. However, in regards benefits in kind frontier workers have a choice, they can obtain these benefits either in the state where they reside or the state in which they work. *Posted workers* are individuals who are normally employed in one state but are sent temporarily to another state to work for a maximum period of 24 months. Posted workers remain insured in the state where they are normally employed and thus continue to pay contributions to the social security system of that state. However, posted workers are entitled to all health-care benefits in kind in the state to which they have been sent, regardless of whether or not they have transferred their residence there.

Individuals who are not working, while residing in a different state from which they are insured – for instance, *family members* of insured individuals, or *pensioners* who moved abroad or returned home after retirement – are entitled to all benefits in kind provided under the legislation of the state where they reside. These benefits are provided by insurance institutions of the individuals' place of residence as if they were insured with it. The individuals should register with the insurance institution of their place of residence by requesting an 'S1' document certifying their health-care coverage from their insurance institution. As a rule, the health-insurance institution of the place of residence will then be reimbursed by the institution the individuals are insured with.

Article 35 of Regulation (EC) No 883/2004 sets out the *guidelines for reimbursements* between institutions:

> "1. The benefits in kind provided by the institution of a Member State on behalf of the institution of another Member State under this Chapter shall give rise to full reimbursement.

2. The reimbursements referred to in paragraph 1 shall be determined and effected in accordance with the arrangements set out in the Implementing Regulation, either on production of proof of actual expenditure, or on the basis of fixed amounts for Member States the legal or administrative structures of which are such that the use of reimbursement on the basis of actual expenditure is not appropriate.
3. Two or more Member States, and their competent authorities, may provide for other methods of reimbursement or waive all reimbursement between the institutions coming under their jurisdiction."

Building on these guidelines, article 62 of the Implementing Regulation (EC) 987/2009 sets out principles for assessing reimbursements based on actual expenditure.[12] Article 64 defines how reimbursements in terms of fixed amounts ought to be assessed where they are in use.[13]

Instead of reimbursements based on actual costs, lump-sum payments or (mutual) waiving of payments are thus two possible simplifications included in current EU-level rules. While lump-sum payments played, and still play, a significant role in actually handling reimbursements between health funds in EU countries, the option of waiving any payments where mutual claims are likely to be low and rather balanced are now less and less in use[14] – among other things, it appears, because of informal standards requiring equal treatment vis-à-vis other EU countries. Lump-sum payments are also less in use today than they were until 2009, before the modernized coordination rules came into force.[15] Most countries have thus moved in the direction of claiming reimbursements based on actual costs, as their health funds were not satisfied with procedures and/or results of defining lump-sum payments and because the determination of actual costs has become substantially less burdensome through recent developments in IT-based accounting and billing in the relevant industries.

The implications of these rules and their practical application with respect to two standard cases we are particularly interested in are thus the following. (i) Migrant work-

[12] Actual costs must derive from standard accounting procedures of the institution which has provided the relevant benefits. They may not exceed the rates applicable to benefits in kind for persons who are subject to the legislation applied by this institution.

[13] Monthly fixed amounts are to be assessed based on average expenditure for insured individuals in three age groups (less than 20, 20–64 and 65 and more years of age), reduced by a deduction of 20 percent (15 percent for pensioners and family members). There is no official reason for this deduction, but it may reflect the fact that individuals staying abroad tend to consume fewer health services in their target country, even if they are registered to stay there on a permanent basis.

[14] According to annex 1 of Regulation (EC) 987/2009, this option is currently applied, on a mutual basis, between the Nordic EU member countries only.

[15] Annex 3of Regulation (EC) 987/2009 lists nine EU countries (e.g., Italy, Spain and Portugal from the Southern part of the EU, but also the UK, Ireland, and the Netherlands) that are continuing to claim reimbursements for health benefits in kind on the basis of fixed amounts.

ers who are EU nationals and move to another EU country to take up employment there are typically covered by their host countries' health-care systems or health-insurance schemes, as are their family members. If family members stay in the home country, they can receive treatment there, following the legal rules applied in their state of residence, but their health costs are taken on by the workers' health funds, mostly in terms of actual costs incurred. The same happens if migrant workers or their family members go home as tourists from time to time, to visit relatives and friends, etc. (ii) Pensioners moving to another EU country after retirement remain insured in their home countries' health funds. They can receive treatment in their country of residence but, again, the health costs that arise are reimbursed by their health funds, mostly based on actual costs. Unless they have some pension entitlements from their home country as well, the same applies to migrant workers who return home once they are retired – only, to avoid confusion we should say that they remain insured in their former host countries' health funds, with consequences that are otherwise identical.

b) Bilateral agreements between 'sending countries' and 'receiving countries'

As the EU-level framework only applies to mobility within the European Union, the legal basis with regard to all kinds of mobility between non-EU countries, or between EU countries on the one side and non-EU countries on the other, is quite different. However, bilateral agreements, where they exist, may effectively provide for *similar rules relating to health-care portability*. To illustrate this, we will examine the bilateral agreements Germany and Austria have with non-EU countries. Now that most of their neighboring countries are EU member states, the list of countries whose citizens are subject to these bilateral agreements regarding social protection is relatively short.[16] Still, those countries where the largest groups of immigrants to both Germany and Austria come from are represented on these lists. Traditionally, this has been Turkey and former Yugoslavia; more recently, agreements with the latter have been extended to its successor states and in some cases amended. Here, we will thus take bilateral agreements between this sub-set of typical sending countries on the one side, and Germany and Austria as two countries typically receiving immigration on the other side to summarize the essence of provisions made in such agreements.

[16] Germany has bilateral agreements on social protection with 17 non-EU and non-EEA countries (among these are the US, Canada, Japan and Australia, but also Morocco, Tunisia, Turkey and the successor states of Yugoslavia; see http://www.bmas.de/portal/13982/sozialversicherungsabkommen.html); Austria has the same with 13 non-EU and non-EEA countries (again the US and Canada, Tunisia and Turkey and most of the states in former Yugoslavia; see http://www.bmeia.gv.at/aussenministerium/aussenpolitik/voelkerrecht/staatsvertraege/bilaterale-staatsvertraege.html).

As a fundamental difference to rules applied within the EU, there is *no free mobility* of workers or citizens between the sending countries and receiving countries we are now looking at. Nevertheless, there has been a period of active recruitment of workers from Turkey and Yugoslavia to Germany and Austria in the 1950s and 1960s. This policy was terminated following the oil-price shock and the resulting crisis in the mid-1970s. But family re-unification for those already there continually offered a legal entitlement for further waves of migration. The stock of immigrants from these countries – respectively, their successor states – living in Germany and Austria has therefore continued to grow to date.

The first bilateral agreements regarding the social protection of migrant workers and their family members were made at an early stage in this process (in 1964, both Germany and Austria signed agreements with Turkey; and in 1968, an agreement was signed between Germany and Yugoslavia). There have been some changes in the rules agreed upon through up-dates of these agreements as time went by (e.g., between Germany and Turkey in 1984). After 1990, a wave of renewals of agreements started between Germany and the states in former Yugoslavia, initially stating that the old agreement should continue to apply (for instance, vis-à-vis Bosnia-Herzegovina in 1992, where this is still the state of affairs), followed by new agreements with a number of these countries in more recent times (for instance, with Croatia, Macedonia and Serbia in 1997). Austria also made a new bilateral agreement with what was then Yugoslavia (namely, Serbia and Montenegro) in 1998 and entered new agreements with other successor states of Yugoslavia in the late 1990s (Croatia and Macedonia 1997, Bosnia-Herzegovina 1999).

The structure and provisions of all these bilateral agreements are rather similar – in fact, the more recent ones with either Germany or Austria as one contracting party are almost identical. Compared to the EU-level framework discussed in the previous section, the agreements all define a *territorial rule* with respect to employees who, with few exceptions, are basically subject to the legislation (hence, arrangements for health-cost funding) in their territory of employment. They also include rules regarding *equal treatment* of individuals rightfully claiming benefits in kind in the territory of the other state (which sometimes requires approval from their insuring body) and regarding *exportability* of cash benefits. In these agreements, there are also rules regarding *aggregation* of multiple benefit entitlements, but this is largely immaterial in the area of health-cost funding.

As a result, migrant workers are again largely neglected in these agreements since, provided they are able to obtain a work permit and to enter a regular job, they are fully covered by health funds in their host countries. As with the EU-level law, the agreements mainly relate to *individuals* who are *residing or staying temporarily* in the contracting

state that is not the one where they have health-cost cover. That is, they apply to frontier workers (commuters) and posted workers (expatriates), to family members of migrant workers living abroad, to retired individuals residing in the other state and also to tourists and other people travelling there. The basic rights of all these individuals are that they can usually receive cash benefits in accordance with the legislation of the state where they are insured and that they have access to benefits in kind in accordance with the legislation of the state in which individuals are residing or staying. For the latter case, there are also rules regarding reimbursements between the health funds involved.

By the relevant clauses of the agreements, these *reimbursements* can be based on actual costs or, alternatively, on fixed amounts (i.e., relevant averages of monthly expenditure in the country where benefits have been provided). The option of mutually waiving payments is included in the agreements only exceptionally (e.g., between Germany and Turkey, since 1984), but it is effectively nowhere utilized. In fact, Germany is nowadays claiming reimbursements from foreign institutions based on actual costs only, while mixed regimes with lump-sum payments for differing sub-groups of individuals covered in bilateral agreements apply to payments in the opposite direction. Austria is still claiming and making lump-sum reimbursements vis-à-vis most of the contracting states considered here, based on a recent series of special agreements regarding how these payments are to be assessed. It appears that authorities in Germany as well as in Austria would have a preference for switching to reimbursements based on actual expenditure as a universal standard, while they acknowledge that this might be difficult to administer for institutions in a number of their contracting states.

All in all, regarding countries such as Germany and Austria the situation created through bilateral agreements on social protection for individual who are mobile between these and non-EU countries is not fundamentally different from that governed by the common legal framework applying to all EU citizens, their implications for standard cases again being as follows. (i) Migrant workers are typically covered by their host countries' health-care systems or health-insurance schemes. The same applies to their family members, while family members who stay in the home country can receive treatment there, but their health costs are taken on by the workers' health funds. (ii) Pensioners moving to the other country after retirement remain insured in the health funds of the country where their pension benefits are provided. When they receive treatment in their country of residence, health costs are then reimbursed by their health funds. For pensioners who have pension entitlements in both countries, health costs are covered from their country of residence (while reimbursements may still apply to health costs arising during temporary stays in the other country). In any of these cases, reimbursements are either based on actual costs or on lump-sum payments, depending on the countries involved and

on the relevant category of cases, but there is a trend towards claiming, or paying for, actual costs wherever there is room for adjusting existing agreements.

c) Assessment

Regarding the international portability of health care and health-cost funding, current EU-level rules applying to EU citizens are interesting as they are well-known to be rather generous to facilitate actual utilization of the union's free-mobility rules. In addition to that, we have also looked at relevant provisions in bilateral agreements made by Germany and Austria with non-EU countries – as they are examples of two highly developed countries receiving a substantial amount of immigration from outside the EU. Before moving ahead, we should briefly highlight what we think is important about the current portability framework, concentrating on instances of international changes in residence or work place that are temporary (but of some length) or permanent (with the option of returning home, again on a more permanent basis, much later).[17]

As we see it, EU-level rules as well as the rules involved in bilateral agreements made by Germany and Austria effectively define two broad types of arrangements regarding the portability of benefit entitlements vis-à-vis social protection systems in different countries. For *migrant workers* and, in most cases, also their family members, the existing legal framework can be characterized as a "*package deal*": these workers and their relatives are usually admitted nearly automatically to the national risk pool for funding health costs as an annex to their legal status based on an official work permit (granted to at least one member of the respective household). The package deal is relevant for the utilization of health services by these migrants in the respective country of employment. *All other cases of international mobility* give rise to some amount of "*cross-border coverage*" of health services, with some interaction between the two health systems involved regarding reimbursements for the costs of treatment. Among other things, this applies to family members residing outside the workers' country of employment or to retirees residing outside their former country of employment.

EU-level rules and bilateral agreements leave room for the package-deal solution, while it is otherwise mostly governed by national law in the countries of employment of migrant workers. International law then mainly takes care of the rules for cross-border coverage, i.e., the conditions under which individuals may get access to health services in other countries and the terms for determining any related cross-border payments between

[17] In this paper, we are not concerned about health costs arising in foreign countries during short-term stays which are usually limited to a maximum of 90 days per travel and tend to last much shorter on average. We are aware of the fact that tourist visa are sometimes used as a platform for various forms of semi-legal or illegal mobility. For the moment, however, dealing with this rather complex issue is clearly beyond the scope of our considerations.

national health funds. The remarkable thing about this set up is that the package deal for migrant workers effectively neglects the existence of portability problems involved in international mobility of individuals who can be expected to contribute most actively to national health funds in their former as well as their current countries of employment. This has potentially far-reaching consequences for the structure of risks covered in national health systems in both sending and receiving countries involved in this deal. Similar problems may arise through the coordinating rules applying to pensioners with mixed employment records as these rules allocate responsibility for their health costs to one country, with limited attention to where they have been paying contributions or taxes while they were still active. In any case, given the uncertainties about how to appropriately assess reimbursements, the options for shifting responsibility for covering health costs across countries to substitute for current cases of cross-border coverage may deserve further consideration.

3.2 Arrangements for within-country portability across health funds

In order to further explore problems that could be involved in the portability of health-insurance cover and to learn more about potential solutions, we will now also examine the rules applying to individuals who are willing to switch between different providers within a given country. Specifically, the case of workers changing their jobs or occupational status, with consequences for their sources of health-cost funding that are not fully dealt with in international law, could be a major issue for designing portability arrangements applying within a given country.

However, we will be very selective in this section. First of all, we will concentrate on *private health insurance*. The main reasons for doing so are that public systems with multiple, competing providers are rare, so that arrangements for portability between public health funds often are not needed at all, while private providers are subject to market forces which, to the extent that regulation does not set them off, could necessitate a more careful design of portability rules where they are needed in this branch of health-cost cover. Second, we will look at relevant rules in a very limited number of countries only.

The role and regulation of private health insurance differs substantially across countries, mainly depending on how health care is provided and funded for those under public arrangements. If public programs are absent, or if participation in these programs is not mandatory for a majority of the population, private health insurance can be the dominant form of cover. When it coexists with public programs, there is a major distinction within the domain of private insurance between “substitutional” forms of cover (insurance for full costs, intended to replace public health insurance or public provision of health care) and “supplementary” insurance (covering costs of services or types of treatment that are

not, or not fully, included in benefit packages offered by public schemes). Here, we will briefly discuss the rules addressing portability in arrangements of any of these types, taking just three countries as interesting examples.

Specifically, we will briefly comment on relevant rules applying in the United States (as an example of the rare case where private insurance is the main form of health-cost cover), in Germany (where "substitutional" private insurance is effectively a niche product, but subject to remarkable regulation), and in Slovenia (where "supplementary" private cover is almost universal). Clearly, any of these examples has idiosyncratic features,[18] but we think that discussing them in some detail is more instructive than attempting to keep things abstract and general.

a) United States

As it has already been noted, the US is an interesting outlier in that, for working-age individuals and their families, *private, employer-provided health insurance* is clearly the *dominant form of cover*. Indeed, the majority of the population in this country receives private health insurance coverage through the workplace, either through their own employment or the employment of a family member (Gruber and Madrian 2002).[19] Contracts made by employers are almost exclusively based on group insurance, with very limited alternative pooling mechanisms available. Alternatively, insurance may be purchased in the individual market, however, this is generally very expensive, less comprehensive, and often not available to very unhealthy individuals.

While the workplace pooling of risks does have some advantages,[20] by having health insurance largely restricted to the workplace, insurance-induced immobility may occur. As Gruber and Madrian (2002, p. 2) note, "[g]iven the high and variable level of health care costs for many workers, health insurance can be a key factor in the decision to work, to retire, to leave welfare, or to switch jobs". In addition, the cost of providing health insurance varies considerably for employers, mainly depending on the size of the risk pool for which they are seeking group insurance. Indeed, the cost is so high for some smaller firms that, over time, an increasing number of them have stopped providing health insurance altogether.[21] For many observers, the potential of health insurance to impact labor

[18] For a much broader survey of private health-insurance arrangements in various countries and their potential in the co-existence with public systems, see Preker et al. (2009).

[19] This will remain true in spite of new legislation that slightly adjusts existing public programs (for welfare recipients and retirees) and is otherwise meant to make health insurance basically mandatory and more affordable.

[20] Gruber and Madrian (1994, p. 86) note that this allows "for economies of scale in administration; it reduces the problem of adverse selection as long as workplaces are chosen independently of health status; and it allows individuals to take advantage of the non-taxation of employee fringe benefits."

[21] As Gruber and Madrian (2002, p. 5) put it, "[l]arge workplace pools also provide a means for individuals to purchase insurance without the adverse selection premium that insurers demand in the individual

supply and job mobility has thus been of particular concern. A distinct, yet related concern is that employer-based health insurance is available to many workers, but also leads to considerable gaps in coverage.

In fact, labor economists in the US have long agreed that the provision of employer-provided health insurance plays a significant role in decreasing job mobility, leading to "job-lock", where people feel unable to leave their jobs due to the fear of losing their health insurance benefits. Since health insurance coverage in the US is not a homogenous good, individuals are often unable to obtain comparable health insurance across jobs. A number of barriers to switching jobs have been identified in the literature, including: insurance at new employment not covering pre-existing conditions; probationary periods for new coverage; losing credit gained under previous insurance towards deductibles and out-of-pocket payments; the costs in transitioning; new employers offering a more limited range of insurance options, and new employers offering insurance that is too expensive, or not providing health insurance at all (see, e.g., Bartel and Borjas 1977, Mitchell 1982, Holtz-Eakin 1993, Madrian 1994, Gruber and Madrian 2002, Rashad and Sarpong 2006).

A number of possible solutions were suggested in the literature to address the job-lock phenomenon (see, e.g., Gruber and Madrian 1994). These included divorcing health insurance coverage from the employment relationship, with pooling instead occurring elsewhere, for instance, at the regional or national level. Alternatively, it was suggested that employer-provided insurance could be maintained, but that "full" insurance portability across jobs could be enabled. Without discussing in much detail what this could mean, however, Gruber and Madrian (1994, p. 89) felt that this option raised a number of difficult design issues, particularly in relation to how the responsibility for providing the insurance would be assigned.[22] They also felt that both of these options would have fundamentally changed the nature of health insurance coverage in the US, so that large transition costs may render them impractical.

It was a more modest measure of "limited portability" of health insurance that was in fact first implemented by way of "continuation-of-coverage" laws in order to address this issue. The first continuation-of-coverage law was introduced by the State of Minnesota in 1974, which was followed by more than 20 other states before the federal government

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health insurance marketplace, since the unobservable components of health will average out in large groups. For smaller groups, on the other hand, there is the risk that insurance purchase is driven by the needs of one or two (unobservably) very ill employees, whose costs cannot possibly be covered by the premium payments of healthier workers."

[22] Gruber and Madrian (1994, p. 89) argue that "[m]aking the initial employer responsible for all future insurance would lead to large distortions in initial hiring decisions and massive administrative costs in tracking employees through their job changes. Assigning responsibility to each subsequent employer would make it difficult to guarantee individuals fully comparable coverage on each job, and if coverage is less generous in alternative employment, the problem of job-lock remains."

passed the Consolidated Omnibus Budget Reconciliation Act (COBRA)[23] in 1986 which mandated continuation of coverage nationally (Gruber and Madrian 1994). COBRA aimed at easing portability restrictions on employer-provided health insurance by requiring employers to temporarily continue coverage after the employment contract has been terminated (Rashad and Sarpong 2006). COBRA allowed for employees, their spouses, their former spouses, and their dependents who were previously covered by health insurance to maintain that coverage if a "qualifying event" caused them to lose coverage.[24] Individuals who elected continuation of coverage could be required to pay the full cost of the coverage, plus a 2-percent administrative charge. Thus, while the cost of continuation coverage was often more expensive than the amount which active employees were required to pay, it was usually less expensive than individual health coverage. However, continuation coverage was only required to be provided under COBRA for a maximum of 18 or 36 months,[25] so that "limited" portability was effectively a means to bridge certain temporary gaps in health-insurance coverage, but did not solve the job-lock problem.

This matter was further addressed in 1996 by the Health Insurance Portability and Accountability Act (HIPAA). HIPAA limited the ability of a new employer's health plan to exclude coverage for pre-existing conditions, enabled credits for past insurance, provided additional opportunities to enroll in a group health plan for those who lost other coverage or experienced certain life events, prohibited discrimination against employees and their dependent family members based on any health factors, including prior medical conditions, previous claims experience, and genetic information, and guaranteed that certain individuals would have access to, and could renew, individual health insurance policies.[26] Gruber and Madrian (1997) have highlighted the importance of these laws in reducing the occurrence of job-lock. However, while HIPAA added protections and made it easier to switch jobs without fear of losing health coverage for a pre-existing condition, the law had limitations that led to continued debates. For instance, HIPAA did not require employers to offer health insurance, did not guarantee that any conditions (prior or current) were covered by the new employer's health plan, and did not prohibit an employer from imposing a pre-existing condition exclusion period if an individual had been treated for a condition during the past 6 months.

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[23] While officially called the *Consolidated Omnibus Budget Reconciliation Act 1985*, because of the discrepancy between the official name and the year in which it was enacted, some publications refer to it as the *Consolidated Omnibus Budget Reconciliation Act 1986***.**

[24] Those events include the death of a covered employee; termination, or reduction in the hours of a covered employee's employment for reasons other than gross misconduct; divorce or legal separation from a covered employee; a covered employee's becoming entitled to Medicare; and a child's loss of dependent status (and therefore coverage) under the plan.

[25] The maximum period of time for which continuation coverage must be made available depends on the type of qualifying event.

[26] For further details, see http://www.dol.gov/ebsa/faqs/faq_consumer_hipaa.html.

In recent years, discussions have focused on the fact that a considerable fraction of the US population have no health-insurance cover at all (in 2009, this was true for some 50.7 million people, or 16.7 percent of the population; see U.S. Census Bureau 2010). Following several political initiatives and heated political debates, new reforms under the Affordable Care Act were passed in early 2010.[27] This new legislation aims at a phased introduction of mandated health insurance over a period of four years, intending to fix all major gaps in the earlier continuation-of-coverage laws and, eventually, to push health insurance towards universal coverage. To accomplish this, a number of changes addressing coverage and portability issues have already become effective over the year of 2010. An important element of these changes is that small businesses are now eligible for tax credits (worth up to 35 percent of employers' contributions, 25 percent in the case of small non-profit organizations) to help them provide health insurance to their workers. Also, for individuals who have been uninsured for at least six months because of a pre-existing condition, new coverage options are provided either through a temporary high-risk pool inaugurated at the federal level or through parallel plans which have to be established at the level of single states. Another federal program provides financial support for employment-based plans to continue coverage for early retirees (i.e., individuals who retire between age 55 and age 65), as well as their spouses and dependents.

Most of these provisions that have already been set into force effectively serve as a bridge to 2014, when tax credits for qualified small businesses providing health insurance to their workers will be increased (to up to 50 percent of employers' contributions, up to 35 percent for small non-profit organizations) and when all discrimination against pre-existing conditions through insurers will be banned. The non-discrimination law that is going to take effect in 2014 does not only prohibit insurance companies from refusing to sell or renew policies because of an individual's pre-existing conditions, it also eliminates their ability to charge higher rates due to health status – as well as gender – in the individual and small group market. Starting from 2014, small businesses and individuals who are not offered insurance through their employers, or who cannot afford the coverage provided there, shall be referred to new marketplaces called Health Insurance Exchanges where they should ideally be able to purchase affordable health insurance from a choice of qualified health plans meeting certain benefit and cost standards. Last but not least, from 2014 onwards all individuals are basically mandated to have health insurance.[28]

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[27] The health care reform law was enacted in two parts: the *Patient Protection and Affordable Care Act* was singled into law on 23 March 2010 and was amended by the *Health Care and Education Reconciliation Act* on 30 March 2010. The name "*Affordable Care Act*" is used to refer to the final amended version of the law.

[28] This new rule may not be applicable to illegal immigrants who are accounted for in the Census Bureau's estimates cited above. Together with the other elements of reform, it is expected to expand coverage by

All in all, the new legislation will channel considerable amounts of public revenues into programs assisting individuals in finding and continuing health insurance and supporting their employers in paying for that. Besides, insurance companies are made subject to strict, new regulation that is also meant to promote access to, and portability of, health-insurance coverage for all individuals. At the same time, the new rules deliberately limit options of insurers for designing and calculating the contracts they are offering, which will most likely have repercussions on their business models and on the future structure and dynamics of their market. Specifically, whether the market segment for Health Insurance Exchanges will actually become sufficiently competitive and transparent under the new regulatory framework, is thus an open question.

b) Germany

In Germany, public health insurance clearly constitutes the dominant form of health-cost coverage, extending to about 90 percent of the population based on mandatory membership rules and additional options to participate on a voluntary basis. Nevertheless, there is also a minority of individuals who opt out of the public health-insurance scheme and seek private cover for their full health costs instead (for descriptions of the institutional background, see Henke et al. 2010 or Werding 2007, pp. 103–6).[29] This is possible because their income exceeds a relevant threshold; it is basically attractive if risk-rated premiums in private insurance are lower than income-related contributions in the public system, and if additional coverage for dependents provided free of charge in the latter system does not reverse this balance. While this way of defining the borderline between private and public health insurance is hardly defendable on normative grounds, the specific type of contracts made in the private sector in this country are rather interesting, especially with respect to the issue of portability.

German *private health insurance* in its *substitutional form* is peculiar in that it offers life-long cover for health costs rated at the risk status at the time of entry. Once a contract has been made, the insurer is not allowed to terminate it – for reasons other than outstanding premiums or fraud on the insured individuals' side, that is. Nor is the insurer allowed to re-assess premiums according to individual experience rating. However, adjusting premiums across the board due to unanticipated increases in average health costs is permitted. This implies that the insurance fully takes away the risk of any (further) deterioration in individual risk status, and that it is meant to fully smooth premiums over the life

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more than 30 million individuals who are currently uninsured. Nevertheless, the rule is particularly controversial, even after the health care reform has been enacted, as opponents consider it unconstitutional.

[29] Besides, there is also a market for *supplementary* private health insurance in Germany which can be bought voluntarily to top up benefits provided by the public health insurance scheme. By the way these contracts are designed, they are unlikely to create considerable portability problems.

cycle of a given individual.[30] The cost of this remarkable arrangement which is backed by strict regulation of both contracts and premiums is that, at least traditionally, insured individuals soon found themselves locked in with their current providers, as capital reserves (termed "aging provisions") that are very important in these types of contracts were not portable across insurers. Switching to another insurer then meant undergoing a new risk-rating and starting to accumulate fresh reserves with a shorter period of life where health costs were still expected to be low, which was not at all attractive after only a few years of insurance with an earlier provider.

The absence of portability of aging provisions has been modified through recent changes in regulation. However, determining a portable amount of provisions for these types of private health-insurance contracts with strong prefunding is more difficult than it may seem. An important reason why provisions were not portable in the past was that this helped avoiding risk segmentation within a given cohort of insured individuals. If those who still were low risks after a certain duration of their contract could have extracted the excess amount of their earlier premiums over their actual health costs and switch to another insurer, this could have harmed others who had become high risks in the meantime. Even a portable amount of aging provisions based on the excess amount of premiums over average health costs could have had the same effect. Premiums for those turning high risks at some point in time had been calculated on the assumption that some, but not all, of the insured members of a given age would suffer deteriorations in their health status over time. But if low risks would leave then, attracted by low rates reflecting their lower, state-contingent expected health costs, old contracts were in danger of losing solvency for paying for the high risks that are left behind. In addition, high risks would be unable to find a new insurer offering health cost cover at their current, or even lower, rates even if aging provisions for average risks were made portable.

An ideal solution for maintaining protection against risk segmentation in existing contracts and, at the same time, allowing for more competition between providers of private health insurance, requires that risk-adjusted amounts of aging provisions are made portable (see Meier 2005; or Baumann et al. 2008). Under such a scheme, low risks would only be able to take away lower-than-average provisions to other insurers, while high risks could take away higher-than-average ones. Effectively, any deterioration in individual risk status in on-going contracts of this type would be reflected by a re-allo-

[30] In the UK, next-to-universal, tax-financed coverage in the National Health Service can also be substituted for through private full-cost insurance. However, in contrast to the case of Germany, insurance contracts are basically made on an annual basis, with risk-rating applying to any renewal. Therefore, portability is not an issue in this system, but individuals may drop out of private insurance when they get older or when their risk status deteriorates. See Besley et al. (1999) or Propper (2000) for descriptions of the basic institutional set-up (and analyses of individual choices within this framework).

cation of parts of the aging provisions that are meant to prefund for the long-term health-status risk – from those who continue to be low risks to those who become high risks. While this need not become visible for those who stay with their current contracts, it has to be made apparent for all those who want to leave.

Actual changes in regulation which have become effective in Germany in 2009 for new contracts differ from the model just sketched. According to the new rules, aging provisions for average risks in a standardized contract with relatively low cover are now portable across insurers. While the resulting amounts of portable provisions are possibly high enough for low risks to find more attractive offers elsewhere, they are clearly too low for high risks who want to switch to another insurer. Therefore, the new rules may give rise to precisely that type of risk segmentation which the old no-portability rules were meant to exclude. However, whether this problem will actually materialize over time remains to be seen.

c) Slovenia

In 1991, Slovenia as a new transition country faced the challenge of establishing an effective, partially privatized health-care system and defining a financially sound scheme for funding this (see Albreht and Klazinga 2009). The solution found with respect to the latter aspect in new legislation which became effective in 1992 is a near-universal social insurance scheme with income-related contributions corresponding to continental European standards, requiring a substantial amount of co-payments from insured individuals for the benefits they receive (see also Tajnikar and Došenovič Bonča 2009). From the very beginning, this was accompanied by the emergence of *voluntary, supplementary insurance* covering these co-payments as a complementary pillar of health-care funding in Slovenia.[31] Participation in the second pillar was heavily promoted by the Slovenian government, so that supplementary insurance with full coverage of co-payments is now also next to universal in this country.

Over time, however, the structure of the relevant market and its regulatory framework has changed considerably. Initially, voluntary supplementary insurance was also provided by the public health insurance scheme, the latter operating as a not-for profit insurer in this area, with just one smaller private, for-profit competitor. In 1998, the branch offering supplementary coverage was singled out from the public scheme and privatized in the legal form of a mutual insurance. By its size, it is still clearly the prototypical large incumbent, with two smaller joint-stock companies competing in the same

[31] In this respect, supplementary health insurance in Slovenia is similar to that in France (see, e.g., Buchmueller and Couffinhal 2004). There, private health insurance also mainly offers reimbursements for co-payments required in the public schemes, not coverage for special types, or higher qualities, of treatment not covered by public insurance as the main alternative.

market. Since the extent of coverage of supplementary health insurance is strongly determined by the features of compulsory, public insurance and, hence, is subject to a great deal of political risk,[32] private insurance of this kind is typically unfunded. Nevertheless, following another reform enacted in 2000, Slovenian private health insurance companies started to accumulate reserves for a number of years.

At that time, insurers collected premiums that were differentiated to some extent by gender, age (at entry) and risk status, as is conventional in such contracts. Because insurers were not required to transfer funds accumulated for individuals who were willing to switch from one insurer to another, competition for new members was distorted. However, financial losses arising from a change in supplementary health insurance were smaller than those arising from a change in insurance for full health costs, so that mobility was not prohibitively costly for customers. Providers of supplementary health insurance and their regulators would have likely had to consider this issue more closely, if pre-funding had been a standard for a longer period of time – and not merely a by-product of a favorable financial situation of this sector which lasted only temporarily.

In 2003, growing deficits in the public scheme and considerable profits created in private health insurance made politicians consider merging the two pillars, i.e., abolishing the latter and integrating it into the former, but final decisions regarding this proposal were postponed. In the following years, the large mutual insurance fund providing supplementary insurance started to incur losses, in spite of its potential for benefiting from huge economies of scale vis-à-vis the two smaller companies. This appeared to be mainly the result of a less favorable age structure of its members.[33] Therefore, the government decided to introduce a risk-equalization scheme between all providers which took effect in 2006 (see Tajnikar and Došenovič Bonča 2009, pp. 284–92, for further details and a discussion of a few shortcomings of this scheme). Furthermore, because such a scheme is at odds with pre-funding based on actuarial principles, funding was terminated and accumulated reserves were disbursed to individual members.[34] Since then, supplementary private health insurance in Slovenia is actually operated on a pay-as-you-go basis, just like the public scheme, though with voluntary membership and individual contributions which are determined in a different way.

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[32] In fact, in the presence of supplementary private cover, redefining the benefit package covered in public schemes can be mainly seen as an approach to shifting financial burdens involved in financing health care on to private sources. Note that, if this relates to co-payments, it is likely to undo any incentive effects for the utilization of health services these policy changes could also be intended to have.

[33] Besides, there are indications that this large company was less active in monitoring claims, as average claims' costs tended to exceed those of their competitors across all age groups.

[34] Individual shares in these funds were assessed based on their age at entry, length of membership and duration of the contract (for 10 years or life-long, with differing funding rules applying to these types of contracts). The risk status of an individual (or any change in this respect during membership) was neglected as an additional, potentially important determinant.

Under current rules, each insurer collects premiums that are uniform for all its members, while premiums may vary across companies. In addition, there is a late-entry loading by which individual premiums are increased (by 3 percent, to a maximum of 180 percent) for each year without supplementary cover. These loadings are not imposed on individuals who are switching from one insurer to another (with less than six uninsured months in between), which is legally possible under some restrictions.[35] Therefore, individuals do not suffer any financial losses when changing their provider, while the problem of risk segmentation across insurance funds is basically taken care of through the risk-equalization scheme.

d) Assessment

The small number of arrangements for private health insurance we have examined in this section are clearly very diverse. Nevertheless, with respect to our main theme regarding the portability of health-cost funding across providers, the examples effectively show a number of common features. First of all, there appears to be a general trend towards a lock-in of individuals in on-going private health-insurance contracts. This phenomenon may show up only in the market for private health insurance, as it does in Germany. If insurance is employer based, as it is in the US, this lock-in may even have a broader impact on job mobility and turnover in the entire labor market. In any case, this observation basically reflects a wide-spread lack of portability.

Another observation is that, where reduced mobility is perceived to be a problem – in the insurance markets and even more so in labor markets – establishing something that could be called "full portability" across different providers of private health insurance does not seem to be very easy. To mitigate or circumvent this problem, legislators do not only establish or adjust corresponding regulation in a way they think appropriate. In addition, they are using financial instruments such as public subsidies, or they add risk-equalization schemes and effectively convert funded schemes into pay-as-you-go schemes. This tendency is most visible in Slovenia, but it also plays a role in the US, taking the form of expensive tax credits for some groups of potential plan sponsors, and in Germany, where a sophisticated approach to pre-funding private health-insurance contracts has been diluted in recent attempts to provide for portability across insurers. In the new German framework, however, it is at least acknowledged that the portability of health insurance has financial consequences which can be, and probably should be, addressed directly through payments between health funds.

[35] Mainly, individuals have to stay with an insurer for at least one year, and they have to observe a notice period of three months.

The main lessons from these observations for a discussion of international portability in health-care benefits and health-cost cover are then as follows. First, from an actuarial perspective, switching from one health scheme to another is probably not as easy as the current framework for international migrants in public health insurance suggests. Second, one ought to be careful about the design of mechanisms addressing this issue, as inappropriate solutions can either affect the financial situation of health funds, eventually leading to risk segmentation and jeopardizing their solvency, or may indeed have negative repercussions on mobility. Third, the potential impact of portability rules on the structure and performance of insurance markets is particularly interesting, since international mobility may effectively introduce competitive pressure in domains that have been deliberately exempted from competition at a national level, for instance, through the introduction of public health care and public health-insurance schemes.

4 A conceptual framework for the portability of health-care benefits

Thus far, we have reviewed different types of materials that are important, or at least interesting, with respect to designing a conceptual framework for making health-cost cover portable across countries. Now, we want to address this question directly, discussing how international mobility of individuals who settle, at least temporarily, in another country typically affects the systems funding for their health costs. In this respect, the most important distinction is not between public and private systems but between *unfunded and (partially) pre-funded systems*. In reality, most public schemes are indeed unfunded, while private health insurance has to be funded if it does not just cover expected current health costs – unless public regulation imposes another business model on the providers. Thus, the two distinctions have large overlaps, but they are not identical. Here, we will deal with the two relevant types of systems in turn, first developing a conceptual framework for designing appropriate portability rules for unfunded schemes covering health costs (see Section 4.1), then investigating the role of accumulated financial reserves for the appropriate design of such rules (see Section 4.2).

4.1 Portability in unfunded systems of health-cost cover

In unfunded schemes, all transactions between insured individuals and health funds that occurred in earlier periods – governed by the various elements of insurance and redistribution described in Section 2.2 – are past history. We highlighted earlier that unfunded health systems are implicitly offering long-term relationships in which the balance of payments made and services received by average members systematically shifts around over time. Yet, whenever an individual considers becoming mobile, there is nothing left

of premiums or contributions made until then to fund for future health costs of the individual. Therefore, the consequences of mobility for unfunded systems of health-cost cover – in sending as well as in receiving countries – need to be determined in a *forward-looking perspective*: what matters are the future contributions and future benefit entitlements of the individual and all dependents, as far as they are covered together with the individual under consideration.

From the perspective of sending countries, future contributions are revenues foregone, and future benefit entitlements are (implicit) liabilities that are going to be wiped out if the individual moves away. In receiving countries, new liabilities are created and additional revenues are going to accrue if the individual is admitted to enter an unfunded health system there. Meaningful portability rules for health-cost cover from unfunded systems should take all these consequences into account, while existing legal arrangements either neglect them (for migrant workers) or make them a reason why other individuals (e.g., pensioners) are only admitted to the receiving countries' health systems if they have acquired at least some amount of pension entitlements in this country.

a) Expected health costs: determinants

To fully spell out the implications of (international) mobility for unfunded schemes covering health costs, let us consider a formal model which captures all relevant characteristics of the individuals covered and all relevant features of existing health systems (see Holzmann and Koettl 2011, Sections 3 and 5, for a similar model addressing portability in social insurance in a broader fashion, with some applications to health care). The starting point for our considerations are life-time profiles of expected health costs of a given individual arising within a given health system, as those shown in Section 2.1. Technically speaking, these profiles are vectors, or lists, of *annual health costs*, $AHC_a^{g,j}$, for individuals of gender $g \in \{f, m\}$ (*f*emales and *m*ales) in risk class $j \in \{l, h\}$ (*l*ow or *h*igh) and at age $a \in \{0, 1 \ldots \omega\}$ (ω being the age at which the survival probability is set to zero in current life tables). For simplicity, we restrict attention to two risk classes, viz. low risks who are basically healthy and (average) high risks whose health costs are permanently increased, as in Figures 2 and 4 above.

In the following, we will effectively concentrate on annual health costs arising from a particular age onwards at which an individual is considering to migrate to another country or to another health system, respectively. To do so, we have to consider a number of potential changes affecting expected future health costs for this individual both over the individual's remaining life span and over time. First of all, we need to take into account the probability that the individual will survive until age $a+1$, $\sigma_a^{g,j}$ (with $0 < \sigma_a^{g,j} < 1$ for $a < \omega$), and subsequently to any higher age (with $\sigma_\omega^{g,j} = 0$). We assume, with some

sense of realism, that survival probabilities are differentiated not only by age, but also by gender and risk status (with $\sigma_a^{g,l} \geq \sigma_a^{g,h}$). For those who are currently low risks, we also need to take into account that they may continue to be low risks at age $a+1$ with probability λ_a (in the range $0 < \lambda_a < 1$), or that they may experience a deterioration in their health status with probability $1-\lambda_a$. The way we define high risks, namely as individuals who have developed conditions leading to a permanent increase in expected future health costs, we do not allow for a change in health status in the opposite direction. For convenience, we assume that the probability of a change in health status may vary with age but does not significantly vary by gender.

In addition to these life-cycle changes in relevant characteristics of the individual, there are also changes which may affect the individual's future health costs as time passes by. If the series of annual health costs is taken from a cross section, relating to individuals at different ages in a particular year, we need to consider future increases in age-specific annual health costs through an annual health-cost inflation factor, $1+c$, which may differ from general price inflation and is simply assumed to be constant here. Also, to make annual health costs measured as a longitudinal profile for a given individual comparable across time, assessing them in terms of present values for the current year, we need an annual discount factor, $1+r$, which is again assumed to be constant.[36]

b) Expected health costs: differentiation by risk status

Building on these ingredients, we can calculate *expected future health costs*, $EHC_a^{g,j}$, for individuals of gender *g* in risk class *j* and at age *a*. For individuals who are *high risks*, expected health costs are simply given by the sum of annual health costs for a high risk arising from age *a* onwards, weighted with the relevant survival probabilities, up-rated with health-cost inflation, and discounted to form present values for the current time period (with $t \in \{0, 1 \ldots\}$ being a time index that is equal to zero for the current year).

$$EHC_a^{g,h} = \sum_{t=1}^{\omega-a} \left[\frac{(1+c)^t}{(1+r)^t} \prod_{x=a}^{a+t-1} \sigma_x^{g,h} AHC_{a+t}^{g,h} \right] \qquad (1)$$

This way of expressing expected life-time health costs for high risks is certainly very transparent. Alternatively, we can also use a recursive formula which simply adds the present value of annual health costs for a high risk expected for the next year of life, appropriately weighted and up-rated, to expected future health costs of a high risk assessed from the perspective of this next year. This alternative version of writing expected future health costs for high risks reads

[36] In theory, meaningful restrictions applying to both factors only imply that $c > -1$ and $r > -1$, while we can safely assume *c* and *r* to be larger than zero, certainly in terms of long-term averages, in reality.

$$EHC_a^{g,h} = \frac{1+c}{1+r}\sigma_a^{g,h}\left(AHC_{a+1}^{g,h} + EHC_{a+1}^{g,h}\right). \qquad (1')$$

A recursive formula of this type is actually needed to express expected future health costs for individuals who are currently low risks, as they may become high risks with some probability at any point in time in the future. Expected life-time health costs for *low risks* are thus given by

$$EHC_a^{g,l} = \frac{1+c}{1+r}\sigma_a^{g,l}\left[\lambda_a\left(AHC_{a+1}^{g,l} + EHC_{a+1}^{g,l}\right) + (1-\lambda_a)\left(AHC_{a+1}^{g,h} + EHC_{a+1}^{g,h}\right)\right], \qquad (2)$$

a generic formula for expected future health costs for individuals in any risk status being

$$EHC_a^{g,j} = \frac{1+c}{1+r}\sigma_a^{g,j}\left[\lambda_a\left(AHC_{a+1}^{g,j} + EHC_{a+1}^{g,j}\right) + (1-\lambda_a)\left(AHC_{a+1}^{g,h} + EHC_{a+1}^{g,h}\right)\right]. \qquad (3)$$

If the first term in square brackets in equation (3) is set to its high-risk value $(j = h)$, the probability of a change in risk status for low risks (λ_a) cancels out from this formula, and the equation simplifies to (1').

c) Non-contributory cover for dependents

Depending on relevant rules applied in the system of health-cost cover applying to the individual we are looking at, we may also have to take into account health costs for a partner and the children of this individual if they have non-contributory cover from the same system.[37] If an individual has dependents with non-contributory cover, we can re-interpret equation (3) as a formula for assessing expected future health costs for this individual *i*, with gender *gi*, risk status *ji* and age *ai*, the relevant intermediate result being $EHC_{ai}^{gi,ji}$. To obtain *total expected future health costs* linked to the coverage of health costs for this individual, we then have to add health costs for a partner *p* and for each of the *N* children (numbered $n \in \{1, \ldots N\}$) who are eligible for additional cover. The relevant amount of expected future health costs is then given by

$$EHC_a^{g,j} = EHC_{ai}^{gi,ji} + pEHC_{ap}^{gp,jp} + \sum_{n=1}^{N} k_{an} EHC_{an}^{gn,jn}, \qquad (4)$$

where $p \in \{0,1\}$ and $k_{an} \in \{0,1\}$ are eligibility counters applying to partners and children, respectively. In equation (4), expected future health costs for eligible partners, $EHC_{ap}^{gp,jp}$, are calculated as in equation (3), taking into account the partner's gender, risk status and age. When calculating expected future health costs for each eligible child, $EHC_{an}^{gn,jn}$, the formula stated in equation (3) must be applied to the periods until $an = \chi$

[37] Otherwise, we should treat them in isolation, i.e., as separate individuals who are considering to migrate elsewhere, applying the same logic as for the single individual we have looked at thus far.

(not $an = \omega$), χ being the last year of age in which children can be expected to be eligible for non-contributory cover through (one of) their parents.

d) Long-term sustainability of financing health care

Last but not least, when assessing the amount of expected future health costs arising for a given individual within a given system of health-cost cover, we also have to address the fact that this system may not be "sustainable" in its current form over the time horizon of our calculations or, eventually, in terms of the *intertemporal government budget constraint*.[38] In other words, based on the equations we have derived here thus far, we may account for future health costs that may not arise at all for those who continue to have cover from the system, for instance, because health-cost inflation *c* is too high, exceeding expected price and wage inflation, or because the age composition of the insured population is expected to deteriorate.[39] The easiest way to deal with this complication is to apply a uniform sustainability factor $1-s$ (with $0 < s < 1$) to expenditure accruing in each year in the future. Adjusting our earlier calculations, we then obtain *sustainable future health costs*, $SHC_a^{g,j}$, which are given by

$$SHC_a^{g,j} = (1-s)EHC_a^{g,j}. \tag{5}$$

e) Expected revenues for financing health care

Future health costs essentially turn into future expenditure saved if an individual is actually leaving an unfunded system of health-cost cover. Besides, expected financial contributions to this system which the individual could have made in the future are of course no less important. The way in which unfunded systems of health care or health insurance are financed can be different. Around the world, ear-marked contributions specifically collected for health funds, injections from the general-government budget that are mainly tax-financed, or some mixture between these two approaches play a dominant role in this area. Without a loss in generality, we may take annual "tax" revenues, $T_a(y_a^{g,j})$, that are raised from each individual and are effectively channeled into the health system as the basis for assessing expected financial contributions that turn into future revenues foregone if an individual is leaving the system. The way we model them, these revenues are derived from a generic tax function T_a which may differ by the tax payer's age and is

[38] See Blanchard (1990) for a conceptual clarification of what "sustainability" means from a public-finance point of view. In EU Economic Policy Committee (2001; 2003) it is explained and discussed how this notion is nowadays used to monitor public finances in a long-term perspective in EU countries (and, occasionally, also in other developed countries, see Hauner et al. 2007) for practical purposes.

[39] In both cases, future health expenditure could not be financed using a constant share in GDP of the respective country, i.e., from constant contribution rates or a constant fraction in tax revenues in an otherwise unchanged environment.

applied to a tax base $y_a^{g,i}$ which is assumed to consist of wages and pensions mainly, but may comprise other income, consumption, or any combinations of these components as well. In any case, the tax base may vary by gender, health status and age due to the rules applied as well as the ability to pay taxes.

Building on a time series of annual tax payments conditioned on the relevant characteristics of a given individual, we can then determine the present value of *expected future tax revenues* that this individual would have to pay under current rules for the system we are looking at. In its most generic form, the relevant formula reads

$$ET_a^{g,j} = \frac{1+w}{1+r}\sigma_a^{g,j}\left[\lambda_a\left(T_{a+1}(y_{a+1}^{g,j}) + ET_{a+1}^{g,j}\right) + (1-\lambda_a)\left(T_{a+1}(y_{a+1}^{g,h}) + ET_{a+1}^{g,h}\right)\right]. \qquad (6)$$

Here, the assessment of future tax revenues follows a similar logic as the assessment of expected future health costs, see equation (3), with a recursive structure to allow for changes in risk status at any point in time in the future. The factor $1+w$ (with $w > -1$) reflects wage inflation or any increase in the average, individual-level tax base occurring. For simplicity, we assume that the tax function is adjusted to wage inflation in such a way that tax progression is neutralized with respect to the growth in average wages. That is, within a given period of time the tax function T_a may well exhibit progression with respect to the tax base $y_a^{g,i}$, while it behaves as if it were linear in an intertemporal perspective. The function is also assumed to be stable otherwise, as we neglect potential future increases in contribution rates, tax rates etc., making adjustments regarding the future sustainability of the system on the expenditure side; see equation (5). If cover for dependents affecting future health costs is non-contributory – as is assumed in equation (4) – equation (6) is indeed the final version of expected future revenues linked to membership of an individual in a given system of health-cost cover.[40]

f) Expected net costs of migrants

We are thus approaching the final result of our calculations regarding the financial consequences of the possibility that an individual may leave an unfunded system covering health costs, for the individual as well as for any dependents, and may then enter another system of the same type located elsewhere. This result is given by *expected future net costs* (or surpluses, as it may be) related to the membership of this individual in an unfunded system of health-cost cover,

$$ENC_a^{g,j} = SHC_a^{g,j} - ET_a^{g,j}. \qquad (7)$$

[40] Otherwise, health costs and revenues relating to partners and children should be assessed in separate calculations (see footnote 37).

Note that the *ENC*s calculated for a given individual (and all dependents with non-contributory cover) can be larger than, equal to, or smaller than zero. They are determined by individual characteristics of those who consider migrating as well as by features of the health systems which would be affected. For the potential sending country *A*, $ENC_{a,A}^{g,j}$ measures the net costs saved, or the surplus foregone, if a particular individual actually leaves the national health system – compared to a situation where it has continued, and eventually life-long, cover. For a receiving country *B*, $ENC_{a,B}^{g,j}$ measures net costs incurred, or the surplus accruing, if the individual is admitted to the health system, hence to the national risk pool, for *life-long cover* in this country.

The result of our calculations regarding the financial consequences of mobility between unfunded systems of health-cost cover therefore implies the following. When letting go a migrant, health funds in the sending country may effectively wish to claim $\left|ENC_{a,A}^{g,j}\right|$ if $ENC_{a,A}^{g,j} < 0$; they may be willing to pay up to $\left|ENC_{a,A}^{g,j}\right|$ if $ENC_{a,A}^{g,j} > 0$. Conversely, when accepting a migrant, health funds in the receiving country may be willing to pay (in brackets: they may wish to claim) $\left|ENC_{a,B}^{g,j}\right|$ if $ENC_{a,B}^{g,j} < 0$ $(ENC_{a,B}^{g,j} > 0)$. Ideally, to make unfunded health-cost cover portable the two health funds involved could thus compensate each other for any net costs avoided or net costs incurred, based on the net-present-value positions of both health systems, if the individual becomes mobile across the two countries instead of staying in the sending country.

The same logic can also be applied to *temporary moves*, provided they last long enough that accounting for the consequences for the health funds involved appears to be worthwhile. If this is the case, transferring the provision of insurance for health costs (including the elements of redistribution that may be attached to it, following the rules of the receiving countries' system of health-cost cover) may make sense. If the temporary move of an individual, plus any dependents, lasts for *d* years, health funds in the sending country may wish to claim (or pay) $\left|ENC_{a,A}^{g,j} - ENC_{a+d,A}^{g,j}\right|$ if this difference is negative (respectively positive). That is, expected net costs accruing in the more remote future, after the individual will have returned, need to be deducted from the result applying to a case where mobility is open-ended or expected to last indefinitely. Conversely, health funds in the receiving country may be willing to pay (or claim) $\left|ENC_{a,B}^{g,j} - ENC_{a+d,B}^{g,j}\right|$ if this difference is negative (respectively positive). Real-world scenarios of international migration can of course be substantially more complicated, involving various sources of uncertainty, unexpected changes in earlier plans, and consecutive moves in different directions. But in any case, the formula for calculating the consequences of mobility for unfunded national health systems that we have derived here can be easily applied pro rata temporis, the shortest duration of an expected stay in a given country, or under the rules of a given health system, for which this makes sense probably being one year.

g) How to isolate insurance from redistribution

We will discuss later on, in Section 5.2, whether the distinction between elements of insurance and elements of redistribution should be taken into account in designing appropriate portability rules (see Section 2.2 for a closer description of these components of existing arrangements of health-cost cover). Disentangling the effects of insurance for expected future health costs from those of redistributive elements of unfunded health systems may nevertheless be useful at this stage to see how this could be done and to prepare for an in-depth treatment of the material issues that arise.

The design of elements of redistribution varies a lot across national systems covering health costs. The scope of insurance which is actually involved in funded schemes also shows some diversity, while all unfunded systems of health-cost cover next to automatically provide insurance in all its basic forms distinguished above: cover for current health costs (by which individual contributions would have to correspond to expected annual health costs in the current year), insurance against any deterioration of one's health status (by which contributions would have to follow the time profile of expected average health costs over the remaining life cycle), and some amount of intertemporal burden smoothing (to obtain a flatter time profile of contributions over the life cycle than the one just described). Redistribution then leads to further modifications of the total amount as well as the life-cycle profile of contributions due, while national health systems typically give each individual access to benefits which are fully captured by expected (sustainable) future health costs as assessed above.

Probably the easiest way of determining contributions that cover all elements of insurance, but no redistribution, in an unfunded system of health-cost cover is to calculate the per-capita amount of total annual health costs for each individual who is covered by the system and for each year that membership can be expected to last (weighted with the relevant survival probabilities, that is).[41] Fictitious annual lump-sum premiums which are obtained in this way cover a fair share in annual health costs and do not reflect the extra-costs arising from changes in health status. They may also vary a bit over time, depending on long-term trends in total health expenditure for the insured population, but they should take away the strong, age-related trend in expected health costs observed at the individual level. At the same time, they do not reflect the effects of redistribution by income involved in actual contributions, and they attribute a price to all kinds of non-contributory

[41] As in the calculations described in Sub-section *c*, cover for dependent children should of course be restricted to the (maximum) period in which they can be eligible. Also, one could calculate a separate amount of per-capita costs for this group because these costs tend to be considerably lower than for an average adult (see, e.g., Figures 1 and 3) and, more importantly, because it is often unclear whether they will remain under the coverage of the current system when they start making their own decisions (to participate in the labor force, to move abroad, etc.)

cover. Yet, one could be more careful in neutralizing the intergenerational redistribution that is typically involved in unfunded systems of health-cost cover.[42]

If expected future health costs of an individual remain unchanged, while revenues collected from the individual are adjusted to undo the effects of redistribution, expected future *net* costs will change accordingly. They will become higher (and, apart from exceptional cases, may no longer be negative) for those who must be expected to pay for the redistributive elements of a given health system as the contributions of these individuals are fictitiously reduced in these calculations. Conversely, expected net costs will become lower for those at the receiving end of redistribution because their contributions are fictitiously increased. The differences between expected net health costs by age, gender and risk status will thus become smaller than when redistribution were included in the calculations, but they need not disappear. Specifically, variation of expected net health costs by age is still likely to be substantial. The reason is that annual health costs tend to increase at higher ages, while contributions – those actually paid as well as those imputed here – are likely to be considerably lower at later stages of the life cycle. Yet, the same individuals will typically have paid contributions exceeding their annual health costs at younger ages. Their positive (and high) expected net health costs at old age are thus the result of an implicit element of pre-saving which is inherent in any kind of intertemporal burden smoothing.

One might thus wonder why we stick to our forward-looking perspective in assessing the consequences for national systems of health-cost cover here if individuals consider emigrating or immigrating, respectively. Instead, we might try to account for the amount of pre-saving directly, based on past contributions and past health costs, with some adjustments for the effects of redistribution that may have taken place. But this would not be appropriate, due to the element of insurance against changes in health status – at least, if health costs differ substantially between those at low risk and those at high risk. To provide insurance for health-status risks, irrespective of when a change in health status occurs, funds that are fictitiously attributed to an individual need to cover future health costs in an appropriate differentiation – an aspect which cannot be dealt with based on figures observed in the past. (We will further elaborate on this point immediately, when we turn to discussing systems that are actually funded; see Section 4.2.)

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[42] Accounting for average health costs of those actually insured in each year limits the intergenerational redistribution to some kind of burden sharing, or mutual insurance, among all those whose life cycles overlap. More careful approaches would have to make sure that, on present value terms, life-time contributions of each individual are equal to life-time health costs arising for an individual at average health risk. In other words, one would have to approach the way in which only a narrow sub-set of funded health insurance schemes is actually calculated (see Section 4.2). Here, we content ourselves with applying a less precise yardstick to determining the effects of unfunded insurance without redistribution.

Otherwise, the implications of our adjusted calculations look much the same as those in the previous sub-section. When the effects of redistribution are neutralized, differences in expected future net costs across different types of individuals are smaller, and net health costs themselves are most likely positive in each case. Still, if individuals consider migrating from one country to another, adjusted net health costs can be taken to indicate a potential willingness to pay on the side of the national health scheme in the sending country. At the same time, net health costs assessed there reflect potential claims of the health scheme in the receiving country. Again, the same logic can be applied to temporary migrants if the provision of health insurance shall be transferred for a limited number of years and if calculations regarding future net health costs are therefore restricted to this period.

4.2 Portability in (partially) pre-funded systems

Instead of being operated on a pure pay-as-you-go basis, systems covering health costs can indeed accumulate financial reserves. This is useful, in particular, to offer insurance against changes in health status that materialize over time, to engage in intertemporal burden smoothing, or to avoid or limit intergenerational redistribution (see, again, Section 2.2). In schemes that are at least partially pre-funded, (international) mobility of individuals does not only appear to have an impact on the balance of expected future costs and revenues, but also on the use of funds which have been accumulated in the past. If the total stock of reserves remains unchanged, individuals leaving such a scheme increase the amount of funds that are available on a per-capita basis, while individuals entering the scheme reduce it. Therefore, the question arises whether the *existence of financial reserves* should not also play a role for designing appropriate portability rules.

For instance, when an individual considers leaving a pre-funded scheme, some share in existing funds could be attributed to the individual and should probably be paid out, rather than creating a windfall gain for all other individuals who remain in the scheme. Likewise, in terms of premiums or benefit entitlements an individual who considers entering such a scheme is likely to be treated very differently from individuals of the same age and health status who have contributed to the current stock of reserves in the past. But things could be different if new entrants were able to carry with them a portable amount of reserves that they have built up elsewhere.

At closer inspection, however, expected future net costs and any amount of reserves that may currently exist are strongly linked to each other. This implies that determining the financial consequences of mobility of individuals across systems of health-cost cover need not be fundamentally different, depending on whether these systems are funded or

not. This can best be seen for schemes that are indeed fully-funded. But, with some adaptations to such a mixed regime, it is also true for partially-funded schemes.

a) Fully-funded schemes

As a matter of fact, in fully-funded systems expected future net costs of each individual should exactly correspond to the share in funds accumulated in these systems that can be attributed to the same individual. In other words, expected net costs (*ENC*) as assessed in the above sense (see Section 4.1) for an individual of given gender, risk status and age are usually positive, indicating a willingness to pay for net costs avoided whenever the individual considers leaving the system. The maximum payment that the system would be willing to offer is equal to the amount of reserves which have been accumulated to (*fully*) pre-fund for these expected net costs. Conversely, by the terms of a contract for an individual entering a fully-funded scheme of health-cost cover, expected net costs of the new member arising in this scheme should be zero – unless the individual is bringing some amount of (portable) reserves. In this latter case, however, the scheme that is to be entered would be willing to accept a corresponding amount of *ENC*.

Fully-funded systems of health-cost cover are typically based on actuarial calculations by which these links between accumulated funds and future net costs can be easily verified. Preserving most of the notation introduced in the previous section, we should note that fully-funded health-insurance contracts are essentially based on the *condition that expected net costs are zero* at the age *e* when an individual first enters the system. Being careful about the precise timing underlying our model, this implies that

$$\frac{1}{\sigma_{e-1}^{g,j}} EHC_{e-1}^{g,j} = \sum_{t=1}^{\omega-e+1} \left[\frac{1}{(1+r)^t \sigma_{e-1}^{g,j}} \prod_{x=e-1}^{e+t-1} \sigma_x^{g,j} P_{e+t-1}^{g,j(e)} \right], \tag{8}$$

i.e., that future health costs and future revenues expected at this time must off-set each other. Here, our modeling of the revenue side is meant to reflect that payments made by the individuals covered in a fully-funded health insurance are premiums, *P*, rather than income-related contributions or taxes. Note that we allow for premiums that are differentiated by gender and risk status at the year of entry and may also vary with age – but not with current risk status, as pre-funding would not be needed then.[43]

If, at a higher age *a*, an individual who has been in an average risk status of the relevant age cohort, $\bar{j}(e)$, to date considers leaving the scheme, equation (8) can be re-written and re-arranged to form

[43] Correcting for the contingent survival probability $\sigma_{e-1}^{g,j}$ on both sides of the equation is needed because we have to assume the individual to be alive at age *e*. Only, by our forward-looking definition of the *EHC*s, we effectively discount all figures entering the equation to the period when the individual was aged $e-1$, without any further implications.

$$EHC_a^{g,\bar{j}(e)} - \sum_{t=1}^{\omega-a}\left[\frac{1}{(1+r)^t}\prod_{x=a}^{a+t-1}\sigma_x^{g,\bar{j}(e)}P_{a+t}^{g,\bar{j}(e)}\right] = \sum_{t=e}^{a}\left[\prod_{x=t}^{a-1}\frac{1+r_x}{\sigma_x^{g,\bar{j}(e)}}\left(P_t^{g,\bar{j}(e)} - AHC_t^{g,\bar{j}(e)}\right)\right]. \quad (9)$$

Basically, the left-hand side of equation (9) represents expected future net costs from age $a + 1$ onwards, that is, $ENC_a^{g,j}$ in a fully-funded health-insurance scheme built on actuarial principles, while the right-hand side of equation (9) reflects the accumulation of financial reserves for an average individual until age *a* which takes place within such a scheme. Apart from a change in the reference period and a few up-dates regarding expectations which have materialized over time, the equality stated here should still be immediate from condition (8).

Although equation (9) is kept as simple as it could be, the *accumulation of funds* described here may require a few words of explanation. (For much more detailed calculations on essentially the same issue, see Baumann et al. 2008.) Note, first of all, that past values of average health costs and premiums (as well as past interest rates) are no longer subject to any uncertainties, so that we can now use actual figures. Given that, accumulated funds mainly derive from an excess of insurance premiums P_t over annual average health costs AHC_t incurred in the past – assuming that the time profile of premiums is frontloaded compared to the health-cost profile to pre-fund for potential changes in risk status and to smooth the financial burden of premiums over time. Multiplying these annual differences by the interest factor(s) $1 + r_t$ and summing them up until age *a* on present-value terms also reflects (compound) interest earned on existing reserves. In addition, mortality observed for individuals of the same age cohort between ages *e* and *a* implies that the reserves built up from premiums paid by those who died in the meantime have been "bequeathed" to those who survived, which leads to the weighting by σ_t^{-1}.

Regarding the financial consequences of mobility of individual members for fully-funded schemes of health-cost cover, *excepted future net costs* and *accumulated funds are* thus essentially two sides of the same coin. In other words, they are just *two different ways* of assessing payments that are needed to make insurance cover fully portable across providers or even across systems.

An important complication in determining portable amounts of funds for a given individual in a fully-funded health-insurance scheme is hidden behind the assumption of an individual with "average" risk status in equation (9). To actually pre-fund for expected future net costs, portable funds should be lower than average for individuals who are still low risks at age *a*, while they should be higher for individuals who are high risks. The risk status at the age of entry is usually taken into account when calculating premiums, so that it automatically feeds through to higher reserves for individuals who were high risks from the very beginning. However, insurance against any deterioration in risk status that occurs later on means that those who continue to be low risks effectively contribute to a

higher pre-funding also for those who have just developed a relevant condition. If total funds accumulated in such a scheme were stored in individual accounts, part of current premiums paid by the former group would have to be channeled, year by year, into funds covering higher expected net costs for the latter group (see Baumann et al. 2008 for an in-depth analysis, or Pauly et al. 1995 who implicitly stress this point in their idea of health-insurance contracts with "guaranteed renewability"). This *re-allocation of funds by changes in risk status* is invisible, or even immaterial, as long as all individuals stay in the same scheme covering their health costs. But it needs to be made explicit when an individual is willing to leave the scheme. Otherwise, the individual would lose an important part of long-term insurance cover (if a high-risk individual could only take away funds needed for an average risk), or those left behind would suffer financial losses and their contracts might become subject to risk segmentation (if a low-risk individual could take away average amounts of funds).

Against this background, projecting expected health costs based on the characteristics of a given individual – in line with how the insurance contract is calculated in general – may thus be a simple, more targeted alternative to assessing portable shares in existing reserves in a backward-looking fashion. Forward-looking calculations are in fact the only way to determine how much of the funds accumulated through earlier contributions need to be re-allocated in the case of a change in risk status, if risk-specific differences in health costs are substantial and if this health-status risk is subject to the insurance provided by a given system of health-cost cover. Note that in fully funded systems which do not insure the health-status risk (and do not add an element of intertemporal burden smoothing), portability is not much of an issue as individuals are always paying premiums to cover their actual current health costs. In addition, this approach could also be applied to fully-funded systems which, backed by compulsory membership rules and additional regulation, effectively include some elements of redistribution (e.g., cover for dependents at less-than-actuarial premiums).

While determining the financial consequences of mobility across health funds leads to very similar calculations for both funded and unfunded systems, there are still a number of differences between these two types of schemes. For instance, when individuals consider leaving a fully-funded scheme, it is more likely that their former insurer is willing to make a payment – rather than wishing to claim one – than in an unfunded scheme. The reason is that fully-funded schemes typically do not involve any elements of interpersonal redistribution (and do not give rise to intergenerational redistribution). The relevant amounts of *ENC*s, or the funds which can be attributed to each individual, can therefore be assumed to be *positive* in virtually all relevant cases. For the same reasons, fully-funded schemes will usually offer less favorable conditions than in an earlier, fully-

funded contract when individuals consider joining them – or they have to ask for compensating payments. There is also a major difference between funded and unfunded systems in terms of *property rights* – in an economic perspective, but potentially also in a legal sense. Claims based on a share in accumulated funds that an individual has contributed to in the past may appear to be substantially stronger than those solely based on financial consequences of mobility expected for the future. In spite of the substantial parallels which we have pointed out here, this aspect might become important with respect to designing portability rules for practical purposes. Even if the basic idea remains the same, with two health funds involved in covering health costs for individuals who are mobile effectively compensating each other for any net costs saved or net costs incurred, related payments may appear to be justified much better when they can also be phrased in terms of a transfer of existing funds.

b) Partially funded schemes

In reality, systems covering health costs are not either fully funded or entirely based on the pay-as-you-go mechanism. There is in fact a continuum of potential solutions in between these two extremes. However, schemes that do not belong to one of these pure types will mostly be rather close to one of them. On the one hand, systems holding relatively high amounts of reserves may not be operated on a strictly actuarial basis, being constrained in this respect by public regulation or openly acknowledging that the future is uncertain, so that actuarial calculations based on expected life-time health-care costs of insured individuals would have to be revised from time to time anyway.[44] As a consequence, compared to total costs that could be reasonably expected for the future the degree of pre-funding may effectively be partial only, for instance, relating to an extended, but still limited, time horizon. On the other hand, systems that are largely unfunded may nevertheless hold some amount of reserves, for instance, in terms of "demographic buffer funds". These funds result from an increase in contribution rates beyond current cost rates and may be scheduled to continue to grow for a while. They may then be reduced and eventually depleted to keep contribution rates stable in a period when expected costs go up. They are thus available as an aggregate stock of funds which can be used for shaping

[44] Revisions of this kind, with re-assessments of expected health-cost profiles and premiums, actually happen in fully-funded schemes. Nevertheless, we consider them immaterial for our calculations sketched in the previous sub-section as these calculations are meant to reflect the financial consequences of mobility based on all information that is currently available. If future changes could be foreseen with sufficient certainty, they should already be included in current insurance conditions. – Note that a similar problem arises with respect to assessing the future sustainability of unfunded schemes. In this regard, too, all information that is currently available should be exploited to determine the consequences when insured individuals are currently deciding to become mobile. It is hardly avoidable that, later on, this assessment may turn out to be imprecise.

the extent of intergenerational redistribution involved in an otherwise unfunded scheme, but they are never formally attributed to individual members' accounts.

For any partially funded scheme of health-cost cover, condition (8) does not hold, not even for an "average" insured individual, due to the unfunded part of expected future health costs and the intergenerational redistribution that is automatically involved. Determining the share of a given individual in existing funds is nevertheless possible, simply by assessing the *share* in expected future health costs for all current members which can be covered from these funds. This aggregate-level share could then be applied to *expected future health costs related to a particular individual*. The calculation would result in a correspondingly higher amount of funds for those who have higher expected costs because of an unfavorable risk status or because of elements of redistribution involved in the respective scheme. However, following the common logic for assessing the implications of (international) mobility for both unfunded and fully-funded schemes of health-cost cover that we have developed here, calculations of this kind are not really needed. Instead, one should once again determine *expected future net costs*, i.e., costs saved or surpluses foregone if an individual moves out or in, based on equations (1) through (7) or based on the left-hand side of equation (9) – depending on how the scheme is operated and on the elements of insurance and redistribution it is offering. The effects of partial pre-funding for future net costs relating to this individual as well as the individual's role for accumulating reserves are then implicit in these calculations.

To see this, note that in systems of health-cost cover that are mostly unfunded, but do hold some amount of funds, existing reserves should have an impact on the future sustainability of these systems. As a consequence, the "sustainability factor" introduced in equation (5) will be larger (that is, the discount for a lack of sustainability will be smaller) than if there were no funds.[45] Thus, if everything else is unchanged, expected future net costs of a given individual tend to become larger, or less negative, in a partially-funded scheme compared to an unfunded scheme. Therefore, if an individual who considers leaving the scheme is expected to be a net contributor (with $ENC_a^{g,j} < 0$), the scheme may claim a lower payment; if the individual is a net recipient ($ENC_a^{g,j} > 0$), the scheme may be willing to make a higher payment than in the alternative case of an unfunded scheme. In the first case, the funds left behind reduce the losses involved in the emigration of individuals with low health costs or high capacities to make contributions. In the second case, individuals with relatively high expected costs who are leaving the scheme are effectively endowed with part of the funds that have been built up in this scheme. Mutatis mutandis, the same applies to the financial consequences of migrants who are entering

[45] Or, in an alternative approach for assessing *ENC*s, expected future revenues collected from a given individual could be correspondingly smaller.

into partially-prefunded systems of health-cost cover. If everything else is unchanged, the willingness to pay for the entry of a new member will be lower than in an unfunded scheme, as the existence of funds implies that net contributors are needed less urgently; similarly, payments to be claimed for the admission of a new member will be higher, as net recipients would effectively draw on existing funds otherwise.

For these considerations, the precise timing of how funds have been built up in the past, or how they are scheduled to be spent in the future, is immaterial. What matters is that these funds exist and that they can be used to pay for some fraction of health costs of those who are currently under the scheme. Whether they are expected to continue to grow through future excess-contributions or whether they will be run down fast over a limited time horizon – all this is captured correctly in calculations regarding the present-value effects of future contributions and future health costs.[46]

4.3 Assessment

In this chapter, we have been discussing in some detail what we think is an appropriate conceptual framework for establishing international portability of health care or health-insurance cover. We have focused specifically on potential gains and losses arising from international mobility for the health funds involved on both sides – and, likewise, for individuals who opt out, or drop out, of long-term insurance of their health-status risk which is an important dimension of health-cost cover in quite a number of actual arrangements. We found that these gains and losses can be basically derived from the sign and amount of expected future net costs related to each individual who wants to become mobile, i.e., from expected health costs minus future contributions, adjusted for the risk status of the individual as well as for all elements of redistribution included in the relevant schemes. Calculating these net costs clearly requires some adjustments for how specific systems covering health costs are designed. But their fundamental role for potential problems involved in mobility, hence for approaches to establishing portability, is largely invariant to the way in which different sources of health-cost funding are financed.

5 Policy Implications

Continued and potentially life-long coverage of health-care costs has a great value for the individuals involved. This is clear for individuals who expect to benefit directly from the insurance and redistribution involved in existing schemes, for instance, because they are unhealthy, have low income, etc. Other individuals may expect to be net-payers in a giv-

[46] Keep in mind that, over time, aggregate amounts of funds can move in any direction even in a fully-funded system, depending on the relative size of current net injections and current withdrawals arising for all insured individuals.

en scheme. Still, they can benefit from being protected if health risks and other relevant risks materialize in an unexpected fashion, which is valuable from an ex-ante perspective if individuals are risk averse. In addition, whether they like it or not, individuals who are (expected to be) net payers are also important for the financial viability of health schemes and, hence, for other members who are at the receiving end of insurance and redistribution provided by these systems.

Against this background, *mobility* across health funds and even more so across countries may lead to significant *changes in mutual advantages and liabilities of individuals and insurers* if health-cost cover is not portable. Here, we will first highlight in more detail the problems that may arise from a lack of portability (see Section 5.1). Then we will move on to discuss options for establishing some form of "portability" in health care and health-cost cover. Specifically, we will propose a solution which is based on transfers between systems covering health costs, also providing simulations that are meant to illustrate how such a scheme could work under real-world conditions and what further issues might turn up if it is put into practical use (see Section 5.2).

5.1 Problems arising from a lack of portability

As we have seen in Section 4, individuals who are willing to move between different sources of health-cost funding are at risk of making substantial financial losses if they are losing entitlements that have been acquired with their former insurer without being able to find comparable cover elsewhere. On the other hand, if they are able to switch rather easily from one source of health-cost funding to another, this may impose substantial burdens on other members of either the former or the future risk pool. All these potential losses – or corresponding benefits for the individual leaving a system or for other members of one of the risk pools involved – are effectively two sides of the same coin, viz., the financial consequences of an individual exiting from or entering a health scheme.

In reality, these potential losses and benefits may materialize or not, depending on how they affect the design of relevant rules as well as the behavior of individuals. Therefore, we will also have to consider how relevant rules and behavioral responses interact when discussing the problems arising from a lack of portability.

a) For potential migrants

An extreme form of non-portability arises if migrants drop out of their earlier system of health-cost cover, but are not getting access to such a system in their destination country. Under less extreme forms, migrants may no longer be able to utilize their earlier system to get access to a full range of health services, or they may not be offered comparable cover at comparable costs in a new system, for instance, because net-contributions they

have made in their earlier system are neglected there. Clearly, any of these cases may give rise to concerns regarding the *migrants' social and financial situation* (see Avato et al. 2009, pp. 455–56), though maybe at varying degrees. In addition, the existence (or simply the fear) of these consequences may feed back on individual decisions, creating *economic distortions* and *inefficient outcomes* of these decisions.

Most importantly, the lack of portability of health care and health-cost cover may discourage individuals from migrating,[47] even where it can be expected to increase social welfare (from a supranational perspective). The same may apply to decisions to migrate home later on. It may also affect migrants' choices between different target countries, or between different jobs within a given country. In any of these cases, individuals tend to respond to differences in access to health-cost cover in a way that is individually rational, but does not lead to an efficient allocation of labor or efficient location choices of private households. Avato et al. (2009, p. 455) point to the possibility that a lack of access to health care or health insurance (or lack of portability thereof) may drive migrants into working in the informal sector. In a sense, all these implications for international mobility are a variant of what is called "job-lock" in discussions held in the US regarding their national system of employer-based, private health insurance (see Section 3.2). Lack of portability may thus not only be detrimental with respect to actual migrants, but also hits potential migrants, preventing them from becoming mobile in the first place. As a consequence, it may even have a negative impact on labor market performance and economic dynamics for society at large, both in potential source and target countries.

Of course, different individuals will be affected by this "mobility-lock" in different ways. For instance, young, healthy workers with good qualifications are typically welcome in any target country. They can easily get access to the health system there because, inter alia, they are expected to be net-payers in this system.[48] Things are most likely different with respect to individuals who are older and less healthy, so that the expected future net costs of their health care are likely to exceed zero by a substantial margin. The same may be true with respect to individuals with low qualifications or large families, depending on how these characteristics are reflected in national systems for funding health costs. Up to a point, countries receiving migration are able to discriminate between some of these groups in their immigration laws; for instance, by rewarding youth and qualifications in points-test systems for admitting new migrants, or by demanding health checks before granting residence or work permits. However, restricting access to a coun-

[47] In an empirical study, Geis et al. (2008) show that quality of the health-care system in the target country appears to attract migration, while they are unable to control for the cost of financing health care in separation, i.e., as distinct from the negative effects of a more general "tax" measure.

[48] Problems that are nevertheless related to these cases of mobility without portability show up elsewhere, namely in terms of negative effects for health systems in their home countries; see Sub-section *b*.

try (only) to avoid high expected health costs of migrants is a rather untargeted approach. Where this is an issue, focusing on health costs and on the question of how they will be funded is likely to be a better solution.

Differences in expected future net costs related to health care also explain the current legal framework, with an asymmetric treatment of (young) migrant workers and their families vs. non-workers and pensioners in portability rules that exist at an EU-level or through bilateral agreements (see Section 3.1). Apart from special cases (such as commuters and expatriates) workers and their families are effectively not addressed in these rules because they are usually admitted to their target countries' health systems directly, while non-workers and pensioners must bring health-cost cover from their home countries, so that their health costs accruing in the target country can be covered through reimbursements between health systems. From a national point of view, and in the absence of further rules addressing the portability issues involved, fully embracing immigrants who are expected to be net-payers and restricting access to systems of health-cost cover for migrants whose expected net costs are relatively high is a rational response. At least, it means that all individuals are free to migrate. Also, if there are provisions regarding access to health services and international reimbursements for those who remain insured in their source countries, individuals' decisions to migrate are not (at least, not heavily) distorted. Still, this solution is far from ideal – with potentially adverse effects that are probably not so much relevant for the individuals who are mobile but mainly for their health funds.

b) For health funds and other members of their risk pools

If health funds could charge each new member with risk-adjusted premiums that are entirely based on actuarial calculations, mobility of individuals and a lack of portability would not be a problem for insurers and other immobile members of a given risk pool. In this case, the problems that result would fall exclusively on individuals who consider moving from one scheme of health-cost cover to another, taking on the form of financial losses or a lock-in to a current health fund.[49]

However, public health-care systems or public health insurance providing the dominant form of cover in most countries are typically far away from fitting to this description. Not only do they insure current health costs and long-term health-status risks without risk-rating (relating at least to the time of entry); their funding often also involves redistribution along several dimensions instead of being based on actuarial calculations. This implies, among other things, that the exit of a high-income, low-risk individual or the entry of a low-income, high-risk individual can bring about financial losses or in-

[49] See Sub-section *a* as well as the discussion of German-type private health insurance in Section 3.2.

creased costs that would be a problem for an insurer faced with competition and, in any case, imposes a burden on other members of the same risk pool. Of course, the opposite is true for the entry of a low-risk individual or the exit of a high-risk individual.

In times when international mobility was more limited, the resulting marginal *increases* (or *reductions*) *in contribution rates or taxes* may have been negligible. With higher mobility, however, this has become more prominent. The ultimate problem that arises for health funds and their immobile members is a *process of risk segmentation* which could be fueled endogenously once it has reached a certain stage. Systems providing health-cost cover that are relatively expensive due to an unfavorable structure of insured risks (with, on average, a relatively poor health status) are then less and less attractive for those who are relatively good risks, so that the latter have an additional incentive to move away. At the same time, these individuals are attracted by countries with health funds covering risk pools with a more favorable structure. This problem may have far-reaching consequences that would not only affect national health systems but broader prospects for economic development and social cohesion within and between the countries affected. It can become particularly pressing for countries where many young individuals emigrate or where emigration leads to a brain drain.

While risk segmentation mainly relates to the structure of health risks covered in different systems of health insurance, a lack of portability rules can also create *distorted incentives to migrate resulting from the redistributive elements* of national systems of health-cost cover. Health funds that are rather generous in terms of redistribution may attract migrants, specifically those with low income or many dependents who would benefit most, while health funds with little redistribution may deter them. The countries which would be hit hardest might differ from those that suffer from risk segmentation. Also, while a process of risk segmentation leaves little room for manoeuver, distortions of migration incentives through redistribution can be removed by scaling back the amount of redistribution involved in the national health systems affected. But this may lead to a "race to the bottom" which can affect national fiscal systems at large and is likely to become detrimental for the incumbent populations – at least at some point.

5.2 Ensuring portability

From our discussion thus far, especially from our review of practical arrangements and the difficulties showing up there (see Section 3), it is clear that portability can effectively mean different things. It could refer to any kind of continuation of coverage over discontinuities in a given individual's life cycle, irrespective of the precise terms and conditions that apply. In this weak sense, portability is established whenever the individual does not drop out of health insurance entirely when becoming mobile. However, this rather weak

notion clearly avoids just the worst kinds of portability problems. Alternatively, portability could be meant to imply that health-cost coverage is continued without any change in the terms applying – an outcome that is rather difficult to accomplish in the context of health-care schemes, as these are mainly providing benefits in kind which are delivered under specific conditions and in a specific way which is to an important degree determined at the local level. This strong notion would amount to identical continuation of coverage, rather than portability.

Somewhere in between these two extremes, portability can also be taken to mean that individuals are transferred to a new scheme of health-cost cover, while the resulting changes in mutual advantages and liabilities are taken care of in such a way that individuals are treated comparably favorable as before, given the particular features of their old and new systems providing health care and funding health costs. Additionally, reasonable rules for portability should make sure that other members of the systems to be left and the systems to be entered do not suffer financial losses, or do not make windfall gains, as a consequence of some individuals becoming mobile. Effectively, this latter notion of comparable continuation under a different system and the absence of external costs and benefits for other members of the systems involved is what we prefer to call "*full portability*"[50] when finally discussing the policy implications arising from the considerations we have made in this paper.

a) Basic options

Our in-depth analysis of the effects of mobility for both unfunded and (partially) prefunded systems of health-cost cover indicates that, if an individual switches from one source of funding to another, this has an impact on expected future net costs incurred in each system. Combining the formal framework for assessing these changes that was developed in Section 4 with the typical features of health costs and systems covering these costs discussed in Section 2, it turns out that the sign as well as the size of these effects is likely to depend on following aspects: fundamental levels of health costs accruing in a given country; institutional features, such as the elements of insurance and redistribution involved in a given system; the individual's health status; and the individual's age when becoming mobile.

Against this background, the *current legal framework* for international portability of health-care benefits and health-cost cover for migrant workers which has been described in Section 3.1 appears to be untargeted, inconsistent and also potentially harmful for at

[50] Holzmann and Koettl (2011, p. 11) add a third criterion. Besides the absence of "benefit disadvantages" for migrants and their descendants and "fiscal fairness" for sending and receiving countries, they ask for "bureaucratic effectiveness" both for the institutions involved and for migrants.

least one of the three parties involved: individuals who consider becoming mobile, other members of the health fund they are about to leave, or other members of the health fund they are going to enter. The framework is untargeted because, for standard cases of migrant workers[51] and their family members, it simply ignores any consequences that are specific to health-care systems and health-cost funding – making admission to a health fund in the destination country subject to a "package deal", i.e., an annex to their work permit, and not taking care at all of the effects for health funds in the source country. The framework is inconsistent as other categories of migrants, e.g., pensioners, are treated very differently. For these cases, existing rules imply a solution with cross-border coverage, based on reimbursements for health services provided in the destination country that are paid by health funds located in the source country.[52]

While the legal status quo can thus not be considered as a meaningful portability regime, there are basically two options for establishing international portability of health-care benefits, ensuring access to health services for mobile individuals and dealing with the resulting issues in health-cost funding in an appropriate way. Following changes in residence or work place that are permanent or temporary, but of some length,[53] migrants could (i) stay under the coverage of their *source-country system* indefinitely, combined with *reimbursements* that are paid to health funds in foreign countries for any health services received there; or (ii) they could be moved to the *target country's system* of health-cost funding, combined with *mutual compensations* based on the expected financial consequences of such moves for each of the two systems involved.

The first option amounts to a generalization of the rules currently applying to pensioners and other migrants who are not considered as workers or workers' family members. If the application of these rules is not selectively restricted to those cases in which target-country systems are afraid of making financial losses, continued coverage for migrants would be guaranteed under this solution. Access to health services and quality of treatment would then largely depend on characteristics of the health-care system in the destination country, and all financial consequences could be dealt with through reimbursements that ought to be assessed as carefully as possible in terms of actual fees for services. While, in a stylized setting, this approach appears to be sufficiently targeted and operative, there are also a number of limitations to it.

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[51] That is, neglecting special cases such as frontier workers (commuters) or posted workers (expatriates).

[52] The potentially harmful consequences of the current framework, mainly the rules applying to migrant workers and their families, have been discussed in some detail in Section 5.1.

[53] We have already stressed that, in this paper, we are not so much concerned about the implications of health costs accruing in foreign countries during short-term travels (see footnote 17). It appears that these cases can indeed be meaningfully dealt with based on reimbursements for any treatment provided, as they are under current rules – unless tourist visa are effectively used as a platform for other forms of international mobility.

For instance, an important difficulty arises from the question of whether migrants should be treated according to the principles of health-cost funding effective in their destination country or those effective in their source country. Applying the rules of the destination country is not only a matter of social inclusion of migrants who live in this place. It also has an important practical side, as otherwise health funds located in this country would have to apply foreign social-protection law of all the countries where immigrants have been received from, which may well turn out infeasible. However, if health services for migrants are provided in line with the destination country's rules ("as if they were insured there", as under existing international agreements), health funds in the source country are losing control over some part of the health costs they have to pay for. Managing health care, i.e., guiding providers' as well as patients' activities through public regulation or direct contracts, is then no longer possible as far as health costs accruing for emigrants are concerned. If the number of emigrants is low, this may not be considered very important. With increasing mobility at an international level, however, this may well become a problem in a growing number of countries.

The second option fully acknowledges the fact that health services for migrants can be provided most easily in their destination country and that principles for funding these services are often designed to fit to specific patterns of supply and demand in a given health system. It rests on the conclusion that provision of services and sources of health-cost funding for individuals who are internationally mobile should then be ideally located in just one country at a time. However, moving individuals – workers, their family member, pensioners, etc. – to another system of health-cost cover when they are willing to settle in another country, at least for a certain period of time, also requires a potentially two-sided system of transfers between their former and future health funds, meant to compensate for the resulting changes in expected net costs accruing at both ends. Considering the difficulties involved in the option of continued coverage in the source-country system of health-cost funding with reimbursements for services received abroad, this alternative option is our preferred solution for ensuring full portability. It is in any case the one which we are now going to investigate and illustrate in a little more detail.

b) Full portability through transfers between systems covering health costs

Ensuring full portability in health-cost coverage through compensating payments between health funds is a basic idea that immediately derives from our calculations in Section 4. In the absence of such payments, these calculations would indicate potential financial losses arising in at least one of the two health funds involved from the exit or the entry of mobile individuals. Essentially, expected net costs avoided in one place (or, alternatively, expected net surpluses accruing there) have to be transferred to cover expected net costs

incurred (or expected net surpluses foregone) in the other place in order to guarantee coverage under comparable conditions for migrants actually switching between health funds located in different countries and to avoid further harmful consequences, such as financial burdens imposed on other members of these health funds and a process of (international) risk segmentation in health-cost funding.

The nature of the compensating payments we have in mind is that of severance charges or redemption fees which are well-known also in other contexts. Here, they are needed due to liabilities and entitlements related to the life-cycle dimension of health risks and to the long-term cover provided for these risks in many existing arrangements for funding health costs. Besides the elements of insurance involved in a given scheme, elements of intertemporal burden smoothing and intra- and intergenerational redistribution may also add to the need for, and the size of, these transfers. Building on the conceptual framework we have developed above, payments are assessed based on (quasi-)actuarial principles, taking the aspects mentioned here into account. As we see it, this is not only an obvious way of approaching the insurance side of health-cost funding. It also provides an appropriate benchmark for how to deal with the consequences of international mobility for all kinds of redistribution which is legislated and operated at a national level.

Note that assessing transfers which are needed to establish full portability in the way it is suggested here (see Section 4.1, Sub-section *f*) does not imply that the amount of redistribution involved in national systems of health-cost cover is somehow extended to other countries. Neither are sending countries made liable for paying for redistributive elements of health funds as legislated in the receiving country, nor do receiving countries have to pay for redistribution as it is implied in the legal framework of the sending country. Instead, what we are proposing is a coordinating mechanism which accommodates the coexistence of national health systems that differ a lot in terms of the amount and the directions of redistribution linked to health-cost funding. Each country is made fully responsible for the insurance as well as the redistribution it has promised to all individuals who are once covered under its authority. If some of these individual move away, national health funds are asked to pay up to as much as a compensating transfer as they would have had to spend on these individuals anyway under their current rules (or they are offered up to as much as they would have extracted from these individuals under continued coverage). Countries receiving immigrants are basically asked to offer them full health-cost cover in line with their current rules,[54] but at the same time they are offered up to as

[54] Under the EU-level coordinating social law nothing else appears to be feasible, and this requirement is also in the spirit of bilateral agreements we have reviewed here (see Section 3). Only, with the compensating payments we are suggesting, problems relating to the next-to-automatic inclusion of workers and their families in the receiving country's health system will become less pressing. (Depending on the sign of expected net costs in a given case, these problems can hit health funds in the sending or in the

much as a compensation as this may cost (or they are asked to pay up to as much as their health funds may benefit from these additional members). In any case, our proposal makes sure that continuation of comparable coverage can be provided to individuals who are willing to migrate and, at the same time, avoids external costs and benefits for other members of the health funds involved as much as this is possible with respect to each individual case.

Nevertheless, an alternative approach could be conceived of in which the effects of redistribution at the national level would not be reflected in compensating transfers at the international level, so that payments are only based on the insurance elements provided in each place (see Section 4.1, Sub-section *g*). A solution of this kind is disputable: why should sending countries bother to maintain redistribution through compensating payments vis-à-vis individuals who want to emigrate, and why should receiving countries offer special payments for foreigners who want to enter them voluntarily, even though they are likely to be net-payers with respect to redistributive elements involved in the national health system? If there are doubts or reservations regarding these two questions, the same principle, viz. a neglect of redistribution involved in health-cost funding, may be applied to cases where countries would have to receive compensating payments to ensure some amount of portability – because net-payers in terms of redistribution want to emigrate or because net-recipients are seeking admission to immigrate. Such a modified solution could keep compensating payments smaller, which could be favorable with respect to the liquidity of unfunded health systems and make international agreements more likely which are required for our proposal to become effective. However, the latter prediction is far from clear as a consensus between two health systems with respect to individual cases is dependent on whether one country's willingness to pay comes sufficiently close to, or even exceeds, the other country's reasonable claims. Smaller payments may effectively reduce the scope for agreements which appear to be acceptable at both ends. They could also harm individuals seeking comparable cover elsewhere. Most importantly, the willingness of one country to pay for migrants who could contribute to redistribution there is limited by the total effects of a migrant on its net balance, including the effects of redistribution, not by an artificially reduced amount of pure insurance premiums. Therefore, health funds who are negotiating an appropriate amount of transfers for a given case of international migration may themselves have reasons to act according to our original proposal and to assess compensating payments in such a way that existing elements of redistribution are taken into account.

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receiving country.) Furthermore, inclusion can also be offered to individuals who often would not get access to health cost-cover in their countries of residence, e.g., pensioners.

c) Illustrative calculations

To demonstrate in some more detail what we have in mind, we now use the conceptual framework developed in this paper for actually estimating the *direction and size of the transfers* that would be needed to ensure full portability of health-cost cover for individuals with differing characteristics (gender, age, health status, number of dependents, and potentially also income or wages) who are willing to change their work place or residence. Specifically, we will present illustrative calculations based on the equations derived in Section 4.1 (focusing on public, unfunded systems of health-cost coverage) and on health-cost profiles for advanced and less advanced economies shown in Section 2.1 (again using Germany and Slovenia as examples).

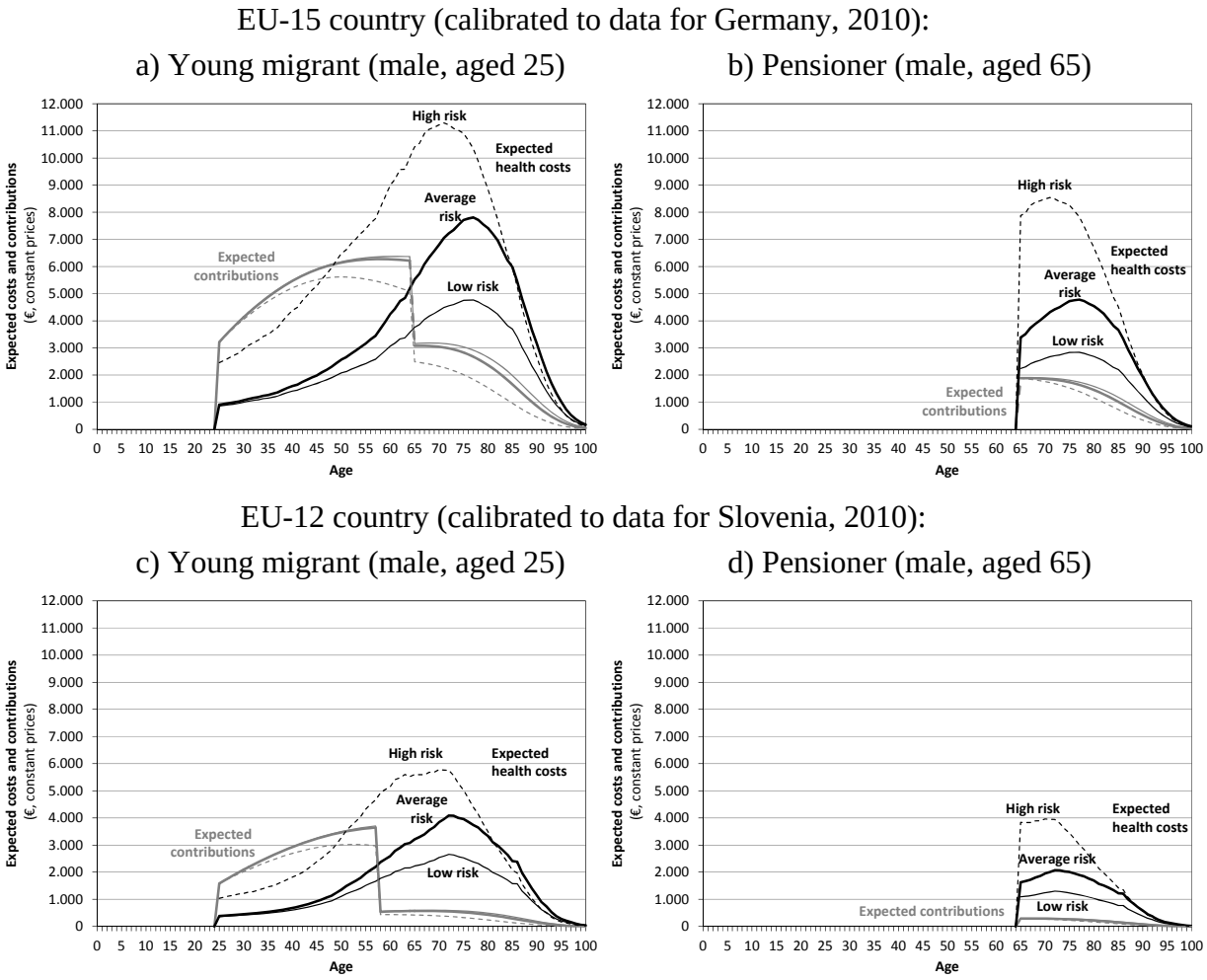
Starting from the profiles of annual health costs for public health insurance schemes operated in these two countries (as shown in Figures 1 through 4), we can first determine expected health costs for individuals over their remaining life span, differentiated by gender, age and health status. Information regarding age-specific survival probabilities of males and females which is needed for this purpose is taken from current releases of national life tables (for the entire population, as provided by the statistical offices of Germany and Slovenia).[55] In addition, we have to define expected rates of health-cost inflation and expected interest rates that appear to be plausible when applied over a longer time span into the future. Effectively, we are setting health-cost inflation to constant real rates of about 1.7 percent and 2.3 percent in Germany and Slovenia, respectively,[56] while the real interest rate is uniformly set to 3 percent in both cases. As an intermediate step, the results of these operations can be displayed in terms of time profiles of *health costs* expected for each additional year of life of an individual of given gender, age and health status. Figure 5 shows a narrow selection of sample profiles, concentrating on males aged 25 ("young migrants") and 65 ("pensioners") and reflecting the differentiation by current health status and the variation across countries, while disregarding the effects of discounting future health costs (so that the results are displayed in terms of future real figures, not present values).

Figure 5 also includes rough estimates of expected *contributions* that migrants can be expected to pay for health insurance. To obtain these estimates, we use stylized wage

[55] This implies that we are not using specific survival probabilities relating only to those insured in public health insurance. Considering the extremely broad coverage of public schemes in these two countries (see Section 3.2), this may not create much of a distortion. Also, keep in mind that we have to estimate risk-specific mortality rates from average mortality rates using stylized assumptions (see footnote 3) which we uniformly apply to data for both countries.

[56] These figures are based on annual average increases of per-capita health costs in the "EU reference scenarios" for the future development of public health expenditure in these two countries until 2060 (as projected in European Commission and EU Economic Policy Committee 2009).

Figure 5: Expected future health costs and contributions of males currently aged 25 and 65, differentiated by risk status

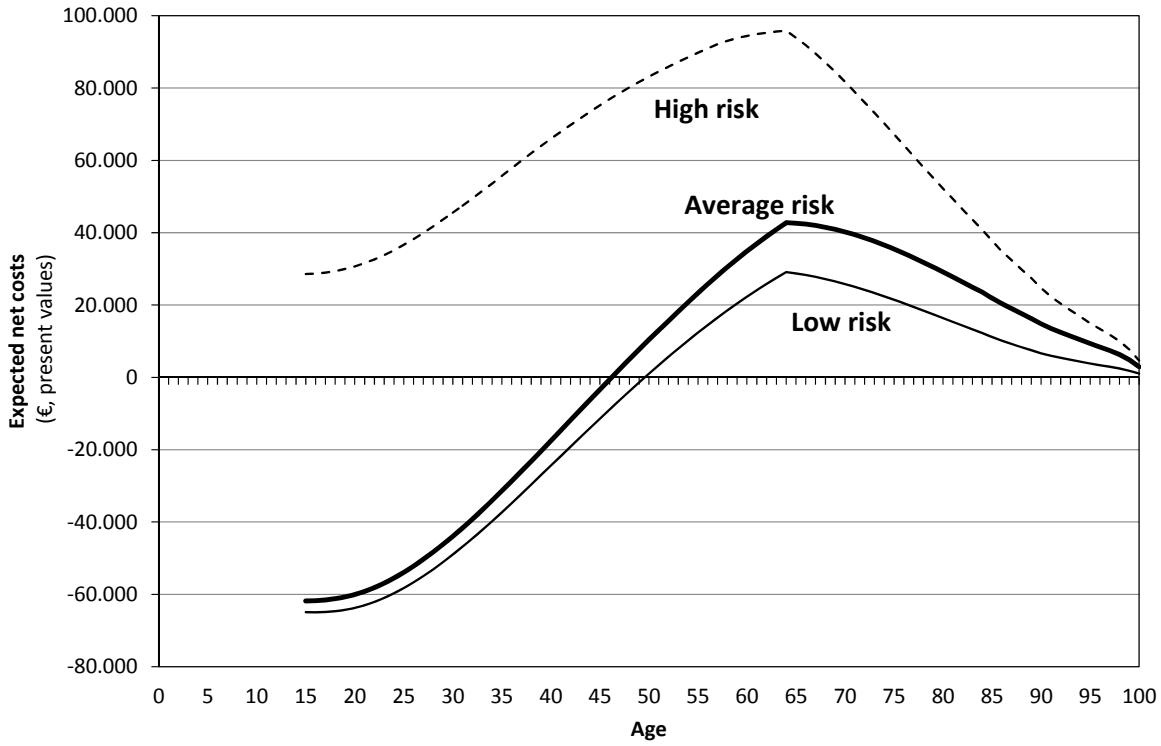


Source: own calculations.

profiles for males and females derived from German micro-data (in Fenge et al. 2006),[57] expected real rates of future wage growth (1.7 percent in Germany, 2.3 percent in Slovenia, as in European Commission and EU Economic Policy Committee 2009), and current rates of public health-insurance contributions applied in both countries (14.9 percent in Germany, with an upper threshold on earnings subjected to contributions; 12.92 percent

[57] These wage profiles are converted into multiples of current average wages to make them portable across time and across countries, and are then applied to year-2010 average wages for active members of the German social insurance system (as officially stated by the administration of the national public pension scheme). As we are lacking comparable data for Slovenia, we decided to rescale the German wage profiles according to Eurostat data on average wages observed in 2010 in both countries.
Note that there is no genuine differentiation by health status in the wage profiles we have constructed, as we are lacking more specific information on this issue. The (small) differences in contributions by health status that are visible in Figure 5 are effectively a result of differences in survival probabilities.

Figure 6: Expected future net health costs of males in an EU-15 country, differentiated by age and risk status (calibrated to data for Germany, 2010)



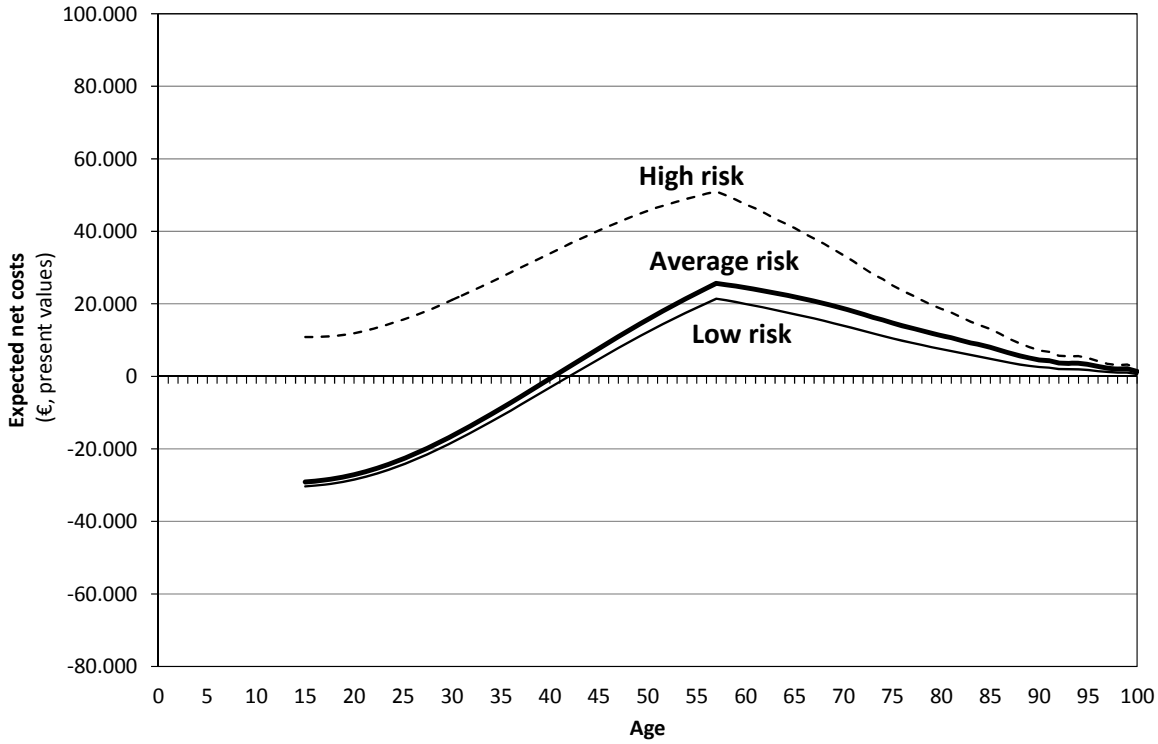
Source: own calculations.

in Slovenia, where no such ceiling exists). From wage profiles and national benefit formulas, we also estimate pension entitlements accumulated in the public pension schemes of both countries, imposing health-insurance contributions (at a reduced rate of 5.21 percent in Slovenia) on these pensions when individuals reach the statutory age limit (at age 65 in Germany, age 58 in Slovenia if the work record is sufficiently long.

After proper discounting, expected health costs and revenues can then be aggregated (over each profile) and subtracted from each other (for individuals of a given gender, age and health status). At this stage, we also apply a "sustainability factor", as suggested in Section 4.1 (a discount on future health costs of 4.2 percent for Germany, 12.2 percent for Slovenia).[58] The final results of these calculations is then given by a set of estimates for the present value of *expected future net costs* of individuals, differentiated by gender, age and risk status. Figures 6 and 7 display these results for German and Slovenian males,

[58] These figures are taken from European Commission (2009), reflecting the infinite-time-horizon ("S2") measure of "sustainability gaps" involved in public finances of these countries. They are derived from long-term projections for several types of age-related public spending, including public health expenditure. A similar figure for Germany (4.5) can be found in the latest "Sustainability Report" of the German government (Bundesministerium der Finanzen 2008) based on Werding and Hofmann (2008).

Figure 7: Expected future net health costs of males in an EU-12 country, differentiated by age and risk status (calibrated to data for Slovenia, 2010)



Source: own calculations.

clearly demonstrating how results vary with (current) age and health status. In addition, the two figures also point to certain differences in risk-specific and age-related net costs between public health insurance systems in these two countries.

Some of the results shown in these figures are also included in Table 1 (at 10-year intervals) where they are complemented with parallel results obtained for women. Further information that is needed to estimate expected future net costs relating to larger households, is provided in Table 2 which shows results for under-aged children who have cover as dependents. These latter results are directly derived from expected health costs accruing until age 18,[59] while these children are expected not to make any contributions themselves as long as they have health-cost cover through their parents.

Figures 6 and 7 as well as Table 1 reveal that, according to our simulations, age-related profiles of expected net costs of health care *share some basic features* across the two countries we are looking at. Net costs for young males at low (or average) health risks are clearly negative, indicating a considerable surplus of expected contributions

[59] If non-contributory cover for dependents can last longer or shorter than this by national rules, the average age for leaving this status should be applied here.

Table 1: Expected future net health costs, differentiated by gender, age and risk status

	EU-15 country (calibrated to data for Germany, 2010)					
	Males			Females		
Age	low risk	average risk	high risk	low risk	average risk	high risk
15	-64.908	-61.801	28.569	-2.716	-26	110.289
25	-58.247	-53.902	36.636	-3.391	856	110.564
35	-37.308	-31.431	55.710	2.622	8.495	107.677
45	-11.379	-3.336	75.221	16.595	24.874	111.660
55	12.354	23.288	89.769	31.659	43.253	114.850
65	28.759	42.618	93.895	39.046	54.142	108.048
75	21.474	35.519	67.209	27.222	42.809	74.842
85	11.178	21.913	37.775	13.309	24.800	39.320
95	3.824	9.340	14.972	4.432	9.850	14.583
	EU-12 country (calibrated to data for Slovenia, 2010)					
	Males			Females		
Age	low risk	average risk	high risk	low risk	average risk	high risk
15	-30.332	-29.147	10.867	-872	236	52.225
25	-24.291	-22.720	15.675	-46	1.708	51.784
35	-10.959	-8.870	27.342	4.867	7.310	51.925
45	4.795	7.720	40.191	13.413	16.875	55.256
55	18.931	22.931	49.656	21.790	26.483	56.541
65	17.186	21.931	40.904	17.766	23.222	43.132
75	10.473	14.722	25.085	10.056	14.720	24.481
85	4.893	8.013	13.050	4.163	7.082	10.856
95	1.738	3.282	5.038	1.294	2.571	3.703

Source: own calculations. – All figures in the table are net present values denominated in year-2010 €.

over expected costs. They become positive between age 40 and age 50 (in Slovenia a little earlier than in Germany) and peak around the retirement age. Afterwards they are declining as contingent survival probabilities decrease. These fundamental trends also apply to individuals at high risk but, for obvious reasons, the curves for this group are at a substantially higher level than for individuals in lower risk categories (so that high risks are expected to impose net costs on their health systems throughout). All these trends are similar for females compared to males but, across all risk categories, expected net costs for young women start at substantially higher levels than they do for males, while they decline somewhat faster towards the end of the life. The first of these effects is mainly due to differences in labor-force participation and to lower wages from which contribu-

Table 2: Expected future net health costs for under-aged children, differentiated by gender, age and risk status

	EU-15 country (calibrated to data for Germany, 2010)					
	Boys			Girls		
Age	low risk	average risk	high risk	low risk	average risk	high risk
0	15.607	15.626	33.539	14.549	14.567	31.718
5	10.178	10.263	24.020	9.797	9.880	23.267
10	6.327	6.433	15.587	6.490	6.600	16.040
15	2.421	2.486	6.204	2.716	2.789	6.972
	EU-12 country (calibrated to data for Slovenia, 2010)					
	Boys			Girls		
Age	low risk	average risk	high risk	low risk	average risk	high risk
0	9.297	9.308	20.114	8.650	8.660	18.750
5	5.518	5.564	13.010	5.383	5.428	12.692
10	3.213	3.267	7.917	3.317	3.372	8.160
15	1.222	1.255	3.126	1.321	1.357	3.383

Source: own calculations. – All figures in the table are net present values denominated in year-2010 €.

tions are levied. The second one derives from the fact that women's health costs typically increase less with age than health costs of males do (see Figures 1 and 3 above).

Besides these common features that are not just artifacts of uniform assumptions, there are also a few *differences* between the age-related profiles of expected net costs in the two countries. First of all, the increase and decrease of expected net costs for males is far less pronounced in Slovenia compared to Germany, but differences are larger for young men than for older men. The reason for this is that expected health costs increase less with age in Slovenia, while the profile of expected contributions is much more front-loaded there than in Germany (see Figure 5). Second, the spread in expected net costs between high risks and low risks is a lot stronger in Germany than it is in Slovenia. This is mainly driven by an equally stronger spread in expected health costs. Third, the same applies to the spread in expected net costs between females and males because, on absolute terms, cross-country differences in the gender wage gap are stronger than cross-country differences in the gender-specific health-cost differential. The latter two effects cumulate, of course, for females in a high-risk status.

Table 2 indicates that there is also a difference between the levels of health costs accruing for children in the two countries, while there appears to be no further difference in the structures of health costs by gender, age or risk status. When estimating expected

net costs of children with non-contributory cover, one could of course look further ahead, not only until children no longer have cover as dependents. As a rule, they may take up employment and enter the public health-insurance scheme of the country where they are currently living with some probability in the more remote future. With adjustments for additional years of health-cost inflation, wage growth and discounting, we could therefore add the effects derived here for the future life cycle of young adults – and move on to including an expected number of grandchildren, grand-grandchildren, etc. (see Sinn 2001 or Werding and Munz 2005 for applications of this idea in analyses relating to unfunded public pension schemes). However, while these effects can be sizeable at an aggregate level in terms of their expectation value, they are also subject to high variation and uncertainty at the individual level. We therefore leave them aside here.[60] Note that, otherwise, our results would be qualitatively unaffected, since these additional effects would have to be accounted for in both source and destination countries.

Now, what do the numbers displayed in the above tables tell us that matters for portability in health-cost cover? If, for instance, a 25-year old male in good health migrates from Slovenia to Germany in 2010 (intending to stay there on a permanent basis), public health insurance in Slovenia foregoes an expected net surplus of future contributions over future health costs of about 24,300 € (see Tables 1 and 3). At the same time, the German public health-insurance system can expect to receive a surplus of about 58,250 €. There is thus an overall gain of 33,950 €.[61] Also, if the Slovenian system would like to claim 24,300 € to avoid negative consequences for other members, and if the German system's maximum willingness to pay is 58,250 €, there appears to be ample room for a *mutually beneficial agreement*: both sides could share the surplus, or they could settle to the smaller amount to make sure there are no losses – or what is left of the surplus could in fact be disbursed to the individual.

Interestingly, if the same individual would decide to return home as a 65-year old forty years later, the German system might again be prepared to make a compensating payment to the Slovenian system. If the individual is still a low risk (in brackets: has turned into a high risk), German health funds would save expected net costs of 17,000 € (55,600 €), while the Slovenian system would have to take on expected net costs of 13,000 € (30,950 €), assessed from today's perspective.[62] The overall gain that results, hence the room for an agreement, is 4,000 € (24,650 €) based on year-2010 present val-

[60] In a sense, we assume that (implicit) contracts regarding long-term insurance for health costs are first made when individuals start making independent decisions. These contracts may include health costs of dependents, but do not automatically extend to life-long cover for these (and all further) descendants.

[61] This is effectively some fraction of what is usually called the "immigration surplus" (see Borjas 1995).

[62] As such, these figures are not included in Table 2, since the results displayed there relate to individuals (e.g., 65-year old males) who migrate *today*. If this happens in 40 years' time, current effects have to be up-rated to reflect expected increases in prices of health services and then discounted.

Table 3: Consequences of international migration for expected future net health costs, various examples

	Changes in expected future net health costs			
	in Slovenia	(Direction of migration)	in Germany	Overall
Singles aged 25				
Male at low risk	24.291	⇨	-58.247	-33.957
Male at high risk	-15.675	⇨	36.636	20.961
Female at low risk	46	⇨	-3.391	-3.345
Female at high risk	-51.784	⇨	110.564	58.780
Family of three*	32.894	⇨	-47.089	-14.195
* Male aged 25, female aged 25, daughter aged less than 1; all at low health risk.				
Family of four**	-8.321	⇨	-2.327	-10.648
** Male aged 35, female aged 30, son aged 10, daughter aged 5; son at high risk, all others at low risk.				
Singles aged 65				
Male at low risk	17.186	⇦	-28.759	-11.573
Male at high risk	40.904	⇦	-93.895	-52.991
Female at low risk	17.766	⇦	-39.046	-21.280
Female at high risk	43.132	⇦	-108.048	-64.916
Retired couple***	51.161	⇦	-120.787	-69.626
*** Male aged 70, at high risk; female aged 65, at low risk.				

Source: own calculations. – All figures in the table are net present values denominated in year-2010 €.

ues – and it will look substantially larger in 2050 when this becomes relevant. If a male aged 65 migrates in the same direction today, the overall gain is 11,600 € (53,000 €).

Combining information from the other tables, Table 3 gives a number of further examples of changes in expected net costs for public health-insurance systems in Slovenia and in Germany through migration of individuals or households with varying characteristics in one direction or the other. If, through emigration or immigration, net costs increase in a system, there is a positive sign in the relevant column; if net cost decrease, there is a negative sign. The "overall" column sums up the resulting changes, so that a negative sign there indicates that *total expected net costs across the two systems* are decreased through migration, while a positive sign points to an increase in total expected net costs. Negative overall effects also imply that there is some leeway for health funds in the sending and the receiving country to agree on a compensating payment for potentially harmful losses (surpluses foregone or net costs incurred) on one side from, ("windfall") gains (net

costs avoided or surpluses accruing) on the other side. If overall effects are positive, such an agreement is difficult, as losses on one side exceed gains on the other.

The selection of examples covered in Table 3 is clearly arbitrary, but further cases can easily be assembled from Tables 1 and 2. The scenarios we have constructed here relate to cases where young individuals (alone or with a partner and children) would migrate from Slovenia to Germany, that is, from a less advanced to a highly developed country; or where older individuals (alone or as couples) consider migrating in the opposite direction. These latter cases could be return migration of individuals who immigrated earlier, or they could be emigration of individuals who want to spend their retirement abroad, for instance, in regions with a better climate or with lower costs of living. All in all, the examples have some realism to them.

In most of the cases considered here, migration with unrestricted access for migrants to the health system in the destination country and with compensating payments dealing with the problem of external costs or benefits appears to be easily feasible. The only cases where things are different are those of young individuals at a high health risk who want to migrate from Slovenia to Germany. As, according to our simulation, treatment of high risks is a lot more expensive in Germany than it is in Slovenia, total expected net costs go up if individuals actually migrate, and it may not be easy to agree on how these extra-costs will be shared. This observation has many implications. For one, individuals in poor health may simply be less likely to migrate. For another, countries receiving immigration may be interested in attracting healthy individuals, while they may not agree to pay for any extra-costs which alleviate the immigration of individuals in poor health. Considering the responsibility for the incumbent population (potentially including many earlier immigrants) and for a financially sound situation of the existing social protection system, this position is clearly defendable. Yet another aspect is that the difference in costs may reflect differences in the quality of treatment or even in the availability of special types of treatment. Against this background, admitting individuals at high risk without claiming full compensation for the expected net health costs incurred could be a humanitarian issue or, quite differently, the individuals themselves could be willing (and able) to pay for the gap that arises. In these two latter cases, compensating payments can serve an important function in transferring at least the amount of net costs avoided in the source country, even if this does not cover all costs arising in the destination country.

It is probably not surprising that, even with transfers based on differences in expected future net costs, establishing portability is difficult with respect to individuals at high health risks. Two observations from Table 2 are therefore of interest. First, we included individuals in a high-risk status in some of the examples for families or couples considered there. The resulting overall changes in net costs were still favorable because

they were dominated by reductions in expected net costs for other household members. With this kind of "family insurance", increased health risks are thus not necessarily harmful for mobility and portability. Second, being at a high-risk status does not appear to be a problem if individuals are willing to move from a country where their expected net costs are relatively high to a country where these are lower. This is effectively accomplished by the introduction of compensation for potentially harmful effects of mobility on health funds in the destination country – and it can still mean a reduction in expected net costs for health funds in the source country.

We have mentioned here that migration of younger and older individuals can be linked to each other across time by processes of return migration.[63] It should be noted therefore, that moves in both directions can be feasible under the framework we are considering here. Expected net costs may decline, i.e., there may be room for mutually beneficial agreements between the two health systems involved, when individuals are moving in either direction simply because these individuals are getting older over time (so that age-specific cost differentials across both places change) or because their health status may definitely deteriorate in the time elapsing between migration and return migration (so that risk-related cost differentials become more pronounced). However, where migration with full portability is difficult to establish for young individuals, limiting the period for which portability is granted can never circumvent this problem.[64]

If the overall effects of mobility with compensating payments between the health funds involved are favorable, that is, if they indicate a decline in expected net costs for individuals with certain characteristics moving in one direction, they must be unfavorable for individuals with the same characteristics who are willing to move in the opposite direction. According to our stylized simulations, this would apply to young, healthy individuals who want to move from Germany to Slovenia or to individuals who are older and/or less healthy and want to move from Slovenia to Germany. These asymmetries are hardly avoidable, mostly because they are rooted in actual cost differentials and not in administrative barriers or inappropriate rules. At the same time, this may simply be one of the reasons why migration is mostly flowing in the directions for which portability can be established more easily: individuals usually have incentives to migrate where migration is likely to be beneficial – not only with respect to systems of health-cost funding, but also in terms of its overall economic effects. Appropriate rules for the portability of

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[63] In Section 4.1, it has also been demonstrated that changes in expected net costs, hence compensating payments, cannot only be determined for the case that individuals switch to another source of health-cost funding for the rest of their lives but, with assessments on a pro-rata basis, also if this is considered to happen only for a considerable time period.

[64] That is, the resulting increase in expected net costs can be reduced, but never removed, if it is assumed to last for a limited period of time only. This is at least true, if the form of age-related profiles of expected net health costs is basically similar across all the countries involved.

health-care benefits can contribute to avoiding specific distortions of these incentives. But designing these rules in such a way that fundamental incentives are reversed is difficult and probably also not advisable.

6 Discussion

In this paper, we have argued that arrangements for funding health care are very important for the individuals covered but that portability of these arrangements in cases of international mobility can be difficult to establish because of the long-term nature of insurance provided and the additional elements of redistribution that may be included. Against this background, we tried to clarify the consequences of mobility – and of a lack of portability – for individuals who consider becoming mobile as well as for the sources of health-cost cover operated in potential source and target countries. We have concluded that, to establish portability for individuals who actually move from one source of health-cost funding to another and to avoid external costs or benefits that could arise at both ends, compensating payments may be needed between the two health funds involved. These payments should be assessed based on changes in expected net costs (expected health costs minus expected contributions), adjusted for health-cost inflation, wage growth, long-term (non-)sustainability and properly discounted over time for both of the systems involved. This would require major changes in existing portability arrangements, even for the most advanced sets of current rules, such as those agreed upon multilaterally at the EU-level or laid down in bilateral agreements on social protection.

Compared to current rules (see Section 3), the solution developed in Sections 4 and 5 has a few novel features which we think important and advantageous. First of all, our proposal includes migrant workers and their family members in the legal framework for portability of health-cost cover. With respect to these cases, it differs from the current "package deal", by which migrants are admitted to the national risk pool for funding health costs in the receiving country as an annex to their work permit, in that it actively addresses potential external costs or windfall gains falling on other members of the two health funds involved. Also, our proposal contributes to establishing continuation of comparable coverage for migrant workers – to the extent that this is possible under a different legal framework and within a different system for providing health services. Second, our proposal allows for a formal transfer of health-fund membership in cases of mobile pensioners (or other types of migrants who are not working). While these individuals are currently being dealt with through some form of cross-border coverage, with a constant need for interaction between two health systems regarding provision of services and related reimbursements, pensioners and other non-working migrants could be fully

included in the health system in their country of residence, again with continuation of comparable cover. Compensating payments which have to be made just once then contribute to avoiding external costs or benefits that would otherwise arise with some certainty. The actual burden sharing for health costs at old age which results from our proposal is also less arbitrary, and likely to be more appropriate, for pensioners with a complicated work biography, entailing employment in more than one country. Last but not least, our proposal is easily applicable to cases of temporary migration of some duration (say, a year or more) for which the responsibility for health-cost coverage can be fully transferred to the receiving country, while migrants retain the right to return to full, life-long health-cost cover in the sending country later on. In these cases, compensating payments simply have to be assessed for the expected duration of the temporary move only.

Do we really think that our ideas can be made the basis of actual policies applied in this area without much further thinking? There are admittedly a number of unresolved issues, more technical ones, but also material aspects, which may imply practical limitations for the application of our ideas.

As to the *technical issues*, one certainly needs to revisit the conceptual framework for assessing expected future net costs of health care for migrants we have suggested in Section 4. While the data requirements for making this framework operative are limited, some of the information that is needed for this purpose may not exist everywhere. To some extent, this even applies to age-related profiles of health costs which are the most important ingredient, and also to life tables as well as age-related wage profiles that are specific for the population covered in a given scheme of health-cost funding. In addition, the definition of appropriate categories of health risks, related cost differentials and transition probabilities, and the impact of these risks on survival probabilities clearly need more empirical work. In next steps of research, therefore, some effort needs to be spent on assessing relevant micro-data from further countries (as those taken from US sources which we have used to calibrate our illustrative calculations in Sections 2 and 5).[65] Other assumptions and procedures for calculating an appropriate amount of compensations between former and future sources of health-cost cover for migrants are not only a matter of empirical validation, but also of agreements regarding how to deal with an uncertain future in a reliable (or, at least, acceptable) way. For instance, this relates to health-cost inflation and financial sustainability expected for the future and the way in which these aspects can be reflected in the projections required for estimating expected net costs of migrants.

[65] First of all, it is an important question in this context whether changes in health status do matter at all for expected future health costs of a given individual, taking into account the resulting differences in mortality. In our simulations, they have a rather strong impact, but as the basis for this conclusion is weak, the question deserves further attention (see footnotes 3 and 5).

To see whether, and how, these problems can be solved one could turn to collecting information that is needed to make our proposal operative – age-related health-cost profiles in particular – for as many countries as this is currently possible. Using these materials, one could then perform sample calculations for a sufficiently large number of real-world cases of migrants between that appear to be prototypical for mobility between different countries and different health systems. The results in terms of compensating payments that would appear to be appropriate building on our approach could then be compared to reimbursements made under the current framework, where they apply, or to health costs of migrant workers, where corresponding data can be obtained. Furthermore, the results could be discussed with experts representing different aspects of relevant practical experience, that is, members of national welfare administrations, especially persons working in international liaison offices of insurance providers and health ministries, also officials from foreign-affairs departments, the EU, international organizations and, of course, interested researchers.

Some of the *material issues* that probably need to be considered more closely have already been noted in earlier sections of this paper. Specifically, the question of whether compensating payments should be assessed based on the *elements of insurance* involved in actual systems covering health costs or whether they should also reflect the various *elements of redistribution* raises more than just practical considerations. Clearly, this alternative could be looked at in the course of tests and sample calculations that we have suggested above and they could also be discussed among experts. Basically, however, the question calls for more fundamental clarifications regarding the rights and obligations deriving from life-long health-cost coverage through national systems as well as the consequences of the differing approaches developed or, at least, sketched in this paper for full portability as we have interpreted this notion.

We have briefly mentioned that differences in expected health costs across countries may reflect *differences in cover and in the quality of services* provided. If these differences only relate to different elements of insurance and redistribution involved in the sources of health-cost funding in different places or countries, this raises the question of what "comparable cover" or "comparably favorable cover" (see Section 5.2) really means, considering the particular features of migrants' old and new systems funding health costs. It is in any case a reason why (part of) the surpluses of expected net costs in their former sources of health-cost funding over those in their new systems could actually be disbursed to the migrants themselves – for instance, in order to buy additional cover they would otherwise lose. But if there are genuine differences in the quality of health-care systems, so that comparable cover simply cannot be provided in the destination country, this problem cannot be solved due to the dominant nature of health care as a bundle of

services which can be delivered most easily where individuals are currently staying. In this case, migrants may be interested in being transferred to the health system of their destination country only temporarily to keep up their entitlements vis-à-vis their old system for a later period in their life, when health care becomes more important for them and they may be able to return to their source country.

Another issue that arises is that *compensating payments* between health funds *cannot provide for full portability in all cases.* If changes in expected net costs are such that the maximum willingness to pay of one of the funds is smaller than the amount that the other fund would like to claim, there is no leeway for a mutually beneficial settlement. Therefore, even in the presence of a scheme of compensating payments that are meant to ensure portability, there is the possibility of unfavorable effects for migrants which can become prohibitive with respect to alleviating mobility. In our discussion, we have highlighted that this problem has a strong economic dimension and is no longer the outcome of administrative barriers and inappropriate rules. If this is true, it may not be in the interest of one of the countries involved to agree to a solution taking care of such cases. Still, there may be other considerations regarding how to deal with this possibility, and this may be a subject for further debate.

This leads to a broader discussion of our proposed solution. For those who first think about it, the idea of countries claiming or making payments related to cases of inward and outward migration may sound unusual. Specifically, source countries may find it politically difficult to regulate emigration in a corresponding fashion – and after the fall of the Iron Curtain they may even take pride in not doing so in an overly intrusive way. Given that, they may also be in a weak position when attempting to direct any claims to other countries that are currently receiving substantial amounts of immigration. Furthermore, from an economist's perspective the freedom to move (out) is considered to be important as it basically represents a mechanism for voting with one's feet (see Tiebout 1956) which establishes *competition between jurisdictions* and forces them to act in their citizens' interest.[66] However, some *coordination* is actually needed in several fields for this particular type of competition to be genuinely fruitful. Well-known examples calling for international agreements on a number of common basic principles are tax competition and public redistribution (see, e.g., Sinn 2003, chs. 2 and 3). These two cases are clearly applicable also with respect to national health-care systems and national arrangements for health-cost funding. In addition, the list of fields where uncoordinated international systems' competition is likely to fail may have to be augmented with the aspect of long-term insurance.

[66] For similar reasons, the right to emigrate freely is also an important human-rights issue.

Last but not least, we would like to mention that our ideas are to some extent reminiscent of the *Bhagwati-tax proposal* which was meant to deal with the consequence of a "brain drain" from international migration for many sending countries (see Bhagwati and Dellalfar 1973 or Bhagwati 1976). Here, this general idea is brought to bearing in a way that is specifically targeted at the financial consequences of migration for national health systems. To make sure that such a piece-meal approach does not lead to new distortions, our proposal should probably be augmented with similar portability rules applying to other branches of social protection systems and public finances in general, because migrants who are expected to be net-payers with respect to health care and health-cost funding may be net-beneficiaries elsewhere and vice versa. Similar calculations may therefore be needed for (public) pension schemes (see, e.g., Werding and Munz 2005) and further systems providing insurance or redistribution to eventually assess the total (economic and fiscal) effects of migration, the ultimate task being to create a *comprehensive framework for undistorted decisions to migrate*.

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In this paper, full portability of health-cost coverage is taken to mean that mobile individuals can, at a minimum, find comparable continuation of coverage under a different system and that this does not impose external costs or benefits on other members of the systems in the source and destination countries. Both of these aspects needs to be addressed in a meaningful portability framework for health systems, as lacking or incomplete portability may not only lead to significant losses in coverage for an individual who considers becoming mobile – which may impede mobility that is otherwise likely to be beneficial. It may also lead to financial losses, or windfall gains, for sources of health-cost funding which can ultimately lead to a detrimental process of risk segmentation across national health systems.

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