# Does pension portability influence the direction of labor migration?

by Ágnes Horváth[1]

**Abstract**

Current literature on labor mobility and pension systems focuses on labor market outcomes and fiscal effects of immigration. However, an increasing part of cross-border employment-related mobility can be characterized as temporary migrants who return to their home country during their lifetime. In this case workers receive a mixture of their home and host country's pension benefits. Hence, different types of pension systems give different incentives to workers, i.e. their decisions on which country to work in and for how long will depend on the type of the host country's pension system. Our simplified, static model captures temporary migration and suggests that the time workers spend abroad will differ depending on the fact whether the host country is characterized by an earnings-related or a flat-rate pension system.

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## I. Introduction

Founders of the European Union have envisaged a common market of goods, services, capital and labor already in the 50's to hinder future military conflicts among its members. The ambitious plan of continuous deepening of economic integration has proved to be successful in many aspects. Indeed, deeper economic integration became a self-sustaining as well as a self-strengthening process.[2] However, it is also well-known that one of the four freedoms, namely the envisaged common labor market still remains a utopia. Flexibility or rather inflexibility of European labor markets became a popular topic among both theoretical researchers and economic policy think tanks.

Although labor mobility across borders can be considered quite low in major European countries in international comparison[3], employment-related migration began to rise within Europe in the second half of the 90s. These labor flows were primarily driven by the shortages of skilled and highly skilled labor experienced by the information technology sector. Nevertheless, one also has to keep in mind that some countries, notably Italy, Spain, Portugal and Greece, make extensive use of unskilled labor as well, chiefly in agriculture, building and construction and domestic services.[4] Although, it is well known that the majority of older Member States have not opened up their borders to new ones with respect to cross-border labor mobility, large flows of migrants were administrated in Ireland, Spain and Italy from Eastern European countries, primarily from Poland and Romania. Even more interestingly, a large fraction of migrants can be characterized as so-called temporary migrants as they return to their home countries.

There are several reasons why people would migrate and work abroad[5]. Besides wage differentials, more generous transfers of Western welfare systems are definitely among the top candidates. The more so within an enlarged European Union, where portable social security claims were introduced. Current European legislation ensures that migrant workers are

[2] For example, the creation of a common currency area was a trivial solution to the famous problem of the "inconsistent quartet" that arose by liberalizing trade and capital markets but leaving central banks autonomous in their interest rate and exchange rate policies at the same time. For a detailed history of the creation of EMU see e.g. Padoa-Schioppa (2004)

[3] See e.g. OECD (2007b) and e.g. Obstfeld–Peri (1998) for data on mobility within Europe.

[4] More about the changes within the categories of immigrants can be found in e.g. Leibfritz–O'Brian–Dumont (2003).

[5] For an overview see e.g. Hatton–Williamson (2002).

eligible to proportional transfers/benefits of the host country when they work abroad and pay contributions for at least 12 months.

The European portability scheme also applies to old-age pensions. Consequently, the time worked abroad might have a significant effect on future pension benefits and hence on the lifetime utility of the migrant. The more so as there is a wide spectrum of pension systems within Europe; many types of earning-related systems operate parallel to flat-rate systems.

In this article I will show that the type of pension system may indeed matter in the migrant's choice of destination. Depending on how long the worker intends to stay abroad, he/she will prefer one type of pension system to another. In section II I look at selected articles of the existing literature in the topic. Section III describes the current features of the European portability scheme. In section IV I build a model that can embody the effect of different kinds of pension systems on the decision which country to work in and for how long. Section V concludes.

## II. Literature overview

When analyzing labor mobility issues, standard economic models focus on wage differentials, the skill distribution of workers and differences in tax systems but usually ignore the effect of working abroad on future pension benefits.

However, Wildasin (1999) showed that differences along European social insurance and public pension systems create considerable incentives to migrate. He uses data on public pension contributions and benefits to estimate the change in the present value of lifetime wealth for representative workers in seven EU countries, finding that migrants may experience changes in public pension wealth, up to 25% of lifetime wealth.

There are studies that take into account differences in pension systems but they differ from this paper in two key aspects. First, studies that analyze the economic effects of immigration concentrate on the effects on labor market outcomes or on the fiscal budget. With respect to labor market outcomes, theory suggests that the increase in the labor supply via immigration should increase competition for the available jobs and give rise to lower wages for the natives. With different methodologies, several papers support these results.[6] Studies that concentrate

[6] For a recent overview see Borjas (2003).

on the fiscal burden immigration might put on both home and host countries, stress the fact that because of fiscal externalities, social benefits and costs of migration do not correspond to its private benefits and costs. Studies concentrate on low-skilled migratory shocks, assuming a younger age structure and/or higher fertility rate of migrants than that of the native population and conclude that immigration may be a remedy for the increasing fiscal burden of ageing.[7] In addition, political economy approaches emphasize the effect of immigration/migration on the preferences of governments on the choice of social security systems.[8]

Second, the few studies that incorporate differences in the pension systems assume immigration rather than migration in their model, not allowing for temporary migration. However, according to Holzmann–Koettl–Chernetsky (2005), a significant number of international migrants do not permanently stay in their host country and eventually return to their home country. Current return migration ratios suggest a rate of well above 30 percent and with the ease of communication and transportation, the temporary movement between countries – and hence also return migration – is likely to increase further.

## III. The European portability scheme

Two aspects have to be distinguished concerning the efficient allocation of labor with respect to pension systems. The first one concerns the question whether all obstacles have been removed so that free movement of labor is possible within the European Union. The second one deals with efficiency, asking whether labor mobility is distorted. This section deals with the first aspect.

The current European portability scheme is not meant to replace different national social security systems or harmonize them but provides a framework for their coordination. Indeed, each member state is free to decide who can be insured, what kind of benefits can be received and under what conditions, how these benefits are calculated and how contributions should be paid. However, national authorities have to respect certain fundamental principles in application that have been outlined already in the 70s.[9]

[7] See e.g. Storesletten (2000), Razin–Sadka (1999a,b), Krieger (2003), Kemnitz (2003), Shou (2006).
[8] See e.g. Rossignol–Tangourdeau (2006).
[9] See European regulation 1408/71 (EEC) and 574/72 (EEC).

One of the main principles is that EU migrants can only be subjects to the legislation of one member state: a person has to pay contributions to and is covered by the social security system of the country where his/her occupational activity takes place.[10] Consequently, a worker who starts to work abroad is no longer being insured in his/her home country but in the host country for the time staying there. Moreover, the principle of equal treatment states that once the foreign worker starts to pay the contributions, he/she is entitled to have the same rights and obligations as nationals of that country.

The so-called principle of aggregation of periods provides the starting point for this article. When calculating benefits, national authorities have to take into account the total number of insurance periods, irrespective of the fact where residence or employment took place. For example, if a Romanian construction worker is insured for 10 years in Spain and for 30 years at home, then both Spanish and Romanian authorities should calculate his pension benefits based on the total of 40 years of occupation. When the worker reaches the retirement age, he receives his pension benefits along the principle of apportionment. In our special case, he receives the 10/40 part of his Spanish pension and 30/40 part of his Romanian pension, from the respective authority.

Although, EU countries made considerable progress in mutual recognition of the so-called first pillar[11] pension claims acquired in other Member States, there remain important fields of pension portability that still need to be improved. E.g. Occupational schemes still impose significant portability losses on moving workers. In this paper I will focus our attention to unfunded public schemes.

Unfunded pension systems are based on the so-called pay-as-you-go principle that means the practice of paying debts as they are incurred. In the case of pension payments this necessarily means that contributions of the working population provide the benefits of pensioners. Pay-as-you-go-financed pension systems can be categorized into two basic systems. The Anglo-Saxon/Beveridge system provides flat-rate benefits, while the continental/Bismarckian system provides earnings-related benefits.[12] Among the earnings-related benefits, pension systems can differ in their degree of earnings-relatedness, alternatively in their degree of redistribution.

[10] For exceptions and a more detailed summary of the content of the regulations see e.g. Reyes (2004).
[11] For an overview of pension categories see Simonovits (2003) and OECD (2005, 2007a).
[12] See e.g. Kolmar (2007) for historical background and a comparison of the two system types.

Within Europe there is a wide spectrum of pension system types (see Table 1). Although the majority of Member States can be characterized by a defined benefit system, these differ considerably in their accrual rates, earnings measures, valorizations and indexations.

Table 1 Pension system types in selected EU Member States (2007)

| **Bismarckian public pension systems** (earnings-related) | **Beveridge public pension systems** (flat-rate) |
|---|---|
| ***Defined benefit*** Austria, Belgium, Finland, Greece, Hungary, Luxembourg, Netherlands, Portugal, Spain | Czech Republic, Denmark Ireland UK |
| ***Points*** Germany, Norway, Slovak Republic | |
| ***Defined benefit/Points*** France | |
| ***Notional accounts (NDC)*** Italy, Poland | |
| ***Notional accounts/Defined benefit*** Sweden | |

Source: OECD (2007a), for description and key characteristics of the pension system types see e.g. Simonovits (2003).

A full harmonization of European pension systems is unlikely even in the long run. First, a European-level, coordinated pension policy would give rise to several questions: how to share the costs of redistribution among countries or how to set the levels of benefits on an EU-wide basis. As demographic processes differ across EU countries, different dependency ratios imply that countries would bear disproportionate shares of the resulting fiscal burden, making coordination problematical at the political decision-making level. Moreover, studies show that these different systems reflect not only differences in historical roots and demographic processes but also different value judgments of citizens.[13] Europeans believe that their pension system should be and is already justifiable and show no willingness to reform the current characteristics of their system.[14]

[13] See e.g. Gelissen (2000, 2001).
[14] See e.g. Boeri et al (2002), Kohl (2003).

## IV. A static model

In this paper, I am only interested in the behavior of so-called economic migrants and I will ignore political asylum seekers/refugees. An economic migrant is leaving his/her home country because of personal preference and the potential for economic gain, rather than out of necessity arising from persecution or life-threatening circumstances. The economic theory of migration is based on the usual assumption that migrants try to maximize their lifetime utility. Hence, migrants believe that they can increase their expected future utility by moving to another country.[15] The key factors that will affect their utility are income from labor, wealth and transfers, not forgetting that there are also economic costs that can be associated with migration.

In addition, I will focus on the two major types of PAYG systems and will simplify the question to whether flat-rate or earnings-related systems give stronger incentives to work abroad. First, I outline the key characteristics of the model assuming homogeneous worker population when it does not matter which type of the PAYG pension system is operated abroad. In this simplified framework wage differentials alone would not keep workers in the host country. Second, I turn my attention to the heterogeneous case, when the difference of earnings-related and flat-rate pension benefits becomes important.

I will make three key assumptions that distinguish this paper from the current literature. First, I will concentrate on the inhabitants of the less developed/poorer country. I assume that after working in the higher-wage country, workers return. Hence, they receive and spend their pension benefits in the poor country, even if they spent their whole working time abroad.

Second, I will allow for temporary migration. In fact, the goal of this study is to find out whether there are differences in the length of time people work abroad when the host countries differ in key parameters of their pension systems.

Third, I assume perfect portability of the pension systems in the sense that workers get pension benefits proportional to their length of work in each of the countries they worked and no portability losses; hence I can take into account differences in pension systems when determining the utility derived from pensioners' consumption. Here I will concentrate on differences in benefit calculations, namely I will analyze the cases of flat-rate and earnings-related benefits in unfunded systems.

[15] See for example Sinn (2003).

### IV.1. The basic model

In the model there are two countries; the home country is characterized by low wages while the host country by high wages. There is free movement of labor across these countries: workers are free to decide in which country they work and for how long. Nevertheless, only workers of the low wage country will apply for jobs abroad as inhabitants of the rich country cannot increase their lifetime utility by working in the poor country.

To make the model as simple as possible I will make further simplifying assumptions. In the first step, I will assume a homogeneous working population. Moreover, I will ignore possible wage dynamics both within and across the countries, but I will assume that migrants can earn a higher wage in the host country than in their home country. Hence, earnings are an attribute of the country rather than that of the worker. I will also assume that those who decided to migrate will be able to find a job sooner or later but will not change labor market conditions in the host country significantly. Furthermore, I will assume that the values of the policy parameters (tax and contribution rates, benefit calculations) differ across the two countries but I keep them time invariant.

In the model individuals maximize their lifetime utility that consists of four parts: $Tu(c)$ is the utility the worker derives from his/her consumption at home, $T^*u(c^*)$ is the utility derived from the consumption in the host country and $\mu u(d)$ is the utility derived from the consumption of pension age at home ($d_E$ will stand for pensioner's consumption in an earnings-related system and $d_F$ for a flat-rated one). In addition, I believe that workers like to stay at home for several reasons, e.g. they get a strong homesick feeling when working abroad and therefore I introduce $v(T^*)$, a decreasing concave function.[16] All people altogether work one unit of time and spend $0 < \mu < 1$ time in retirement, $\delta$ is the discount factor. Workers are allowed to decide how much time they work at home ($T$) and abroad ($T^*=1-T$).

$$U(c,c^*,d,T,T^*) = T\,u(c) + T^*u(c^*) + \mu\,\delta\,u(d) + v(T^*) \qquad (1)$$

s.t. $c = (1-\tau)w$

$c^* = (1-\tau^*)w^* - s^*$

[16] $v'(0) > 0$ and $v'(1) = -\infty$.

$$d_E = T\beta w + T^*\beta^* w^* + \frac{T^* s^*}{\mu} = b_E + \frac{T^* s^*}{\mu}$$

$$T = 1 - T^*$$

Worker consumption ($c$, $c^*$) is equal to earnings less taxes and contributions ($\tau$, $\tau^*$) - assuming that $\tau^*$ also incorporates the non-negligible cost of migration - and savings ($s^*$). Hence, public pensions raise pensioners' consumption by providing a flow of benefits during retirement, but reduce workers' consumption by requiring a flow of contributions during the working years. I also assume that the worker is not able to save for his pension age at home because of the low level of income.

In the basic scenario, the pension system is earnings-related in both countries; hence individuals who pay higher accumulated contributions also get proportionally higher benefits. Here, higher contribution means that the worker pays the contribution for a longer time period and higher benefit means that his pension benefit is proportional to his/her working time in the respective country. $\beta$ and $\beta^*$ are approximately 40 times the percentages of wage income that the pensioner gets for each of the insurance years spent in the home and host country, respectively. For sake of simplicity I use a Cobb-Douglas utility function: $u(c)=\log c$ and $v(T^*) = \lambda \log (1-T^*)$. Consequently, the utility function becomes:

$$U\left(T^*, w, w^*, s^*, \lambda\right) = (1-T^*)\log\left((1-\tau)w\right) + T^*\log\left((1-\tau^*)w^* - s^*\right) + \mu\delta\log\left((1-T^*)\beta w + T^*\beta^* w^* + \frac{T^* s^*}{\mu}\right) + \lambda\log\left(1-T^*\right) \tag{2}$$

First, I determine the local optimum of foreign savings by setting the first derivative of the utility function with respect to $s^*$ to zero:

$$s^* = \mu\frac{\delta\left(1-\tau^*\right)w^* - \left(1-T^*\right)\beta w - T^*\beta^* w^*}{T^* + \mu\delta} = \mu\frac{\delta\left(1-\tau^*\right)w^* - b_E}{T^* + \mu\delta} \tag{3}$$

Hence, to get nonnegative savings one needs $\delta\left(1-\tau^*\right)w^* \geq b_E$. Consequently, optimal savings do not only depend on $w$, $w^*$ but also on $\beta$, $\beta^*$,$\mu$ and $\delta$. Note that the optimal time spent abroad will depend on $\lambda$ as well.

To keep the model simple, I assume that the share of workers who apply for work abroad is not large enough to have an effect on the macro balance of contributions and benefits either in the home or in the host country. The more so, as I assumed earnings-related PAYG pension benefits so far, hence there will be less contributions in the home country but they have to pay less benefits as well, the opposite holds for the host country. The share of workers working abroad is denoted by *m* in the home country and *m** in the host country.

Domestic pension balance

$$\sum_{i}^{N}\left[T_i\ \tau\ \ w_i(1-m)-\mu\ T_i\beta\ \ w_i(1-m)\right]=\tau-\mu\beta=0 \qquad (4)$$

Foreign pension balance

$$\sum_{i}^{N^*}\left[T_i^*\tau^* w_i^*\left(1+m^*\right)-\mu\ T_i^*\beta^* w_i^*\left(1+m^*\right)\right]=\tau^*-\mu\beta^*=0 \qquad (5)$$

**IV.2. Introducing wage heterogeneity**

Second I turn my attention to the potential effect of differences in pension systems abroad. Hence, I will assume that the poor country maintains an earnings-related system but the host countries will differ in their pension system type. This is a good starting point to examine the cases of Polish migrants in Ireland or the UK on the one hand and Romanian workers in Spain on the other. Poland, Romania and Spain operate an earnings-related pension system while Ireland and the UK a flat-rated one. In the case of an earnings-related pension system, those individuals who pay higher contributions also get proportionally higher benefits. While in the case of a flat-rate system the size of pension benefits is irrespective of contributions, all eligible individuals get the same amount ($\beta_0^*$) for full stay and proportionally for *T**. Consequently,

$$b_E=T\beta w+T^*\beta^* w^* \quad \text{and}$$

$$b_F=T\beta w+T^*\beta_0^*$$

To be able to analyze the effect of different pension system types, I need to introduce heterogeneity among the workers. I will have low-wage and high-wage workers both at home *($w_L$, $w_H$)* and abroad *($w_L^*$, $w_H^*$)*. To get a rough picture, I will assume that a certain share of

those who get a higher wage at home are able to find a job abroad. In addition, to make this toy model more realistic, the worker abroad gets a higher foreign wage job with probability *p* and a lower foreign wage job with probability (1–*p*). Consequently, workers will also differ in their time spans they spend abroad *($T_L^*$=0, $T_H^*$)*.

I will still assume that the share of workers who apply for work abroad is not significantly large enough to have an effect on the macro balance of contributions and benefits neither in the home nor in the host country. Nevertheless, migration will change the value of *average* lifetime earnings ($\overline{w},\overline{w}^*$) that determine the value of pension benefits (in a flat-rate system) as well.

$$\overline{w} = \frac{N_L w_L + N_H w_H - hT_H w_H}{N_L + N_H - hT_H} \tag{6}$$

$$\overline{w}^* = \frac{\left(N_L^* + (1-p)\ hT_H^*\right) w_L^* + \left(N_H^* + p\ hT_H^*\right) w_H^*}{N_L^* + N_H^* + hT_H^*} \tag{7}$$

where $N_L, N_L^*$ stand for the size of low-wage workers in the home and host country, similarly $N_H, N_H^*$ stand for the size of high-wage workers in the home and host country, respectively. *h* stands for the size of workforce that decides to move abroad for certain reasons. Hence, due to any small number of migrants average lifetime earnings will fall in the home country and rise in the host country. Consequently, ceteris paribus any small number of migrants will cause a reduction in pension benefits at home and an increase abroad.

In the first case I will assume an earnings-related pension system both in the home and the host country. The Neumann-Morgenstern type utility function of the worker who decides to work abroad is the following:

$$U\left(c, c^*, d, T_H^*\right) = T_H u(c) + T_H^* u\left(c^*\right) + \mu\ \delta\ u(d) + \nu\left(T_H^*\right) \tag{8}$$

s.t. $c = (1-\tau) w_H$

$$c^* = \left(1-\tau^*\right)\left[(1-p) w_L^* + p\ w_H^*\right] - s^*$$

$$d = T_H \beta w_H + (1-p)\ T_H^* \beta^* w_L^* + p T_H^* \beta^* w_H^* + \frac{T_H^* s^*}{\mu} = d_E + d_E^*$$

$$T_H = 1 - T_H^*$$

$$v\left(T_H^*\right) = \lambda \log\left(1 - T_H^*\right)$$

First, I determine the local optimum of foreign savings abroad by setting the first derivative of the utility function with respect to $s^*$ to zero:

$$s_E^* = \mu \frac{\left(\delta\left(1-\tau_E^*\right) - T_H^*\beta^*\right)\left((1-p)w_L^* + pw_H^*\right) - \left(1-T_H^*\right)\beta w_H}{T_H^* + \mu\delta} \qquad (9)$$

In the second case I will assume an earnings-related pension system in the home country and a flat-rate pension system in the host country. Consequently a worker who works abroad (i.e. $T_H^* \neq 0$) gets pension benefits:

$$b_F = T_H \beta w_H + T_H^* \beta_0^* \qquad \text{where } \beta_0^* = \frac{\left(N_L^* + N_H^* + hT_H^*\right)\tau^*\overline{w}^*}{\left(N_L^* + N_H^* + hT_H^*\right)} = \tau^*\overline{w}^*$$

where I used equations (5) and (7). This case will differ from the first case in the definition of pensioners' consumption *(d)*:

$$d = T_H \beta w_H + T_H^* \beta_0^* + \frac{T_H^* s^*}{\mu} = d_E + d_F^*$$

Again, I determine the local optimum of savings abroad by setting the first derivative of the utility function with respect to $s^*$ to zero:

$$s_F^* = \mu \frac{\delta\left(1-\tau_F^*\right)\left[(1-p)w_L^* + pw_H^*\right] - \left(1-T_H^*\right)\beta w_H}{\left(T_H^* + \mu\delta\right)} - \mu\, T_H^*\tau_F^* \frac{\left(N_L^* + (1-p)hT_H^*\right)w_L^* + \left(H^* + phT_H^*\right)w_H^*}{\left(T_H^* + \mu\delta\right)\left(N_L^* + N_H^* + hT_H^*\right)} \qquad (10)$$

Although equations (9) and (10) suggest that if $T_H^* > 0$ then $s_E^* > s_F^*$ always, this is only true when the sum of tax and contribution rates are the same ($\tau_E^* = \tau_F^*$) which is not necessarily the case. However, if I assume that the sum of tax and contribution rates is the same in the two host countries, trivially optimal savings in (9) and (10) will be equal when $T_H^*$ is zero, i.e. if nobody works abroad. There is a second solution as well, because (9) and (10) will also be equal when the two pension systems pay the same benefit. In this case, using (5) and (7) I get a critical $T_{HC}^*$:

$$T_{HC}^{*} = \frac{\tau_F^{*}\left(N_L^{*}w_L^{*} + N_H^{*}w_H^{*}\right)}{h\left(\beta^{*} - \tau_F^{*}\right)\left((1-p)w_L^{*} + pw_H^{*}\right)} - \frac{\beta^{*}\left(N_L^{*} + N_H^{*}\right)}{\left(\beta^{*} - \tau_F^{*}\right)h} \tag{11}$$

Hence, the critical $T_{HC}^{*}$ depends on the tax and contribution rates, the wage difference and the income distribution of the host country but also on the size of the workforce who decide to work abroad. In addition, there exists a critical $T_{HC}^{*}$ above which it is more rational to choose a destination country where an earnings-related pension system is operated and under which it is more rational to get a job in a country where a flat-rated pension system is operated. Consequently, depending on the time the worker intends to spend working abroad, he/she should choose different destination countries.

## III. Conclusions

The simple model tries to capture the link between the type of pension systems and the time spent abroad by so-called temporary migrants who return to their home country sometime in their lifetime. I conclude that different types of pension systems give different incentives to workers; indeed I showed that optimal savings will differ when pension system types differ in the host countries. Consequently, this simplified, static model suggests that the time workers spend abroad will differ depending on the fact whether the host country is characterized by an earnings-related or a flat-rate pension system. Those who intend to work no longer then the calculated threshold value should choose a flat-rated system as they cannot profit from an earnings-related pension benefit because of the shortage of time. On the other hand, those who intend to spend a longer time abroad (above the threshold value) can increase their life-time utility by choosing a country that is characterized by earnings-related pension benefits.

Regarding further research, more weight could be put on the macroeconomic part by relaxing the assumed negligible effect of migrants on the fiscal budget. The more so, as temporary migration may become more general among Eastern European workers when the EU opens up its borders in front of workers of the new Member States.

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