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Emigration of Swedish health professionals

Bachelor Thesis in Economics

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Abstract

There seems to be a gap in previous literature where economists and social scientists do not focus on factors driving emigration of health professionals between developed countries. Although, there is a lot of literature that discusses emigration of health professionals from developing towards developed countries, there are few previous studies of health professional emigration between developed to developed countries. This paper examines and analyzes factors which might be of importance in determining the direction of emigration of health professionals between developed countries. The concept of health professionals in our study contains people with more than 3 years of education within the health and social welfare sector, not referring to any particular occupation such as nurses, doctors, dentist etc; or whether they are specialized in any area. This paper analyses factors that affect emigration of Swedish health professionals, using economic and social variables in a structured regression model. The results indicate that the percentage of Swedish health professionals is directly affected by factors of destination countries such as geographical proximity, GDP(PPP) per capita, income tax rate and co-workers encouraging development.

1 Introduction

Emigration of Swedish health professionals has increased in the past decade, mostly in terms of emigration towards neighboring countries but also to other countries. The World Health Organization (WHO) estimated a shortage of more than 4 million health professionals across the world, where 57 countries were deemed to have a critical shortage (WHO, 2006). This scarcity and shortage is an up to date topic in Swedish media and is actively discussed by the Swedish government. The concept of “*flying doctors*” (Donnelly, L 2009) meaning rent or relay doctor, is a problematic subject in Sweden due to the high expenditure that the national government spends on rent doctors. The concept originates from a group of Scandinavian surgeons that emigrated to the United Kingdom (UK) in order to help cut waiting lists. Commuting of health professionals among Scandinavian countries is another common phenomenon. Norway and Denmark are among the top countries that Swedish health professionals emigrate to (SCB, 2008).

During 2004 to 2008 the Swedish health expenditure of rent doctors increased from 727 to 1787 million SEK (NPS, 2009). A forecast done by the Swedish Medical Association stated that 4400 full-time employed doctors will be of shortage by 2015 (Swedish Medical Association, 2008). Even though Sweden has one of the lowest rates of highly skilled emigration in Northern Europe (Hedberg & Malmberg, 2008), the concern is not the emigration rate but rather the effects and impacts of emigration and what factors that causes this labor mobility. The purpose of this paper is to analyze incentives and factors why Swedish health professionals emigrate. Emigration of health professionals is not an isolated topic concerning only Sweden. But, rather a broader and relevant issue for many other countries around the world.

International labor mobility of health professionals has become an important topic in today’s globalized society as many countries experience a shortage of supply of health professionals. Highly educated people are moving abroad to a large extent due to reduced boundaries together with other economic and social factors. Most previous literature investigates immigration factors of low income countries rather than emigration factors, however parts of immigration theories can be used to explain emigration patterns (Pedersen et al, 2003).

In the past decade international emigration of health professionals has increased substantially, which can be partly explained by technological advancement, rising international competition for skilled labor, commercialization of health care in labor market processes, great global inequality in wages, as well as working conditions and retirement prospects (Mackintosh et al, 2006).

1.1 Purpose

The purpose of this paper is to analyze factors which may create incentives for Swedish health professionals to move abroad, using economical descriptive statistics and sociological factors. The aim of this paper is to contribute to the discussion of Sweden's position in the international mobility of health professionals, and explain trends and movements between different destination countries. By highlighting the major factors that influence the emigration patterns in order to explain the emergence of emigrating health professionals.

1.2 Outline

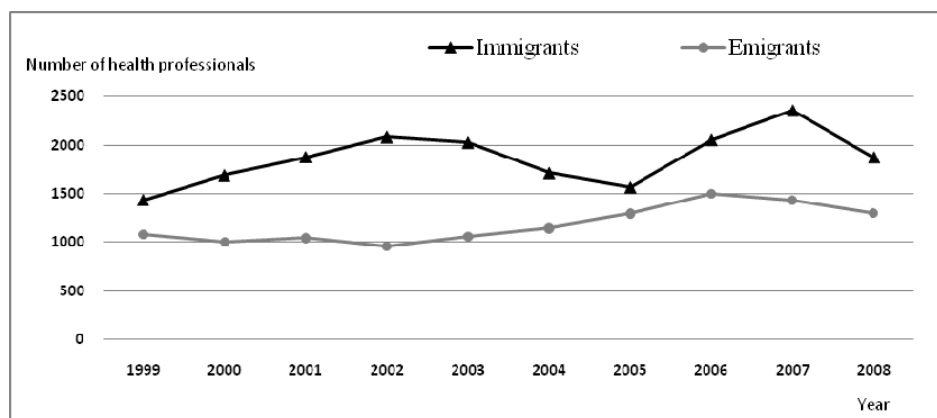
Section 2 provides a background of emigration trends of health professionals in Sweden and discusses the determinants of the demand and supply for health professionals. Highlights and explanations of theories and models are provided in previous research in section 3. Section 4 states the hypothesis, discusses the data and limitations. Section 5 provides an overview of key variables and the method used. The regression analysis and the results can be found in section 6 and section 7 closes the discussion and provides a summary of the findings.

2 Background

2.1 Trends of Swedish migration

During 2005-2006 the Swedish general emigration rate increased with a total of 18 percent and during 2007 the emigration rate reached the highest level since 1892 (SCB, 2007). However the increase in 2007 was less than in the previous three years and a marginal reduction occurred in 2008. More than half of those who emigrated were Swedish citizens and the most popular destination countries were Norway, UK and the United States of America (USA) followed by Denmark, Spain and Finland (SCBa, 2009).

Emigration flows of health professionals have received great attention (OECD, 2007) both internationally and by the Swedish health workforce (NPS, 2009). Internationally there has been a sharp increase for the past five years in mobility of health professionals. Migration of health professionals between Sweden and other countries has increased especially in terms of doctors, dentists and nurses the past decade (NPS, 2009). This has in turn led to a net increase in immigration for Sweden's part. It is difficult to internationally compare migration of Swedish health professionals due to differences in definitions and sampling methods across countries. For instance, some countries' statistics show only the amount of authorized health professionals and do not consider whether the health professional is foreign or domestically educated. The figures only show whether they are a part of the workforce or not.



Source: Statistics of Sweden (SCB, 2009)

Figure.1 Emigration and immigration of health professionals in Sweden

Figure 1 describes the latest decade of Swedish health professionals emigrating, where we observe a slightly increasing trend between 1999-2006 and thereafter a slight decrease 2006-2008. According to figure 1, the number of immigrating health professionals is higher than the number of emigrants, indicating that there is a demand for health professionals in the domestic market.

In 1954 The Nordic Passport Union was established allowing Nordic citizens to reside in any Nordic country without a residence permit. Sweden had held a liberal policy towards migration between the Nordic nations even before this. In January 1995 Sweden joined the European Union (EU), this gave access to free mobility within the EU member countries and the internal European labor markets. In 1981 a common system of Nordic requirements for authorized health professionals was established, together with a particular competence level for the general health professionals within EU members. Due to these joint agreements and requirements, the mobility of health professionals has increased. Newly established legal frameworks, together with recognition for qualifications and diplomas across countries, has supported the international movement of health professionals.

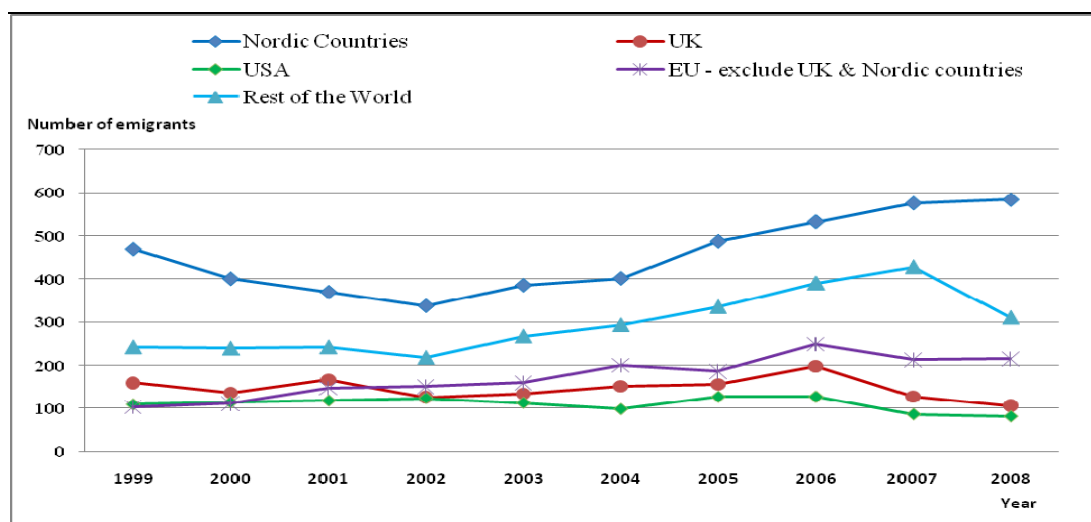
There are similarities between the Scandinavian labor markets i.e. fairly generous unemployment insurance benefits, which can be of potential relevance regarding labor mobility compared to other countries (Pedersen et al, 2003). Studies by Pedersen also show that the emigrants return within a decade, indicating that most emigration flows are temporary. In addition Pederson states that Sweden have had preferences to emigrate to the 'Rest of the World' and the other Nordic countries, over the European Economic Area countries (Pedersen et al, 2003). Migration flows in general are also explained from an historical perspective i.e. colonial migration (Hedberg, Malmberg, 2008). The historical perspective might explain why Swedish health professionals move among Nordic countries as in history the borders have shifted between the Nordic countries several times.

The emigration of health professionals between Sweden and EU region is mainly affected by the Swedish labor market, both in Sweden and the rest of the EU region (NPS, 2009). This mobility can partly be used as an indicator of the labor markets current situation, although immigration outside the EU region mainly contains refugees and emigration of close relatives which can not be used as an indicator in all cases. The legal framework concerning health professional migrating from other countries outside of EU region has changed with the purpose to simplify recruitment from the member states of the unions.

Requirements tend to be less restrictive and recognition of qualifications is facilitated within free mobility areas; e.g. The Nordic Passport Union, the Trans-Tasman Area (Australia, New Zealand), and the EU. Labor mobility within the member countries of the Organization for Economic Cooperation and Development (OECD) also represents an important share of immigrant health professionals. The EU for example, has estab-

lished an inclusive model of mutual recognition of qualifications in which, first-level registered nurses or midwives are free to work in any other member State (OECD, 2008).

In most OECD countries, if not all, no immigration program targets health professionals specifically. However, general immigration schemes may provide simplified procedures to facilitate the recruitment of health professionals, notably at the local or regional level (OECD, 2008).



Source: Statistics of Sweden (SCB, 2009)

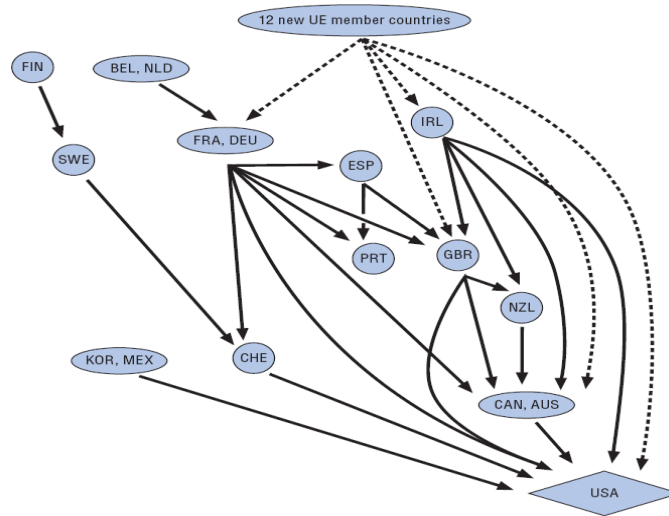
(1) UE -include France, Spain, Germany, Portugal, Poland, Italy, Ireland, Belgium, Netherlands

Figure 2: Number of Swedish health professional emigrants, 1999- 2008, age group 16-74 years and destination country.

Figure 2 shows a relatively steady increase of emigrating Swedish health professionals to other Nordic countries since 2002. The USA and the UK together with some other European countries are also among the top countries which Swedish health professionals emigrate to. However, the UK together with countries in the rest of the world show a stronger down turn in the late 2006 than the EU countries and the USA.

Intra-OECD movement of health personnel is likely to continue in the near future. Several factors lie behind this trend, for example: the persistence of historical rights (liberty, freedom to move, etc), the development of a free or facilitated mobility area, as the case of the European Union. Also, the differences in levels of health professionals' remuneration, few or unpromising work prospects in the origin countries. Arrangements to facilitate the recognition of foreign OECD qualifications; and the increasing intra-

OECD mobility of other categories of emigrants e.g. students, highly-skilled professionals and researchers, or intra-company transferees (OECD,2008).



Fin=Finland; *Swe*=Sweden; *Che*=Switzerland; *Kor*=South Korea; *Mex*=Mexico; *Esp*=Spain; *Fra*=France; *Deu*=Germany; *Prt*=Portugal; *Irl*=Ireland; *Gbr*=Great Britain; *Nzl*=New Zealand; *Can*=Canada; *Aus*=Australia; *USA*=United States of America.

Source: OECD (2008).

Figure 3. The Cascade Model

Figure 3 describes the ‘the cascade model’ stressing health professionals emigration by the The OECD Health Policy Studies (2008). This model explains the trends of emigration within the OECD countries. Although it does not include all the countries in the world, it gives a fair view of the pattern of emigrating health professionals. The countries in the bottom of the figure are those which receive the most immigrants. The USA is the only net receiver, meaning that more health professionals arrive than leave. Emigration of health professionals has become a more actively discussed subject in result of the increasing globalization of the international health workforce. The emigration of health professionals across countries results in an uneven distribution of health professionals around the world which is an important issue to be addressed in the current global shortage (OECD, 2007).

The main purpose of the cascade model is to show how countries who have either a geographical or cultural proximity, will be affected by emigration. In the cultural case we can include language as is the case for Ireland, the UK, Canada, Australia and the USA. Sweden’s immigration of professionals is due to proximity. Swedish professionals develop within the country and then emigrate towards other countries at lower levels seen in figure 3 of the cascade model. However the model’s arrows do not show the ex-

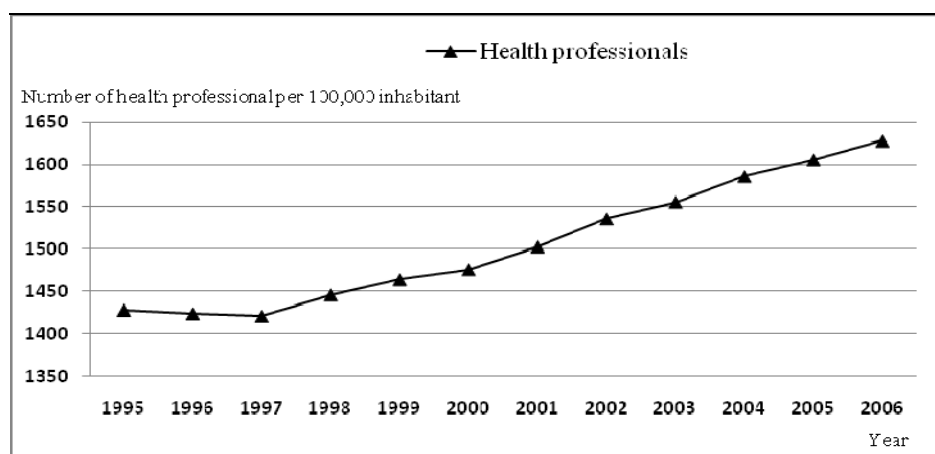
act place where Swedish professionals end up, however it stresses geographical and cultural proximity between countries.

Health professionals' immigrants within the OECD show patterns which are quite similar to those of any other immigrant, skilled or unskilled. The mobility is strongly determined by language, geographic proximity, cultural and historical ties, and bilateral migration policies (OECD, 2008).

Language is a strong and valued factor which is not necessarily learned or included along professional studies. In the health care sector it is of extreme importance to master the destination's language. It is a key requirement for responsive, efficient and safe delivery of health care. In the case of the OECD countries, immigrants need to satisfy language tests in order to practice their profession. In some countries the passing scores have been increased in recent years (OECD, 2008).

2.2 Supply and demand

The majority of Sweden's health workforce is educated in a foreign country and the major part of the foreign supply of the Swedish health workforce is educated within the EU region (NPS, 2009). During 1960-1973 the amount of medical students in Sweden rose from 431 to 1026 students. In the early 1980's there were concerns regarding the surpluses of medical students and in 1984 the admission was reduced to 845 students in order to constrain health care expenditure (OECD, 2007). The purpose was to limit the increase in health expenditure and avoid unemployment among health professionals. A limit which resulted in an under-estimation of future growth in demand for health professionals. This cut down might have contributed to the current shortage of the national health workforce (NPS, 2009).



Source: The Swedish National Board of Health and Welfare statistical database (2009).

Figure 4. Supply of Swedish health professionals per 100 000 inhabitant

Figure 4 shows the increase in supply of Swedish health professionals between 1995 and 2006. The trends differ between the types of health occupations, but in absolute terms the supply has increased (NPS, 2009). Data collected from the Swedish National Board of Health and Welfare employment database differs from the data provided by Statistics Sweden (SCBb, 2009) in terms that the statistics are only for those occupational groups who attain a Swedish health authorization or a Swedish diploma in medicine. Since late 1997 there has been a remarkably steady increase in supply of health professionals. More recent data figures for the latest years are not attainable due to coding errors in the employment data of SCB (NPS, 2009).

For some of the occupational groups of health professionals where supply has risen, the employment figure for that particular occupation has not increased i.e. Swedish dentists. The Swedish National Board of Health and Welfare (NPS, 2009) argues that high unemployment rates for a particular occupation group indicate that the demand is lower than the supply. In those circumstances unemployment rate works as a good indicator of the imbalance between the demand and supply for that particular group. Low unemployment rate indicates that the demand is larger than the supply; however it does not state how large or small the gap in between demand and supply is. Also to acknowledge that if the unemployment rate is low or almost unnoticeable it is of little use as an indicator. The unemployment figures during 1995-2006 indicate that the demand is at least as great as, or even larger than the supply (NPS, 2009).

The long term demand is very difficult to approximate; however, three important factors that affect demand are: demographic factors, political factors, health and welfare factors. On the supply side economic conditions are stated to be the most important factors. Economic conditions also affect migration patterns. During 1988-1998 the general Swedish emigration rate increased with almost two hundred percent, as in the late 1990's the Swedish economy experienced a deep recession. Highly skilled labor such as health professionals are considered to have high earning possibilities and have a tendency to be more mobile than some other occupational groups. This might lead to higher incentives for health professionals to move as the economic turn down is emerging (Pedersen et al, 2003).

Migration has been crucial for the Swedish population growth. In 2008, 76% of the increasing population rate was due to immigration and 24% due to excess of births in the nation (SCBa, 2009). During the 21-century the Swedish population has increased mostly due to immigration. The size of the population and its characteristics, whether they are healthy or unhealthy, old or young, etc influences the demand and supply of health professionals from a demographic perspective.

The current Swedish scarcity of health professionals is partly due to an increasing aging population, longer treatment periods, and a large increase in critical patients. Peoples' living habits have changed resulting in an increased probability of cardiovascular diseases, cancer, diabetes type 5 and obesity among younger people. These factors add up

to an increase in the demand for health professionals and it is expected to double by the next decade (SNAPS, 2008). The Swedish demand for physicians, dentists, specialized nurses and midwives exceeds the country's current supply (NPS,2009).

The emigration of health professionals is clearly affected by both the demand and supply side of health professionals. Although, Sweden has a scarcity of health professionals the country still exports parts of its domestic stock. However, there are some countries such as the Philippines, India and Cuba, which encourages export of health professionals in order to meet other countries' shortages. The scarcity in Sweden is for the major part met by foreign supply of health professionals immigrating to Sweden (NPS, 2009).

The emigration has been signaled as the main reason for the shortage of health professionals in several countries. The international emigration of health professionals is not the main cause of the developing world human resources (HR) crisis of health professionals, although it contributes to exacerbate the acuteness of the problems in some countries (Dumont and Zurn, 2007). Even considering an unrealistic scenario where emigration of health professionals from developing countries is stopped, these countries would still face up considerable health human resource gaps (OECD, 2008).

The International Physicians in Sweden (ILIS) has emphasized on the value of international experiences of both Swedish health professionals and the foreign supply of health professionals¹. Health professionals with foreign background or international experience is seen as a highly valuable resource, due to multicultural experience and language skills. The ILIS aims for intergration and manifoldness within the Swedish sector of health care and medical treatment where great knowledge and experience are of vital importance (ILIS, 2007). Considering return of emigration or onward emigration this might be one of the basic reasons, why Swedish health professionals emigrate.

The management of health human resources is of high importance. This management is in charge of constantly improving the overall patient treatment and how the health care is delivered. The increasing interdependency between countries through international migration of skilled workers has involved strongly the management of health human resources (OECD, 2008).

The emigration of health professionals is considered to be of vital importance in order to maintain an adequate supply of health workers in countries of critical shortage. Some of these countries, among those Sweden, perceive emigration of health professionals as

¹ International Physicians in Sweden (ILIS); <http://www.slfs.se/ilis>

negative for the domestic supply of health professionals in the home country (Forcier et al, 2004).

Not all the emigration of health professionals should be regarded as responding to pull factors specific to the health sector of the destination country i.e. better pay, professional development and career opportunities or the desire to work in a diverse environment. Many other factors play a role, including push factors, such as lack of safety, proper facilities, not enough jobs in the origin country, as well as migration policies (OECD, 2008).

3 Previous Research

One difficulty in performing an accurate study, includes the variety of sources used by countries to record migrants (i.e. work permits, population registers) and the absence of data linked to occupation makes it difficult to analyze health work migration. The migration of health workers is strongly influenced by the regulatory frameworks of individual governments. These frameworks control the training, recruitment and deployment of health professionals. Such regulations give rise to particular national patterns of migration (Bach, 2003).

Previous research of considerable dimensions was made by Mejia et al. in 1979 through the World Health Organization. The establishment of accurate data on stocks and flows of health professionals remains a major challenge that continues to inhibit effective migration management (Bach, 2003; Hoffman and Lawrence, 1996).

The concept of “self-selection” lies at the core of labor economics, which in theory implies that rational persons make optimizing decisions of what market and field to participate in, in terms of occupation, location, education, status etc. Roy (1951) discusses the optimizing choices of labor selecting between two different occupations including also location. As for choice of location emigrants are not randomly selected from a sample of a country’s population. Therefore there is a need to analyze those factors which motivates only some persons in the home country to migrate to a particular destination country. These are the studies of economic migration and labor economics.

Earlier empirical studies on Swedish emigration are primarily based on Swedish citizens and on domestic born emigrants and have shown that emigration propensities increased with educational level and potential income, however they decreased with age (Pedersen et al. 2001; Andersson and Konrad, 2003). Return and onward migration studies states that low skilled immigrants have higher incentives to stay as the standard of living is high from an international perspective. Meanwhile a highly skilled immigrant with limited employment opportunities in Sweden has higher probabilities of emigrating (Nekby, 2006).

According to Hedberg & Malmberg (2008) the typical emigrant is a male or female at the approximate age of twenty. They argue that social and economic changes such as leaving the parental home and seeking a career path influence and encourage development. They additionally state that the older the person is the weaker are the incentives to migrate as the individual gets more established in life, attaining a life partner, housing facilities and improved economic stability.

The emigration of the labor force has been studied with special emphasis on how movements affect national economies. For the last twenty to thirty years the focus has been in the ‘beneficial brain drain’ dilemma. The results found have shown positive

benefits for both the country of origin as well as for the country of destination (Lodigiani, 2009). The ‘beneficial brain drain’ model explains how the population which has a tendency to migrate to developed countries pursues greater employment opportunities, higher income returns and professional career opportunities (Kuhn and McAusland, 2006). These factors create an incentive for the citizens currently living in the country of origin to increase their investment in human capital. This is done to a level where the capital losses due to emigration can be offset by the gains of the migration-induced investments in the country of origin (Haupt and Janeba, 2009).

Only a small proportion of the total population within the country of origin will decide to emigrate. As there is an investment promoted by the ‘beneficial brain drain model’ the human capital level will raise in the country of origin. As the human capital rises there is more value added to the educated people in the remaining population within the country of origin (Robinson, 2007).

From an international perspective, two important factors taken in consideration by the employer are education and experience in the labor market. Highly skilled labor such as health professionals are in a more favorable position to be hired than the unskilled labor workers. Health professionals will be hired due to their qualifications and their bargaining power (Wickramasekara, 2002).

Although the liberalization of labor markets and the mutual recognition of qualifications are necessary but not sufficient to stimulate mobility, the movement of nurses and physicians between countries remains at a relatively low level, partly because of linguistic and cultural barriers (Jinks et al. 2000, Buchan et al. 2002).

Highly skilled professionals emigrating from a developed country have different reasons why to mobilize across borders. These reasons are different in comparison with the immigrants from developing countries. In the case of Sweden as the country of origin the following factors are found to be drivers for emigration.

One of the main factors which drive health professionals to move is the possibility to avoid high tax burdens as disposable income is related to tax (Haupt and Janeba, 2009). The opportunity to enhance earnings remains a pivotal factor in explaining the propensity to emigrate within a context in which state policies can foster or inhibit migration.

The difference in salary levels between source and destination countries are an important stimulus to emigration (Bach, 2003). Although, there is research on nursing supply which found only a weak positive relationship between wage and labor supply (Antonazzo et al. 2003; Chiha and Link, 2003; and Shield, 2004).

An important factor for a highly skilled worker, in order to keep him satisfied with his job, is the possibility of achieving a continuous professional development. The value of keeping learning-on-the-job and the ability to develop a diverse set of skills are integral components of individual career satisfaction, planning and progression (Bach, 2003).

There are studies which explore health professionals' reasons to emigrate. Variables such as a safer environment, better living conditions, proper working facilities, career opportunities and remuneration are key factors in the migration of health professionals (Awases et al. 2005; Vujicic et al. 2004).

A study made in Germany found several relevant factors which have a direct impact on physicians': job satisfaction and hence retention; decision-making and recognition; continuous education and job security; and administrative tasks and collegial relationships (Janus et al. 2007). Flexibility is an important factor, especially given the growing female population in the medical workforce. Improved working-time flexibility, creating a more flexible career development opportunities, and offering a wider range of options for continued education are main instruments to improve medical retention (Young and Leese, 1999).

Forecasts made by the WHO for the next following years predict personnel shortages. These shortages have become a challenging task, especially because of the difficulties to incorporate changes in order to increase productivity from the health professionals. Even with these problems, it is likely that future demand for more and better health care will keep the need for additional health professionals at the limits that the economy of every single country can sustain (Cooper, 2008).

Countries that in the past were fairly immune to the migration of health professionals are being drawn into an increasingly integrated global labor market in which migration is a more significant and volatile component of human resource planning. This overall increase arises from a variety of factors such as regulations by destination countries, market openness, etc (Bach, 2003).

4 Hypothesis

According to Combes (2008) the gravity model states that economic interactions between two geographically defined entities are proportional to the size of these entities and inversely related to the distance between them. They have great empirical explanatory power. The impact of distance is strong and not diminishing over time. Countries which are geographically nearby each other tend to interact more.

H1: We expect that Swedish health professionals will migrate to countries geographically close to Sweden.

Haupt and Janeba (2009), and Bach (2003) show that taxation and wages are important factors for health professionals to move across borders.

H2: We expect that countries where the tax burden is lower and the GDP(PPP) per capita is higher relative to Sweden the workers will decide to seek job there.

Job satisfaction is one major factor which is wanted by health professionals. It is of important significance to have the opportunity to keep on learning on the job and to be recognized in terms of professional development.

H3: We expect that countries with high level of professional development, will have a higher tendency of receiving Swedish health professionals.

4.1 Concepts and Data

This paper presents a comprehensive study of Swedish emigration of health professionals by using annual data on migration outflows from Sweden to other countries. The data on emigration of Swedish health professionals were collected from Statistics Sweden (SCB, 2009), in a time period between 1999 and 2008; identifying sex, educational level, whether born in Sweden or abroad and destination country. Distances to destination countries are taken from Google Maps (2009)

The Economic variables: income tax rate and GDP (PPP) per capita of the destination countries are collected from the World Economic Outlook Report (IMF, 2009) and the Index of Economic Freedom (2009). The sociological variables are collected from the Gallup World poll (2009) database such as job satisfaction and encouraged development.

Our contribution to the study of Swedish health professionals emigration will be to analyze variables included in previous studies and add additional variables of interest in concern of Swedish health professionals such as *work hard, get ahead, education expenditure*. Furthermore, adding additional variables that were suitable for analyzing

health occupations i.e *urban population, old age dependency ratio, child dependency ratio* .

4.2 Limitations

In order to make our analysis we had to do some limitations of our research. This paper does not focus on the concepts of brain-drain or brain-gain and neither the affect on the Swedish economy nor the national economies of the destination countries. Our study only focuses on emigration and neither on onward nor return of emigration. The time limit is set at one decade in between 1998-2008 due to data restrictions. Limitation of 90 countries was due to the information retrieved from Statistics Sweden (SCB, 2009).

4.3 Emperical part and variables

We considered a set of different variables (see appendix. 2) related to previous research in order to examine whether they would be any significance in Sweden's case. Many of these variables contain similar information as well as they attain a high degree of multi-collinearity. As some of these variables attain similar information they can be used as proxies for other variables. We tested different kinds of variables (see appendix. 2) which were based on previous studies and the following four key variables turned out to be significant:emigrating health professionals, capital distance, GDP per capita, income tax rate, encourage development out of the different previous research based variables. Furthermore in smaller observation sets such as in our case it is more likely that several variables turn out to be insignificant.

Emigrating health professionals: This variable represents the percentage share of the total population of Swedish health professionals which emigrate to the different countries (SCB, 2009).

Capital Distance: This variable measures the proximity of the countries where Swedish Health Professionals tend to emigrate. It is based in the kilometers that separate the capital of Sweden, Stockholm, to the capital of the destination country (Google Maps, 2009).

GDP (PPP) / per capita: It is measure as the Gross Domestic Product (in Purchasing Power Parity terms in US dollars) divided by mid-year population, figures from 2007 (IMF, 2009).

Income Tax Rate: This variable measures the share of money that workers need to return to the government in for of a tax, figures for the year 2009. In practice, the income tax base deviates from a comprehensive income measure in several important respects, by excluding non-market activities, limiting refunds for losses, and including capital

gains on realization rather than on accrual (Auerbach, 2008; Index of Economic Freedom, 2009).

Encourages development: This variable is based on the Gallup World Poll (2009), used as a proxy for job satisfaction. It asks the question: Is there someone at work who encourages your development or not? (Asked only to those with job).

We also used three dummy variables the first one was English language to prove the cultural proximity setting 1 for English speaking countries and 0 for the rest. The second dummy for OECD member countries (2009) setting 1 for OECD members and 0 for the rest. The third and last dummy setting 1 for European union countries (EU15, 1995) and 0 for all other countries.

We found multi-collinearity between the variables: *GDP(PPP) per capita*, *Estimated Income*, *Public health and education expenditure*, and *city: quality healthcare*. The variable *GDP (PPP) per capita* is taken into the equation model as proxy for the other strong correlated factors.

Accordingly, the personal development of health professionals is of major importance. There is a high correlation among the ‘job satisfaction’ variables. Specially, between *encourages development* and *work hard, get ahead*. Other variables taken in consideration due to its multi-collinearity were: *Labor freedom* and *satisfied with your job*. The variable *encourages development* is taken in the model as proxy for all the ‘job satisfaction’ variables.

The variables of *urban population*, *old age dependency ratio*, *child dependency ratio* and *unemployment rate* were taken under consideration in the previous research. They are stated as acting forces for the demand and supply which have influence on emigration patterns of health professionals. However in our case they turned out to be insignificant. The remaining three key variables together with the data sources used in the empirical model were; Capital distance, GDP(PPP) per capita, Income tax rate, and Encourage development.

Table 1. Descriptive statistics for key variables.

Variable	N	Min	Max	Mean	Std. Dev.
Emigrating health professionals	90	.00	20.86	1.11	3.077
Capital distance	90	377	17443	4564	3723.852
GDP(PPP) per Capita	90	389	82440	18316	16561.591
Income tax rate	85	.00	59.00	31.129	12.382
Encourages development	79	.37	.81	.572	.097
Valid N (list wise)	76				

Table 1 presents the descriptive statistics for the chosen key variables. Our findings are that the minimum value for emigrating health professionals is 0.00 due to the fact that in the data set there are four countries (Albania, Belarus, Hong Kong and Palestine) where no health professionals had emigrated to during the time period of 1999-2008. The country with the lowest GDP(PPP) per capita is Burundi \$389.00USD. The minimum value of 0.00 Income tax rate reflects the United Arab Emirates since there is no personal income tax rate (Al Tamimi, 2004).

4.4 Method

In order to examine the relationship between the different variables we used correlation analysis, and structure a hypothesis on an ordinary least squares (OLS) regression analysis.

Based on the hypotheses we formulated the following model:

Equation 1:

$$\text{Emigrating health professionals} = \beta + \beta_1 \text{Capital distance} + \beta_2 \text{GDP(PPP) per capita} + \beta_3 \text{Income tax rate} + \beta_4 \text{Encourages development} + e_1$$

We used an OLS regression analysis, based on equation 1, in order to identify the effects of these four variables towards the percentage of emigrating health professionals. We based our assumption of an OLS regression that there is a linear relation of ordinal interval scale, normal distribution error terms, no autocorrelation and a residual average equal to 0. We tested for fixed country effects, where we used dummy variables for the English language to prove the cultural proximity noted in the cascade model in figure 3. Just as we did with the dummy variable for economic agreements for the OECD mem-

ber countries. The last dummy variable taken into consideration just included countries within the European Union.

By adding the three dummies we formulated the following model:

Equation 2:

$$\text{Emigrating health professionals} = \beta + \beta_1 \text{Capital distance} + \beta_2 \text{GDP(PPP) per capita} + \beta_3 \text{Income tax rate} + \beta_4 \text{Encourages development} + \text{dummy English} + \text{dummy OECD} + \text{dummy EU} + e_1$$

5 Results

We begin with providing the findings of the bivariate correlation coefficients between the variables and then presenting the findings from the OLS regression and continue with the parameter analysis as well as the dummy results.

Correlation matrix								
	Emigrating health professionals	Capital distance	GDP(PPP) Per Capita	Income tax rate	Encourages Development	English Language	EU countries	OECD countries
Emigrating health professionals	1							
Capital distance	-.197	1						
GDP (PPP) per capita	.450**	-.215*	1					
Income tax rate	.281**	-.006	.270*	1				
Encourages Development	.322**	.290**	.316**	.086	1			
English Language	.124	.328**	.165	.052	.200	1		
EU countries	.318**	-.353**	.539**	.457**	.157	-.027	1	
OECD countries	.461**	-.222*	.700**	.452**	.200	.086	.639**	1

Table 2. Correlation matrix

** . Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 2 presents the correlation matrix between the different key variables and the dummy variables. The strongest correlation was found between the Emigrating health professionals and OECD countries at 0.461 and the second strongest between the GDP(PPP) per capita 0.450 at the significant level of 0.01. The correlation between Emigrating health professionals and Encourage development is at 0.322 close to the correlation to EU countries at 0.318 also at the significant level of 0.01.

The lowest and insignificant correlations for Emigrating health professionals was found between the English language countries at 0.124 and the Capital distance as well as it was negative -0.197.

The highest correlation between the variables was found between and OECD countries and GDP(PPP) per capita 0.700 and OECD countries and EU countries 0.639 as well as EU countries and GDP(PPP) per capita 0.539 at significant level 0.01.

English language countries was only significant to Capital distance 0.328 level of 0.01. Encourage development had no significance to any of the dummy variables.

Table 3. Regression Results of Equation 1

Variables	Unstandarized coefficients	Std. Errors	Standarized coefficient	t-Statistics	Prob.	VIF
Constant	-5.934	2.052		-2.892		
Capital distance	-1.876	8.888E-5	-.225	-2.112	0.038	1.237
GDP per Capita	6.827E-5	2.496E-5	0.310	2.734	0.008	1.400
Income tax rate	0.048	0.027	0.181	1.796	0.077	1.105
Encourages						
Development	9.207	3.742	0.274	2.46	0.016	1.345
R- squared		0.347		F-Statistics		9.437
Adjusted R-squared		0.310		Prob (F-statistic)		0.000
Valid N listwise		76				

Table 3 provides a summary of the results of the regression analysis for equation 1, stating that all the key variables are significant at the significant level of 0.1. The GDP(PPP) per capita had the highest significant level (0.008) and the Income tax rate the lowest (0.077). The VIF shows the degree of multi-collinearity for particular small and moderate samples. In small samples, such as in our case, one can find lack of statistical significance of individual independent variables while the overall model may be strongly significant. The limit of detection for multi-collinearity is 2.5.

According to our findings the VIF for all the variables are in between 1.105 – 1.400 which are below the limit value. With these figures we conclude that the key variables do not contain the same information. The tolerance level of multi-collinearity for the different variables are in a range of 0.714 – 0.905, which is very close to 1 indicating that they have strong tolerance for multi-collinearity. The R-squared value is 0.347 and the Adjusted R-squared is at a level of 0.31 which might be due to the reduced number of observations.

GDP(PPP) per capita had the highest standardized coefficient at 0.310 and Encourage development at 0.274, which indicates that they have the largest effect on Emigrating health professionals. Capital distance has a negative standardized coefficient at -0.274 and the lowest was Income tax rate at 0.181.

Table 4. Regression Results of Equation 2

	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t-Statistics	Prob.	VIF
1 (Constant)	-6.014	2.155		-2.791	.007	
Capital distance	-2.510E-4	1.052E-4	-.301	-2.384	.020	1.721
GDP(PPP) per capita	5.034E-5	3.147E-5	.229	1.600	.114	2.206
Income tax rate	.051	.032	.191	1.602	.114	1.538
Encourages development	9.764	3.815	.290	2.560	.013	1.386
English language countries	.993	.952	.113	1.043	.301	1.277
EU countries	-1.104	1.217	-.126	-.907	.368	2.088
OECD countries	.987	1.078	.142	.916	.363	2.598
R-squared		0.370	F-Statistics			5.695
Adjusted R-squared		0.305	Prob (F-statistic)			0.000
Valid N listwise		76				

Table 4 presents the results for equation 2, where all variables except for Capital distance and Encourages development turned out to be insignificant at significance level 0.1. The regression results of equation 2 are therefore excluded in our final conclusions.

6 Conclusions

Migration of health professionals is not an isolated topic concerning only Sweden, but rather a broader and relevant issue for many other countries around the world. However we have chosen to look at the topic from a Swedish perspective, due to the current shortage of health professionals in Sweden.

The purpose of this paper is to investigate why Swedish health professionals emigrate with a focus on the pulling factors. The concept of health professionals in our study contains people with more than 3 years of education within the health and social welfare sector, not referring to any particular occupation such as nurses, doctors, dentist etc; or whether they are specialized in any area.

The OLS regression test was run by using the data of 90 countries collected from SCB (2009), Gallup world poll (2009) and World Economic Outlook Report (IMF, 2009). We argued that the percentage of emigrating Swedish health professionals is directly affected by factors of the destination country such as; geographical proximity, GDP(PPP) per capita, income tax rate and encouraging development.

According to our regression results GDP(PPP) per capita has the highest affect of emigration of Swedish health professionals, while as Income tax rate has the of the lowest influence. Encourage development has the second highest effect indicating that Swedish health professionals tend to value professional development.

As stated in our results, our variables can only explain 34.7% of our analysis where 65.3% is still unexplained. This might be due to other sociological and cultural variables which we have not been able to take into account. This gives an opportunity for further or complementary studies from a more sociological point of view.

In this analysis of the emigration of Swedish health professionals, language and economical agreements/union (EU,OECD) have a minor impact on whether and where the Swedish health professionals decide to emigrate to.

Continuos studies would be to analyse the patterns of onward or return of emigrating of Swedish health professionals testing for push rather than pull variables. Providing an extension to this paper.

In concidering return migration, if foreign experience is seen as inessential the Swedish goverment should induce incentives for swedish health professionals to stay in Sweden such as better working conditions leading to increased job satisfaction, tax reduction or social benefit to reduce the emigration rate.

The OECD (2008) stresses that almost all countries have an existing migration policy that encourages migration patterns of health professionals to move from one country to

another. As well as the free zones created by the European Union and other world regions allowing labor mobility among health workers and professionals.

Our recommendation would be to continue to encourage migration policies for health professionals with the aim of achieving professional development and to take advantage of knowledge spillovers attained in foreign countries.

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1. Appendix list of countries

1. Afghanistan
2. Albania
3. Algeria
4. Arab Emirates,
United
5. Argentina
6. Australia
7. Austria
8. Azerbaijan
9. Bangladesh
10. Belarus
11. Belgium
12. Bolivia
13. Bosnia-
Herzegovina
14. Brazil
15. Bulgaria
16. Burundi
17. Canada
18. Chile
19. China
20. Colombia
21. Cyprus
22. Czech Repub-
lic
23. Denmark
24. Egypt
25. El Salvador
26. Eritrea
27. Estonia
28. Ethiopia
29. Finland
30. France
31. Gambia
32. Germany
33. Great Britain
and
Northern Irel-
and
34. Greece
35. Hong Kong
36. Hungary
37. Iceland
38. India
39. Indonesia
40. Iran
41. Iraq
42. Ireland
43. Israel
44. Italy
45. Japan
46. Jordan
47. Kenya
48. Korea,
49. Latvia
50. Lebanon
51. Lithuania
52. Luxembourg
53. Macedonia
54. Malaysia
55. Malta
56. Marino Serbia
57. Morocco
58. Netherlands
59. New Zealand
60. Nigeria
61. Norway
62. Pakistan
63. Peru
64. Philippines
65. Poland
66. Portugal
67. Romania
68. Russia
69. Saudi Arabia
70. Serbia and
Montenegro
71. Singapore
72. Slovakia
73. Slovenia
74. Somalia
75. South-Croatia
76. Spain
77. Sri Lanka
78. Sudan
79. Switzerland
80. Syria
81. Tanzania
82. Thailand
83. The West
Bank and Gaza
Strip
84. Tunisia
85. Turkey
86. Uganda
87. Ukraine
88. United States
of America
89. Uzbekistan
90. Vietnam

2 . Appendix list of EU and OECD countries

List of OECD countries:

- | | |
|-------------------|------------------------------|
| 1. Australia | 15. Japan |
| 2. Austria | 16. Korea |
| 3. Belgium | 17. Luxemburg |
| 4. Canada | 18. Netherlands |
| 5. Czech Republic | 19. New Zeland |
| 6. Denmark | 20. Norway |
| 7. Finland | 21. Poland |
| 8. France | 22. Portugal |
| 9. Germany | 23. Slovakia Republic |
| 10. Greece | 24. Spain |
| 11. Hungery | 25. Switzerland |
| 12. Iceland | 26. Turkey |
| 13. Ireland | 27. United Kingdom |
| 14. Italy | 28. United States of America |

List of EU countries:

- | | |
|-----------------|--------------------|
| 1. Austria | 12. Portugal |
| 2. Belgium | 13. Spain |
| 3. Denmark | 14. Sweden |
| 4. Finland | 15. United Kingdom |
| 5. France | |
| 6. Germany | |
| 7. Greece | |
| 8. Ireland | |
| 9. Italy | |
| 10. Luxemburg | |
| 11. Netherlands | |

3 Appendix list of variables

Descriptive statistics on considered variables of previous research

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Emigrating health professionals	90	.00	20.86	1.11	3.07
Capital distance	90	377	17443	4564.42	3723.85
GDP Per Capita	90	389	82440	18316.40	16561.59
Unemployment rate	90	.80	40.00	8.89	7.60
Income tax rate	85	.00	59.00	31.12	12.38
Estimated Income	87	296	57676	12873.21	12065.09
Public health expenditure	88	4.00	5233	898.69	1074.67
Public education expenditure	69	6.20	28.30	14.60	4.88
Education attainment	58	.00	39.70	18.02	9.70
Technological Index	72	2.17	6.24	4.18	.84
Urban population	90	11.00	100.00	63.21	21.49
Old age dependency ratio	90	1.30	35.10	15.18	8.26
Child dependency ratio	90	15.30	99.90	38.20	20.38
Labor freedom	85	30.80	99.40	63.81	14.83
Satisfied with your job	84	.43	.95	.7781	.11
Property rights	85	10.00	95.00	52.47	26.68
Preserve Environment	86	.13	.90	.45	.17
City Quality Healthcare	87	.17	.93	.60	.18
Freedom In your Life	87	.26	.96	.66	.17
Life expectancy	90	43.60	82.70	72.30	8.75
Work Hard Get Ahead	79	.32	.95	.72	.165
Encourages Development	79	.37	.81	.57	.09
N (Valid list wise)	40				

4. Appendix Regression results

1. Regression results for Equation 1

Model		Unstandardized Coefficients		Standardized Coefficients		90,0% Confidence Interval for B		Collinearity Statistics		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-5.934	2.052		-2.892	.005	-9.354	-2.514		
	Capital distance	-1.876	8.888E-5	-.225	-2.112	.038	.000	.000	.808	1.237
	GDP per Capita	6.827E-5	2.496E-5	.310	2.734	.008	.000	.000	.714	1.400
	Income tax rate	.048	.027	.181	1.796	.077	.003	.093	.905	1.105
	Encourages Development	9.207	3.742	.274	2.460	.016	2.971	15.444	.743	1.345

a. Dependent Variable: Emigrating health professionals
Valid N listwise 76

2. Model summary Equation 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.589 ^a	.347	.310	2.75438

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	286.385	4	71.596	9.437	.000 ^a
	Residual	538.651	71	7.587		
	Total	825.035	75			

a. Predictors: (Constant), Encourages Development, Income tax rate, Capital distance, GDP per capita

3. Regression results for Equation 2

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		90,0% Confidence Interval for B		Collinearity Statistics		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-6.014	2.155		-2.791	.007	-9.607	-2.420		
	Capital_distance	-2.510E-4	1.052E-4	-.301	-2.384	.020	.000	.000	.581	1.721
	GDP_Per_Capita	5.034E-5	3.147E-5	.229	1.600	.114	.000	.000	.453	2.206
	Income_tax_rate	.051	.032	.191	1.602	.114	-.002	.104	.650	1.538
	Encourages_Development	9.764	3.815	.290	2.560	.013	3.403	16.126	.721	1.386
	English_Language	.993	.952	.113	1.043	.301	-.595	2.581	.783	1.277
	EU_countries	-1.104	1.217	-.126	-.907	.368	-3.134	.926	.479	2.088
	OECD_countries	.987	1.078	.142	.916	.363	-.810	2.785	.385	2.598

a. Dependent Variable: Emigrating health professionals

Valid N listwise 76

4. Model summary Equation 2

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	304.933	7	43.562	5.695	.000 ^a
	Residual	520.103	68	7.649		
	Total	825.035	75			

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.608 ^a	.370	.305	2.76560	.370	5.695	7	68	.000

a. Predictors: (Constant), OECD, English, Encourages_Development, Income_tax_rate, Capital_distance, EU, GDP_Per_Capita