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Workplace, Human Capital and Ethnic Determinants of Sickness Absence in Sweden, 1993-2001

Tommy Bengtsson
Kirk Scott

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Forschungsinstitut
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Tommy Bengtsson
Lund University
and IZA

Kirk Scott
Lund University

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IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
E-mail: iza@iza.org

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ABSTRACT

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This study charts the differences between the sickness absence of immigrants and Swedes during a period when a flourishing labour market in the beginning of the 1990s turned into a tense and problematic one. We consider not only human capital factors for various immigrant groups and natives, but also workplace conditions and macro level factors. Using register based information on 100,000 individuals for the period 1992-2001, we find large differences in sickness absence between natives and several immigrant groups and that these differences persist after controlling for human capital, workplace factors, and macro economic factors.

JEL Classification: J15, J21, J32

Keywords: immigration, health, sickness benefits, labour market, integration

Corresponding author:

Tommy Bengtsson
Department of Economic History
Lund University
Box 7083
22007 Lund
Sweden
E-mail: tommy.bengtsson@ekh.lu.se

1. Introduction

Today many immigrants to Sweden face severe problems in finding work, much the same as in the rest of Western Europe. A stylized understanding is that immigrants have lower incomes, a larger share of their income comes from the social insurance system and they have a higher early retirement rate than Swedes. This situation a result of the economic problems Sweden began facing in the first part of the 1990s, when unemployment rates suddenly went up to European levels after roughly three decades of full employment. Instead, immigrants began experiencing problems in the labour market during the 1980s, when the Swedish economy was prospering, more so than the rest of Europe (Bengtsson and Scott 2006; Rosholm, Scott & Husted 2006). In fact, the roots of these problems may be found even earlier than the 1980s.One major consequence of the weakening labour market attachment has been that many immigrant groups are today much more dependent on the social insurance system than natives.

The Swedish social insurance system is a cash system in which a person should be able to enjoy a reasonable standard of living whether employed or not. An employed person who becomes ill or receives an injury at work should be able to maintain approximately the same standard of living as when working full time. This system was formally introduced with the inception of public sickness insurance in the 1950s and since then it has evolved into its present form. The benefits are related to income and should largely compensate for income loss during periods of illness and retirement.

Many studies, using various sources of Swedish data, have showed that labour force attachment among immigrants has been weakening over the past three decades, and the relative incomes earned by those immigrants actually in the labour force have been declining. Prior to 1970, immigrants exhibited economic performance similar to, if not better than,

native-born Swedes with the same occupations. After 1970, there are indications that this shifting immigrant labour market performance is not merely a reflection of shifting quality of immigrant cohorts, but also of shifting labour market conditions which adversely affect all migrants, even those from cohorts which were fairly successful in earlier years (Scott 1999; Rosholm, Scott, & Husted 2006; Ekberg & Gustafsson 1995; Rooth 1999; Bevelander & Nielsen 2001; Bengtsson & Scott 1998). During the 1980s, when the overall labour market situation was very good in Sweden, immigrants faced problems finding employment. Those with jobs had a lower degree of income assimilation than before, and they had a higher rate of sickness absence than natives (Bengtsson & Scott 2006). The higher consumption of sickness benefits among immigrants could either be a result of composition effects, that they are over-represented in categories with a high degree of sick leave, for example those with lower educational levels. The 'over-consumption' of sickness benefits may also be seen as a symptom of the problem of weak labour market attachment or unsatisfactory employment conditions.

The main conclusion of our previous study on consumption of sickness benefits, covering the period 1982-1991, was that the differences in sickness benefits between foreign born and natives, as well as between various immigrant groups, are large and persist also after accounting for standard human capital factors (Bengtsson and Scott, 2006). And it was not simply a matter of change in the composition of immigrants, from labour immigration in the 1960s to tied migrants and asylum seekers from the 1970s onwards. Instead the pattern is more complex. The measured effects of country of birth on sickness benefit differences were larger than differences due to human capital factors such as education or sex. Cross country differences were also larger than effects of income position and urban/rural differences.

The previous study ended in 1991 for two reasons. First, we wanted to find out whether immigrants faced problems prior to the economic and financial problems in the

1990s. Second, the sickness insurance system changed in 1992, with employers becoming responsible for paying sick leave benefits for the first fourteen days of each illness period. Previously, a person was reimbursed from the sickness insurance system from day one. This implied a change in the registration of sickness benefits, which we will return to shortly.

The present study charts the differences between the sickness benefit consumption of immigrants and natives during a period when a flourishing labour market in the beginning of the 1990s turned into a tense and problematic one. While we in the previous article limited ourselves to only include human capital and temporal factors, much due to the fact that information about workplace factors are only available from 1987 onwards, here we include both workplace factors, and macro level factors. Thus it is an extension of the previous study in two respects - in time and in scope. We begin by comparing the situation during the 1990s with the 1980s to identify possible differences between the periods. We then expand the models to include information about workplace and the economic situation at macro level.

2. Background and Previous Research

The Swedish sickness benefit system is a compulsory system, dating back to 1955. It is jointly paid for by the employee (the qualifying period), the employer (the employer period) and the Social Insurance Office (the public period). The goal is to give the employee a high degree of compensation while maintaining incentives both for the employee to return to work and for the employer to get him/her back to work. In 2008, the compensation rate is 80 percent of the benefits-based income, SGI[1], after a one-day qualifying period. The employer then pays the first 14 days of eligible assistance per sick period. Thereafter the public

[1] SGI (sjukpenninggrundade inkomst) is the term for the income upon which health benefits are based. It is generally equivalent to the expected yearly earnings from employment, but income above a fixed ceiling is not included.

insurance system takes over the responsibility. The employee needs to be examined by a doctor to receive compensation after the seventh day. There is also an upper limit to the benefits but not to the payments, which is proportional to the salary. Despite recent restrictions, the sickness insurance system is still quite generous up to a certain income level.

From its inception, the sickness insurance system became gradually more generous. The increase in benefit levels paid is reflected in an almost monotonic increase in the average number of sick days per insured from the 1950s through the late 1980s. Consequently, the economic pressure on the insurance system increased, and this was compounded by the economic recession of the early 1990s. The compensation rate was therefore lowered several times and the qualifying period increased from zero to one day or two days (depending on the year) during the period 1991 to today. As the compensation decreased so did the average number of sick days. As a result of economic pressures, a major change in the system took place in 1992, when the employer assumed responsibility for the first two weeks of sick leave. From this point, the number of sickness days reported to the Insurance Board as well as the income from sick leave reported to the tax authorities is no longer easily interpreted, an issue we will return to in our analysis.

The literature concerning sickness benefit systems has been centred around the construction of the system itself and whether it is socially optimal, e.g. if it provides adequate incentives for individuals to return to work after illness and for employers to get workers back after a prolonged duration of sick leave (Brown & Sessions 1996, Bäckman 1998, Rikner 2001). Most studies focus on the reports of number of sick days and changes in the insurance system, but few concentrate on the received benefits themselves. The reforms in the period up to 1987 were followed by increases in the average number of sick days (Lantto & Lindblom 1987, Bäckman 1998), while the reforms of the 1990s gave the intentional

results of decreasing the number of sick days (Johansson & Palme 1996, Cassel et al 1996, Edgerton et al 1996).

Turning to the medical literature on health of immigrants, epidemiologists in the United States, Australia, Canada and Great Britain show that in the 1950s and 1960s the health conditions among immigrants differed from those who remained in the sending countries (Hjern 1995). Immigrant children grew taller and disease patterns differed between the populations. Many of the early studies of the influence of changes in life style factors on cancer and coronary-heart diseases use data on immigrants since they provide a 'natural experiment,' where effects of environment prior to immigration can be isolated from the effects after immigration. Typical to those studies is the comparison between those who migrated and those who stayed. Later research has instead focused on the difference between immigrants and natives.

Knowledge about the health of immigrants, however, has not improved much since the 1990s (Riksförsäkringsverket 1996). Few studies have been made using a 'natural experiment' approach which compares health of migrants with that of non-migrants remaining in the home country[2], with the studies that do exist focusing on the health of immigrants compared with natives. We still know very little about mortality and causes of death among immigrants in Sweden, and what we do know is limited to a smaller study of Stockholm County, which shows a higher mortality below 65 years of age for immigrants (Diderichsen 1989). Studies of perinatal and infant mortality show small differences between immigrants and natives (Aurelius & Ryde-Blomqvist 1978, Mjönes & Koctürk 1986).

The difference in health between immigrants as a group and native-born Swedes was rather small in the 1990s, while the differences within the group of immigrants are rather large, much as it is today. Screening of asylum seekers show that they have a high prevalence

of infections and parasitical diseases. Tuberculosis is more frequent among immigrants than natives. Genetic disposition for age-diabetes exists in some of the home countries of the immigrants. Differences are also found in cancer of the gastrointestinal system (Hjern 1995). Asylum seekers also show higher prevalence of psychological diseases than natives (due to torture and traumatic events) and immigrants from Eastern Europe, former Yugoslavia and the Mediterranean countries have higher incidence of suicide than Swedes. Somatic damages from the home country (war, torture) are likely to be important, but the diagnoses for those arriving in 1988-90 do not show any proof of this (Riksförsäkringsverket 1996, p. 34).

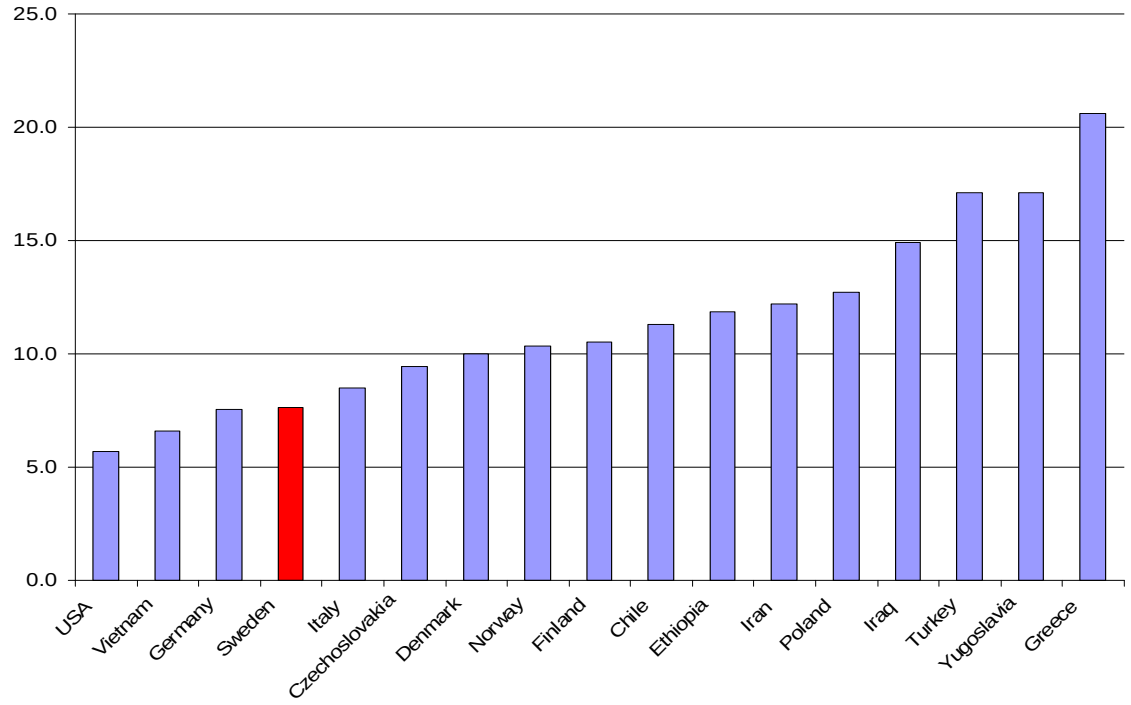
The proportion early retired of the population in ages 16 - 64 years also varies strongly with birth country in the 1990s, even more than today. While about 6 percent of Swedish born males and 8 percent of the females had early pensions in 1994, the figures for immigrants from the other Nordic countries were 11 - 12 percent for males and again slightly higher for females after standardizing for age composition (Riksförsäkringsverket 1996, p. 50). The group with the highest degree of early retirement in 1994 consisted of labour immigrants from the former Yugoslavia, Greece, and Turkey. These countries register 15 - 17 percent of the males and 20 - 26 percent of the females as entering early retirement.

Well-defined somatic diseases are of minor importance for differences in sickness leave and early retirement between various immigrant groups and natives. Early retirement is instead often due to somatic disorders of the locomotive system caused by monotonic jobs (Riksförsäkringsverket 1996). It is also likely that general labour market conditions such as unemployment, closing of factories, and investment in new machinery are of great importance for early retirement.[3] Thus, the differences of early retirements between nationalities are not only a result of differences in health but also in employment conditions

[2] The studies of coronary-heart diseases among immigrants from Finland to Sweden are exceptions (Alfredsson et al 1982).

and the labour market in general. The dependency of sickness benefits and early retirement pensions among immigrants are therefore net indicators of a mixture of health and integration at the workplace.

Figure 1. Mean number of registered sick days per employee and year, 1993-2001.



Source: Swedish Longitudinal Immigrant database (SLI), see section 3.

Figure 1 shows that the mean number of sick days reported in government registers varies considerably among the different immigrant nationalities. Greeks, Iraqis, Turks, and Former Yugoslavians had, for example, more than twice as many sick days as Swedes in during the period 1993—2004. The fact that the numbers differ so greatly leads us to assume that there are some fundamental differences between workers with different national heritages. Previous research shows that immigrants are absent from work more often, and that these absences are likely to result in a greater number of sick days on average than for natives

[3] The exception is immigrants entering early retirement after a short stay in Sweden (less than 5 years). They often have a specific disease panorama (psychological diseases and developmental disorders, Riksförsäkringsverket 1996, p. 70).

(Nilsson, 2005). Thus the differences between the countries are due to both higher frequencies and longer periods of sick leave comparative to natives.

There are three possible options to explain these variations in sickness benefit consumption. The first is that the various nationalities are employed to differing degrees in occupations with a high rate of injury or work-related illness. People with low education also have higher degrees of sick leave than those with higher education, leading to higher rates of sickness absence in occupations requiring little formal human capital. The second is that there may be some factors related to the conditions - economic, environmental, social, and cultural - in the home country, which influence the number of sick days an individual is willing to, or must, take. The third is that sick leave may be a measurable effect of poor economic assimilation. This would be the case if immigrants from certain countries were employed to a larger extent in occupations that they consider unpleasant or undesirable. The concept of dual labour markets illustrates the possibility for an individual to enter the labour market in one of two 'tracks.' The first track can be considered 'normal,' with access to training and promotion, while the second track can be seen as a dead end, with no or very little possibility for upward movement.[4] It may be the case that immigrants are more likely than natives to enter into this second type of employment, and thus be unable to realise their goals, leading to dissatisfaction.

[4] For a basic review of segmented labor market theories and criticisms, see Cain (1976) and Piore & Berger (1980).

3. Data and Method

This study examines the determinants of sickness benefit consumption by adopting an approach typical in the analysis of economic assimilation. Here we will assume that excessive consumption of sickness benefits is a function of various socioeconomic factors, in much the same way as other studies regard wages as a function of individual-specific and macro factors. Since the occasional sick day is not seen as a major societal problem, this study will only examine the occurrence of a large number of sick days per year, defined as more than 15 days *without* the individual being placed on long-term sick leave.

The data used in this analysis comes from the Swedish Longitudinal Immigrant Database (SLI). The SLI is essentially a register-based, representative panel containing economic and demographic data on a randomly selected sample of 550,000 native Swedes and immigrants from 16 countries during the period 1968 – 2001.

Due to the construction of the sickness benefits system as an income replacement scheme, the panel has been restricted to those individuals reporting positive earnings from employment. Self-employed individuals are also omitted, to allow for greater compatibility within the panel. In addition, the stipulation of positive earnings is tightened through the inclusion of only those reporting earnings greater than 3 ½ base amounts[5] and less than 7 ½ base amounts (a range of approximately SEK 129,150 – 276,750 in 2001 prices). The lower bound will ensure that the individuals have been fairly active in the labour market during the year. The upper bound is included because the Swedish sickness benefit scheme reimburses to a maximum income of 7 ½ base amounts. Today, individuals above this income ceiling

[5] "Many of the benefits within social insurance are linked to the so-called base amount. The base amount is also used to calculate the pensionable income, pension points and maximum levels within social insurance. It is an index of price movements, which means that benefits follow price trends. Price trends are measured in the consumer price index." National Social Insurance Board web page: http://www.rfv.se/english/social/base_k.htm

face increasing costs for sickness absence, and thus may have different incentive structures. It can also be assumed that higher paid employees often have the possibilities of alternative solutions, further justifying their exclusion.[6] The possibility that part-time and full-time individuals may have differing propensities to consume sickness benefits poses a slight problem to this study. Information on hours worked is not available in the data, leaving no clear way to tackle this problem. An attempt to identify the severity of the issue was made through an examination of the behaviour of individuals in quintile income bands and no great differences were evident, leaving us confident that hours worked is not a driving factor behind our results.

We employ a nested model approach by using three models, beginning with a simple model accounting only for individual characteristics. The second model builds on the first and adds macroeconomic variables, and the third model builds on the first two and adds macroeconomic data on workplace characteristics. The variables included in the three models are found in Table 1.

Table 1. Variables included in the three models

Model A	**Model B**	**Model C**
Sex	Sex	Sex
Education	Education	Education
Age	Age	Age
Civil Status (married / single)	Civil Status (married / single)	Civil Status (married / single)
Number of children	Number of children	Number of children
Years since migration	Years since migration	Years since migration
Previous sickness absence	Previous sickness absence	Previous sickness absence
Previous hospitalization	Previous hospitalization	Previous hospitalization
	Residential location (metro / non-metro)	Residential location (metro / non-metro)
	Municipal unemployment rate	Municipal unemployment rate
	Year dummies to capture institutional changes	Year dummies to capture institutional changes
		Workplace turnover
		Workplace growth rate
		Immigrant share at workplace
		Sector of employment (service / manufacturing)
		Workplace size
		Relative income

[6] One example here is university professors, who have a very low rate of sickness absence given the flexible structure of their employment.

From a previous system which was financed through two parties - the employee and the state - the 1990s saw a shift in responsibility for financing sickness absence. From January 1 1992 onwards, the employer was given the responsibility of paying sickness benefits for the first fourteen days of every sickness period. With this change it has become increasingly difficult to analyze sickness benefit usage. While we have information about the number of days compensated, we lack information on the composition of the sick leave. Studies of sickness absence prior to 1992 are fairly straightforward, since the number of days in the official registers represents the actual number of days absent. From 1992 onwards the number of observable days can hide a varying number of actual days depending on how the absence occurred. A reported absence of two days, for example, can have two possibilities for actual days absent. In the first possibility, two observed days in one continuous sickness period implies 16 actual days of sickness absence (the employer's 14 days, plus the 2 days visible in the registers). The second possibility yields 30 days of absence if the 2 observable days are the result of two sickness periods (two employer periods of 14 days each, plus 1 extra day in each period).

This problem is not an insignificant obstacle to studies of sickness absence following 1992, but it is felt that some analysis can still be pursued. To this end the target signifying excessive sick days has to be changed from the 25+ days in the previous study to 15+ days in the current study. It is impossible to accurately assess an absence period of 25 days given the changes in the insurance system. In the example above, this target can be reached with only 2 observable sick days, while it would be necessary to examine only those with 11 or more sick days to ensure that all individuals registered as surpassing the target actually had more than 25 days absence. This would then encompass individuals with between 25 and 176 sick days,

obviously adding bias to our results. Given this problem, we have constructed our dependent variable to encompass all individuals reporting positive earnings from sickness benefits.

Given the panel construction of the data, and the fact that the topic of interest is a binary variable (i.e. the case of having more than 15 sick days in a year, or not), the choice of estimators is a random effects logit, which gives us the benefit of both a panel-wide and an individual-specific error term.

4. Results

Table 2 shows the predicted probability of incurring excessive sick days in a given calendar year by country of birth calculated at the means for each country, and at the means for Sweden for the period 1993—2001, as well as for the period 1982—1991. Here we base the probabilities on the estimated coefficients from the basic model controlling only for individual characteristics, and use the means to calculate the 'average' individual for each nationality. We then use the country-specific coefficients, but calculate the probability using the Swedish mean values. The benefit of this second approach is that any differences in probability due to differing composition of the populations are removed. In other words, if one nationality has a different age structure than another, this would produce differing probabilities even if all coefficients were the same. By forcing all nationalities to have a 'Swedish' composition we allow for comparability between groups with varying structures.[7]

[7] An alternative to remove the composition effect would be to use the means for the entire labor force instead of Swedes. The difference would, however, be rather small since natives totally dominate the labor force.

Table 2. Probabilities of having 15+ sick days in a given year controlling for individual effects and calculated at the mean values for each nationality and imposing Swedish means. 1982—1991 and 1993—2001. Percent.

	1982-1991	1993-2001	1993-2001
	Using Swedish Mean Values	Using Swedish Mean Values	Mean Values of Each Nationality
Sweden	2.7	10.4	10.4
Chile	12.1	15.0	15.6
Czech	8.5	11.1	12.0
Denmark	8.5	12.3	14.1
Ethiopia	6.4	17.5	18.3
Finland	13.2	13.0	15.7
Germany	4.5	8.7	8.7
Greece	19.5	20.6	22.0
Iran	15.7	18.2	16.6
Iraq	34.1	21.0	19.0
Italy	9.6	9.8	10.3
Norway	6.8	11.8	13.8
Poland	13.4	14.8	16.9
Turkey	15.7	21.9	21.3
USA	3.9	10.1	7.9
Vietnam	17.9	8.6	8.7
Yugoslavia	21.0	20.0	21.7

Note: Figures for 1982-1991 from Bengtsson & Scott 2006.

This table clearly shows that there are differences in propensity to use a large number of sick days by nationality in both periods, and that these differences are not due to compositional effects of the type described by the model. Since this study focuses on the situation of the immigrants themselves, rather than the sick leave system and its financing, we will present probabilities using Swedish means in the remainder of this section, as this removes the effects of the composition of a given immigrant population.

Comparing the two periods, we find that nationalities with low and medium probabilities of excessive sick days during the 1980s almost all have higher probabilities during the 1990s. Two countries, Vietnam and Iraq, with very high propensities in the 1980s show the opposite pattern. Overall, the variation across countries was smaller during the 1990s than the decade before. We should, however, be careful when comparing the two periods, given the changes in the sick leave system from 1992. We therefore limit ourselves

to conclude that there are large differentials across countries after controlling for individual characteristics even during the 1990s, with about the same rank as in previous period.

The individual variables vary in effect by nationality, as could be expected, but there are some general patterns that can be identified. The first is an inverse relationship between educational attainment and sickness benefit consumption for different immigrant nationalities, shown in Appendix Table 1.[8] For almost all nationalities, increased educational level has an unambiguous and large effect, leading to fewer reported sick days. Both secondary and university education decrease the probability of incurring excessive sick days, and the magnitude of this decrease increases with educational level. This may be a reflection of several processes, however. The first is that increased educational level may lead to increased job satisfaction, and therefore an incentive to go to work. The second is that increased education may increase the probability of having employment with flexible working hours, which could include the ability to regulate hours individually without reporting in sick. The final reason that education may have a limiting effect on sickness benefits is that education may be a revealed portion of the otherwise unobserved characteristics ability or initiative. In this respect, individuals with a higher educational level may be more motivated and thus less likely to stay home from work. There is also reason to assume that the impact of education has increased in recent years with the abolition of supplementary sickness benefit schemes. Since sickness benefits today account for less that 100 percent of pay, sick days now have a higher absolute cost for those earning higher salaries – a condition which should be positively correlated with education. The other clear effects which applied to all nationalities were the strongly positive effect of sex - women have a much higher likelihood of reporting sick days than men - and the positive effects of

[8] Appendix Table 1 reports only the results of the full model (Model C), but the coefficients remain roughly the same throughout the three models.

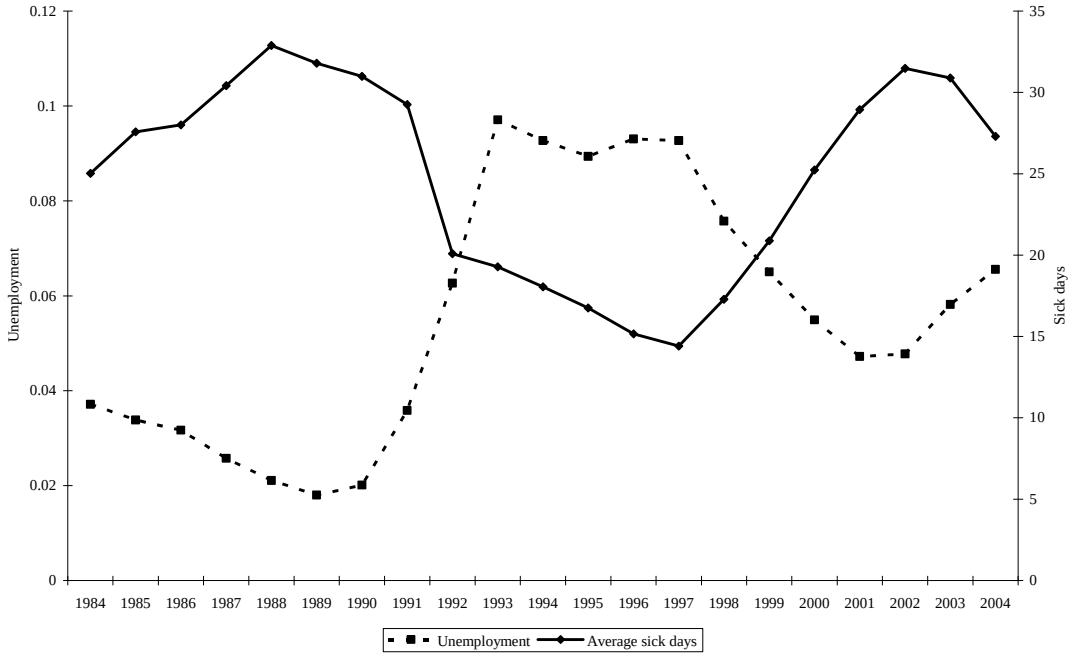
previous sickness / hospitalization on current sickness absence. The gender differences are far stronger during this period than in the 1980s (Bengtsson and Scott 2006).

Now that it has been established that differences in sickness benefit consumption do exist between different nationalities after controlling for individual characteristics, we will take a closer look at various other factors influencing sickness benefit consumption.

In a world where the incidence of sick leave from work is totally dependent upon non-work-related somatic illness, we would expect the rate of sickness benefit consumption to be somewhat constant. There would quite probably be a long-term improvement in public health, but this is measurable in terms of decades or more, and thus beyond the range of this study. Seasonal variations may occur due to varying virulence patterns, and some shocks may cause spikes in consumption due to epidemics, but overall the average level of consumption would be more or less constant.

Figure 2 shows the relationship between unemployment and sickness absence in Sweden, and it clearly shows an inverse relationship between the average number of sick days per worker and the general economic climate in Sweden. Given this relationship, our model is expanded to include variables intended to capture macroeconomic cyclical factors such as the municipal unemployment level, residential location (defined as living in Stockholm, Gothenburg or Malmö or living in smaller towns), and year dummies to account for other temporal effects.

Figure 2. Unemployment and average number of sick days per worker.



Source: Swedish National Insurance Board. Average number of days calculated as total sick days / labor force.

Table 3 shows the gender-specific estimated probabilities of having more than 15 sick days when individual (Model A), macroeconomic (Model B), and workplace specific (Model C) factors are taken into account. The probabilities are calculated at Swedish means, as mentioned above, and we include separate figures for men and women. The first point to note here, as mentioned above, is that the difference in propensity between the sexes is quite large. Another point is that there is still a clear difference between the nationalities, but this difference becomes smaller as additional factors are taken into account.

The addition of macroeconomic information allowing for temporal variation has some impact on sickness benefit propensity, but this impact is limited for most nationalities. The municipal unemployment rate, for instance, has a very small and ambiguous effect on sickness absence, despite the national correlation.

Table 3. Probabilities of having excessive sick days for men controlling for (A) individual level factors, (B) individual and macroeconomic effects and (C) when workplace factors are added, calculated imposing Swedish means. Percent.

	Men			Women			
	A	**B**	**C**	**A**	**B**	**C**	
Sweden	7.5	7.4	7.6	12.4	12.3	12.6	**Sweden**
Chile	10.3	9.4	8.5	16.7	15.5	14.1	**Chile**
Czech.	8.9	8.7	6.8	14.7	14.3	11.3	**Czech.**
Denmark	9.7	9.1	9.4	15.8	14.9	15.3	**Denmark**
Ethiopia	12.3	10.2	9.5	19.7	16.5	15.6	**Ethiopia**
Finland	9.9	9.8	9.1	16.2	15.9	14.9	**Finland**
Germany	6.6	6.1	5.3	11.0	10.2	9.0	**Germany**
Greece	13.7	12.5	10.5	21.7	20.1	17.1	**Greece**
Iran	12.6	10.6	8.8	20.2	17.2	14.5	**Iran**
Iraq	15.3	13.4	11.1	24.1	21.3	18.0	**Iraq**
Italy	7.6	7.4	7.7	12.5	12.3	12.8	**Italy**
Norway	9.3	9.0	8.3	15.2	14.7	13.7	**Norway**
Poland	12.2	11.3	9.0	19.5	18.2	14.8	**Poland**
Turkey	13.3	12.8	11.4	21.2	20.5	18.4	**Turkey**
USA	7.2	7.0	6.2	12.0	11.7	10.4	**USA**
Vietnam	5.0	4.4	3.7	8.5	7.4	6.4	**Vietnam**
Yugoslavia	15.5	14.7	13.3	24.4	23.1	21.1	**Yugoslavia**

Source: SLI. See Appendix Table A1.

Yet another aspect which can influence an individual's sickness absence is found in workplace factors. If an individual is employed at a workplace which is considered unpleasant or an individual has an unfulfilling job then there may exist incentives to stay home from work. To this end we have included workplace factors such as the workplace turnover rate and the growth rate of the workplace to give us some idea of the dynamics of the place of employment. Additional workplace information includes the share of non-Nordic immigrants employed at the workplace, the workplace size and a very rough indication of sector of employment (broken into manufacturing and service sectors). The final variable included in Model C is an attempt to identify 'unfulfilling' employment. We do not have adequate information on occupation in our data, so a proxy had to be found. Using the 1990 census we calculated the mean income for each educational category[9] and sex. These figures

[9] The educational category used is the Swedish 5 digit SUN code. This allows for quite narrow definitions of education.

are then inflated using the consumer price index to obtain mean income levels for each year used in the study. We then created a variable which records an individual's yearly earnings as a percent of the mean wage for all individuals of the same sex and educational level. If we assume that an individual is working within his / her educational field, then we can use this as a rough measure of labour market mismatch. The next assumption necessary is that an individual feels dissatisfaction when the received wage is lower than that of his / her 'peers.' If this is so, and if sickness benefit consumption is partially a function of job dissatisfaction, then this variable should yield significant negative effects.

Looking at this variable for unfulfilling employment (reported as 'deviate' in Appendix Table 1) we see that there is indeed a strong effect of relative income on propensity to report sick days. As relative income increases, the probability to have excessive sick days declines. One point that must be made, however, is that the direction of causality is not completely clear for this variable. One may have a lower income because of a history of illness, implying that the deviation variable is a result, rather than a determinant**.** If income deviation is primarily the result of labour market mismatch then the results point to yet another clear gain to society through improving the economic integration of immigrants.

Immigrants might be employed at workplaces that are not wage discriminating but are unfavourable with regard to work injuries and diseases caused by the workplace environment in general. To the extent that sick leave is due to workplace injuries, it could be said that individuals from different nationalities are selected into occupations which have a high rate of injury. If this is true, then the nationality effect could simply be an occupational effect. Earlier studies have shown that although there are differences in workplace injury between immigrants and natives, these differences are generally quite small. (Bengtsson & Scott 2006; Wadensjö 1996). Given this, it is concluded that the occupational effect, while surely not non-existent, is not a driving force behind the nationality coefficients.

Due to the prevalence of labour immigrants in more physically demanding employment, while other western immigrants have an occupational structure more similar to natives, we would expect these immigrants to have a higher average number of sick days than natives. The results for the labour-sending countries (Greece, Turkey, former Yugoslavia) correspond with *a priori* expectations, while the other Western countries, as expected, display patterns similar to natives. Somewhat surprising, however, are the diverging patterns exhibited by immigrants from refugee-sending countries. It could be expected that trauma from the home country, coupled with less-than-desirable employment situations in Sweden should lead to a greater number of sick days than natives, and possibly even higher than labour migrants.

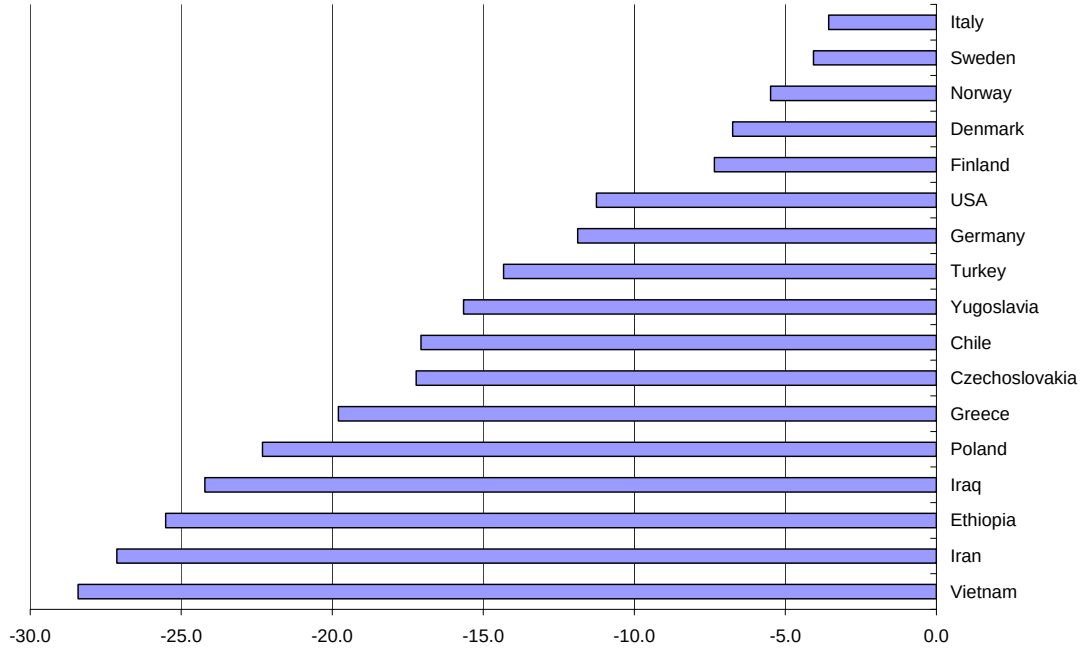
Model C shows that some refugee nationalities are actually closer to the Swedish level than the labour migrants while others display probabilities at about the same level as labour migrants. The only refugee-sending country which absolutely conforms to expectations is Iraq, ranking among those with the highest probabilities of reporting excessive sick days. Given the fact that refugees have shown great difficulty in establishing themselves in the labour market, their sickness benefit pattern may be merely the result of positive self-selection. This is due to the fact that we only examine employed persons in this study, and there is reason to suspect that refugees who obtain employment are more positively selected than native employees, which might well explain the very low level of sick leave for the Vietnamese.

Workplace size tends to have a positive effect on workplace absence, and this positive effect is most obvious at for workplaces with 21 or more employees. This is quite likely an effect of social control mechanisms, which are strongest in small workplaces. As workplace size increases, it becomes easier for employees to report in sick without attracting attention. This could also, however, be a result of the fact that large workplaces tend to dominate

industrial production, and thus the workplace size could be highly correlated with types of employment characterised by high rates of sickness absence. This effect is partially captured in our variable for sector of employment, where it is clear that the manufacturing sector has a much higher rate of sickness absence than the service sector.

Table 3 makes it quite clear that both cyclical and especially workplace factors are important for an understanding of differences in workplace absence between nationalities. Figure 3 attempts to illustrate the importance of these factors.

Figure 3. Percentage change in probability to consume excessive sick days between Model A (individual characteristics only) and Model C (full model). Calculated at Swedish means.



Here we see the percentage decrease in the probability of incurring excessive sick days in a given year when these new factors are included. Comparing models A and C we can see that all nationalities have a decrease in propensity when the cyclical and workplace factors are included. For some nationalities the decreases are over 20 percent.

5. Conclusion

This study shows that there exist differences in sickness benefit consumption between natives and various immigrant groups in the period 1993 to 2004, that the differences are in some cases large, and, that they remain after controlling for the standard human capital and time effects. In this respect the situation is similar to that during the 1980s, though the differences between workers from different countries are smaller.

The effects of education are indeed strong - higher educational levels are correlated with fewer days of sick leave - and similar for all nationalities. The differences between men and women are much stronger in the 1990s than during the 1980s. A very interesting result is the effect yielded by the variable for relative income within an educational category. This variable shows a significant and negative effect, which is interpreted as showing that individuals who earn less than others with the same educational level and course of study have a higher likelihood to report sick days. This is seen as evidence that a portion of sickness benefit consumption may actually be the result of labour market mismatch and discontent, and not merely somatic illness.

The results concerning sick leave in this study are similar, but not identical, to findings regarding immigrant employment and income development (Scott 1999, Rosholm, Scott, & Husted 2001, Ekberg & Gustafsson 1995, Rooth 1999, Bevelander & Nielsen 2001). The difference is mainly that refugees coming after 1985 show a larger divergence than the established immigrant groups concerning sickness benefits, but are at the bottom of the employment and income assimilation studies. We can speculate that this is because of two factors. The first is that the established immigrant groups have shown a tendency to be employed in traditional, monotonous industrial occupations abandoned by natives during the 1960s. The second factor is that those refugees who have found employment in the face of

labour market obstacles are most likely a positively selected group, and thus perhaps more motivated to attend work, a fact which may bring down the average number of sick days for the group.

Thus, the most important factors in identifying the propensity to consume a large number of sick days are birth country and educational level, and in that order. Workplace factors and the general economic situation are important too, but less so than birth country. While the gap between various immigrant groups and native Swedes are much smaller after taking individual human capital characteristics, workplace factors, and various macro-economic factors into account, they still remain large.

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Appendix Tables.

Table A.1 *Random effects logit, Dependent variable > 15 sick days / year. 1993 – 2001.*

	Sweden	Chile	Czecho-slovakia	Denmark	Ethiopia	Finland	Germany	Greece
Secondary Edu	-0.121**	-0.167**	0.128	-0.074	-0.131	-0.071	0.273*	-0.008
University Edu	-0.662**	-0.525**	-0.227	-0.625**	-0.374**	-0.708**	-0.501**	-0.550**
Sex	0.528**	0.744**	0.584**	0.398**	0.634**	0.568**	0.703**	0.937**
Metro Area	0.029	-0.052	0.057	-0.133	0.256**	0.053	-0.086	0.108
Age	-0.067**	-0.023	-0.056	-0.029	-0.081*	0.002	-0.058	-0.049
Age^2	0.001**	0.001*	0.001	0.001	0.001**	0.000	0.001*	0.001*
Married	-0.070**	-0.044	0.112	0.105	-0.120	-0.009	-0.128	0.143
Number Children	0.023**	0.004	-0.032	0.033	-0.022	0.002	0.002	-0.089*
Income Deviation	-1.053**	-1.120**	-0.612**	-1.194**	-0.786**	-1.422**	-0.365*	-0.325*
Sick Days t-1	0.019**	0.018**	0.024**	0.019**	0.017**	0.019**	0.021**	0.019**
YSM		-0.025	0.010	-0.003	0.026	0.011	-0.010	0.009
YSM^2		0.000	0.000	0.000	-0.001*	0.000	0.000	0.000
Hopitalization 1 - 5 Days t-1	0.307**	0.398**	0.093	0.323**	0.341**	0.154*	0.240	0.539**
Hopitalization 6 + Days t-1	0.744**	0.422**	0.301	0.389*	0.446**	0.795**	1.093**	0.214
Unemp Rate	0.001	-0.019	0.025	-0.019	0.009	0.018	0.008	-0.036
Workplace Turnover	0.256**	0.271	-0.365	-0.209	0.142	0.060	0.580**	0.184
Workplace Growth	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Share Immigrants	0.855**	0.352**	1.096**	1.141**	0.447**	-0.132	0.787**	0.647**
Sector	-0.154**	-0.327**	-0.172	-0.314**	-0.155	-0.417**	-0.290**	-0.220*
11-20 Employees	0.264**	0.445**	0.349	0.859**	0.348	-0.026	0.292	0.163
21 + Employees	0.413**	0.479**	0.624**	1.062**	0.375**	0.026	0.415**	0.396**
yr1994	0.098	0.115	-0.035	-0.031	-0.132	0.151	0.043	0.045
yr1995	-0.002	-0.073	-0.081	0.098	-0.134	0.045	0.128	0.013
yr1996	-0.178	-0.240	-0.425	-0.110	-0.233	-0.070	-0.099	-0.283
yr1997	-0.587	-0.838	-0.781	-0.595	-0.676	-0.556	-0.691	-0.596
yr1998	-0.026	-0.202	-0.377	-0.212	-0.032	0.147	-0.019	-0.208
yr1999	0.313	0.067	0.026	0.364	0.173	0.359	0.422	0.089
yr2000	0.518	0.173	0.042	0.553	0.258	0.522	0.646	0.146
yr2001	0.630	0.335	0.162	0.338	0.433	0.780	0.711	0.111
_cons	-0.448	-0.865	-2.063	-1.266	-0.293	-1.124	-2.230	-1.891
/lnsig2u	0.241	0.214	0.382	0.245	0.198	0.181	0.559	0.532
sigma_u	1.128	1.113	1.211	1.130	1.104	1.095	1.322	1.304
rho	0.279	0.274	0.308	0.280	0.270	0.267	0.347	0.341

* - 10% ** - 5%. Significance levels not given for year dummies or constant.

Table A.1 (cont) *Random effects logit - full model, Dependent variable > 15 sick days / year. 1993 – 2001.*

	Iran	Iraq	Italy	Norway	Poland	Turkey	USA	Vietnam	Yugo-slavia
Secondary Edu	-0.217	-0.279*	-0.222	0.187	0.072	0.010	0.061	0.372**	-0.134*
University Edu	-0.714**	-0.963**	-0.827**	-0.507**	-0.384**	-0.578**	-0.444	-0.114	-0.465**
Sex	0.821**	0.734**	0.393**	0.590**	0.490**	1.046**	0.703**	0.940**	0.503**
Metro Area	0.106	0.215	-0.266	-0.119	-0.006	-0.131*	0.118	0.231*	0.136**
Age	0.065	-0.098	-0.080	0.023	-0.050	-0.004	0.014	-0.069	-0.006
Age^2	0.000	0.001*	0.001	0.000	0.001**	0.000	0.000	0.001*	0.000
Married	-0.131	-0.236*	-0.201	-0.042	-0.095	0.177**	0.071	0.237**	-0.119*
Number Children	0.027	0.029	0.182**	0.021	-0.023	-0.014	-0.041	0.086**	-0.021
Income Deviation	-0.560**	-1.283**	-0.943**	-0.958**	-0.703**	-1.015**	-0.328	-1.745**	-0.915**
Sick Days t-1	0.017**	0.018**	0.020**	0.020**	0.019**	0.015**	0.014**	0.019**	0.019**
YSM	0.003	0.021	0.013	0.015	0.019	0.024	0.050*	0.028	0.036**
YSM^2	-0.001	0.000	0.000	-0.001	-0.001	0.000	-0.001	-0.002	-0.001**
Hopitalization 1 - 5 Days t-1	0.230*	0.129	0.254	0.356**	0.296**	0.317**	0.850**	0.121	0.495**
Hopitalization 6 + Days t-1	0.619**	0.504	0.948**	0.542**	0.785**	0.604**	1.454**	0.000	0.670**
Unemp Rate	-0.007	0.033	-0.001	0.001	-0.017	-0.030	0.039	0.027	-0.019
Workplace Turnover	0.120	-0.199	0.436	-0.069	0.169	0.271*	-0.118	0.639**	0.388**
Workplace Growth	0.000	0.000	0.000*	0.000	0.000**	0.000	0.000	0.000	0.000
Share Immigrants	1.092**	0.826**	-0.089	1.274*	0.858**	0.461**	0.225	-0.257	0.628**
Sector	-0.264**	-0.554**	-0.147	-0.477**	-0.235**	-0.358**	-0.159	-0.684**	-0.211**
11-20 Employees	0.422**	0.951**	0.120	-0.090	0.099	0.180	0.037	0.525*	0.311**
21 + Employees	0.668**	1.280**	0.246	0.591*	0.394**	0.640**	-0.013	1.181**	0.613**
yr1994	0.334	0.051	-0.107	0.097	0.100	0.293	-0.106	0.378	0.161
yr1995	0.085	-0.359	-0.112	-0.136	-0.034	-0.069	-0.397	0.199	0.166
yr1996	-0.234	-0.381	-0.108	-0.082	-0.429	-0.138	-0.674	0.224	-0.089
yr1997	-0.730	-1.048	-1.050	-0.297	-0.908	-0.531	-0.931	-0.268	-0.705
yr1998	-0.041	-0.028	-0.354	0.352	-0.443	-0.104	-0.502	0.367	0.025
yr1999	0.232	-0.198	-0.485	0.523	0.076	0.076	-0.447	0.654	0.204
yr2000	0.229	0.323	0.216	0.527	0.102	0.222	0.093	0.878	0.314
yr2001	0.537	0.369	0.158	0.419	0.238	0.204	0.129	0.847	0.417
_cons	-3.954	0.156	-0.477	-2.664	-1.318	-1.875	-3.206	-1.743	-2.065
/lnsig2u	0.445	0.531	0.523	0.468	0.471	0.323	0.340	0.247	0.516
sigma_u	1.249	1.304	1.299	1.264	1.265	1.176	1.185	1.132	1.294
rho	0.322	0.341	0.339	0.327	0.327	0.296	0.299	0.280	0.337

Table A.2 *Means. 1993 – 2001.*

	Sweden	Chile	Czecho-slovakia	Denmark	Ethiopia	Finland	Germany	Greece
Num Sick Days	7.64	11.28	9.45	10.00	11.84	10.53	7.55	20.62
Share >= 1 Day	0.17	0.21	0.18	0.20	0.23	0.20	0.15	0.27
Primary Edu	0.20	0.30	0.07	0.33	0.32	0.35	0.15	0.44
Secondary Edu	0.40	0.36	0.23	0.34	0.31	0.36	0.30	0.27
University Edu	0.40	0.34	0.69	0.31	0.37	0.28	0.54	0.26
Sex	0.56	0.46	0.59	0.54	0.43	0.62	0.50	0.36
Metro Area	0.46	0.71	0.54	0.38	0.76	0.52	0.50	0.70
Age	41.54	42.43	45.41	43.98	40.41	44.13	45.55	41.48
Married	0.46	0.54	0.65	0.55	0.47	0.49	0.59	0.74
Number Children	0.90	0.91	0.62	0.75	1.08	0.78	0.68	1.03
Income Deviation	1.16	1.13	1.09	1.15	1.09	1.16	1.12	1.13
Sick Days t-1	6.27	8.74	7.47	7.87	8.34	8.31	5.77	13.38
YSM		14.57	20.22	19.89	14.50	20.71	19.89	18.95
Hopitalization 0 Days t-1	0.93	0.93	0.95	0.92	0.93	0.93	0.94	0.95
Hopitalization 1 - 5 Days t-1	0.05	0.06	0.04	0.05	0.05	0.05	0.04	0.04
Hopitalization 6 + Days t-1	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02
Unemp Rate	6.08	5.45	6.33	6.20	5.28	6.06	5.97	5.71
Workplace Turnover	0.19	0.22	0.19	0.18	0.24	0.19	0.18	0.22
Workplace Growth	27.78	20.18	16.36	22.28	65.56	26.11	22.28	23.44
Share Immigrants	0.08	0.22	0.18	0.09	0.24	0.10	0.19	0.36
Sector	0.70	0.69	0.71	0.57	0.81	0.59	0.71	0.72
1-10 Employees	0.04	0.08	0.16	0.04	0.07	0.03	0.23	0.26
11-20 Employees	0.07	0.09	0.09	0.06	0.05	0.06	0.11	0.10
21 + Employees	0.89	0.83	0.74	0.90	0.88	0.91	0.66	0.65
yr1993	0.10	0.10	0.12	0.11	0.08	0.11	0.11	0.11
yr1994	0.10	0.10	0.11	0.11	0.08	0.11	0.11	0.11
yr1995	0.11	0.10	0.12	0.11	0.09	0.11	0.11	0.10
yr1996	0.11	0.10	0.12	0.11	0.10	0.11	0.11	0.10
yr1997	0.11	0.11	0.11	0.11	0.10	0.11	0.11	0.11
yr1998	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
yr1999	0.12	0.12	0.11	0.11	0.12	0.11	0.11	0.11
yr2000	0.12	0.13	0.10	0.11	0.14	0.11	0.11	0.12
yr2001	0.12	0.14	0.10	0.11	0.16	0.11	0.11	0.12

Table A.2 (cont) *Means. 1993 – 2001.*

	Iran	Iraq	Italy	Norway	Poland	Turkey	USA	Vietnam	Yugo-slavia
Num Sick Days	12.18	14.92	8.50	10.33	12.69	17.12	5.69	6.57	17.13
Share >= 1 Day	0.22	0.24	0.17	0.20	0.22	0.25	0.12	0.15	0.26
Primary Edu	0.12	0.22	0.33	0.30	0.11	0.48	0.08	0.60	0.35
Secondary Edu	0.19	0.29	0.29	0.37	0.33	0.28	0.14	0.26	0.32
University Edu	0.69	0.48	0.36	0.32	0.56	0.22	0.77	0.12	0.32
Sex	0.43	0.34	0.32	0.60	0.63	0.37	0.47	0.42	0.45
Metro Area	0.66	0.66	0.66	0.40	0.68	0.78	0.61	0.28	0.55
Age	43.08	42.09	45.25	44.09	44.23	39.12	42.36	38.79	42.17
Married	0.64	0.73	0.64	0.52	0.63	0.76	0.62	0.64	0.68
Number Children	0.93	1.47	0.80	0.77	0.72	1.62	0.96	1.19	0.95
Income Deviation	1.07	1.09	1.15	1.13	1.07	1.10	1.06	1.16	1.17
Sick Days t-1	8.99	12.27	6.46	7.96	10.52	13.06	5.17	5.21	12.68
YSM	13.93	13.54	19.59	17.80	17.18	18.41	18.45	14.17	18.28
Hopitalization 0 Days t-1	0.92	0.93	0.94	0.92	0.94	0.93	0.94	0.94	0.94
Hopitalization 1 - 5 Days t-1	0.06	0.05	0.04	0.06	0.04	0.05	0.05	0.05	0.04
Hopitalization 6 + Days t-1	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Unemp Rate	5.44	5.54	6.04	6.28	6.26	5.64	5.90	5.93	6.53
Workplace Turnover	0.22	0.21	0.20	0.19	0.20	0.22	0.19	0.16	0.19
Workplace Growth	27.55	28.54	17.68	26.93	23.22	22.36	28.75	20.89	21.69
Share Immigrants	0.23	0.27	0.25	0.08	0.21	0.34	0.20	0.25	0.24
Sector	0.77	0.64	0.70	0.63	0.70	0.72	0.81	0.21	0.49
1-10 Employees	0.14	0.13	0.23	0.03	0.17	0.21	0.21	0.09	0.13
11-20 Employees	0.08	0.08	0.11	0.05	0.09	0.08	0.11	0.06	0.07
21 + Employees	0.78	0.78	0.65	0.92	0.74	0.70	0.69	0.85	0.80
yr1993	0.09	0.08	0.11	0.12	0.10	0.09	0.11	0.08	0.11
yr1994	0.09	0.08	0.11	0.12	0.10	0.09	0.11	0.08	0.11
yr1995	0.09	0.09	0.11	0.12	0.11	0.09	0.12	0.09	0.11
yr1996	0.10	0.09	0.11	0.11	0.11	0.10	0.12	0.10	0.11
yr1997	0.10	0.10	0.11	0.11	0.11	0.10	0.12	0.11	0.11
yr1998	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.12	0.11
yr1999	0.12	0.12	0.11	0.11	0.12	0.12	0.11	0.13	0.11
yr2000	0.14	0.14	0.11	0.10	0.12	0.14	0.11	0.14	0.12
yr2001	0.16	0.18	0.11	0.11	0.12	0.16	0.11	0.15	0.13