

**Earnings, Occupation and Schooling Decisions of
Immigrants with Medical Degrees:
Evidence for Canada and the US**

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ABSTRACT

Both Canada and the United States are increasingly reliant on immigrant physicians for the provision of primary care and specialist health services, particularly in more rural regions. However immigrant physicians who obtained their medical training elsewhere face a costly and time consuming process to be licensed to practice medicine in the host country. Furthermore, key differences between Canadian and US immigration policy for skilled immigrants may mean that internationally-educated physicians migrating to Canada are less likely to become licensed to practice medicine. In this paper, we analyze the earnings, occupations and post-migration schooling decisions of immigrants with medical degrees using the 2000 United States Census and the 2001 Canadian Census. In both countries, recent immigrants with medical degrees are at a significant earned income disadvantage relative to the native born with medical degrees while immigrants from earlier arrival cohorts are at an earnings advantage relative to the native born. In Canada, immigrants with foreign medical degrees are much less likely to be employed as physicians than either the Canadian born or immigrants with Canadian medical degrees. Recent immigrants with medical degrees are more likely to be studying either full-time or part-time than are the Canadian born or other immigrants with medical degrees and this is true whether or not the individual is employed as a physician. The same is not true based on the US analysis of individuals working as physicians. This difference may be a result of the different immigrant selection systems for skilled workers and professionals. The design of the Canadian points system creates a greater risk of selecting immigrants with medical degrees who are unable to find work as physicians in Canada relative to the United States.

1. Introduction

In countries like Canada and the United States, immigration policy has a significant impact on the supply of workers in different occupations. While considerable research has occurred on the overall performance of different groups of immigrants arriving in each of these two countries, considerably less research has been carried out at the occupation level where unique challenges may exist in terms of the successful integration of immigrants into employment suitable given their skills and qualifications. The medical profession is an important example of an occupation in which significant hurdles often must be overcome before an immigrant with a foreign medical degree receives permission to work as a physician.

The nature of medical training varies across countries and this lack of standardization means that many immigrants may come to either the United States or Canada and then be disappointed to learn that they are not considered qualified to work as a physician. In both countries, holders of medical degrees from other countries must go through an expensive and time-consuming process of examinations, medical residencies in Canadian or US hospitals, and licensing procedures before they are licensed to practice medicine. Given these costs as well as the costs associated with leaving their new country, immigrants may choose instead

to accept alternative employment rather than enter a medical program to obtain the credentials necessary to work as a physician.

In this paper, we investigate the earnings outcomes of immigrants employed as physicians in both Canada and the United States. Since we are able to identify immigrants with medical degrees who are not employed as physicians in the Canadian Census data, we investigate the occupational outcomes of immigrants with medical degrees in Canada in order to identify which group of immigrants with medical degrees are most likely to be employed in alternative occupations. Finally, we analyze the post-migration schooling decisions of immigrants with medical degrees, both those employed as physicians (for the case of Canada and the United States) and for all immigrants with medical degrees irrespective of whether they are employed as physicians (only for the case of Canada). The goal of this part of the analysis is to identify whether immigrants with medical degrees are returning to school after arrival in the receiving country in order to upgrade either their skills or their credentials.

A number of studies have analyzed the labour market outcomes of immigrants with medical degrees for both the US and Canada. A study that is particularly relevant for our analysis is Boyd and Schellenberg (2007) who analyzed data from the 2001 Census of Canada and investigated the extent to which internationally-educated physicians and engineers are not employed in their chosen profession, relative to those trained in Canada. The foreign-born doctor's birthplace is the most important determinate of the probability of working as a doctor. They find under-employment to be most common for foreign-trained immigrant doctors born in Southeast Asia and East Asia while those from Eastern Europe and South Asian countries are the most likely to be employed as doctors in Canada.

Another study that is also relevant is that of Szafran, Crutcher, Banner and Watanabe (2005) who carried out a small scale survey of the educational levels of individuals who received their educational training outside of Canada but subsequently applied to the Canadian Resident Matching Service for postgraduate training. Immigrants within this group were more likely to cite the presence of barriers to training and licensing barriers to practice as having been important.

Grant and Oertel (1997) argue that a long queue exists of foreign-trained physicians seeking entry into Canada representing an important source of medical human capital. However, they make the case that barriers have been set up by the provincial medical licensing boards that are similar to a protective tariff, limiting the country's access to lower cost supply of physician's services.

In a recent paper, Phillips et al. (2007) examine administrative data from the American Medical Association, the Canadian Medical Association and other sources to document the extent to which Canadian-educated physicians are working in the US and US-educated physicians are working in Canada. They find that while only 408 US-educated physicians were working in direct patient care in Canada in 2004, 8162 Canadian-educated physicians were working in direct patient care in the US in 2006, and close to 70% of these were specialists. Canadian-educated specialists in the US represent 19% of the Canadian specialist workforce, while Canadian-educated primary care physicians in the US represent 8% of the Canadian general practitioner workforce. Overall, 1 in 9 of Canadian educated physicians are practicing in the US; after excluding US-born physicians educated in Canada, still 1 in 12 are practicing in the US. They conclude that physician emigration to the US is in fact an important contributing factor to the shortage of physicians in Canada.

A significant US literature exists on physicians' remuneration (see, for example, Bashaw and Heywood, 2001). However, there appears to be a dearth of literature explicitly on the labour market outcomes of foreign-born physicians in the US. An exception is a report by the United States Government Accountability Office (2006). The report provides statistics on use of visas for foreign physicians intended to alleviate physician shortages in the US.

This study contributes to the existing literature by presenting new econometric results on the success of immigrants with medical degrees at having their credentials recognized and remunerated in Canada and the United States. In section 2, policy differences between Canada and the United States are described in terms of how these differences may impact upon the earnings and probability of working as a physician for immigrants with medical degrees. In section 3, the Census micro data files are described. The sample restrictions are outlined and a number of key summary statistics are presented. The results of the Logit and OLS regression estimation are presented and interpreted in section 4. Section 5 contains concluding remarks and discussion of ongoing and future work by the authors.

2. Relevant Policy Differences between Canada and the United States

Before comparing the labour market outcomes of immigrants with medical degrees in both Canada and the United States, it is important to have an understanding of the relevant policy environments in each country. Three main types of policies are relevant to this question. First, public policy towards access to health services and health insurance differ considerably between the two countries. In the United States, provision is mixed between a large private health care system along with some government provision. Medical insurance is primarily provided through the private sector with an important role of provision of medical services managed through the medicare system for individuals over the age of 65. In contrast,

Canadian healthcare is primarily provided through government-run hospitals and physician payment schemes. Health insurance is universal and limits are placed on the ability of physicians to determine their own compensation or bill in excess of the government regulated fees for service system. However, it is important to note that variation exists across provinces since health care is a provincial jurisdiction under the Canadian constitution. Transfers from the federal government to the provinces to help pay for health care are at least partly conditional on the provinces following the same set of core principles (as stipulated by the Canadian Health Act) in the delivery of health care. However, there are differences across the provinces along at least some dimensions of the way in which these services are provided.

A large literature exists that compares the health outcomes of Canadians and Americans in order to try to identify the impacts of the different systems of health care provision. Lasser, Himmelstein and Woolhandler (2006) compare the health status, access to care, and utilization of medical services in the United States and Canada using data taken from the joint Canada/US Survey of Health. US respondents (compared with Canadians) are found to be less likely to have a regular doctor, more likely to have unmet health needs, and more likely to forgo needed medicines. Both countries are found to have disparities based on race, income, and immigrant status but these were more extreme in the case of the US. The authors conclude that residents of the United States are less able to access care than are Canadians and that the universal coverage available in Canada appears to reduce most disparities in access to care.

A second relevant policy dimension relates to the recognition of foreign medical training. Lesky (this volume) comprehensively reviews the expensive, time-consuming and complex processes required for foreign-trained medical professionals to work as physicians in both Canada and the United States (see also McMahon, 2004, and Boyd and Schellenberg, 2007). In both countries, there is strong evidence that these administrative hurdles make it

difficult for individuals with foreign medical training to receive licences to practice as physicians. Shafqat and Zaidi (2005) argue that the large scale influx of foreign medical graduates into western, developed countries has been present for decades. However, they argue that both the process of having foreign educational credentials recognized and the finding of employment as physicians have become much more difficult in countries like the US and Canada. McMahon (2004) describes the situation in the US with regard to the reliance on foreign-trained physicians. International medical graduates are reported to account for one quarter of the physicians in the United States, which represents an increase of 160 percent since 1975. McMahon argues that there is an ever-increasing dependence on international medical graduates on the part of the US health care industry.

In spite of this, many urban and rural communities continue to have shortages of physicians. Micka, Leeb and Wodchisc (2000) study US administrative data to see whether international medical graduates (IMGs) are more likely than US medical graduates (USMGs) to be found in areas with high need or medical under-service. They find that consistently more states have IMG disproportions than USMG disproportions with the magnitude of these effects being larger for IMGs. They also find that IMGs are more likely to be found in states with a high number of physicians relative to USMGs. Statistics are presented on the number of foreign-trained doctors in the US and the number of IMG residents. The former group grew dramatically over the period 1950 through 1996 at a much faster rate than did the latter group. They report that in 1996, 23.4 percent of the active post-resident physician workforce was foreign-trained. They conclude that the majority of IMGs (as is the case for USMGs) have located in non-needy counties. (See Benarroch and Grant, 2004, and Dostie and Leger, 2009 for related research on the internal migration of physicians in Canada.)

The key immigration policy difference for our analysis relates to the different selection processes in Canada and the United States related to the admission of skilled immigrants. Many foreign-born individuals wishing to work as physicians in the United States would enter the country on an H1b "professional worker" visas, and these visas require the applicant to have: 1) already passed step 3 of the United States Medical Licensing Examination, 2) to have an offer of a training position already in place, and 3) to already have a temporary state medical license. In contrast, the Canadian immigrant selection (points) system for skilled workers and professionals does not place the same professional requirements on applicants wishing to immigrate to Canada. While significant barriers exist to acquiring a medical license for individuals with foreign medical degrees, an individual with a medical degree and good language ability in either English or French stands a good chance of satisfying the points requirements for admission based mainly on his/her high level of formal education. Even if the person's educational credentials do not allow him/her to work as a physician in Canada, the system is designed to admit the person based on the high level of human capital that the applicant is deemed to possess.

3. The Data and Estimation Sample

The data used in the estimation come from the 2001 Canadian Census confidential Master file and the 2000 United States public use five percent file. The Canadian data were accessed through the University of New Brunswick Research Data Centre and are drawn from the 20 percent file. The age range in the analysis of both the Canadian and the US data is restricted to individuals age 29 to 65. One strength of the Canadian Census data is that the field of study is available as well as the level of education attained, allowing us to identify with some precision those individuals who have obtained a medical degree.

While the US Census data permit much larger sample sizes, there is no data on field of study so that medical degree holders cannot be identified separately from other higher degree holders. Although most people working as a physician in the US report a Professional degree as their highest degree (86.6 percent of the native born and 85.8 percent of the foreign born physicians), another 8.3 and 10.5 percent of the native born and the foreign born physicians report a doctorate degree as their highest degree. Of course, it is possible that someone who reports a doctorate as their highest degree may also have a professional degree. The remaining four percent of the native born and foreign born physicians either had a Master's degree or Bachelor's degree as their highest degree.¹ Although people with a Bachelor's degree may be currently working as a physician while completing their medical degree, only 7.6 percent of people with Bachelor's as their highest degree reported being currently in school.

We restrict the Canadian sample to include only individuals who have at least a medical degree (regardless of occupation), while we restrict the US sample to include only individuals employed as physicians or medical specialists. Using the Canadian data, we can estimate the determinants of working as a physician, being a student, and the level of earnings conditional on having a medical degree. For the US, we can estimate the determinants of being a student and the level of earnings conditional on working as a physician. We also carry out a parallel analysis using the Canadian Census data on the sub-sample of individuals employed as medical doctors, for comparative purposes.

In both the Canadian and the American analyses, immigrants who arrived at age 29 or older are assumed to have received their medical degree outside of the receiving country. Immigrants who arrived in their new country at the age of 18 or younger are assumed to have

¹ A small number of people in the US sample report working as a physician but state that they have less than a Bachelor's degree. While this may be due to reporting errors, it is possible for medical students to enter medical school without completing a Bachelor's degree. In any event, omitting these observations has no effect on the results.

received their medical degree at a university in the receiving country. The remaining group of immigrants who arrived between the ages of 18 and 29, are referred to as the ‘MD degree indeterminate’ group since it is unclear whether these individual immigrants are likely to have received their training within the receiving country or not. A similar approach is used in Boyd and Schellenberg (2007). Unfortunately, individuals who study in the US or Canada, return to their home countries (as would be required on a J-class visa in the US) and then migrate to the US or Canada will be classified as having obtained their medical credentials in another country.

In addition, it is possible to identify temporary residents in the 2001 Canadian Census. These individuals are typically in Canada on either temporary work permits or temporary student visas. As part of the analysis, the population of individuals within Canada who have a medical degree are divided into three groups: 1) the Canadian born, 2) immigrants, and 3) temporary residents. Since the Census data do not contain the year of entry into Canada for temporary residents, we are unable to distinguish between temporary residents who received their medical training in Canada versus temporary residents who received their medical training outside of Canada.

Table 1 contains sample means of labour force status, occupation, and student status for individuals in the 2001 Canadian Census who hold a medical degree. There is generally a high rate of employment as a physician for those individuals who received their medical degrees in Canada - 87.6 percent for the Canadian born and 85.8 percent for the foreign born. Canadian-born individuals with Canadian medical degrees² have a very low unemployment rate at 0.5 percent and a very low rate of non-participation in the labour force at 3.8 percent. Foreign-born individuals with Canadian medical degrees have

² In the analysis of both the Canadian Census data and the US Census data, it is assumed that education of the native-born is obtained in their country of birth.

somewhat higher rates of unemployment (1.1 percent) and of non-participation (4.8 percent).

However, these statistics change considerably once the focus is placed on the foreign born with foreign medical degrees. For example, the rate of employment as a physician falls to 42 percent for all foreign born, 25.4 percent for permanent residents and 51.3 percent for naturalized Canadians. The unemployment rate and non-participation rates are 13.9 percent and 28.9 percent, respectively, for permanent residents. This is strong preliminary evidence that difficulties with recognition of international medical degrees have a significant impact on the ability to work as a doctor in Canada for the foreign born with international medical degrees.

The statistics for the 'location uncertain group' generally fall between the statistics of the individuals with medical degrees obtained in Canada and those with international medical degrees. For example, the group of all foreign born within the location uncertain group have a rate of employment as a physician of 68.3 percent while the permanent residents within the location uncertain group have a rate of employment as a physician of 37.1 percent. The equivalent statistics for naturalized Canadians and temporary residents are 74.3 percent and 55.2 percent.³

Within this location uncertain group, the unemployment rate for the permanent residents is 8.6 percent and the rate of non-participation is 24.6 percent. For naturalized Canadians, the unemployment rates and non-participations rates are generally closer to those of the Canadian born; however, important differences remain. For temporary residents, the unemployment rates and non-participation rates are close to those of the permanent residents for whom the location of training is uncertain, at 4.6 percent unemployment and 27.9 percent non-participation.

³ Permanent residents typically have lower years of residence in Canada than do naturalized Canadians given that immigrants cannot immediately apply for citizenship and will be more likely to choose Canadian citizens the longer they have lived in Canada.

The high rate of non-participation of temporary residents is driven by the high rates of being either a full-time or a part-time student, at 30.1 percent and 4.9 percent respectively. Permanent residents whose medical training occurred outside of Canada also have relatively high rates of being a student at 12 and 9.9 percent respectively. Similar results are found for the permanent residents with uncertain location of their medical training.

In Table 2, the regional distribution of individuals with medical degrees is presented by immigrant status. In the upper panel, statistics are presented based on the Canadian data by immigrant status and whether the person is working as a medical doctor (MD). When immigrants and the Canadian born are compared, we see that immigrants working as a physician are more likely to reside in Ontario and in British Columbia relative to the native born. However, among individuals not working as a physician, immigrants are much more likely to reside in Ontario (56.5 percent) than are the native born (34.7 percent). In terms of the distribution across Canada's major cities, immigrants not working as a physician are concentrated in Toronto (40.7 percent) and this concentration is greater than is the case for the native born not working as a physician (15.8 percent). Similarly, immigrants with medical degrees are overly represented in larger Census Metropolitan Areas (CMAs) and this is especially true for those not employed as medical doctors.

In the lower panel of Table 2, equivalent statistics are presented based on the US Census data for the case of individuals currently employed as physicians. As was the case for Canada, considerable variation exists across the US regions for both the native born and the foreign born. In contrast to the Canadian case, the differences between the immigrant and American-born differences in the distributions are small with the exception of the Middle Atlantic region where immigrant doctors are more concentrated relative to

the American-born doctors. Greater foreign-born/American-born differences are present in the distributions across the major cities. Relatively more foreign-born doctors are present in New York (16.5 percent), Los Angeles (7 percent) and Chicago (5.6 percent) compared to the American-born doctors (7, 3.5 and 3 percent, respectively).

In Table 3, sample statistics related to earned income and hours of work are presented by immigrant status for individuals employed as physicians in Canada and the US.⁴ In Canada, immigrants working as doctors have approximately \$10,000 lower average earnings than do the Canadian born working as doctors.⁵ Although immigrant doctors in the US earn more than immigrant doctors in Canada, immigrant doctors in the US experience a larger income penalty relative to the American-born doctors with mean earned income of \$141,273 compared to \$161,037 for the case of the American born. The median values of earned income show similar overall patterns; however, in each case, the median is roughly \$40,000 less than the relevant mean in the US and around \$25,000 in Canada.

In Table 4, mean characteristics are presented for immigrants with medical degrees in Canada and for immigrants working as physicians in the US. In both columns for Canada, we see a fairly even distribution across source country regions. By comparing the sample means for the same source regions across the two columns, we can gain a sense of the rate (by source country region) at which immigrants with medical degrees are working in Canada as doctors. For example, 5.7 percent of immigrants with medical degrees who are working as doctors were born in the US while only 2.7 percent of immigrants with medical degrees who are not working as doctors were born in the US. An even larger discrepancy can be seen for immigrants from the UK, Australia and New Zealand – 19

⁴ In both the Canadian and the American data, an individuals' earned income is defined to be the sum of earnings from wages and salaries as well as earnings from self-employment. This is to ensure that earnings from medical work that may be taken as self-employment are not excluded.

⁵ Earned income is in 1999 US dollars.

percent of immigrants who have medical degrees and are working as doctors originate from these countries while only 5.1 percent of immigrants with medical degrees but not working as doctors come from these countries. Similarly, immigrants from South Africa, Western Europe and the developed countries of East Asia are also relatively more likely to be working as doctors. In contrast, immigrants with medical degrees from Eastern Europe, Western Asia and the Middle East, and less developed countries in East Asia have especially high rates of not working as doctors.

Also from Table 4, we see that permanent residents with medical degrees have especially high rates of not working as doctors. In addition, there is a clear relationship between period of arrival and the rate of working as a doctor. For example, 5.9 percent of immigrants working as doctors are in the 1997-2001 arrival cohort while 37.1 percent of immigrants with medical degrees not working as a doctor arrived over that period. In contrast, 21.2 percent of immigrants with medical degrees who are working as doctors arrived between 1972 and 1976 while only 5.6 percent of the immigrants with medical degrees from this arrival cohort are not working as doctors. Finally, a strong relationship is apparent between working as a doctor and having received one's medical training in Canada.

For immigrants working as physicians in the US, the last column in Table 4 indicates that fully one quarter (25.3%) of immigrant physicians are from South Asia. Also in contrast to the figures for Canada, immigrant physicians in the US are more likely to be recent arrivals, though immigrants to Canada who are not working as physicians are heavily skewed towards recent arrivals. This may in part reflect the fact that skilled immigrants to the US are more likely to enter in terms of occupation-based visas compared to the Canadian points system that gives credit for higher education even though the individual's credentials may not be recognized in Canada.

The final set of descriptive statistics that we consider in this section relate to the industry of employment of individuals holding medical degrees. Industry of employment is likely to be an important determinant of earnings, even for the subset of individuals who report working as physicians. For example, physicians working in the emergency rooms of public hospitals are likely to earn less than physicians in private practice. As well, there is interest in ascertaining the extent to which physicians may be working in research positions or in hospital administration rather than in the direct provision of medical care to patients. For MD holders who are not working as physicians, there is interest in identifying whether they are working in other health-related industries or in industries unrelated to the practice of medicine. The top two panels of Table 5 provide a breakdown by industry of individuals working as physicians in the US and Canada respectively. The bottom panel of Table 5 provides the industry breakdown of MD holders in Canada who are not working as physicians. In the US, a little more than 50% of US-born physicians are working in physician's offices while in Canada, 62% of Canadian-born physicians are working in physician's offices. Among physicians working in the US, the biggest difference is between non-citizens (permanent and temporary residents) and citizens (US-born and foreign-born), with fewer than 30% of the former group working in physician's offices. Similarly, in Canada the main difference is between temporary residents and others (Canadian-born and immigrants who are permanent residents or citizens), with 46% of the former group working in physician's offices. The number of physicians working in other industries is relatively small in both countries, regardless of immigrant status.

The bottom panel of Table 5 provides the industry distribution of medical degree holders in Canada who are not working as physicians. For both immigrants and the Canadian-born, the two largest categories are 1) industries outside of the health, education and government sectors and 2) no industry reported. Among temporary residents, close to

50% report no industry at all. As well, a larger proportion of temporary residents work in universities in colleges (16%) than permanent residents or citizens.

4. Estimation Results

The next stage of the analysis involves the estimation of multivariate models in order to explore the underlying relationships between immigrant status, source country, period of arrival, and place of medical training on: 1) whether or not the person is working as a physician, 2) whether the person is a currently either a full-time or part-time student, and 3) the log earnings of individuals with medical degrees.

In Table 6, results are presented from Logit estimation over whether the person is employed as a physician and whether the person is currently a student, using the Canadian Census data. The first column contains estimates of odds ratios and confidence intervals for the Logit estimation over whether the person is working as a physician. The estimates of the odds ratio for the immigrant indicator variable and the interaction of the immigrant indicator with the permanent residence dummy variable are both not statistically significant.⁶ Temporary residents with a medical degree are less likely to be working as a physician than are the Canadian born and this effect is even more pronounced for female temporary residents. The interaction of the female indicator variable with the FB-PR variable indicates that female permanent residents with medical degrees are less likely to be employed as a physician than are female Canadians with medical degrees.

As suggested by the sample means results described above, a strong relationship is found between period of arrival and working as a physician, with the more recent arrival

⁶ The odds ratio for the FB variable can be thought of as identifying the separate effect of naturalized citizens since the interaction of the FB variable and the permanent resident variable (FB-PR) identifies the other possible immigrant group. Note that the FB variable equals zero for temporary residents (TR=1). Since year of arrival is not available for temporary residents in the Canadian Census, immigrant controls for period of arrival and location of medical education apply to permanent residents and citizens only, while temporary residence status is modeled simply as an intercept shift captured by the TR variable.

groups being much less likely to work as a physician (odds ratio of 0.12 for the 1997-01 group) compared to the earlier cohorts (odds ratio of 2.136 for the 1962-66 cohort). While there are certainly substantial delays involved before many recent immigrants with foreign medical credentials can be licensed to practice in Canada, it is important to recall that it is not possible to distinguish arrival cohort differences from the effects of duration in Canada in a single cross sectional data set. Thus, the estimated effects by arrival period could arise from a dynamic pattern of immigrants being more likely to transition to working as a physician with more time in Canada, or it could be that there are differences across immigrant arrival cohorts that result in recent arrival groups being less likely to be employed as physicians relative to the earlier arrival groups (and these differences may or may not change over time).

After controlling for period of arrival and other variables, we find that there are significant differences in the likelihood of working as a physician by region of origin. Immigrants with medical degrees who were born in South Africa are more likely to be employed as physicians relative to the American-born default immigrant group, while those from the Philippines are less likely to be employed as physicians relative to the default group. Immigrants from less developed countries in East Asia are also less likely to be employed as physicians compared to the default source country group. It is also notable that with other controls included, the location where an individual obtained his or her medical degree does not have a significant effect on the likelihood of practicing medicine in Canada.

Using the information in the Canadian Census on both mother tongue (MT) and language spoken at home (Home), we include controls in the regression for immigrants whose mother tongue was neither English nor French (Other) and whose usual language spoken at home was neither English nor French. The mother tongue variable is not

significant; however, the language spoken at home control is significant, indicating a lower probability of working as a medical doctor for individuals who speak a language other than English or French at home. This effect should be interpreted with caution since the decision to speak a language other than English at home is endogenous and could be capturing the effects of unobserved heterogeneity.⁷

In the second set of results of Table 6, odds ratios from Logit estimation are presented for a model of whether or not the individual with a medical degree is currently a student. Not surprisingly, immigrants are more likely to be students than the Canadian born. Similarly, temporary residents with a medical degree are also more likely to be studying. A number of the coefficients on the year of arrival controls are not statistically significant; however, several of them indicate that immigrants who arrived in Canada between 1962 and 1976 were significantly less likely to attend school in the survey year than are the default group, the 1982-86 arrival group. The coefficients on the source country controls are generally not individually significant with the exception being the East Asian developed countries with an implied lower probability of attending school in the survey year.

Since we can identify the occupation of employment of medical degree holders in Canada who are not working as physicians, it is possible to estimate the determinants of the particular occupational group in which an individual is working. We specify five categories of occupation: 1) physician, 2) other highly skilled occupations (including highly skilled occupations in the health industry, such as medical administrators), 3) moderately skilled occupations, 4) less skilled and all trades, and 5) people who do not report any occupation, who are unemployed or who are out of the labour force. In Table 7

⁷ We also estimated logit models on whether or not the individual is a medical specialist, conditional on being a medical doctor. However, we found that very few variables were statistically significant other than the province of residence controls so we have decided not to include these results.

we report the estimated relative-risk (RR) ratios from a multinomial Logit estimation with physicians as the reference category. Temporary residents are more likely than Canadian born individuals to be in the other occupation groups except lower skilled/trades. Women are more likely to be not working, and the estimated effect is even larger for temporary and permanent residents.

Recent arrivals are also more likely to be working in other occupational groups and are more likely not to be working at all. The magnitude of the effects is lower for less recent arrival cohorts. Thus at least some recent immigrants with medical degrees who do not work as physicians are working in other relatively highly paid occupations. It is important to note however that relative to immigrants from the US, immigrants from most other regions outside of Canada are significantly less likely to be working in another highly skilled occupation. Medical degree holders from the Philippines in particular are more likely to be working in lower-skilled occupations or not working. Finally, if the individual normally speaks a language other than English or French at home, he or she is more likely to be working in each of the other occupation groups than working as a physician.

In Table 8, we limit both Canadian and US samples to currently practicing physicians and present estimates from Logit models for the likelihood of being a student estimated separately over the US and Canadian samples. This type of schooling investment could represent time spent as an intern or resident, something that is required of almost all individuals with medical training outside of Canada before they can be licensed to practice in Canada. The first column results for Canada are generally similar to those found in the second set of results in Table 6. This indicates that immigrants (and temporary residents) with medical degrees are more likely to attend school than are the Canadian-born with medical degrees and this is true whether or not the person is employed

as a physician. Once again, there is evidence that for earlier arrival cohorts of immigrants, this effect may not be present. In contrast, the estimates in the second set of results of Table 8 do not indicate the same pattern for immigrants in the US. The coefficient on the immigrant indicator variable is not statistically significant. Also, the coefficients on the year of arrival variables are not significant. In fact, the US model generally has poor explanatory power indicating that post-migration schooling patterns may not differ appreciably for immigrants relative to the equivalent investments by the American born.

This difference between the US and Canadian post-migration schooling patterns may again possibly be explained by the different selection processes for skilled immigrants in each country. In Canada, relatively few immigrants enter the country with pre-arranged employment. Instead, skilled immigrants with no family connections to Canadians typically enter Canada under the points system which means they are more likely to be accepted if they have characteristics that are associated with greater labour market success. An internationally trained physician applying to enter Canada is likely to be admitted because the larger number of years of education means they are more likely to have a high number of points. However, these immigrants face protracted administrative and educational hurdles before they can be licensed to practice medicine, including a residency in a Canadian teaching hospital. Therefore, post-migration investments in education are likely required in order to work as physicians. Immigrants entering the US with medical degrees are much more likely to have pre-arranged employment and while medical residency requirements still must be met in most cases, the accreditation process may be more streamlined and timely. Alternatively, differences in student status between the US and Canada may instead be due to systematic differences in how individuals interpret and respond to the relevant question about student status. Unfortunately we are

unable to confirm our hypothesis with the data available since the stage of education (e.g., intern, resident, fellow) is not reported in either the Canadian or US Census data files.

Table 9 contains regression results from log-earnings regressions estimated using the 2001 Canadian Census data and the 2000 US Census data. In all regressions, we restrict the sample to include only those individuals who report positive income from wages and salaries and/or self-employment income. The first set of regression results is based on the specification of right hand side control variables used in the Logit estimation described in Table 6, that is, estimation is over the entire sample of individuals who have a medical degree. The second and third sets of results in Table 9 correspond to the same specification but applied to a sample limited to individuals working as physicians, for Canada and for the US respectively.

For the determinants of earnings across all medical degree holders, we see that the coefficients on the immigrant indicator (FB) and its interaction with the permanent resident variable (PR) are both individually insignificant. Temporary residents have much lower earnings than those of the Canadian born. Period of arrival is strongly related to earnings with immigrants arriving in the 1997-2001 period having much lower earnings (66 percent lower) than the default category (the 1982-86 group) and the 1962-66 arrival group has roughly 39 percent higher earnings than the default group.⁸

The coefficients on the region of birth variables reveal that immigrants with medical degrees born in South Africa have higher earnings than the default group (US). Immigrants from all other regions of birth have lower log earnings than US immigrants, although the estimated difference for the UK/Australia/New Zealand group, the Western Europe group and the developed countries in East Asia group are not significantly lower. Differences are substantial, ranging from 18 to 42 percent lower earnings than otherwise

⁸ The earning differentials are calculated as $e^{\beta} - 1$.

comparable US immigrants. The controls for education outside of Canada are not individually significant nor are the controls for mother tongue being neither English nor French. However, the control for language spoken at home being neither English nor French is significant and represents 29 percent lower earnings for this group.

The second and third sets of results in Table 9 give the determinants of earnings for Canadian and US physicians respectively. An important result is that earnings differences between Canadian born physicians and immigrant physicians are substantially smaller than what was estimated for immigrant and Canadian-born individuals with medical degrees, although they are still significantly different from zero. As well, differences in earnings across region of origin among physicians are also of smaller magnitude and most are not significantly different from zero. For the US results, immigrant physicians in the US who arrived in the default category time period (1982-86) are at an earnings advantage of 25.6 percent relative to the American born. However, a strong pattern in the arrival period coefficients is present with the three more recent arrival cohorts having significantly lower earnings than the default arrival group and the earliest arrival cohorts typically having significantly higher earnings. This overall pattern is similar to what was found for immigrant physicians in Canada, but with a greater initial disadvantage for the most recent cohort in the US analysis relative to earlier cohorts. In contrast to the Canadian results, source country variation seems large, with immigrant doctors from countries other than Canada, UK/Australia/New Zealand and South Africa having significantly lower earnings than the Canadian default group. Differences range from around 13 percent for the Western Asia/Middle East group to 35 percent for the Caribbean group.

With detailed controls for region of birth and period of arrival already included, the place of medical education variables do not appear to have any additional effect on

earnings for physicians in either country. In contrast, controls for language spoken at home suggest that in both countries, when English is not the usual language spoken at home, physician earnings are 16.6% lower in Canada and 8.7% lower in the US, other things equal.

Since barriers to credential recognition likely delay the time at which international MD holders enter the workforce as physicians, these individuals may also elect to delay any decision to reduce work hours or to retire. Among working physicians, if older immigrants are more likely to be working full-time, then this may explain the positive wage differential of the earlier arrival cohorts. However restricting the sample to working physicians aged 29-55 has little effect on the arrival period results in either country. The only exception is that the earnings of immigrant physicians who arrived in the US prior to 1961 are even larger. For the country of origin, the estimated earnings differences in the US results are marginally more negative.

Another potential explanation for earnings differences relates to the differences in the industry distribution of physicians between immigrants and non-immigrants as illustrated in Table 5, if for example physicians working in private clinics earn more on average than salaried physicians working in public hospitals. Including a set of industry dummy variables in the earnings regressions for both Canada and the US improves the overall fit of the models and yields coefficient estimates for these variables that are highly significant. However, the estimated arrival period effects and country of origin effects are almost identical to what is reported in Table 9.

Table 10 presents the final set of regression results on the determinants of earnings among medical degree holders who are not working as physicians, with other occupations grouped as before into ‘other highly skilled occupations’, ‘moderately skilled occupations’, and ‘less skilled occupations/trades’. In contrast to what was observed in

Table 9, there are no significant differences in the earnings of immigrants in other highly skilled occupations compared to Canadian-born medical degree holders by period of arrival or by region of origin. Earnings are significantly lower for temporary residents and for individuals whose medical degree was not obtained in Canada. For immigrant with medical degrees who are working in moderately skilled occupations, recent immigrants have significantly lower earnings but the difference goes to zero for people arriving prior to 1992. There are also significantly lower earnings for individuals from most regions of origin compared to US-born immigrants in these jobs. In the final column of results, we see that both landed immigrants and temporary residents in lower skilled jobs and trades actually earn substantially more than non-immigrants. However, this earnings gap is more or less entirely negated for immigrants from regions of birth other than the US.

5. Summary and Conclusions

Using data taken from the 2001 Canadian Census and the 2000 US Census, the earnings, occupations and schooling investment decisions of immigrants with medical degrees have been analyzed. Using the Canadian data, significant differences are found in the likelihood of practicing as a physician by country of origin, immigrant status and period of arrival. Based on the analysis of both the US and the Canadian data, we have found significant differences in earnings between immigrant and native-born practicing doctors, after controlling for age and arrival period. In both countries, recent immigrants with medical degrees are at a significant earned income disadvantage relative to the native born, even if

they are working as physicians. In contrast, immigrants from earlier arrival cohorts are at an earnings advantage relative to the native born both in the US and Canada.

A substantial component of the earnings gap between immigrants and Canadian-born individuals with a medical degree is due to the fact that other things equal, relatively recent immigrants are less likely to be practicing as physicians. There is generally a high rate of employment as a physician for those individuals who received their medical degrees in Canada - 87.6 percent for the Canadian born and 85.8 percent for the foreign born. However, these statistics change considerably once the focus is placed on the foreign born with foreign medical degrees. For example, the rate of employment as a physician falls to 42 percent for all foreign born, 25.4 percent for permanent residents and 51.3 percent for naturalized Canadians. This is evidence that difficulties with recognition of international medical degrees have a significant impact on the ability of international medical degree holders to work as physicians in Canada.

Logit estimation for the binary outcome of whether the person is employed as a physician is carried out using the Canadian sample. A strong relationship is found between period of arrival and working as a physician, with the more recent arrival groups being much less likely to work as a physician compared to the earlier cohorts. Individuals who speak a language other than English or French at home are also found to have a lower probability of working as a physician. Logit models for being a student were estimated over both the Canadian and the American samples. In the Canadian results, recent immigrants with medical degrees are more likely to attend school than are the Canadian-born with medical degrees and this is true whether or not the person is employed as a physician. In contrast, the estimates for the US do not indicate the same pattern for immigrants. This difference between the US and Canadian post-migration schooling

patterns may be explained by the different selection processes for skilled immigrants in each country.

Given the shortages of physicians in many areas of Canada and the US, particularly rural areas, the substantial number of immigrants with medical degrees who are not employed as physicians is a cause for concern. Significant financial and administrative barriers combined with the relatively low number of residencies available to immigrant doctors either significantly delay the point at which an immigrant doctor can become licensed to practice medicine or result in the individual seeking employment outside of the medical profession. The Canadian points system for the selection of immigrants in the Skilled Workers and Professionals class of immigrants may contribute to this occupational mismatch by recognizing the value of a foreign medical degree in terms of immigration but not necessarily for the ability to practice medicine. For those immigrants who are able to become licensed, significant earnings disadvantages are present for more recent arrivals and for physicians from many other regions. This may imply a certain degree of underemployment of immigrant physicians in their host countries, an issue requiring additional research.

A number of limitations should be mentioned. First, the analysis relies on data in the Canadian and US Census files that are entirely self-reported. Aside from errors in reported educational qualifications, occupation of employment, and earnings, there may also be differences in how respondents evaluate student status with regard to physicians working as interns or medical residents. As well, the fact that we have employed only a single Census file for each country means that we cannot distinguish the effect on training, occupation and earnings of additional time in the host country from cohort effects. We have also not considered the potentially important issue of the subsequent emigration of immigrants to Canada or the US, although Census questions on migration patterns will

allow us to gain some insights into the extent of movement of physicians between Canada and the US. Finally, we have not controlled for the fact that certain variables such as language normally spoken at home are potentially endogenous. Thus, causality of the relationship between language and the various outcomes examined should not be inferred.

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Table 1: Proportion of Canadian residents holding a medical degree, by occupation of employment, immigrant status and location of medical training, Adults aged 29-65, Canadian Census

Location of Medical training*	In Canada	In Canada	Outside Canada	Outside Canada	Outside Canada	Location uncertain	Location uncertain	Location uncertain	Location uncertain
Immigrant Status	All FB	All NB	All FB	Permanent Residents	Naturalized Canadians	All FB	Permanent Residents	Naturalized Canadians	Temporary Residents
Current Occupation									
Specialist MD	0.277	0.315	0.145	0.085	0.178	0.203	0.123	0.218	0.217
GP	0.581	0.562	0.275	0.169	0.335	0.480	0.248	0.525	0.335
All MDs	0.858	0.876	0.420	0.254	0.513	0.683	0.371	0.743	0.552
Other health-related occupations	0.031	0.025	0.069	0.072	0.067	0.061	0.108	0.052	0.040
Manager/Professional	0.062	0.065	0.186	0.203	0.177	0.112	0.143	0.106	0.161
Trades/Services	0.016	0.014	0.148	0.207	0.115	0.066	0.167	0.046	0.041
No occupation stated	0.034	0.020	0.177	0.263	0.128	0.079	0.211	0.054	0.207
Labor Force Status									
Unemployed	0.011	0.005	0.077	0.139	0.042	0.037	0.086	0.027	0.046
Not in Labor Force	0.048	0.038	0.196	0.289	0.143	0.097	0.246	0.069	0.279
Student Status									
Full-time Student	0.083	0.063	0.071	0.120	0.043	0.072	0.161	0.055	0.301
Part-time Student	0.042	0.030	0.069	0.099	0.052	0.040	0.057	0.037	0.049

* Imputed information based on age at arrival in Canada: individuals arriving aged 29 or more are classified as having obtained their medical training outside of Canada; individuals arriving aged 18 or less are classified as having obtained their medical training in Canada; for individuals arriving between ages 19 to 28, the location where they obtained their medical training is classified as uncertain.

Table 2: Demographic Characteristics of Immigrant and non-immigrants with a medical degree, adults aged 29-65, 2001 Canadian Census and 2000 US Census

CANADA	Share of Total Population	FB, working as an MD	NB, working as an MD	FB, not working as an MD	NB, not working as an MD
Region¹					
Atlantic	0.076	0.069	0.078	0.027	0.068
Quebec	0.241	0.126	0.320	0.143	0.315
Ontario	0.380	0.454	0.332	0.565	0.347
Prairies	0.037	0.076	0.054	0.039	0.051
Alberta	0.099	0.108	0.090	0.076	0.080
BC	0.130	0.167	0.127	0.150	0.139
City²					
Toronto	0.156	0.250	0.129	0.407	0.158
Montreal	0.114	0.102	0.160	0.129	0.152
Vancouver	0.066	0.111	0.069	0.131	0.090
USA					
	Share of Total Population	FB, working as an MD	NB, working as an MD		
Region					
New England	0.049	0.058	0.069		
Mid Atlantic	0.141	0.249	0.157		
East N. Cent.	0.160	0.154	0.144		
West N. Cent.	0.068	0.040	0.069		
South Atlantic	0.184	0.182	0.191		
East S. Cent.	0.060	0.028	0.055		
West S. Cent.	0.112	0.091	0.098		
Mountain	0.065	0.028	0.065		
Pacific	0.160	0.169	0.152		
City³					
New York	0.064	0.165	0.069		
Los Angeles	0.043	0.070	0.035		
Chicago	0.031	0.056	0.031		
Philadelphia	0.018	0.021	0.028		
Boston	0.015	0.028	0.025		
Washington	0.018	0.028	0.022		
San Francisco	0.018	0.021	0.020		

Notes:

1. Canadian territories are not reported so that general population numbers do not add to 1.
2. Statistics are for the Statistics Canada Census Metropolitan Area.
3. Statistics are for Metropolitan Area.

Table 3: Earnings¹ and hours of work of immigrant and non-immigrants working as physicians or with medical degrees, adults aged 29-65, 2001 Canadian Census and 2000 US Census²

	FB, not working as MD	NB, not working as MD	FB, working as an MD	NB, working as an MD	FB, working as an MD	NB, working as an MD
	Canada	Canada	Canada	Canada	USA	USA
Earned Income						
Average	\$39,495	\$98,152	\$130,785	\$140,907	\$141,384	\$161,329
Median	\$19,421	\$71,211	\$103,574	\$116,521	\$100,000	\$123,000
Hours of work						
Average	39.5	44.7	50.7	49.1	52.6	53.9
Median	40	45	50	50	50	52

1. Earned income is from wages and salaries plus self-employment income, converted into 1999 US dollars.
2. The samples are restricted to individuals with positive earnings during the year.

Table 4: Characteristics of Immigrants with medical degrees, adults aged 29-65, 2001 Canadian Census and 2000 US Census

Canada	FB, working as an MD	FB, not working as an MD	US	FB, working as an MD
Region of Birth				
USA	0.057	0.027	Canada	0.040
UK/Aus/NZ	0.190	0.051	UK/Aus/NZ	0.036
Western Europe	0.082	0.038	Western Europe	0.061
Eastern Europe	0.092	0.178	Eastern Europe	0.058
South Africa	0.076	0.011	South Africa	0.008
Rest of Africa	0.101	0.095	Rest of Africa	0.061
Western Asia/Mideast	0.053	0.100	Western Asia/Mideast	0.072
South Asia	0.112	0.140	South Asia	0.254
E-Asia, developed	0.085	0.064	E-Asia, developed	0.092
E-Asia, less developed	0.072	0.199	E-Asia, less developed	0.082
Philippines	0.014	0.038	Philippines	0.084
C/South America	0.033	0.041	C/South America	0.090
Caribbean	0.032	0.019	Caribbean	0.060
Immigration Status				
Canadian Citizen	0.804	0.542	Naturalized citizen	0.644
Permanent Resident	0.124	0.380	Not a citizen ²	0.356
Temporary Resident ¹	0.072	0.078		
Period of Arrival			Period of Arrival	
1997-01	0.059	0.371	1997-01	0.080
1992-96	0.093	0.252	1992-96	0.154
1987-91	0.104	0.134	1987-91	0.133
1982-86	0.106	0.056	1982-86	0.106
1977-81	0.104	0.049	1977-81	0.126
1972-76	0.212	0.056	1972-76	0.153
1967-71	0.180	0.046	1967-71	0.130
1962-66	0.063	0.014	1962-66	0.068
pre-1961	0.080	0.022	pre-1961	0.050
Age at arrival	23.9	34.4	Age at arrival	24.9
Location of MD Education			Location of MD Education	
Not in Canada	0.416	0.774	Not in USA	0.297
In Canada	0.345	0.077	In USA	0.208
Uncertain	0.239	0.149	Uncertain	0.495

Notes

1. Year of arrival is not available for temporary residents in the Canadian Census datafile.
2. Includes both landed immigrants (permanent residents) and temporary residents.

Table 5: Industry of Employment by occupation of employment, immigrant status and location of medical training, adults aged 29-65, 2001 Canadian Census and 2000 US Census

Working as MD – United States

Immigrant Status	US Born	Citizens	Citizens	Citizens	Non Citizens
Location of MD Training	US	Not US	Uncertain	US	
Physician's office	52.4	48.4	52.2	45.1	29.7
Hospital	35.1	39.9	37.9	45.3	59.0
Outpatient clinic	4.4	6.2	4.0	3.9	3.9
Other Health Ind.	2.3	1.7	1.8	1.9	1.9
University/College	2.3	0.9	1.6	1.7	2.6
Other Industry	3.5	3.0	2.5	2.1	3.0

Working as MD – Canada

Immigrant Status	Canadian Born	PR, Citizens	PR, Citizens	PR, Citizens	Temporary Residents
Location of MD Training	Canada	Not Canada	Uncertain	Canada	Uncertain
Physician's office	64.0	61.9	71.9	67.1	46.0
Hospital	30.7	33.4	24.8	29.3	50.8
Outpatient clinic	3.1	2.4	2.0	2.1	*
Other Health Ind.	1.2	1.5	*	*	*
Other Industry	1.1	0.8	*	*	*

Not working as MD – Canada

Immigrant Status	Canadian Born	PR, Citizens	PR, Citizens	PR, Citizens	Temporary Residents
Location of MD Training	Canada	Not Canada	Uncertain	Canada	Uncertain
Physician's office	9.3	4.3	6.6	10.3	*
Hospital	16.3	9.6	14.0	*	13.1
Other Health Ind.	12.0	9.5	10.1	13.4	*
University/College	13.5	8.3	8.3	15.3	16.1
Government	3.9	1.8	2.8	*	*
Other Industry	48.5	36.1	33.3	27.0	22.0
No industry reported	16.5	30.4	24.9	23.8	46.1

* Suppressed due to confidentiality restrictions

Table 6: Logit Estimation¹ of Determinants of Working as an MD and Being a student, conditional on holding a medical degree— adults aged 29-65, Canadian Census

	Indicator for working as MD			Indicator for being a student		
	OR	95% CI		OR	95% CI	
FB	0.779	0.450	1.348	2.187	1.191	4.015
FB-PR	0.759	0.573	1.005	1.013	0.689	1.490
TR	0.242	0.145	0.404	2.949	1.674	5.193
Female	0.873	0.735	1.036	1.240	1.029	1.495
Female*FB	0.710	0.555	.909	0.850	0.619	1.168
Female*FB-PR	1.001	0.695	1.441	0.909	0.596	1.387
Female*TR	0.441	0.264	0.739	0.629	0.352	1.124
Arrival Period						
1997-01	0.120	0.081	0.175	0.931	0.552	1.570
1992-96	0.205	0.151	0.279	0.808	0.514	1.270
1987-91	0.424	0.312	0.575	0.656	0.412	1.043
1982-86	1.000	--	--	1.000	--	--
1977-81	1.106	0.765	1.599	0.618	0.373	1.023
1972-76	1.888	1.334	2.672	0.471	0.284	0.781
1967-71	1.942	1.336	2.822	0.464	0.269	0.802
1962-66	2.136	1.205	3.786	0.112	0.026	0.485
Pre 1961	1.347	0.811	2.237	0.959	0.466	1.972
Region of birth						
USA	1.000	--	--	1.000	--	--
UK/Aus/NZ	1.503	0.967	2.336	0.767	0.448	1.313
W.Europe	1.127	0.688	1.845	0.740	0.419	1.307
E.Europe	0.849	0.536	1.345	1.192	0.695	2.044
South Africa	6.890	3.518	13.49	0.632	0.321	1.245
Rest of Africa	0.945	0.598	1.493	1.179	0.688	2.021
Philippines	0.408	0.225	0.738	0.521	0.228	1.194
W.Asia/M.E.	0.862	0.532	1.396	1.337	0.764	2.341
South Asia	0.909	0.579	1.428	0.738	0.428	1.273
E.Asia-dev	1.281	0.777	2.110	0.450	0.239	0.845
E.Asia-less dev	0.540	0.344	0.848	1.114	0.657	1.890
C/S. America	0.627	0.366	1.075	1.490	0.799	2.777
Caribbean	0.694	0.380	1.267	0.893	0.378	2.108
Education						
Canada	1.000	--	--	1.000	--	--
Not Canada	0.746	0.548	1.016	1.487	0.994	2.225
Uncertain	0.885	0.660	1.187	0.900	0.587	1.380
Language Other						
Mother tongue	.999	.819	1.218	0.963	0.760	1.222
Language at home	0.510	0.429	0.606	1.141	0.901	1.444
	N=13,049	~R ² =0.279		N=13,049	~R ² =0.206	

Notes

1. Regressions also include controls for age, age squared, city, region of residence, and urban/rural status.

Table 7: Occupation of Employment of MD holders in Canada: Multinomial Logit¹ Relative Risk Ratios

Reference Category = Physician/Specialist	highly skilled occupations		moderately skilled occupations		less skilled and trades		no occ/ue/nlf		
	RR	p-value	RR	p-value	RR	p-value	RR	p-value	
FB	0.95	0.90	1.18	0.63	1.27	0.83	1.11	0.80	
FB-PR	1.10	0.69	1.29	0.17	1.20	0.46	1.41	0.07	
TR	5.22	0.00	4.07	0.00	1.10	0.90	6.41	0.00	
Female	0.58	0.00	1.44	0.01	1.58	0.06	1.61	0.00	
Female*FB	2.23	0.00	1.07	0.72	0.70	0.24	1.40	0.07	
Female*FB-PR	1.05	0.90	0.99	0.97	1.28	0.39	1.79	0.01	
Female*TR	1.29	0.67	0.87	0.73	2.16	0.25	2.76	0.00	
Arrival Period									
1997-01	7.83	0.00	7.48	0.00	9.15	0.00	16.54	0.00	
1992-96	5.90	0.00	3.35	0.00	4.51	0.00	6.63	0.00	
1987-91	3.84	0.00	2.24	0.00	1.46	0.18	2.39	0.00	
1982-86	1.00		1.00		1.00		1.00		
1977-81	1.32	0.49	0.92	0.76	0.75	0.43	0.84	0.54	
1972-76	1.25	0.53	0.52	0.01	0.28	0.00	0.39	0.00	
1967-71	1.70	0.16	0.55	0.03	0.16	0.00	0.44	0.00	
1962-66	0.79	0.71	0.68	0.31	0.11	0.05	0.61	0.20	
Pre 1961	1.96	0.18	0.45	0.04	0.08	0.02	1.09	0.82	
Region of Birth									
USA	1.00		1.00		1.00		1.00		
UK/Aus/NZ	0.37	0.00	1.07	0.80	0.79	0.76	0.73	0.37	
W.Europe	0.51	0.07	1.49	0.19	1.41	0.66	0.79	0.55	
E.Europe	0.48	0.03	1.75	0.06	3.25	0.12	1.69	0.13	
South Africa	0.11	0.00	0.20	0.00	0.05	0.01	0.17	0.00	
Rest of Africa	0.37	0.01	1.09	0.77	1.75	0.46	2.24	0.02	
Philippines	0.36	0.10	3.79	0.00	11.27	0.00	2.79	0.02	
W.Asia/M.E.	0.33	0.01	1.15	0.68	3.33	0.12	2.23	0.03	
South Asia	0.37	0.00	1.09	0.77	2.52	0.23	1.90	0.07	
E.Asia- dev	0.40	0.02	1.10	0.77	0.84	0.83	1.31	0.47	
E.Asia-less dev	1.04	0.89	2.91	0.00	3.11	0.14	1.54	0.22	
C/S. America	0.53	0.16	2.59	0.01	4.50	0.06	1.98	0.08	
Caribbean	0.42	0.11	1.73	0.22	3.11	0.20	1.91	0.13	
Education									
Canada	1.00		1.00		1.00		1.00		
Not Canada	1.80	0.06	1.12	0.62	1.91	0.10	1.13	0.59	
Uncertain	1.60	0.11	1.00	0.99	1.28	0.53	0.78	0.26	
Other Language									
Mother tongue	0.95	0.77	1.00	0.97	1.24	0.27	0.87	0.36	
Home language	1.68	0.00	1.57	0.00	2.21	0.00	2.32	0.00	
		N=13,049							
		~R ² =0.219							

Notes:

1. Regressions also include controls for age, age squared, city, region of residence, and urban/rural status.

Table 8: Logit¹ estimation of determinants of being a student, conditional on working as a medical doctor, 2001 Canadian Census and 2000 US Census

	Canadian Census			US Census		
	OR	95% CI		OR	95% CI	
FB	2.658	1.303	5.421	0.803	0.359	1.799
FB-PR	1.092	0.618	1.932	--	--	--
TR	2.300	1.143	4.629	--	--	--
NonCitizen	--	--	--	0.993	0.691	1.425
Female	1.123	0.907	1.390	0.808	0.669	0.976
Female*FB	0.825	0.536	1.270	1.713	1.215	2.415
Female*FB-PR	0.859	0.368	2.004	--	--	--
Female*TR	0.852	0.341	2.126	--	--	--
Female*NonCitizen	--	--	--	0.848	0.541	1.329
Arrival Period						
1997-01	0.599	0.268	1.338	1.691	0.990	2.888
1992-96	0.714	0.373	1.366	0.998	0.605	1.645
1987-91	0.645	0.349	1.194	1.099	0.679	1.777
1982-86	1.000	--	--	1.000	--	--
1977-81	0.652	0.353	1.203	0.998	0.632	1.577
1972-76	0.470	0.261	0.849	1.100	0.713	1.697
1967-71	0.489	0.261	0.917	0.830	0.506	1.363
1962-66	0.141	0.032	0.631	1.154	0.627	2.125
Pre 1961	1.190	0.513	2.762	1.157	0.588	2.277
Region of birth						
US/Canada	1.000	--	--	1.000	--	--
UK/Aus/NZ	0.609	0.328	1.130	1.744	0.803	3.788
W.Europe	0.759	0.389	1.479	1.251	0.614	2.547
E.Europe	0.799	0.374	1.709	0.530	0.234	1.199
South Africa	0.688	0.326	1.452	1.739	0.519	5.824
Rest of Africa	1.014	0.523	1.968	0.706	0.320	1.556
Philippines	0.238	0.050	1.122	1.231	0.610	2.486
W.Asia/M.E.	1.354	0.642	2.856	0.750	0.357	1.579
South Asia	0.678	0.341	1.345	0.620	0.319	1.202
E.Asia-dev	0.324	0.148	0.709	1.062	0.515	2.188
E.Asia-less dev	0.509	0.238	1.086	1.299	0.653	2.587
C/S. America	0.984	0.420	2.306	1.207	0.609	2.392
Caribbean	0.495	0.126	1.949	1.738	0.827	3.653
Education						
Receiving Country	1.000	--	--	1.000	--	--
Not Rec. Country	1.573	0.947	2.611	1.205	0.787	1.845
Uncertain	1.319	0.774	2.25	1.349	0.940	1.936
Language Other						
Mother tongue	0.936	0.701	1.25	1.000	--	--
Language at home	1.062	0.743	1.518	1.582	1.291	1.940
N=9,640 ~R ² =0.224			N=31,027 ~R ² =0.044			

Notes: Regressions also include controls for age, age squared, city, region of residence, and urban/rural status.

Table 9: OLS regression¹ Estimates of Determinants of log earnings² conditional on holding a medical degree, adults aged 29-65, 2001 Canadian Census and 2000 US Census

	Canada Any Occupation		Canada Employed as an MD		US Employed as an MD		
	Coef.	P-value	Coef.	P-value	Coef.	P-value	
FB	0.003	0.975	-0.079	0.385	0.228	0.001	
FB-PR	-0.066	0.291	-0.010	0.892	--	--	
TR	-0.788	0.000	-0.812	0.000	--	--	
NonCitizen	--	--	--	--	-0.102	0.006	
Female	-0.377	0.000	-0.350	0.000	-0.453	0.000	
Female*FB	-0.006	0.890	0.008	0.877	0.060	0.094	
Female*FB-PR	-0.054	0.517	0.001	0.997	--	--	
Female*TR	0.382	0.004	0.415	0.010	--	--	
Female*NonCitizen	--	--	--	--	-0.008	0.878	
Arrival Period							
1997-01	-1.096	0.000	-0.473	0.000	-0.710	0.000	
1992-96	-0.636	0.000	-0.214	0.018	-0.306	0.000	
1987-91	-0.246	0.001	-0.054	0.492	-0.097	0.046	
1982-86	--	--	--	--	--	--	
1977-81	0.157	0.036	0.139	0.065	0.033	0.483	
1972-76	0.261	0.000	0.193	0.007	0.120	0.006	
1967-71	0.156	0.038	0.100	0.191	0.216	0.000	
1962-66	0.332	0.000	0.273	0.002	0.074	0.210	
Pre 1961	0.158	0.088	0.098	0.297	0.159	0.021	
Region of birth							
US/US/Canada	0.000		0.000		0.000		
UK/Aus/NZ	-0.068	0.318	-0.032	0.630	-0.137	0.065	
W.Europe	-0.048	0.552	-0.034	0.664	-0.295	0.000	
E.Europe	-0.290	0.000	-0.053	0.536	-0.367	0.000	
South Africa	0.441	0.000	0.267	0.003	-0.094	0.435	
Rest of Africa	-0.281	0.001	-0.193	0.022	-0.368	0.000	
Philippines	-0.549	0.000	-0.163	0.364	-0.281	0.000	
W.Asia/M.E.	-0.356	0.000	-0.095	0.372	-0.163	0.016	
South Asia	-0.196	0.015	-0.008	0.923	-0.217	0.000	
E.Asia-dev	-0.142	0.113	-0.085	0.363	-0.280	0.000	
E.Asia-less dev	-0.322	0.000	-0.127	0.184	-0.416	0.000	
C/S. America	-0.326	0.001	-0.115	0.275	-0.330	0.000	
Caribbean	-0.419	0.000	-0.360	0.005	-0.425	0.000	
Education							
In Host Country	--	--	--	--	--	--	
Not Host Country	-0.102	0.080	-0.057	0.345	0.010	0.824	
Uncertain	-0.026	0.617	-0.071	0.178	0.063	0.085	
Language Other							
Mother tongue	-0.023	0.530	-0.001	0.991	--	--	
Language at home	-0.341	0.000	-0.182	0.000	-0.090	0.000	
		N=11,678 aR ² =0.315		N=9,411 aR ² =0.173		N=30,007 a-R ² = 0.19	

Notes: 1. Regressions also include controls for age, age squared, city, region of residence, and urban/rural status.

2. Log earnings include all annual earnings from wages and salaries as well as self-employment income. The sample is restricted to individuals with positive annual earnings.

Table 10: OLS regression¹ estimates of Determinants of log earnings² conditional on holding a medical degree but not working as a physician, by broad occupational group - adults aged 29-65, 2001 Canadian Census

	Other highly skilled occupations		moderately skilled occupations		less skilled and trades		
	Coef.	p-value	Coef.	p-value	Coef.	p-value	
FB	-0.11	0.78	-0.40	0.24	2.45	0.00	
FB-PR	0.23	0.18	-0.11	0.47	-0.19	0.37	
TR	-0.97	0.00	-0.48	0.10	2.30	0.00	
Female	-0.31	0.02	-0.64	0.00	0.00	1.00	
Female*FB	0.07	0.72	0.58	0.00	-0.31	0.29	
Female*FB-PR	-0.35	0.22	-0.16	0.34	0.04	0.85	
Female*TR	0.18	0.63	0.52	0.09	0.23	0.69	
Arrival Period							
1997-01	-0.35	0.31	-0.55	0.02	-0.71	0.00	
1992-96	-0.07	0.83	-0.46	0.02	-0.47	0.02	
1987-91	0.16	0.62	-0.20	0.28	-0.29	0.17	
1982-86	0.00		0.00		0.00		
1977-81	0.50	0.16	0.21	0.33	0.38	0.17	
1972-76	0.30	0.40	0.46	0.07	0.68	0.01	
1967-71	0.46	0.23	0.47	0.06	-0.39	0.68	
1962-66	0.40	0.41	0.42	0.29	1.29	0.01	
Pre 1961	-0.16	0.72	0.65	0.06	0.85	0.11	
Region of Birth							
USA	0.00		0.00		0.00		
UK/Aus/NZ	0.14	0.61	-0.31	0.25	-1.94	0.00	
W.Europe	0.41	0.16	-0.34	0.29	-2.85	0.00	
E.Europe	-0.29	0.34	-0.79	0.01	-2.51	0.00	
South Africa	0.30	0.33	0.35	0.40	-1.60	0.04	
Rest of Africa	-0.52	0.08	-0.61	0.04	-2.73	0.00	
Philippines	-0.26	0.40	-0.87	0.00	-2.51	0.00	
W.Asia/M.E.	-0.57	0.20	-0.90	0.01	-2.85	0.00	
South Asia	-0.49	0.20	-0.93	0.00	-2.87	0.00	
E.Asia- dev	-0.27	0.43	-0.54	0.08	-2.67	0.00	
E.Asia-less dev	-0.38	0.19	-0.68	0.01	-2.63	0.00	
C/S. America	0.12	0.72	-0.78	0.01	-2.57	0.00	
Caribbean	0.48	0.12	-1.09	0.00	-2.55	0.00	
Education							
In Canada	0.00		0.00		0.00		
Not in Canada	-0.60	0.03	0.20	0.35	0.42	0.29	
Uncertain	-0.15	0.55	0.22	0.24	0.29	0.43	
Other Language							
Mother tongue	0.02	0.90	0.05	0.70	-0.36	0.14	
Language at home	0.51	0.14	0.15	0.48	-0.01	0.98	
		N=572 aR ² =0.403		N=950 aR ² =0.413		N=443 aR ² =0.443	

Notes:

1. Regressions also include controls for age, age squared, city, region of residence, and urban/rural status.
2. Log earnings include all annual earnings from wages and salaries as well as self-employment income. The sample is restricted to individuals with positive annual earnings.