

# METROPOLIS BRITISH COLUMBIA

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### **The Costs of Regulatory Federalism: Does provincial labour market regulation impede the integration of Canadian Immigrants?**

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# Metropolis British Columbia

## *Centre of Excellence for Research on Immigration and Diversity*

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**THE COSTS OF REGULATORY FEDERALISM: DOES  
PROVINCIAL LABOUR MARKET REGULATION IMPEDE THE  
INTEGRATION OF CANADIAN IMMIGRANTS?**

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## Abstract

Does regulation impede or facilitate immigrant participation in the labor market? To answer this question we focus on the growing, and increasingly regulated, Canadian health care sector. On the one hand, occupational regulation may facilitate immigrant entry into the labor market as it imposes standards based on credentials, and recent immigrants tend to be highly skilled. On the other hand, provincially designated authorities often enforce regulatory standards, and their selection criterion may unwittingly penalize those with foreign credentials or experience. Using a longitudinal data set combining information on the regulation of nine Canadian health care occupations and the Canadian Census from 1991 to 2006, we test whether the introduction of regulation places a greater burden on the immigrant population relative to the native born. Specifically, we employ a difference in methodology, exploiting variation across provinces and over time in whether an occupation is regulated to identify its effect on the ratio of immigrants to native born-workers employed in that occupation. The results indicate that, on average, a province's introduction of occupational regulation increases the participation of immigrants relative to the native born by 20%.

## 1. Introduction

Immigrant participation in the labor market is an important aspect of public policy. This is particularly the case for Australia, Canada, and the United States, countries in which active immigration programs have brought large numbers of economic immigrants seeking employment. These active immigration programs can only maintain broad public and political support if immigrants are successfully integrating into the labor market. The integration of these immigrants into the labor market can foster domestic economic growth and provide skilled workers where there are skill shortages in the destination country. Furthermore, no immigration program that relies on economic immigrants would be sustainable if those migrants were not successful in attaining the goals that drove them to move; thus integration of immigrants into the labor market is the return provided to immigrants that ensures a healthy supply of international workers. Finally, successfully integrated immigrants in the destination country can also encourage growth in the immigrants' country of origin through remittances. As such, it is important to understand those forces that facilitate and impede immigrant participation in the labor market.

Recent studies have documented a decline in the economic performance of immigrants in Canada, making the study of immigration in this setting a high priority for policy makers. Green (1999) used the 1981 and 1986 censuses and landing records from 1973-1991 to demonstrate that while Canadian immigrants have been relatively over-represented in high skills occupations, this over representation has been declining over time. Aydemir (2003) and Aydemir and Skuterud (2005) have documented the decline in earnings for immigrants to Canada over the period 1980-2000. Ferrer and Riddell (2008) show that while foreign experience and schooling are undervalued relative to domestic experience and schooling, credential recognition (the sheepskin effect) is relatively stronger for foreign-born workers in Canada. In a resume audit, Oreopoulos (2012) shows that applicants with foreign-sounding names receive fewer callbacks, and foreign experience is less valued by prospective employers. Recently, Girard and Smith (2012) have used the 2006 Census to show that immigrants are less likely to be employed in regulated occupations. While Zietsma (2010) shows that immigrants with the requisite skills for a regulated occupation are less likely to be matched to employment in that field. The declining economic performance of immigrants has taken place over a period in which the regulation of the labor market in Canada has increased, which leads us to our question: Does regulation impede or facilitate the integration of immigrants into the labor market?

This is an important policy question, as many labor market institutions are designed with reference to the currently affected participants in the labor market as well as the end users of the goods and services provided by those workers, but without consideration of the integration of foreign workers. Many labor market institutions serve to protect workers from job-related hazards and to protect consumers from goods and services that are dangerous or deficient in quality. As the integration of immigrants into the labor market is not of primary importance to regulatory bodies, these institutions may have unintended consequences on immigrant participation.

To answer this question we study nine occupations in the Canadian health care sector. We exploit exogenous variation in labor market regulation arising from provincial legislation to identify the effect of regulation on immigrant participation. Specifically we employ a difference-in-difference estimator, using within-occupation and within-province variation in regulation to measure the impact of an occupation becoming newly regulated on the ratio of immigrant to native-born workers. We define the date of the introduction of regulation to be the year following the adoption of legislation establishing the

requirement that workers within an occupation register with a provincially designated regulatory authority.

The study of labor market regulation has long been central to the study of economics with classic contributions from Adam Smith (1937), Milton Friedman and Simon Kuznets (1954), and George Stigler (1971), with a primary focus on its effect on wages and entry into the occupation. Muzondo and Pazderka (1980) have documented the effect of occupational licensure in Canada for selected occupations.

Kleiner and Krueger (2010) have documented the growth of labor market regulation in the United States, showing that participation in regulated occupations has now surpassed labor union membership. Recent studies have continued to examine the effect of labor market regulation on pay (Kleiner and Krueger (2009)), as well as the effect on the performance of services (Kleiner and Kudrle (2000)), and employment (Law and Kim (2005)). The above studies primarily verify the rent-seeking scenario: that labor market regulation increases wages for the affected occupations, while the effect on entry is mixed. A reason for the latter finding could be that regulation increases the demand for the services provided by members of that occupation, as the consumer protection aspect of regulation could increase the demand for the regulated laborers sufficiently to offset the decrease in supply generated by the introduction of restrictions on entry.

The most related study to this paper is the recent contribution of Law and Marks (2009), which examines the effect of regulation on the participation of women and minorities in the labor market. Law and Marks (2009) employ a similar estimation strategy to the one that we use in this paper. They estimate a probit model of entry into an occupation on a pooled cross-section of data from the U.S. during the progressive era when many states passed laws regulating segments of the labor market. They study nine occupations with a difference-in-difference estimator using files from the Integrated Public Use Microdata files of the US census.<sup>1</sup> They find that there was a negative effect of regulation on the participation of blacks for barbers, though barbers were more likely than whites to be employed as barbers both pre- and post-regulation. They also find that regulation increased the likelihood that an individual became a midwife or plumber, suggesting that there was an increase in the demand for these skills as a re-

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1 The occupations studied by Law and Marks (2009) are: accountants, barbers, beauticians, engineers, midwives, pharmacists, plumbers, practical nurses, and registered nurses.

sult of the regulation. They also found that there was a positive effect of regulation on the employment of women as engineers, plumbers, pharmacists, and registered nurses.<sup>2</sup> Law and Kim (2005) study the effect of regulation on entry into the occupation for architects, attorneys, beauticians, barbers, dentists, engineers, nurses, physicians, plumbers, teachers, and veterinarians. Using the number of workers in an occupation per thousand residents of each US state as the dependent variable, they find that regulation has a positive effect on entry for beauticians, teachers, and veterinarians. They find a negative effect of regulation on the growth rate for architects, dentists, physicians, and veterinarians, and a positive effect of regulation on the growth rate for beauticians. They also investigated the effect of medical licensing on the quality of care, demonstrating that it decreased state maternal and appendicitis mortality rates.

There are also a number of studies that focus on a single occupation. Kleiner and Kudrle (2000) study dentistry showing that regulation raised the demand for dental care by reducing uncertainty, and that this resulted in higher prices for dental care, but had no measurable effect on the quality of care. Federman, Harrington, and Krynski (2006) study Vietnamese manicurists in the US, showing that the requirement of English proficiency reduced the likelihood that a Vietnamese immigrant became a manicurist by 5.7 percentage points. Blau (2007) showed that the regulation of child care facilities and providers in the US had a negative effect on the wages of child care employees. Pagliero (2011) studied the effect of regulation on lawyers with a structural model suggesting that the removal of regulation would decrease lawyer salaries significantly. Angrist and Guryan (2008) showed that the introduction of teacher testing lead to an increase in wages for teachers. The findings of these studies are mixed as the regulatory interventions differ dramatically across occupations. However, it seems there is some consensus that regulation can reduce entry and increase wages.

We add to our collective understanding of how labor market institutions affect the economic performance of immigrants. Using our estimator we find that regulating an occupation increases the ratio of immigrant to native-born participation in a province by 20%. This effect is statistically significant at the 5% level and is robust to including either occupation- or province-specific time trends. This result is important for policy makers at both national and sub-national levels, as it suggests that there is some scope for coordinating occupational regulation in our decentralized regulatory environment.

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<sup>2</sup> Note that the results reported by Law and Marks (2009) are not marginal effects but the point estimates on the coefficients of interest.

The remainder of the paper is outlined as follows. Section two describes the regulatory environment for the nine occupations studied. Section three describes the data and the sample. Section four describes our empirical strategy. Section five provides the results, and section six concludes.

## **2. Regulatory Environment**

Labor market regulation can take a variety of forms. Some regulations impose standards and restrictions so as to improve the working conditions for labor, as in Besley and Burgess' (2004) study of the effect of labor laws in India on economic performance. In this paper we study occupational regulation and, in particular, the establishment of required registration with a regulatory body. As noted in Kleiner and Krueger (2010), this is the most minimal form of occupational regulation, surpassed in intensity by certification and licensure. We concentrate on registration in this paper because it is the first of the three forms of regulation to emerge, and while it is often accompanied by certification and licensure requirements, these are sometimes applicable only to specific tasks within an occupation classification as designated by the legislative authority.

Our account of labor market regulation comes from the Canadian Institute for Health Information (2009) database, which records the initial year of the required registration for an occupation. A survey of the provincial legislation that establishes the requirement of registration has shown that registration is frequently accompanied by restrictions on the use of titles, minimum entry to practice standards, the establishment of disciplinary procedures, the establishment of a registration fee, and the creation of, or appointment to, a regulatory body to oversee governance of the profession. Evans (1983) notes that while these practices may decrease competition in the affected markets, Canada's supreme court ruling in the "Labour case" found that self-regulating occupations are not limited in their authority by Canadian competition policy.

We study nine occupations in Canada. This selection of occupations was not random, rather it consists of the universe of occupations in the Canadian health care sector that meet the following criteria: a) the occupation had variation across provinces and over time in the existence of regulation, b) there were sufficiently many persons employed in that occupation so as to obtain a reasonable sample of workers from the long form census for each province in each year, and c) there was a clean mapping

of occupations receiving regulation into the national occupational codes provided by respondents to the census. This leaves us with the following list of occupations: audiologists, chiropractors, dietitians, medical laboratory technologists, medical radiation technologists, occupational therapists, psychologists, respiratory therapists, and social workers. Focusing exclusively on health occupations is of benefit to our estimation strategy, as it reduces the scope for omitted variables bias in our analysis. It also improves the plausibility that we can exploit the exogenous nature of the regulation as a natural experiment. The regulation of health care occupations is largely pursued for consumer protection purposes.<sup>3</sup> The occupations studied are not the most regulated occupations in the Canadian health care sector; physicians, dentists, and nurses, for example, are more intensively regulated in each of the ten provinces, as the tasks conducted by them are considered more invasive. Thus, it is likely that the non-invasive nature of the tasks for these occupations is what has led to the situation where there are provinces that have left some of these occupations unregulated in recent years.<sup>4</sup>

Table 1 lists the occupations studied along with the number of provinces that had established regulations for each occupation, for each census year. As is clear from the table, labor market regulation has been increasing across provinces during the sample period. What is true, but not evident from the table, is that regulation is an absorbing state; no province has ever removed existing labor market regulations for any of the included occupations. The most frequently regulated occupations of these nine are chiropractors, dieticians, occupational therapists, and psychologists with all of the ten provinces requiring registration in 2006. The least frequently regulated are respiratory therapists and medical radiation technologists with four and two provinces regulating each, respectively, in 2006.

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3 A word of caution on this last remark, some provinces require application for regulation by a professional association, and so our estimator could be influenced by any excluded variables that affect regulation applications and the ratio of immigrants to native born in an occupation. For example, this could be the case if there were concerns of the public about the credentials or foreign-trained professionals.

4 Some of the occupations listed below are included in scope of practice legislation, but not all.

Table 1: Number of Provinces Regulating Occupations				
Occupation	1991	1996	2001	2006
Audiology	4	6	6	7
Chiropractor	9	10	10	10
Dietitians	5	7	9	10
Medical Laboratory Technologists	1	3	4	6
Medical Radiation Technologists	1	1	1	2
Occupational Therapists	6	7	9	10
Psychologists	8	9	10	10
Respiratory Therapists	3	4	4	4
Social Workers	3	5	6	7

Source: Canadian Institute for Health Information.

Table 2 provides a complete picture of the regulatory landscape for these nine occupations. In table 2, the year in which regulation was enforced is listed for each occupation and province. Those years, which fall within the time frame for our study, 1990 - 2005, are highlighted in boldface text. A couple of highlights are worth noting from this table. While there is variation across provinces and over time in whether each occupation is regulated or not, regulatory changes are not uniformly distributed across provinces. In particular, neither Quebec nor Manitoba display any within-province variation in the regulation of any of the occupations studied, as both provinces have regulated each occupation prior to 1991. While Manitoba and Quebec are the most regulated provinces for this set of occupations, British Columbia is the least, with only four of the nine occupations being regulated. It is also worth noting that most of the within-province variation in occupational regulation is coming from Ontario, with seven of the nine occupations having regulation introduced within the sample period.

**Table 2: First Year of Occupational Regulation by Province**

Occupation	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL
Audiology	NR	<b>2002</b>	<b>1992</b>	1961	<b>1994</b>	1964	1987	NR	1973	NR
Chiropractor	1934	1923	1943	1945	1925	1974	1958	1972	1962	1992
Dietitians	<b>2004</b>	<b>2000</b>	1958	1982	<b>1994</b>	1974	1988	<b>1998</b>	<b>1994</b>	1965
Medical Lab. Tech	NR	<b>2002</b>	<b>1996</b>	NR	<b>1994</b>	1973	<b>1992</b>	<b>2004</b>	NR	NR
Medical Rad. Tech	NR	NRa	NRa	NRa	<b>2004</b>	1973	NRa	NRa	NRa	NRa
Occupational Ther.	<b>2000</b>	1990	1971	1971	<b>1993</b>	1973	<b>1997</b>	NR	1976	1987
Psychologists	1977	1960	<b>1997</b>	1966	1960	1962	1967	1981	<b>1991</b>	1988
Respiratory Ther.	NR	1988	NR	1981	<b>1991</b>	1985	NR	NR	NR	NR
Social Workers	NRb	<b>2003</b>	NR	NR	<b>2000</b>	1958	1989	<b>1994</b>	1988	1994

Postal abbreviations used for Canadian provinces. NR indicates Not Regulated as of 2006.

Boldface text indicates regulation introduced within sample period.

a: Not regulated but registration with CAMRT required.

b: Partially Regulated (private sector workers).

Source: Canadian Institute for Health Information.

Workers in these nine occupations find themselves employed in a variety of settings, from hospitals to schools; private laboratories to government offices; even universities and private practice. One important feature of the Canadian health care sector is the role of the provincial governments as providers of a publicly administrated, comprehensive, universal, portable, and accessible health insurance program. These health insurance programs, while provided and administered by the provinces, are partially funded through transfer payments from the federal government.<sup>5</sup> There is variation within occupations, over time and across provinces, as to whether the services of these occupations are eligible for coverage under the provincial health insurance plans. Unfortunately, many of the services covered are task and not necessarily occupation specific, leaving this information unexploitable in our analysis. For example, the services of an occupational therapist are covered in most provinces if provided in a hospital setting, but not covered otherwise.

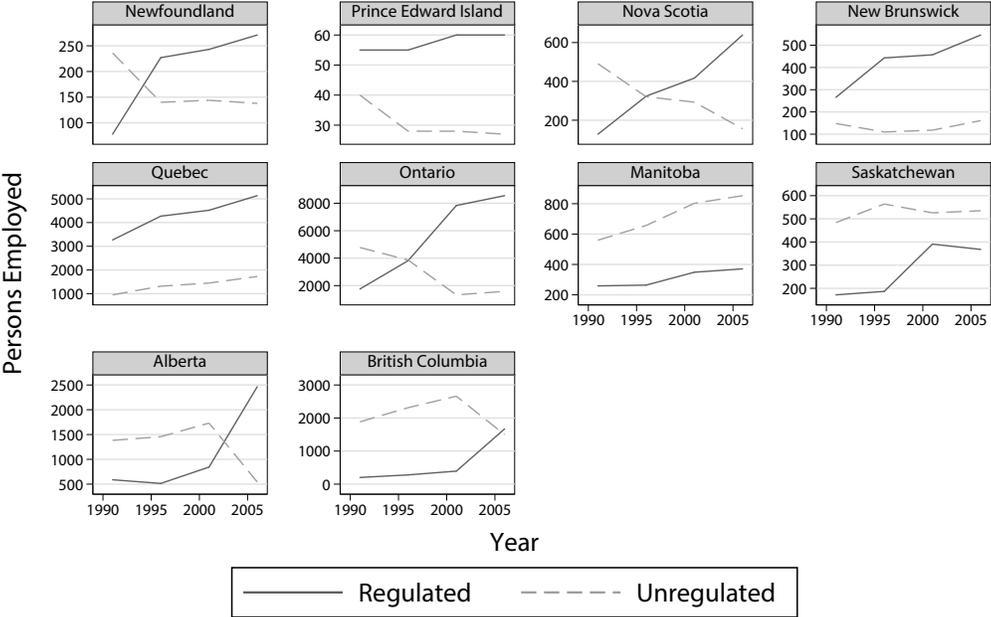
<sup>5</sup> The criteria for provincial eligibility for Canada Health Transfers requires that health insurance be provided in a way such that it is publicly administrated, comprehensive, universal, portable, and accessible (Canada Health Act (1985)).

Figure 1 shows total employment in these nine occupations for each province over time. Clearly over the sample period there has been continuous growth in employment in all provinces except Prince Edward Island and Saskatchewan. While Prince Edward Island experienced an overall decline in employment in these occupations, Saskatchewan experienced an overall increase in employment.



Figure 2 shows total employment in the regulated and unregulated occupations for each province over time. Employment in regulated occupations has grown in all provinces between 1991 and 2006, though not uniformly. Employment in unregulated occupations has increased only in four provinces: Manitoba, New Brunswick, Quebec, and Saskatchewan. In 1991, in all provinces but Quebec, Prince Edward Island, and New Brunswick, there was less employment in regulated occupations than unregulated occupations. What is also noticeable from figure 2 is that in some provinces (Newfoundland, Nova Scotia, Ontario, Alberta, and British Columbia) there has been a shift from more employment in unregulated occupations to more employment in regulated occupations; while the gap between employment in regulated and unregulated occupations has decreased in Saskatchewan. Finally, by 2006, only Manitoba and Saskatchewan continued to have more employment in unregulated occupations than regulated.

### Employment in Regulated and Unregulated Occupations



Graphs by province or territory of current residence (2006)

As noted by Stigler (1971), a useful way of understanding the creation of regulation is to consider both the supply of and demand for its existence. Of first order importance is that regulation is often demanded by the general public, as they benefit from the consumer protection it provides. The other demanders of regulation are often the industry participants themselves (Stigler (1971)). If regulation is accompanied by entry restrictions and price controls, incumbents in the regulated occupation stand to benefit financially from its enactment. Finally, regulation may be demanded by the providers of private insurance programs, as this could reduce agency problems in monitoring the quality of the services insured.

Regulation is supplied by the legislature. Politicians benefit from regulation, as it can improve their standing in the eyes of the public. In Canada’s parliamentary democracy the executive and the legislative authority are linked at each of the federal and provincial levels. Thus, the many bureaucrats that administer the publicly provided health insurance programs are ultimately under the authority of politicians. These bureaucrats benefit greatly from regulation as it insulates them from the possible

negative consequences of being responsible for the oversight of workers in these occupations. Further fueling this public demand for regulation in this case is the added feature of the single-payer public health insurance programs in Canada. It is possible that the regulation of an occupation can more greatly facilitate its inclusion under publicly provided insurance in a province. This is expected, as regulation can insure that the product provided by workers in an occupation is of high enough quality while minimizing the monitoring costs as monitoring duties are assigned to the regulatory body. As such, bureaucrats may demand regulation in order to reduce their workload and the risks of having to deal with the provision of low quality care by practitioners in the affected occupations.

### **3. Data**

The primary data source for our study is the confidential files of the Canada Census for the years 1991, 1996, 2001, and 2006. These files contain information regarding the occupation of each respondent including whether an individual is an immigrant or was born in Canada. This is a 20% sample of the Canadian population. The question on the census pertaining to occupational classification asks respondents what their occupation was for employment during a reference week and if they were unemployed to report their occupation of their most recent employment within the past five-year period. As a sample, we select all of the working age population from these files, those between 24 and 65 years of age, for each of the ten provinces of Canada. The reference week for each census year was in December of the preceding year, giving us observations on individuals from 1990 to 2005. We augment this data with information on whether an occupation is regulated, or not, from the Canadian Institute for Health Information (2009). From this data we construct a panel data set with a provincial occupation as the unit of observation. We then have ninety cross-sectional units over four time periods.

Summary statistics are presented in table 3. The mean number of immigrants in one of our nine occupations in a province in a year is 45, while the mean number of native-born workers in an occupation in a province in a year is 224. The mean ratio of immigrant to native-born participants in an occupation is 0.15. Just over half of our sample of occupation-province pairs is regulated in a province in a year. We can also see from the table that the unemployment rates for immigrant and native-born workers in these occupations over the fifteen-year period are similar at approximately 2% for both.

Table 3: Summary Statistics				
Variable	Mean	Std. Dev	Min	Max
Number of Immigrants	45.32682	105.0112	0	907
Number of Native Born	224.648	396.7832	0	3195
Regulation	0.547486	0.4984366	0	1
Unemployed Native Born	5.075419	11.114	0	84
Unemployed Immigrants	1.148045	3.474257	0	40
Ratio of Immigrants to Native Born	0.1589476	0.1620834	0	1.5
Number of Observations 357				

#### 4. Empirical Strategy

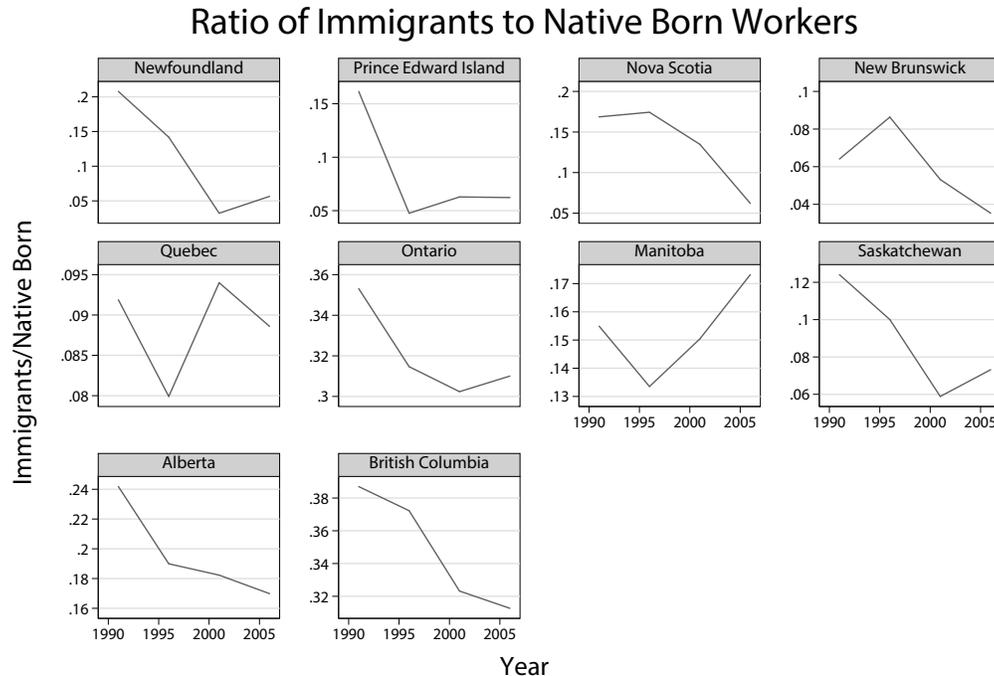
Our measure of immigrant participation is the ratio of immigrant to native-born workers in an occupation:

$$\frac{N_{p,k,t}^{Immigrant}}{N_{p,k,t}^{Native Born}}$$

where  $p$  denotes the province,  $k$  denotes the occupation, and  $t$  denotes the time period. This ratio is our dependent variable,  $y_{p,k,t}$ , in the regression specification below. We study the participation in an occupation of immigrants relative to the participation of native born for a number of reasons. First, this measure is interesting because it is a useful metric for the integration of immigrants. If immigrants are becoming more integrated in the Canadian labor market, we would expect this measure to increase. Second, it is useful because there is no reason, ex ante, to believe that it would change in a systematic way in the absence of regulation. Temporary macroeconomic activity and policy changes over the sample period would plausibly affect both the numerator and denominator of our measure equally. Specifically, if an event occurred that increased the demand for a particular occupation that was uncorrelated with regulation, we would anticipate that this measure would be unchanged.

Figure 3 shows the average values of our dependent variable over time for each province. There is considerable variation in this series within each province over time and across provinces. The ratio of

immigrant to native-born workers in an occupation has decreased over time for all provinces with the exception of Manitoba. It has decreased in every year only for British Columbia and Alberta.



Graphs by province of current residence (2006)

To explain our difference-in-difference methodology, consider the following stylized example. Suppose neither Ontario nor Alberta regulated audiologists in 1996, but that by 2001 Alberta began requiring audiologists to register with the designated regulatory body. To measure the impact of this policy change on the ratio of immigrant to native-born participation in the field of audiology, one can simply record the difference in this ratio between Alberta and Ontario before the regulatory change in Alberta to obtain the baseline difference, and then also record the difference in this ratio after the new regulation took effect. The difference between these two differences is a measure of the effect of the introduction of required registration on immigrant participation relative to the native born. Using many occupations across many provinces over four time periods allows us to get the average treatment effect of regulating an occupation for the nine occupations considered.

Specifically we run the following regression:

$$y_{p,k,t} = \alpha_p + \beta_t + \gamma_k + \delta R_{p,k,t-1} + \epsilon_{p,k,t}$$

Where  $\alpha_p$  are provincial fixed effects that capture all time invariant provincial influences on the ratio of immigrants to native born.  $\beta_t$  are time effects, capturing, for example, global macroeconomic conditions.  $\gamma_k$  are occupation effects, capturing time invariant occupation-specific determinants of our dependent variable.  $\delta$  is the effect of regulation,  $R_{p,k,t-1}$ , our variable of interest. This is a binary variable taking a value of one if an occupation is regulated in the preceding (and subsequent) time period(s). Finally the  $\epsilon_{p,k,t}$  are the random errors.

One sufficiency assumption for the consistency of the FE estimator is that:

$$E[X'_{it} (\epsilon_{p,k,t} - \overline{\epsilon_{p,k}})] = 0, t = 1 \dots T$$

This states that the policy variable must be uncorrelated with deviations of the error term from its average over the time period. With this assumption, our panel data enables us to estimate the treatment effect of regulation without the use of instrumental variables.<sup>6</sup>

## 5. Results

The regression output is displayed in table 4. The estimates of  $\hat{\delta}$  suggest that when an occupation becomes regulated the provincial ratio of immigrants to native-born workers in that occupation increases by approximately 0.04. This is a significant and economically meaningful magnitude considering that the mean of the provincial ratio of immigrant to native-born workers for these occupations is 0.15. An increase of 0.04 represents an increase in this ratio by a factor of almost 4. This suggests that contrary to conventional wisdom and anecdotal evidence, regulating an occupation increases immigrant participation in that occupation relative to native participation. The first column of table 4 presents a

<sup>6</sup> The other sufficient condition is that the matrix of control variables is of full rank.

baseline specification without the inclusion of time trends. One would exercise extreme caution with the inference from this exercise if the effect were driven by province or occupation-specific time trends. The second and third columns of table 4 then include these province-specific and occupation-specific time trends, respectively. It is clear from the table that the result is robust to the inclusion of both province- and occupation-specific time trends. There is some loss of precision with the inclusion of occupation-specific time trends, though the effect of regulation is still significantly different from zero at the 5% level.

Table 4: Effect of Regulation on Immigrant Participation Relative to Native-Born Participation					
	(1)	(2)	(3)	(4)	(5)
Regulation	0.0461***	0.0526***	0.0373**	0.0452	0.0591
	(-0.0139)	(-0.0153)	(-0.0139)	(-0.0441)	(-0.139)
Province-Specific Trends	No	Yes	No	No	No
Occupation-Specific Trends	No	No	Yes	No	No
Provincial Occupation-Specific Effects	No	Yes	No	Yes	Yes
Provincial Occupation-Specific Trends	No	No	Yes	No	Yes
Observations	357	357	357	357	357
	0.465	0.481	0.487	0.655	0.8
Robust standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					
Province, Occupation, and Year fixed effects included in specifications (1), (2), and (3).					
Clustered Standard Errors at the Province Level in all regressions					

Once we include provincial occupation-specific effects and provincial occupation-specific time trends, the magnitude of the effect of regulation is still consistent with our baseline specification, though the precision of the estimate is greatly diminished. This lack of precision can be attributed to the inclusion of ninety provincial occupation-specific effects and another ninety provincial occupation-specific

time trends.<sup>7</sup>

That immigrant participation increases relative to native participation when an occupation becomes regulated appears puzzling at first glance. However, when one considers that our indicator for occupational regulation is the requirement of mandatory registration plausible underlying mechanisms emerge. Mandatory registration requires resources: a regulatory body must be established (or an established body is charged with the administrative authority for the profession) which must have staff to administer the regulation through the establishment of a registry and to administer the ethical code of conduct and disciplinary hearings and procedures. Along with the creation of infrastructure to facilitate registration comes infrastructure that can serve as a conduit for immigrant participation, such as: the centralization of authority on entry into the profession; and the provision of information on the qualifications and credentials necessary for registration. The associations that are now granted the authority for regulating the occupation can likely begin to provide more services to their members. As they have the ability to charge fees from all participants in an occupation, free riding becomes impossible, thus increasing the resources available for programs provided by these associations. Some of these services may include resources for accessing employment in that area. Hence if these services are more valuable as a means of securing employment for immigrants than native born-workers, immigrant participation will increase. Many of these associations and colleges also create a clear and transparent method for foreign credential recognition, something that is lacking for many unregulated occupations. However, it is unclear from the data at hand to what extent these practices have been adopted simultaneously with regulation.

It's also possible that the increased visibility of the occupation once it becomes regulated increases the attractiveness of immigration to Canada for those with the requisite skills. Immigrants who would otherwise not have immigrated to Canada may now do so once they see that their skills would be matched to a somewhat protected field of employment. Similarly another plausible mechanism driving our result is that immigrants already in Canada move across provinces to jurisdictions where registration is required. This would be natural if it is in fact the case that there is a higher return to foreign credential

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<sup>7</sup> The authors have requested additional data from Statistics Canada from the 1981 and 1986 censuses to obtain more observations for our analysis. With these new data, we would expand the scope of variation in regulation to include an additional 17 regulatory changes while we currently are working with 27. This would also increase the number of observations by 180.

recognition in Canada, as demonstrated in Canada by Ferrer and Riddell (2008).

A major limitation of the analysis presented above is that no control variables were employed; only year, provincial, and occupational fixed effects and time trends were included. The absence of data that contains variables exhibiting simultaneously both within province and within occupation variation is concerning. Any omitted factors that vary within a province and an occupation that have changed over time could bias the results if they affected immigrant participation relative to the native born and were correlated with the introduction of regulation.<sup>8</sup>

The greatest limitation of our study is that it is possible that the effects of regulation are different for different sub-groups of the population; for example visible minorities and women. In this paper we have only considered one sub-group of the population, immigrants, and we have measured their performance in the labor market relative to native-born workers. As such, it could be the case the regulation hurts native-born workers (decreasing the denominator of our dependent variable) leaving immigrant participation unchanged (the numerator). To further investigate these factors, one must use micro-level data to estimate the effect of regulation on the probability that a worker works in a particular occupation.

In this study we have only considered the effects of regulation on the extensive margin: whether an individual works in an occupation or not. In order to conclude that these regulations have facilitated immigrant integration in the labor market, one would also have to consider the effects on the intensive margins: hours worked and wages. This we leave to future research.

## 6. Conclusion

In this paper we have studied the effect of labor market regulation on the participation of immigrants. We measured immigrant participation relative to native-born participation and found that this measure increased significantly once a province adopted the requirement of registration for an occupation. This suggests that regulation may serve as a useful vehicle for immigrant integration into the labor

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<sup>8</sup> Auxiliary regression analysis was conducted to examine the effect of regulation on total employment, and no statistical relationship was present in the data. We have not presented these results, as the absence of adequate control variables is more of a concern with employment in an occupation as a dependent variable than the ratio of employment for two sub-populations.

market through its validation of foreign credentials and recognition of foreign experience. This result is in line with previous studies that have found mixed results of the effect of labor market regulation on the participation of populations that have faced discrimination in the labor market. The result is also consistent with the findings of Ferrer and Riddell (2008) – that credential recognition has a larger effect on wages for immigrants than the native born.

While our result is robust to the inclusion of occupation-specific trends and province-specific trends, we lose precision when including provincial occupation-specific effects and trends. That said, the magnitude of the estimated effect of regulation remains relatively unchanged.

The policy implications of this result are important for all countries with active immigration programs. However, there is still a lot that we do not know about how legislated regulations are put into practice on the ground. Future research on the particular labor market institutions that arise through legislated regulation would add tremendous value to our understanding of the effect of regulation on immigrant participation in the labor market.

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