

# The Social Rate of Return to Investing in Character: An Economic Evaluation of Alberta's Immigrant Access Fund Microloan Program

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**Abstract** Skilled immigrants have been identified as a key source of labour supply to address the expected labour market shortages in Canada arising from an aging population and strong economic growth. The integration of immigrants into the workforce often requires that they have the necessary accreditation to work at their chosen occupation. However, credential recognition has proven to be a significant labour market barrier for skilled immigrants in part due to a lack of access to credit. We estimate the social rate of return of investing in immigrant credentials by analyzing the results of the Immigrant Access Fund (IAF), an institution providing small loans on a not-for-profit basis to assist Alberta immigrants in acquiring the Canadian accreditation and training they need to work their field of expertise. Under very conservative assumptions, our assessment of the average return to the public funds put towards the IAF loan program—and not recouped through loan repayment—is on average 33 %, which makes immigrant accreditation a step to be considered in immigration policy.

**Keywords** Skilled immigrant · Credential recognition · Microloans · Social rate of return

## Introduction

It is well known that credential recognition is a significant barrier for immigrant professionals seeking to work in their chosen field. Many of these professionals require time to invest in unpaid Canadian work experience, formal courses for upgrading skills and acquiring knowledge of Canadian laws, practices and professional standard, and to prepare for and sit licencing exams. Often, the sums of money required to enable these investments that are necessary for credential recognition are not large, but recent

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immigrants lack access to affordable, if any, credit through existing financial institutions. Immigrants may not have financial collateral to back a loan, and banks and other lenders may find the administrative overhead unattractive for small loans. In other words, a market failure in credit markets limits the human capital gains from skilled immigrants for the Canadian economy resulting in the visible deadweight loss to society of underemployed and unemployed skills and human capital.

In this paper, we describe an innovative microloan program that was created to address this market failure. The Immigrant Access Fund started in Alberta in 2005 as a partnership program between immigrant borrowers, prominent community members in Calgary and Edmonton, and the provincial and federal governments to be a “lender of last resort” for immigrant professionals. Essentially, Immigrant Access Fund (IAF) sponsors from the community guarantee the loans of typically \$5,000 to borrowers for the lending institution. The immigrant borrower repays the principal plus interest of “prime plus 1.5 %”. The provincial and federal governments have been providing funds to cover the administration and delivery of the loans which are not recouped through the loan repayment but may be recouped through the tax system if the immigrant borrower succeeds to move out of unskilled jobs into their preferred profession. In this paper, we calculate the rate of return to the government funds used to effectively subsidize the borrowing costs for immigrant professionals. We find that based on the program’s success rates for borrower repayment and for borrowers finding employment in their chosen profession, government support for the IAF represents a high-return use of public funds. At a time where concern about potential labour shortages and lack of skilled workers coexists with reports on large fractions of underemployed high-skilled immigrants, this program provides a scalable model for improving immigrant success in Canada for the benefit of increased productivity of the Canadian labour force.

Skilled immigrant workers have been identified as a key source of labour supply for addressing the expected labour market shortages in Canada arising from an aging population and strong economic growth (Emery 2006). However, the integration of immigrants into the workforce requires that they have the necessary accreditation to work at their chosen occupation in the Canadian labour market. Credential recognition has proven to be significant labour market barrier for skilled immigrants in Canada as evidenced by the high rates of underemployment of this group.<sup>1</sup> To address the underemployment of skilled immigrants in Alberta, the IAF provides small loans on a not-for-profit basis to assist immigrants in acquiring the accreditation and training they need to work in their field of expertise. These loans assist educated immigrants in moving from low-income “survival” jobs to jobs that better utilize their valuable knowledge and skills. Although anecdotal evidence suggests that the IAF program has produced successes, there is no analytical evidence as to the overall economic value of the program. Our assessment of the return to the IAF’s loan program offers a tool to evaluate the program success and to compare it with other programs aimed to enhance the integration of immigrants in the labour market. The annual social return of the IAF loan program is estimated around 33 %.

<sup>1</sup> A 2007 IAF report cited that 49 % of skilled immigrants in Alberta reported that they were overqualified, 45 % were working in the fields which are not related to what they studied, and 64 % found that there was no consideration for their foreign education and/or for work experience. The IAF study drew these statistics from International Qualifications Assessment Service (IQAS) Assessment Services Study, Alberta Employment, Immigration and Industry, 2007.

Canada is among the world's top destinations for immigrants, with 200,000 newcomers accepted every year. The Canadian visa program emphasizes skills and education as entrance requirements in order to facilitate labour market integration of immigrants. Despite this, reports on the socio-economic status of immigrants are discouraging. Immigrants are more likely to work in low-wage occupations, experience higher rates of unemployment, and be below low-income cut-offs (Picot and Hou 2003; Picot et al. 2007). The underemployment of skilled immigrants also represents a loss for the Canadian economy in terms of lower GDP.

Research suggests that for immigrants, difficulty with credential recognition is at the heart of this problem. A substantial part of immigrant skill depreciation concerns the devaluation of foreign experience (McDonald and Worswick 1997; Green and Worswick 2003; Goldman et al. 2011) and lower literacy skills among immigrants (Ferrer et al. 2006). While formal education still has considerable value for immigrants, relative to those who do not have formal education, the overall value that the market puts on immigrant skills is below that of the native-born.<sup>2</sup> The assessment and the recognition of immigrants' foreign credential appear to depend on factors like the importance attached to the education-based skills, the procedure, and the behaviour of employer in front of the unknown (Reitz 2001b, 2003; Oreopoulos 2009).

To address the foreign credential recognition problem, a range of government and non-government stakeholders have launched initiatives to help immigrants in the assessment and recognition of their foreign credentials. There is a patchwork of funds available from both profit and non-profit organizations to support immigrants seeking to acquire Canadian accreditation, skill upgrading, including language skills, cultural orientation to the Canadian workplace, resume writing, etc. These programs are delivered by federal or provincial government (the Immigrant Loans Program and provincial credential recognition programs in BC Manitoba and Saskatchewan), employers, credit unions and banks (HSBC "passport account" and ICICI Bank of Canada "newcomer accounts"), educational institutions and micro-credit organizations (IAF in AB and the Ottawa Community Loan Fund) and community organizations (The Black Creek Micro-Credit Program).<sup>3</sup>

Microfinance or small loan programs have been emerging as a potentially useful approach for helping immigrants to settle in the host country (The Globe and Mail February 20 2010). Interest in microfinance was spurred in the 1990s when attention was drawn towards new financial institutions that aimed to bring financial services to the poor (Goetz and Gupta 1996). Academic research in the area of microfinance boomed (Besley and Coate 1995; Brau and Woller 2004; Karlan 2007; Morduch et al. 2009; Woller et al. 1999). Although most of the current research is focussed on developing countries and the needs of the very poor, part of the activity in microfinance

<sup>2</sup> Ferrer and Riddell (2008). The situation was easier for immigrants in 1960 due to the lack of high levels of education among the native-born (Baker and Benjamin 1994; Li and Peter 2001; Reitz 2001a; Beach and Worswick 1993). However, rising education levels among the native born, particularly university graduates, during the 1970s and 1980s reduced the comparative advantage of immigrants, even though they continued to arrive with relatively high levels of education and experience.

<sup>3</sup> The Black Creek Micro-Credit Program is a loan support program established in 2007 as a part of the Black Creek Community Capacity Project, partnering with Access Community Capital Fund and Alterna Savings to support individuals in the community who need assistance with funding for business and skill development.

is concerned with credit that constrained low-to-medium income households. The microfinance challenges in the USA and Canada differ from those experienced in South America and India. A traditional component of microfinance in developing world, peer monitoring and joint liability to assist repayment has proven unsuccessful in the developed world. In addition, the socio-economic structure of developing countries (extensive public social networks, small size of the microenterprise sector and increased competition from large retailer firms) generates a low demand for loans devoted to buy equipment and finance small business, the main purpose for microfinance in third world countries (Morduch et al. 2001; Coyle and Wehrell 2006). For this reason, microfinance in North America has mostly focussed on training, which emerges as a much more important constraint in leaving poverty than financial constraints are (Morduch et al. 2001). Previous Canadian experience with microloan includes the Calmeadow Metrofund, Canada's largest non-profit microlending institution. The outcomes of microfinancing by this program have been analyzed in Gomez and Santor (2001) and Santor and Gomez (2008) who identify a positive role of social capital on the performance of microborrowers.

Microfinance is a relatively new enterprise in the business of helping credit constrained immigrants who are seeking to acquire Canadian accreditation and education upgrades. Micro-credit programs target immigrants in temporary need, acting as lenders of last resort. Immigrants are expected to have exhausted other sources of financing first, such as EI grants or student loans, prior to applying to the IAF for a loan.<sup>4</sup> The loans will generally cover tuition costs with only some institutions allowing borrowing to cover living expenses and other costs. In general, the impact of the programs is small, though growing, and repayment rates are very high. To date, however, there has been little effort towards systematic evaluation of these microfinance programs.<sup>5</sup>

Ideally, the effect of a microlending program would be tested by randomly granting small loans to borrowers (treated group) or not (control group). Then, the subsequent labour market outcomes of the "treated" group given a loan could be compared with those of the "control" group who were denied of loans to assess the effect of microlending (Heckman et al. 1998). This type of data is extremely rare, and most program assessment must rely on non-experimental techniques. In our study, we do not attempt to estimate the individual rate of return to individuals obtaining accreditation through the IAF, because the IAF does not collect information on post-accreditation labour market outcomes of the borrowers. Instead, we use census data to calculate the (net) increase in lifetime earnings that could be realized from accreditation given the success and repayment rates and the operating costs derived from the IAF data. Hence, our results are more indicative of the expected return of microcredit loans, rather than individual returns. Using very conservative assumptions, we find very high returns to microloan programs for immigrant accreditation.

<sup>4</sup> In contrast, it is believed that for profit lenders like banks have the primary goal of building long-term financial relationships. Unlike the government, these institutions have the long-term goal of becoming financially sustainable, although this is not currently a reality (Buckley and Griep 2003).

<sup>5</sup> One evaluation was done for an extinct program (the Immigrant Loan Program run in Vancouver). Another report by Karim Harji (May, 2007) evaluated the social impact of the Ottawa Community Loan Fund (OCLF). The organization helps small businesses; give loans for accreditation of foreign-trained professionals and for social enterprises/co-ops. It was found that the production of social value of this organization is significant.

## The Immigrant Access Fund

The IAF is an Alberta-based not-for-profit organization that with its partner organizations provides internationally trained/educated professional and trades people with loans of up to \$5,000 (exceptions to \$10,000 are considered) to help with the costs of tuition fees, books and course materials, exam fees, living and travel expenses, qualification assessment and professional association fees, or other things relating to becoming able to work in their field.<sup>6</sup> The IAF is different from other programs providing microloans to immigrants in other provinces in terms of how it funds its loans (other microloan programs have bank partners to fund approved loans), how it delivers its loans (through loan delivery partners rather than a bank) and applicant eligibility (immigrants from all occupations are welcome to apply; other programs have restrictions). These unique characteristics have led to IAF being the largest and most successful microloan program for immigrants in Canada.

The IAF program started in Calgary in 2005 and expanded to Edmonton in August of 2007. As of October 2009, a total of 375 loans had been approved—233 (62 %) through the Calgary loan delivery partner Momentum and 142 (38 %) through the Edmonton loan delivery partner, the Edmonton Mennonite Centre for Newcomers. The average IAF loan is \$4,619. Since 2007, more than \$1.6 million in loans has been committed and \$1.4 million disbursed. The repayment rate is 98 % (only seven loans have been written off), which is extremely high for a microloan program. The high repayment rate is more remarkable given that 65 % of IAF loan recipients were unemployed when they applied to the IAF. Of the 35 % that were employed, 50 % were working in “survival” jobs and 50 % were working in their field but not in positions commensurate with their skills and experience. Twenty percent of applicants had monthly expenses that exceeded their income.

The IAF has a unique operating model in that it partners with other agencies to deliver its microloans. IAF’s Calgary partner is Momentum, and its Edmonton partner is the Edmonton Mennonite Centre for Newcomers (EMCN). IAF develops strong relationships with other agencies and organizations working with immigrants on accreditation, training, and employment matters and counts on them to refer their clients to IAF for loans. The IAF board is diligent not to duplicate services provided by others, preferring to support those services by referring IAF clients to them. The IAF also acts as a lender of last resort where its clientele consists of applicants who do not qualify for loans through commercial lenders or government programs. IAF microloans are different than other loans because IAF does not require applicants to be employed, have a credit history in Canada, or have collateral, all typical bank requirements. Loan approvals are based on the applicant’s character, determined through an extensive personal interview and assessment, rather than their collateral. Somewhat similar to student loans, which also require no collateral, the IAF microloans are nevertheless more flexible as they do not have residency requirements or being a full-time student. Loans are registered with a credit agency, so loan recipients can build their credit rating in Canada. Interest is paid at 1.5 % above prime; recipients pay interest only while

<sup>6</sup> The significant stakeholders/supporters of the loan program are the loan delivery partners Momentum (Calgary) and the Edmonton Mennonite Centre for Newcomers; the Alberta government; The Calgary Foundation; HSBC Bank Canada; RBC Financial Group and the United Way of Calgary and area.

completing their accreditation/training (maximum of 2 years) and have another 2 years to pay back the principal (<http://www.iafcanada.org/common-questions/loan-terms-conditions/>). IAF loans are not limited to predetermined occupations, but while IAF borrowers represent 63 different occupations, engineers, accountants, physicians and nurses account for 50 % of loan recipients.

Loans are presently being funded by a \$1 million line of credit, which has been secured by personal guarantees of Calgary business and community leaders. To date, almost all of IAF's operating funds to cover application assessment, loan delivery and loan administration have been provided by the provincial and federal governments (since IAF only recently obtained charitable status, funding options were limited). Being so heavily dependent on government for operating funds leaves the IAF vulnerable to funding cutbacks and shifts in government priorities. Since borrowers are only expected to repay the loan principal and prime plus 1.5 for interest, the IAF is not recouping these administration and loan delivery costs through the loan contract. This feature of the contract means that borrowers benefit from subsidized borrowing costs.

Administrative and loan delivery costs are substantial for the IAF. These costs likely lie between 50 and 100 % of the loan principal.<sup>7</sup> Private lenders are unlikely to be enthusiastic about making small loans like these without charging substantial interest costs to cover these high overhead costs. With the IAF program, the borrower repays the loan principal over 4 years at an interest rate of prime plus 1.5. The borrower is not charged to recoup the administration and loan delivery costs that are roughly equal to the amount of principal. In other words, the borrower is subsidized to keep the cost of borrowing reasonable. If this loan were to be made by a commercial lender, then presumably, the loan repayment would be set so that the lender covers the opportunity cost of the funds allocated to the principal and administrative costs. For example, a borrower would effectively borrow \$10,000 to receive \$5,000 in funds for their use. Over a 4-year period at a 5 % interest rate, the borrower would have paid a total of \$12,160.<sup>8</sup> Accounting for the repayment of the administration loan delivery costs means that the borrower would have paid an effective annualized rate of interest of around 22 %. If the repayment of the loan is not guaranteed, then the lender could require an even higher interest to compensate for the risk.

### Who Are the IAF Applicants?

In this section, we first present the characteristics of the IAF borrowers based on the data collected by the IAF at the time of the loan application and over the term of the loan. We compare these borrowers with the characteristics of recent immigrants to

<sup>7</sup> From email correspondence with Dianne Fehr, program manager, 298 loans approved from the IAF program start to March 31, 2009 totalling \$1,392,845. Total administration and loan delivery costs from program start to March 31, 2009 were \$1,241,806. On the other hand, for the fiscal year 2008/2009, the IAF incurred costs of \$492, 270 to approve \$723,145 in loans to 159 people, although some of the costs were for managing existing loans.

<sup>8</sup> The continuously compounded interest  $r$  can be calculated as: If  $v$  is the cash inflow in the future,  $p$  is the cash outflow now,  $r$  is the annual interest rate and  $T$  is the time to cash inflow, we can use the formula  $((1+r)^T)*p=v$  to calculate total payments on a loan. So, if the borrower must repay \$10,000 at 5 % interest, the total payments over 4 years would be \$12,160. Since the borrower only received \$5,000 in funds and the balance of the loan was administrative costs, the effective annual interest payment is  $22\% = \ln(\$12,160/\$5,000)/4$ .

Calgary and Edmonton according to 2006 census data. The mean characteristics of loan applicants are presented in the first column of Table 1. Columns 2 and 4 represent the same values for recent immigrants to Edmonton and Calgary. Columns 3 and 5 show changes in the overall fraction of immigrants arriving between 2001 and 2006 relative to the fraction arriving between 1996 and 2001 for selected characteristics.

The typical loan IAF applicant is male and has been in Canada for 1 to 2 years before applying for a loan, although there is a considerable fraction of applicants that have been in Canada for more than 5 years (16 %). The majority of the applicants reside in Calgary (57 %) and Edmonton (40 %) with only 3 % coming from other Alberta locations. The majority of the loan applicants are from Asia (31 %), Africa (31 %), South America (14 %) and countries of the Middle East (15 %). These two last groups are more likely to be in Calgary, while Asians are more likely to apply for the loan in Edmonton. More South American and Asian women apply for these loans than immigrant men from those regions.

Loan applicants were equally likely to be employed (44 %) or unemployed (42 %) before applying to the IAF for a loan. Unemployment seems to be more prevalent in the city of Calgary and slightly more prevalent among women. Underemployment is 12 % among all applicants. However, conditional on working at the time of the loan application, underemployment is much higher, about 27 %, and is more concentrated among female immigrants (40 %).

Three-quarters of borrowers intend to work in occupations related to health (39 %), engineering (21 %), or finance/accounting (16 %). Female immigrants are overrepresented in health occupations (56 % of all health occupations) and social sciences—education (60 % of all social sciences occupations). Most of the immigrants are working towards occupations in regulated professions (81 %); this is particularly so among women (88 % of all women). The variable occupational change is a derived variable that is equal to one if the applicant's area of expertise/occupation before coming to Canada is not the same as their intended occupation/accreditation (using two-digit occupation categories). Only a small fraction (14 %) plans to change their occupation category.

Overall, accreditation or education plan completion rates are 45 %, and 30 % of borrowers reporting “working in their field”. Completion rates are slightly higher for men (48 %) than that for women (41 %) and are also higher in Calgary (54 %) versus Edmonton (33 %). This is likely due to the shorter time the Edmonton program has been operational. Conditional on completing their accreditation or education plan, 67 % of the borrowers report “working in their field”, which can be interpreted as a raw measure of success.

Comparing the demographics of loan applicants and the overall recent immigrants with Calgary and Edmonton, it is obvious that loan applicants are not representative of the immigrant population. Loan applicants are less likely to be women than recent immigrants to Calgary and Edmonton. They are also less likely to be Asian and more likely to come from Africa, Latin America or the Middle East. Further, they are also overrepresented in the health occupations and among occupations in natural and applied sciences (engineers). The presence of a selection bias in terms of who applies for an IAF loan suggests that increasing immigration levels will not necessarily increase proportionally the customer base of the IAF program. Instead, the composition of new immigrant arrivals will be a key determinant of increasing loan applicants in the future.

**Table 1** Mean characteristic of loan applicants and census immigrants

	IAF	2006 census Calgary		2006 census Edmonton	
	%	%	5-year change	%	5-year change
<b>Demographics</b>					
Female	0.39	0.51	0	0.52	0
Residence: Calgary	0.57	–	–	–	–
Residence: Edmonton	0.40	–	–	–	–
Residence: other	0.03	–	–	–	–
<b>Time between immigration and application</b>					
Less than 3	0.06	0.23 <sup>a</sup>	0.01 <sup>a</sup>	0.08 <sup>a</sup>	0.01 <sup>a</sup>
3–6 months	0.09				
6–12 months	0.17				
1 to 2 years	0.22				
2 to 3 years	0.12				
3 to 4 years	0.11				
4 to 5 years	0.06				
More than 5 years	0.16	–	–	–	–
<b>Place of birth</b>					
South America	0.14	0.05	0.03	0.06	0.00
Europe	0.11	0.15	–0.03	0.14	–0.06
Africa	0.30	0.10	0.04	0.13	0.04
Middle East	0.15	0.08	0.04	0.10	0.04
Asia	0.31	0.54	–0.04	0.52	0.00
<b>Labour force status before applying</b>					
Underemployment (unconditional)	0.12	–	–	–	–
Employed	0.44	0.69	–0.04	0.62	–0.04
<b>Program results</b>					
Completed programme	0.45	–	–	–	–
<b>Occupation when completed accreditation</b>					
Trades	0.03	0.10	–0.02	0.12	–0.03
<b>Health</b>					
Natural resources	0.01	0.17	0.01	0.11	–0.01
IT	0.05				
Engineer	0.21				
Finances	0.16	0.15	–0.01	0.13	–0.01
Business	0.06				
Social sciences	0.07	0.07	–0.01	0.11	0.02
Other	0.03	0.46	0.04	0.46	0.05
Regulated trade	0.45	–	–	–	–
Regulated profession	0.81	–	–	–	–
Occupational change	0.14	–	–	–	–

The sources are authors' calculations using data provided by the IAF on loan applicants and Statistics Canada, 2006 and 2001 Census of Population, Statistics Canada catalogue no. 97-564-XCB2006008

<sup>a</sup> Refers to the percentage of the immigrant population arriving less than 5 years ago



However, lacking the necessary data to assess this selection bias, it is hard to predict future trends in loan applications. For instance, columns 3 and 5 reveal that a higher fraction of immigrants arriving between 2001 and 2006 come from countries more likely to apply for loans (an increase of 4 % in immigration from Middle East and Africa and a 3 % increase in migration from South America (Calgary only)). However, the fraction of immigrants in health or engineering occupations has not increased over the period considered.

### Methodology for Calculating the Social Rate of Return to the IAF Loan Program

The near 100 % repayment rate for the principal and interest on the IAF loans made to date means that direct loan funds are being used in a way that covers their economic (or opportunity) cost. The administrative and loan delivery costs are really the more pertinent feature of the contract that requires evaluation as they are effectively a subsidy to the borrower. The use of public funds, or other donated funds, for this kind of purpose is economically justified if the social return to that expenditure exceeds the opportunity cost of those funds. In other words, would society be better off investing the funds in risk-free bonds or expending them on a loan program that increases the earnings and employment outcomes of skilled immigrants?

A standard way for an economist to value the returns to society from immigrants investing in accreditation is to use an income-based approach. Assuming that the wages/earnings of a worker reflect the value of their labour services to society, then lack of recognition of credentials implies an underutilization of resources for Canadian society. Lack of recognition of credentials combined with a systemic inability to assess these skills precludes many qualified immigrants to find employment according to such qualifications, or even within their fields of expertise. The gain to society from recognizing these credentials would be represented by the gain in income that immigrants experience after accreditation.

If we wish to assess the value of Canadian accreditation for an immigrant, we need to assess the value of the stream of net benefits that they will produce from now until they retire compared with the value of the costs of training/credentialing which are incurred in the present. Since the funds devoted to training (plus interest) are repaid by the immigrants, the only costs to consider are the opportunity costs (what could have been earned without accreditation) and the overhead costs of managing the fund  $A$ , which are at present absorbed by the IAF rather than paid by the borrower.

As a dollar received in the future has a value of less than \$1 today due to the opportunity cost of money, the costs and benefits of the investment are converted into *present value* terms. The *present value* of a dollar received in  $t$  years is the amount of money that you would have to invest today at interest rate  $r$  to receive the \$1 in  $t$  years. The net present value (NPV) of an investment that will generate benefits  $B_t$  and costs  $C_t$  in each period  $t$  is the simple sum of the present value of  $B_t - C_t$  from the year in which the project begins to the date at which the project ends, year  $t$ . A value for  $r$  is assumed for the calculation that represents the risk-free, market rate of return to alternative investments (e.g. if you invested in long-term government bonds instead of education program). This value is usually between 4 and 5 %.

Finally, we also consider the uncertainty involved in the investment. First, the immigrant may be unable to finish the program, and second, there is no guarantee that

the immigrant will find work in his or her area of expertise once accreditation is completed. In either case, the potential benefit of training is reduced to  $pB_t$ , where  $p$  is the probability of successfully completing the program and finding work in the chosen area of expertise.

$$NPV = PV - PC = \sum_{t=a}^{65} \frac{(p \cdot B_t - C_t)}{(1+r)^{t-a}} - A$$

In the context of the IAF program, the NPV of the accredited immigrant is the sum of the expected present value of benefits minus costs from the year in which the immigrant completes his accreditation. We compare these earnings with those obtained from performing an unskilled job for which no Canadian post-secondary education is needed. We consider several time horizons for the calculation of the returns. The average age at immigration of immigrants to Alberta is around 30 years, and we allow a minimum of 2 years for learning, applying and completing accreditation, hence a horizon of 30 something years from age 32 to age 65.<sup>9</sup> If the NPV for the project is a positive number at the assumed interest rate, then the project is deemed to be worthwhile. If the NPV is negative, then the benefits are not large enough to generate the benchmark rate of return for the funds invested in the project.

An alternative way to use the NPV formula to evaluate an investment project is to calculate the internal rate of return (IRR) to the investment. Instead of assuming a value for  $r$  to calculate the NPV of the project, the costs and benefits are combined according to the NPV formula, and an algorithm is used to determine the interest rate that would yield an NPV of 0 for the project:

$$IRR = r^* \rightarrow \text{where } r^* \text{ satisfies } NPV = \sum_{t=1}^T \frac{pB_t - C_t}{(1+r^*)^{t-1}} - A = 0$$

The IRR is interpreted as the real annual rate of return to the investment, which is directly comparable with annualized rates of return to other investments like stocks, bonds, real estate or IRR's from other projects.

To do these calculations, a pre-tax age-earning profile is generated for someone working with recognized credentials (for the  $B_t$  values) and for what a person can be expected to earn without accreditation (for the  $C_t$  values). These age-earning profiles are estimated by using data from the public use file of the 2001 census data for the province of Alberta to fit the earning profile of an average individual according to their age and education level as follows (regression results are available in the [appendix](#)):

$$\ln(\text{wage}) = a + b \text{ age} + c \text{ age}^2 + d \text{ HS edu} + e \text{ BA edu} + f \text{ Grad edu} + \varepsilon$$

We use the predicted earnings from this regression to calculate the NPV, from age 32 to 65, of attaining accreditation. Because the empirical evidence suggests that immigrant experience is heavily discounted in Canada, we adjust the age profile to correspond to that of a person 7 years younger. This corresponds to the idea that immigrants are likely to be treated as new entrants in the labour market since their foreign

<sup>9</sup> This seems supported by the applicant's characteristics, since 54 % of all applicants have applied before, 2 years after landing and information, and those who have completed have done so, within 2 years.

experience is not recognized.<sup>10</sup> It also allows our simulated earnings to account for steeper returns during the initial years of work after accreditation.

Estimating the alternative earning profile for non-accredited immigrants requires that an assumption be made about the nature of work they do and the level of education required for that work. We use the age-earning profile for high school graduates as this alternative. This essentially assumes that these immigrants are treated as having no post-secondary credentials in the Alberta labour market. Compared with the reported levels of unemployment and underemployment of IAF borrowers, we are going to understate the earning gain that would come with accreditation since the high school graduate earnings are higher. We make this assumption for two reasons. First, it is not clear whether the poor labour market situation of IAF borrowers reflects permanent or temporary situations, or voluntary or involuntary outcomes. Hence, we make the assumption that immigrants could obtain the earnings of high school graduates in the Canadian labour market if they choose to do so. Second, assuming a better non-accreditation labour market experience for immigrants introduces a downward bias in our calculation of the value of the IAF program. Since we do not know with absolute confidence what the true earning profiles of immigrants are, this conservative assumption will allow us to think of our calculations as “lower bounds” for the program’s values.

The most general way to think about what will influence the social return to the IAF lending program is that the social return will be increasing in the size of the earning gain of the immigrant with the credential and the probability of working in a job that requires the credential and decreasing with the size of the upfront administration/loan delivery costs. The estimated age-earning profile for a high school graduate and for a BA degree holder with a 10 % chance of working in a job that requires and rewards the BA credential is shown in Fig. 1. The two components of the NPV are represented by the blue and black columns, which measure the present value of the difference in the income streams and the overhead costs respectively. The estimated earning difference between an accredited and non-accredited immigrant peaks between 15 and 25 years after accreditation. This is calculated for a 10 % chance of success at completing the program and finding a job in the field, a 5 % interest rate and a 5,000 loan. Clearly, even with a 100 % of principal administration cost, with an NPV of the accreditation of over \$10,000, investing in BA level accreditation is socially profitable in this scenario.

Occupations have different rates of success and different earning profiles. To account for these differences and offer as complete a picture as possible of the value of the IAF program, we present specific IRR for loans invested in acquiring different types of Canadian accreditation in a variety of scenarios. In particular, age-earning profiles are constructed for individuals in different occupations. In addition, this strategy allows us to show the sensitivity of the results to different assumptions about the post-accreditation number of work years, the probability of success in completing the program and working in the desired occupation and the amount borrowed.

Table 2 shows the IRR of loans provided to obtain BA accreditation (panel 1) and graduate degree (either MA or PhD) accreditation (panel 2). We offer several possible scenarios. First, as mentioned before, we consider that accreditation earnings are

<sup>10</sup> See McDonald and Worswick (1997), Green and Worswick (2003), Ferrer and Riddell (2008) and Goldman et al. (2011).

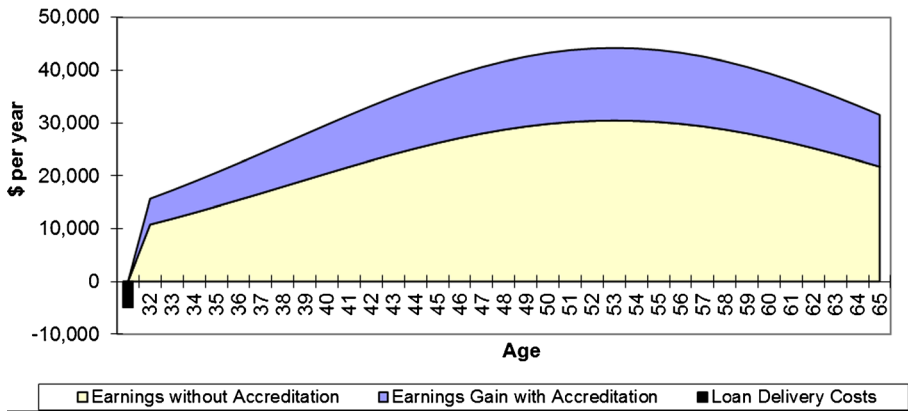


Fig. 1 Costs and benefits of IAF loans for Alberta society

achieved with a range of probabilities. This is intended to reflect that either accreditation may fail, or that, even if successful, the immigrant may not be able to find a

Table 2 Internal rates of return of loans providing accreditation

Overhead	Prob	Age Accreditation	IRR (average)	IRR health <sup>a</sup>	IRR engineering
Panel 1. Accreditation BA					
10,000	1	32	1 or more	1 or more	1 or more
10,000	0.75	32	0.18	1 or more	0.67
5,000	0.75	32	0.33	1 or more	1 or more
5,000	0.65	32	0	0.58	0.32
10,000	1	36	1 or more	1 or more	1 or more
10,000	0.75	36	0.22	0.76	1 or more
5,000	0.75	36	0.47	1 or more	1 or more
5,000	0.65	36	0	0.83	0.61
Panel 2. Accreditation graduate school					
10,000	1	32	1 or more	–	1 or more
10,000	0.75	32	0.53	–	0.71
5,000	0.75	32	1 or more	–	1 or more
5,000	0.65	32	0.38	–	0.42
10,000	1	36	1 or more	1 or more	1 or more
10,000	0.75	36	0.84	1 or more	1 or more
5,000	0.75	36	1 or more	1 or more	1 or more
5,000	0.65	36	0.54	1 or more	0.76

<sup>a</sup> These estimates assume that individuals work from age 32 or 36, with the experience profile of a 25 or 29-year-old individual



suitable job in the field or at the desired level. Second, we consider different ages at which the immigrant will start working after accreditation. This is to take into account that the length of time necessary to acquire the proper credentials varies by field. Our base age is 32. We examine the sensitivity of the results to late accreditation (age 36) that may be more realistic for immigrants in the health professions (Emery et al 2006). Finally, we consider two different loan sizes, the maximum amount provided by the IAF to international medical graduates (IMGs) (\$10,000) and the average loan size (\$5,000). Based on consultation with the IAF managers, we assume an administrative cost on the loans of 100 %.<sup>11</sup>

Column 4 in Table 2 shows the internal rate of return on a loan to an immigrant to acquire a bachelor's degree credential. For each scenario, we include the benchmark case of a no-risk outcome, characterized by 100 % probability of success in obtaining accreditation and work in the field of expertise. This no-risk outcome results in a calculated annual return of 100 % or more to the IAF loan program. This reflects the fact that compared with the cost of the loan, the increase in earnings with the credential over the remaining working life is enormous. In other scenarios with different risks, age of accreditation and overhead costs, the IRR ranges between 0.47 and 0.18. The IRR on graduate accreditation is even higher, ranging between 1 or more and 0.38. For a given probability of success in obtaining work with the credential, smaller loans offer a higher IRR, while lowering the probability of success reduces the IRR, *ceteris paribus*. Columns 5 and 6 show the IRR to specific degrees in health sciences and engineering, obtained when fitting Eq. (2) to individuals in the health industry and the "professional, scientific and technical services industry". Overall, these estimates show that the social return on investments in accreditation are much higher than returns on conventional financial instruments. They are also much higher than the total, or social, rates of return to post-secondary education of Canadian students (Rathje and Emery 2002; Emery 2005).

The IRR allows for easy comparison between the returns of the program and alternative assets. However, given the variation in IRR by probability of success, it would be interesting to analyze the program in terms of this variable. We compute the minimum probability of success necessary to yield a 5 % return on the loaned funds and the cost of administering and delivering the loan. This is a useful tool to keep track of the performance of the IAF's loans and may be useful in guiding the expansion of the program.<sup>12</sup> For our analysis of the minimum probability of success, we have introduced a change in our calculations. The nature of the discounting of experience profiles used in Table 2 presents some problems when applied to the case of physicians. Because physicians are paid a predetermined amount by service provided, the same discounting of experience profiles used for other occupations may not necessarily apply to an immigrant that successfully acquires a licence to practice medicine. Instead, we

<sup>11</sup> These costs likely lie between 50 and 100 % of the loan principal but our choice of 100 % produces conservative estimates of rates of return to the IAF loans program.

<sup>12</sup> It requires, however, that in the future, the program collects information on the post-accreditation outcomes of loan applicants.

will consider the fact that physicians may get lower earnings during the residency period and while they establish their practice (for a total of 3 years). We maintain the previous experience profile for other health professionals.

The minimum probability of success necessary to yield a 5 % return on the loan is reported in Table 3. The first column shows the case for BA credentials, and columns 2 and 3 show the case for graduate accreditation, relative to working as a high school graduate or at a job requiring post-secondary level education respectively. In general, variation in the overhead costs or the age at which accreditation begins has little influence in the minimum probability of success. Most of the variation comes from the accreditation obtained and our assumption about what is the alternative income stream of the immigrant if he does not acquire accreditation. For instance, for a loan to obtain a bachelor's degree credential to yield 5 % return, assuming that the immigrant will otherwise find a job at the level of a high school graduate, there needs to be a 70 % probability of success in completing accreditation and finding a job at bachelor's degree level. This probability could be lower if the immigrant is obtaining a graduate credential (60 %) or higher, if we are assuming that the alternative to obtaining the graduate credential is to work at bachelor's degree level (87 %).

**Table 3** Minimum probability of success to yield a 5 % interest rate

	BA credentials	Graduate credentials	
	Relative to HS earnings	Relative to HS earnings	Relative to post-secondary earnings
<b>General</b>			
Overhead 10,000; age 36	0.71	0.61	0.87
Overhead 10,000; age 32	0.71	0.61	0.87
Overhead 5,000; age 36	0.70	0.60	0.87
Overhead 5,000; age 32	0.70	0.60	0.87
<b>Engineering</b>			
Overhead 10,000; age 36	0.63	0.62	0.99
Overhead 10,000; age 32	0.63	0.62	0.99
Overhead 5,000; age 36	0.63	0.62	0.99
Overhead 5,000; age 32	0.63	0.62	0.99
<b>Health</b>			
Overhead 10,000; age 36	0.56	0.34	0.51
Overhead 10,000; age 32	0.56	0.34	0.51
Overhead 5,000; age 36	0.55	0.33	0.50
Overhead 5,000 age 32	0.55	0.34	0.50

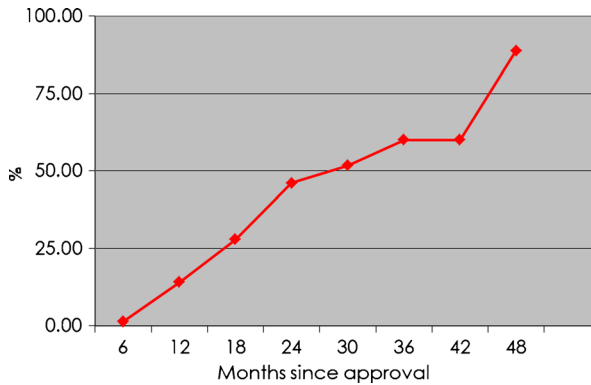
Except when otherwise indicated, these estimates assume that individuals work from age 32 or 36 with the experience profile of a 25 or 29 years old. For the case of graduate credentials in the health occupations, we have omitted the experience profile assumed. Instead, we assume that the individual experienced a 3-year reduction in earnings, while completing the residency program and settling into practice

These threshold probabilities for IAF value also vary by what field or occupation the accreditation is for. This is likely due to the differences in returns that can be observed across occupations requiring licencing.<sup>13</sup> Licencing is cited as one of the main barriers to working in the occupation of field the immigrant is trained for. Not surprisingly, 81 % of applicants completing a professional credential do so in a regulated profession, and 45 % of those applicants completing a skilled trade credential do so in a regulated trade. The increase in the returns that can be expected if working in a regulated trade or profession reduces the required probability of success necessary to generate a 5 % rate of return on accreditation. For instance, the minimum probability is 63 % for engineers seeking a bachelor's level accreditation. Note that acquiring a graduate accreditation does not reduce this probability, even when we assume that the alternative is to work at high school level. This suggests that that the net gain of a graduate degree in this field is likely very small. There is absolutely no gain in income from acquiring a graduate credential in engineering if the immigrant can work at the bachelor's level (Rathje and Emery 2002). In the case of health professionals other than physicians, the required minimum probability of success is 56 %. Physicians have the lowest required minimum probabilities of success, ranging from 34 to 50 % depending on our assumptions about alternative income streams if the IMG borrower does not acquire a medical licence.

As of the September 2009 Community Update from the IAF, few of the occupations represented by the IAF borrowers are showing success rates that are high enough to suggest that the IAF program is generating a social rate of return of 5 % per year. Overall, 80 % of loan recipients are earnings \$40,000 or more 3 years after receiving the loan, whereas the fraction of loan applicants in this income bracket was only 24 %. Health-related occupations have a success rate of 39 % (33 % for physicians and 42 % for bachelor's level accreditation), and professional occupations have a 43 % success rate. However, this seems to be a product of how recent the IAF loans had been made such that few borrowers have had sufficient time to complete their education and accreditation programs and find work in their field. Using information about the date when the loan was approved, we can recalculate the success rates among immigrants that obtained the loan more than 18 months ago, hence ensuring that they had sufficient time to complete accreditation and find jobs in their fields of expertise. The overall rate of completion among this group is 95 % but much lower for the health occupations (60 %) and the professional occupations (49 %) (see Fig. 2).

The IAF reported in 2012 that over 70 % of the applicants are working in their field of study after completion of the accreditation program. This number exceeds the average minimum probability of success required in Table 2 to break even. Most of the loans are given to immigrants in health occupations (42 %), engineering (18 %) and accounting (17 %). Further improvement in the social return to the program may come

<sup>13</sup> According to Kleiner and Kruger (2010), the average return to occupational licencing is around 15 % in the US.



**Fig. 2** Success rate by length of loan

from reducing the overhead/loan delivery costs of the IAF. This could be achieved through scale economies (more loans for fixed overhead costs), or by finding more economical arrangements for delivering loans, or by having borrowers pay back some portion of the administrative and loan delivery costs.

## Conclusions

It is estimated that Alberta will have a labour shortage of 100,000 workers by 2015 (Emery 2006). At the same time, underemployment of skilled immigrants is estimated to cost the Canadian economy \$13 billion/year<sup>14</sup>. In this context programs that help Alberta's immigrants to apply their skills and experience to help fill that shortage are under scrutiny by many government agencies and civic groups. This paper evaluates the performance of the IAF in terms of the internal rate of return of the loans and the minimum probability of success that will yield a 5% interest on the loans. Effectively, each dollar that the government puts towards this program generates \$3 or more in GDP as represented by the income gain from the recognized credentials of the immigrant borrower under conservative assumptions regarding the opportunities of non-accredited immigrants. The IAF represents a scalable model for how to improve the efficiency of the Canadian immigration system.

Our calculations abstract from additional general equilibrium effects arising from externalities associated to education (increased social cohesion and well-being from reduction in unemployment and underemployment, increased productivity, and increased competition for jobs). To the extent that these externalities are considered to be mainly positive, the full social value of these programs would be even higher. This provides interested parties with a tool to compare the returns obtained through this venue with alternative programs. It also suggests venues that may enhance the social rate of return of the program.

<sup>14</sup> Gordon Nixon, President and CEO of RBC Financial Group, Immigrant Access Fund 2005, 2008 Celebration Dinner.



**Appendix**

**Table 4** Regression results used to compute life earnings of accredited immigrants

**General**

Source	SS	df	MS			
Model	14835.0258	8	1854.37823	Number of obs = 29541		
Residual	36555.2841	29532	1.23781945	F( 8, 29532) = 1498.10		
				Prob > F = 0.0000		
				R-squared = 0.2887		
				Adj R-squared = 0.2885		
				Root MSE = 1.1126		
Total	51390.31	29540	1.73968551			

lnwg	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
age	.2165554	.0028261	76.63	0.000	.2110161	.2220947
age2	-.002353	.0000352	-66.80	0.000	-.002422	-.002284
edu_2	.2193194	.019052	11.51	0.000	.1819767	.2566621
edu_3	.4463341	.0233768	19.09	0.000	.4005146	.4921536
edu_4	.3788685	.020914	18.12	0.000	.3378761	.4198609
edu_5	.5919368	.0208232	28.43	0.000	.5511225	.6327512
edu_6	.806562	.0821827	9.81	0.000	.6454802	.9676438
edu_7	.7455339	.0352019	21.18	0.000	.6765366	.8145312
_cons	5.121701	.0515388	99.38	0.000	5.020683	5.22272

**Health**

Source	SS	df	MS			
Model	758.170457	8	94.7713071	Number of obs = 2844		
Residual	3118.70316	2835	1.10007166	F( 8, 2835) = 86.15		
				Prob > F = 0.0000		
				R-squared = 0.1956		
				Adj R-squared = 0.1933		
				Root MSE = 1.0488		
Total	3876.87362	2843	1.36365586			

lnwg	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
age	.1536429	.0102072	15.05	0.000	.1336286	.1736571
age2	-.0016184	.000123	-13.15	0.000	-.0018597	-.0013771
edu_2	.059658	.0815967	0.73	0.465	-.1003368	.2196529
edu_3	.3041929	.0894185	3.40	0.001	.128861	.4795248
edu_4	.4753599	.0717081	6.63	0.000	.3347546	.6159651
edu_5	.6782101	.0735779	9.22	0.000	.5339384	.8224817
edu_6	1.192593	.1075177	11.09	0.000	.9817721	1.403414
edu_7	1.005821	.1053347	9.55	0.000	.7992803	1.212361
_cons	6.078335	.2017905	30.12	0.000	5.682664	6.474006

**Education**

Source	SS	df	MS			
Model	816.993035	8	102.124129	Number of obs = 2067		
Residual	2208.43531	2058	1.07309782	F( 8, 2058) = 95.17		
Total	3025.42834	2066	1.46438932	Prob > F = 0.0000		
				R-squared = 0.2700		
				Adj R-squared = 0.2672		
				Root MSE = 1.0359		
lnwg	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
age	.1772646	.0118807	14.92	0.000	.1539652	.200564
age2	-.0017775	.0001425	-12.48	0.000	-.0020569	-.0014981
edu_2	.099775	.1058971	0.94	0.346	-.1079016	.3074517
edu_3	.4859851	.1277553	3.80	0.000	.2354419	.7365283
edu_4	.5234266	.1077202	4.86	0.000	.3121746	.7346787
edu_5	.8277403	.0930439	8.90	0.000	.6452704	1.01021
edu_6	.6844596	.3111234	2.20	0.028	.0743101	1.294609
edu_7	.9730638	.1003929	9.69	0.000	.7761816	1.169946
_cons	5.312201	.2415122	22.00	0.000	4.838567	5.785835

**Engineering**

Source	SS	df	MS			
Model	757.642249	8	94.7052812	Number of obs = 2408		
Residual	2533.1443	2399	1.05591676	F( 8, 2399) = 89.69		
Total	3290.78654	2407	1.36717347	Prob > F = 0.0000		
				R-squared = 0.2302		
				Adj R-squared = 0.2277		
				Root MSE = 1.0276		
lnwg	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
age	.2117879	.010655	19.88	0.000	.190894	.2326819
age2	-.0023577	.0001304	-18.09	0.000	-.0026133	-.002102
edu_2	.2218414	.0891024	2.49	0.013	.0471158	.396567
edu_3	.3798649	.104929	3.62	0.000	.174104	.5856259
edu_4	.4737558	.0833893	5.68	0.000	.3102333	.6372783
edu_5	.6899263	.0810633	8.51	0.000	.5309648	.8488877
edu_6	.5374082	.2942339	1.83	0.068	-.0395708	1.114387
edu_7	.7001484	.1000705	7.00	0.000	.5039149	.8963819
_cons	5.445177	.2062136	26.41	0.000	5.040802	5.849553

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