How immigration identity and intermarriage influence earning ability

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Abstract

Using data collected by the General Social Survey of 2011, this paper tries in estimate the labour market performance of immigrants involved in different marital status situations, such as being single, being married to a native-born Canadian, and being married to another immigrant. Males and females are analyzed separately. The regression results suggest that immigrants earn less than natives and that marriage improves people's earning ability. For immigrants, intermarriage and endogamous marriage are not much different in terms of earning ability. Immigrant males are not significantly influenced by family structure. However, immigrant females in an endogamous marriage have a higher assimilation rate than those who intermarried. Their low initial wage is offset by a higher assimilation rate.

1. Introduction

Population migration is a key component of the process of globalization that has had a profound influence on the world, both economically and culturally. According to a recent survey done by the Gallup Organization (Esipova and Ray 2012), there were 640 million adults in 2012 who migrated to a foreign country and the top three destination countries for international migrants were the United States, the United Kingdom and Canada.

As the third largest immigrant host country, Canada has always been a typical area for the study of immigration issues. According to the 2011 Census, the total population in Canada was 33.5 million people and immigrants accounted for about one fifth of that population. Immigrants have been considered to be an important addition to the labour force in Canada from the days the country was formed. According to Citizenship and Immigration (Kuste 2012), 23% of the Canadian labour force is now composed of immigrants. Citizenship and Immigration also predicts that, between 2011 and 2016, immigrants will account for all of the net labour force growth.

How this important part of the population is going to integrate into Canada's labour market and become involved in the local society is important to study. A lot of elements can help immigrants to access and maintain a promising career. Education, occupation and marriage can be considered as three major ways for immigrants to merge to a new society. This paper is going to focus on the interactions between immigrants' earnings and their marriage choices.

In order to evaluate if marriage can help immigrants to improve their economic status, the paper is going to use data collected from the General Social Survey (GSS) of 2011. One particularity of this survey is that it includes information on the birth places of respondents' spouses. The paper includes the following sections. After this introduction, the second section is a literature review. I then present the data and the basic models in the third section. The fourth section will consist of an interpretation of the empirical results that will indicate, among other things, how intermarriage affects immigrants' labour market performance. The fifth section is a conclusion that tries to generate policy strategies.

2. Literature Review

There is a common phenomenon in most developed countries that immigrants' average labour market performance is lower than that of the native-born. Male immigrants were the subject of most scholarly research in the earlier times. Researchers studied the reasons for the employment and wage differences between male immigrant and natives. In the 1980s, the scope of the research extended to female immigrants as well. It was only in the 1990s that family influence on immigrants' performance in the labour market began to be an important topic of research.

Mincer (1978) is the pioneer in studying how family is related to migration decisions. The paper defined marriage as a family tie that brings a negative effect on migrating wives' employment and wages. By analysing the 1973 US census, Mincer found that the presence of family ties is a disruption to migration and that it also creates marriage instability. However,

at the same time, instability stimulates migration and female labour market participation. The paper also found that migration affects negatively the employment and the income of the wives, but that it has a positive effect on husbands.

Baker and Benjamin (1997) laid an important foundation for research on immigrant's labour market behaviour and family structure. Using data from the 1986 and 1991 Canadian Surveys of Consumer Finances (CSF), they focused on immigrant women and built a family investment model. The paper suggests that the wives in immigrant families are likely to support their husbands' human capital investment by taking on "dead-end jobs", thus sacrificing their own future competitiveness in the job market. At the same time, immigrant women in exogamous marriages (those who are married to non-immigrants) can get better employment because they are able to spend more time searching for a promising job. As the study shows that employment behaviour and wages of mixed families and immigrants' families fit to the family investment model better, the authors thus concluded that intermarriage was a good way for immigrant women to merge into the host country by obtaining language ability and social connections as well as acquaintance with other customs.

In relation to the family investment model, Duleep and Sanders (1993) found with 1980 US census data that Asian female immigrants' labour force participation behaviour is consistent with that model. However, by using US data for 1980 and 1990 and a comprehensive target group, Blau, Kahn and Waldfogel (2000) found that, as the time that immigrants spend in the host country increases, the wage and the number of working hours grow at the same rate for both spouses, indicating that both spouses invest in their own human-capital in a similar way. As the results are not consistent with the family investment

model, the authors concluded that the immigrants' economic and legal status can be the reasons for the deviation from the family investment model.

Focusing on how immigrants' spouses influence their mutual labour force participation behaviours, Cobb-Clark and Connolly (2001) studied immigrant spouses' participation in the labour market so as to find out how family influences immigrants' settlement process. The results show that wives tend to work shorter hours if their husband works longer hours. They also indicate that education is not an important element for spouse's labour supply behaviour whereas age, language fluency and time of immigration are crucial indicators.

Based on the previous literature, Meng and Gregory (2005) investigated how intermarriage between immigrants and natives helps immigrants do better in the labour market. Unlike Baker and Benjamin (1997) who focused on female immigrants only, they studied both genders. The paper presented the determinants of intermarriage and then analyzed the causal effect of intermarriage on earnings. By using the Australian Census of Population and housing during the period between 1981 and1996, factors such as age, education, language ability, time spent in host county, and religious belief are identified as major determinants of intermarriage. The authors used OLS to estimates how intermarriage influenced immigrant's income and found that, compared to immigrants in endogamous marriages, the raw premium for intermarried immigrants from non-English speaking background countries is 17% and 22% men and women respectively.

From the previous studies, it seems that we can draw a clear conclusion that intermarriage helps immigrants to be better involved in the host country's labour market, thus narrowing the income gap between immigrant and native-born. But exceptions always exist. Kantarevic

(2004) used 1970 and 1980 U.S. census data and found that intermarriage can bring immigrants about a 2.5% wage premium compared to being married to an immigrant. However, this premium vanished after the researchers considered that marriage is an endogenous factor for earning ability. This can be explained by the fact that intermarried immigrants are positively selected while non-intermarried immigrants are negatively selected. Besides, Kantarevic (2004) also concluded that differences in the immigration populations, such as language ability and education between US and Australian immigrants, are the most important factors that accounted for the differences in the results.

Using similar data, Furtado and Theodoropoulos (2011) again drew a contradictory conclusion that networks are the component that enables immigrants to obtain better employment. In their study, they used the US census data of 2000 and hypothesized that marriage to natives helped immigrants' access to native social networks. By using ordinary least squares and instrumental variables frameworks, the paper found that marriage to a native indeed increases immigrant employment rates. Then the authors proposed "marriage-specific mechanisms" and indicated that citizenship right and the characteristics of the spouse cannot fully generate the premium brought by intermarriage. To clarify how intermarriage and networks facilitate immigrant's employment, the paper showed that the premium brought by intermarriage is larger in the following conditions: 1) when the employment gap between natives and immigrants is large; 2) when immigrants are less educated; and 3) when immigrants do not have a large community that belongs to the same ethnic group. Those hypotheses were established by the data and generated a convincing conclusion that networks help explain how marriage increases immigrant's employment

opportunities. The authors also gave an explanation for their contradiction with Kantarevic (2004)'s study in that intermarriage can help low-wage workers more than high wage workers.

Apart from English speaking countries, scholars also studied the issue in other countries such as France. Meng and Meurs (2004) studied how intermarriage affects the process of economic assimilation in France using a survey conducted by INSEE (National Institute of Statistics and Economic Studies) and INED (National Institute of Demographic Studies) for 1992. They found that immigrants who intermarried can earn between 27% and 36% more than those who are married to non-natives. Besides, the benefit brought by marrying native-born is larger for African immigrants (who usually speak French better) than non-African immigrants and this indicates that better language skills can help immigrants get more premiums from intermarriage.

Adserà and Ferrer (2014) analyzed Canadian immigrant women's labour market behaviour using Canadian census data from 1996 through 2006. The result contradicts the common sense view as they showed that immigrant women married to native-born males had a flatter assimilation rate than those married to immigrant males. However, after taking education into account, the paper found that highly educated immigrant women assimilated faster than immigrant women with a low level of education. We can draw a conclusion from this research that marriage is not as important as education for immigrant women to integrate into the labour market of the host country.

To sum up, how intermarriage influences the accumulation of immigrants' human capital is still a debated topic that needs to be further studied. The past results indicate that

there are a lot of unknown mechanisms behind the interaction between immigrant's labour

market behaviour and marriage choices. Besides, in the past literature, Canadian immigrants

are rarely studied. Thus, it is worthwhile to evaluate how marriage influences Canadian

immigrants' career development.

3. Analytical Framework---Data and model specification

3.1 Data and variables

This paper uses data obtained from the 2011 General Social Survey (GSS) which

includes information on the birthplace of respondents' spouses, whether they were born in

Canada or in a foreign country. The total sample size is 22,435 individuals but the study is

only going to focus on those who participated in the labour force. Thus I dropped the

observations whose age is less than 18 or more than 65. As the survey provides information

on respondents' total income and not specifically on their wages, I dropped those individuals

who reported that their income was not mainly from wages (57.8% of whole sample claims

that their income comes from employment). Those who had a zero or a negative income in

2010 are also dropped. In this way, income is considered as the main indicator to evaluate the

degree of success in the labour market. After removing individuals with incomplete

observations, these exclusions leave us with a total 10,235 valid observations.

Table A1 in the appendix describes all the variables used in the analysis. The earnings

variable *(Lgincome)* represents respondents' annual income from the labour market in 2010.

Since the General Social Survey gives income in 5,000 dollar groups only, I took the

midpoint of each group. For the group reported having more than $100,000 annual income, I used $110,000 to approximate their wages. I also used $120,000 and $150,000 instead of $110,000 to estimate the income of that group and the results are robust to that change in assumption. As it is commonly done, I take the natural logarithm of the income for the analysis of the regression results.

As marital status and immigration status are the main issues that the paper focuses on, I generate a series of dummy variables so as to sort out the effect of marital status' influence on immigrants' and native-born workers' capability to earn wages in the labour market. First of all, they are divided in two groups: whether they are single or married. In a more detailed classification, I define six dummy variables to indicate marital status and origin of the spouse. People who never married and are currently not in a marriage status are defined as single (it excludes common law). They are further divided into two groups according to their immigrant status; those include single native-born (the reference group) and single immigrants (*singimm*). The legally married people and those living common law are considered as married. They are divided into four groups according to their own and their spouse's immigrant status. These four groups who are: native-born who is married to native-born in Canada (*nativenativ*); native-born whose spouse is an immigrant *(nativeimm)* ; immigrant married to a native-born (*immnati*); and immigrant whose spouse is also an immigrant (*immimm*). Here I defined immigrant as individuals whose birthplace is not Canada. I set single native-born as the reference group.

For the immigrants, I generate another variable for the number of years since immigration to evaluate their experience in Canada (*imyoit*). This is defined as follows: current age minus

age at landing. The longer the time spent in the host country, the more one can accumulate

human capital. For the native-born, this variable is set to zero. Furthermore, since the

regressions include dummy variables for immigrants, I subtract 10 years from the number of

years since immigration in order to evaluate the effects of immigration after 10 years in

Canada instead of at entry. This is more relevant given the focus on marital status of this

paper, and it does not change the coefficients of years since immigration.

In addition to the influences brought by immigration and marriage, human capital

characteristics such as education, language ability and age are included in the model.

Moreover, gender and the length of working time can influence one's earnings and thus are

also included in the model.

The education variables derived from the codebook include five groups. The highest level

is a graduate degree such as masters or PhD *(educ1)*; the second group is holding a bachelor

degree (*educ2*); the third group is partial university or community college education (*educ3*);

and the fourth group is high school diploma (*educ4*) and the last group is basic elementary or

no degree. The group with the lowest level of education is set as reference group.

Another important variable is age, which can be obtained directly from the code book and

the paper is going to use age when the respondent took the first interview (*Agec*). Age is a

proxy for experience and age square (*agec2*) is also included. Also, gender is an important

criterion in the labour market, especially as this paper is focusing on family structure.

Language ability is a key asset for immigrants' human capital. As the survey only offers

information on respondents' childhood language, thus I assume that the people who cannot

handle one of the official languages in their childhood time will face obstacles in the labour

market. Thus I generate a dummy variable (*nolanguage*) equal to unity to indicate inability during childhood in the official Canadian languages (English or French).

The model also takes account of visible minority as an indicator of respondents' performance in labour market. Here I generate a dummy equal to unity if a person belongs to visible minority and zero for a non-visible minority person (*vm*).

The paper includes geographic variables by dividing Canada into five regions. The first area is the Atlantic Provinces which include the provinces of New Brunswick, Prince Edward Island, Nova Scotia, and Newfoundland and Labrador. Thus, I generated a dummy that equals one for the people live in the Atlantic area and that equals zero if they live elsewhere (*Ata*). Following the same logic and method, the paper considers residents in Alberta, Saskatchewan and Manitoba as having similar characteristics and sets them into the second group to define the Central provinces (*middle*). The residents of the provinces of British Columbia (*Bc*) and Quebec (*Qubr*) will be set into the third and fourth groups respectively. Ontario residents are set as the reference group.

The amount of time that people work is related to one's wage and also a good indicator of how involved one is in the labour market. The codebook offers statistics that shows the number of weeks and the number of hours in a week that one worked in the past 12 months. I take the natural logarithm of these two statistics as independent variables (*lnwkwe* and *lnwkhr*).

3.2 Model specifications

As the paper focuses on how marital status and immigration status influence earnings, I start with a specification that includes only these two variables to see the raw effect on earnings. I do this for the total population and for males and females separately.

$$\ln W = \alpha_0 + \alpha_1 Married + \alpha_2 Immigrant \quad \text{(Specification-1)}$$

where $\ln W$ is the natural logarithm of respondent's annual earnings. The two repressors are the marriage dummy and the immigrant dummy.

After deriving a rough conclusion from this simple specification, I explore how the origin of the spouse influences earnings. The second specification adopted by the paper is shown below.

$$\ln W = \alpha_0 + \alpha_1 singimm + \alpha_2 nativeimm + \alpha_3 nativenativ + \alpha_4 immimm + \alpha_5 immnati ,$$

$$\text{(Specification-2)}$$

where the variables *singimm, nativeimm, nativenativ, immimm* and *immnati* were defined earlier.

As for the next part, the paper adopts a more complete specification to formalize the earnings for Canadian and immigrant workers.

$$\ln W = \alpha_0 + X\beta + \alpha_1 Married + \alpha_2 Immigrant , \text{(Specification-3)}$$

where X is a vector of the independent variables that were described earlier. In this specification, I consider the net effects brought by marital status and immigration identity, without taking account of the origin of the spouse.

In the next specification, I include all the human capital variables mentioned earlier and the detailed marital status indicators. By adopting the following model, the paper tries to derive a comprehensive interpretation of the effects brought by different kinds of marriages.

$$\ln W = \alpha_0 + X\beta + \alpha_1 singimm + \alpha_2 nativeimm + \alpha_3 nativenativ + \alpha_4 immimm$$
$$+ \alpha_5 immnati \quad \text{(Specification-4)}$$

Also, as females and males are involved into the labour market differently, the paper is going to estimate the model for the total sample and for each gender separately. According to Nakosteen and Zimmer (1987) and Korenman and Neumark (1991), the premium brought by marriage can be different for males and females.

In the final specification, following the work of Adserà and Ferrer (2014), I interact the assimilation effects for immigrants with the identity of the spouse, as they are in the fourth specification, to see if the origin of the spouse affects the rate at which immigrants assimilate.

$$\ln W = \alpha_0 + X\beta + \alpha_1 singimm + \alpha_2 nativeimm + \alpha_3 nativenativ + \alpha_4 immimm$$
$$+ \alpha_5 immnati + \alpha_6 \, assiimmimm + \alpha_7 \, assiimmnati , \text{(Specification -5)}$$

Under this specification, *assiimmimm* is the assimilation variable for immigrants that married with immigrants and *assiimmnati* is the assimilation variable for immigrants that married with natives. I generated these two new variables by multiply *immimm* and *immnati* with the years of immigration separately. By adopting this specification for female and male workers respectively, I try to investigate further how the family investment model can help explain the effect of marriage.

3.3 Descriptive statistics

Table 1 shows that the total number of the observations is 10,235. Out of those, 5,061 are males and 5,173 are females. From the statistics we can also see that women earn less than men on average. The means of the marriage and immigrant dummy variables show the proportions of married and immigrants in the whole sample. The proportion married and the proportion of immigrants are slightly higher among women.

From the table, we can tell that the average age is 43.4 years in our sample. Table 2 shows that, among the whole sample, 1,597 are immigrants and 8,638 are born in Canada. The average annual income of my sample is $53,531. Table 1 shows that there is an income gap between female and male workers as the males' annual income is $61,199 and females' annual income is $46,026. However, Table 2 shows that the income gap is not as large between immigrants and non-immigrants.

As for the human capital variables, the first education group indicates the highest level of education. According to Table 1, on average females have a higher level of education than males, as the means for the first and second education levels are higher than for males. Table 2 also shows that immigrants have a higher proportion of visible minorities than the native-born, which is consistent with our common knowledge.

For the marital status variables, the means indicate the percentages of the sample that are involved in a certain kind of marriage. Marriage between native people is the most popular among the sample as 50.6% of the respondents belong to that category. Only 3.7% of the people in the sample are immigrants that are married to Canadian born. However, Table 2 shows that 60% of the native-born are married with another native-born. The same thing is

observed for immigrants, as 48% of them are married to other immigrants.

Table 1-Variables means by gender (see Table A1 in appendix for the definitions of the variables)

Variable	Female Mean	Male Mean	All Mean
Lgincome	10.51	10.84	10.68
income	46,026	61,199	53,530
educ1	0.313	0.262	0.288
educ2	0.345	0.319	0.332
educ3	0.143	0.161	0.152
educ4	0.137	0.152	0.144
nolanguange	0.127	0.141	0.134
Agec	43.43	43.28	43.35
agec2	2027	2022	2024
lnwkwe	3.834	3.834	3.834
lnwkhr	3.527	3.732	3.629
Vm	0.0936	0.102	0.0977
Ata	0.178	0.171	0.174
middle	0.258	0.277	0.267
Bc	0.111	0.105	0.108
qubr	0.188	0.186	0.187
imyoit	1.988	2.130	2.058
singimm	0.0493	0.0399	0.0447
nativeimm	0.0361	0.0429	0.0395
nativenativ	0.499	0.512	0.506
immimm	0.0611	0.0885	0.0746
immnati	0.0340	0.0395	0.0367
Married	0.683	0.630	0.657
Immigrant	0.168	0.144	0.156
N	5,173	5,062	10,235

Table 2- Variables means for the immigrants and native-born (see Table A1 in appendix for the definitions of the variables)

	Immigrants	Native-born
Variable	Mean	Mean
Lgincome	10.65	10.68
income	52,785	53,668
educ1	0.435	0.260
educ2	0.272	0.343
educ3	0.120	0.158
educ4	0.0971	0.153
nolanguange	0.631	0.0416
Agec	44.98	43.05
agec2	2157	2000
lnwkwe	3.831	3.834
lnwkhr	3.625	3.630
vm	0.492	0.0248
ata	0.0551	0.196
middle	0.229	0.274
bc	0.159	0.0986
qubr	0.117	0.200
imyoit	13.19	0
singimm	0.286	0
nativeimm	0	0.0468
nativenativ	0	0.599
immimm	0.478	0
immnati	0.235	0
N	1,597	8,368

4. Empirical results and interpretations

4.1 Raw differentials by immigration and marital status

According to the first specification, we derive how marriage and immigration status are related to one's labour market performance without considering any other influence. The results are shown below in Table-3

Table 3-Raw earnings differences by immigration and marital status			
	(1)Male	(2)Female	(3)All observation
	lgincome	*lgincome*	*lgincome*
married	0.791^{***}	0.423^{***}	0.619^{***}
	(23.50)	(11.67)	(25.04)
immigrant	-0.0954^{***}	-0.102^{**}	-0.0918^{***}
	(-2.90)	(-2.33)	(-3.44)
constant	10.23^{***}	10.14^{***}	10.34^{***}
	(327.00)	(305.24)	(-17.03)
R^2	0.2289	0.0601	0.1736
N	5,062	5,173	10,235

t statistics in parentheses

$^{*} p < 0.10,$ $^{**} p < 0.05,$ $^{***} p < 0.01$

Marriage increases the wages of males by a large amount. However, immigration identity brings a negative effect as an immigrant male earns 9.5% less than non-immigrants. The results for females are similar to those of men. Marriage is a positive criterion while immigrant identity is still a disadvantage for females. However, the advantage brought by marriage is smaller for females than that for males. Immigration identity brings a slightly larger disadvantage for females than for males. The different effects among males and females will be further explored in the next specifications. My results are consistent with the studies of Nakosteen and Zimmer (1987) and Korenman and Neumark (1991), who indicate that marriage brings different premiums for males and females.

Next, I extend the marriage and immigration variables by including spouse's immigration identity in specification -2. The natural logarithm of respondent's annual earnings is regressed on the five marital status variables, with single natives as the reference category. The results are shown in Table 4.

Table 4-Raw earning differences by immigration status, marital status and origin of the spouse (reference: single native)

	(1)Male lgincome	(2)Female lgincome	(3)All observation lgincome
Singimm	-0.103	-0.0607	-0.0826
	(-1.05)	(-0.65)	(-1.20)
nativeimm	0.865***	0.502***	0.696***
	(18.79)	(7.08)	(16.96)
nativenativ	0.782***	0.427***	0.615***
	(22.13)	(10.94)	(23.39)
immimm	0.637***	0.251***	0.468***
	(14.28)	(3.82)	(12.55)
immnati	0.863***	0.444***	0.672***
	(15.70)	(5.82)	(14.69)
female			-0.336***
			(-17.07)
Constant	10.23***	10.13***	10.34***
R^2	0.2321	0.0621	0.1758
N	5,062	5,173	10,235

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

First of all, the marital status of single immigrant and single native males' cannot bring statistical significant effects to one's earning ability. Natives who are married to immigrants and to other native-born gain a significant positive premium compared to the single ones. Among the immigrants, those who are married to natives earn substantially more than those who marry immigrants. In this specification, the premium brought by intermarriage is quite important as the earnings of immigrants who intermarried are similar to those of natives.

Consistently with the first specification, the benefit brought by marriage is smaller for

females than for males. Native women who are married with immigrant men are those who earn the most compared to single natives. Immigrant females who intermarried can earn 19.3% more than immigrants who chose endogamous marriage. Moreover, female immigrants that intermarried can earn slightly more than those in couples who are both natives. Similarly with the model for males, there is no statistical significant coefficient detected for single immigrants and their earnings.

For the specification that includes all the observations, natives who are married with immigrants can earn the most among all of the marital statuses. Immigrants who are married with immigrants only earn 46.8% more than the single natives. Again, there is no significant effect for the single immigrant.

4.2 Regression controlled wage differentials

After a rough estimation from previous specifications, the paper is going to borrow Meng and Gregory (2005)'s model which includes human capital variables and other characteristics. The coefficients of marital status and immigration status for specification-3 are shown in Table 5. The complete regression results are in Appendix Table A2.

Table 5- Regression-controlled differences for immigration and marital status			
	(1)Male	(2)Female	(3)All observation
	lgincome	*lgincome*	*lgincome*
married	0.243***	0.0548**	0.145***
	(10.12)	(2.33)	(8.77)
immigrant	-0.241***	-0.317***	-0.277***
	(-4.75)	(-5.21)	(-7.06)
Female			-0.266***
			(-17.26)
Constant	4.722***	4.125***	4.489***
R^2	0.5543	0.5125	0.5507
N	5,062	5,173	10,235

t statistics in parentheses

$^* p < 0.10,$ $^{**} p < 0.05,$ $^{***} p < 0.01$

Complete regression results are in Appendix Table A2. The regressions control for education, language, age, weeks and hours worked, visible minority, region and the number of years since immigration. The coefficient for immigrants indicate the earning gaps after 10 years in Canada.

After adding up the human capital variables and comparing the results with the raw differences, marriage still generates positive results for a male worker's earning potential while immigration identity is still a negative factor. The married males can earn 24.3% more than those who are single. The number is smaller than that of the raw difference. This is because human capital helps explain part of the benefit brought by marriage. Furthermore, immigrant identity decreases one's earning ability by 24.1%, which is higher than that in the first specification. This is related to the fact that immigrants have better human capital attributes, especially education, than native-born, as was shown earlier in Table 2.

As for females, when the human capital variables are added to the model, the coefficient of the marriage term becomes much smaller but still significant. Similarly to males, the negative effect brought by immigration identity increased from 10.2% to 31.7%. We can draw a conclusion that immigrant identity brings more negative effects to females than to

males.

Consistent with the results for the previous subsamples, the specification with all the observations shows a decreasing premium brought by marriage and an increasing adverse impact brought by immigration identity. Specifically, married people can earn 14.5% more than those who are single. Immigrants can only earn 27.7% less than non-immigrants. Females earn 26.6% less than males.

As for other human capital variables shown in Table A2, a higher education generates a positive effect towards one's earning ability. Specifically, education brings larger premium for females than that for males. The premium brought by education diminishes as the level of education decreases. Apart from education, the regressions also detected a statistically significant positive relationship between workers' earnings and their age, hours of work, weeks of work, and years of immigration for the immigrants only.

In specification-4, I decompose the marriage effect using 5 dummy variables which indicate the origin of the spouse in relation to immigration identity. The results for the coefficients of those variables are shown in Table-6 and the complete regression is in Appendix Table A3.

Table 6-Regression controlled earning differences by immigration status, marital status and spouse identity (reference: single native)

	(1)Male	(2)Female	(3)All observation
	lgincome	*lgincome*	*lgincome*
Singimm	-0.244***	-0.254***	-0.250***
	(-2.91)	(-3.22)	(-4.29)
nativeimm	0.234***	0.0897*	0.156***
	(6.74)	(1.89)	(5.44)
nativenativ	0.244***	0.0702***	0.153***
	(9.78)	(2.96)	(8.95)
immimm	-0.0364	-0.278***	-0.157***
	(-0.67)	(-3.79)	(-3.54)
immnati	0.0795	-0.273***	-0.0913*
	(1.29)	(-3.22)	(-1.78)
Female			-0.266***
			(-17.30)
Constant	4.721***	4.112***	4.482***
R^2	R^2	0.5129	0.5510
N	5062	5173	10235

t statistics in parentheses

$^* p < 0.10,$ $^{**} p < 0.05,$ $^{***} p < 0.01$

Complete regression results are in Appendix Table A3. The regressions control for education, language, age, weeks and hours worked, visible minority, region and the number of years since immigration. The coefficients for immigrants indicate the earning gaps after 10 years in Canada.

First of all, the regression shows a statistically significant negative result for single immigrant males, indicating that single immigrants earn 24.4% less than single native-born. Compared to the results from specification-2 in Table 4, the negative effect brought by immigration effect is much larger when controlling for human capital. It reflects the fact that immigrants have more human capital than natives. Moreover, as in the specification showing the raw differences, marriage brings positive effects towards male workers' earning ability and immigration identity brings a negative effect. More specifically, a married native male can earn around 24.4% more than his single counterpart if his wife is native. A similar 23.4% premium is realized if a native male is married to an immigrant woman. The coefficients for

married immigrant males are insignificant.

The regression results for females are slightly different from those for males. Single immigrant females earn 25.4% less than native-born females. This is also larger than that in the second specification. The positive effects brought by marriage towards female native-born are less than what marriage brought to males. Native-born who married immigrants earn 9.0% more than those who are single and native-born. As for native-born who married natives, marriage brings a premium of 7.0%. At the same time, unlike for males, marriage does not bring positive effects for female immigrants. The regression results shows that immigrant females who married to immigrants will earn 27.8% less than single native females. At the same time, perhaps contradicting the previous literature on family investment model, intermarriage does not appear to bring a significant benefit for female immigrants. Intermarried females still earn 27.3% less than single natives. Unlike for males, the coefficient of intermarriage for females is statistically significant.

The last column shows the results for both genders and adds an extra gender dummy which is equal to one for a female. Single immigrants are the least competitive participator in the labour market as they earn 25.0% less than single native-born. Marriage brings benefit to immigrants as those married to natives will earn 15.9% more than their single counterparts. (Subtract the coefficient of *immnati* to that of *singimm*). At the same time, marriage between immigrants also brings a premium of 9.3% compared to single immigrants. (Subtract the coefficient of *immimm* to that of *singimm*) The coefficient of intermarriage is not statistically significant at the 5% level. However, compared to single natives, the premium brought by intermarriage and endogamous marriage cannot offset the negative effect due to immigration

identity. Native-born who are respectively married with an immigrant and with a native will earn 15. 6% and 15.3% more than single natives. Consistently with previous literature in other countries, as females earn 26.6% less than males, a gender bias exists in the Canadian labour market.

To conclude, compared to males, marriage generates less positive effects for both native and immigrant female workers. For male immigrant workers, there is no statistically significant relationship between their marriage choice and earning ability. At the same time, female immigrants who intermarried and married immigrant males have the same earnings. Being single is the best choice for immigrant females to be competitive in the labour market. For the whole sample, a significant negative coefficient is being detected only for immigrants married to immigrants.

4.3 Regressions with different assimilation rates

Based on the previous regression results, intermarriage does not bring significant benefits to immigrants. As this result may contradict Mincer (1978)'s family investment model, I will further explore if the assimilation rate of female immigrants differs by the origin of the spouse, as Adserà and Ferrer (2014) found. Therefore, interactions between assimilation rate and origin of the spouse are added for the married immigrants. They are the variables "*assiimmimm*" and "*assiimmnati*" in Table 7. Table A4 of the appendix has the complete results.

Table 7- Regression controlled earning differences by immigration status, marital status and spouse identity (reference: single native) with different assimilation rates for married immigrants

	(1)Male	(2)Female	(3)All observation
	lgincome	*lgincome*	*lgincome*
singimm	-0.285***	-0.319***	-0.310***
	(-2.67)	(-3.56)	(-4.41)
nativeimm	0.237***	0.0910*	0.158***
	(6.83)	(1.91)	(5.52)
nativenativ	0.247***	0.0720***	0.156***
	(9.91)	(3.03)	(9.10)
immimm	-0.0377	-0.282***	-0.157***
	(-0.69)	(-3.46)	(-3.35)
immnati	0.139*	-0.141	0.00202
	(1.82)	(-1.29)	(0.03)
assiimmimm	-0.00414	-0.00628	-0.00623*
	(-0.77)	(-1.26)	(-1.70)
assiimmnati	-0.00762	-0.0142***	-0.0115***
	(-1.30)	(-2.67)	(-2.89)
F-test for equality of assimilation rates	0.86	2.66	3.05
Prob > F	0.3545	0.1033	0.0808
R^2	0.5553	0.5144	0.5519
N	5062	5173	10235

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Complete regression results are in Appendix Table A4. The regressions control for education, language, age, weeks and hours worked, visible minority, region and the number of years since immigration. The coefficients for immigrants indicate the earning gaps after 10 years in Canada.

The assimilation effects for male immigrants are not statistically different from those of the single immigrants. The absolute values of the coefficients are smaller than 0.001 and thus have little effect on earning ability. An F-test shows that there is no statistically significant different between the assimilation rates for immigrant males married to natives and those married to immigrants. Thus, we can drive a valid conclusion that marriage does not affect assimilation for male immigrant's earning ability.

Things are little bit different for females. The assimilation rate for immigrant females married to natives is -1.41% lower than that of single immigrants, while the number for those married to immigrants is only -0.63% lower . An F-test shows that these two coefficients are statistically different at the confidence level of 10%. Those results are consistent with Adserà and Ferrer (2014). In the family investment model proposed by Mincer (1978), one possible interpretation could be that immigrant women who are married with immigrants need to initially take a low wage job so as to support their family. However, the low initial wage is compensated by a higher assimilation rate. On the other hand, following previous descriptive statistics, immigrants have a higher education than native-born. For instance, 42.9% of the immigrant females have a graduate degree while the number is only 29.3% for native-born women. According to Adserà and Ferrer (2014)'s latest explanation, it is the high education of immigrant women that helps them to assimilate faster in spite of a low initial wage.

As for the whole sample, the assimilation rate for those in an endogamous marriage is higher than that of those who intermarried. Because of the female workers, the coefficient for both of the assimilation variables are statistically significant. An F-test also shows that those two coefficients are significantly different from each other.

In conclusion, by allowing different assimilation rates into the model, we can say that family structure is more important for females than for males. Female immigrants need to support their family by taking a low wage job as a start. But their education advantage helps them to assimilate faster.

5. Conclusion

To investigate how marriage influences the Canadian immigrants' labour market behavior, this paper used data collected by the General Social Survey (2011). The paper proposed five specifications to derive empirical results on how earning ability is influenced by marriage situation and immigration identity.

After the empirical study, the paper generates the following conclusions:

1) Marriage can bring positive effects towards one's earning ability. However, the premium brought by marriage is different for males and females. Compared to males, females gain less from marriage. This finding is similar to what was found in the previous literature.

2) Immigration identity brings negative effects on earning ability.

3) Intermarriage does no bring significant benefits to immigrant workers. Specifically by gender, there is no statistically significant relation between male immigrants' earning ability and their intermarriage choice. As for females, single immigrant women can earn more than those who married. Intermarriage and endogamous marriage does not bring a premium for their earning ability. When I combine both genders, a negative effect is detected for immigrants' endogamous marriage.

4) The results also indicate that people's earning ability increases with the level of education. The length of working time and immigrants' years since immigration are also positively correlated with earnings.

5) Immigrant females in endogamous marriages have a higher assimilation rate than those who intermarried. Based on Adserà and Ferrer (2014)'s study and Mincer

(1978)'s family investment model, the paper derives a conclusion that married

immigrant females may need to accept lower wages to support the family when they

arrive, but that their education is the key criterion that helps them catch up.

Appendix

Table A1-Variable descriptions	
Lgincome	Logarithms of labour market income in the year previous to 2011
educ1	Dummy variable indicating having a graduate university degree such as masters or Ph.D. (reference: no degree)
educ2	Dummy variable indicating having a bachelor university degree (reference: no degree)
educ3	Dummy variable indicating having a college degree (reference: no degree)
educ4	Dummy variable indicating having a high school diploma (reference: no degree)
nolanguange	Dummy variable indicating that one does not have an official language as a childhood language
Agec	The age of respondent when they took the first interview
agec2	The square of age when they took the first interview
lnwkwe	Logarithms of the total weeks worked in the previous year
lnwkhr	Logarithms of the total hours worked in a week
Vm	Dummy variable indicating visible minority
Ata	Dummy variable indicating that one lives in the Atlantic Provinces (reference: Ontario)
middle	Dummy variable indicating that one lives in one of the three province of Manitoba, Saskatchewan and Alberta (reference: Ontario)
Bc	Dummy variable indicating that one lives in British Colombia (reference: Ontario)
Qubr	Dummy variable indicating that one lives in Quebec (reference: Ontario)
imyoit	The number of years since of immigration of immigrants minus 10, so that the effect of immigration dummy variables is evaluated after 10 years of immigration (this term is equal to 0 for the native-born)
singimm	Dummy variable indicating that one is single immigrant (reference: single native-born)
nativeimm	Dummy variable indicating that one is native and married with an immigrants (reference: single native-born)
nativenativ	Dummy variable indicating that one is native and married with a native-born (reference: single native-born)
immimm	Dummy variable indicating that one is immigrant and married with an immigrant (reference: single native-born)

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Immnati	Dummy variable indicating that one is immigrant and married with a native-born (reference: single native-born)
assiimmimm	Assimilation variable for immigrants who are married with an immigrant(interaction between *imyoit* and *immnati*)
assiimmnati	Assimilation variable for immigrants who are married with a native-born (interaction between *imyoit* and *immimm*)

	(1)Male	(2)Female	(3)All observation
	lgincome	lgincome	lgincome

Table A2-Complete regression results with immigrant status and marital status

	(1)Male lgincome	(2)Female lgincome	(3)All observation lgincome
educ1	0.499***	0.721***	0.594***
	(13.06)	(16.40)	(20.23)
educ2	0.290***	0.391***	0.325***
	(7.89)	(9.04)	(11.43)
educ3	0.183***	0.262***	0.207***
	(4.29)	(5.29)	(6.31)
educ4	0.123***	0.187***	0.139***
	(2.95)	(3.88)	(4.37)
nolanguange	-0.0377	-0.0365	-0.0339
	(-1.00)	(-0.90)	(-1.22)
AGEC	0.104***	0.113***	0.109***
	(16.92)	(14.87)	(22.38)
agec2	-0.00110***	-0.00117***	-0.00114***
	(-15.49)	(-13.31)	(-20.30)
lnwkwe	0.340***	0.319***	0.335***
	(7.57)	(6.48)	(9.80)
lnwkhr	0.568***	0.627***	0.613***
	(12.43)	(17.53)	(21.37)
vm	-0.0602	-0.0714	-0.0652**
	(-1.53)	(-1.47)	(-2.12)
ata	-0.123***	-0.140***	-0.132***
	(-4.46)	(-4.38)	(-6.26)
middle	0.0915***	0.0886***	0.0899***
	(3.71)	(3.04)	(4.76)
bc	0.00813	0.0310	0.0243
	(0.25)	(0.80)	(0.95)
qubr	-0.106***	-0.0571**	-0.0814***
	(-4.14)	(-2.04)	(-4.31)
imyoit	0.0120***	0.0162***	0.0139***
	(6.63)	(7.43)	(9.84)
married	0.243***	0.0548**	0.145***
	(10.12)	(2.33)	(8.77)
immigrant	-0.241***	-0.317***	-0.277***
	(-4.75)	(-5.21)	(-7.06)
female			-0.266***
			(-17.26)
constant	4.722***	4.125***	4.489***
	(20.03)	(18.71)	(28.00)
R^2	0.5543	0.5125	0.5507
N	5,062	5,173	10,235

Table A3-Complete regression results with immigration status, marital status and origin of the spouse

	(1)Male	(2)Female	(3)All observation
	lgincome	*lgincome*	*lgincome*
educ1	0.498***	0.721***	0.592***
	(13.04)	(16.21)	(20.13)
educ2	0.289***	0.391***	0.324***
	(7.87)	(8.98)	(11.39)
educ3	0.181***	0.261***	0.206***
	(4.25)	(5.24)	(6.26)
educ4	0.124***	0.188***	0.140***
	(2.99)	(3.86)	(4.39)
nolanguange	-0.0271	-0.0329	-0.0283
	(-0.72)	(-0.80)	(-1.01)
AGEC	0.104***	0.112***	0.109***
	(16.81)	(15.03)	(22.39)
agec2	-0.00109***	-0.00117***	-0.00114***
	(-15.33)	(-13.43)	(-20.26)
lnwkwe	0.341***	0.321***	0.336***
	(7.56)	(6.70)	(9.90)
lnwkhr	0.567***	0.628***	0.613***
	(12.39)	(17.56)	(21.33)
vm	-0.0456	-0.0767	-0.0591*
	(-1.13)	(-1.56)	(-1.89)
ata	-0.126***	-0.140***	-0.133***
	(-4.53)	(-4.34)	(-6.26)
middle	0.0909***	0.0886***	0.0895***
	(3.68)	(3.04)	(4.74)
bc	0.00551	0.0304	0.0229
	(0.17)	(0.79)	(0.90)
qubr	-0.107***	-0.0567**	-0.0815***
	(-4.17)	(-2.01)	(-4.30)
imyoit	0.0113***	0.0163***	0.0135***
	(6.23)	(7.37)	(9.49)
singimm	-0.244***	-0.254***	-0.250***
	(-2.91)	(-3.22)	(-4.29)
nativeimm	0.234***	0.0897*	0.156***
	(6.74)	(1.89)	(5.44)
nativenativ	0.244***	0.0702***	0.153***
	(9.78)	(2.96)	(8.95)
immimm	-0.0364	-0.278***	-0.157***
	(-0.67)	(-3.79)	(-3.54)

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immnati	0.0795	-0.273***	-0.0913*
	(1.29)	(-3.22)	(-1.78)
female			-0.266***
			(-17.30)
Constant	4.721***	4.112***	4.482***
	(20.01)	(18.75)	(27.98)
R^2	0.5549	0.5129	0.5510
N	5,062	5,173	10,235

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A4-Complete regression results with immigration status, marital status and spouse identity, with different assimilation rates for married immigrants

	(1)	(2)	(3)
	lgincome	lgincome	lgincome
educ1	0.499***	0.717***	0.592***
	(13.09)	(16.33)	(20.24)
educ2	0.289***	0.389***	0.324***
	(7.90)	(9.01)	(11.44)
educ3	0.183***	0.259***	0.207***
	(4.31)	(5.27)	(6.34)
educ4	0.125***	0.185***	0.140***
	(3.01)	(3.84)	(4.42)
nolanguange	-0.0250	-0.0274	-0.0245
	(-0.66)	(-0.66)	(-0.88)
AGEC	0.103***	0.111***	0.108***
	(16.81)	(14.90)	(22.17)
agec2	-0.00108***	-0.00116***	-0.00113***
	(-15.34)	(-13.32)	(-20.07)
lnwkwe	0.339***	0.321***	0.335***
	(7.47)	(6.81)	(9.89)
lnWKWE	0.568***	0.626***	0.613***
	(12.40)	(17.52)	(21.32)
vm	-0.0435	-0.0819*	-0.0592*
	(-1.07)	(-1.67)	(-1.90)
ata	-0.127***	-0.139***	-0.133***
	(-4.55)	(-4.32)	(-6.28)
middle	0.0909***	0.0896***	0.0898***
	(3.68)	(3.07)	(4.75)
bc	0.00617	0.0300	0.0230
	(0.19)	(0.79)	(0.91)
qubr	-0.107***	-0.0577**	-0.0818***
	(-4.19)	(-2.06)	(-4.33)
imyoit	0.0156***	0.0232***	0.0198***
	(3.09)	(5.86)	(6.12)
singimm	-0.285***	-0.319***	-0.310***
	(-2.67)	(-3.56)	(-4.41)
nativeimm	0.237***	0.0910*	0.158***
	(6.83)	(1.91)	(5.52)
nativenativ	0.247***	0.0720***	0.156***
	(9.91)	(3.03)	(9.10)
immimm	-0.0377	-0.282***	-0.157***
	(-0.69)	(-3.46)	(-3.35)

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immnati	0.139[*]	-0.141	0.00202
	(1.82)	(-1.29)	(0.03)
assiimmimm	-0.00414	-0.00628	-0.00623[*]
	(-0.77)	(-1.26)	(-1.70)
assiimmnati	-0.00762	-0.0142[***]	-0.0115[***]
	(-1.30)	(-2.67)	(-2.89)
female			-0.267[***]
			(-17.33)
constant	4.742[***]	4.133[***]	4.508[***]
	(19.97)	(18.86)	(27.96)
R^2	0.5553	0.5144	0.5519
N	5,062	5,173	10,235

t statistics in parentheses

[*] $p < 0.10$, [**] $p < 0.05$, [***] $p < 0.01$

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