The male/female earnings gap and female self-employment[☆]

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Abstract

This paper examines the gender differences in the choice to become self-employed. Of particular interest is the relationship between the male/female earnings gap in wage and self-employment, and the male/female differences in the average predicted probability of self-employment. It has been argued that earnings inequality in wage-employment lead women to choose self-employment. However, it may be the case that inequality in the form of consumer discrimination causes an earnings gap between males and females in self-employment. If inequality is higher in self-employment than in wage-employment, then there would be females in wage-employment who would be in self-employment in the absence of inequality in both sectors.
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1. Introduction

It is observed in the US that the male/female earnings gap is larger in self-employment than in wage-employment. Devine (1994) showed that in 1990, the ratio of median female to male hourly earnings in wage and self-employment was 0.75 and 0.48, respectively.[1] It is also observed that the incidence of self-employment is much lower for females than males. Although males and

females share many common determinants in their wage versus self-employment decision, it has been found that there are notable gender differences as well. Boden (1996, 1999a), Carr (1996), Connelly (1992), and Hundley (2000) find that the probability of self-employment for females is positively associated with marriage and having young children, whereas for males they find no significant relationship. Some of the above authors have also suggested that self-employment is seen by males as a way to capture the benefits of extra work effort. Boden (1999a) revealed that 11.9% of males claimed that the main reason they became self-employed was for the money or because the money was better, compared to 6.6% for females.[2] Hundley uses some of these gender differences in the probability of self-employment to explain differences in the earnings between males and females in the self-employment sector. In his paper, he argues that females enter self-employment because it offers them the opportunity to choose their own hours, enabling them to perform their role as the primary worker at home and to perform market work. If there is a certain amount of time an individual must work before they produce any output, then hourly earnings of females in self-employment would tend to be lower than their male counterparts who spend more time in the market. Hundley hypothesizes that marriage and the number of young children increases the work load of females at home and thus indirectly lowers their productivity in market work.

In his empirical work, he finds that the ratio of female to male hourly earnings in both employment sectors are almost identical and close to one when comparing similar males and females who are single with no children.[3] If one is married with no children, then the ratio remains close to one in self-employment but falls to 0.88 in wage-employment. This is contrary to his hypothesis that females choose self-employment to accommodate increased home work because of marriage. However, in line with his hypothesis, an increasingly positive difference between the ratio in wage-employment and self-employment opens as one has more children. A drawback of Hundley's work is that he does not control for actual labor market experience. Since experience is probably negatively correlated with marriage and the number of children, the lower returns to marriage and children for females compared to males could be exaggerated in the wage and self-employment sectors.

This paper synthesizes the research on the male/female differences in the probability of self-employment and the male/female differences in the earnings in wage and self-employment. Using the Canadian Survey of Labour and Income Dynamics (SLID) in 1994, the log hourly earnings gap in wage and self-employment are decomposed into the portion explained by differences in the endowment of productivity related variables and the residual—the portion explained by differences in the returns to these endowments. The residual portion of the earnings gap can be attributed to many things. As hypothesized by Hundley, differences in non-market productivity that cause one gender to specialize more in non-market work may be the cause. Alternatively, the residual gap could be explained by other unmeasured differences in productivity or differences in the reporting of earnings or hours worked between the sexes. This paper considers the effect of misreporting of hours worked and specialization in non-market activities in explaining the earnings gap in both employment sectors.

Using the coefficients from the earnings equations, the expected earnings differential between self and wage-employment is then calculated and used in the estimation of structural probit equations for male and female self-employment choice. In this way, the direct effect of individual

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[2] Boden (1999a) uses data from the Contingent Worker supplement of the February 1995 CPS.
[3] He uses the final wave in 1986 of the National Longitudinal Study of the High School Class of 1972 and the Panel Study of Income Dynamics in 1989.

characteristics on self-employment choice can be distinguished from the indirect effect of these characteristics through expected earnings. The causes of the male/female difference in the average probability of self-employment are then investigated. Male/female differences in individual characteristics, in the coefficients of the structural probit, and in the coefficients of the earnings equations are all considered. The latter case is of particular interest because the portion of the earnings gap explained by the differences in the returns to endowments is often attributed to discrimination. Since the nature of the discrimination in each of the sectors is not the same – wage-employed females may face employer discrimination and self-employed may face consumer discrimination as described in Becker (1971) and Borjas and Bronars (1989) – the impact of discrimination on earnings in both sectors could potentially be quite different. Thus, the different levels of discrimination across sectors could explain the low female self-employment rate. If discrimination against females is higher in self-employment than in wage-employment, then there would be females in wage-employment who would be in self-employment in the absence of discrimination in both sectors. In this case, pay and employment equity legislation, while lessening discrimination in wage-employment, would increase the number of females misallocated to wage-employment.[4]

While discrimination in wage-employment is well documented, the meaning of discrimination in self-employment is less clear. As mentioned above, one possible source of discrimination in self-employment is consumer or buyer discrimination. Individuals may simply dislike buying goods or services from females. Although Borjas and Bronars (1989) suggest consumer discrimination in the context of racial differences, the United States Small Business Administration (1995) suggests that consumer discrimination based on gender differences exists as well. The credit market may also be a source of discrimination in self-employment as banks may be less willing to give loans to self-employed females. Less access to capital would limit the size and the success of female owned businesses. Empirical evidence on such discrimination is mixed. Lee-Gosselin and Grise (1990) find that 38% of female business owners in their study feel their gender was related to obstacles they faced in dealing with their customers, suppliers and banks. Furthermore, Riding and Swift (1990) find that there are gender differences in the terms of the loans made available by banks. On the other hand, Fabowala et al. (1995) show that after controlling for business related factors gender differences in the access to credit disappear.

The effect of relative earnings between self and wage-employment on self-employment choice has been studied before by Rees and Shah (1986), Fujii and Hawley (1991), Bernhardt (1994) and Simpson and Sproule (1998). However, the first three concentrate solely on men and hence do not study the difference in the determinants of self-employment choice between genders. The latter does consider females and uses the SLID as well, but they use annual earnings in their regressions, do not consider the impact of the misreporting of hours worked and do not allow the presence of young children to affect earnings.

In this paper, it is found that the male/female log hourly earnings gap in Canada is larger in self-employment than in wage-employment. After controlling for labor market experience, one-third to two-fifths of the earnings gap in self-employment can be attributed to differences in the returns to the presence of young children. Overall, the decomposition of the gaps into the explained and unexplained portion yields the result that in most cases the explained portion is larger in self-employment than in wage-employment. Therefore, if females were paid according

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[4] Boden (1999b) examines how gender inequality in wage earnings affect women's decision to switch from wage to self-employment. However, he does not consider gender inequality in self-employment earnings.

to the male's earnings function in both wage and self-employment, female wage-employment earnings would rise more than female self-employment earnings and the average probability of female self-employment would decline. Since differences in individual characteristics account for only one-quarter to two-thirds of the gap in the average predicted probability of self-employment between males and females, it is the male/female differences in the way the probability of self-employment responds to changes in individual characteristics that is responsible for the gap.

2. Econometric framework

The model presented here is based on Rees and Shah (1986). Men and women are either in wage-employment or self-employment. The earnings in each sector are given by:

$$\ln Y_i^{\mathrm{w}} = \alpha_0^{\mathrm{w}} + \alpha_1^{\mathrm{w}} D_i + \alpha_2^{\mathrm{w}} X_i + \varepsilon_i^{\mathrm{w}}, \tag{1}$$

$$\ln Y_i^{\mathrm{s}} = \alpha_0^{\mathrm{s}} + \alpha_1^{\mathrm{s}} D_i + \alpha_2^{\mathrm{s}} X_i + \varepsilon_i^{\mathrm{s}}, \tag{2}$$

where Y_i^{w} and Y_i^{s} are the earnings of an individual in wage-employment and self-employment, respectively; X_i is a determinant of earnings in each sector, D_i is a dummy variable that equals 1 if the individual is female and 0 otherwise, and $\varepsilon_i^{\mathrm{w}}$ and $\varepsilon_i^{\mathrm{w}}$ are normal disturbance terms with zero mean and constant variance. The coefficients on D_i are used to capture the difference in the earnings functions between males and females in each sector.[5] Given these levels of earnings, individuals choose between self and wage-employment. The net benefit of working in self-employment is, S_i^*, is given by:

$$S_i^* = \psi_0 + \psi_1 D_i + \psi_2 X_i + \psi_3 (E[\ln Y_i^{\mathrm{s}}] - E[\ln Y_i^{\mathrm{w}}]) + \psi_4 Z_i^{\mathrm{s}} + u_i, \tag{3}$$

where Z_i^{s} is a variable that affects the choice of employment sector through channels unrelated to earnings and u_i is an normal error term with zero mean and constant variance. If $S_i^* > 0$, then the worker chooses to be in self-employment, otherwise he chooses wage-employment. If all the explanatory variables in (3) are known, the coefficients can be estimated using a probit model. Substituting the expected value of (1) and (2) into (3) yields the reduced form version of the employment mode decision.

$$S_i^* = \psi_0 + \psi_3(\alpha_0^{\mathrm{s}} - \alpha_0^{\mathrm{w}}) + (\psi_1 + \psi_3(\alpha_1^{\mathrm{s}} - \alpha_1^{\mathrm{w}}))D_i + (\psi_2 + \psi_3(\alpha_2^{\mathrm{s}} - \alpha_2^{\mathrm{w}}))X_i$$
$$+ \psi_4 Z_i^{\mathrm{s}} + u_i. \tag{4}$$

When the reduced form probit is estimated, ψ_2, the effect on the probability of self-employment of individual characteristic X_i, cannot be distinguished from the indirect effect of the characteristic through the difference in earnings, $\psi_3(\alpha_2^{\mathrm{s}} - \alpha_2^{\mathrm{w}})$. Likewise, the effect of different coefficients on the female indicator variable in the earnings equations cannot be examined by estimating the reduced form self-employment choice probit because the effect of different intercepts, $\psi_3(\alpha_1^{\mathrm{s}} - \alpha_1^{\mathrm{w}})$, cannot be distinguished from the effect of females selecting into self-employment for reasons unrelated to earnings, ψ_1. In order to distinguish the direct effect of various characteristics on the probability of self-employment and to obtain a measure of the impact of the different coefficients on the female indicator variable in the earnings equations, estimates of coefficients in the earnings Eqs. (1) and (2) must be obtained and the probit model implied by (3) estimated.

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[5] In general, there could be more than one determinant of earnings in each sector and D_i could be interacted with some or all of them. However, a simple case is presented for ease of explication.

There are, however, two problems associated with the estimation of the earnings equations. The first is a sample selection bias and the second is that self-employment earnings may be under reported. Self-employment earnings are observed if the individual is self-employed, $S_i^* > 0$ and wage-employment earnings are observed only if $S_i^* < 0$. To estimate (1) and (2) correctly, sample selection error terms must be included.

$$\ln Y_i^w = \alpha_0^w + \alpha_1^w D_i + \alpha_2^w X_i + \theta_1^w \lambda_i^w + \theta_2^w \lambda_i^w D_i + v_i^w, \tag{5}$$

$$\ln Y_i^s = \alpha_0^s + \alpha_1^s D_i + \alpha_2^s X_i + \theta_1^s \lambda_i^s + \theta_2^s \lambda_i^s D_i + v_i^s. \tag{6}$$

The error terms, v_i^w and v_i^s have zero mean but are heteroskedastic, and λ_i^w and λ_i^s are the relevant inverse Mill's ratio. Consistent estimates of the earnings equations can be obtained by estimating (5) and (6).

However, since self-employment income is often argued to be under reported, estimation of (6) may lead to biased estimates.[6] Suppose that for both males and females true earnings are a multiple of reported earnings. That is to say, $Y_i^s = k_i Y_i^{s'}$, where $Y_i^{s'}$ is the reported self-employment earnings. Let k_i be such that $\ln k_i = \mu + \eta_i$, where μ is some constant and η_i is a normal error term with mean zero and constant variance. Substituting the above into (6) yields,

$$\ln Y_i^{s'} = \alpha_0^s - \mu + \alpha_1^s D_i + \alpha_2^s X_i + \theta_1^s \lambda_i^s + \theta_2^s \lambda_i^s D_i + v_i^s - \eta_i. \tag{7}$$

The estimate of the constant will be downward biased by μ. If males and females under report their income on average by the same amount – have the same μ – then the estimated difference between male and female earnings is unaffected; it will equal $-\alpha_1^s$.[7] If females under report more than males, $\mu_f > \mu_m$, then the estimated difference between male and female earnings will be increased by the amount: $|\mu_m - \mu_f|$, and the earnings gap due to the difference in the returns will not be distinguishable from the part due to under reporting.

Using the same substitutions, (3) can be rewritten to assess the impact of using $E[Y_i^{s'}]$ in place of $E[Y_i^s]$:

$$S_i^* = \psi_0 + \psi_3 \mu + \psi_1 D_i + \psi_2 X_i + \psi_3 (E[\ln Y_i^{s'}] - E[\ln Y_i^w]) + \psi_4 Z_i^s + u_i + \eta_i, \tag{8}$$

A bias term in the constant term offsets the effect of using the expected reported self-employment earnings in the employment choice equation. The other coefficients are unaffected and the predicted self-employment probabilities will still be correct. Also, even if females and males differ in the amount of under reporting, the probability of self-employment for females when they are paid according to the male's earnings equation is also correct as long as females do not change the portion they under report.

3. Data

The data are from the public use files of the Canadian Survey of Labour and Income Dynamics (SLID) in 1994. The sample is restricted to individuals between the ages of 16 and 64. Excluded from the sample are individuals without a job for the entire year, individuals who were full-time students any time during the year, part time workers (less than 30 h per week), workers in the agricultural industry, doctors, dentists, veterinarians and unpaid family workers. Since this paper

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[6] Evidence of under reporting can be found in Pissarides and Weber (1989) and Clotfelter (1983).
[7] To arrive at estimates for the population as a whole, all the selection terms are set to zero.

focuses on the role of the earnings differential between self-employment and wage-employment in explaining self-employment choice, individuals whose attachment to their jobs depends little on their earnings and whose earnings may not reflect their true productivity should be excluded. Workers in the agricultural industry, doctors, dentists and veterinarians are excluded because they have few opportunities in the wage-employment sector.[8] After enforcing the age, labor force participation and full-time student restrictions, the main job of each individual is identified as the job in which the individual works the most hours. Earnings and then job durations are used if hours data are missing. Based on the characteristics of the main job, the remaining sample restrictions are implemented.

After making these sample restrictions, the self-employment rate is 16.4 and 8.3% for males and females, respectively. Summary statistics by gender and employment mode are presented in Table 1.[9] Males and females are roughly the same age in wage-employment, but males in self-employment are about 2.1 years older than their female counterparts. The usual proxy for experience, age-years of schooling-5, yields approximately the same pattern. Individuals in self-employment have more potential experience than the wage-employed when comparisons are made within genders. When comparisons between genders are made, males are found to have 0.6 years more potential experience than females in wage-employment and 2 years more in self-employment.[10] However, since females are more likely to have spells of non-participation, the usual proxy for experience overestimates the labor market experience of women more than men. This is confirmed when the full-year, full-time experience equivalence variable from the SLID is examined.[11] The difference in experience between males and females increases to 3.5 years in wage-employment and 6.7 years in self-employment. Although SLID's experience variable is missing for nearly 21–31% of the individuals, depending on gender and employment sector, it will be used in the analysis and a missing experience dummy included in the regression because part of the male/female earnings gap in either sector may be explained by the larger differences in actual experience. Differences in educational attainment may also explain the earnings differentials, but this is not the case here because males are more likely to have not graduated from high school and less likely to have a degree at the bachelors level or above in both sectors.

Another interesting observation is that male immigrants and males whose first language is not English or French are a larger proportion of the self-employed (22 and 21%, respectively), than of the wage-employed (15 and 13%, respectively). The opposite is true for females, but the differences are not large. Eighteen percentages of wage-employed females are immigrants, while 15% of self-employed females are immigrants. Also, 15% of wage-employed females have a foreign mother tongue, while the fraction is 14% for self-employed females. Immigrant males may be entering self-employment because they can achieve higher earnings than in wage-employment. On the other hand, there may be some non-pecuniary reasons that cause them to choose self-employment. The analysis in the subsequent sections will shed light on this question.

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[8] Doctors, dentists and veterinarians are identified in the public use file as individuals with a degree above the bachelor's level, who work in the health diagnosing and treatment occupation, and are classified as professionals in the Pineo–Porter–McRoberts occupational classification system.

[9] Definitions of all the variables can be found in Table A.1.

[10] The years of schooling variable is top-coded at 20 in the SLID. Since males are more likely to hold degrees above the bachelor's level, potential experience will be over predicted for males more than females and the gap between them exaggerated.

[11] Starting from the year an individual first worked full time, a full year (6 months or more), full time (30 h or more per week) experience variable is constructed. A full year part time job counts as 0.5 years of experience, as does a full year some full time some part time job. A part year job, whether full or part time is counted as 0.25 years of experience.

Table 1
Summary statistics

Variable	Wage-employed				Self-employed			
	Male		Female		Male		Female	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
Age	38.6928	0.2040	38.2861	0.2454	43.1923	0.4701	41.0807	0.7796
Experience (years)	13.6281	0.2359	10.1190	0.2285	17.3499	0.6113	10.5798	0.8592
Missing experience	0.2210	0.0095	0.2486	0.0111	0.2147	0.0198	0.3086	0.0387
Age-schooling-5	20.3885	0.2257	19.7685	0.2752	24.8812	0.5287	22.8828	0.9130
Married	0.6181	0.0096	0.5679	0.0115	0.7527	0.0208	0.6414	0.0369
Kids (0–4)	0.1851	0.0072	0.1558	0.0079	0.1686	0.0166	0.1702	0.0274
Immigrant	0.1512	0.0080	0.1775	0.0106	0.2172	0.0208	0.1542	0.0322
Other language	0.1314	0.0075	0.1467	0.0095	0.2066	0.0201	0.1376	0.0278
Other self-employed	0.0369	0.0035	0.0669	0.0066	0.0822	0.0118	0.1315	0.0237
Education								
Less than high sch.	0.1978	0.0072	0.1310	0.0072	0.2055	0.0174	0.1646	0.0257
High school grad.	0.1555	0.0069	0.1701	0.0088	0.1387	0.0154	0.1761	0.0296
Below bachelor's	0.4576	0.0096	0.4999	0.0115	0.4427	0.0229	0.4157	0.0365
Bachelor's and above	0.1679	0.0080	0.1790	0.0098	0.1823	0.0188	0.2183	0.0351
Industry								
Prim., manu., const.	0.4975	0.0097	0.2050	0.0095	0.4345	0.0225	0.0807	0.0158
Trade	0.1589	0.0073	0.1318	0.0072	0.2147	0.0195	0.1902	0.0262
Business services	0.0838	0.0060	0.1554	0.0087	0.1885	0.0184	0.2133	0.0381
Government	0.0966	0.0052	0.0851	0.0057	0.0012	0.0010	0.0021	0.0021
Community services	0.0849	0.0051	0.3013	0.0106	0.0215	0.0076	0.1582	0.0278
Personal services	0.0722	0.0052	0.1197	0.0073	0.1396	0.0168	0.3556	0.0348
Occupation								
Other white collar	0.3766	0.0097	0.7243	0.0098	0.2909	0.0220	0.3061	0.0370
Sales	0.0594	0.0048	0.0624	0.0053	0.1883	0.0188	0.2145	0.0302
Service	0.0954	0.0058	0.1095	0.0066	0.0766	0.0133	0.3846	0.0366
Blue collar	0.4516	0.0095	0.0896	0.0063	0.4374	0.0223	0.0805	0.0159
Log hourly earnings	2.8089	0.0082	2.5963	0.0097	2.0390	0.0601	1.7199	0.1123
Self-employment rate					0.1642	0.0068	0.0827	0.0060
Sample size	6586		4807		1159		442	

Since the industries and occupations males and females select differ in many respects, industrial and occupational composition may also play a role in explaining the earnings differential. In both sectors, males are concentrated in primary, construction, manufacturing and transportation industries. More detailed analysis, not shown in Table 1, finds that males in wage-employment are more likely to be in manufacturing and trade, while self-employed males are more likely to be in construction, trade and business services. On the other hand, females are more likely to be employed in the community services while wage-employed, and personal and business services when self-employed. Looking at the occupational distribution, males are more likely to be in blue collar occupations, while females are more likely to be in other white collar, sales and service occupations. The fraction of self-employed males and females in other white collar occupations are similar though.

Finally, turning to the earnings gaps, males earn more than females in both sectors. The gap between the average male and female log hourly earnings is 0.21 in wage-employment and 0.32 in

Table 2
Reported weekly hours and weekly hours estimated from time diary

Variable	Wage-employed		Self-employed	
	Male	Female	Male	Female
Reported weekly hours	44.83 (0.2360)	39.99 (0.1992)	54.98 (0.8492)	48.11 (1.1418)
Estimated weekly hours	39.22 (0.6535)	35.57 (0.6210)	45.80 (1.4217)	36.78 (2.2250)
Reported/estimated	1.14 (0.0190)	1.12 (0.0196)	1.20 (0.0371)	1.31 (0.0819)

self-employment.[12] Comparison of earnings across sectors is valid only if earnings are accurately reported in both sectors. To my knowledge, evidence of under reporting of income by gender is not available, so it is assumed that males and females behave in the same manner in that respect. Likewise, the accuracy of reported hours may have an effect on hourly earnings ratio. Since it is unclear how a self-employed individual would define "hours of work" on the job, misreporting in self-employment is likely to be prevalent. Unlike wage-employed individuals who may have fixed work schedules, self-employed individuals may be more likely to mix work and non-work related activities during the day, especially if they are working at home. It might be the case then that because female self-employed are more likely to work at home, they tend to over-report their amount of hours worked. In which case, the female/male hourly earnings ratio in self-employment would be artificially low.

Evidence of this occurrence is presented in Table 2. Using Canada's General Social Survey (GSS) Cycle 12 in 1998, average reported usual hours worked in a week at one's main job and estimated average hours worked in a week on the main job are calculated by sex and sector.[13] Reported usual hours is obtained from a question that asks individuals the number of hours they worked in the past week. An estimate of average actual hours is obtained from the time diary data in the GSS. Since events recorded in the diaries are processed by interviewers in a systematic manner, a more consistent estimate of hours of work across self-employed individuals should be obtained. In the GSS, the individuals were asked to fill out 24 h time diary on a certain day of the week. Using this information, an estimate of the average hours worked in a week by a particular group is calculated in two steps. First, the average minutes worked in each day of the week is calculated. Second, a weighted sum of the average minutes is taken using the proportion of individuals that reported some work done on the day of the week they filled out their time diary as weights. The formula used is:

$$\text{Estimated hours} = \frac{\sum_{i=1}^{7} \text{day}_i \times \text{dur}_i}{60}, \tag{9}$$

where day_i is the proportion of individuals that reported some work done on the day they filled out their time diary and dur_i is the average minutes worked on that day of the week by the individuals that filled out time diaries that day and who did work that day.

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[12] Hourly earnings is obtained by dividing annual earnings by annual hours. Individuals making more than 303 dollars an hour have been dropped in calculation of log hourly earnings.

Also, the female/male earnings ratio in self-employment is much larger than the ones mentioned in the introduction from previous research using US data. The reasons for this are not explored in this paper, but the nature of self-employment is likely to be different in Canada than the US. In the US, the self-employed tend to earn more than the wage-employed, while in Canada the opposite is true.

[13] The sample restrictions for the SLID data are also applied here.

Table 2 shows that when asked their usual hours per week on their main job, both self-employed males and females are found on average to work more hours than their wage-employed counterparts. The estimated hours per week is much lower than the reported hours for all groups. The difference between the hours reported and estimated hours of work is approximately 5 h for the wage-employed and 10 h for the self-employed. However, while the estimated hours per week for self-employed males is still larger than that of wage-employed males, the estimated hours per week for wage and self-employed females are nearly identical. The third line in Table 2 presents the reported hours divided by the actual hours. The amount of over reporting of hours worked is similar for males in both sectors and for wage-employed females, but is higher for self-employed females. The ratio of reported over estimated hours is 1.31 for self-employed females, but is below 1.2 for the other groups. While the difference in the reported over estimated hours between females and males is not significant at conventional levels, it does suggests that the gap between male and female hourly earnings in self-employment may be upward biased.[14]

4. Empirical results

4.1. Selection into self-employment

Before estimating the reduced form self-employment choice equations, an exclusion restriction, a variable that affects self-employment probability but not earnings, just be established. In this paper, the number of other self-employed individuals in the economic family will be used in the self-employment choice equation. A larger number of self-employed in the family may indicate the presence of a family business which would increase the probability of one being self-employed.[15]

The reduced form probit estimates of the self-employment decision are provided in Table 3. For males, experience, marriage and the number of other self-employed individuals in the family have a positive effect on the probability of self-employment. As expected, a mother tongue other than French or English, also, increases the probability of self-employment for males. Whether this is due to pecuniary or non-pecuniary reasons is yet to be determined. None of the educational dummies, with less than high school as the omitted variable, are statistically significant.

On the other hand, for females, the probability of self-employment is not significantly related to experience. Females with some post secondary schooling are less likely to be self-employed and females with a larger number of other self-employed individuals in the family are more likely to be self-employed. One other self-employed individual in the family raises the probability of self-employment by 14 and 8 percentage points for males and females, respectively. Finally, for females, self-employment is not significantly related to the presence of young children or marriage. While Hundley (2000) obtains this result, Boden (1996, 1999a), Carr (1996) and Connelly (1992) find evidence of females choosing self-employment for child care reasons and flexibility. However,

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[14] The difference is significant at the 25% level. The delta-method is used to calculate the standard errors for the estimated weekly hours and the reported over estimated hours ratio. The standard errors around the estimates in Table 2 are relatively large because of the small sample size in the GSS. After making the sample restrictions, only 4700 workers remain.

[15] Using the Canadian Labour Force Survey in 1998, Marshall (1999) shows that in a sample of dual earner couples, given the husband was self-employed, the probability that the wife is self-employed is 34%, and given the wife is self-employed, the probability of the husband being self-employed is 56%. At the same time, the unconditional probability that the wife is self-employed is 16% and the unconditional probability the husband is self-employed is 26%.

Table 3
Reduced form probit equation

Variable	Male		Female	
	Coefficient	S.E.	Coefficient	S.E.
Experience	0.0412	0.0129	−0.0003	0.0165
Experience squared	−0.0005	0.0003	0.0004	0.0005
Missing experience	0.5040	0.1536	0.2937	0.1496
High school grad.	−0.0279	0.0892	−0.1021	0.1389
Below bachelor's	0.0169	0.0734	−0.2053	0.1100
Bachelor's and above	0.0948	0.0956	0.0015	0.1400
Immigrant	0.0374	0.1016	−0.1659	0.1464
Other language	0.2227	0.1035	−0.0066	0.1453
Married	0.1470	0.0719	0.0736	0.0868
Kids (0–4)	−0.0053	0.0775	0.1014	0.1081
Other self-employed	0.5559	0.1131	0.4423	0.1174
Maritimes	−0.2370	0.0709	−0.1321	0.0998
Quebec	−0.0230	0.0814	0.0880	0.1144
Prairies	−0.0595	0.0711	0.1962	0.0933
BC	0.0798	0.0918	0.1925	0.1204
Constant	−1.7808	0.1757	−1.6936	0.1675

it must be remembered that the coefficients in the reduced form probit are a composite of the effect on self-employment choice through earnings and the effect through paths other than earnings. It is possible that the positive effect of the presence of young children or marriage on self-employment choice is confounded by their negative effects on self-employment earnings.

4.2. Explaining the male/female earnings gap

OLS estimates of the log hourly earnings equation are presented in Table 4.[16] In the wage-employment sector, the difference in the returns to experience are not statistically significant between males and females and the returns to higher levels of education are significantly higher for females.[17] Marriage has a greater positive impact on earnings for males than females, but aside from that, the higher earnings of males do not seem to be based on any specific characteristics. Instead, the difference between the constant terms is the largest source of the advantage. Likewise, in the self-employment sector, the difference in the returns to experience are not statistically significant and females have higher returns to higher levels of education.[18] Evidence of Hundley's hypothesis is found in that the presence of young children gives a negative return for females in self-employment, and statistically insignificant returns for males in either sector and females in wage-employment.

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[16] When correcting for selectivity, it is found that the selection coefficients are statistically insignificant except in the case of wage-employed females. In that case, it is found that the unobservable characteristics that make one select into wage-employment have a positive effect on wage-earnings. However, the coefficients on the productivity related variables in the selection adjusted regression are not statistically different from those in the OLS regression. Therefore, only the OLS results are presented in the main text of paper. The selection adjusted regressions are presented in Tables A.2 and A.3.

[17] The omitted education level is individuals with less than a high school education.

[18] The years of experience squared term is omitted in the self-employment equation because when it is included the experience variables are generally found to be insignificantly different from zero.

Table 4
OLS log hourly earnings regression

Variable	Wage-employed				Self-employed			
	Male		Females		Males		Females	
	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Experience	0.0439	0.0023	0.0417	0.0031	0.0124	0.0059	0.0224	0.0099
Experience squared	−0.0008	0.0001	−0.0007	0.0001				
Missing experience	0.4029	0.0286	0.3670	0.0293	0.4711	0.2073	0.3042	0.2432
High school grad.	0.1248	0.0217	0.1436	0.0305	−0.0284	0.1544	0.3869	0.2724
Below bachelor's	0.2142	0.0174	0.2767	0.0253	0.2839	0.1009	0.6711	0.2213
Bachelor's and above	0.4872	0.0242	0.6241	0.0314	0.3026	0.2560	1.0038	0.2772
Immigrant	−0.0249	0.0268	−0.0771	0.0315	−0.1455	0.1596	0.3717	0.3064
Other language	−0.0599	0.0304	0.0278	0.0334	0.0055	0.1417	−0.2316	0.2503
Married	0.1224	0.0163	0.0369	0.0175	0.0028	0.1505	0.1527	0.2077
Kids (0–4)	−0.0203	0.0178	0.0330	0.0232	0.0226	0.1428	−0.7459	0.3450
Maritimes	−0.2388	0.0175	−0.2932	0.0209	0.0332	0.1658	−0.2914	0.2056
Quebec	−0.0810	0.0198	−0.1199	0.0243	0.1476	0.1323	−0.6361	0.2801
Prairies	−0.1162	0.0182	−0.1904	0.0207	0.1746	0.1222	−0.2003	0.2213
BC	0.0215	0.0235	0.0033	0.0264	−0.0208	0.2336	−0.0814	0.2797
Constant	2.1641	0.0265	2.0148	0.0326	1.5099	0.2125	0.9712	0.3264

Having a foreign mother tongue lowers the earnings of wage-employed males by 6%. Similarly, the earnings of immigrant females in wage-employment are 8% lower than that of their Canadian born counterparts. Thus, while both foreign born males and females may be entering self-employment to obtain better earnings, there are no significant gender differences in the way immigrants and foreign mother tongue individuals are treated with respect to earnings.

The return to holding a bachelors degree or above is very high for self-employed females, but when industry and occupation controls are included in regressions shown in Table 5, the returns falls to a more reasonable level.[19] This suggests that highly educated females are concentrated in industries and occupations that pay a positive premium. The large negative return to children for self-employed females also becomes slightly smaller, but it is still negative and statistically significant. It may be the case that self-employed baby-sitters working at home while caring for their own child cause the large negative coefficient, and that the industry and occupation categories are too broad to control for this situation. However, when self-employed baby-sitters working at home are eliminated from the sample, the return to children only increases to −0.645 from −0.685.[20]

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[19] The appropriateness of the inclusion of industry and occupation dummies depends on whether the choice of industry/occupation is restricted. If the choice is unrestricted, then differences between males and females in their choice of industry/occupation may explain part of the earnings gap. Compensating differentials may exist between industries/occupations, and males may be more likely to select into the industries/occupations where the differentials are positive. On the other hand, if choice is restricted, then including controls for industry/occupation choice is inappropriate since part of the earnings gap would be attributed to differences in distribution across industries/occupation when it is really due to differences in the opportunities of employment.

[20] Self-employed babysitters working at home are identified as individuals that do some work at home, who work in the personal services occupation, and are in the unskilled clerical–sales–service occupation based on the Pineo–Porter–McRoberts classification system.

Table 5
OLS log hourly earnings regression with industry and occupation controls

Variable	Wage-employed				Self-employed			
	Male		Females		Males		Females	
	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Experience	0.0367	0.0022	0.0324	0.0028	0.0118	0.0058	0.0121	0.0105
Experience squared	−0.0006	0.0001	−0.0006	0.0001				
Missing experience	0.3328	0.0272	0.2806	0.0270	0.4827	0.2104	0.0989	0.2555
High school grad.	0.1010	0.0200	0.0510	0.0268	0.0555	0.1466	0.2684	0.2814
Below bachelor's	0.1888	0.0169	0.1321	0.0228	0.2646	0.1096	0.4900	0.2458
Bachelor's and above	0.3912	0.0266	0.3860	0.0302	0.2685	0.2327	0.4173	0.2853
Immigrant	−0.0119	0.0253	−0.0704	0.0263	−0.0934	0.1570	0.2792	0.2953
Other language	−0.0427	0.0268	0.0383	0.0283	−0.0422	0.1364	−0.0283	0.2522
Married	0.0999	0.0154	0.0096	0.0158	−0.0255	0.1304	0.1456	0.2196
Kids (0–4)	−0.0122	0.0162	0.0249	0.0220	0.0026	0.1379	−0.6854	0.3719
Maritimes	−0.2373	0.0166	−0.2673	0.0181	0.0255	0.1453	−0.1708	0.2052
Quebec	−0.0807	0.0189	−0.1139	0.0229	0.1406	0.1304	−0.6147	0.2896
Prairies	−0.1067	0.0171	−0.1737	0.0189	0.1822	0.1253	−0.1598	0.2084
BC	0.0321	0.0210	0.0189	0.0232	−0.0347	0.2400	−0.1670	0.2866
Sales	−0.0801	0.0371	−0.1239	0.0321	−0.1512	0.1875	−0.3347	0.2541
Service	−0.1838	0.0259	−0.2041	0.0276	−0.5653	0.2401	−0.6826	0.2312
Blue collar	−0.1065	0.0178	−0.2020	0.0365	−0.1825	0.1547	−0.4097	0.2824
Trade	−0.2402	0.0213	−0.2086	0.0327	−0.0256	0.1537	−0.5205	0.3176
Business services	−0.0834	0.0293	−0.0419	0.0283	−0.1994	0.2644	−0.1210	0.3208
Government	0.0834	0.0205	0.1840	0.0300				
community services	−0.0456	0.0238	0.0956	0.0258	−0.0881	0.4278	−0.4522	0.4087
Personal services	−0.3941	0.0308	−0.2683	0.0335	−0.2868	0.1981	−0.4947	0.3373
Constant	2.4141	0.0320	2.3078	0.0385	1.7794	0.2653	2.0804	0.4403

After controlling for industry and occupation, returns to higher education becomes higher for males in wage-employment, and insignificantly different between males and females in self-employment. In wage-employment, the returns to working in a blue collar occupation is higher for males than females in wage-employment, but the returns to working in the various service industries are higher for females than males. The industry and occupation dummies are not significantly different between males and females in self-employment.

Table 6
Decomposition of differences in mean log hourly earnings

	Total	Endowments		Married	Kids (0–4)	Over reporting of hours worked
Industry/occupation controls		No	Yes	No	No	–
Wage-employment	0.2126	0.0250	0.0504	0.0547	−0.0089	–
Self-employment	0.3191	0.0051	0.1710	–	0.1232	0.0877
Percentage of total gap						
Wage-employment (%)		11.75	23.71	25.74	−4.17	–
Self-employment (%)		1.60	53.58	–	38.60	27.48

Table 6 presents the decomposition of the male/female earnings gap for both sectors, using the method suggested by Polachek (1975):

$$\ln \bar{Y}_m - \ln \bar{Y}_f = \hat{\alpha}'_{1m} \left(\bar{X}_{1m} - \bar{X}_{1f} \right) + \left(\hat{\alpha}'_{1m} \bar{X}_{2m} - \hat{\alpha}'_{1f} \bar{X}_{2f} \right) + (\hat{\alpha}_{1m} - \hat{\alpha}_{1f})' \bar{X}_{1f}, \qquad (10)$$

where $\ln \bar{Y}$ is the mean level of earnings, $\bar{X}$ the vector of average values of the explanatory variable, $\hat{\alpha}$ is the vector of estimated coefficients for those variables and 'm' and 'f' index males and females, respectively, subscript 2 denotes family denotes family related explanatory variables and their associated coefficients, and subscript 1 is for non-family related variables and coefficients. The first term on the right-hand side is the part of the earnings gap due to differences in endowments of non-family related variables, the second term captures the differences in the family related variables and their returns, and the third term is the residual difference in the earnings gap due to differences in the returns to non-family related characteristics. The first and the second terms represent the explained portion of the earnings gap. While the first term can be viewed as the difference in the earnings gap because of differences in observed productivity characteristics, the second term can be interpreted as measuring the difference in the earnings gap due to differences in unobserved productivity. As suggested by Hundley, the productivity of females in self-employment may suffer if self-employed females have their attention split between child-care and market work. Furthermore, the positive return to marriage for males in wage-employment may indicate that marriage allows males to specialize in market work and increase their productivity.

When industry and occupation dummies are not included, the percentage of the earnings gap explained by the differences in endowments is 11.8% in wage-employment and 1.6% in self-employment. When they are included, the percentages become 23.7 and 53.6% for wage and self-employment, respectively. The portion of the earnings gap explained by differences in the family related characteristics and their returns are less sensitive to the introduction of controls for industry and occupations, so only the results without them are presented. Marriage accounts for 25.7% of the earnings gap in wage-employment, while the presence of young children accounts for 38.6% of the gap in self-employment.[21] Although differences in family characteristics do not explain the entire earnings gap as it does in Hundley's work, the effect of marriage and the presence of young children are still important in explaining the gap.[22]

The last column in Table 6 shows the amount of the earnings gaps that can be explained by differences in the over reporting of hours. Although Table 2 showed the differences in over reporting are not statistically significant at conventional levels, it is still interesting to see how much a difference over reporting might make. Since self-employed females tend to over report hours more than males, the actual earnings gap in self-employment should be smaller than reported. The last line in Table 2 indicates that, on average, to obtain the true level of self-employment earnings for males and females, male earnings needs to be multiplied by 1.20 and female earnings by 1.31. Thus, for self-employment, $\mu_m = \ln(1.20)$ and $\mu_f = \ln(1.31)$. As a result, the gap between male and female earnings is overestimated by 0.0877 in self-employment. In other words, the difference in over reporting in self-employment can account for 27% of the earnings gap between males and females in that sector.

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[21] Some of the cells in Table 6 are empty because the difference between males and females in their returns to marriage or kids is not statistically significant in those cases.

[22] When actual labor market experience is omitted, as in Hundley's work, the returns to the presence of young children falls from −0.7459 to −0.8000 for females in self-employment when industry and occupation dummies are not included. Thus the inclusion of a control for actual labor experience market is one factor that leads to the differing results.

Table 7
Structural probit equation

Variable	Male		Female	
	Coefficient	S.E.	Coefficient	S.E.
Experience	0.0628	0.0172	0.0050	0.0166
Experience squared	−0.0011	0.0004	0.0002	0.0005
Missing experience	0.4272	0.1500	0.3468	0.1536
Earnings differential	0.8161	0.2731	0.4637	0.1531
High school grad.	0.0564	0.0948	−0.2247	0.1475
Below bachelor's	−0.0541	0.0786	−0.3565	0.1083
Bachelor's and above	0.2215	0.1073	−0.0943	0.1380
Immigrant	0.1272	0.1049	−0.3525	0.1549
Other language	0.2019	0.1029	0.0382	0.1422
Married	0.2587	0.0761	0.0211	0.0859
Kids (0–4)	−0.0177	0.0783	0.4511	0.1430
Other self-employed	0.5447	0.1141	0.4479	0.1190
Maritimes	−0.4443	0.0957	−0.1649	0.1024
Quebec	−0.1992	0.0960	0.3146	0.1200
Prairies	−0.2878	0.1024	0.1925	0.0934
BC	0.1283	0.0941	0.2838	0.1207
Constant	−1.2650	0.2092	−1.3020	0.1931

Overall, a large fraction of both earnings gaps can be explained by differences in productivity. When controls for industry and occupations are not included, 33 and 40% of the earnings gap in wage and self-employment, respectively, is accounted for. When these controls are included, the fraction of the explained earnings gap rises to 45 and 92% for wage and self-employment, respectively. Therefore, even without accounting for over reporting of hours worked, more of the earnings gap in self-employment is explained than in wage-employment.

4.3. Male/female differences in the probability of self-employment

Using the estimated coefficients of the earnings equation from the previous section, the predicted earnings differential between self and wage-employment can be calculated for both males and females and used in estimation of the structural probits suggested by Eq. (3).[23] The results of this estimation are presented in Table 7. Looking first at the results for males, experience, a degree at the bachelor's level or above, marriage, a foreign mother tongue and the predicted earnings differential, have a positive impact on the probability of self-employment. Higher levels of experience and education may be associated with a lower variance in self-employment income, so if individuals are risk adverse, more experience and education may make self-employment more acceptable. Experience and higher education may also be associated with more employment opportunities

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[23] To avoid a collinearity problem when the expected earnings differential is entered into the probit equation, a characteristic that affects the probability of self-employment only through earnings must be found. Since most individual characteristics can arguably be associated with a person's preference towards self-employment, and because regional dummies may control for differences in the availability of self-employment opportunities across regions, a job specific characteristic should be used. Since job tenure is unreported for the self-employed in a majority of the cases, industry and occupation dummies, the exclusion restriction used by Rees and Shah (1986), are omitted from the structural probit. It is acknowledged that this is not a optimal solution as these dummies variables may reflect differences in the availability of self-employment opportunities across industries and occupations.

if the self-employment venture fails. Furthermore, more labor market experience would tend to suggest the individual has more assets and be better able to withstand the fluctuations in self-employment income. Likewise, marriage may increase the probability of self-employment because the potential extra income of the spouse would lead to more stable household income and consumption. Of course, differences in preferences or the amount of opportunities in self-employment that are related to the level of experience, education and marriage may also be the cause of these positive coefficients. Differences in preferences related to ethnicity or culture may be the source of the positive impact of having a foreign mother tongue on the probability of self-employment. It is interesting to note that from the estimates of the earnings equations in Tables 4 and 5, experience, higher education and marriage increase wage-employment income more than self-employment income, and having a foreign mother tongue decreases wage-employment income more than self-employment income. The direct of effect of these variables on the probability of self-employment is the opposite of the indirect effect of these variables through earnings, while the direct effect of having a foreign mother tongue on the probability of self-employment operates in the same direction as the indirect effect. Consequently, the coefficients on experience and marriage are lower in the reduced form probit and the effect of holding a degree at or above the bachelor's level insignificant, while the coefficient on the other language variable is higher in the reduced form probit. The different paths in which these variables affect self-employment choice could not be identified without the estimation of the structural probit.

Turning to the results for females, the second column in Table 7 shows that the presence of young children has a positive effect on the probability of self-employment, while having some post secondary education below the bachelor level and being an immigrant has a negative effect. The positive coefficient for the presence of young children in the structural probit, as opposed to the insignificant coefficient in the reduced form probit, gives support to the hypothesis that females enter self-employment to balance child care responsibilities and market work. However, as indicated in the previous section, the cost of this flexibility is lower hourly earnings in self-employment. The negative effect on the probability of self-employment from having some post secondary education below the bachelors level is a curious result. The effect is negative as well in the reduced form probit, and becomes more negative in the structural probit because postsecondary education below the bachelors level increases female self-employment earnings more than female wage-employment earnings. It could be the case that there are fewer opportunities in self-employment for females at this education level. Similarly, after taking into account the negative effect on immigrant's earnings in wage-employment, the coefficient on immigrant status in the structural probit analysis becomes negative and significant. Perhaps the ethnic or cultural reasons that increases the probability of self-employment for males decreases them for females.

There are many differences between males and females in their coefficients of the structural probit equation. These differences may explain the gap in the average predicted probability of self-employment between them. On the other hand, differences in the average value of the individual characteristics between males and females or differences in the way males and females are compensated in wage and self-employment may be the cause. Table 8 presents the average predicted self-employment probability in various situations. The average predicted self-employment probability for gender j is:

$$\frac{\sum_i \Phi(X_{ij}\psi_j)}{n_j}, \tag{11}$$

Table 8
Differences in the average predicted probability of self-employment

	Average predicted probability of self-employment
Using the structural probit coefficients for males	
Males	0.1642
Females	0.1437
Using the structural probit coefficients for females	
Males	0.1099
Females	0.0827

where Φ is the cumulative density function of a standard normal, ψ the vector of estimated coefficients from the structural probit regression, X_i is the vector of explanatory variables, n be the sample size and i index individuals. The difference between the average predicted self-employment probability for males and females when the coefficients of the male structural probit regression are used is:

$$\frac{\sum_i \Phi(X_{im}\psi_m)}{n_m} - \frac{\sum_i \Phi(X_{if}\psi_f)}{n_f}, \tag{12}$$

where 'm' and 'f' represent males and females, respectively. The gap between the average male and female predicted self-employment probability is 0.1642–0.0827, or 0.0815. The first part of Table 8 shows that the difference between predicted average self-employment probability for males and females, when the coefficients from the male structural probit equation are used, is only 0.0205. When the coefficients from the female structural probit equation are used in the second part of Table 8, the difference in the average probability is 0.0272. Thus differences in characteristics between males and females explain only 25–33% of the difference in average predicted self-employment probability. The majority of the gap must be due to the differences in the coefficients of the structural probits or earnings functions.

One of the major differences in the coefficients of the structural probits between males and females is that the probability of self-employment for males is more responsive to the expected earnings differential than for females. The marginal effect at the mean is 0.19 and 0.06 for males and females, respectively. This corresponds with the survey evidence presented in Boden (1999a) that finds males are more likely to cite pecuniary benefits as the main reason for entering self-employment. Given that the total gap between male and female self-employment earnings is 0.32, even if average female self-employment earnings rose by this amount and female wage-employment earnings remained unchanged, the probability of self-employment for females at the mean would rise by only 0.02. Since a larger percentage of the earnings gap in self-employment is explained, if females were paid according to the male's earning function in both wage and self-employment, the self/wage-employment earnings differential for females would become more negative and the gap in the average probability of self-employment would remain largely unaffected or increase.

Furthermore, if females responded to the earnings differential in the same way as males, the gap in the average probability of self-employment would also increase. Since the earnings differential between self- and wage-employment is negative whether or not one accounts for over-reporting, the more sensitive one is to the expected difference in self and wage-employment

earnings, the less likely one will be self-employed.[24] Therefore, neither the male/female earnings gap in self-employment, nor the male/female difference in the response to the earnings differential can explain the male/female difference in the average predicted probability of self-employment. Instead, differences in the coefficients of the structural self-employment choice probit, aside from the response to the earnings differential, are the main source of the gap.

5. Conclusion

In this paper, the gender differences in the choice to become self-employed in Canada are investigated. Previous papers (Boden, 1996, 1999a; Carr, 1996; Connelly, 1992) have studied gender differences in the probability of self-employment. Others (Rees and Shah, 1986; Fujii and Hawley, 1991; Bernhardt, 1994) have examined the effect of relative earnings between self and wage-employment on self-employment choice for men. Also, Boden (1999b) has examined gender inequality in wage earnings and female self-employment choice. The contribution of this paper is to look at the effect of gender inequality in both wage and self-employment earnings on the male/female gap in self-employment rates.

Although the male/female earnings gap is larger in self-employment than in wage-employment, it is found that a larger fraction of the earnings gap in self-employment can be explained by productivity differences than in wage-employment. Therefore, differences in the returns to productivity related explanatory variables cannot account for the gap in the average predicted probability of self-employment. If differences in the return to characteristics between genders are interpreted as discrimination, this implies females face less discrimination in self-employment than in wage-employment. Also, it is found that although family related characteristics do not explain the entire earnings gap in self-employment as in Hundley (2000), unobserved productivity differences controlled by these family related characteristics are important in explaining the earnings gap in both wage and self-employment. Without these controls, in some cases, the fraction of the earnings gap explained in wage-employment could be larger than in self-employment. This could lead to the erroneous prediction that the average predicted probability of self-employment for females would increase when females are compensated according to the male's earnings functions.

Since the earnings gap failed to explain the male/female gap in the average predicted self-employment probability, differences in observed characteristics and differences in the response of the probability of self-employment to these characteristics were considered. Differences in observed characteristics could only explain between 25 and 33% of the gap in the average predicted probability of self-employment, so differences in response to these characteristics are the main source of the gap. The findings in this paper agree with Boden (1996, 1999a), Carr (1996) and Connelly (1992) in that women are more likely to enter self-employment for the purpose of caring for a young child. However, this factor does not explain why fewer women than men are in self-employment. Instead, understanding the reasons behind the fact that experience, higher levels of education and marriage affect the probability of self-employment probability of males more than females, and why being an immigrant and having foreign mother tongue has a positive effect on male self-employment but a negative effect on female self-employment, are key to explaining the gap between male and female self-employment rates. Liquidity constraints are one possible

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[24] The average earnings differential between females in self and wage-employment may be positive, if self-employed females under report annual earnings more than wage-employed females to some degree. In that case, the difference in the response to the earnings differential may explain part of the male/female gap in the average probability of self-employment.

explanation for the difference. Liquidity constraints are likely to be less binding on married males with more experience and education and it might be the case that females have less access to capital than males. Different social attitudes specific to immigrants and individuals with a foreign mother tongue is offered as another possibility. While public policy is likely ineffectual in changing the social attitudes of newly arrived Canadians, it could improve women's access to external capital. Improved access need not necessarily come in the form of direct government sponsored loans. Instead, programs offering greater access to business skills training and mentoring might provide the same benefit. These would improve the quality of business plans presented to banks and would encourage the development of important contacts.

Acknowledgement

Appendix A

See .

Table A.1
Definition of variables

Age	Age of individual at the beginning of 1994
Experience (years)	Years of full-year full-time work equivalents
Missing experience	1 if experience missing
Age-schooling-5	Age minus years of schooling minus five
Married	1 if married
Kids (0–4)	1 if individual has a child between the age of 0 and 4
Immigrant	1 if individual is an immigrant
Other language	1 if individual's mother tongue is not English or French
Other self-employed	The number of other self-employed members in the family
Education	
Less than high sch.	1 if individual did not graduate high school
High school grad.	1 if individual graduated high school only
Below bachelor's	1 if individual has postsecondary education below bachelor's level
Bachelor's and above	1 if individual has postsecondary education above bachelor's level
Industry	
Prim., manu., const.	1 if individual is in the primary, manufacturing, construction, transportation, communication or other utilities industries
Trade	1 if individual is in the trade industry
Business services	1 if individual is in the business services industry
Government	1 if individual is government administration
Community services	1 if individual is in the community service industry
Personal services	1 if individual is in the personal service industry
Occupation	
Other white collar	1 if individual is in a managerial, administrative, natural science, engineering, mathematics, social science, medicine and health, teaching or clerical occupation
Sales	1 if individual is in a sales occupation
Service	1 if individual is in a service occupation

Table A.1 (*Continued*)

Age	Age of individual at the beginning of 1994
Blue collar	1 if individual is in a farming, horticultural, animal husbandry, fishing, trapping, forestry, mining, processing, machining, product fabricating, construction, transport or material handling occupation
Log hourly earnings	Natural logarithm of annual earnings divided by annual hours

Table A.2
Selectivity adjusted log hourly earnings regression

Variable	Wage-employed				Self-employed			
	Male		Females		Males		Females	
	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Experience	0.0454	0.0028	0.0402	0.0031	0.0095	0.0058	0.0256	0.0121
Experience squared	−0.0008	0.0001	−0.0006	0.0001				
Missing experience	0.4213	0.0353	0.4039	0.0305	0.4218	0.1876	0.4044	0.3546
High school grad.	0.1236	0.0216	0.1248	0.0310	−0.0372	0.1553	0.3796	0.2705
Below bachelor's	0.2149	0.0174	0.2397	0.0272	0.2765	0.1015	0.6344	0.2414
Bachelor's and above	0.4917	0.0250	0.6233	0.0311	0.2807	0.2700	1.0117	0.2697
Immigrant	−0.0230	0.0267	−0.0993	0.0320	−0.1547	0.1561	0.3378	0.3159
Other language	−0.0482	0.0336	0.0256	0.0330	−0.0248	0.1474	−0.2416	0.2569
Married	0.1310	0.0187	0.0633	0.0187	−0.0412	0.1818	0.1871	0.2528
Kids (0–4)	−0.0213	0.0178	0.0480	0.0233	0.0264	0.1444	−0.7358	0.3309
Maritimes	−0.2487	0.0206	−0.3127	0.0215	0.0805	0.1927	−0.3265	0.2355
Quebec	−0.0828	0.0198	−0.1025	0.0247	0.1494	0.1333	−0.6026	0.2763
Prairies	−0.1188	0.0183	−0.1548	0.0229	0.1820	0.1265	−0.1513	0.2767
BC	0.0251	0.0237	0.0385	0.0276	−0.0330	0.2410	−0.0448	0.3265
Lambdaw	−0.1344	0.1424	−0.6978	0.1978				
Lambdas					0.2266	0.3550	−0.2945	0.9521
Constant	2.1759	0.0288	2.1097	0.0422	1.9443	0.6605	0.3552	1.9829
R^2	0.3150		0.3314		0.0446		0.2163	

Table A.3
Selectivity adjusted log hourly earnings regression with industry and occupation controls

Variable	Wage-employed				Self-employed			
	Male		Females		Males		Females	
	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Experience	0.0383	0.0027	0.0313	0.0027	0.0076	0.0056	0.0200	0.0129
Experience squared	−0.0006	0.0001	−0.0005	0.0001				
Missing experience	0.3518	0.0332	0.3104	0.0305	0.4145	0.1911	0.3539	0.3957
High school grad.	0.0998	0.0199	0.0353	0.0280	0.0462	0.1468	0.2421	0.2758
Below bachelor's	0.1894	0.0169	0.1021	0.0266	0.2523	0.1093	0.3884	0.2462
Bachelor's and above	0.3958	0.0272	0.3850	0.0301	0.2335	0.2427	0.4104	0.2876
Immigrant	−0.0098	0.0252	−0.0881	0.0273	−0.1047	0.1529	0.1883	0.2872

Table A.3 (*Continued*)

| Variable | Wage-employed | | | | Self-employed | | | |
| | Male | | Females | | Males | | Females | |
	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Other language	−0.0305	0.0292	0.0370	0.0281	−0.0899	0.1446	−0.0539	0.2634
Married	0.1088	0.0175	0.0307	0.0176	−0.0902	0.1582	0.2251	0.2624
Kids (0–4)	−0.0133	0.0163	0.0370	0.0222	0.0087	0.1387	−0.6531	0.3491
Maritimes	−0.2476	0.0193	−0.2826	0.0188	0.0943	0.1722	−0.2677	0.2448
Quebec	−0.0825	0.0189	−0.1001	0.0232	0.1449	0.1314	−0.5332	0.2876
Prairies	−0.1094	0.0172	−0.1456	0.0220	0.1930	0.1295	−0.0375	0.2747
BC	0.0359	0.0213	0.0466	0.0257	−0.0540	0.2468	−0.0808	0.3319
Sales	−0.0803	0.0373	−0.1233	0.0321	−0.1633	0.1828	−0.3772	0.2432
Service	−0.1845	0.0259	−0.2057	0.0275	−0.6048	0.2458	−0.7364	0.2388
Blue collar	−0.1069	0.0178	−0.2056	0.0365	−0.1831	0.1533	−0.4221	0.2843
Trade	−0.2402	0.0212	−0.2066	0.0327	−0.0237	0.1528	−0.5115	0.3178
Business services	−0.0842	0.0294	−0.0395	0.0283	−0.1932	0.2619	−0.1552	0.3367
Government	0.0831	0.0205	0.1823	0.0298				
Community services	−0.0459	0.0238	0.0952	0.0257	−0.0973	0.4172	−0.4893	0.4051
Personal services	−0.3939	0.0308	−0.2653	0.0332	−0.2671	0.2015	−0.5184	0.3340
Lambdaw	−0.1397	0.1318	−0.5538	0.2180				
Lambdas					0.3365	0.3465	−0.7751	1.0451
Constant	2.4268	0.0338	2.3828	0.0486	2.4238	0.6372	0.5403	2.1743
R^2	0.4105		0.4659		0.0776		0.2746	

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