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Abstract

Using 1999 and 2001 Canadian matched employer-employee data with rich information on worker and job characteristics, the authors identify the relative importance of immigrant wage differentials within and across establishments and the sources of these differentials. Whereas existing explanations of immigrant wage differentials emphasize immigrants' productive characteristics, differentials across establishments may be entirely independent of immigrants' actual or perceived skills or quality. The findings show highly non-random sorting of immigrants across establishments within Canada's major cities and geographic regions. For immigrant men, this sorting affected wage differentials more than did differences in how immigrant and native men were paid within establishments. For immigrant women, however, particularly those from less developed world regions, within-establishment wage differentials appear to have been more important. These findings raise numerous important questions for future research, such as whether the highly non-random sorting of immigrants across establishments primarily reflects immigrants' search behavior or employers' recruiting methods.

KEYWORDS: Immigrant Wage Differential

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Using 1999 and 2001 Canadian matched employer-employee data with rich information on worker and job characteristics, the authors identify the relative importance of immigrant wage differentials within and across establishments and the sources of these differentials. Whereas existing explanations of immigrant wage differentials emphasize immigrants' productive characteristics, differentials across establishments may be entirely independent of immigrants' actual or perceived skills or quality. The findings show highly non-random sorting of immigrants across establishments within Canada's major cities and geographic regions. For immigrant men, this sorting affected wage differentials more than did differences in how immigrant and native men were paid within establishments. For immigrant women, however, particularly those from less developed world regions, within-establishment wage differentials appear to have been more important. These findings raise numerous important questions for future research, such as whether the highly non-random sorting of immigrants across establishments primarily reflects immigrants' search behavior or employers' recruiting methods.

According to the 2001 Canadian Census, at the turn of this century immigrant men in Canada had wages that were on average 13% below those of similarly aged native-born men with equal levels of schooling. Among immigrant women, the comparable wage differential was roughly 8%. Similar immigrant wage differentials were evident in the 2000 U.S. Census. Evidence of initial earnings disparities upon entry in a host country, and of subsequent economic assimilation, is now well established in the literature (Chiswick

1978; Borjas 1985). These early studies, however, tell us little about *why*, conditional on observable human capital characteristics, immigrants initially face wage disparities. In developing public policy to help immigrants compete for jobs and wages in host country labor markets, and to ensure that a future supply of immigrants can be attracted, understanding the source of these differentials is of critical importance.

More recently, much research has been directed toward obtaining a better understanding of the underlying sources of immigrant wage differentials. Examples include studies focused on immigrant language abilities (for example, Chiswick 1991; Chiswick and Miller 1995; Carnevale et al. 2001; Dustmann and van Soest 2002), literacy skills (Ferrer, Riddell, and Green 2004), schooling quality (Sweetman 2003), job tenure attainment (McDonald and Worswick 1998), occupational attainment and mobility (Green 1999; Weiss et al. 2003), and differential returns to foreign sources of schooling and labor market experience

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The Workplace and Employee Survey (WES) data used in this analysis are publicly accessible through remote access. For further information, contact the Labour Statistics Division at Statistics Canada.

(for example, Friedberg 2000; Bratsberg and Ragan 2002; Aydemir and Skuterud 2005). A common thread in all this research is the notion that the human capital of immigrants is, or at least is perceived to be, in some way inferior to that of natives with similar levels of schooling and experience. It is also possible, however, that these differentials reflect employer, as opposed to worker, heterogeneity and immigrants are non-randomly sorted across employers. If that is the case, the wage disadvantages immigrants experience may be entirely independent of the actual or perceived skills or quality of immigrants themselves, which points to very different policy prescriptions.

The idea that employer wage effects may be responsible for wage disparities between particular groups in the population has been applied to wage differentials based on gender (Groshe 1991a; Bayard et al. 1999a) and race and ethnicity (Bayard et al. 1999b). These studies offer valuable information on whether affected groups might be better served by policies that seek to redress the segregation of particular types of workers across establishments (for example, affirmative action policies) or differences in how workers are paid within establishments (for example, comparable worth policies). In the context of immigrants, this line of research appears particularly relevant and fruitful. On the one hand, there is reason to believe that, within workplaces, immigrants may be less productive, or have more difficulty signaling their productivity, than their native-born colleagues with equivalent levels of schooling and experience. On the other hand, immigrants are also more likely than the native-born to live in ethnic enclaves or urban ghettos where low-wage employers may be concentrated; and on average, they have had less time than their native-born counterparts to build the social networks necessary to obtain jobs with high-wage employers. Yet despite the relevance of these questions for immigration policy, to the best of our knowledge, this paper is the first to examine the immigrant wage differential at the level of the establishment. Given that immigrants account for a large and growing share of the population in both the United

States (11% in 2000, growing since at least 1970) and Canada (18% in 2001, with growth since 1951), this analysis seems important and long overdue.

To identify the relative importance of within- and across-establishment wage variation in the relative wage outcomes of immigrants, we exploit establishment identifiers and rich information on worker characteristics (including immigrant status and detailed job characteristics) available in Statistics Canada's Workplace and Employee Survey (WES). Following an overview of the WES data, we examine if and to what extent immigrants are non-randomly sorted across establishments. We then decompose the immigrant wage differential into its within- and across-establishment components. Finally, through examination of those results, we evaluate the relative contribution of worker, job, and establishment characteristics to the observed differentials.

1. Data

The Workplace and Employee Survey (WES) is a nationally representative annual survey of Canadian business establishments.¹ What distinguishes the WES from the usual establishment-level data is that in addition to surveying the workplace, the WES randomly samples a small number of employees within each establishment and asks them to complete a separate employee survey. The data are also longitudinal, providing information on establishments for six consecutive years and on employees for two consecutive years.

The major limitation of the WES is that employees are lost when there is an establishment separation (except in the rare cases in which the transition is to another establishment in the sample). This feature of the data has two consequences for our analysis. First, since the attrition in the employee data is likely highly non-random and potentially correlated with immigrant status (see, for

¹In addition to all levels of public administration, the sample excludes primary industries (agriculture, fishing, hunting and trapping), religious organizations, and private households.

example, the evidence of substantial onward migration rates among Canadian immigrants in Aydemir and Robinson forthcoming), including the second waves of the employee data potentially introduces sample selection biases. To avoid this, we restrict our analysis to the first wave of two panels of employee data (1999 and 2001). The second consequence of the WES sample design is that estimating “pure” employer wage effects that are unconfounded by unobserved worker heterogeneity is impossible. Unfortunately, we are aware of no solution to this problem (see Section 3 for more on this issue).

The WES data do, however, have two important advantages over the matched employer-employee data found elsewhere in the literature. First, in contrast to the data examined in Groshen (1991a), Bronars and Famulari (1997), and Bayard et al. (1999a, 1999b), the WES data are nationally representative, which serves to raise the policy relevance of our findings. Second, unlike the administrative data used by Abowd, Kramarz, and Margolis (1999) and Abowd, Kramarz, and Finer (1999), the WES data offer a rich source of information on workers’ human capital and job characteristics, including country of birth. This allows us not only to evaluate the role of sorting and employer heterogeneity in immigrant wage outcomes, but also to go further than is possible with administrative data in identifying underlying sources of immigrant wage differentials within establishments.

When we pool the 1999 and 2001 employee data, we obtain samples of 36,473 native-born workers and 6,918 immigrants employed in 6,760 establishments (on average, 6.4 workers per establishment). To separately identify immigrant and establishment wage effects, we need some establishments with a mixture of immigrants and native-born workers. Of the 6,760 establishments in our sample, 2,722 (40%) contained at least one immigrant employee and one native-born employee. Using the sampling weights in the WES, we find that immigrant shares were 19.3% (men) and 18.1% (women) in the full sample. In comparison, the percentage of workers who were foreign-born in a comparable sample taken from the complete 20% master file of

the 2001 Canadian Census was 20.4% (men) and 19.7% (women).

Table 1 reports sample means of the worker, job, and establishment characteristics used in the decomposition analysis. The first two columns report the means separately for immigrants and native-born workers. The third column presents the means for the combined sample, and also flags (with an asterisk) which differences between the immigrant means and native-born means are statistically different ($p < .05$). Raw mean log wages (in the first row) are virtually identical for immigrants and native-born workers. However, the following rows indicate that immigrants had significantly more labor market experience and were more educated. Whereas fewer than one in five native-born workers had a bachelor’s degree (0.179), more than one in four immigrants did (0.263), and the incidence of graduate degrees was twice as high among immigrants (0.100, compared to 0.053). These raw means imply substantial wage disparities conditional on labor market experience and schooling.

Despite these immigrants’ apparent human capital advantage, however, their jobs and the jobs of native-born workers did not differ substantially in characteristics. Immigrants were more likely than native-born workers to be professionals and production workers and to be employed in jobs requiring professional or graduate degrees, and they were less likely to be employed in technical jobs or trades, jobs requiring a high school diploma or less, and seasonal or contract jobs. These differences are, however, relatively small, and none of the remaining job characteristic means are statistically different.

The following rows of Table 1 indicate that immigrants and the native-born did not differ substantially by establishment size distributions, but did differ by geographic distributions of workplaces. Immigrants were significantly more likely than the native-born to be employed in Toronto and Vancouver and significantly less likely to work everywhere else in the country. The percentage of all immigrant workers in Canada who were employed in Toronto (43%, compared to 14% of native-born workers) is particularly remarkable and suggests that immigrants

Table 1. Sample Means by Immigrant Status.

<i>Variable</i>	<i>Immigrants</i>	<i>Native-Born</i>	<i>Total</i>
Log Hourly Wage	2.842	2.834	2.835
<i>Worker Characteristics</i>			
Immigrant	1.0	0.0	0.187
Male	0.503	0.484	0.487
Experience	22.9	19.3	20.0*
Years of Grade School	11.8	11.8	11.8
Trade/Vocational	0.085	0.124	0.117*
College Diploma	0.263	0.244	0.247
Bachelor's Degree	0.263	0.179	0.195*
Graduate Degree	0.100	0.053	0.062*
<i>Job Characteristics</i>			
Managers	0.127	0.133	0.132
Professionals	0.192	0.166	0.171*
Technical/Trades	0.382	0.410	0.405*
Marketing/Sales	0.082	0.079	0.080
Clerical/Administrative	0.129	0.142	0.140
Production Workers	0.089	0.069	0.073*
Supervisor	0.379	0.367	0.369
Number Supervised	5.3	5.1	5.1
High School or Less Required	0.541	0.597	0.587*
Some Post-Secondary Required	0.270	0.245	0.250
Bachelor's Degree Required	0.100	0.104	0.103
Professional/Graduate Degree Required	0.088	0.054	0.060*
Job Tenure (Years)	6.3	6.4	6.4
Use a Computer	0.600	0.612	0.610
Flexible Hours	0.357	0.375	0.371
Works Weekends	0.239	0.268	0.263
Works Evenings or Nights	0.211	0.228	0.225
Seasonal	0.009	0.021	0.019*
Contract	0.037	0.053	0.050*
<i>Establishment Characteristics</i>			
Atlantic Provinces	0.009	0.071	0.059*
Montreal	0.099	0.128	0.122*
Rest of Quebec	0.011	0.136	0.113*
Toronto	0.434	0.138	0.193*
Rest of Ontario	0.184	0.247	0.235*
Manitoba/Saskatchewan	0.037	0.067	0.061*
Alberta	0.082	0.099	0.096*
Vancouver	0.112	0.057	0.067*
Rest of British Columbia	0.034	0.057	0.052*
1-19 Employees	0.293	0.312	0.309
20-99 Employees	0.273	0.287	0.285
100-499 Employees	0.225	0.187	0.195*
500+ Employees	0.208	0.213	0.212
Number of Observations	6,918	36,473	43,391

*Immigrant and native-born means are statistically different at the 5% level, as determined by regressing each variable on a constant and an immigrant dummy. Standard errors are estimated by bootstrapping to take account of the WES complex survey design.

must have been concentrated across the establishments in our data.

2. Sorting

A necessary (but not sufficient) condition

for employer wage effects to contribute to an immigrant wage differential is non-random sorting of immigrants across establishments. We therefore begin by more formally testing if, and to what extent, immigrant employment was segregated. Our approach is very similar

to that of Carrington and Troske (1997), but rather than examine the distribution of a dissimilarity index or Gini coefficient, we focus on the variance of the within-establishment immigrant share, which allows us to test straightforwardly for non-random sorting across all workplaces, as well as within geography, industry, and establishment size cells and within the full interaction of these cells.² In addition, we report separate results for men and women.

In particular, suppose we have a sample with N_j workers employed within establishment j , J establishments, and $N = \sum_j N_j$ observations in total. The expected immigrant share within establishment j is $\phi_j = E[m_i | i \in j]$, where m_i is an immigrant dummy. Since workers are randomly sampled within establishments, the sample immigrant share within establishment j —call it \bar{m}_j —is an unbiased estimator of ϕ_j . Of interest is the magnitude of the between-establishment variance of ϕ_j in the population. This statistic is $V[\phi_j] = E[(\phi_j - \phi)^2]$, where ϕ is the immigrant share in the population. An unbiased estimator of this value is $\hat{V}[\phi_j] = \sum_j \alpha_j (\bar{m}_j - \bar{m})^2$, where $\alpha_j = N_j/N$ and \bar{m} is the grand sample mean of m_i . This is, in fact, just the sample variance of \bar{m}_j between establishments, which we could also write as $\hat{V}[\bar{m}_j]$, not to be confused with the sampling variance of \bar{m}_j for a given establishment $\hat{V}[\bar{m}_j | j] = \sigma_j^2 / N_j$, where $\sigma_j^2 = V[m_i | i \in j]$.³

²Since our random sorting of immigrants across establishments makes little sense if the establishment sampling weights are used, the sorting analysis in this section is performed using unweighted data. We have performed similar tests (in at least 2 ways) using the sampling weights, and our findings do not change. Arguably, since the WES sample design is stratified random sampling, with the stratifications based on 14 industries, 6 geographic regions, and 3 establishment size groups, our results based on the full interaction of geography, industry, and establishment size are nationally representative.

³These quantities are clearly distinguished in the variance decomposition

$$V[\bar{m}_j] = E_j[V(\bar{m}_j | j)] + V_j[E(\bar{m}_j | j)],$$

where the first term is the expected sampling variance of \bar{m}_j for establishment j and the second term is the expected between-establishment variance of \bar{m}_j .

In our full sample of all establishments, the between-establishment variance of \bar{m}_j is 0.047, which is shown in the first row of Table 2. Is this point estimate statistically large? The null hypothesis of “random sorting” of immigrants across establishments corresponds to $\phi_j = \phi$ for all j . Assuming a binomial distribution for m_i under random sorting the expected variance of \bar{m}_j in any single sample is $V[\bar{m}_j] = [\bar{m}(1 - \bar{m})] / N_j$. However, across samples there will be sampling variation in this statistic. To test our sample estimate of $V[\bar{m}_j]$ against the null of a random distribution of immigrants, we therefore need to know the variance of $V[\bar{m}_j]$ and not just its expected value above. We bootstrap the sampling distribution of $V[\bar{m}_j]$ under the null hypothesis of a random distribution, which amounts to randomly re-sorting the immigrant dummy variable m_i in the data, but not the firm identifier, and recalculating $V[\bar{m}_j]$. This approach ensures that the establishment-size distribution remains constant.⁴

From 1,000 replications of this re-sorting we use the 10th and 990th highest values of the variance as the bounds of our 99% confidence interval. Comparison of the empirical estimates to the 99% confidence intervals from a random distribution of the observations in our data suggests that immigrants were, in fact, highly non-randomly distributed across establishments (see first row of Table 2). This is true whether we consider men and women separately or together. In no case do we obtain an empirical estimate of the variance that is close to falling within our 99% confidence interval.

Of course, it could be that these results simply reflect the unequal geographic distribution of immigrants. To test for this possibility, we calculate the between-establishment variance of \bar{m}_j within geographic groups by replacing the grand mean, \bar{m} , with the mean of \bar{m}_j within establishment j 's geographic region. The results, based

⁴When we calculate the variance within groups (that is, by geography, industry, and establishment size), m_i is randomly re-sorted within each group. This ensures that both the establishment-size distribution and the immigrant share within groups remain constant.

Table 2. Variance of within-Establishment Immigrant Shares and 99% Confidence Interval under Null of Random Distribution of Immigrants.

Description	Empirical Estimate	99% Confidence Interval
<i>1. Total</i>		
Between All Establishments	0.047	(0.020–0.022)
Between Establishments within Geography (9)	0.035	(0.018–0.020)
Between Establishments within 3-Digit Industries (90)	0.043	(0.020–0.021)
Between Establishments within Establishment Size (4)	0.047	(0.020–0.021)
Between Establishments within Geog. × Industry × Firm Size (1,811)	0.031	(0.025–0.027)
<i>2. Men</i>		
Between All Establishments	0.056	(0.030–0.032)
Between Establishments within Geography (9)	0.045	(0.027–0.030)
Between Establishments within 3-Digit Industries (90)	0.052	(0.029–0.032)
Between Establishments within Establishment Size (4)	0.056	(0.029–0.032)
Between Establishments within Geog. × Industry × Firm Size (1,734)	0.029	(0.022–0.024)
<i>3. Women</i>		
Between All Establishments	0.062	(0.037–0.040)
Between Establishments within Geography (9)	0.048	(0.033–0.036)
Between Establishments within 3-Digit Industries (90)	0.058	(0.035–0.038)
Between Establishments within Establishment Size (4)	0.062	(0.036–0.039)
Between Establishments within Geog. × Industry × Firm Size (1,675)	0.031	(0.025–0.027)

Notes: The 99% confidence interval represents the 10th and 990th highest values from 1,000 replications of randomly resorting workers across establishments. The number of cells conditioned on is shown in parentheses in the first column. The geography and firm-size cells are those shown in Table 1.

on nine cities and provinces, are shown in the second row of Table 2. As expected, the variances are substantially lower, but immigrant employment continues to appear highly segregated. In the following rows, we consider sorting within ninety 3-digit industries, four establishment-size categories, and within the full interaction of our geography, industry, and establishment-size cells. Even when we look within 1,811 geography-industry-size groups, we continue to find evidence of statistically significant non-random sorting of immigrants across establishments. The interesting question then is to what extent this sorting was related to the idiosyncratic wage-setting behavior of establishments.

3. Wage Decomposition

In this section we estimate establishment wage effects and examine the relative importance of within- and across-establishment immigrant wage differentials and the sources of these differentials. Our decomposition of the immigrant wage differential into its

within- and across-establishment dimensions is based on the linear regression

$$(1) \quad w_{ij} = \beta^c + m_{ij}\beta^m + x'_{ij}\beta^x + z'_{ij}\beta^z + \mu_j + \varepsilon_{ij},$$

where w_{ij} is the log hourly wage rate of worker i employed in establishment j ; m_{ij} is an immigrant dummy; x_{ij} is a column vector of worker characteristics; z_{ij} is a column vector of job characteristics; μ_j is a fixed effect for individuals employed in establishment j ; and ε_{ij} is a random error term. The returns to m_{ij} , x_{ij} , and z_{ij} in equation (1) reflect wage differentials within establishments, which may or may not exceed the population returns, depending on how these characteristics are sorted across establishments.⁵ The estimated establishment fixed effects μ_j , on the other

⁵In general we find, as did Bronars and Famulari (1997), a strong positive correlation between observable worker skills and our estimated establishment wage effects. This implies that our estimated returns to worker skills will be smaller than those estimated for the population (that is, the returns that would be estimated if the vector μ_j were omitted from equation 3).

hand, essentially capture mean log wages within establishments after purging individual wages of their within-establishment returns. By including an immigrant dummy in (1) we ensure that our estimate of μ_j does not reflect the combination of independent immigrant wage effects (for example, discrimination) and the non-random sorting of immigrants across establishments.

The major advantage of the WES data in estimating equation (1) is the richness of the worker and job characteristics observed, which allows us to go further than would otherwise be possible in identifying the sources of within-establishment immigrant wage differentials. Of particular interest here is the extent to which the relatively low returns to foreign sources of schooling and experience, identified in Aydemir and Skuterud (2005) for example, reflect wage differentials between immigrants and natives employed in similar jobs in the same establishments, as opposed to a concentration of immigrants with abundant foreign human capital in low-wage establishments. The major limitation of the WES data, however, is that their sampling design does not allow us to separately identify unobserved person effects. To the extent that any residual wage variation (conditional on worker and job characteristics and an immigrant dummy) is correlated with our firm identifiers, that is, $E(\mu_j \varepsilon_{ij}) \neq 0$, our estimates of the establishment fixed effects will be biased (see equation 2.4 in Abowd, Kramarz, and Margolis [1999] for the exact omitted variable bias term). Our hope is that the observable individual-level covariates included in x_{ij} and z_{ij} are sufficiently rich to purge our estimated establishment wage effects of enough individual heterogeneity that our main results primarily reflect rents or compensating differentials as opposed to unobserved worker heterogeneity.⁶

⁶Interestingly, Abowd et al. (2002) can account for 84.4% (French data) and 90.6% (Washington data) of total wage variation in their data when they estimate both unobserved person and establishment effects (our own calculations, based on their reported covariance matrix). In contrast, our full set of worker and job characteristics, together with our establishment fixed effects, account for only 72%, suggesting that much of

However, given this limitation of our data, our estimated establishment fixed effects should be interpreted with some caution. To gauge the meaningfulness of our results, in the final section of the paper we consider whether our main findings are robust with respect to two strong correlates of establishment-level wage rents—reported wage satisfaction and union status.

A critical feature of equation (1) to note is that all the returns, except the constant, are restricted to be the same for immigrants and natives. As a result, any immigrant wage differentials must be captured either by differences in the observable characteristics of workers, including their job characteristics and in which establishments they work, or by the coefficient on the immigrant dummy. In the case of the establishment fixed effects this restriction makes sense, since these effects reflect unmeasured characteristics of establishments, which are the same for immigrants and the native-born. As for the human capital and job characteristic returns, we avoid allowing different returns because we find such differences difficult to interpret. In contrast, wage differentials resulting from differences in the observable characteristics of workers offer a straightforward interpretation. As an example, rather than estimate different returns to immigrant and native-born human capital, in our x_{ij} vector we use information on age at migration to distinguish labor market experience and schooling obtained abroad from that obtained in Canada. Since many immigrants will have obtained some or all of their schooling and experience in Canada, these approaches are by no means equivalent. To the extent that immigrants are paid less than native-born workers in the same establishments with truly identical human capital and job characteristics, perhaps due to discrimination, for example, there will be an unexplained gap captured by a negative estimate of β^m . Since the experience of immigrant women may be very different from that of immigrant men, but female wage differentials are not of primary interest, we

the unobserved worker heterogeneity remaining in our data is orthogonal to how workers were sorted across establishments.

do, however, allow for a full interaction of all the covariates, including the constant but excluding μ_j , with a female dummy.

The raw difference in mean log wages between immigrants and natives (identified in Table 1) can be decomposed as

$$(2) \quad \bar{w}^m - \bar{w}^n = \beta^m + (\bar{x}^m - \bar{x}^n)'\beta^x + (\bar{z}^m - \bar{z}^n)'\beta^z + (\bar{\mu}^m - \bar{\mu}^n),$$

where the superscripts m and n denote the immigrant and native-born means, respectively. The first term on the right-hand side of (2) is the unexplained differential; the second term is the effect of variation in worker characteristics; the third term is the effect of variation in job characteristics; and the fourth term is the effect of sorting of immigrants across establishments. This decomposition amounts to nothing more than a restrictive form of the standard Oaxaca decomposition in which the returns to characteristics are restricted to be identical between groups.

Finally, as the results in Tables 1 and 2 reveal, immigrant employment is highly concentrated in Canada's major urban centers, which accounts for an important part of the non-random sorting of immigrants across the establishments in our data. The increasing tendency for more recent immigrant cohorts to settle in Canada's major urban centers (particularly Toronto and Vancouver) has in recent years been getting much attention in policy discussions. This is, however, an issue quite different from how immigrants are sorted across establishments within Canada's cities and regions. To the extent that policymakers can more easily influence the distribution of immigrants within Canada's regions and cities, the immigrant differential in establishment wage effects within geography is of more policy relevance than the overall differential. In addition, because much of the geographic variation in our establishment wage effects likely reflects locational amenities, such as climate and living costs (see Rosen 1986), which have unclear implications for economic well-being, the across-geography variation is arguably less interesting than the within-geography variation, which is more likely to reflect rents or other types of compensating differentials.

To decompose the establishment wage effect differentials into their within- and across-geography components, we estimate, at the individual level, the equation

$$(3) \quad \hat{\mu}_j = m_{ij}\alpha^m + w_j'\alpha^w + \eta_{ij},$$

where $\hat{\mu}_j$ is the fixed effect of establishment j estimated in equation (1); m_{ij} is again an immigrant dummy; w_j is a vector of nine geography dummies defined in Table 1; and η_{ij} is an error term that, in part, captures any measurement error in $\hat{\mu}_j$, which we assume is uncorrelated with m_{ij} and w_j . We also estimate specifications in which w_j is defined as industry, establishment size, and the full interaction of geography, industry, and size, as with the tests of sorting in Section 2. The establishment wage effect differential in equation (2) can then be decomposed as

$$(4) \quad (\bar{\mu}^m - \bar{\mu}^n) = \alpha^m + (\bar{w}^m - \bar{w}^n)'\alpha^w,$$

where the first term on the right-hand side is the differential within establishment characteristic cells (for example, geography) and the second term is the differential across these cells.

4. Results

4.1. Worker Characteristics

In Table 3 we report the results from estimating versions of equation (1) and performing the decomposition in equation (2) with no job-characteristic vector. In the first column of Table 3 we include only a constant, an immigrant dummy, and a year 2001 dummy to capture any cyclical variation in our inflation-adjusted wages. The coefficient on the immigrant dummy is 0.004 for both men and women, which simply duplicates the result of essentially identical mean log wages reported in the first row of Table 1. In column (2), we add the establishment fixed effects, which explain an additional 56% of the overall variation in log wages (the R^2 increases from 0.046 to 0.610). The coefficient on our immigrant dummy can now be thought of as identifying the difference in mean log wages between immigrants and natives within the 40% of establishments that had a mixture

of immigrant and native-born workers. The establishment fixed effects, in turn, identify mean log wages within establishments after accounting for this “independent” immigrant wage effect, and the fact that some establishments had more immigrants than others. The results imply a within-establishment wage disadvantage for immigrants but, on average, higher establishment wage effects. Interestingly, these effects were substantially larger for immigrant women than for immigrant men (6% compared to 2%). Given that immigrants are much more likely to live (and work) in Canada’s major cities, where we know wages are higher, the higher establishment wage effects are perhaps not surprising (although this does not explain the larger female effects). What is more surprising is that even before we condition on the observable human capital advantages identified in Table 1, immigrants appear to have earned lower wages within establishments. A possible explanation is that the immigrant human capital advantage occurs entirely across establishments.

In the third and fourth columns of Table 3 we condition on labor market experience (quadratic) and the set of education variables in Table 1, respectively. The results for both men and women imply large human capital advantages for immigrants even within establishments. For immigrant men, the estimated human capital returns imply a wage advantage of 7%. For immigrant women the implied effect is slightly smaller, at 5%. Moreover, the relative distribution of establishment wage effects continues to imply, if anything, wage advantages for immigrants, although for men the difference is now very close to zero. The combined positive effects of establishment sorting and human capital on the relative wages of immigrants now imply large unexplained wage gaps. For immigrant men the unexplained differential is 7.6%, while for women it is 10.3%. An obvious explanation for this result is that our estimates fail to distinguish Canadian from foreign sources of schooling and experience and thereby, on average, overvalue immigrant human capital. This could happen, for example, if foreign credentials and work experience are noisier signals of worker productivity

than credentials and experience earned in Canada.

In the final column of Table 3 we distinguish labor market experience and schooling obtained abroad from that obtained in Canada. Although we do not directly observe the foreign quantities of experience and schooling, we do observe immigrants’ year of migration and can estimate their total years of schooling.⁷ Assuming schooling is strictly continuous, these two variables, together with current age, allow us to separate potential labor market experience and schooling into its Canadian and foreign components.⁸ Consistent with our findings in Aydemir and Skuterud (2005), the results indicate substantially lower returns to experience and schooling obtained abroad (for brevity, these results are not shown, but the results from the full specification, shown in the appendix, are very similar). Thus, for example, for men with five years experience working in Canada, an additional year of Canadian experience is expected to raise wages by 2.5%. The comparable return to foreign experience is only 0.6%. In fact, neither for men nor for women is the pattern of returns to foreign experience statistically distinguishable from a perfectly flat profile. Similarly, a bachelor’s degree obtained abroad boosts male wages by 18.3%, compared to 25.3% if it came from a Canadian university. The

⁷Specifically, we use the complete 20% master file of the 2001 Canadian Census, which provides information on both credentials obtained and total years of schooling, to estimate mean years of schooling conditional on the list of credentials identified in the WES. These estimates are available from the authors.

⁸To the extent that immigrants arrive in Canada with foreign labor market experience and return to school in Canada, our measures will overstate years of foreign schooling and Canadian experience by the number of years spent in Canadian schools and understate years of Canadian schooling and foreign experience by exactly the same amount. This introduces a very special form of non-classical measurement error, which, depending on the relative magnitudes of the true returns to Canadian and foreign experience and schooling, may result in upward or downward biases in the estimated returns (see Aydemir and Skuterud 2005 for more details). Our results are, however, virtually identical if we instead allow the returns to total schooling and experience to vary between immigrants and natives (these estimates are available from the authors).

Table 3. Contribution of Worker Characteristics to Immigrant Wage Differentials.

Description	(1)	(2)	(3)	(4)	(5)
<i>Male Decomposition</i>					
Establishment Fixed Effects	—	0.022* (0.008)	0.023* (0.007)	0.006 (0.007)	0.018* (0.009)
Worker Characteristics	—	—	0.031* (0.002)	0.074* (0.003)	-0.019 (0.022)
Unexplained	0.004 (0.021)	-0.018 (0.017)	-0.050* (0.017)	-0.076* (0.018)	0.006 (0.022)
<i>Female Decomposition</i>					
Establishment Fixed Effects	—	0.055* (0.007)	0.064* (0.007)	0.057* (0.007)	0.066* (0.007)
Worker Characteristics	—	—	0.019* (0.002)	0.050* (0.002)	-0.030 (0.023)
Unexplained	0.004 (0.022)	-0.051* (0.016)	-0.079* (0.016)	-0.103* (0.014)	-0.032 (0.028)
<i>Covariates</i>					
Immigrant Dummy	Yes	Yes	Yes	Yes	Yes
Year 2001 Dummy	Yes	Yes	Yes	Yes	Yes
Establishment Fixed Effects	—	Yes	Yes	Yes	Yes
Experience (Quadratic)	—	—	Yes	Yes	—
Education	—	—	—	Yes	—
Canadian Experience (Quadratic)	—	—	—	—	Yes
Foreign Experience (Quadratic)	—	—	—	—	Yes
Canadian Education	—	—	—	—	Yes
Foreign Education	—	—	—	—	Yes
R-Squared	0.046	0.610	0.632	0.664	0.667

Notes: Each column represents a single linear regression using a pooled sample of 43,391 men and women. All covariates (including the constant) are interacted with a gender dummy, but restricted to be the same for immigrants and natives. Decompositions represent the difference in mean predicted log wages between immigrants and natives using subsets of the covariate coefficients. Worker characteristics are labor market experience and education (with Canadian and foreign quantities distinguished in the final column). The unexplained difference is given by the coefficient on an immigrant dummy.

*Statistically significant at the 5% level. Standard errors are estimated by bootstrapping to take account of the WES complex survey design.

fact that these large differential returns are observed *within* establishments employing both immigrants and native-born workers—so they do not simply reflect sorting of immigrants with primarily foreign sources of human capital into relatively low-wage establishments—is an important result that has, to our knowledge, not been documented elsewhere.

When we distinguish the source of immigrants' human capital, both the male and female unexplained wage gaps decrease by 7 percentage points (and become statistically insignificant). This decrease is entirely explained by the decrease in the implied value of immigrants' education and experience.

Now, despite immigrants appearing to be much more educated than the native-born (if all university degrees are treated equally), immigrants' human capital characteristics, on average, imply small wage disadvantages of 2% (men) and 3% (women). The effect of establishment sorting, however, continues to be positive, and if anything, increases slightly (relative to column 4), suggesting some concentration of foreign human capital across establishments.

4.2. Job Characteristics

Conditioning on observable human capital characteristics does not address the question

of whether immigrants were performing jobs very different from those of native-born workers employed in the same establishments. In Table 4 we add job characteristics to our estimation of equation (1) and the wage decomposition in equation (2). We include indicators of occupation, supervisory duties, the educational requirements of jobs, current job tenure, computer usage, and various details of work arrangements, such as indicators of night shifts and temporary contracts (see the notes to Table 4 for details). With the exception of the occupation (Green 1999) and job tenure (McDonald and Worswick 1998) variables, to our knowledge, none of these variables have been examined elsewhere in analyses of immigrant wage differentials.

In the first column of Table 4 we add occupation controls, which explain an additional 4.5% of the variation in log wages. The results indicate that, even in an analysis that controls for education and experience, immigrant men are found to have been employed in relatively high-paid occupations, although the implied wage effect of 1.7% is small. Immigrant women, on the other hand, tended to be employed in relatively low-paid occupations, although again the implied wage effect is small (-1.4%). The difference is explained by the fact that immigrant men were significantly more likely than native-born men to be employed as professionals and less likely to be working in technical jobs or trades, whereas immigrant women were significantly more likely than native-born women to be production workers (see the means in Table 1). As a result, the small positive unexplained gap for men in Table 4 (0.6%) becomes somewhat negative (-1.5%), whereas the negative gap for women (-3.2%) becomes smaller in magnitude, though it remains negative (-1.3%). The effect on the establishment and worker characteristic estimates is even smaller.

In the remaining six columns of Table 4 we gradually add the other job characteristic controls, which together account for an additional 2% of the overall wage variation. Of relative importance are the additional human capital indicators—minimum educational requirements and the indicator of whether a computer is used on the job. Overall, job

characteristics tend to imply slightly higher wages for immigrant men, but, if anything, slightly lower wages for immigrant women. The advantage for immigrant men compensates for their lower human capital returns and a persistent small negative unexplained gap, so that in the final specification there is no evidence of any within-establishment immigrant wage differential (-0.015 + 0.024 - 0.009). In contrast, within establishments immigrant women appear to have experienced roughly a 5% wage disadvantage (-0.017 - 0.010 - 0.021). Nearly half of this differential (2.1%) is not explained either by lower returns to foreign sources of human capital or by the relative job characteristics of immigrant women within establishments. Still, relative to the wage gaps obtained if all human capital is treated equally (column 4, Table 3), this differential is small. What is more interesting and surprising is the apparent 5% relative wage advantage resulting from the non-random sorting of immigrant women across establishments.

4.3. Establishment Characteristics

We have argued that the relative distribution of establishment wage effects *within* Canada's major cities and regions is more interesting than the distribution *across* these large geographic areas. In Table 5, we report the results from decomposing the immigrant establishment wage effect differentials identified in the final column of Table 4 (0.5% for men and 5.1% for women) into their within- and across-geography, industry, and establishment size components (as given in equation 4). Our prior is that much of the apparent positive sorting of immigrants, particularly immigrant women, across establishments reflects their concentration in Toronto and Vancouver, where wages (and living costs) tend to be substantially higher.

Indeed, the first column of Table 5 indicates that once we condition on major cities and regions, immigrants appear concentrated in relatively low-wage establishments. So *within* Toronto and Vancouver, where the majority of Canada's immigrant workers live, the non-random sorting of immigrants across business establishments implies, if

Table 4. Contribution of Job Characteristics to Immigrant Wage Differentials.

Description	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Male Decomposition</i>							
Establishment Fixed Effects	0.007 (0.008)	0.004 (0.008)	0.002 (0.008)	0.004 (0.008)	0.004 (0.007)	0.004 (0.007)	0.005 (0.007)
Worker Characteristics	-0.004 (0.019)	-0.008 (0.019)	-0.018 (0.019)	-0.023 (0.019)	-0.017 (0.019)	-0.015 (0.019)	-0.015 (0.018)
Job Characteristics	0.017* (0.002)	0.019* (0.002)	0.028* (0.002)	0.027* (0.002)	0.024* (0.002)	0.024* (0.002)	0.024* (0.002)
Unexplained	-0.015 (0.019)	-0.011 (0.019)	-0.009 (0.019)	-0.004 (0.019)	-0.007 (0.019)	-0.009 (0.018)	-0.009 (0.019)
<i>Female Decomposition</i>							
Establishment Fixed Effects	0.057* (0.006)	0.052* (0.006)	0.052* (0.006)	0.052* (0.006)	0.051* (0.006)	0.051* (0.006)	0.051* (0.006)
Worker Characteristics	-0.027 (0.019)	-0.016 (0.021)	-0.012 (0.021)	-0.017 (0.020)	-0.017 (0.020)	-0.017 (0.020)	-0.017 (0.020)
Job Characteristics	-0.014* (0.001)	-0.013* (0.001)	-0.007* (0.002)	-0.006* (0.002)	-0.006* (0.002)	-0.009* (0.002)	-0.010* (0.002)
Unexplained	-0.013 (0.022)	-0.019 (0.024)	-0.030 (0.025)	-0.026 (0.024)	-0.024 (0.024)	-0.021 (0.024)	-0.021 (0.024)
<i>Covariates</i>							
Immigrant Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year 2001 Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Establishment Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canadian Experience (Quadratic)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Foreign Experience (Quadratic)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canadian Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Foreign Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supervisory Duties	—	Yes	Yes	Yes	Yes	Yes	Yes
Educational Requirements	—	—	Yes	Yes	Yes	Yes	Yes
Job Tenure (Quadratic)	—	—	—	Yes	Yes	Yes	Yes
Computer Use	—	—	—	—	Yes	Yes	Yes
Work Arrangements	—	—	—	—	—	Yes	Yes
Temporary Job	—	—	—	—	—	—	Yes
R-Squared	0.711	0.717	0.723	0.726	0.727	0.728	0.729

Notes: Each column represents a single linear regression using a pooled sample of 43,391 men and women. All covariates (including the constant) are interacted with a gender dummy, but restricted to be the same for immigrants and natives. Decompositions represent the difference in mean predicted log wages between immigrants and natives using subsets of the covariate coefficients. Worker characteristics are Canadian and foreign, labor market experience and education. Job characteristics are 6 occupation categories (managers, professionals, technical/trades, marketing/sales, clerical/administrative, and production/operation/maintenance workers), 2 indicators of supervisory duties (a supervisor dummy and number supervised), educational requirements of the job (4 credential categories), job tenure (a quadratic), computer use, work arrangements (flexible hours, Saturday or Sunday work, night work), and indicators of seasonal and contract work. The unexplained difference is given by the coefficient on an immigrant dummy.

*Statistically significant at the 5% level. Standard errors are estimated by bootstrapping to take account of the WES complex survey design.

anything, a wage disadvantage. This effect is particularly large for immigrant men (5.3%) and exceeds any of the within-establishment

wage differentials estimated in Table 4. For immigrant women, on the other hand, sorting within geography implies a much smaller

wage disadvantage (1.5%), which is less than the overall within-establishment wage differentials identified in the final column of Table 4. These results are entirely consistent with the popular perception that immigrants lack the social networks necessary to obtain jobs with high-wage employers. What is interesting, though, is that this sorting appears to have mattered much more for immigrant men than for immigrant women.

In the second and third columns of Table 5 we perform the decomposition given in equation (4), but now using industry and establishment size cells, respectively, instead of geography cells. The results indicate that immigrants were employed in industries with, on average, slightly lower establishment wage effects (1.3% for men and 0.5% for women), but within industries the sorting is positive (1.8% for men and 5.6% for women). Sorting across establishment size, on the other hand, played little role, which is consistent with the roughly similar distribution of immigrants and native-born workers across establishment size shown in Table 1. What about sorting within geography-specific industry-size cells? Again, both the male and female results suggest negative sorting, but for men the magnitude of this effect (1.5%) is now considerably smaller than in column (1) (5.3%). What explains the difference? It must be that much of the negative sorting of immigrants within geography was in fact sorting across industry. This is interesting in light of the evidence from elsewhere (for example, Krueger and Summers 1988) that industry wage differentials are related to the payment of efficiency wages. This provides some very limited evidence that the negative sorting of immigrant men within Canada's major cities and regions has welfare implications.

4.4. Region of Birth and Years Since Migration

Up to now we have made no distinctions between immigrants. Of course there are many dimensions of immigrants on which our results may vary in important ways. For example, we might expect the relative importance of establishment sorting to vary with years since migration, entry cohort,

age at arrival, country of origin, or the language abilities of immigrants. Over the past two decades Canada has experienced a dramatic shift in the source countries of new immigrants from relatively developed countries with similar cultures and languages to relatively underdeveloped countries where cultures and languages are often very different from those in Canada. As a result of this shift, even with many years of data all these variables of interest tend to be highly correlated, which makes disentangling their effects difficult. With only two years separating our cross-sections (1999 and 2001), distinguishing assimilation and cohort effects in any meaningful way is particularly difficult (Borjas 1985).

In what follows we distinguish immigrants along two dimensions. First, immigrants from traditional source regions, defined as regions contributing a stable or declining share of arrival cohorts, are distinguished from immigrants from non-traditional source regions, defined as regions contributing a rising share. Traditional regions include North and South America, the Caribbean, Oceania, and northern, western, and southern Europe, and non-traditional regions are eastern Europe, Africa, and all of Asia. Evidence from the Canadian Census over a 20-year period suggests that this broad distinction is an important one that captures much of the deterioration in the labor market performance of recent immigrant cohorts relative to cohorts of the 1960s and 1970s (Aydemir and Skuterud 2005). Our hope is that conditioning on source region in this way will substantially reduce between-cohort heterogeneity, so that the differentials we find between recent and earlier immigrants will primarily reflect assimilation. To the extent that our approach is successful, our results provide evidence on the extent to which the well-established wage assimilation patterns of immigrants reflect improved sorting across establishments, perhaps due to the accumulation of social capital, as opposed to human capital accumulation or improved job matches.

In Table 6 we report the results from performing the complete decomposition of the immigrant wage differential given by

Table 5. Decomposition of Establishment Fixed Wage Effects.

<i>Description</i>	(1)	(2)	(3)	(4)
<i>Male Decomposition</i>				
Within Cells	-0.053* (0.016)	0.018 (0.010)	0.001 (0.012)	-0.015* (0.007)
Across Cells	0.058* (0.007)	-0.013 (0.010)	0.004 (0.006)	0.020 (0.014)
<i>Female Decomposition</i>				
Within Cells	-0.015 (0.014)	0.056* (0.009)	0.045* (0.012)	-0.009 (0.006)
Across Cells	0.066* (0.007)	-0.005 (0.010)	0.006 (0.007)	0.060* (0.013)
<i>Cells</i>				
Geography (9)	Yes	—	—	—
Industry (90)	—	Yes	—	—
Size (4)	—	—	Yes	—
Geography × Industry × Size (1,811)	—	—	—	Yes
R-Squared	0.090	0.419	0.208	0.740

Notes: Each specification represents a single linear regression using a pooled sample of 43,391 men and women. The dependent variable in all specifications is the estimated establishment fixed effect from the final specification of Table 4. The cells (that is, covariates) in the four specifications are, respectively, 9 geography dummies; 90 3-digit industry dummies; 4 workplace size dummies (1–19 employees; 20–99 employees; 100–499 employees; and 500+ employees); and the full interaction of all 3 (1,811 cells). With the exception of the constant term, the covariate effects are restricted to be the same between men and women and between immigrants and natives. The within-cell difference represents the coefficient on the immigrant dummy (interacted with male and female dummies). The between-cell difference represents the difference in mean predicted log wages between immigrants and natives using the estimated geography, industry, and size effects (and their full interaction in the final specification).

*Statistically significant at the 5% level. Standard errors are estimated by bootstrapping to take account of the WES complex survey design.

equations (2) and (4) separately for recent and non-recent immigrants from both traditional and non-traditional source regions. We define recent and non-recent immigrants as those whose time in Canada since migration is, respectively, less than 10 years and 10 years or more. This provides sample sizes of 3,416 traditional/non-recent immigrants; 436 traditional/recent immigrants; 1,981 non-traditional/non-recent immigrants; and 1,085 non-traditional/recent immigrants.

Perhaps not surprisingly, the raw immigrant-native difference in mean log wages was in all cases substantially more negative for recent immigrants. For example, among men from non-traditional source regions, the immigrant-native wage gap was 18.8% for recent immigrants compared to 5.8% for non-recent immigrants. The remaining rows of Table 6 indicate that in all cases the larger unconditional wage gaps for recent arrivals

appear to have been primarily driven by differences in worker characteristics. Examination of the individual worker characteristics reveals that in all cases this result reflects the greater accumulation of Canadian work experience among non-recent immigrants (note that, assuming mean age at migration has not changed dramatically over time, our definition of “recent” implies that non-recent immigrants must have been substantially older, on average, than recent immigrants). More interestingly, conditioning on geography, the immigrant-native disadvantage in establishment fixed effects was, in all cases, larger for more recent arrivals. For example, among immigrant men from non-traditional regions, the gap in establishment fixed effects within geography was 8.2% for non-recent immigrants compared to 14.2% for recent immigrants. This apparent improvement in establishment wage effects through time is

observed even among similarly sized establishments within industries in a particular city or region. These results suggest that at least part of immigrant wage assimilation reflects sorting of immigrants into relatively high-wage establishments through time.

Equally striking are the results in Table 6 if we compare traditional to non-traditional immigrants with similar years since migration. In all cases, immigrants from non-traditional source regions faced substantially larger unconditional wage gaps (relative to natives) than did immigrants from traditional source regions (the point estimates for non-recent immigrant women actually suggest wage advantages). For example, among recent immigrant men, those from traditional source regions faced a 4.5% wage disadvantage compared to an 18.8% disadvantage among those from non-traditional source regions.

What explains the poor wage outcomes of Canadian immigrants from non-traditional source regions? Whether we compare recent or non-recent arrivals, among men the biggest contributing factor, by a considerable margin, appears to have been the relative concentration of non-traditional-source-region immigrants in low-wage workplaces within Canada's major cities and regions. For women, on the other hand, the large relative wage disadvantages of non-traditional-source-region immigrants are by and large unexplained, although even here there is evidence that this group of immigrants was concentrated in low-wage workplaces. These large unexplained within-establishment differentials among immigrant women from non-traditional source regions are remarkable given our human capital controls, which distinguish Canadian and foreign sources of schooling and experience, and the detailed job characteristic controls including occupation and the educational requirements of jobs.

As for the large negative effects of establishment sorting within geography for men, it is unclear to what extent they reflect rents, as opposed to compensating differentials or sorting of unobserved ability across establishments. Interestingly, the WES data contain a subjective wage satisfaction question. Specifically, all employees were asked, "Considering

the duties and responsibilities of this job, how satisfied are you with the pay and benefits you receive?" with responses coded into 4 levels of satisfaction. In addition, the WES data identify the union status of individual employees. Since both variables should be highly correlated with rents, to the extent that our establishment wage differentials reflect true premiums, we should expect to see similar differentials using these measures.

Indeed, immigrant men from non-traditional source regions did report significantly lower wage satisfaction levels and were significantly less likely to be unionized than either native-born workers or immigrants from traditional source regions (these results are available from the authors on request). Similarly, immigrant men who had arrived in Canada within the past 10 years (whether from traditional or non-traditional source regions) consistently reported lower wage satisfaction levels and unionization rates than either native-born workers or immigrant men who had lived in Canada for more than 10 years. Finally, consistent with the smaller role of establishment wage effects in explaining immigrant wage differentials for women, differences in wage satisfaction levels between non-traditional-source-region women and either natives or traditional-source-region immigrant women, and between recent and either native-born or non-recent immigrant women, are much smaller and in most cases not statistically significant (relative unionization rates of immigrant women from non-traditional source regions and of recent immigrant women are, however, consistently negative and significant). These results also suggest that despite the limitation of the WES data in separately identifying unobserved person effects, the differences in establishment wage effects between immigrants and native-born workers and between different immigrant groups do, at least in part, reflect something other than unobserved worker heterogeneity.

5. Summary

Our major finding is that the concentration of immigrant men in low-wage establishments within Canada's major cities and regions was

Table 6. Decomposition of Immigrant Wage Differential Separately for Traditional and Non-Traditional Source Country Immigrants.

	<i>Traditional</i>		<i>Non-Traditional</i>	
	<i>Non-Recent</i>	<i>Recent</i>	<i>Non-Recent</i>	<i>Recent</i>
<i>Male Decomposition</i>				
Establishment Fixed Effects	0.051* (0.006)	0.026 (0.015)	-0.016 (0.010)	-0.067* (0.014)
– Within Geography	-0.001 (0.022)	-0.018 (0.033)	-0.082* (0.031)	-0.142* (0.039)
– Within Industry	0.042* (0.016)	0.005 (0.027)	0.015 (0.022)	-0.020 (0.024)
– Within Size	0.042* (0.020)	0.041 (0.032)	-0.019 (0.026)	-0.067* (0.028)
– Within Geography × Industry × Size	0.006 (0.010)	-0.026 (0.026)	-0.028* (0.014)	-0.045* (0.013)
Worker Characteristics	0.025 (0.015)	-0.132* (0.032)	-0.002 (0.037)	-0.102* (0.048)
Job Characteristics	0.043* (0.003)	0.003 (0.005)	0.020* (0.003)	-0.016* (0.005)
Unexplained	0.008 (0.019)	0.058 (0.049)	-0.061 (0.037)	-0.003 (0.050)
Immigrant-Native Difference in Mean Log Wage	0.126* (0.025)	-0.045 (0.071)	-0.058 (0.037)	-0.188* (0.038)
<i>Female Decomposition</i>				
Establishment Fixed Effects	0.079* (0.006)	0.012 (0.014)	0.042* (0.009)	0.009 (0.012)
– Within Geography	0.019 (0.019)	-0.050 (0.039)	-0.034 (0.025)	-0.071* (0.026)
– Within Industry	0.064 (0.012)	0.002 (0.032)	0.056 (0.021)	0.060* (0.022)
– Within Size	0.059* (0.016)	0.036 (0.041)	0.035 (0.024)	0.036 (0.023)
– Within Geography × Industry × Size	0.001 (0.009)	-0.027 (0.024)	-0.016 (0.010)	-0.019 (0.013)
Worker Characteristics	0.007 (0.017)	-0.115* (0.032)	0.085* (0.034)	-0.012 (0.045)
Job Characteristics	-0.002 (0.003)	-0.022* (0.003)	-0.005 (0.003)	-0.037* (0.003)
Unexplained	0.003 (0.027)	0.026 (0.050)	-0.109* (0.036)	-0.182* (0.054)
Immigrant-Native Difference in Mean Log Wage	0.087* (0.027)	-0.099 (0.052)	0.013 (0.046)	-0.222* (0.027)
R-Squared	0.730			

Notes: All results, except the establishment fixed effects decomposition (that is, the “within” estimates), are based on a single linear regression using a pooled sample of 43,391 men and women, of whom 36,473 are Canadian-born; 3,416 are non-recent immigrants (<10 years since migration) from a traditional source region (North and South America, the Caribbean, Oceania, and Northern, Western, and Southern Europe); 436 are recent immigrants (≥10 years since migration) from a traditional source region; 1,981 are non-recent immigrants from a non-traditional source region (the rest); and 1,085 are recent immigrants from a non-traditional source region. The dependent variable is the log wage, and controls include the full set of covariates in the final specification of Table 4. All covariates (including the constant) are interacted with a gender dummy, but are restricted to be the same for all immigrants and natives. The establishment fixed effects decomposition is performed the same way as in Table 5.

*Statistically significant at the 5% level. Standard errors are estimated by bootstrapping to take account of the WES complex survey design.

a more important source of immigrant wage differentials than differences in how immigrant men were paid within establishments. Certainly immigrant men were, on average, more educated and had more labor market experience than native-born men doing similar jobs in the same establishments, but once we distinguish human capital obtained abroad from that obtained in Canada, this apparent human capital advantage implies neither a wage advantage nor a wage disadvantage. Among immigrant women, on the other hand, there is relatively little evidence of concentration in low-wage establishments. Immigrant women, however, appear to have experienced relatively large within-establishment wage disadvantages. Interestingly, an important part of this disadvantage is not explained either by lower returns to immigrant women's human capital or by the types of jobs they did, including the occupation and educational requirements of jobs. Finally, when we produce separate results for recent immigrants and immigrants from non-traditional source regions, we find strong evidence, for both men and women, of negative sorting across establishments within Canada's major cities and regions and large unexplained wage gaps within establishments.

These findings raise a number of important questions for future research. First, what are the mechanisms leading to the highly segregated distribution of immigrant workers across Canadian business establishments? In particular, does it primarily reflect the search methods of immigrants or the recruiting methods of employers? Second, why does this sorting appear to result in relative wage disadvantages for immigrant men, but not immigrant women? And to what extent does this difference reflect true wage premiums, as opposed to differing preferences for job attributes or sorting of unobserved ability? Of particular interest here are the roles of ethnic enclaves, social networks, and job referrals. Finally, what explains our finding of large unexplained within-establishment wage disadvantages experienced by recent immigrants, particularly women, from non-traditional source regions, even when our analysis allows for lower returns to human capital from these regions and controls for detailed job characteristics? Our study may provide some guidance for researchers who attempt to answer these questions, as our results underscore the importance of disaggregating the sample by immigrants' gender and source country.

Appendix Table A1
Establishment Fixed Effects Log Wage Regression (Equation 1)

<i>Independent Variable</i>	<i>Men</i>		<i>Women</i>	
Year 2001 Dummy	0.020*	(0.009)	-0.008	(0.008)
Immigrant	-0.009	(0.019)	-0.021	(0.024)
Canadian Experience	0.019*	(0.002)	0.017*	(0.002)
Canadian Experience Squared	-0.030*	(0.003)	-0.028*	(0.003)
Foreign Experience	0.006*	(0.003)	-0.008	(0.005)
Foreign Experience Squared	-0.005	(0.015)	0.026	(0.020)
Canadian Years of Grade School	0.018*	(0.003)	0.007	(0.004)
Foreign Years of Grade School	0.013*	(0.004)	0.007	(0.005)
Canadian Trade/Vocational	0.024	(0.015)	0.009	(0.019)
Foreign Trade/Vocational	0.028	(0.032)	0.047	(0.067)
Canadian College Diploma	0.045*	(0.014)	0.047*	(0.011)
Foreign College Diploma	0.019	(0.030)	0.059	(0.034)
Canadian Bachelor's Degree	0.062*	(0.021)	0.109*	(0.016)
Foreign Bachelor's Degree	0.039	(0.046)	0.100*	(0.037)
Canadian Graduate Degree	0.059*	(0.027)	0.108*	(0.023)
Foreign Graduate Degree	0.099	(0.054)	0.021	(0.054)
Professionals	-0.157*	(0.020)	-0.068*	(0.026)
Technical/Trades	-0.234*	(0.016)	-0.205*	(0.026)
Marketing/Sales	-0.312*	(0.032)	-0.269*	(0.038)
Clerical/Administrative	-0.375*	(0.024)	-0.310*	(0.026)
Production Workers (Managers)	-0.310*	(0.026)	-0.308*	(0.038)
Supervisor	0.087*	(0.010)	0.083*	(0.012)
Number Supervised / 100	0.022	(0.013)	0.076*	(0.019)
Some Post-Secondary Required	0.067*	(0.014)	0.073*	(0.016)
Bachelor's Degree Required	0.202*	(0.025)	0.144*	(0.019)
Prof./Graduate Degree Required (High School or Less Required)	0.196*	(0.031)	0.186*	(0.026)
Job Tenure (Years)	0.006*	(0.003)	0.009*	(0.002)
Job Tenure Squared	-0.007	(0.011)	-0.020*	(0.008)
Use a Computer	0.095*	(0.012)	0.033*	(0.016)
Flexible Hours	0.037*	(0.011)	0.008	(0.012)
Works Weekends	-0.013	(0.014)	0.018	(0.022)
Works Evenings or Nights	-0.007	(0.013)	0.033	(0.020)
Seasonal	0.020	(0.026)	0.109	(0.075)
Contract	-0.003	(0.032)	-0.036*	(0.018)
Constant / Female Dummy	2.447*	(0.046)	0.074	(0.075)
Establishment Fixed Effects	Yes			
R-Squared			0.730	
Number of Observations			43,391	

Note: Results are from a single linear regression where all the covariates, except the establishment fixed effects, are interacted with a female dummy.

*Statistically significant at the 5% level. Standard errors are estimated by bootstrapping to take account of the WES complex survey design.

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