Canadian Journal of Regional Science
Revue canadienne des sciences régionales

Hanging together or falling apart? Estimating city wage inequality of race, gender, and ethnicity: 2000-2010

Jamie Goodwin-White

Department of Geography and California Center for Population Research, University of California, Los Angeles. Address comments to goodwin-white@geog.ucla.edu.

Metropolitan labour markets vary in terms of how demographic categories of workers are positioned relative to each other. With mounting recent attention to who gained or lost out in the recent recession, I aim to estimate the relative earnings position of major gender, race, and nativity groups for 15 large US metropolitan areas, employing an inequality of opportunities approach that focuses analysis on between-group differences. How and to what extent did between-group earnings inequality characterize metropolitan labour markets before the recession, and what changed as the recession played out? What forms of wage inequality were attenuated or intensified and where? Which differences were the most significant? What follows is then an analysis of 1) how between-group inequality is configured and varies geographically and 2) how these configurations changed over the decade. Results show varying configurations of labour market inequality both pre- and post-recession, as well as generally declining gender inequality, an inverse relationship between gender and immigrant/native inequality at the metropolitan level, and generally increasing or static racial wage gaps. All cities move away from gender inequality and toward greater racial or immigrant inequality over the period, although the nature of the shifts varies in ways that reflect cities' differing inequality of opportunity contexts.

As the US economy turns from recession to recovery, economic inequality has become a focal point of academic and popular discussion. Most accounts suggest that US economic inequality is at its highest level in nearly a century (Sommeiller & Price 2014). With a bevy of research focusing on the pulling away of the top few percentiles, this paper takes a more inductive approach to mapping varying metropolitan-level configurations of between-group wage inequality by gender, race, and nativity. As part of a larger research agenda examining unequal geographies of the recession, I seek a better understanding of the patterns and variance in city configurations of inequality.

In recent years, sociologists have undertaken and called for more comparative geographic work on earnings inequality (Morris & Western 1999, McCall 2001b, Reskin 2003, McCall & Percheski 2010, Leicht 2014), making the argument that racial and gender gaps vary geographically. While critical of group-based analyses, they have all called for approaches in which mechanisms of difference are brought to the fore and overall wage distributions examined. Development economists' recent 'inequality of opportunities' focus provides a theoretical and methodological approach to address some of these concerns. This literature theorizes between-group differences as constitutive of varying economic configurations, rather than as a residual from human capital models of outcomes. It places between-group earnings inequality up front and examines its composition, as well as its contribution to and across regimes.

I adopt this approach here in order to look at the composition of between-group inequality across 15 US labour markets before and after the recent recession began. Geographers and regional scientists have often used decomposable inequality measures to understand the contribution of sub-regions to overall inequality and its change over time. Here, I use them cross-sectionally within US cities to compare between-group inequality. How do major demographic groups fare in terms of earnings, relative to each other? How much of metropolitan-level earnings inequality is between-group inequality? What between-group patterns underlie shifts in overall inequality? Which groups gain or lose relative to each other, and where? Which patterns are consistent, and which vary geographically or change over the decade? These questions will have to be answered before explanations of differing and shifting configurations can be attempted in future research.

Background

Regional variations in earnings inequality received a great deal of focus in the 1990s as geographers and other social scientists considered the implications of economic restructuring for different demographic groups, including women (Scott 1992, England 1993, Kodras & Padavic 1993, Blau & Kahn 1994), and immigrants (Borjas, Freeman, & Katz 1996, Waldinger 1999). Analysis of geographic variance in wage and employment conditions faced by different groups of workers yielded new understandings of patterns and processes of inequality. Among men, less-educated workers and racial minorities were disproportionately imperilled (Bound & Freeman 1992, Holzer & Offner 2001), due to their higher job loss in areas shifting away from well-paying manufacturing employment. As the gender wage gap diminished with increasing class differences (McDowell 1991, Bernhardt,

Morris, & Handcock 1995) McCall found that the gender gap declined most where less-educated men lost position (1998). Researchers also identified geographic explanations for immigrants' relative labour market disadvantages as regional economies and demographics changed (Wright & Ellis 2000, Clark 2001, Ellis 2001). A comparative geographic perspective on immigrant labour market outcomes continues due to the importance of local contextual inequalities (Ellis, Wright, & Parks 2007, Goodwin-White 2008) and the shifts of immigrants to non-traditional locations in the U.S. (Stamps & Bohon, 2006, Goodwin-White 2012).

More multi-dimensional work has examined metropolitan labour markets as components of a system of inequality working simultaneously across race, ethnicity, class, and gender lines. This approach provides glimpses of how one form of inequality gains ground where/as another declines, or how multiple stratifications cement wage differences. Cotter, Hermsen, & Vanneman (1999) examined the likelihood that race-gender groupings attained percentiles of white male earnings, finding gender gaps related to varied metropolitan-level configurations of race and class. Parks' analysis of men's racial wage differentials integrated metropolitan-level institutional explanations (specifically incarceration, unionization, and public employment) with demographic and industry characteristics, establishing that racial gaps are geographically variant but also geographically produced (2012). McCall's attention to four city 'configurations of inequality' from 1980-1990 established 'industrial' Detroit's high class and low gender inequality, 'immigrant' Miami's low gender and higher racial and class inequality, and the still different shifting configurations of 'high-tech St. Louis' and 'post-industrial Dallas' (2001a). McCall's uniquely intensive cross-MSA analysis has also uncovered diminished racial wage gaps for women (1998) but penalties for Asian and Latino men (2001b) in high-immigration cities, as well as relatively better wages of African Americans in areas with substantial manufacturing employment and unionization (2001b).

Many of the studies above echo sociological work on labour queues wherein employers rank workers on the basis of socially-configured demographic characteristics such that the highest-ranked workers get jobs first, lose them last, and get better jobs. Reskin & Roos (1990), following Thurow's (1983) explanation of the employment patterns and divergent consequences of African American and white men, argue that gendered labour market outcomes are: "no longer merely the result of individual decisions but the result of socially-structured rankings". Similarly, lamenting sociologists' near abandonment of earnings inequality to economists, Morris & Western noted that earnings inequality is "shaped by structures of power and inequality that originate outside of the marketplace" (1999).

Morris & Western (1999) initiated an array of pieces chronicling sociology's engagement with economic inequality. These challenged sociology's prevailing emphasis on group comparisons, pointing out neglect of demographic, political, and institutional-level changes that affect all workers, and unexamined rising within-group inequality. Reskin (2002) argued that accepted explanations of group differences rely on individual-level data that cannot point to motives of job allocators or specify contextual effects. Thus ascriptive differences are described without explaining the mechanisms converting them to labour market outcomes. Leicht (2008) added that group wage models are flawed in starting with human capital explanations before describing the residual as discrimination, failing to examine how group differences vary over the wage distribution. All of these critiques fault after-the-fact theorizing of wage gaps for suggesting that ascription exists independently of allocation, and that the constitution of inequality is explained by ascriptive group circumstances. These authors suggest greater attention to mechanisms and contexts, often in terms of comparative analysis of labour markets or institutions. Reskin argues that studying groups simply calls attention to differences that need explanation, but she suggests that contexts can 'proxy' for mechanisms, such as McCall's promising finding of women's low racial wage gaps in Midwestern manufacturing cities with few immigrants (2001b). A later review by McCall and Percheski also suggests that geographic variation in income inequality is understudied (2010).

The current paper follows McCall in looking across various groups and labour markets, although it falls short of institutional explanations of the patterns of changing inequality and does not concern itself with within-group variance. Rather, the work presented here is an attempt to see *how* fifteen top metropolitan-area configurations of between-group inequality are configured, vary, and change over the decade, based on a pointedly simplified division of labour. I suggest that Reskin's question of how allocation happens could thus be extended to ask how ascription happens in and across labour markets, given the continued stasis of some gender and racial wage gaps even as differences between these groups attenuate. This simplification allows greater comparative attention to relative overall position of groups vis-à-vis each other, between different labour markets, and pre- and post-recession. My main concern is modeling overall conditional relative wage distributions, thus avoiding problems plaguing comparisons of averages and average-based models amongst groups and metros with differently ranged and shaped earnings distributions (Bernhardt, Morris, & Handcock 1995).

Motivated by Darity and his colleagues' argument that worker categories explain a greater share of economic inequality than skills do (Darity, Guilkey, & Winfrey 1996) I adopt an "inequality of opportunity" approach. I adopt this from development economists, who increasingly argue that individuals' opportunities for and choices of education, skills acquisition, and work are not independent of the unequally constituted societies they inhabit (Bourguignon, Ferreira, &

Menendez 2007, Ferreira & Gignoux 2011, 2014; following Roemer 2006). In this formulation, between-group differences are at the forefront of inequality analysis rather than what remains to be explained once human capital variables have been taken into account. In the words of its proponents " ... preferences are formed by circumstances" (Roemer & Trannoy 2013). This seems a particularly useful framework in a period of economic decline, and also bearing in mind the limitations of human capital models' black box of decision and preference.

Detailed comparative attention to inequality shows where group circumstances (whether because of supply/composition factors or simple discrimination) matter most. Within these 15 metros are labour markets wherein earnings inequality is more about race than gender, where gender inequality is not decreasing, and where immigration intersects with race and gender differentials differently pre and post- recession. Some cities evidence increasing between-group inequality, others show diminishing between-group inequality, and in others the relative position of worker groupings changes over the decade. Conflating McCall's work on contextual inequality, sociological perspectives on group rankings, and inequality of opportunity research, I am interested in what might be called earnings queues, or city-level structures of the relative wage positions of gender, race, and nativity. What does the geographic variance in these tell us about the social structure of the economy and how who ends up at the bottom is configured? What do local labour market configurations of inequality look like, and how do these change between 2000 and 2010? This preliminary investigation provides theoretical and empirical groundwork for more in-depth analyses of the mechanisms behind the patterns seen here, as well as for iteration for different groups and locations.

Methodology
The data come from the 2000 Public Use Microdata and the pooled 2006-2010 American Community Survey (Ruggles *et al*. 2010), and are matched on metropolitan statistical area (CMSA). Although the ACS samples are much smaller they are commonly used for comparison with the 2000 IPUMS given the comparability of demographic and labour market data, with larger sample sizes than the Current Population Survey data. Since I use only broad demographic groupings and the 15 largest metropolitan areas, these samples are quite large (although caution in interpreting immigrant Asian wages in some of the smaller labour markets is warranted as noted below). From each sample, I extract waged and not self-employed workers 25-55 years of age and resident in one of 15 top metropolitan statistical areas. Only those who worked near full-time, near full-year hours last year (at least 40 weeks out of the year and at least 35 hours per week) are included.

The samples are divided by immigration status, race/ethnicity, and gender. Men are further divided by race and immigration status, but US-born women are undifferentiated. This division privileges gender wage gaps and racial and ethnic wage gaps among men, but does so to present a simplified profile across US labour markets. The US does not include information on legality or undocumented status in official statistics and so these data include undocumented workers subject to the above exclusions on participation. At any rate, undocumented immigrants are an important component of US economic inequality and its geography. These are then ethnic and gender divisions of wages across metropolitan statistical areas between 2000 and 2010 with seven generalized categories:

white   US-born white men;
black   US-born black men;
nbh   US-born Hispanics;
nba   US-born Asians;
female   US-born women;
fbh   Immigrant Hispanics;
fba   Immigrant Asians.

They represent major groupings of workers generally seen to constitute the US labour market and society, as well as groups that experience differ-ent average earnings and occupational profiles. They are arbitrary but are used here as a necessary compromise toward presenting generalized profiles of local labour market inequalities.

In order to get a picture of the overall within-and-between group wage distributions by metropolitan area, I construct metropolitan-level scalar inequality indices jointly determined by earnings and group (gender, race, nativity) status. The estimation method makes use of recent developments in theorizing and estimating "inequality of opportunity". Specifically, Ferreira & Gignoux (2014) propose the application of scale-invariant inequality indices to measurement of Roemer's 'equality of opportunity' argument, which posits that the distribution of outcomes should be independent of 'morally irrelevant' circumstances beyond individuals' control. Following Bourguignon, Ferreira, & Menendez (2007), these are simply the joint distributions of earnings estimated typically as follows:

$$Y = f[C,E(C,v),u] \qquad (1)$$

where Y = advantage, C = circumstances, and E = efforts

These authors conceptualize y as an 'advantage' (often earnings or income), for which inequality of opportunity inheres if the conditional distribution $F(y|C)$ differs for k-type partitions of C. The continuous joint wage distribution is partitioned out as a scalar measure capturing the degree of inequality in earnings (Y) attributable to circumstances (C) and a standardized residual (u). Race, gender, and parental background are often thus considered 'circumstances', but 'efforts' such as education and work choices are not exogenously determined and are thus bracketed. (Ferreira & Gignoux estimate earnings conditional on mother's education and ethnicity.) The choice of the inequality of opportunities approach is thus theoretically driven. As well as modeling wage gaps conditional on characteristics across an entire population distribution, this approach privileges between-group inequality and captures how broad demographic groupings

Figure 1. Group Income Inequality (Mean Log Deviations)
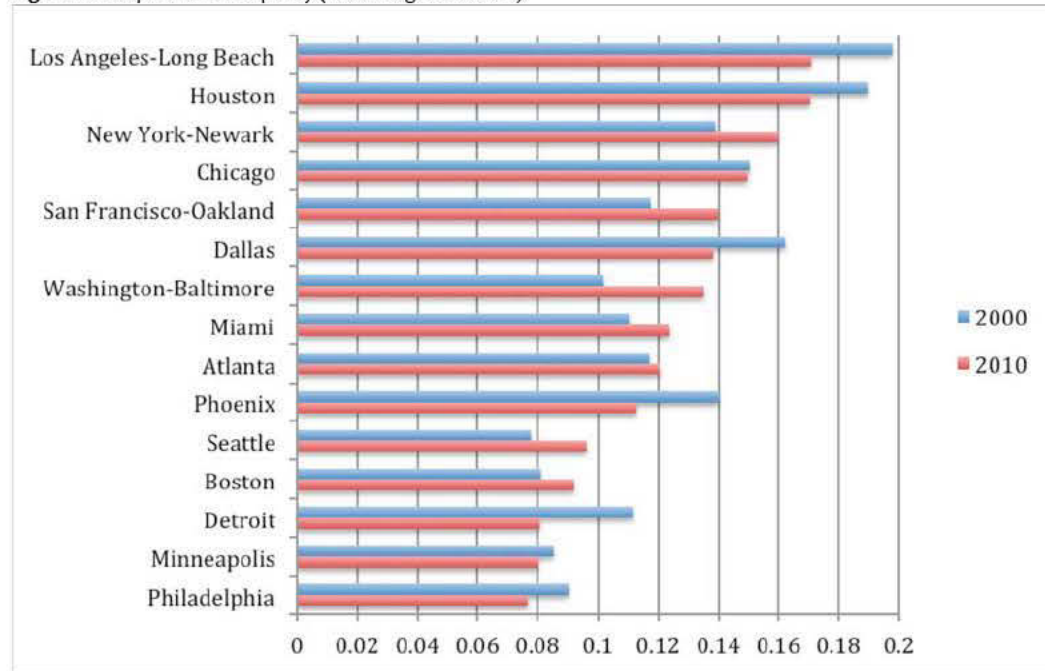
Sources: 2000 US Public Use Microdata Samples and pooled 2006-2010 American Community Survey

sort into regional economies. Rather than trying to 'explain away' wage gaps, this approach seeks to describe the hierarchical array of demographically-typed workers that characterize metropolitan labour markets, finding the relative rankings and distance between different worker categories. Different groups could well have been chosen, although choosing too many groupings renders comparisons challenging.

The procedure, as implemented by Stata's IOP routine (Wendelspiess Chavaz Juarez & Soloaga 2013) involves the construction of a reduced form OLS regression of a continuous earnings outcome variable on circumstances, with US-born white men as the reference group, such that:

$\ln \gamma \ (earnings) = \alpha + \beta_0 + \beta_1 \ female + \beta_2 black + \beta_3 US \ Hispanic + \beta_4 immigrant \ Hispanic + \beta_5 US \ Asian + \beta_6 immigrant \ Asian + \varepsilon$ (2)

Subsequently, a decomposable inequality index (here, I use Theil's L, also known as the mean log deviation from the generalized entropy class) is applied to the resulting conditional expectation of earnings. Theil's L, or the mean log deviation, is $GE(0) =$

$\frac{1}{N} \sum_{i=1}^{N} ln \left(\frac{y}{y_i}\right)$, where the choice of o (rather than 1, as in Theil's T) indicates a measure more sensitive to the bottom of the earnings distribution. The mean log deviation of the predicted values is divided by the mean log deviation of the original values, such that:

$\theta(\{y_i^k\}) = IB(\{y_i^k\})/I(F(y))$ (3)

(equation 5 in Ferreira & Gignoux, 2014), with IB= between-group inequality and I=overall inequality.

The resulting scalar 'inequality of opportunity' measure $\theta(\{y_i^k\})$ allows comparability of the amount of earnings inequality between groups across metropolitan areas. The difference between the conditional earnings function estimated for independent demographic categories (circumstances) and the overall marginal distribution is applied to examine how returns to population subgroups vary across local labour markets. Bootstrapping in IOP is computationally intensive and not recommended for this reason as well as because it has no obvious statistical interpretation with regard to the decompositions (which elucidate samples' inequality). Since the emphasis in the analysis here is overwhelm-

ingly descriptive, focused more on configurations between cities rather than on change over time, and since sample sizes are large, bootstrap estimates are not used here.

The metropolitan-level inequality of opportunity measure is decomposable by means of a Shapley type decomposition, accounting for shares of 2000 and 2010 metropolitan-level earnings inequality due to each group's distance from the reference category. Shapley values are used here as in Ferreira & Gignoux, to estimate the amount of between-group inequality attributable to group circumstances. They are simply descriptive constituents and should not be interpreted as causal factors. The decomposition simultaneously estimates the independent contribution of each circumstance (group) variable to the scalar inequality of opportunity measure $\theta(\{y_i^k\})$. The use of the Shapley value in decomposition has become widespread in studies of income inequality, especially where subregional or subgroup differences are constitutive.

Regional scientists and economists have specialized in using similar decompositions to entropy/Theil and Gini

measurements of inequality to assess convergence and divergence of economic development between regions (Terrasi 1999, Akita 2003, Shorrocks & Wan 2005, Fan & Sun 2008). At first glance, these investigations, which consider the contribution of economic development within regions to inter-regional inequality, seem to have little to do with the current analysis. The connection is in the continuous inequality measurement and its decomposition for constitutive but non-causal components.

Shorrocks points out that the Shapley value approach can be used to decompose any sub-group contributions to inequality (1999). Specifically, the decomposition involves eliminating the effect of each contributing factor variable (in all possible sequence permutations) and assigning in its place the average value of its marginal contribution, taking into account that interactions of factors affect inequality estimates. The approach comes from game theory, and further details of its development and estimation can be found in Sastre & Trannoy, 2002 as well as in Shorrocks 1999. As estimated here, the decomposition provides a glimpse of the varying ways between-group inequality is configured between metropolitan areas, both before and after the recession.

The analysis is presented in three sections, in which 1) the degree of between-group earnings inequality is captured for each metropolitan labour market, 2) this overall inequality measure is decomposed such that its specific racial/gender/nativity composition can be compared across labour markets, and 3) group-specific earnings gaps can be compared across labour markets. Each subset of results is analysed in 2000 and 2010 in order to assess metropolitan configurations of group inequality pre- and post-recession.

Results
What proportion of overall metropolitan-level earnings inequality do simple between-group gender, race, and ethnic divisions explain? Overall mean log deviations are reported in Figure 1. Most cities here have between-group

inequality in the teens, although less than ten percent of Philadelphia, Boston, Minneapolis, Seattle, and post-recession Detroit's total wage inequality is between-group differences. Los Angeles' notably high economic inequality is nearly 1/5th between-group differences in 2000, meaning that different demographic groups occupy distinctly segmented points in the overall wage distribution. Prior to the recession, Houston looked less like Los Angeles in this regard than it does by 2010. Both cities have reduced their between-group share of inequality by 2010.

Los Angeles' greater decline overall may be attributable to the worst-off individuals improving their relative lot, or to the best-off having their earnings reduced. This could of course be due to a change in composition, such that the worst-off immigrants, for example, no longer come to or stay in Los Angeles, or that the most affluent US-born white men leave, rather than that the absolute earnings of either group change. The former is more plausible. In Figure 2, LA demonstrates little change in the group composition of earnings inequality, although minor shifts away from gender inequality toward US-born racial inequality are evident. Figure 3 demonstrates that most of the diminished between-group inequality is due to higher wages of Asian immigrants relative to other groups in 2010. This could be due to improvement of this group's wages, either absolutely or through selection, or simply evidence that other groups fared worse.

Wage variance within gross categories is a much larger component of metropolitan level economic inequalities, especially as these groups' varying skills profiles are not taken into account. However, between-group differences (or inequality of opportunity) are still considerable, especially for full-time, full-year, prime-age workers. Highest inequality cities (Los Angeles, Houston, and Dallas) see some decline in this figure by 2010, as do low-inequality Phoenix, Detroit, and Philadelphia. Chicago, Minneapolis, and Atlanta remain fairly stable in terms of the proportion of wage inequality ex-

perienced between these major groupings, and the remaining 6 metropolitan areas (New York, DC, San Francisco, Boston, Miami, and Seattle) increase.

Before looking at earnings returns to specific groups it is critical to compare metropolitan-level configurations. What is the racial, ethnic, and gender cast of inequality of opportunity? How does this vary between labour markets and change with the recession? In Figure 2 the fifteen metros are divided into three groups of five cities each:

A   In these metros, inequality is marked by high but falling gender wage gaps;

B   In these metros, between-group inequality is largely about differences between immigrants and others;

C   In these metros, African American wages are most distant from all other groups.

The figures report the shares of between-group earnings inequality attributable to each category, subject to wage gaps with white men and also group sizes. The importance of the various group sizes in each metropolitan area becomes evident in the next section where group wage gaps are compared. The US-born Hispanic *share* of group inequality increases in cities where their share of the labour market increases, even though their actual wage gaps might go down.

Declining gender inequality marked all 15 metros. Again, these are reporting group *shares* of inequality. Although the importance of gender inequality diminishes vis-à-vis other group differences (notably immigrant) in Seattle, the following section will make clear that Seattle's gender gap does not decrease. In the Group A metropolitan areas, it dominated their reconfigured inequality profiles as the recession proceeded; although they also had the lowest group inequality (in which all but Seattle showed declines). In 2000, these inequality profiles were at least ½ about gender, or more than 2/3 in Detroit, Seattle, and Minneapolis. Racial and ethnic wage

gaps matter less here. Philadelphia's drop in gender inequality places it in this category, although the doubling of already high African-American inequality would shift it into the third group of metros by 2010. These cities move gradually away from gender-dominant inequality toward greater racial and ethnic inequality between men (African American for Philadelphia, immigrant Hispanic for Boston, both for Minneapolis). Seattle replaces some pre-recession gender inequality with that of immigrant Hispanics, and Detroit with that of African Americans, although gender inequality remains dominant in both metros. These cities' changed inequality profiles are not simply because men fare worse in these cities by 2010 as the recession takes hold, but also because immigrants are increasing shares of these cities' workers as immigrants' migration and residence patterns shift from more traditional immigrant locations (Suro & Singer 2002, Singer 2004).

The five Western immigrant metros in group B are dominated by Hispanic immigrants' wage distance from all other groups, with Boston moving into this category by 2010. Falling gender inequality is not half that of the previous cities in 2000, and well below 20% by 2010. This metropolitan-level pattern of the inverse relationship between immigrant and gender inequality is similarly found by McCall (1998). Hispanic differences are more significant in Los Angeles and Phoenix, while African American differences matter in San Francisco, Dallas, and Houston. With the exception of Phoenix, these metros experience the highest between-group inequality. All but San Francisco are declining. Immigrant-native inequality so dominates these metropolitan profiles that they look remarkably stable as the economy shifts toward recession. Los Angeles, this group's paradigmatic metropolitan area, is almost completely stable in its group inequality configuration. These cities are becoming more entrenched in their own systems of group inequality as the recession proceeds.

The moderate-high inequality cities in Group C evidence the historic trinity

of group inequality in the US: a wage disadvantage marked by immigration, race for African Americans, and gender. Inequality of opportunity is more immigrant in New York and more African American and female in Atlanta. (New York could be classified in Group B except for its higher African American inequality.) Gender inequality diminishes as immigrant inequality increases (dramatically in Washington and Miami). US-born Hispanic differences are small but increasing in New York and Chicago, where racial differences increase overall. The critical point here is that African American inequality with white men is an increasing share of overall inequality, and close to levels of gender and immigrant inequality. Philadelphia could have been included with its increasing African American inequality and decreasing gender inequality were it not marked more by the latter and a two-part (race and gender) rather than a three-part (race, gender, and immigration) configuration.

The actual relative group wage differentials, expressed by the coefficients on the mean log deviations regressions, underlie these metropolitan-level indices and their shares. The group coefficients are thus reported in Figure 3. The r^2s were reported in Figure 1, and the decompositions in Figure 2. Full tables of results for each metropolitan area are available upon request. Regularities across metropolitan areas in group distances and rankings demonstrate the utility of the race/ethnic/gender 'earnings queue' approach, while deviations illustrate the variability of hierarchical labour market constitution.

The gender wage gap favours men by about 20-30% in 2000, but it declines over the decade by about 10 percentage points (except Seattle, where it remains a high 30%). Hispanic immigrants earn 80% less than US-born white men in New York and San Francisco, 60-70% less in Los Angeles, Washington, Dallas, Houston, and Chicago, and about 50% less in Philadelphia and Detroit. This gap *increases* everywhere as the recession takes hold, excepting Los Angeles (where it could hardly increase), Phoenix, and Detroit.

US-born Hispanics' wage gaps are generally 20-30% and stable: highest in large immigrant cities, but lower in Washington, Minneapolis, Phoenix, Seattle, and Detroit. African Americans show strikingly persistent relative wage penalties of 30-50% worsening over the decade in most cities, with highs in New York (51% and increasing) and lows in Phoenix, Seattle and Detroit (24-26% and stable or decreasing). Asian immigrants started off at a 10-20% disadvantage, (with the exception of low-wage Detroit, where they had an 11% advantage) but only maintained significant disadvantages in the major immigrant cities of Los Angeles, New York, and San Francisco by 2010. In Boston, Dallas, Seattle, Phoenix, and Detroit Asian immigrants *pulled ahead* of US-born whites. US-born Asians' wages are not significantly different from US-born whites in 2000. By 2010, they are the highest earners in Boston and Chicago, but face 15-25% earnings penalties in Houston, Minneapolis, and Detroit. It is difficult to interpret metropolitan-level wage gaps for Asians as their wages are similar to those of whites and their group size small.

Figure 3 provides a visualization of metropolitan configurations of group inequality via plotted relative wage distributions. The values are group coefficients from the modeled conditional wage distributions. The axes extend from 0 at the outer edge to -.8 in the center (the largest wage differential, for Hispanic immigrants in New York). The closer each endpoint of the hexagon gets to the outer edge the nearer the overall wage distributions for that group are to those of white men, while centrality indicates maximal inequality. More symmetrical rounder plots indicate places where inequality is distributed more evenly amongst all non-white male groups. Narrower ranges indicate higher between-group inequality overall. The figures are again in groups of five based roughly upon the shape shifts of these profiles.

Figure 3(a) shows the largest US metropolitan areas, all characterized by large immigrant populations and high between-group inequality. The shape exemplifies US inequality gen-

Figure 2. Group shares of income inequality (Shapley decompositions)
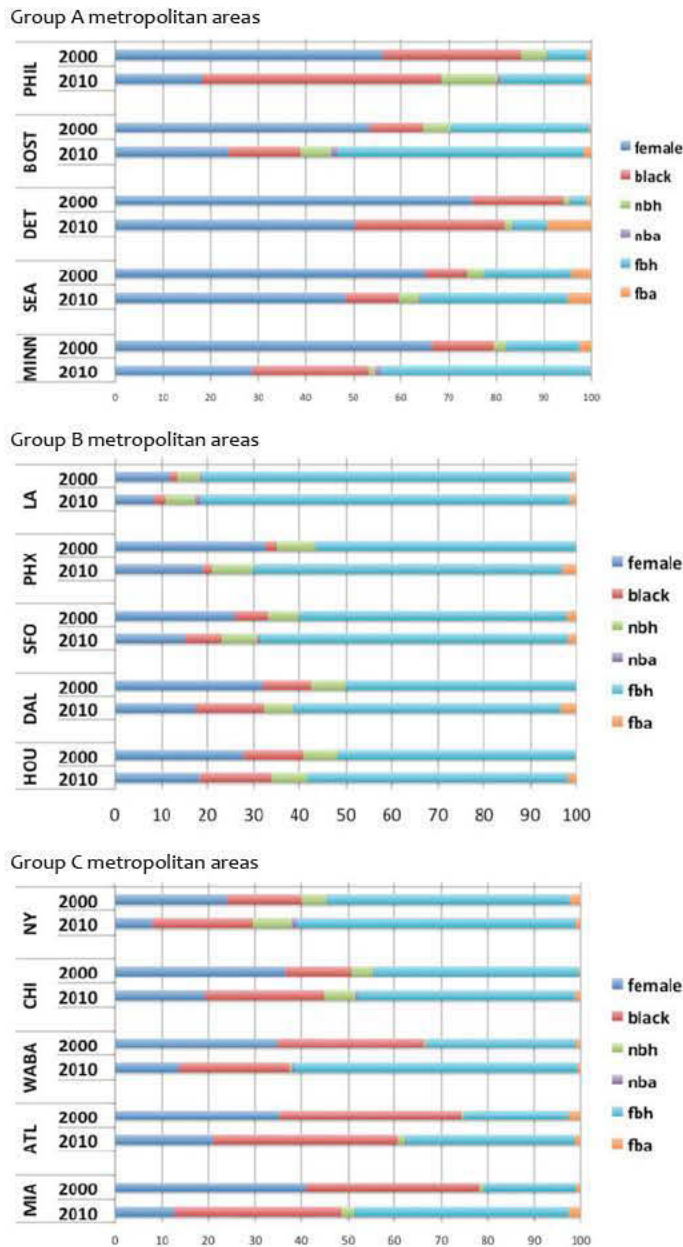
Group A metropolitan areas

Group B metropolitan areas

Group C metropolitan areas

Sources: 2000 US Public Use Microdata Samples and pooled 2006-2010 American Community Survey

erally, reflecting greatest disparity for Hispanic immigrants followed by US-born blacks and Hispanics. In New York, Chicago, and San Francisco women and Asians improve while Hispanics and especially African Americans fare worse, increasing traditional racial segmentation. Washington shows stability for all groups except Hispanic immigrants, who may very well be disadvantaged newcomers to Washington. And Los Angeles shows slight improvement for all groups but African Americans. Again, this could quite easily be about selective out-migration from Los Angeles, given the importance of immigrant and Hispanic inequality in this metropolitan area. New York and Chicago's extremely punitive environment for African Americans worsens significantly over the decade. These cities are marked by pronounced inequality for African Americans and Hispanics, worsening everywhere except Los Angeles.

The next five cities—see Figure 3(b)—evidence stable moderate-low levels of between group inequality. These plots spread out from the more unequal immigrant metropolitan area plots in Figure 3(a) simply through the equalization of Asian immigrants, a pattern that actually began with San Francisco and Chicago. More groups share distance from US-born white men here than in the previous cities' more immigrant configurations. Houston is a more punitive version of Los Angeles, with even lower wages for US-born Hispanics, African Americans and women. Excepting Houston, African Americans' wage disadvantages are moderate and stable. Their lowest disadvantage by far is in Phoenix, where they improve slightly. These cities show slightly less racial inequality, and slightly more gender disadvantage, as well as no Asian immigrant penalty. Phoenix's more even shape, wherein even Hispanic immigrants' wages improve, and all groups (especially immigrants and women) fare relatively better by 2010, is the transition into the last five cities.

The cities in Figure 3(c) have a more even distribution of lower inequality, and so more regular, wider shapes. Asians fare best in all cases. Hispanic immigrants are less disadvantaged, and women and US-born Hispanics relatively more so. Seattle's symmetrical shape comes from increasing African American inequality, and general stasis otherwise including high gender gaps. Boston shows improvements for women, Asians, and US-born Hispanics. Philadelphia's symmetry comes from relatively better immigrant conditions while US-born Hispanics and African Americans fare as badly as in the most unequal cities. Like Phoenix, Detroit shows high falling gender inequality accompanied by relatively low racial inequality. Wage gaps decline over the decade for what are probably newer immigrants to low-inequality Detroit. While Miami's women and Asians fare better

Figure 3(a). Metropolitan-level between-group inequality configurations
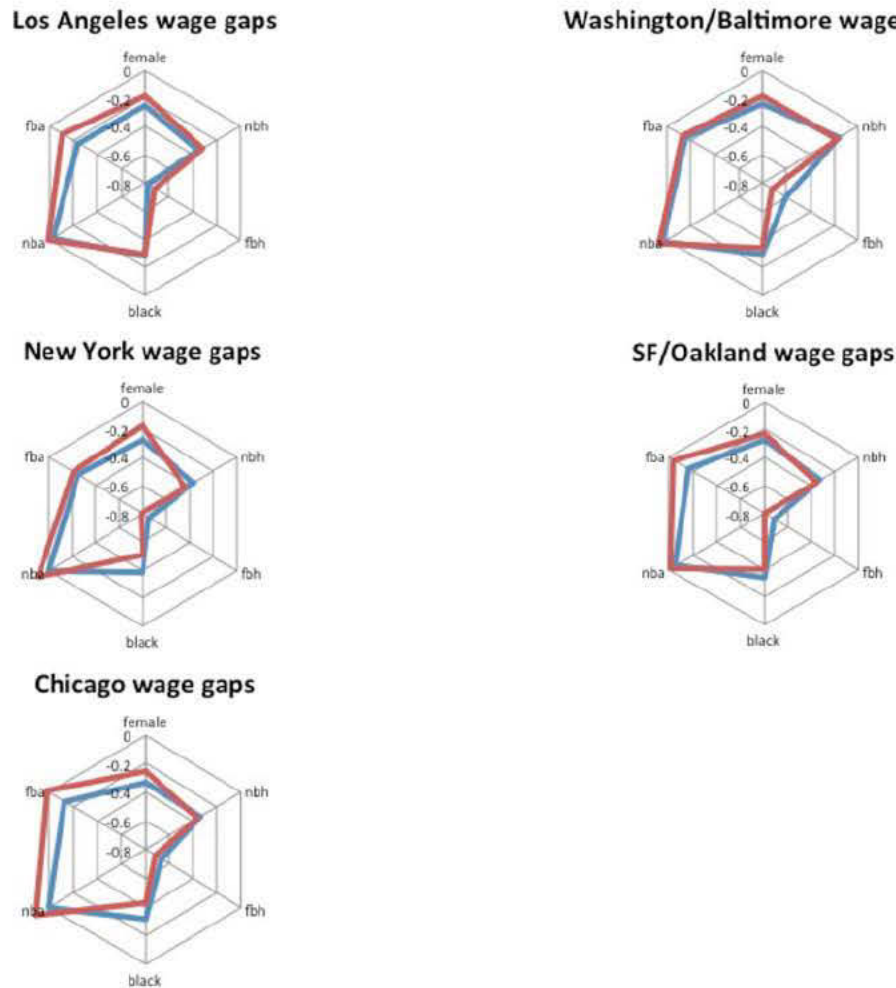
Key: 2000   2010

Sources: 2000 US Public Use Microdata Samples and pooled 2006-2010 American Community Survey

over the decade, African American and Hispanic disparities increase, leaving Miami with the highest levels of group inequality in 3c. These cities are not marked overwhelmingly by immigrant inequality, but by high and declining shares of gender inequality. Their shapes are more symmetrical because white and Asian men maintain distance more equally from all other groups including women, even as overall metropolitan area between-group inequality is low. While the metros in Figure 3(a) (and Houston) could be crudely summarized as having the highest racial inequality, and those in Figure 3(b) as having comparatively higher gender and immigrant disad-

vantages, these last metros show more widely-shared inequality of women and all non-white men.

Discussion

Comparison across metropolitan areas points out that how different groups of workers fare from recession to recovery will depend upon local configurations of inequality. While women fared relatively better everywhere except Seattle, and Asians fared stable or better, African American men fared better in Phoenix and Los Angeles but worse (far worse in New York, Chicago, and Philadelphia) or no better everywhere else. Immigrants fared better

in Phoenix, Los Angeles, Detroit, and Dallas but worse in immigrant cities with higher racial inequality (New York, Washington, Miami, San Francisco, and Chicago). Border cities may simply get fewer (more highly selected) immigrants as the recession proceeds, and newer further destinations may have more worse-off immigrant newcomers. However, high racial wage gaps that increase in New York and Chicago whilst remaining stable or diminishing in western cities cast doubt on simple compositional explanations. While US-born Hispanics' already high inequality increased where all racial inequalities increased (New York and Miami), they also increased

Figure 3(b). Metropolitan-level between-group inequality configurations
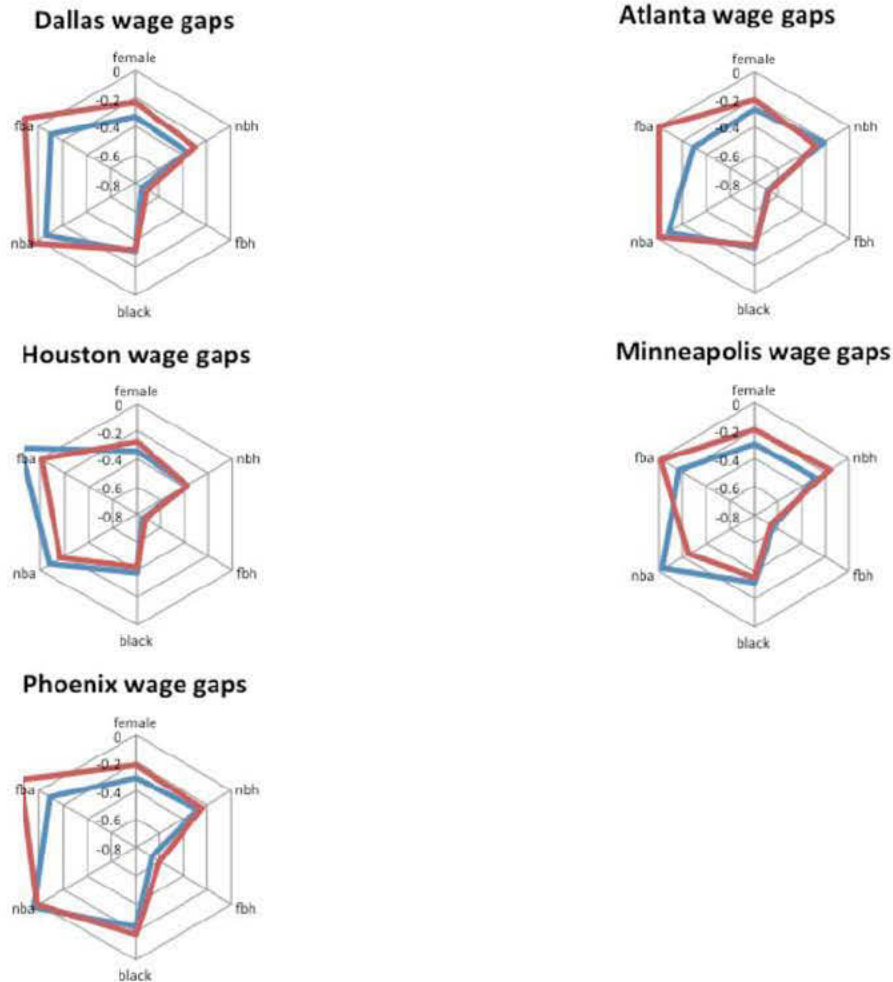
Dallas wage gaps

Atlanta wage gaps

Houston wage gaps

Minneapolis wage gaps

Phoenix wage gaps

Key: 2000   2010
Sources: 2000 US Public Use Microdata Samples and pooled 2006-2010 American Community Survey

in new destination Atlanta. They fared somewhat better in Dallas, Boston, Philadelphia and Minneapolis –where moderate-inequality African Americans fared worse over the period. This group needs further investigation to establish reasons for their relative shifts, although they fit the overall trend whereby diminishing gender inequality shares are replaced by increasing racial and/or immigrant inequality.

There are three models for the six cities showing increased inequality of opportunity. Boston and Seattle's labour markets become more immigrant while gender shares of inequality di-

minish; Washington and San Francisco's Hispanic immigrants and African Americans fare worse; and New York and Miami's racial wage gaps increase overall. Stability can mean Los Angeles' resiliently high inequality profiles in the face of recession, or Chicago's repositioning of relatively equivalent 2000 groups toward entrenched African American disadvantage. Declining group inequality can mean that most groups fare relatively better if few do better absolutely (Phoenix), or that some attenuated gaps remain disproportionately high (Hispanics in Dallas). To contextualize questions of who lost or gained relatively from the recession, it is thus important to realize var-

ying local inequality configurations. Several trends are apparent.

First, cities with lower overall variance (Seattle, Boston, Philadelphia, Detroit, and Minneapolis) have gender dominant inequality of opportunity, although this is changing. These cities had lower and declining/stable group inequality as the recession proceeded because the wages of white men declined. Figure 2 provides the answer to Seattle's exception, as gender's declining component was replaced by an immigrant Hispanic share. Since immigrant wages are stable and high, this means that increased between-group inequality is produced by an influx of

Figure 3(c). Metropolitan-level between-group inequality configurations
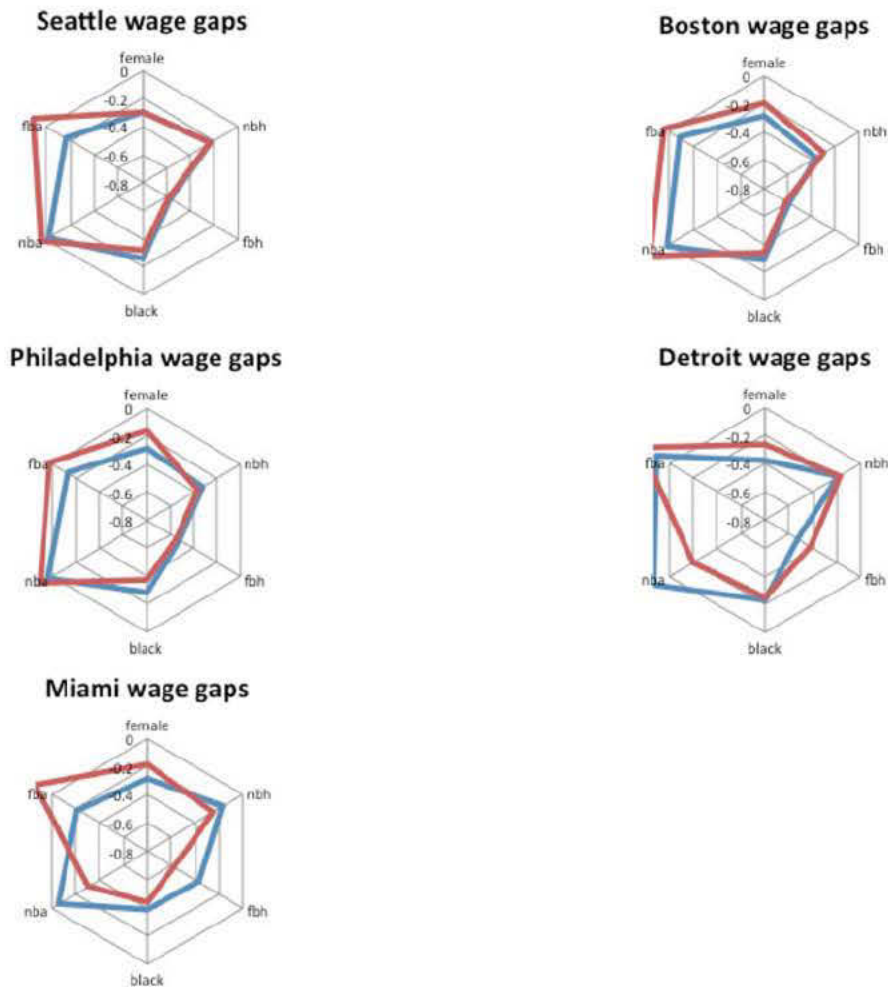
Seattle wage gaps

Boston wage gaps

Philadelphia wage gaps

Detroit wage gaps

Miami wage gaps

Key: 2000   2010
Sources: 2000 US Public Use Microdata Samples and pooled 2006-2010 American Community Survey

immigrants and the relative stagnation of other wage gaps including that for women. That said, these cities have relatively low levels of racial inequality, benefitting from strong manufacturing economies and union density, although Detroit's coverage has fallen. (Hirsch & MacPherson, 2014). This may have placed women lower on an employment hierarchy while equalizing wages for men across racial groups. Unionization benefits men regardless of race, ethnicity, or education (Parks 2012), and also generates more promise for equalizing men's racial wage gaps (McCall 2001b). A less-continuous history of immigration from Mexico may explain why US-born Hispanic

men fare reasonably well, in that they face less stigmatization from continuous immigration (Telles & Ortiz, 2009). Even though racial inequality in these cities was relatively low, African Americans fared worse (especially in Philadelphia and Seattle) with the recession.

Relatedly, many cities move away from gender inequality but toward more traditional forms of racial inequality, which become entrenched with the recession. Not only is the gender share of inequality being replaced by men's racial inequality, but African Americans also lose relative wages. Detroit, Philadelphia, Chicago, and New York exemplify this, with un-

equal racial wage configurations intensifying as the recession takes hold. By 2010, Chicago and New York have between-group inequality as high as Los Angeles and Houston and increasing rather than diminishing, although more configured by racial than immigrant disadvantage. US-born Hispanic inequality also increases in New York, Miami, and Atlanta even as these cities are otherwise stable. This return to higher levels of racial inequality as the recession takes hold, especially for African American men, warrants further investigation. There is little reason to suspect that worse relative wages for African American men (or even US-born Hispanic men) are driven by pop-

ulation shifts across labour markets (not to mention legal status or language barriers). Further, the common finding that unionization has helped men's wages regardless of race is not in evidence in New York and Chicago (the 2 cities in this analysis with among the highest steady union coverage and the greatest most persistent racial wage gaps). In these cities, inequality of opportunity seems to be persistently racial.

Finally, immigrant Hispanics' wage disparities are high and stable, although much lower in the low-inequality cities of Figure 3(c). They fare better over the decade in immigrant Los Angeles and Phoenix (where US-born Hispanic wages are relatively good, and African Americans improve relatively). Because of these extremely high wage gaps, and also because of variable state and local policies, immigrants stand to demonstrate the most impact on these metropolitan areas' group inequality profiles over time. This will be due to demographic shifts, in part, if the expansion of immigrants away from traditional locations continues. Geographic variability in immigrant wage inequality will also likely result from the protections or punishments provided by various locations. Although significant attention has been paid to the new geographic patterns of immigrants, the analysis presented here demonstrates fertile ground for further research in examining how the changing selection of immigration and internal migration more generally relate to the spatial contours of group inequality. If cities and different groups of workers within them have been disproportionately affected by variable economic losses, internal migration and changing residence patterns of all workers will alter the variable contexts of recovery. This is especially the case where immigrants' wages interact with other group's earnings in negative or positive ways (McCall 2001b, Reskin 2003).

This paper has been a first step in modeling the initial varying metropolitan area contexts of labour market inequality, although it points to more questions than it answers. The inequality of opportunity approach and its application to visualizing metropolitan area configurations of inequality has added some flesh to sociologists' calls for more contextual analysis. In Reskin's words, however, the analysis has pointed to differences that need explaining rather than offering explanations. Seattle's wage gaps looked almost identical to Phoenix's in 2000 (barring Phoenix's extremely high Hispanic immigrant gap). What explains why Phoenix's group differences attenuated and Seattle's increased in every case such that Seattle's gender and racial wage gaps exceed Phoenix's and match the Hispanic immigrant gap in 2010? What explains the similar phenomenon such that Los Angeles's decreasing and New York's increasing racial and immigrant wage gaps diverge?

Further research will need to investigate not only shifting metropolitan area demographics and the selection of internal migration, but also changing occupational distributions and rewards. A good deal of previous research has found occupational structure key to the labour market outcomes of different groups within metropolitan areas (Wright & Ellis 2000, McCall 2001a, 2008; Parks 2012). While manufacturing or public sector employment may benefit workers across labour markets, they do not do so evenly. What explains why African Americans disproportionately lose out in New York, Chicago, and Philadelphia while holding ground in Washington? Is this related to the relative losses of Hispanic immigrants in Washington, or the relative gains of women in the remaining cities? Which factors define who ends up at the bottom of the earnings queue, or which forms of inequality persist or increase while others diminish? Which factors are present in the cities where multiple forms of inequality have changed versus those where only some groups face maintained or increased disadvantage? There are demographic and institutional factors at work here. Although this paper has not identified them, the differences themselves have been more thoroughly specified and this yields promise for directing future analysis. There is much to be gained from attempting to fill in our understanding of labour and earnings queues through looking both within and across cities at the shaping of inequality.

References

Akita, T. 2003. Decomposing regional income inequality in China and Indonesia using two-stage nested Theil decomposition method. *Annals of Regional Science 37*,55–77.

Bernhardt, A, Morris, M, & Handcock, M. 1995. Women's gains or men's losses? A closer look at the shrinking gender gap in earnings. *American Journal of Sociology 101(2),* 302-328.

Blau, F, & Kahn, L. 1994. Rising wage inequality and the U.S. gender gap. *American Economic Review 84,* 23-28.

Borjas, G, Freeman, R, & Katz, L. 1996. Searching for the effects of immigration on the labor market. *American Economic Review 86(2),* 246-51.

Bound, J, & Freeman, R. 1992. What went wrong? The erosion of the relative earnings and employment among young black men in the 1980s. *Quarterly Journal of Economics 107,* 201-232.

Bourguignon, F, Ferreira, FHG, & Menendez, M. 2007. Inequality of opportunity in Brazil. *Review of Income and Wealth 53(4),* 585-618.

Chavez, F, & Soloaga, I. 2014. *IOP: Stata module to compute different measures of inequality of opportunity for dichotomous, ordered and continuous outcome variables.* Boston College Department of Economics.

Clark, W. 2001. The geography of immigrant poverty: selective evidence of an immigrant underclass. In R. Waldinger (ed.), *Strangers at the Gates: New Immigrants in Urban America.* Los Angeles: University of California Press, 159-185.

Cotter, DA, Hermsen, JM, & Vanneman, R. 1999. Systems of gender, race, and class inequality: multilevel analyses. *Social Forces 78,* 433-460.

Darity, W, Guilkey, DK, & Winfrey, W. 1996. Explaining differences in economic performance among racial and ethnic groups in the USA. *American Journal of Economics and Sociology 55(4),* 411–425.

Ellis, M, Wright, R, & Parks, V. 2007. Geography and the immigrant division of labor, *Economic Geography, 83(3),* 255-281.

Ellis, M. 2001. A tale of five cities? Trends in immigrant and native-born wages. In R. Waldinger (ed.), *Strangers at the Gates: New Immigrants in Urban America.* Los Angeles: University of California Press, 117-158.

England, KVL. 1993. Suburban pink collar ghettos: The spatial entrapment of women? A*nnals of the Association of American Geographers 83,* 225-42.

Fan, CC, & Sun, M. 2008. Regional inequality in China, 1978–2006. *Eurasian Geography and Economics 49(1),* 1–20.

Ferreira, F, & Gignoux, J. 2011. *The Measurement of Educational Inequality: Achievement and Opportunity.* IZA Discussion Papers 6161. Bonn: Institute for the Study of Labor (IZA).

Ferreira, F, & Gignoux, J. 2014. The measurement of inequality of opportunity: theory and an application to Latin America. *International Association for Research in Income and Wealth 57(4),* 622-657.

Goodwin-White, J. 2008. Placing progress: contextual inequality and immigrant incorporation in the United States. *Economic Geography 84(3),* 303-332.

Goodwin-White, J. 2012. Emerging U.S. immigrant geographies: racial wages and migration selectivity. *Social Science Quarterly 93,* 779–798.

Hirsch, B, & Macpherson, D. 2014. *Union Membership and Coverage Data from the CPS.* (online at unionstats.com).

Holzer, H, & Offner, P. 2001. *Trends in Employment Outcomes of Young Black Men, 1979-2000,* JCPR Working Papers 245, Northwestern University / University of Chicago Joint Center for Poverty Research.

Kodras, J, and Padavic, I. 1993. Economic restructuring and women's sectoral employment in the 1970s: A spatial investigation across 380 U.S. labour market areas. *Social Science Quarterly 74,* 1-27.

Leicht, KT. 2008. Broken down by race and gender? Sociological explanations of new sources of earnings inequality. *Annual Review of Sociology 34,* 237-255.

McCall, L, & Percheski, C. 2010. Income inequality: new trends and research directions. *Annual Review of Sociology 36,* 329-47.

McCall, L. 1998. Spatial routes to gender wage (in)equality: Regional restructuring and wage differentials by gender and education. *Economic Geography 74(4),* 379-404.

McCall, L. 2001. *Complex Inequality: Gender, Class and Race in the New Economy.* New York, London: Routledge.

McCall, L. 2001. Sources of racial wage inequality In metropolitan labor markets: racial, ethnic, and gender differences. *American Sociological Review 66,* 520-41.

McDowell, L. 1991. Life without father and Ford: The new gender order of post-Fordism. *Transactions* of *the Institute* of *British Geographers 16,* 400-419.

Morris, M, & Western, B. 1999. Inequality in earnings at the close of the twentieth century. *Annual Review of Sociology 25,* 623-57.

Parks, V. 2012. The uneven geography of racial and ethnic wage inequality: specifying local labor market effects. *Annals of the Association of American Geographers 102(3),* 700-725.

Reskin, B, and Roos, P. 1990. *Job queues, gender queues: Explaining women's inroads into male occupations.* Philadelphia: Temple University Press.

Reskin, BF. 2003. Including mechanisms in our models of ascriptive Inequality. *American Sociological Review 68,* 1-21.

Roemer, J, & Trannoy, A. 2013. *Equality of Opportunity.* Cowles Foundation Discussion Paper No. 1921, 1-110.

Roemer, J. 2006. Review Essay, The 2006 world development report: Equity and Development. *Journal of Economic Inequality 4,* 233-244.

Ruggles, S, *et al.* 2010. *Integrated Public Use Microdata Series: Version 5.0* [Machine-readable database]. Minneapolis: University of Minnesota

Sastre, M, & Trannoy, A. 2002. Shapley inequality decomposition by factor components: some methodological issues. *Journal of Economics 9,* 59-81.

Scott, A. 1992. Low-wage workers in a high-technology manufacturing complex: The Southern California electronics assembly industry. *Urban Studies 29,* 1231-46.

Shorrocks, A, & Wan, G. 2005. Spatial decomposition of inequality. *Journal of Economic Geography 5,* 59-81.

Shorrocks, A. 1999. *Decomposition Procedures for Distributional Analysis: A Unified Framework Based on the Shapley Value.* University of Essex: mimeo.

Singer, A. 2004. The rise of new immigrant gateways. Washington, DC: Brookings Institution.

Sommeiller, E, & Price, M. 2014. *The Increasingly Unequal States of America: Income Inequality by State, 1917 to 2011.* Washington, DC: Economic Policy Institute.

Stamps, K, & Bohon, SA. 2006. Educational attainment in new and established Latino metropolitan destinations. *Social Science Quarterly 87,* 1225-1240.

Suro, R, & Singer, A. 2002. *Latino Growth in Metropolitan America: Changing Patterns, New Locations.* Brookings Institution, Center on Urban and Metropolitan Policy in collaboration with the Pew Hispanic Center.

Telles, EE, & Ortiz, W. 2009. *Generations of Exclusion: Mexican Americans, Assimilation, and Race.* New York: Russell Sage.

Terrasi, M. 1999. Convergence and divergence across Italian regions. *The Annals of Regional Science 33*, 491-510.

Thurow, L. 1983. *Dangerous Currents: The State of Economics*. New York: Random House.

Waldinger, R. (1999) *Still the Promised City? African Americans and New Immigrants in Postindustrial New York*. Boston: Harvard University Press.

Wendelspiess Chavez Juarez, F, & Sologa, I. 2013. Scale vs. Translation Invariant Measures of Inequality of Opportunity when the Outcome is Binary. http://ssrn.com/abstract=2226822.

Wright, R, and Ellis, M. 2000. The ethnic and gender division of labor compared among immigrants to Los Angeles. *International Journal of Urban and Regional Research, 24(3),* 583–600.