Spillovers from High-Skill Consumption to Low-Skill Labor Markets

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PRELIMINARY AND INCOMPLETE

ABSTRACT

Census data show that the least-skilled workforce in the United States is disproportionally employed, relative to more skilled workers, in the provision of time-intensive services—such as food preparation, cleaning, repair and delivery–that can be broadly thought of as market-substitutes for home production activities. Consumer expenditure data, on the other hand, show that skilled workers, with their high opportunity cost of time, spend a larger fraction of their budget in these services. The sharp asymmetry in the skills of providers and consumers of these services is consistent with standard economic theory, and suggests that skilled-biased technological progress or any other factor that contributes to a widening of the wage distribution would in turn cause positive demand shifts that disproportionally favor the least-skilled workforce.

On national data, we document employment and wage changes over time that are consistent with the existence of positive demand shifts in unskilled labor markets arising from consumption of home production substitutes by skilled workers. Because services that substitute for home production activities cannot be traded outside of a local market, we also analyze city-level data on employment and wages and find several pieces of evidence consistent with the existence of these demand shifts.

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I. Introduction

Many influential papers have documented a large and ubiquitous widening of the U.S. wage distribution in the 1980s (Bound and Johnson, 1992; Katz and Murphy 1992; Juhn, Murphy and Pierce, 1993). Early consensus was that this phenomenon reflected a secular rise in the demand for skills attributable to skill-biased technological change (SBTC).[1] Since the late 1980s, however, changes in inequality have increasingly been concentrated in the top end of the wage distribution. Autor, Katz and Kearney (2006) show that while the 90-50 gap (the difference between the 90th and the 50th quantile of log wages) kept expanding over the last 15 years, the 50-10 gap declined.[2] They also document that during the same period employment shares in both the highest and lowest skill occupations increased, while employment shares in middle skill occupations contracted. The recent improvements in relative wages and employment of the least-skilled seem hard to reconcile with a simple SBTC model.[3]

Autor, Katz and Kearney (2006, 2008), however, argue that wage and employment growth polarization is consistent with a more nuanced form of technological change, that is a model in which information technology can only replace human labor routine tasks (Autor, Levy and Murnane, 2003; ALM henceforth). Because jobs that can be routinized are not distributed uniformly across the wage distribution (Goos and Manning, 2007), the secularly declining price of computer capital has non-monotone impacts on the demand for skill throughout the earnings distribution: it raises demand for the non-routine abstract tasks that are performed by educated professionals and managers (and that are complementary to technology), while it lowers demand for the routine tasks that tend to be performed by moderately skilled workers.

Even if in the ALM "routinization" hypothesis improvements in technology have arguably no direct impact on the non-routine manual tasks performed by low-skill

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[1] See Katz and Autor (1999) and Acemoglu (2002) for reviews of the large literature on the causes of wage inequality; Krueger (1993) and Berman, Bound and Griliches (1994) for more details on the SBTC hypothesis. SBTC is generally referred to as any new technology (or change in production or organizational methods) that increases the demand for more-skilled labor relative to less-skilled labor at fixed relative prices.

[2] Also Murphy and Welch (2001) and Angrist, Chernozhukov and Fernandez-Val (2006) document divergent trends in upper and lower-tail wage inequality in the 1990s.

[3] See Card and DiNardo (2002) for a discussion of other problems and puzzles associated with the SBTC hypothesis.

workers, they cause labor to be reallocated away from repetitive, traditionally middle-skilled tasks towards lower-skilled activities that require a higher degree of interpersonal and environmental adaptability. As a result, as opposed to a basic SBTC model, the ALM hypothesis predicts rising employment not only in high-skilled, but also in low-skilled relative to middle-skilled occupations.[4] Alone, however, labor supply shifts towards the least-skilled jobs might depress unskilled relative wages and expand lower-tail inequality. The present paper highlights demand considerations with the intent to complement technological-based explanations that focus on the production side of the economy. In particular, it identifies a source of consumption-driven demand shifts stemming from the secular widening of the U.S. wage structure and providing a viable explanation for the narrowing of lower-tail wage inequality.

Census data show that the least-skilled workforce in the United States is disproportionally employed, relative to more skilled workers, in the provision of time-intensive services like food preparation, cleaning, repair and delivery, which can be broadly defined as market-substitutes for home production activities. In 2005, this sector absorbed almost 30 percent of the workforce in the lowest decile of the wage distribution, while it employed only 8 percent of workers earning the median wage, and 2 percent of top-wage earners. While employment shares in this sector are found to monotonically decline along the skill (or wage) distribution, consumer expenditure data show that consumption of home production substitutes, as a fraction of total expenditure, monotonically increases with an individual's skills (measured either by educational attainment or hourly wages). These facts are consistent with standard economic theory: more skilled workers –with their high opportunity cost of time– should be net buyers of home production substitutes, while less-skilled workers should be net sellers.

We present a simple two-skill two-sector model, borrowed from Manning (2004), to illustrate how the existence of "substitution effects" in an individual's time allocation decision predicts not only the asymmetry, at any point in time, between the skills of providers and consumers in the market for services that substitute for home production

[4] Goos and Manning (2007) show that the ALM hypothesis is a good explanation for the phenomenon of employment polarization observed in the United Kingdom since 1975. Spitz-Oener (2006) applies and develops the ALM hypothesis in her study of the process of job polarization in Germany since 1979.

activities, but also increasing demand for unskilled work in this market as a result of widening wage inequality. This prediction defines the main hypothesis put forward in this paper—an hypothesis we refer to as "consumption spillovers": skilled-biased technological progress—as well as performance pay schemes (Lemieux, Macleod and Parent, 2006), changes in social norms (Piketty and Saez, 2006) or any other factor that disproportionally increases wages of more skilled workers—should in turn cause positive demand shifts that disproportionally favor the least-skilled workforce. If so, lower wage inequality at the bottom of the distribution could coexist with rising wage inequality at the top.

A first testable implication of the existence of consumption spillovers is that the sharp increase in wage dispersion in the United States over the last 30 years should have been accompanied by a rise in the share of unskilled work employed in activities that free-up time and are increasingly valuable to skilled workers. Indeed, we document that the share of wage earners at the bottom of the U.S. wage distribution employed in the provision of market substitutes for home production activities has steadily increased over time, from 22% in 1980 to 30% in 2005. These shifts are much larger than the ones observed among more skilled workers, who, instead, experience similar, or even larger shifts than unskilled workers into other non-traded activities. Quantile regressions of individual log hourly wages on sector of employment show that, over the same period, the wage penalty to home services has decreased, especially at the lowest quantiles.

These positively correlated employment and wage changes in low-skill labor markets in decades of increasing dispersion of the market returns to skills are consistent with demand shifts like those predicted by consumption spillovers. Clearly, this time-series evidence is potentially explained by other secular changes, such as growing international outsourcing spurred by declining transportation costs. Yet, employment shifts into home services are found to be much larger at the bottom of the wage distribution, while shifts into other non-traded activities are common, and even more pronounced, at higher quantiles. This fact suggests that growing unskilled employment in home services requires explanations beyond those for the general trend of declining employment in traded activities in developed economies. Another potential confounding factor are changes in the structure of the family. Given our focus on services that substitute for home production, an obvious source of demand shifts is represented by increasing female

labor supply. However, after rising sharply in the 1980s, the growth in female labor force participation has flattened in the 1990s (Goldin, 2006). As a result, the growth spurt to service demand by the liberation of women from housework appears to be less of a compelling explanation for growing demand of unskilled work in more recent periods.[5]

In fact, the contrary arguably holds for demand shifts arising from consumption spillovers, which can be expected to be larger in the 1990s than in the 1980s on the base of the following two pieces of evidence. First, recent analyses of tax return data (Piketty and Saez, 2003, 2006) show that, after increasing steadily until the mid 1980s, the wage income share of the top decile of tax units in the United States underwent unprecedentedly sharp rises in the late 1980s, and then again in the mid to late 1990s.[6] Both events are found to be driven by the steep rise in the wage income shares of the very top percentiles.[7] Second, consumption expenditure data reveal that budget shares on home services increase not only with individual measures of skills (education and hourly wages), but with income as well—a finding consistent with preferences for home services being non-homothetic. As a result, we expect demand shifts from consumption spillovers—spurred by rising top income shares—to be particularly large in the 1990s. Importantly, this would imply that consumption spillovers account well for the timing of changes in lower inequality—that has narrowed since the late 1980s (Autor, Katz and Kearney, 2006; Lemieux, 2007).

In addition to providing time-series evidence that is consistent with the existence of spillovers from high-skill consumption to low-skill labor markets, this paper also empirically tests the predictions of the consumption spillover hypothesis on cross-city data. The approach is motivated by the fact that the output of home services cannot be traded outside of local labor markets. Specifically, we build on Manning (2004), which is the only study that has previously emphasized the dependence of unskilled employment opportunities to physical proximity of skilled workers, because the latter are more likely to buy low-skill time intensive services in order to free themselves from home production

[5] The growing share of elderly in the population, on the contrary, might be expected to increase the demand for home services over time.

[6] While the sharp increase in the late 1980s might be (at least partly) attributable to fiscal manipulation following the large top marginal tax rate cuts of the 1986 Tax Reform Act (Feenberg and Poterba, 1993), the subsequent rise in the mid 1990s should not be confounded by changes in reported income.

[7] These facts would not be detected in an analysis of census or survey data because of top coding.

tasks. Manning tests for this idea by studying the cross-city association between presence of skilled workers in a city and concentration of unskilled work in the general set of non-traded activities. In addition to separating services that substitute for home production activities (e.g., personal and household services) from other non-traded activities (e.g., retail trade and health services), we further build on Manning's approach by testing for dynamic predictions both on employment and earnings in unskilled labor markets.

Our work relates to the large literature analyzing the causes of the growth of the service economy, as experienced in the 20th century by the United States and other developed economies. Starting with the seminal contributions of Clark (1957) and Baumol (1967), this literature has explained the growing relative importance of services in national employment by either (or both) non-homothetic preferences for services, or the slower relative growth of labor productivity in services than in agriculture or in industry. In this paper we focus on a narrowly defined set of services (those that substitute for home production activities) for which we can predict and test that budget shares increase with income. Autor and Dorn (2007), on the contrary, combine the idea of lagging productivity with the ALM routinization hypothesis and identify personal services—that is, a subset of home services—as a sector that is less likely to experience technological improvements, since it delivers manual non-routine tasks. Among other results, they document a positive relationship between the growth of upper-tail wage inequality and employment in personal services within commuting zones.[8] This is indeed consistent with one of our findings on city-level data, but in their framework both changes are spurred by non-neutral technological progress.

II. Theoretical framework

The objective of this section is to illustrate the main intuition of the "consumption hypothesis" put forward in this paper: the notion that consumers and providers in the market of services that substitute for home production activities belong to groups at the opposite ends of the skill distribution.

[8] Instead of Metropolitan Statistical Areas (our proxy for local labor markets), Autor and Dorn (2007) use "commuting zones"—that have the advantage of providing a time-consistent definition of local labor markets that cover the entire area of the United States.

The prediction that skilled workers do less home production than unskilled workers, and consume more market substitutes for home goods and services, is a standard result in the theory of allocation of time—as pioneered by Mincer (1963) and Becker (1965) and formalized by Gronau (1977). Following Manning (2004), we embed this concept in a model for an economy with two types of workers ("skilled" and "unskilled") who derive utility from consuming two types of consumption goods: a general good y—produced by firms using a technology in both skilled and unskilled labor, and a domestic good x—which is the output of time-intensive activities (such as cooking and cleaning the house) that an individual can either produce domestically (using her own time), or purchase in the market (by buying-in someone else's time).

Let $F(N_u, N_s)$ denote the production function for good y, where N_u is employment of unskilled workers and N_s is employment of skilled workers. If y is the numeraire good, then the skilled and unskilled wages payable by the y sector will be equal to the marginal products: $w_j = \partial F / \partial N_j$, for $j=u,s$. Assume, instead, that good x is produced by a linear production technology in the labor of any type. Also, the amount of good x that an individual consumes is assumed to be equal to $x=h_0+\beta h_1$, where h_0 is an individual's own time in home production, h_1 is the amount of bought-in time, and $\beta<1$ is an agency cost arising from a standard principal-agent problem, or simply reflecting tax wedges. Individuals choose h_0 and h_1, along with how many hours they work in the y sector (n), in order to maximize a utility function such as $U=U(y, T-n-h_0, h_0+\beta h_1)$. Besides the time constraint (T is the endowment of time), an individual with skill j faces a budget constraint of the form: $y=w_j n - \varpi h_1$, where ϖ is the wage at which domestic help can be hired in the market.

In this setting, as long as $w_s-w_u>\beta$, skilled workers will never engage in time-intensive home production activities, so that $\varpi=w_u$.[9] As a result, skilled workers face the budget constraint $y = w_s n - w_u h_1$, and their demand for domestic help, $h_1^D(.)$, can be characterized as an increasing function of their real wage w_s and a decreasing function of the unskilled wage w_u (and the agency cost β). On the contrary, as long as $\beta>0$, unskilled workers will always choose $h_1=0$.

[9] By backward induction, consider the case in which skilled workers did supply their labor in the market for domestic help. In this case, it would always pay both skilled and unskilled workers to do the housework themselves, and no market for hiring domestic help would exist.

Even if the model described here is very simple, more realistic assumptions will not alter the basic prediction:

Prediction 1 - Skilled workers are more likely to be net buyers of time-intensive services that substitute for home production activities, while unskilled workers are more likely to be net sellers.

In our model, the prediction arises from assuming that individuals are equally effective at producing the home good, regardless of their different skills in the production of y. In more sophisticated settings, the prediction would hold as long as skilled workers have a comparative advantage at producing y.[10] Starting with Gronau (1977), there has been a large body of evidence from time-use surveys showing a negative correlation between an individual's skill and time spent in non-market production. In the next section, we use instead consumption expenditure data and employment data to test another implication of Prediction 1: Consumption of market substitutes for home production activities is increasing with measures of an individual's skills, while employment in these services is decreasing with skills.

The simple framework we have presented can also be used to illustrate the effects of technological progress in the y-sector on the demand for unskilled labor in the home service sector. In particular, given the time period that interests us, we want to examine the effects of SBTC, which can be modeled as an increase in $\partial F / \partial N_s$ relative to $\partial F / \partial N_u$. This will increase the wage differential between skilled and unskilled workers in the y sector, causing h_l^D to rise. As a result, we would expect unskilled employment in the home service sector to increase, either (or both) because of labor shifts across sectors, or as a result of influxes of unskilled workforce (e.g., foreign workers). Depending on the relative magnitude of demand and supply shifts, we could also observe a rise in the equilibrium unskilled wage.

In the next section, we use U.S. national employment and wage data to test whether in the past few decades of increasing dispersion in the market returns to skills we observe patterns consistent with the prediction of our framework:

[10] Notice that $\beta>0$ might also reflect the possibility that housework activities may provide extra benefits beyond the consumption value of household production, and that an individual may attach extra value to goods produced by herself rather than by someone else. However, Prediction 1 would equally hold in this case, as long as these benefits do not differ across skill groups.

Prediction 2: a rise in the dispersion of the market returns to skills will cause a positive shift in the labor demand for unskilled work in the sector of services that substitute for home production activities.

Before turning to our empirical analysis of the features of the market for home services, it is worth pointing out that recent empirical work documenting changes in individual allocation of time presents findings consistent with our framework. Notably, Aguiar and Hurst (2007) find that differences across skill groups in hours of non-market work have widened between 1985 and 2000.[11]

III. The market for home services

In this section we use consumption expenditure data and employment data to test the prediction that consumption of services that substitute for home production activities increases with measures of an individual's skills, while employment in these services decreases with the same measures. In what follows, we define skills either in terms of highest educational attainment or hourly wages.

A. The consumers of home services

Data

The Consumer Expenditure Survey (CEX) is currently the only micro-level data reporting comprehensive measures of consumption expenditures for large cross-sections of households in the United States. It consists of two independent nationally representative surveys, one based on retrospective interviews about expenditures in the previous quarter (the Interview Survey) and one based on weekly diaries (the Diary Survey, DS hereafter). In this paper we use data drawn from the DS samples, because weekly record keeping more accurately account for the kind of expenditures that we want

[11] As reported in Aguiar and Hurst (2007), Table V, among women in any year there are striking differences in hours of work at home across educational groups, and these differences have increased from 1985 on. Men, on the contrary, have always been characterized by considerably fewer hours dedicated to work at home, and no significant differences across educational groups. In addition, Aguiar and Hurst (as well as Ramey, 2007) find increasing inequality in leisure trends across educational groups, another result consistent with substitution effects (in this case between market work and leisure time) playing a role in an individual's time allocation decision.

to measure: Services that are substitutes for home production activities are likely to constitute small and frequent purchases, difficult to recall over longer periods of time (Attanasio, Battistin and Ichimura, 2007).

In the DS, households self-report their weekly purchases using product-oriented diaries. For each household we calculate both a measure of total expenditure, and a measure of expenditure in goods and services that substitute for home production activities. The latter measure includes purchases of food and drinks consumed away from home at full service places; repair and maintenance, delivery, babysitting, housekeeping and personal care services. Appendix Table A1 provides details on the way in which specific expenditure items are mapped into these categories.

We use data drawn from the 2004 Diary Survey. We focus on households headed by individuals at least 18 and no more than 65 who worked for salary in the twelve months before the interview. When not otherwise noticed, the family head is conventionally fixed to be the male in all husband/wife families.

We investigate the correlation between the head's education and hourly wage,[12] and the household's expenditure share on home production substitutes.[13] To shed light on the potential differences across family types, we also run separate analyses for (i) husband/wife families where only the head works (15% of the sample), (ii) husband/wife families where both spouses work (40%), and (iii) other households (45%).

Stylized facts

As shown in the last panel of Figure 1 the household budget share of home production substitutes monotonically increases with the head's educational attainment: these consumption items represent 5 percent of the total expenditures of households headed by high-school dropouts, but 11 percent of those of households headed by college post-graduates. The first three panels show that the monotonic pattern is common across family types.[14] The pattern is also similar across categories of home services: except for

[12] Hourly wages are calculated as annual earnings (in the 12 months before the interview) divided by annual hours of work.

[13] We study budget shares on home services, instead of dollar amounts spent, to abstract from differential savings decisions across skill groups.

[14] The monotonic pattern is less pronounced for married couples where the wife works. However, as shown in Figure A1 (in the appendix), when conventionally setting the family head in

babysitting, household budget shares on any specific category of services are found to be increasing in the head's educational attainment.[15]

Figure 2 plots the fitted values from Ordinary Least Squares (OLS) regressions of the household budget share on home services on the head's log hourly wage. We find evidence of a statistically significant positive relationship. The estimated coefficients are reported in Table 1: column 1 corresponds to the specification plotted in Figure 2, while columns 2 through 5 report estimated coefficients from regressions separately run for different family types. A ten percent increase in the male head's hourly wage is associated with around a 0.1 percentage point increase in the budget share of home services in husband/wife families (columns 2 and 3). As shown in column 4, in husband/wife families where the woman does work we find a stronger relationship between budget share of home production substitutes and the woman's wage, suggesting that when the woman works, the opportunity cost of home production time is more closely tied to her wage than the male's wage. Also in the case of other families (column 5), there is a statistically significant relationship between budget share of home production substitutes and head's hourly wages. The magnitude of the relationship is smaller than for other family types, but the fraction of expenditure on these services is on average higher.

These stylized facts show that, across different family types, consumption of goods that substitute for home production activities increases with proxies for family members' opportunity cost of time. If skilled workers are indeed more likely to consume home services because they substitute their own "costly" time in home production activities with cheaper bought-in-time, then they should do more so, (i) the higher the market returns to their own skills, and (ii) the lower the average wages of those providing these services—who, as we will show in the next section, are predominantly the least skilled in the economy. In this sense, Prediction 2 (that consumption of outsourced home production activities is increasing in the dispersion of wages) represents a testable implication of the role of substitution effects in individual optimal time allocation decisions.

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husband/wife families to be the female (instead of the male), the patter is sharp for these families as well.

[15] This is apparent, for instance, in Figure A2 that decomposes the household budget share on home services in its specific components.

Since skilled workers have generally higher total income, the facts presented in this section are also consistent with home production substitutes being luxury goods, that is, goods with income elasticity of demand higher than one. Indeed, as shown in Figure 3, expenditure shares of home services are found to monotonically increase in wage family income.[16] This is consistent with preferences for home services being non-homothetic,[17] as it has been shown to be the case in other countries: on UK data, Leonardi (2005) estimates that consumption of services such as domestic help, hairdressing, maintenance, repairs and food eaten away from home have income elasticity above one.

When preferences are non-homothetic, aggregate demand for a good will increase with (i) average real per-capita income, and, more specifically, with (ii) inequality measures in the distribution of this income. These considerations have received considerable attention in the literature studying the growth of the service sector over the 20th century: if, as argued by Clark (1957), the income elasticity of demand for services is greater than one, then the emerging prominence of services in the United States (and other countries) can be simply explained by economic growth.[18] The second point is, however, more relevant to the purposes of this study: when the distribution of income in the economy becomes more unequal (and, in particular, top income shares rise), then the composition of aggregate demand should shift towards luxury goods. As discussed in the introduction, recently available evidence from tax data reveals that growth in top income shares has been particularly pronounced in the 1990s, so that we can expect sharp positive demand shifts for home services as well.

[16] Similar results hold when using total family income.

[17] Empirical complications in estimating income elasticities of demand using cross-sectional expenditure data include unobserved variations in the quality of goods purchased and violation of the law of one price. For instance, differences in expenditures would capture differences in prices rather than quantities, if the wealthy systematically prefer higher quality goods. However, in the case of home services, "higher quality goods" are likely to correspond to more labor-intensive goods, in which case richer individuals would still demand more unskilled work in home services.

[18] The fact that non-homothetic preferences might have implications for the composition of aggregate demand has also received large attention in the trade literature. For example, Markusen (1986) theoretically investigates the effects of assuming non-homothetic preferences on the volume and direction of trade, while Dalgin, Mitra and Trindade (2004) empirically document that the Gini coefficient for a country's income distribution is a strong predictor of trade in a gravity model.

B. The providers of home services

To evaluate the skills of the providers of home services, we use data from the 1980, 1990 and 2000 decennial censuses and the 2005 American Community Survey, specifically the Integrated Public Use Microsample Series (IPUMS) files (Ruggles et al., 2004).[19] We use industry of work to identify those service jobs that substitute for home production activities.[20] Appendix Table B1 provides details on the mapping between industrial classification and nine categories of employment. "Home service" jobs include personal services, repair, protective, cleaning and child care services. All of these services cannot be traded outside of a local labor market. We also separately identify the following categories of jobs: other clearly non-traded jobs (e.g., retail trade, except eating and drinking places that are categorized as home services; health, social and entertainment services) and construction jobs; clearly traded sectors (agriculture, mining and manufacturing); wholesale, transport and utilities; financial services; business services; public administration; and education.[21]

We calculate employment shares in these different sectors for workers in different deciles of the hourly wage distribution.[22] Consistent with Prediction 1, in any given year the share of workers employed in home services drops monotonically and sharply along the wage distribution. For instance, as shown in the first panel of Figure 4, in 2005 home services employed 29% of wage earners in the first decile of the distribution, 22% in the second, 15% in the third, 11% in the fourth, and so on, down to 2% in the top decile. There are other sectors where employment shares systematically vary along the wage distribution, but only home services exhibit this striking strictly monotonic downward pattern. Employment shares in other non-traded activities are stable at around 30% across

[19] The analysis is restricted to respondents aged 16 through 65 who were employed in the civilian labor force at the time of the survey, were not unpaid family workers, and did not live in group quarters. For consistency with later analyses, the sample is also restricted to respondents who resided in census-defined metropolitan areas. Hourly wages are calculated by dividing wage and salary income by annual hours worked (the product between weeks worked and hours usually worked per week).

[20] The results presented in this paper are robust to using occupation, instead of industry, to identify home services.

[21] The basic criterion of assignment of non-traded status consists in whether the producer of a good or service has to be located in physical proximity to the consumer for the job to be done. In some cases there is considerable ambiguity in applying this criterion (see Manning, 2004, for a discussion).

[22] Table B1 in the Appendix report all figures for all years.

deciles in the lower half of the wage distribution and drop only in the upper-half; those in construction are fairly constant along the entire wage distribution, while those in other sectors monotonically increase along the distribution.

An analysis of the socio-demographic characteristics of the workforce employed in homes services versus other industries reveals that this sector employs a close to average share of females, but an higher-than-average share of immigrants.[23]

Another peculiar feature of home services emerges when studying changes over time in the sectoral distribution of employment. Between 1980 and 2005, employment opportunities in the United States have been increasingly represented by non-traded jobs. This is not surprising, since labor is much cheaper in developing countries, and transportation and shipping costs have been historically decreasing over time. As shown respectively in Figures 5 and 6, the employment trend out of traded activities is common to the least skilled (wage-earners in the bottom two deciles of the hourly wage distribution) and the rest of the workforce. However, peculiar to the least-skilled workforce is the fact that employment shifts into home services have been much more pronounced than shifts into other non-traded activities, a result consistent with Prediction 2.

We use quantile regressions of individual log hourly wages to explore further whether the observed employment shifts into home services are likely to be driven by demand shifts. Figure 7 reports the coefficients on a dummy variable for employment in the home service sector from quantile regressions that also include controls for individual characteristics (gender, age, education, race, Hispanic origin, nativity status) and are separately run for 1980, 1990, 2000 and 2005. The coefficients are always negative, confirming the well-known fact that home services are traditionally low-paid jobs. The wage penalty to home services, however, has decreased over time, especially at the lower quantiles, as graphically shown by the fact that lines connecting coefficients estimated for each subsequent year lie above those for the previous year, and the shift up is particularly pronounced at the bottom. These findings show wage changes that are positively correlated with the employment shifts documented above, and allow us to conclude that

[23] See Figures B1 and B2 in Appendix B. Also, Figure B3 shows the contribution of specific subcategories of services included in the sector of interest.

time-series evidence supports the existence of demand shifts consistent with our consumption hypothesis.

We can also use the results from the quantile regressions to speculate about the role home services would play if we were to decompose changes in wage inequality over time into "composition" and "wage effects". In any given year, the effect of working in home services on wages across the different quantiles is negative, but the negative effect tends to be larger for lower than higher quantiles of the wage distribution. This means that home services tend to increase wage inequality at any point of the distribution. So, the rise in the fraction of the workforce employed in home services should account for rising wage inequality (composition effect). However, the fact that the negative wage effects shrink over time especially at the lowest quantiles (the lines become flatter, in particular at the bottom) implies that home services contribute to the slowing down of the growth in lower tail inequality (wage effect).

IV. Consumption spillovers within cities

To this point we have provided time series evidence on employment and wage changes in low-skill labor markets at the national level that is consistent with the existence of demand shifts arising from consumption spillovers. However, as discussed in the introduction, we cannot rule out that other factors as well drive the rise in the demand for home services over time. To explore further the case for demand shifts in favor of the least skilled workforce endogenously arising from widening inequality, we now turn to an analysis of local level data. Because of the non-tradeable nature of home services, demand forces in this sector are indeed properly modeled at the local level. As a proxy for local labor markets, we use Metropolitan Statistical Areas (MSAs), which consist of one or more counties centering on a substantial urban area.[24] We restrict the analysis to the 242 MSAs that are defined in all years.[25]

[24] MSA's are geographic entities defined by the U.S. Office of Management and Budget, and include counties that center on a urban core and are characterized by a high degree of social and economic integration (as measured by commuting to work) with the core.

[25] The geographic definition of MSA's is periodically adjusted to reflect the growth of cities. Even if we do not correct for potential inconsistencies over time, other work suggests that this issue should not significantly affect the results. For example, in his analysis of the correlation between employment growth and growth in the share of college graduates across MSA's, Shapiro

Since home services cannot be traded outside of a local labor market, the predicted effects of consumption spillovers on the structure of employment across sectors are expected to be detectable within cities. Regarding wage effects, in response to an unexpected growth in demand for unskilled workers, wage rates will rise temporarily. In the long run, however, labor mobility will re-equilibrate wage rates across locations. On decennial census data, we might still detect "medium run" wage dynamics as long as demand changes more quickly than the migration response. Bound and Holzer (2000) indeed estimate incomplete population adjustments of low-skill workers to local demand shifts over the decade 1980-1990.

C. Employment analysis

To explore employment effects, we begin by showing plots of the share of a city workforce employed in home services versus either the 90-10 hourly wage gap or the top decile wage bill share. As shown in Figures 8 through 12, in any given year there is a positive relationship between both measures of inequality and the employment shares in home services, in the overall city workforce and in the bottom 20 percent of wage earners. Figure 8 highlights the existence of two sets of outliers: Las Vegas (NV) and Atlantic City (NJ) have a much higher than average share of employment in home services, and Stamford (CT) has a much larger than average 90-10 wage gap. However, as shown in the remaining figures, results are robust to the exclusion of these three cities.

To address the concern that the cross-sectional correlation shown in these figures is confounded by systematic differences across cities, we examine the relationship between changes in these variables in a regression framework that also controls for other city-specific contemporaneous changes. Specifically, Table 2 reports a series of regression results from variants of the following specification:

$$(1) \qquad \Delta Emp\_Share^{Home}_{ct} = \alpha + \beta \Delta Inequality_{ct} + \delta \Delta X_{ct} + \gamma_t + \varepsilon_{ct}$$

(2006) shows that his results are robust to examining only those areas whose definitions did not change over time.

where $\Delta Emp\_Share^{Home}_{ct}$ is the change in the share of the city workforce employed in home services between 1980 and 1990, or 1990 and 2000;[26] $\Delta Inequality_{ct}$ is the change in the 90-10 hourly wage gap; ΔX_{ct} are changes in the socio-demographic characteristics of a city workforce (the proportion of women, blacks, Hispanics and foreign-born in the total workforce of the city, and the fraction aged 16-24, 25-34, 35-44 and 44-55), while γ_t is a period fixed effect.

Based on the estimates reported in column 1, panel A of Table 2, a one-standard deviation (9 percentage points) difference in the 90-10 gap is associated with one-fourth of a standard deviation (0.3 percentage points) differential increase in the fraction of the workforce employed in home services.[27] The estimated effects are stable to the exclusion of outliers from the sample (Atlantic City, Las Vegas and Stamford; column 2), the inclusion of controls for changes in the socio-demographic characteristics of a city workforce (column 3) and of city fixed effects (column 4). A perusal of the coefficients for changes in other characteristics of a city workforce reveals a strong positive association between the growth of employment in home services and the change in the female share of the workforce. This variable captures another source of demand shifts for home services, but it is noteworthy that (i) its inclusion does not alter the magnitude or significance of β, and (ii) even if its coefficients is three orders of magnitude larger than β, its estimated effect is indeed smaller when taking into account the degree of variation of the female share.[28]

As shown in column 4, inclusion of city fixed effects has only a minor impact on the coefficient of the variable of interest, suggesting that the results are not driven by omitted variable bias related to time-invariant differences across cities. However, the coefficient might be biased by city-specific time-variant shocks that are correlated with both changes in the 90-10 gap and labor reallocation across sectors. To address this concern, we also present Instrumental Variables (IV) estimates, where decadal changes in the 90-10 gap of

[26] Since the third period available (2000-2005) is half the length of the first two, we drop it from this part of the analysis to avoid the results being sensitive to the assumptions imposed to achieve comparable time horizons.

[27] The average fraction of workforce employed in home services across cities between 1980 and 2000 is 0.10, with a standard deviation of 0.012, while the average change in the 90-10 gap is 0.06 (s.d. 0.09). The effect is then calculated as: 0.032*0.09=0.003.

[28] The average decadal growth in the female share is 0.020, with standard deviation of 0.018.

a city wage distribution are predicted on the base of the predetermined occupational structure of the city workforce (as of the starting of the decade) and relative wage changes across occupations at the national level. We first identify lawyers, doctors, health assessment and treating occupations, and other technicians (except health, engineering and science), as the occupations that contributed the most to the growth in inequality at the top end of the distribution between 1980 and 2000.[29] Second, for each decade we multiply the fraction of a city workforce in the top decile of the wage distribution employed in these occupations at the starting of the decade by the decadal national change in the wage premium associated with these occupations.[30] First-stage regressions reveal that the instrument is a good predictor of city-specific changes in the 90-10 wage gap. These predicted values, however, are a valid instrument only under the assumption that local economies did not trend differently conditional on their occupational structure in the starting period. As shown in column 5, the IV estimate of β confirms that the effect of changes in the 90-10 wage gap on the fraction of the workforce in home services is positive.

Panels B and C of Table 2 report the estimated coefficients of the 90-10 gap from regressions for changes in the employment share in home services of the least skilled workforce (those earning less than the 20th or the 10th percentile of the wage distribution). The estimated associations are much larger, as expected. All of the other results discussed above apply similarly here, with the exception that the IV estimates are not precisely estimated.

D. Differences between the 1980s and the 1990s

As discussed in the introduction, Piketty and Saez' (2002, 2005) analyses of tax data show that, relative to the earlier decade, the growth of top wage shares in the 1990s has been both particularly steep, and more largely concentrated among income earners in the

[29] To do so, following Lemieux (2007), we compute the fraction of workers in each 2-digit occupation who are in the top ten percent of the overall wage distribution, and calculate the change in this proportion between 1980 and 2000. We select the occupations for which the change is the largest.

[30] The wage premium associated with these occupations is estimated from regressions of individual (log) wages, run on national data, separately for 1980, 1990 and 2000. We then calculate decadal changes in the estimated coefficients on dummy variables for employment in these top occupations.

very highest percentiles. In light of the finding (in Section III.A) that home services can be characterized as luxury goods, we argue that the sharper rise of top income shares in the 1990s relative to the 1980s should predict larger demand shifts from consumption spillovers in favor of unskilled work in the more recent decade. This is a prediction we explore further, because it would imply that demand shifts from consumption spillovers account well for the timing of the narrowing of lower tail wage inequality.

In practice, we would like to test for the magnitude of demand shifts from consumption spillovers arising from increasing top wage shares on local level data. Ideally, we would use changes in the wage bill share of the top decile of wage earners as the explanatory variable of interest in equation (1), and quantify differences over time in the magnitude of demand shifts from consumption spillovers by comparing predicted values from equation (1) in different decades. The empirical issue is top coding.[31] Unless measurement error in the top wage bill share on census data is constant over time—an assumption we cannot readily test for—then this approach will be misleading. So, we turn to test for differences across the two decades in a more indirect way.

The goal is finding a proxy for cross-city variation in the growth of top wage bill shares. We propose using a summary measure of the educational attainment of a city workforce at the starting of the decade (e.g., the share of college graduates or post-graduates) as a proxy for changes in top wage bill shares. Specifically, we estimate specifications like:

$$(2)\quad \Delta Emp\_Share^{Home}_{ct} = \alpha + \lambda_1 CollegeShare_{c,t-1} + \gamma_t + \lambda_2(\gamma_t * CollegeShare_{c,t-1}) + \delta X_{ct} + \varepsilon_{ct}$$

where γ_t is a dummy for the 1990-2000 period. Measures of the educational attainment of a city workforce are a better proxy for changes in the top wage bill share whenever changes in the returns to education account for more of the growth in (top-end) wage inequality. Broadly speaking, a better proxy would then result in smaller attenuation bias in the estimated coefficients. Mounting evidence suggests that the growth in the returns to

[31] For example, in the 1990 census reported wages and salaries were top-coded at $140,000 a year, which is above the 95th percentile ($94,270) but well below the 99th percentile ($190,810) of the distribution of earnings in the tax data of Piketty and Saez. The top-code in the 2000 census is larger ($175,000 a year), but so are the 95th ($107,390) and the 99th percentile ($230,204) percentiles of the distribution of earnings in the tax data.

(higher) education is a major explanation for the growth in top end inequality,[32] especially in the 1990s. Notably, Angrist, Chernozhukov and Fernandez-Val (2006) estimate the returns to schooling across quantiles and census years, and show a twist in the schooling coefficient process at high quantiles, especially sharp in 2000. To the extent that—as supported by their findings—higher education is associated with increased wage dispersion to a much greater extent in the 1990s than in the 1980s,[33] then we would expect the estimated λ_2 to be larger in magnitude and more significant than λ_1, because the former is associated with a better proxy variable.

Table 3 reports estimation results from equation 2, for specifications that use either the share of workers with college degrees at the starting of the decade as the proxy variable of interest (columns 1 and 3) or the share of workers with post-graduate degrees (columns 2 and 4). Results reported in columns 1 and 2 confirm that an economically and statistically significant association between the proxies of interest and the growth of unskilled employment in home services arises in the 1990s: a one-standard deviation difference in the share of college graduates or post-graduates in 1990 (6 and 3 percentage points) is associated respectively with one-fifth and one-fourth of a standard deviation (0.5 and 0.8 percentage points) differential increase in the fraction of low-wage earners employed in home services.[34]

Columns 3 and 4 present estimation results from equation 2 where the dependent variable is the decadal change in the share of low-wage earners employed in non-traded activities other than home services. In this case, the coefficients on the proxies for changes in a city top wage bill share are not statistically significant in either decades. This result separates the consumption hypothesis we have formulated from the predictions of a model in which employment shifts across sectors in a city reflect general

[32] Mincer (1998), Dechênes (2002) and Lemieux (2006c) show that over time (log) wages are an increasingly convex function of years of education. Lemieux (2006a) directly relates the "convexification" in the returns to education to rising top end inequality.

[33] Firpo, Fortin and Lemieux' (2007) wage decomposition analysis confirms that the growth in returns to education (especially at a level above high-school) is the most important source of growth in top-end inequality since the late 1980s.

[34] The average college share across cities is 0.23, with a standard deviation of 0.06. The average post-graduate share is 0.09, with a standard deviation of 0.03. The average change in the fraction of low-wage earners employed in home services is 0.02, with a standard deviation of 0.03.

spillovers into non-tradeable activities, simply due to the fact that the higher skilled workers have more income to spend on locally produced non-traded goods.

To the extent that the share of skilled workers in a city is also associated with city-specific skill-biased demand shocks (Acemoglu, 1998 and 1999; Beaudry, Doms and Lewis, 2006), the association between our proxy variables and the share of unskilled workers in non-traded activities might as well be driven by decreasing relative demand for unskilled workers in other (increasingly skill-intensive) sectors, rather than increasing relative demand for them in home services. Since this is a scenario we cannot rule out, we do not propose a causal interpretation of the estimation results from equation 2, but simply notice that they are consistent with the expected sign and magnitude of demand shifts from consumption spillovers.

E. Wage analysis

Current research on the evolution of wage inequality in the United States is exploring why, after at least a decade in which wage differentials increased at essentially all points of the distribution (Juhn, Murphy and Pierce, 1993), the situation has changed since the late 1980s, with wage growth both in the lower and upper tails of the distribution being larger than in the middle (Autor, Katz and Kearney, 2006). In this paper, we put forward the idea that the improvements in the relative wages of the least-skilled might be partly explained by the existence of consumption spillovers—that are, positive demand shifts in favor of unskilled work endogenously arising from the ongoing/secular widening of the wage distribution. In the extreme case in which consumption spillovers were the only explanation for the narrowing of lower tail inequality, then wage growth would still be a linear function of the percentile, as it was in earlier periods, instead of a U-shaped curve.

The city-level empirical analysis so far has been about the quantity side of the labor market, and it has shown that within-cities shifts of employment towards services that substitute for home production are consistent with the predictions of consumption spillovers. In this section we instead study whether patterns of within-cities wage growth at different percentiles are consistent with the existence of demand shifts arising from consumption spillovers.

We build our test from the observation that the upward pressure on the unskilled wages arising from consumption spillovers should *mechanically* be larger in those cities with a larger fraction of unskilled workers employed in home services. Since this fraction changes over time as a result of the same demand forces we would like to capture, we proceed by shutting off employment changes and test whether, as we would expect in the presence of consumption spillovers, within cities decadal wage growth is more likely to be U-shaped in those cities with a larger fraction of unskilled workers employed in home services at the beginning of the decade.

Table 4 reports estimation results from variants of the following specification:

$$(3) \qquad \Delta 10\text{-}50gap_{ct} = \alpha + \pi_1 \Delta 90\text{-}50gap_{ct} + \pi_2 HomeShare_{c,t-1} + \pi_3 (\Delta 90\text{-}50gap_{ct} * HomeShare_{c,t-1}) + \delta X_{ct} + \gamma_t + \varepsilon_{ct}$$

where $HomeShare_{c,t-1}$ is the fraction of wage-earners (with hourly wages below the 10th percentile) who are employed in home services at the beginning of the decade.

As shown in column 2, the coefficient of the interaction term of interest (π_3) is estimated to be positive and significant, and the finding is robust to the inclusion of controls for changes in socio-demographic characteristics of the city workforce (column 3) and city fixed effects (column 4). A potential concern in interpreting the results is that the estimated association between relative wage growth at the top and at the bottom may simply be capturing changes in the median wage. To address this issue, we also estimate the correlation between wage growth at the 10th percentile relative to the 40th percentile and wage growth at the 90th percentile relative to the 60th percentile. As shown in panel B of Table 3, the results are robust to this specification check, suggesting that our findings reflect correlation between changes at the tails rather than being spurious because of changes at the median.

To gain an idea of the economic relevance of the estimated coefficients, consider two cities that both experience a 10% relative wage growth at the top, but have a one-standard deviation difference in *Home_share* (4 percentage points). The city with the higher share of low-skill workers employed in home services is estimated to experience faster relative wage growth at the bottom by 1.5 percent.[35]

[35] This effect is calculated from the coefficients reported in column 4 of Table 3: [-0.954 +3.789*(Home_share+0.04)]*.1 – [-0.954 +3.789*Home_share]*.1 = 0.015.

Finally, notice that in order for increasing upper tail inequality to be associated with narrowing lower-tail inequality, the share of unskilled workers employed in home services in a city must be at least 25%.[36] It is noteworthy that the average employment share in home services across cities has increased from 23% in 1980 to 26% in 1990, suggesting that since the 1990s the size of this sector is large enough for our story to be an explanatory factor for the narrowing of lower tail inequality.

VI. Conclusions

While the growth in U.S. wage inequality was pervasive in the 1980s, it has been concentrated at the top end of the distribution since then. Inequality at the low end, on the contrary, has stopped increasing, or it has even narrowed in the last 15 years. An obvious question is why wage dispersion has changed so differently at different points of the distribution. Autor, Katz and Kearney (2006) suggest that technological change is a possible answer, provided that computerization resulted in a decline in the demand for skilled but "routine" tasks that used to be performed by workers around the middle of the wage distribution.[37] In this paper, we argue instead that decreasing lower-tail wage inequality might stem from consumption demand shifts in favor of unskilled labor endogenously arising from the secular processes of widening wage dispersion and rising top wage income shares. We document the sharp asymmetry in the skills of providers and consumers in the sector of services that substitute for home production activities—an empirical fact consistent with both substitution effects in individuals' time allocation decisions and non-homothetic preferences for these services. Building on this fact, we argue that increasing inequality should rise the demand for these services by skilled workers, and these demand shifts should in turn disproportionally favor the employment and earnings opportunities of the least skilled.

[36] The partial effect of $\Delta 90\text{-}50gap_{ct}$ on $\Delta 10\text{-}50gap_{ct}$—that is, $\pi_1 + \pi_3\ HomeShare_{c,t-1}$—is positive if $HomeShare_{c,t-1} \geq -\pi_1 / \pi_3 = 0.954/3.789=0.25$.

[37] Firpo, Fortin and Lemieux (2007) have recently proposed an unconditional quantile regression decomposition method for changes in wages and shown that, besides occupational shifts consistent with the ALM view of technological change, also the effects of deunionization are a viable explanation for the polarization of wage growth.

Since cleaning, restaurant work and other low-skill jobs that provide market substitutes for home production activities largely involve tasks that machines cannot perform, our story is complementary with explanations based on the non-monotone impact of technological progress throughout the skill distribution. However, our approach does not require the impact of technological progress to have changed from simply skilled-biased in the 1980s to also non-neutral across occupations and sectors in the 1990s. In fact, in our framework rising top hourly wage percentiles and top wage income shares—due to technological change or any other factor that disproportionally increase the relative wages of more skilled workers—represent the driving force of consumption demand shifts that disproportionally favor the unskilled workforce. Ideally, we would test for these demand shifts using an exogenous source of variation in skilled wages—exogenous to the evolution of low-skill labor markets. In practice, we study national and city-level employment and wage data and find a series of results consistent with the existence of demand shifts arising from consumption of low-skill services by skilled workers.

The main contribution of our paper is to stress the importance of consumption demand shifts in the study of the evolution of wage inequality. In this regard, the paper most closely related to ours is Leonardi (2005), who also studies shifts in relative skill demand induced by product demand shifts. However, while we focus on a specific set of low-skill services that are more likely to be consumed by skilled workers, Leonardi highlights instead the skill-intensive goods that are more heavily consumed by skilled/richer workers, and calibrates a model to establish the quantitative importance of changes in the demand of these goods in explaining the increase in relative skill demand in the UK between 1982 and 1998.

Our paper is also related to the voluminous literature that examines the causes of city-level employment and wage growth. By highlighting a mechanism through which strong city performance in the high-skill labor markets might spillover into low-skill labor markets, our approach has similarities with the one in Beaudry, Green and Sand (2007). They show that there are substantial and persistent spillover effects on city-level average wages associated with changes in the fraction of jobs in high paying sectors. The effect they measure is pervasive: it is not restricted to one educational attainment and is present in almost all industries (and importantly for both tradeable and non-tradeable goods).

However, unskilled labor markets appear to be those most largely affected by the spillover effects from good jobs: Beaudry, Green and Sand (2007) find that cities that experience a change in industrial composition in favor of better paying jobs also experience a decrease in wage inequality that is concentrated in the bottom half of the distribution. Given that consumers of outsourced home production tasks are disproportionally workers in "good jobs", our framework provides a potential explanation for what is driving the spillover effect on unskilled labor markets.

Finally, our work relates to the immigration literature. Borjas and Friedberg (2007) show that, as opposed to the continuous decline in the relative earnings of new immigrants observed since the 1960s, the trend reversed in the 1990s, with newcomers doing as well in 2000, relative to natives, as they had twenty years earlier. The turnaround in the relative earnings of new arrivals is found to have occurred primarily at the top and the bottom ends of the skill distribution. As documented in Section II.B, the low-skill services that are the focus of this paper are immigrant-intensive sectors. Positive demand shifts for unskilled work driven by consumption spillovers might then partly explain the drop in the immigrant-native wage gap observed at the bottom of the distribution. It is well known, however, that immigration greatly increased the supply of high-school dropouts in recent decades (Borjas, 2003), so this explanation might appear to be at variance with the conclusion of Cortes (2006) that immigrant-induced shifts in low-skill labor force decrease the price of immigrant-intensive services, with lower wages being a likely channel through which these effects take place. Cortes' result, however, holds in specifications that use the tendency of immigrants to move to the same areas in which previous immigrants from their country live, to instrument for the endogenous location choices of immigrants (Card, 2001). The cross-sectional correlation between immigrants' concentration and prices is instead positive, consistent with immigrants choosing their location based on the economic opportunities that the city offers, and with the immigrant-induced shifts in labor supply not being large enough to offset existing positive price (and wage) pressures.

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Table 1

Correlation between household budget share of home production substitutes and household members' hourly wages; 2004

	All Families	Husband/Wife Families			Other Families
		Woman does NOT work	Woman works		
	(1)	(2)	(3)	(4)	(5)
Head's log hourly wage	0.004***	0.012***	0.008***	0.004***	0.0003***
	(0.001)	(0.003)	(0.001)	(0.000)	(0.000)
Wife's log hourly wage				0.008***	
				(0.000)	
Constant	0.058***	0.026***	0.050***	0.041***	0.068***
	(0.004)	(0.011)	(0.008)	(0.000)	(0.000)
Observations	6,058	933	2,373	2,373	2,752

Note: OLS estimates. The dependent variable is the household expenditure share of goods and services that substitute for home production (see Table A1). Sample restricted to household headed by individuals at least 18 and no more than 65 who worked for salary in the 12 months before the interview. The family head is conventionally fixed to be the male in all husband/wife families. "Other families" in column 5 include single-adult families (72%) and other mixed families (28%).

Source: 2004 Consumption Expenditure Diary Survey.

Table 2: *Decadal changes in 90-10 wage gap and growth of employment in home services within cities; 1980-1990 and 1990-2000.*

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) IV
A. Dependent Variable: Decadal change in share of employment in home services					
90-10 (log) wage gap	0.032***	0.033***	0.030***	0.024***	0.053**
	(0.007)	(0.005)	(0.008)	(0.009)	(0.026)
1990-2000 dummy	-0.004***	-0.004***	-0.002	-0.001	-0.002
	(0.001)	(0.001)	(0.004)	(0.005)	(0.005)
Δ Female Share			0.084**	0.029	0.012
			(0.041)	(0.052)	(0.057)
Δ Black Share			0.042	0.061	0.068
			(0.031)	(0.051)	(0.054)
Δ Hispanic Share			-0.033	-0.102	-0.111
			(0.032)	(0.073)	(0.078)
Δ Foreign Share			0.028	0.097	0.087
			(0.030)	(0.067)	(0.069)
Δ 16-24 Share			0.083	0.003	0.051
			(0.058)	(0.062)	(0.080)
Δ 25-34 Share			0.058	0.001	0.033
			(0.058)	(0.067)	(0.078)
Δ 35-44 Share			0.103	0.056	0.062
			(0.064)	(0.072)	(0.074)
Δ 45-54 Share			0.085	-0.005	0.018
			(0.079)	(0.081)	(0.087)
Constant	0.010***	0.010***	0.005	0.018**	0.020**
	(0.001)	(0.001)	(0.003)	(0.009)	(0.009)
B. Dep. Var.: Change in share of home service employment in bottom two deciles					
90-10 (log) wage gap	0.105***	0.111***	0.093***	0.087***	0.082
	(0.018)	(0.017)	(0.020)	(0.024)	(0.073)
C. Dep. Var.: Change in share of home service employment in bottom decile					
90-10 (log) wage gap	0.103***	0.107***	0.083***	0.089**	0.096
	(0.024)	(0.025)	(0.027)	(0.038)	(0.112)
City dummies	NO	NO	NO	YES	YES

Note: Two periods (1980-1990, 1990-2000) and 242 MSA's are considered (except column 2, that excludes Atlantic City, Las Vegas and Stamford). In column 5: the instrument is the product of (i) the fraction of lawyers, doctors, health assessment technicians and other technicians (except health, engineering and science) in a city workforce at the starting of the decade, and (ii) the decadal national change in the wage premium associated with these occupations. First-stage coefficient and standard error: 58.4 (18.6); R^2: 0.55. Estimates weighted by the average share of national workforce in each MSA between 1980 and 2000. Standard errors (in parentheses) adjusted for serial correlation within MSA. * significant at 10% ** significant at 5% *** significant at 1%.
Source: IPUMS extracts from 1980-1990-2000 censuses.

Table 3

Fraction of graduates/post-graduates in a city workforce at the starting of the decade and decadal growth of low-skill employment in non-traded services; 1980-90, 1990-2000.

Dependent Variable	(1) **Change in share of unskilled workforce employed in home services**	(2)	(3) **Change in share of unskilled workforce employed in other non-traded services**	(4)
College Share$_{-1}$	-0.026		-0.049	
	(0.044)		(0.041)	
1990-2000 dummy	-0.027*	-0.032**	-0.022	-0.023
	(0.015)	(0.014)	(0.018)	(0.016)
College Share$_{-1}$ *	0.089*		0.054	
1990-2000 dummy	(0.053)		(0.054)	
Post-Graduate Share$_{-1}$		-0.042		-0.087
		(0.064)		(0.062)
Post-Graduate Share$_{-1}$ *		0.258***		0.125
1990-2000 dummy		(0.098)		(0.093)
Δ Female Share	0.354***	0.356***	0.130	0.129
	(0.106)	(0.104)	(0.112)	(0.112)
Δ Black Share	0.128*	0.146*	-0.163*	-0.156
	(0.077)	(0.075)	(0.093)	(0.096)
Δ Hispanic Share	-0.170***	-0.137**	-0.065	-0.056
	(0.065)	(0.060)	(0.092)	(0.085)
Δ Foreign Share	0.278***	0.257***	-0.096	-0.097
	(0.060)	(0.057)	(0.090)	(0.083)
Δ 16-24 Share	-0.019	-0.033	-0.090	-0.091
	(0.152)	(0.149)	(0.164)	(0.162)
Δ 25-34 Share	0.014	-0.023	0.126	0.114
	(0.126)	(0.122)	(0.144)	(0.141)
Δ 35-44 Share	0.133	0.103	0.002	-0.003
	(0.140)	(0.135)	(0.153)	(0.152)
Δ 45-54 Share	0.113	0.092	0.016	0.014
	(0.170)	(0.165)	(0.180)	(0.177)
Constant	0.002	0.003	0.026**	0.026**
	(0.011)	(0.010)	(0.012)	(0.010)

Notes: The dependent variable is the decadal change in the share of wage earners below the 20th percentile of a city wage distribution employed in services that substitute for home production (columns 1 and 2) or in other non-traded services (columns 3 and 4). 242 MSA's and two periods (1980-1990, 1990-2000) are considered. Estimates weighted by the average share of national workforce in each MSA between 1980 and 2000.

Standard errors (in parentheses) adjusted for serial correlation within MSA. * significant at 10% ** significant at 5% *** significant at 1%.

Source: 1980-1990-2000 U.S. censuses.

Table 4

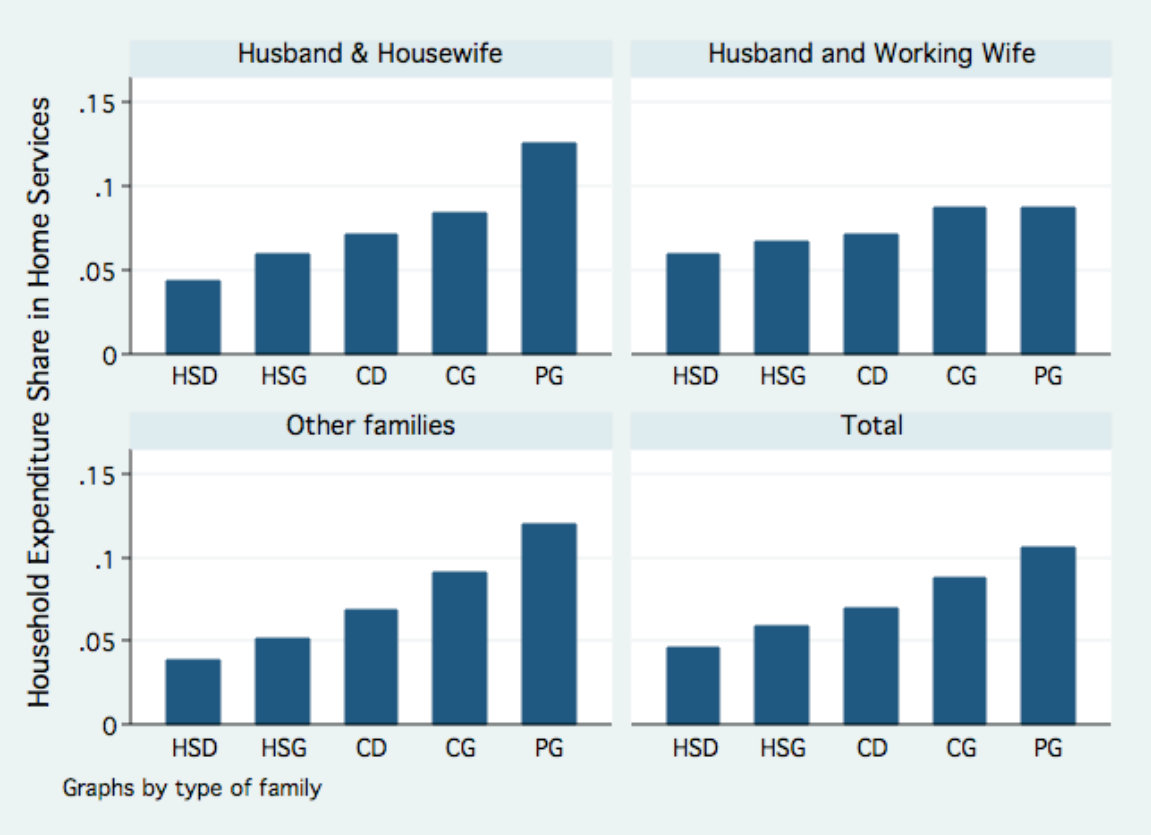
Relative Wage Growth at the bottom and at the top of a city wage distribution

	(1)	(2)	(3)	(4)
A. Dependent Variable: Change in the 10-50 Log Hourly Wage Gap				
Δ90-50 wage gap	-0.083	-1.144***	-0.766**	-0.954*
	(0.086)	(0.380)	(0.368)	(0.552)
$Home\_Share_{t-1}$		0.335***	0.276***	0.333*
		(0.090)	(0.085)	(0.172)
Δ90-50 wage gap		4.411***	3.120**	3.789*
*$Home\_Share_{t-1}$		(1.472)	(1.437)	(2.120)
1990-2000 dummy	0.027***	0.015	-0.013	0.003
	(0.010)	(0.009)	(0.020)	(0.025)
Δ Female Share			-0.134	-0.423
			(0.196)	(0.263)
Δ Black Share			-0.066	-0.194
			(0.253)	(0.372)
Δ Hispanic Share			0.137	-0.242
			(0.170)	(0.368)
Δ Foreign Share			-0.861***	-0.379
			(0.174)	(0.277)
Δ 16-24 Share			0.769**	1.318***
			(0.322)	(0.399)
Δ 25-34 Share			0.301	0.864**
			(0.261)	(0.397)
Δ 35-44 Share			-0.105	0.379
			(0.243)	(0.354)
Δ 45-54 Share			0.080	0.345
			(0.322)	(0.452)
Δ College Share			-0.159	-0.064
			(0.139)	(0.207)
Constant	-0.028***	-0.106***	-0.002	-0.057
	(0.007)	(0.023)	(0.029)	(0.067)
B. Dependent Variable: Change in the 10-50 Log Hourly Wage Gap				
Δ90-60 wage gap	-0.055	-1.472***	-1.159***	-1.709***
	(0.084)	(0.338)	(0.322)	(0.472)
$Home\_Share_{t-1}$		0.190**	0.127*	0.087
		(0.077)	(0.075)	(0.167)
Δ90-60 wage gap		5.902***	4.851***	6.906***
*$Home\_Share_{t-1}$		(1.293)	(1.231)	(1.795)

Notes: The dependent variable is the decadal change in log real hourly wages at the 10^{th} percentile of a city wage distribution net of the change in log real hourly wages at the median (panel A) or at the 40^{th} percentile (panel B). Explanatory variables include: the change in log real hourly wages at the 90^{th} percentile net of changes in log real hourly wages at the median (panel A) or at the 60^{th} percentile (panel B); the share of wage-earners below the 10^{th} percentile employed in home services at the start of the decade ($Home\_Share_{t-1}$); changes in the share of women, Blacks, Hispanics, immigrants, age groups and college graduates in a city workforce. Column (4) also includes city fixed effects. Estimates weighted by the share of national workforce in each MSA. Standard errors (in parentheses) adjusted for serial correlation within MSA. * significant at 10% ** 5% *** 1%. Source: 1980-1990-2000 U.S. censuses.

Figure 1

Household expenditure share on home production substitutes and head's highest educational attainment, by family type; 2004

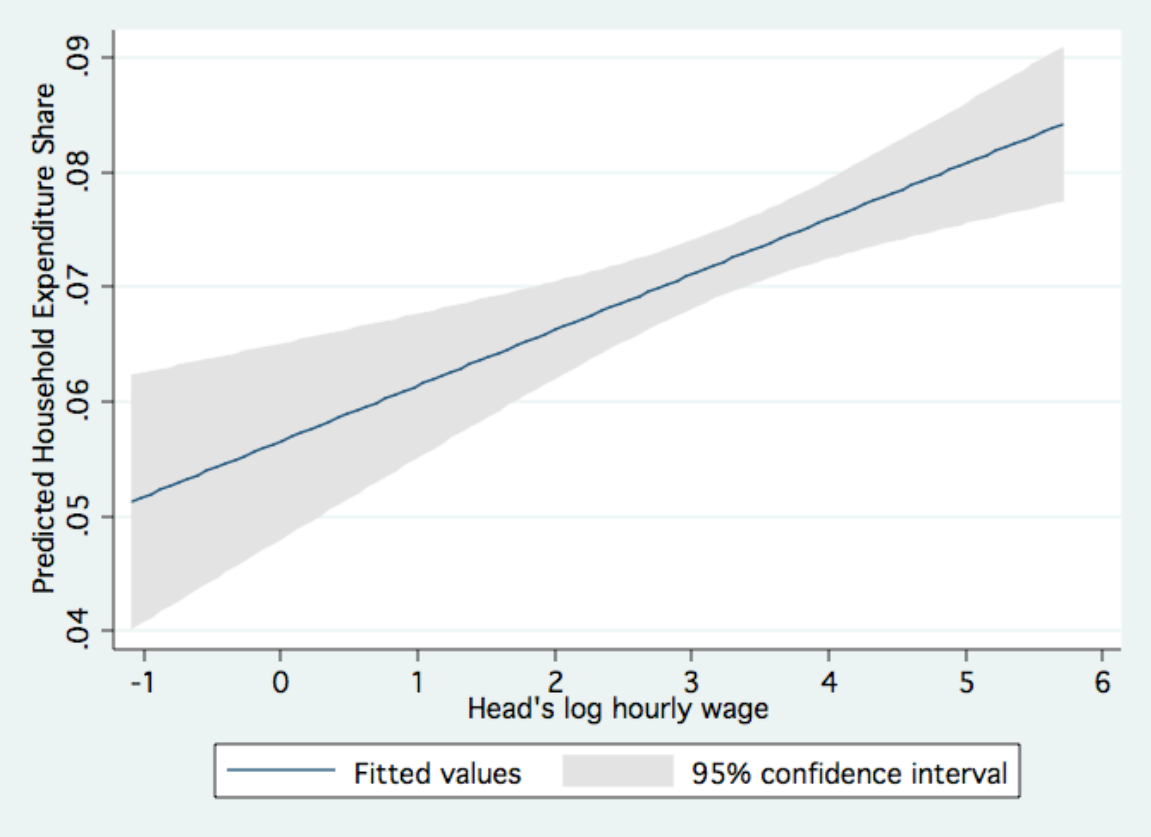


Notes: The graph plots the average fraction of total household expenditure spent in home production substitutes across households headed respectively by high-school dropouts (HSD), high school graduates (HSG), individuals with some college education but no bachelor's degree (CD), individuals with Associate, BA or Master degrees (CG) and individuals with doctorate degrees (PG). The first three panels report budget shares separately calculated for husband/wife families and other families: the latter include single-adult families (73%) and other mixed families (27%). All figures are weighted. The sample is restricted to households headed by individuals at least 18 and no more than 65 who worked for salary in the twelve months before the interview. The family head is conventionally fixed to be the *male* in all husband/wife families (See Figure A1 for female heads).

Source: 2004 Consumer Expenditure Diary Survey.

Figure 2

Correlation between household expenditure share on home production substitutes and head's log hourly wage; 2004

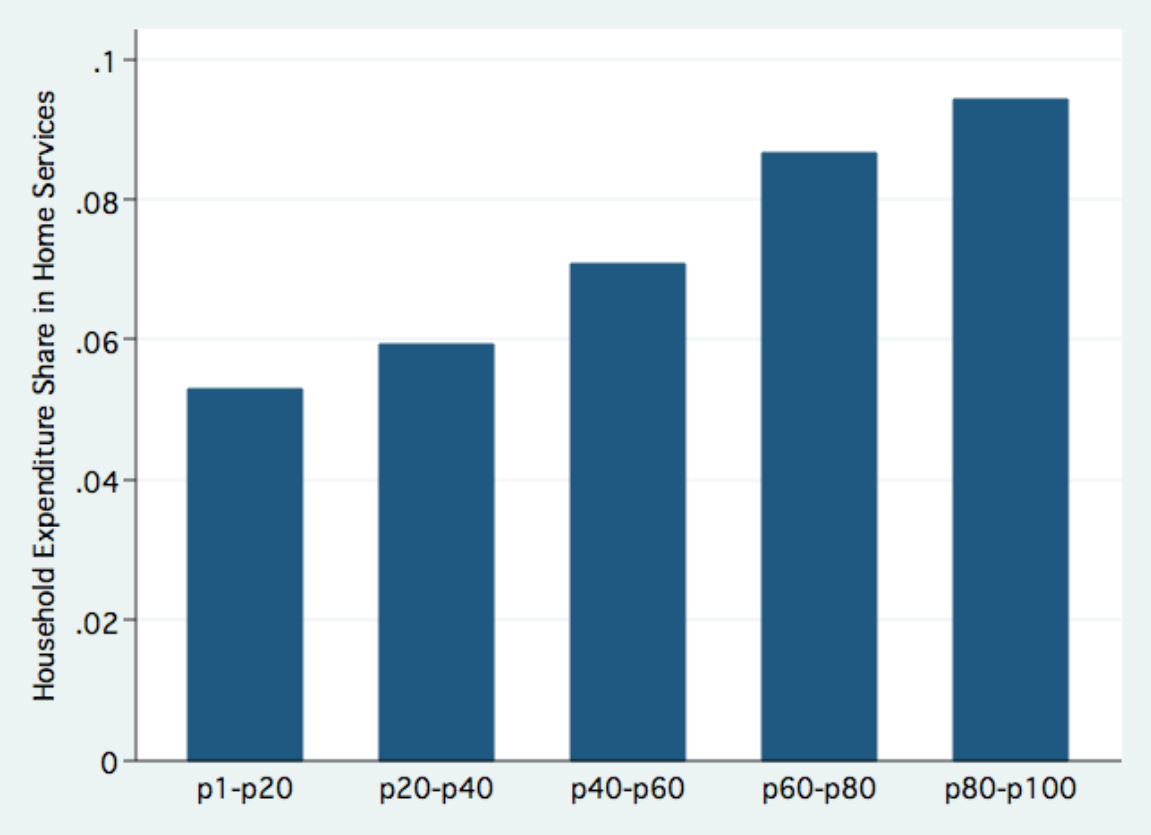


Notes: Ordinary Least Squares fit and 95% confidence interval. The dependent variable is the household expenditure share of services that substitute for home production, and the explanatory variable is the head's log hourly wage. The slope coefficient is 0.004 (standard error of 0.001): see column 1 of Table 1.

Source: 2004 Consumption Expenditure Diary Survey.

Figure 3

Household expenditure share of home production substitutes by percentiles of the household wage income distribution; 2004



Notes: The graph plots the average fraction of total household expenditure spent in home production substitutes by household wage income. Figures are weighted using weights provided by the Bureau of Labor Statistics. The sample is restricted to households headed by individuals at least 18 and no more than 65 who worked for salary in the twelve months before the interview. Source: 2004 Consumer Expenditure Diary Survey.

Figure 4

Employment shares in different sectors by decile of the hourly wage distribution; 2005

Notes: Each bar represents the fraction of the workforce in each decile of the hourly wage distribution employed in a given sector in 2005. So, the bars for each decile across the six sectors sum vertically to one.

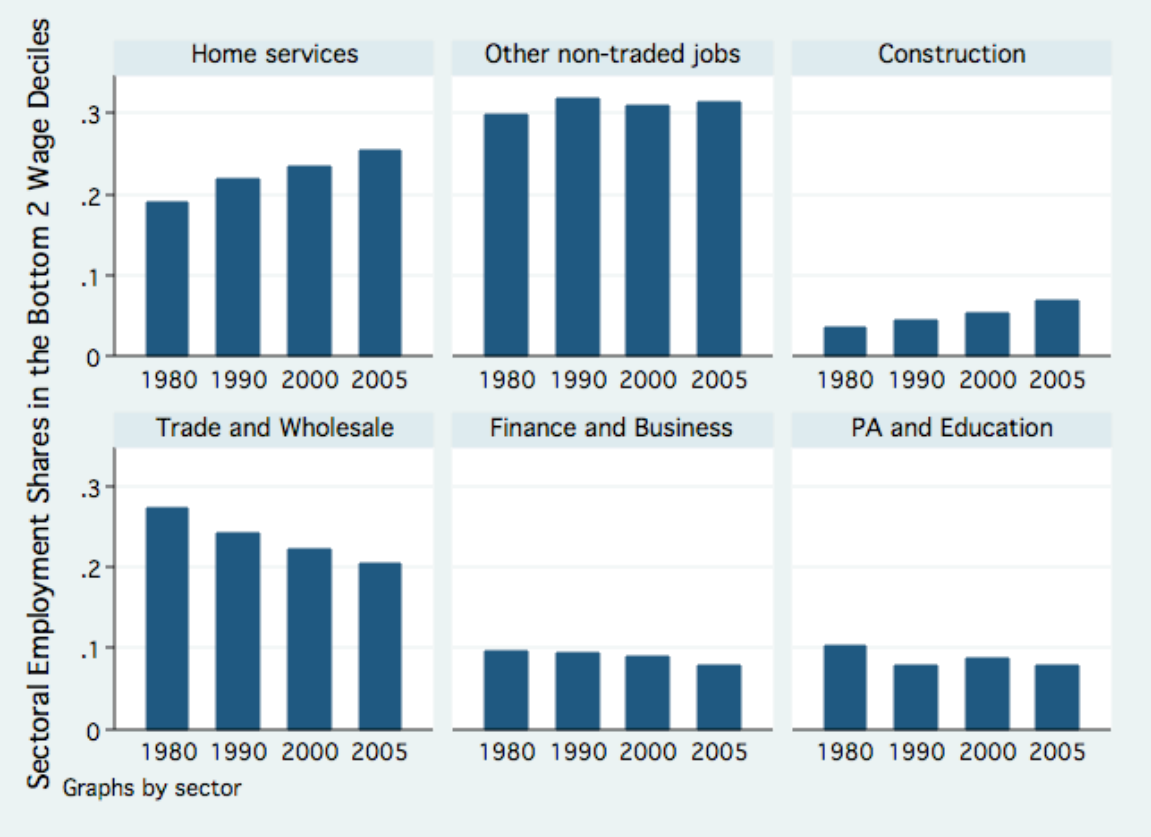
Sample restricted to individuals aged 16 through 65 who were employed in the civilian labor force at the time of the survey, were not unpaid family workers, who did not live in group quarters and who resided in a Metropolitan Statistical Area (MSA). Earnings deciles based on hourly wages, defined as annual wages divided by annual labor supply (the product between number of weeks worked and usual number of hours worked per week).

Figures are weighted by the product of IPUMS weights and annual labor supply.

Source: IPUMS extract from the 2005 American Community Survey file.

Figure 5

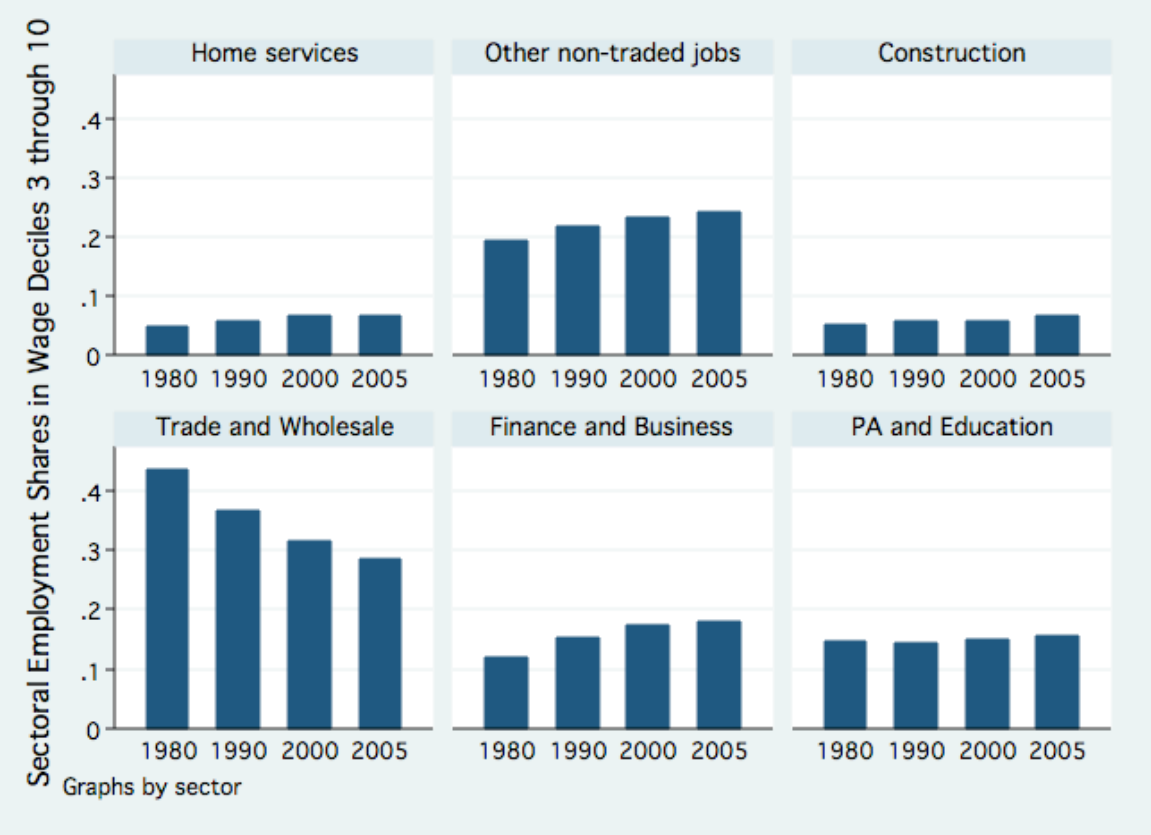
Employment shares in different sectors of the workforce in the bottom two deciles of the hourly wage distribution; 1980, 1990, 2000 and 2005



Notes: Each bar represents the fraction of the workforce in the bottom 2 deciles of the hourly wage distribution employed in a given sector in a given year. So, the bars for each year across the six sectors sum vertically to one.
Sample restricted to individuals aged 16 through 65 who were employed in the civilian labor force at the time of the survey, were not unpaid family workers, who did not live in group quarters and who resided in a Metropolitan Statistical Area (MSA). Earnings deciles based on hourly wages, defined as annual wages divided by annual labor supply (the product between number of weeks worked and usual number of hours worked per week).
Figures are weighted by the product of IPUMS weights and annual labor supply.
Source: IPUMS extracts from 1980-1990-2000 censuses and 2005 American Community Survey file.

Figure 6

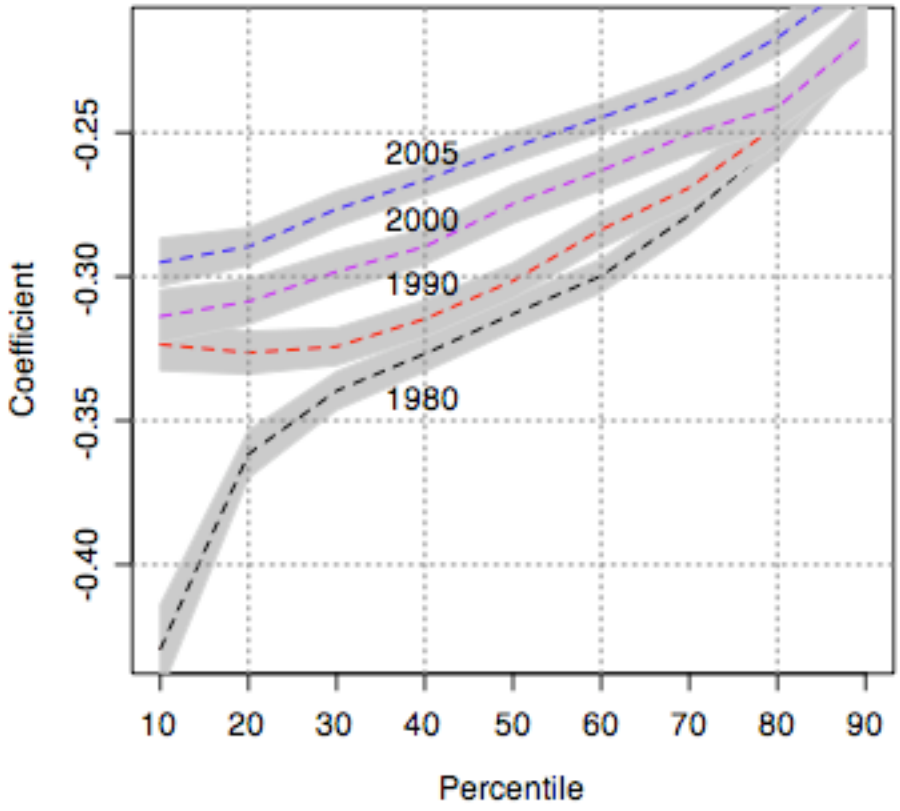
Employment shares in different sectors of the workforce in the deciles 3 through 10 of the hourly wage distribution; 1980, 1990, 2000 and 2005



Notes: Each bar represents the fraction of the workforce in the highest 8 deciles of the hourly wage distribution employed in a given sector in a given year. So, the bars for each year across the six sectors sum vertically to one.
Sample restricted to individuals aged 16 through 65 who were employed in the civilian labor force at the time of the survey, were not unpaid family workers, who did not live in group quarters and who resided in a Metropolitan Statistical Area (MSA). Earnings deciles based on hourly wages, defined as annual wages divided by annual labor supply (the product between number of weeks worked and usual number of hours worked per week).
Figures are weighted by the product of IPUMS weights and annual labor supply.
Source: IPUMS extracts from 1980-1990-2000 censuses and 2005 American Community Survey file.

Figure 7

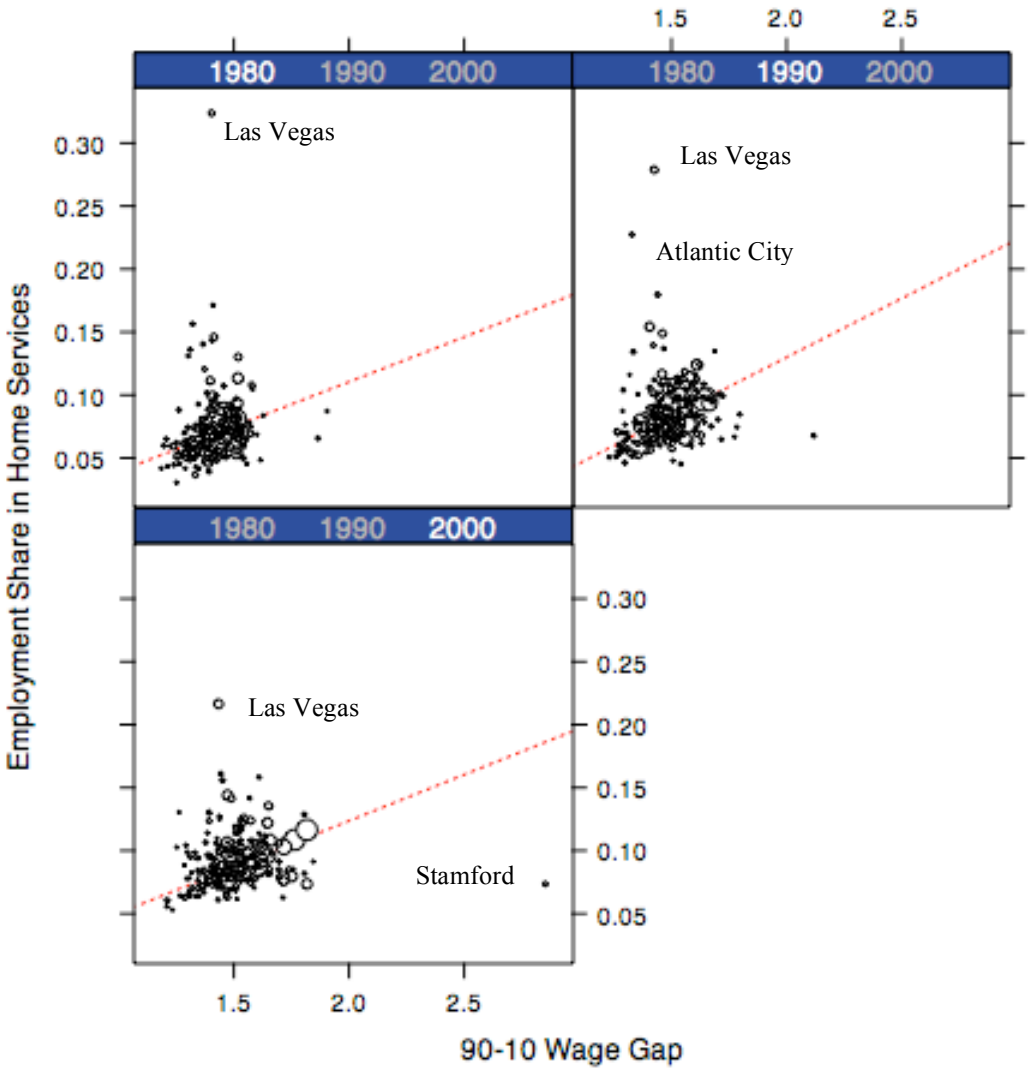
Conditional quantile regressions coefficients; 1980, 1990, 2000 and 2005



Notes: Each line connects the estimated coefficients on a dummy variable for employment in the home service sector from quantile regressions of individual log hourly wages. Models also include controls for individual characteristics (age, age squared, 4 dummies for highest educational attainment, dummies for black, Hispanic origin, foreign-born) and are estimated separately for each year and each percentile 1 through 10 and each decile 20 through 90.
The grey areas plot pointwise 95% confidence intervals.
Sample restricted to individuals aged 16 through 65 who were employed in the civilian labor force at the time of the survey, were not unpaid family workers, who did not live in group quarters and who resided in a Metropolitan Statistical Area (MSA). All estimates are weighted by the product of IPUMS weights and annual labor supply (the product between number of weeks worked and usual number of hours worked per week).
Source: IPUMS extracts from 1980-1990-2000 censuses and 2005 American Community Survey file.

Figure 8

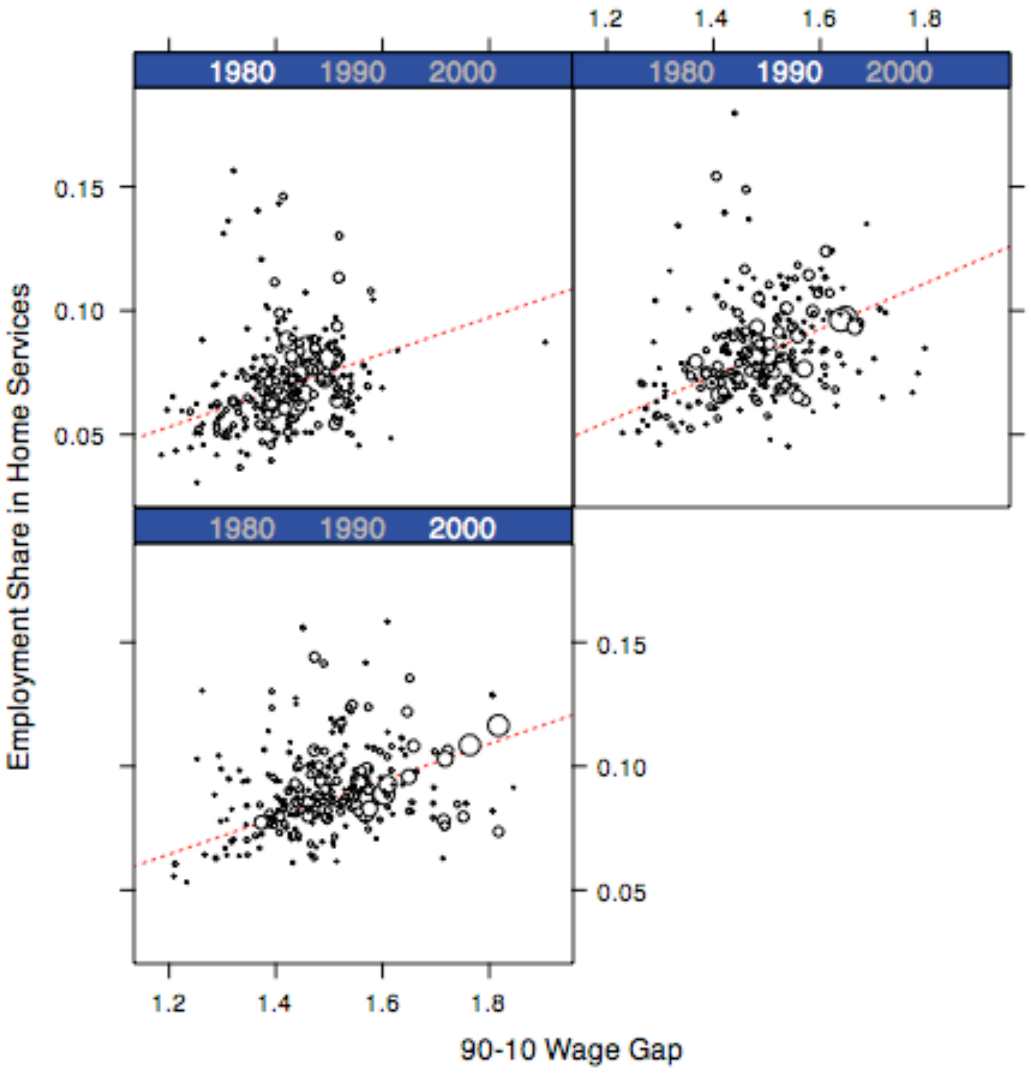
90-10 log hourly wage gap and the fraction of the workforce in home services across MSA's; 1980, 1990, 2000



Notes: The line is the best linear fit in OLS regressions weighted by the share of national workforce in each MSA. The size of the markers is proportional to the square root of the normalized weights.

Figure 9

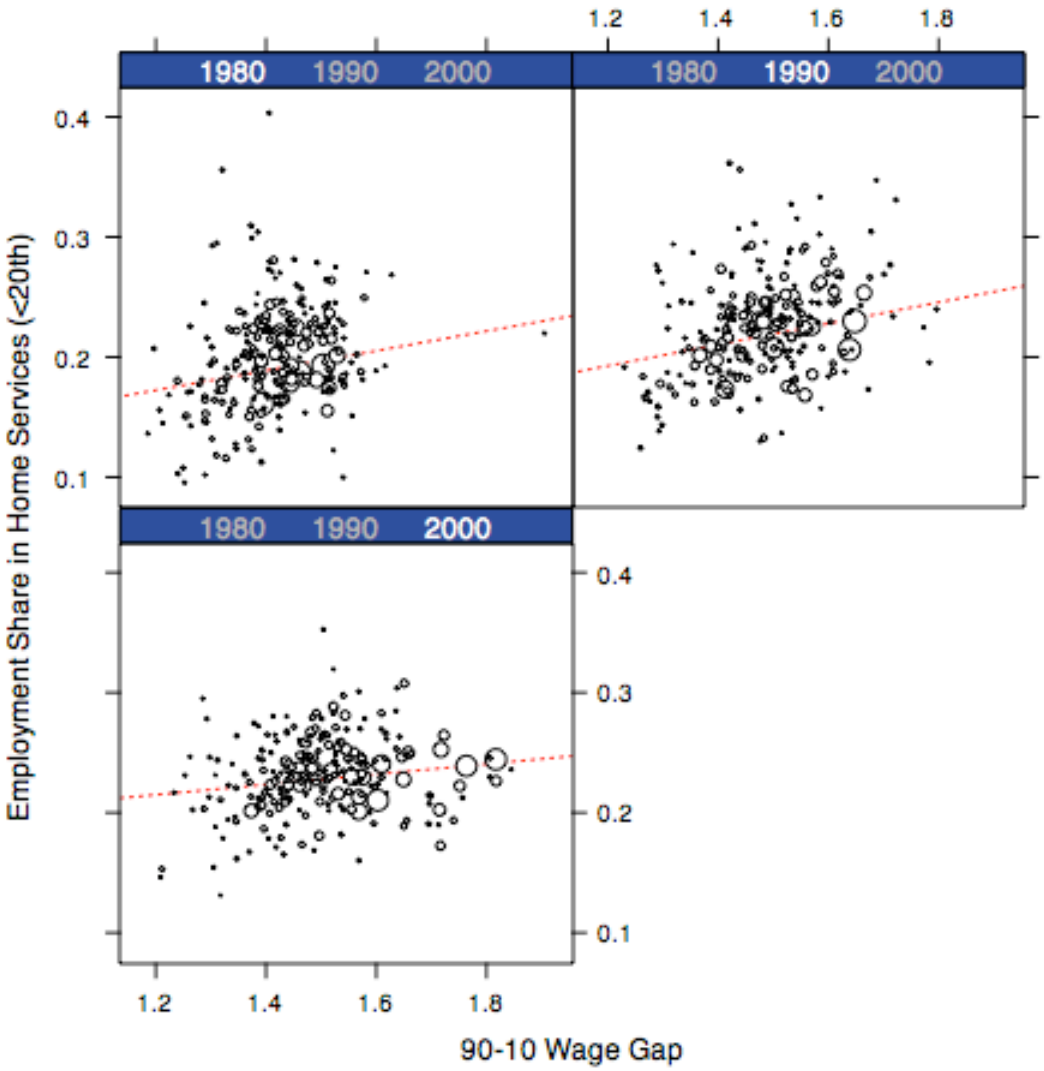
90-10 log hourly wage gap and the fraction of the workforce in home services across MSA's; 1980, 1990, 2000



Notes: The sample excludes Las Vegas, Atlantic City and Stamford. The line is the best linear fit in OLS regressions weighted by the share of national workforce in each MSA. The size of the markers is proportional to the square root of the normalized weights.

Figure 10

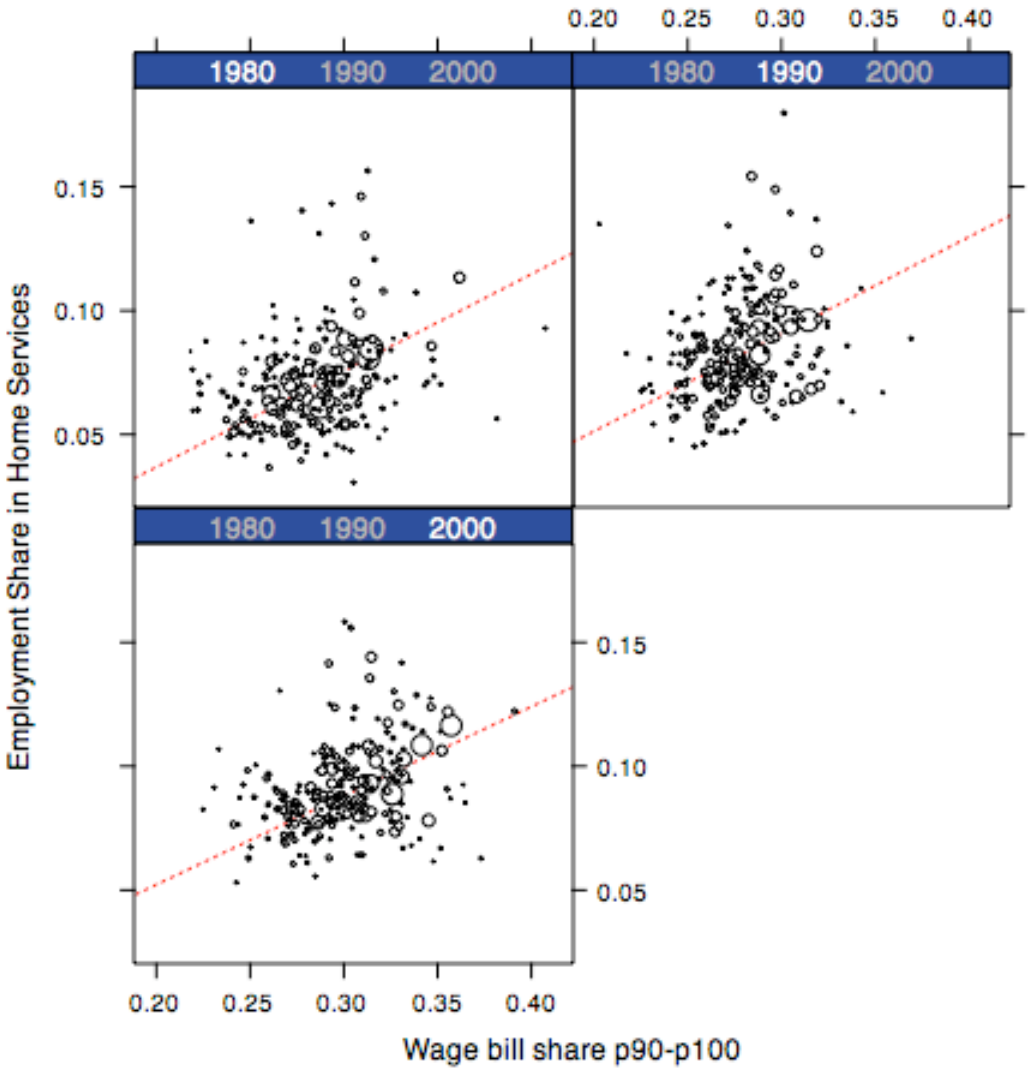
90-10 log hourly wage gap and the fraction of wage earners below the 20th percentile in home services across MSA's; 1980, 1990, 2000



Notes: The sample excludes Las Vegas, Atlantic City and Stamford. The line is the best linear fit in OLS regressions weighted by the share of national workforce in each MSA. The size of the markers is proportional to the square root of the normalized weights.

Figure 11

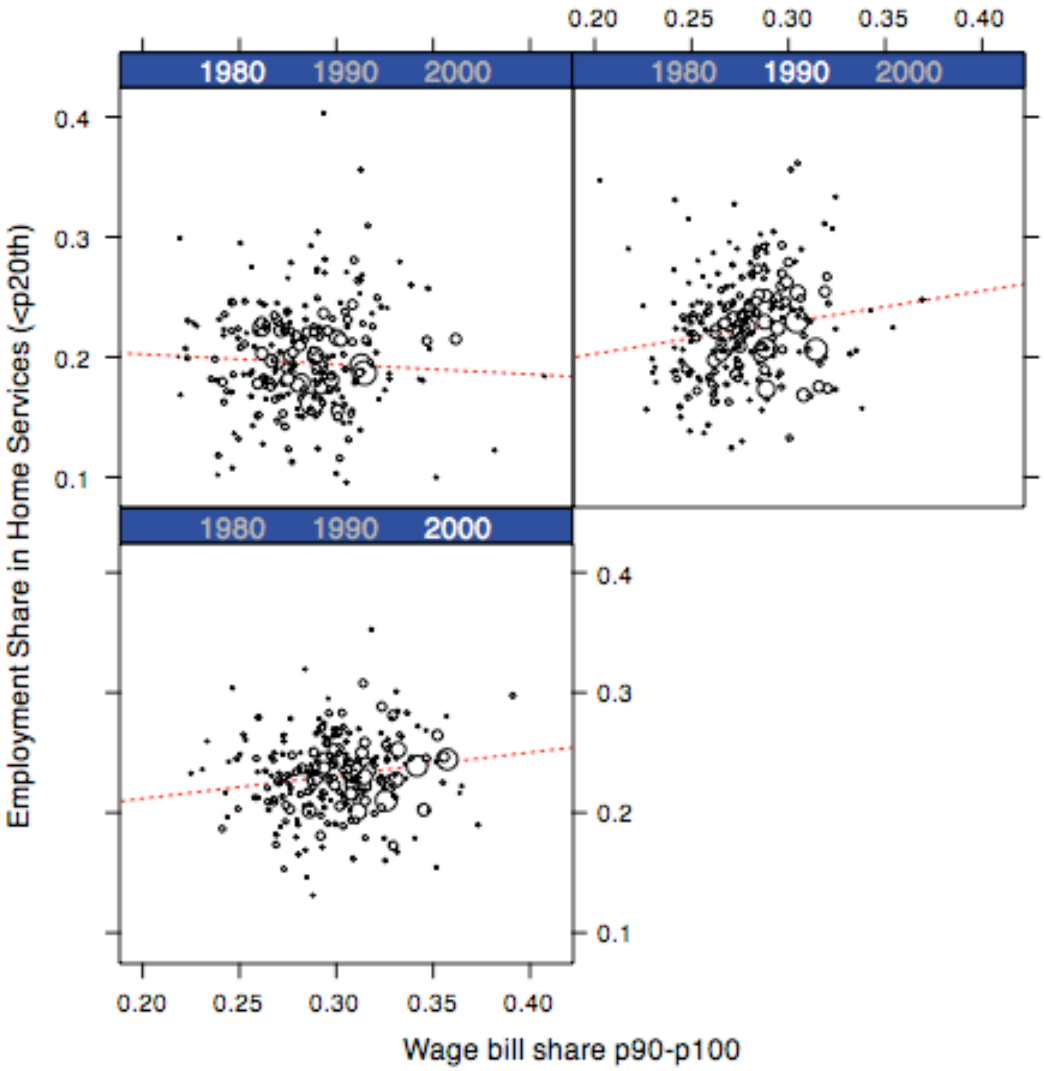
Top wage income share and the fraction of the workforce in home services across MSA's; 1980, 1990, 2000



Notes: The horizontal axis plots the income share of the top decile of wage earners in the city. The sample excludes Las Vegas, Atlantic City and Stamford. The line is the best linear fit in OLS regressions weighted by the share of national workforce in each MSA. The size of the markers is proportional to the square root of the normalized weights.

Figure 12

Top wage income share and the fraction of wage earners below the 20th percentile in home services across MSA's; 1980, 1990, 2000



Notes: The horizontal axis plots the income share of the top decile of wage earners in the city. The sample excludes Las Vegas, Atlantic City and Stamford. The line is the best linear fit in OLS regressions weighted by the share of national workforce in each MSA. The size of the markers is proportional to the square root of the normalized weights.

APPENDIX A
Consumption Expenditure data

Table A1
Identifying expenditure items corresponding to purchases of goods and services that substitute for home production activities

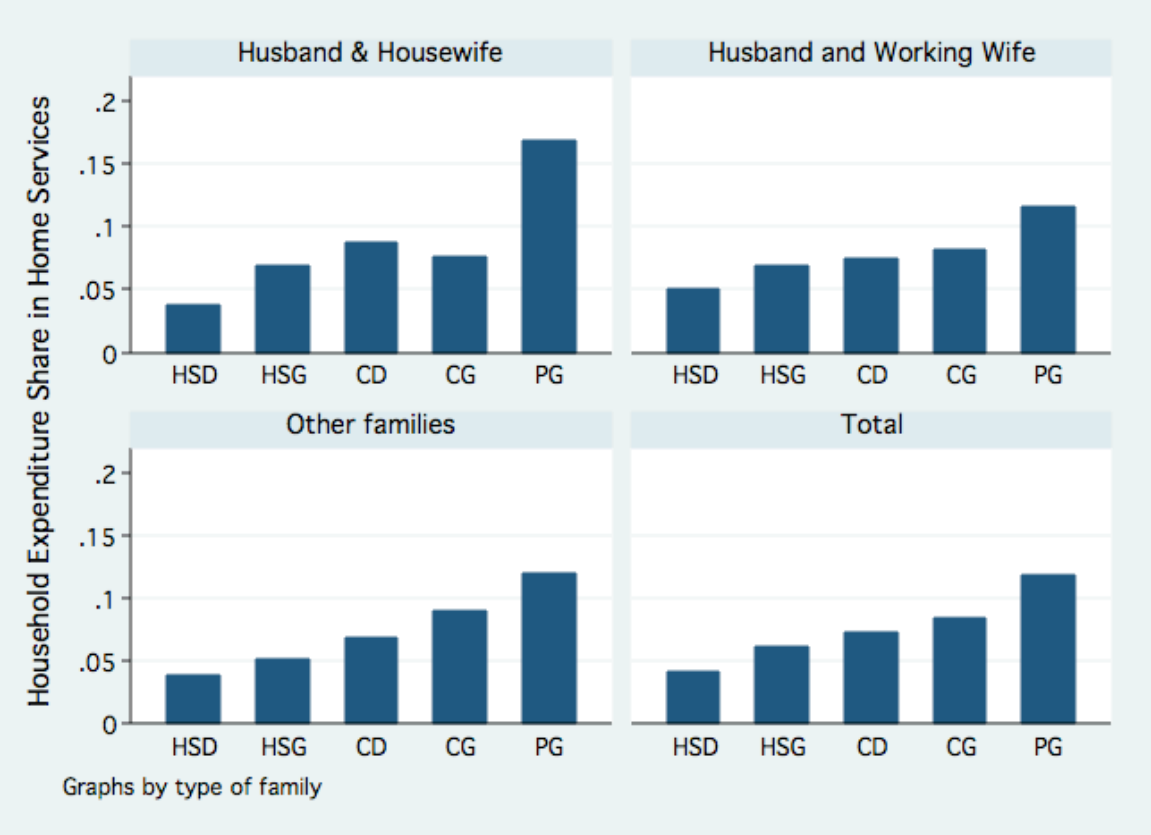
Category	Universal Classification code (UCC)
Food away from Home	190112, 190212, 190312, 190322 Lunch, Dinner, Snacks and Breakfast at Full Service
Drinks away from Home	200512, 200522, 200532 Beer, Wine and other Alcoholic beverages at Full Service at Fast Food.
Repair & Maintenance Services	230000 Repair, maintenance, and improvements for built in dishwasher, garbage disposal, and range hood 230110 Maintenance of property, including items such as ceiling repair, black top, brick, or masonry work, air conditioner repair, roof and awning repair, house painting, papering, chimney cleaning, electrical inspection, furnace inspection and repair, wiring, pest control, carpenter, plumber, etc. 270210 Water and sewerage maintenance 270410 Garbage, trash collection 270900 Septic tank cleaning 340610 Repair of television, radio, and sound equipment, excluding installed in vehicles 340620 Repair of household appliances; including stove, vacuum, washer, dryer, sewing machine, refrigerator, and calculator; excluding garbage disposal, range hood, and built-in dishwasher 340630 Furniture repair, refurnishing, or reupholstery 340903 Miscellaneous home services and small repair jobs not already specified 340913 Repair and alterations of miscellaneous household equipment, furnishings, and textiles 440110 Shoe repair and other shoe services 440130 Alteration, repair, tailoring of apparel and accessories 440150 Watch and jewelry repair
Delivery Services	340120 Delivery services
Babysitting Services	340210 Babysitting or other home care for children
Housekeeping Services	340310 Housekeeping service, such as housekeeping, cooking, maid service, and carpet and upholstery cleaning services 340410 Gardening and lawn care services, such as mowing, tree services, fertilizing, and yard work 340510 Moving, storage, and freight express 340520 Household laundry and dry cleaning, not coin operated 440210 Apparel laundry and dry cleaning, not coin operated
Personal Care Services	650110 Personal care services for females, including haircuts 650210 Personal care services for males, including haircuts

Notes: The classification is based on the Universal Classification Code (UCC) Titles in the 2004 Consumption Expenditure Diary Survey.

Figure A1

Household expenditure share of home production substitutes and head's highest educational attainment, by family type; 2004

Family head conventionally fixed to be the female in all husband/wife families.



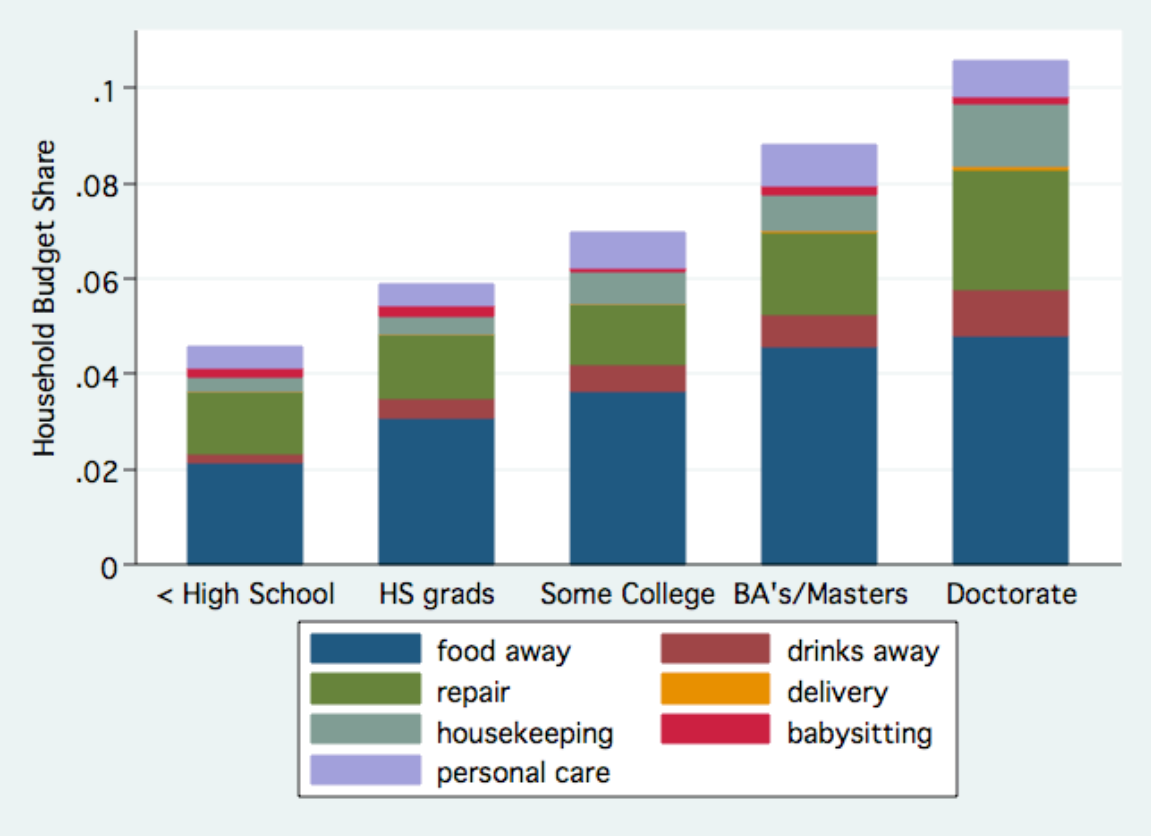
Notes: This graph plots similar figures to the ones reported in Figure 1. The only difference is that the family head is conventionally fixed to be the *female* in all husband/wife families, while in Figure 1 it is fixed to be the male.

Source: 2004 Consumer Expenditure Diary Survey.

Figure A2

Household expenditure share of home production substitutes and head's highest educational attainment, by family type; 2004

Assessing the contribution of specific service categories.



Notes: See notes to Figure 1. For details on specific expenditure categories, see Table A1.
Source: 2004 Consumer Expenditure Diary Survey.

APPENDIX B
Employment and Wage data

Table B1
Identifying Sectors of Employment that deliver services that substitute for home production activities

Category (IPUMS variable IND1990)	Codes	Classification
Agriculture, Forestry and Fisheries	10-32	TR
Mining	40-50	TR
Construction	60	CO
Manufacturing	100-392	TR
Transportation	400, 410-432	WT
Except: **Bus service and urban transit**	**401**	**NT other**
Taxi and limousine service	**402**	**NT other**
Communications	440-442	WT
Utilities and Sanitary Services	450-472	WT
Wholesale Trade	500-571	WT
Retail Trade	**580-691**	**NT other**
Except: **Eating and Drinking Places**	**641**	**NT Home**
Finance, insurance and real estate	700-712	FI
Business and Repair Services	721, 731-732, 741	BS
Except: **Services to buildings**	**722**	**NT Home**
Detective and Protective Services	**740**	**NT Home**
Automotive Rental and Leasing	**742**	**NT other**
Automotive Parking and Carwashes	**750**	**NT Home**
Automotive & Other Repair Service	**751-760**	**NT Home**
Personal Services	**761-791**	**NT Home**
Entertainment and Recreation services	**800-810**	**NT other**
Health and Social Services	**812-40,852, 861, 870-81**	**NT other**
Except: **Child Care Services**	**862-863**	**NT Home**
Legal Services	841	BS
Educational Services	842-851, 860	ED
Engineering, Management & Professional Services	882-893	BS
Public Administration	900-932	PA

Notes: The codes refer to the IPUMS variable IND1990, which is a modified version of the 1990 Census Bureau industry classification scheme and provides a consistent set of industries codes for 1980, 1990 and 2000 Censuses, and for the American Community Surveys (Ruggles et al. 2004). IND1990 was created in the IPUMS using a series of technical papers (published by the Census Bureau) that provide detailed analyses of how the industrial coding scheme for each census year differed from the scheme used during the previous census year. These industrial "crosswalks" are based on samples of cases that are "double coded" into the industrial schemes of the current and previous census year. The original Census Bureau crosswalks are available via links, at http://usa.ipums.org/usa/chapter4/chapter4.shtml#crosswalks

Legend: NT: clearly non-traded sectors, of which: NT Home: non-traded sectors delivering services that substitute for home production activities, and NT other: other non-traded sectors; TR: clearly traded sectors; CO: construction; WT: wholesale, transport and utilities; FI: financial services; BS: business services; PA: Public Administration; ED: education.

Table B2
Employment shares in different sectors by wage decile and year, 1980-2005

	1980	1990	2000	2005	1980	1990	2000	2005
Wage decile	*First decile*				*Second decile*			
Home services	**0.22**	**0.25**	**0.26**	**0.29**	**0.17**	**0.18**	**0.20**	**0.22**
Other non-traded	0.28	0.32	0.30	0.31	0.32	0.32	0.32	0.32
Trade industries	0.20	0.15	0.14	0.12	0.21	0.18	0.15	0.14
Construction	0.04	0.04	0.05	0.06	0.03	0.05	0.06	0.08
Wholesale trade et al.	0.07	0.07	0.07	0.07	0.07	0.09	0.09	0.08
Financial Services	0.05	0.05	0.04	0.04	0.07	0.07	0.05	0.04
Business Services	0.03	0.04	0.05	0.04	0.03	0.04	0.05	0.04
Public Administration	0.03	0.02	0.02	0.02	0.03	0.03	0.02	0.02
Education	0.07	0.06	0.07	0.06	0.07	0.06	0.07	0.06
Wage decile	*Third decile*				*Fourth decile*			
Home services	**0.11**	**0.13**	**0.14**	**0.15**	**0.08**	**0.09**	**0.11**	**0.11**
Other non-traded	0.30	0.30	0.31	0.31	0.26	0.28	0.28	0.30
Trade industries	0.22	0.18	0.16	0.14	0.24	0.19	0.17	0.15
Construction	0.04	0.05	0.06	0.08	0.04	0.05	0.06	0.08
Wholesale trade et al.	0.09	0.10	0.10	0.10	0.10	0.11	0.12	0.11
Financial Services	0.10	0.09	0.07	0.06	0.09	0.09	0.08	0.08
Business Services	0.04	0.05	0.05	0.05	0.04	0.05	0.06	0.06
Public Administration	0.05	0.04	0.03	0.03	0.06	0.05	0.05	0.05
Education	0.06	0.06	0.07	0.07	0.07	0.06	0.08	0.08
Wage decile	*Fifth decile*				*Sixth decile*			
Home services	**0.06**	**0.07**	**0.08**	**0.09**	**0.05**	**0.06**	**0.07**	**0.07**
Other non-traded	0.24	0.25	0.26	0.28	0.22	0.23	0.24	0.24
Trade industries	0.26	0.21	0.17	0.15	0.28	0.22	0.18	0.16
Construction	0.05	0.06	0.06	0.07	0.05	0.06	0.07	0.07
Wholesale trade et al.	0.12	0.12	0.13	0.12	0.13	0.14	0.14	0.14
Financial Services	0.08	0.09	0.09	0.08	0.07	0.09	0.08	0.09
Business Services	0.05	0.06	0.07	0.06	0.04	0.06	0.08	0.07
Public Administration	0.08	0.07	0.06	0.06	0.08	0.07	0.07	0.07
Education	0.07	0.07	0.08	0.09	0.08	0.08	0.09	0.09

(Table B2 continue)

	1980	1990	2000	2005	1980	1990	2000	2005
Wage decile	*Seventh decile*				*Eighth decile*			
Home services	**0.04**	**0.04**	**0.05**	**0.05**	**0.02**	**0.03**	**0.04**	**0.03**
Other non-traded	0.19	0.20	0.22	0.22	0.15	0.18	0.20	0.21
Trade industries	0.31	0.23	0.18	0.15	0.33	0.25	0.20	0.16
Construction	0.05	0.06	0.06	0.07	0.05	0.06	0.06	0.07
Wholesale trade et al.	0.16	0.17	0.16	0.15	0.21	0.18	0.15	0.14
Financial Services	0.06	0.08	0.08	0.08	0.05	0.07	0.08	0.09
Business Services	0.04	0.07	0.09	0.09	0.04	0.07	0.10	0.10
Public Administration	0.08	0.07	0.07	0.08	0.08	0.08	0.08	0.09
Education	0.07	0.08	0.09	0.11	0.07	0.08	0.10	0.10
Wage decile	*Ninth decile*				*Tenth decile*			
Home services	**0.02**	**0.02**	**0.03**	**0.03**	**0.02**	**0.02**	**0.03**	**0.02**
Other non-traded	0.11	0.16	0.18	0.19	0.11	0.14	0.18	0.19
Trade industries	0.34	0.26	0.21	0.18	0.32	0.25	0.20	0.19
Construction	0.07	0.06	0.06	0.05	0.07	0.06	0.04	0.04
Wholesale trade et al.	0.20	0.17	0.13	0.13	0.16	0.15	0.13	0.12
Financial Services	0.05	0.07	0.08	0.09	0.08	0.12	0.12	0.15
Business Services	0.04	0.07	0.12	0.13	0.07	0.11	0.16	0.17
Public Administration	0.08	0.08	0.09	0.10	0.08	0.06	0.06	0.07
Education	0.09	0.10	0.10	0.11	0.09	0.10	0.08	0.07

Notes: Each entry represents the fraction of the workforce in a given decile of the hourly wage distribution in a given year employed in a given sector. So, entries within a decile and year sum vertically to one.

The *home service sub-industries* include the three-digit sectors: eating and drinking places, services to buildings, detective and protective services, automotive rental and leasing, taxi and limousine service, other repair services, personal services, entertainment services, child care services. Traded industries include agriculture, mining and manufacturing. Wholesale trade et al. include transportation and utilities. For the detailed mapping of three-digit industry codes into the above categories, see Table B1.

Sample restricted to individuals aged 16 through 65 who were employed in the civilian labor force at the time of the survey, were not unpaid family workers, who did not live in group quarters and who resided in a Metropolitan Statistical Area (MSA). Earnings percentiles based on hourly wages, defined as annual wages divided by annual labor supply (the product between number of weeks worked and usual number of hours worked per week).

Figures are weighted by the product of IPUMS weights and annual labor supply.

Source: IPUMS extracts from 1980-1990-2000 censuses and 2005 American Community Survey file.

Figure B1
Female share in the workforce, by sectors; 2005

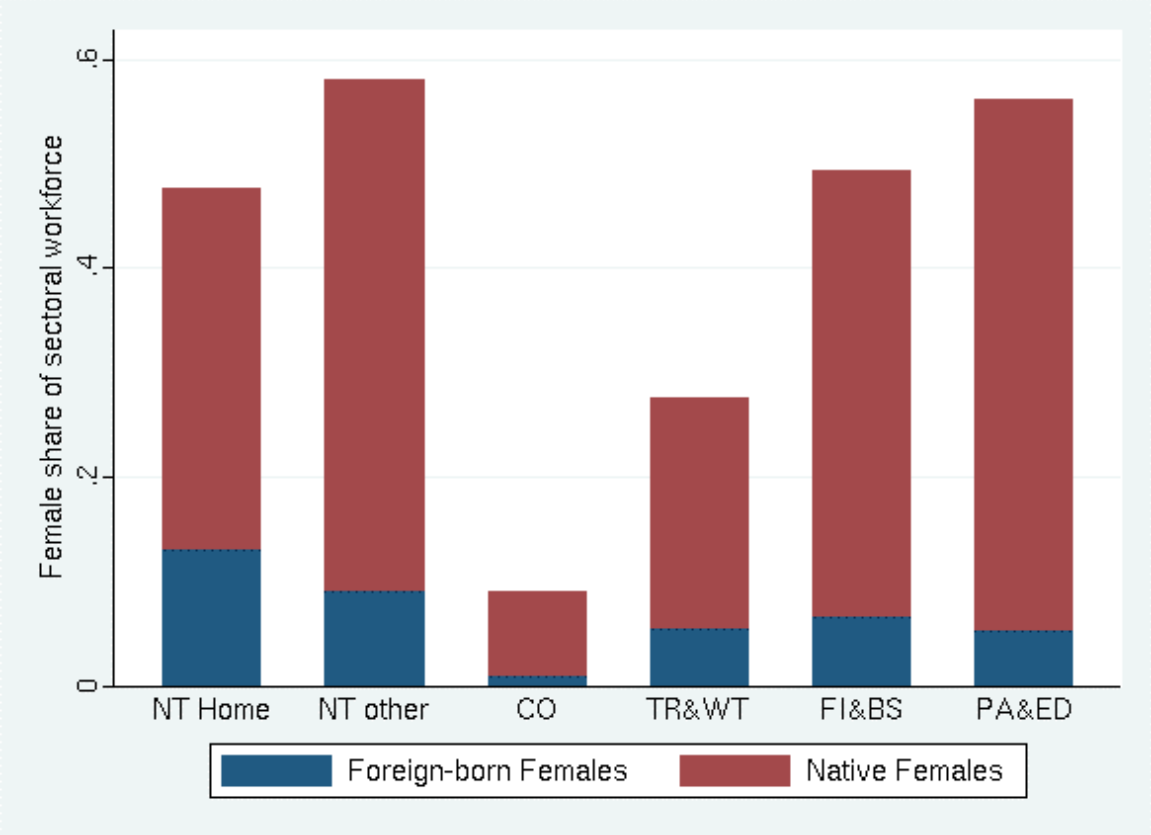


Figure B2

Immigrant share in the workforce, by sectors; 2005

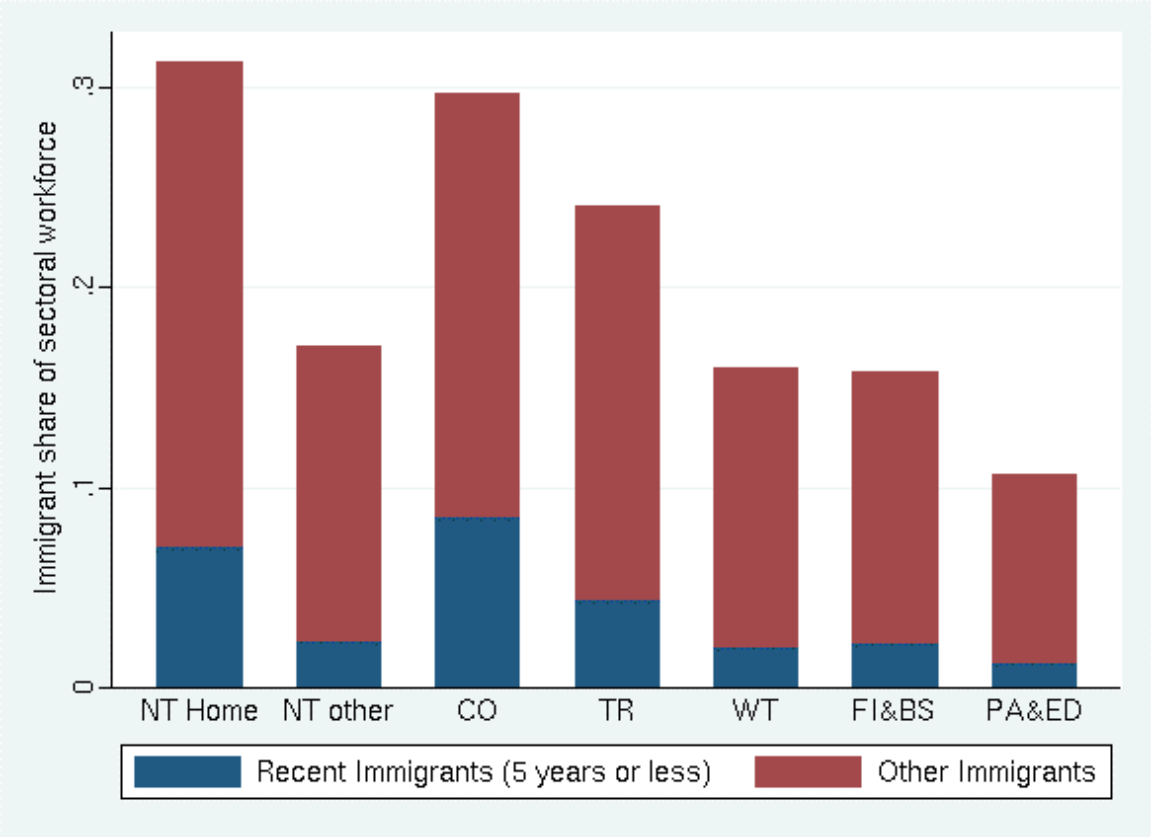


Figure B3

Employment shares in home services by decile of the hourly wage distribution; 2005
Assessing the contribution of specific service categories.