

Moving to the Good Occupations across Generations: Sociotechnical Factors Promoting Economic Growth

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How to cite this paper: Li, P., & Stafford, F. P. (2026). Moving to the Good Occupations across Generations: Sociotechnical Factors Promoting Economic Growth. *Technology and Investment*, 17, 170-199. <https://doi.org/10.4236/ti.2026.173012>

Received: May 30, 2026

Accepted: July 10, 2026

Published: July 13, 2026

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Abstract

Economic growth is a general equilibrium process which usually differs in one era compared to others. To effect growth there will be a changing occupational composition. Relatively few persist in the same occupations as their parents and movement across occupations occurs even in a hypothetical stationary economic environment. Yet, understanding distinct patterns and likely forces shaping overall change for a given era is a way to assess the growth process. Based on a coding of parental occupations to the 2000 Census in the Panel Study of Income Dynamics (PSID) we are able to study the extent and nature of growth promoting migration to occupations across generations. In the recent U.S. time frame family processes have operated in the context of the rise of information technology in the form of STEM and AI occupations and, for women, a notable exodus from housekeeping to a wide range of market occupations. Migration across these ostensibly nominal occupational categories leads to occupational economic mobility, upward or downward. Here, mobility is measured by the change in the wage ranking by occupation of adult children compared to that of their parents. Wage rankings are measured by the occupation specific calculated wage from extensive information on the full work settings in the prior calendar year. Specifically, moving to an occupational with a higher wage is seen as moving to a good occupation. Our method provides a synthesis of intergenerational analysis which looks at a summary income measure on the one hand, and movement across diverse occupational boundaries on the other. A benefit of our empirical approach is that it allows us to compare the mobility of both men and women and to quantify the economic growth attributable to women's notable departure from their mother's occupation as a homemaker. The reference wage year is 2012 and the report of parental occupations extends back to the years when almost 45 percent of all the mothers of

the current adult women and men were reported as home makers when the now adult child was growing up.

Keywords

Occupational Choice, Intergenerational Mobility, STEM, Technology, Economic Growth

1. Introduction

Economic growth is often unbalanced, occurring in sectors differentially, and dependent on sector specific technology such as agricultural technology or in more recent times, artificial intelligence (AI) and information technology (IT). Less recognized, but important empirically and theoretically, is household technology for non-market productivity. The needed changes for diffusion can operate through both occupational or industrial composition. The goal of this paper is to understand economic growth in the recent generations as both a social and technical process mediated through occupational change. The analysis is shaped by the use of intergenerational occupational migration and occupational mobility of the mid-career women and men as of 2012, a point in time when women's labor force achieved its historical high. This cohort was part of a dramatic shift from the mother's occupation in terms of both migration and mobility.

Recent, *Migration*, defined as movement across ostensibly nominal occupational categories, has been shaped by the technology and social processes of unbalanced growth—notably indicated by a growing share of employment in STEM occupations. Social factors—changing beliefs about education and market work and fertility and career planning, especially for women's occupational choice—have been central. A good share of migration has produced upward economic *mobility*—which we define as movement across occupational categories having different wages. Migration matters. Who migrates to the well-paid occupations, realizing positive mobility? Some migrate and move upward to an occupation which now pays more compared to the occupational wage had they persisted in their parent's occupation. Others move downward.

The study analyzes comparative intergenerational mobility of women and men. To study this, allowance needs to be made for the fact that almost half (44 percent) of the mothers of the recent mid-career women had homemaker as their primary occupation¹. To allow for this we utilize the present annual wage structure for 26 occupational groups to define an occupational ranking. This is similar to the use of occupational status in sociology but is of the ordinal “wage status”. An empirical advantage is possible mitigation of the correlated geospatial price level differ-

¹Federal Reserve Economic Data show a rise in the labor force participation rate of women age 16 and older from about 45 percent in 1975 to about 60 percent as of 2000. Post Covid, as of mid-2026, it is 57 percent.

ences. This can induce an apparent cross-generation persistence as with farm workers or those persisting in high cost of living locations.

The overall national average Panel Study of Income Dynamics (PSID) wage effects a type of national wage standardization reducing the issue of spatial price correlation. The PSID wage measure is a complex generated variable and allows for a wage for those working in self-employment or multiple job holding or varying hours over the prior calendar year as several important elements.

Most adults work in an occupation which is different from their parents. Based on 26 occupational categories from the 2000 Census for both parents and adult children, about 14 percent of men age 30 - 55 persist in their father's occupation. About 43 percent have moved to an occupation now paying more than would be the case had they stayed in their father's occupation. About 43 percent have lower occupational earnings. While about 16 percent of women now work in their mother's occupation, about 59 percent are in an occupation with a higher wage ranking and 25 percent are in an occupation with a lower wage.

We explicitly consider housekeeping as an occupation, a sharp departure from traditional growth measures, restricted to market activity only—such as the case of GDP. A substantial share of women migrating to the labor market are in occupations which pay at about the same level as the imputed wage for non-market core housework. Given that about 44 percent of current 30-55 year old women and men both report that their mother did not work in the labor market when they were growing up², including core housework as an occupation is central. The level of housework time by the mother's generation time supports the claim that home making was the primary occupation for many of women in the earlier generation.³ Housework is given a reference wage rank of zero. Close market equivalents, notably cleaning and maintenance, personal care and services, and food preparation rank just above housekeeping. In this way a daughter whose mother was a housekeeper and who has migrated to a low paying occupation, such as work in food preparation, registers as having realized only modest upward mobility, if any.

Much of the upward migration to better paying occupations for women has been from movement to management and some STEM occupations and legal occupations. The migration patterns are also diverse: To illustrate, 3.7 percent of women are in Food Preparation compared to 3.5 percent of their mothers. Of daughters, 3.8 percent are in science, technology, engineering and math (STEM) compared to 0.9 percent of their mothers. Migration from housework was to a wide range of both low and high paying occupations.⁴

Given the extensive movement across occupations differing in their wage rank-

²Note that in the United States, compared to other countries, women with a career perspective are likely to return to work soon after childbirth (Gustaffson & Stafford, 1998).

³Married women age, 30 - 55, with householder status (did not in the labor market), had as of 1983 an estimated annual core housework (cooking cleaning and laundry and not counting direct care of family members) of 1,739 hours.

⁴The odds ratio (available appendix) of persisting in housework across generations was similar to most of the other occupations. So, there does not appear to be a persistent "home body" pattern.

ing, we can assess the overall patterns of economic mobility in a fashion similar to wage or income-based mobility. A quantile model allows us to look at upward mobility across the full range of parental occupations with a flexible functional form of occupational wages. There, for men, we show patterns broadly consistent with other work—namely economic mobility being greatest at the middle. For those whose parents were at the top there is the expected result of regression to the mean, the extent to which it occurs is tempered by a range of parental factors and children's attributes. Of concern is that the low rates of upward mobility occur at low levels of parental occupational wages. While there is room for upward mobility, an interpretation is that limited parental resources are a barrier.

The paper is organized as follows: Section 2 provides a brief sampling of the extensive literature and connects to the relevant theories. Section 3 presents the basic data sources and includes an overview of both the migration patterns as well as the wage mobility statistics. Section 4 presents analysis of the factors shaping wage mobility. Section 5 concludes.

2. Literature Review

2.1. Measurement Approaches

Transitions from a wide range of potential sources (Erda, 2026) to a new occupational distribution⁵ are integral to the evolving economic structure and are essential to growth, but who goes where is shaped by technological, family and social processes. Who persists in the same parental occupation? Who moves to or persists in the well-paid occupations? Here, the occupational transitions are studied for both men and women in relation to their mothers and their fathers. The wider conclusion of intergenerational connections is similar to that offered by others (Carmichael, 2000). Socioeconomic status is very evidently positively correlated from parents to children. What measure should be used to define the presence of occupationally inherited carryover? What leads not just to a contextually similar occupation but to both occupational advantage and disadvantage? Prior work has assessed the limitations of various measures, highlighting the issue of characterizing women's occupations (Hauser & Warren, 1997). We offer our wage-based index as one of a set of measures which captures the main dimension of economic return.

If the father or mother occupies one profession, how strong is the relationship to a son's or daughter's occupation? Previous work (Hellerstein & Morrill, 2011) found that about 30% of sons and 20% of daughters are in the same occupation of his/her father. Such estimates, including ours, are sensitive to the classification of occupations. Occupations have also been characterized by measures of occupational status (Dribe & Helgertz, 2016; Wold, 1960), and this can be thought of as a way to avoid sensitivity to the granularity of the codes. Another branch of the

⁵A more common alternative approach is to consider unbalanced growth as occurring across broad industry categories. The sources of unbalanced growth can be difficult to anticipate or to assess. Will post-Covid hybrid work give rise to a new form of cottage industries? There is research supporting the unexpected benefits of natural disasters such as floods.

literature centers on earnings paired across the generations (Solon, 2002, 2014). While this may provide a common metric there are issues of geospatially different or similar price levels faced by the different generations (Chetty et al., 2014), measuring multi-year or permanent or career peak earnings, and treatment of careers outside the labor market.

An alternative approach used here also allows for a general characterization of occupations. The average market “wage”⁶ paid as of 2012 is measured for each of the 26 broad occupations across the United States for those age 30 - 55, and defines the rank by occupation which is used to assess upward and downward mobility. For non-market work as an occupation, the rank of comparable market work is very low and, in this way, we are able to include movements to and from house holding as an occupational transition.

There are several other considerations which apply to almost all microeconomic analysis. From national sample data there are concerns about deflating by spatially defined price levels. Notably, if a person has the same wage as the parent adjusted for the local price index in that area, and persists in living in that area, then one could say there is a perfect correlation across the generations adjusted for the “real” wage.

If the wage is high there can be a fully persistent high wage correlation. And for a lower nominal wage (the so called “Little Apple” versus the Big Apple), there would be persistent lower wages! This matters also if there is substantial migration from the Little Apple to the Big Apple or vice versa. There would be apparent upward mobility in one case and apparent downward mobility in the other. Empirically, there are many farm workers (separate from owners and managers) in our data, pay is low and the occupational persistence is by far the highest in our data—as measured by the diagonal of a 26 by 26 occupational transition table (available upon request or included as part of the manuscript is preferred). Yet, other (real versus nominal) persistence or mobility may also occur such as for lower income groups—which is of actual interest and not just induced by a measurement issue.

Suppose the price indexed data were “perfect”? By definition, occupational choices are made leading to a heterogeneous form of human capital from which to choose or have available. The operative wage is an expected wage, maybe along the lines of the Roy model (Roy, 1951) of occupational choice. For this reason and those above, we rely on the average wage as of the date of our data by occupation for the 26 occupations⁷.

As in any transition table of this sort there will be a tendency to move to the middle. At the top and bottom there can be only one direction! So, seeing mobility upward from near the top could likely be another measurement issue (aka “error”). But inertia near the top or bottom could be shaped by both real forces and clouded by measurement problems. There is the complicating issue of changing

⁶This as a complex calculated wage rate, not the answer to a question such as “what is your wage rate”, which is fully meaningless in many situations.

⁷The use of wage rankings damps down the effect of a few very high wage realizations from entrepreneurial activity, intertemporal variability in annual measures, and career point.

ranks through time. This raises questions of wage expectations at the time of educational and career choices. Various earnings expectations are shown as not necessarily rational (Freeman, 1976). To address these expectational topics is beyond the scope of the paper.

Our paper can be seen as a part of the effort to broaden the methods for understanding intergenerational economic well-being. Recent approaches have considered matching at the same mid-career point and to use earnings adjusted for inflation over several years to measure a more persistent outcome in the main life cycle point (Gouskova et al., 2010) and to consider mid-career outcomes based on findings in neuroscience on mid-career brain structure epochs (Stafford, 2026).

Other work has also used an approach based on an ordinal ranking, such as occupational status measures, as a way to simplify measurement (Deutscher & Mazumder, 2023). Our method also endorses the idea of home making as a career with an implied market value (Grossbard, 2015; Achen & Stafford, 2026), connects to the literature on fertility transitions (Bailey, 2006; Goldin & Katz, 2015), and to technology shaping economic growth (Black & Spitz-Oener, 2010; Black & Spitz-Oener, 2011; Johnson and Stafford, 1998b).

2.2. General Equilibrium Effects

We identify several factors which have the capacity to shape the overall wage structure. These are potentially reduced occupational exclusion of women (Udry, 1996; Bergmann, 1986; Johnson & Stafford 1998a) and some self-exclusion from selected occupations by men. In recent decades, unbalanced economic growth has been shaped by skill extensive technical change. This economy-wide technical change allows the skilled workers (possibly through IT or AI) to extend their domain of economic activity to occupations previously held by others and is expected to alter the overall structure of wages (and terms of trade across groups) and employment.

Another economy wide factor is changing household production technology. There can be strong labor supply effects induced by changing household technology. Specifically, an increase in the elasticity of substitution between own time and market inputs in the production of non-market home output will induce a related increase in the elasticity of labor supply to the market. The response to such a technical change may be subject to inertia as suggested by the theory of social identity and self-perception (Tajfel & Turner, 1979; Carr & Steele, 2009).

2.2.1. Occupational Composition and Exclusion

In this paper, we assume that work in the home and in the market can be seen as alternative occupations (Grossbard, 2015; Stafford, 1980, 2026; Li & Stafford, 2018)⁸. Although some of the destination market occupations are low paid market activities similar to regular housework (cleaning and maintenance, food preparation, and personal service), most of the movement has been into a wide range of

⁸Data from reported core housework in the PSID show remarkably long weekly hours in the years that would match the age of the parents (Achen & Stafford, 2026).

market activity and has had the effect of boosting real economic growth. Relatively few women whose mothers were not active in the labor market when they were growing up have persisted in home production as a career. Many have moved into occupations which pay well, though some have moved into market occupations which are similar to household work—and which have low pay.⁹

Substantial reductions in market wide occupational exclusion, as distinct from a single employer engaging in discrimination (Becker, 1993), gives rise to general equilibrium wage effects (Bergmann, 1974, 1986; Johnson & Stafford, 1998a). For women reduced exclusion from many better paid occupations relates to the ability to control the number and timing of children. The start of the major change was in the 1960's, and contraception and fertility choices are highlighted for women's labor market outcomes (Goldin & Katz, 2002; Bailey, 2006).

There has been a notable impact of unbalanced growth arising from technical change in both market and in non-market productivity¹⁰. For the latter there has arguably been an increased elasticity of substitution between own time and market inputs allocated to home production (Juster & Stafford, 1991: p. 487, Equation (4)). The perspective of the role of both technology and social factors is important. Consider a wider view of technology and its adoption than in traditional market settings. This includes the new medical care supporting the timing and controlling the number of children as central to career choice. This has combined with non-market production technology facilitating a shift from home production to market activity. These two elements along with information technology and early use of AI have been part of a new and wider pattern of unbalanced growth leading to higher average family income.

Exclusion has often been considered as restricted access by others leading to lower average real wages but higher wages for those included at the expense of the excluded. Within this socio-behavioral framework there can be *self-exclusion*. A group, from a range of possible factors including discrimination outside the marketplace, can end up seeing themselves as not being able to participate successfully in a given labor market or financial market. Such self-exclusion will also lower real average wages, suggesting limited opportunities but here from self-perception. This can also apply to financial decision-making (Bonaparte et al., 2017) with losses at the expense of the group that self-excludes from various portfolio choices.

As measured by the Woodcock-Johnson Applied Problems (AP) test, the greatest gender difference in college enrollment in STEM is among those teenage women scoring in the upper AP ranges but whose self-perceived ability is low relative to their AP test score (Anaya, Stafford, & Zamarro, 2022).¹¹ German girls are also more likely to underestimate their math ability relative to boys (Von

⁹The 26 by 26 transition table shows quite low persistence.

¹⁰Also prepared foods substituting market inputs for own time.

¹¹That is, girls are also more likely to report a lower self-assessment of math ability conditional on AP score.

Weinhardt, 2017)—a factor shown to be shaping later schooling and occupational choices. Such beliefs, shaped by a wider social context, can lead to costly exclusion on both the employee and the employer side of hiring.

2.2.2. Skill Extensive Technical Change and Non-Market Technology

Differing eras of unbalanced economic growth (Baumol, Batey-Blackman, & Wolff, 1985) matter and shape both the wage structure and the share of activity in different occupations. For a son or daughter to land in a production occupation may provide a better wage outcome compared to some of the service occupations, yet the share of production work by both men and women has fallen radically across the generations. Changing technology also connects to exclusion. Consider skill biased *extensive* technical change through the new technology (Johnson & Stafford, 1998b), such as computer-controlled production of manufacturing or other AI applications¹².

A more complete framework could address the role of different income elasticities from different expenditures categories and the role of trade (Laitner, 2000). Here we acknowledge the importance of these growth elements but in this paper our interest in the growth factors as they are realized by a changing occupational structure, particularly the distinct generational shift from unpaid work at home to a range of market occupations. The technology here includes medical innovation supporting the number and timing of children as well as the technology of non-market production for core housework as indicated by household technology models.

Looking forward, future growth phases will likely have a different structure and need a different assessment approach, such as growth influenced by AI and the use of video based remote and hybrid work. This can be partly induced by shocks, even such as Covid or other adverse events (Erda, 2026). In all approaches there will be social factors facilitating or inhibiting transitions. For the study of economic transitions there will be a need for considering the inclusion of diverse social processes. Social identity (Tajfel & Turner, 1979) or self-exclusion (Carr & Steele, 2009) appear to be playing a role, limiting participation in STEM or related management occupations.

Where physical strength may have historically been important, both men and women have often become equally capable in many circumstances, and women can now carry out work tasks which were previously done primarily by men (Black & Spitz-Oener, 2010). If for this and other reasons there has been wider access to certain occupations, a result is technical change favorable to reduced gender restrictions to new occupations of which women have now taken advantage. This change can be better assessed with new measurement (Rosenfeld, 1978; Blau, Drummond, & Liu, 1970).

For men there have been major transitional flows. About as much movement has

¹²A possibility to consider is that some very physically demanding work may not be subject to future technology improvement and may lead to higher wages for those occupations while some skilled medical occupations will be subject to displacement from AI systems.

been to better paying market occupations than their fathers as to occupations paying less than their fathers. We also show persistence to being in low paying occupations for men—most economic mobility is in the “middle range”. Further, this relates to intergenerational persistence in a set of lower paying occupations or not being actively engaged in the labor market, lowering mobility and economic growth.

2.3. Family Human Resource Investment

The different parental occupational groups lead to wide differences in resources to invest in the children’s education. At a more detailed level, the theory of occupational intergenerational transmission can explain the phenomenon of doctors and lawyers passing on from generation to generation because of the specialized human capital investment of their parents. The previous literature examines the relationship between parents’ occupation and children’s careers (DiPietro & Urwin, 2003; Hellerstein & Morrill, 2011). Family investment in human capital is directly related to the children’s learning preferences and reading habits, which in turn are important to their academic and subsequent occupational choice and performance.

High-income parents are able to provide more early cultural resources for their families, expand their children’s horizons, and develop the children’s social vision and intellectual capacity when they later make career related choices, especially in the light of the emerging economic structure. Yet, as implied by studies on the intergenerational wage and income elasticity for fathers and sons, there is overall movement toward the middle across generations (Becker & Tomes, 1986).

Children do not directly contact the world of work; their occupational values are mainly from the understanding of the parental occupation or the occupations of other family members. In vocational preference theory (Holland, 1997), it is assumed that the characteristics children are born with and the contextual input may stimulate parents and their children share a similar vocational personality type and preferences. Preferences form occupational aspirations from their original interests and desired career goals, without regard to the relationship between occupations and their character, knowledge, ability, and professional needs. With limited ability to foresee future career opportunities we expect there to be a stronger pattern of following the parents—both in terms of occupational goals but also of the child’s occupation itself. As a result, the family can create a type of positive occupational inertia or carryover across generations. Notably, parents having a STEM occupation predicts female college STEM studies (Anaya, Stafford, & Zamarro, 2022).

The parents’ occupational background and social network also play an important role in job search. If the father or mother is in a legal profession, when the children graduate from law school they are more likely to find work matched with the legal profession, given the parents’ social network. Some studies have focused on the fact that parents and children are employed in the same workplace, and that parents are more likely to hire their children to work in their unit (Bennedsen et al., 2007; Kramarz & Skans, 2014).

Trice (1991) asked 422 children “What are going to be when you grow up?”

23% of 8-year-olds and 16% of 11-year-olds exactly matched a parent's occupation. Matching is more pronounced when the child feels that the parent is satisfied with the job. Parental occupational status can indirectly affect their children's career ambitions by influencing communication and emotions and attitudes when they get along with their children. It can serve to limit direct exit from a contracting occupation even when it is facing a reduced demand. These factors operate to have generally positive carry over based on the migration index.

3. Data and Descriptive Statistics

3.1. Occupational Data

The Panel Study of Income Dynamics (PSID) is a large, multigenerational study and which, with weights, is nationally representative. The microdata (Stafford, 1986) used include both individual and family measures. The PSID began in 1968 with a sample of more than 18,000 individuals from approximately 5000 families. The PSID includes both cross-sectional and longitudinal data. This study uses both longitudinal and cross-sectional components. In particular, we use the annual modules dedicated to the study of mobility and inheritance of intergenerational occupations available as of 2013. Since 2003 the PSID has collected occupational and industry data coded to the 2000 Census codes. This includes the new and continuing panel members who are asked the main occupation and industry of their parents and their spouse's parents when they were growing up and recoding prior reports to the 2000 definitions.

The wage ranking of occupations as of 2012 is used to characterize both generations. The time frame evaluated is intended to capture the cohorts with dramatic occupation change, especially by women. Conceptually one could consider the occupational rank of each generation separately. This requires stable occupation codes going back to the parents and depends on the ages in each child- parent pair, leading to small sample sizes by occupation and age of the child-parent pair. Moreover, the actual parental wage is not available for those who married into the PSID families.

Information used includes the average annual wage paid to each spouse in the labor market during the prior calendar year. The wage measure is constructed from extensive information of various forms of work hours—such as overtime, time running a family business or practice and the labor component of various forms of income from these forms of earning (Pérez-González, 2006).

Men, whether married or single, are defined to be the household head. The female sample consists of those not married women who are defined to be household heads and of those women who are married or in a permanent relationship. Both men and women are given identical labor market content on which occupation and the wage calculation is based.

The new generation sample is of people age 30 - 55. Under age 30 occupational characteristics may not be an effective proxy of an individual's longer run occupational status (Black & Devereux, 2011). After age 55 there is often intermittent participation and later there are substantial exits from the labor force. Using age

30 - 55 offers an approximate generational window of 25 - 35 years. We consider being a home maker as an occupation, and the shift to market work across generations shapes the overall distribution of traditional market activities as well.

The occupation of “Does not work” or “Did not work” means no current market work or being a home maker (or out of the labor force) for the current generation and “when growing up” for the parental generation. We removed a few observations in which the respondents did not provide key occupational information. Excluding the missing data cases, we have a sample of the 5695, including 2522 males and 3173 females. The occupational code is from the Alphabetical Index of Industries and Occupations issued by the U.S. Department of Commerce and the Bureau of the Census. Occupation is divided into 25 categories, and including “Does or Did not work,” there are 26 broad types of occupations used in the analysis.

3.2. Descriptive Occupational Statistics—Migration to a New Occupational Structure

There are significant differences, many anticipated and consistent with the factors set out in Section 2, between the individuals and their parents in the 26 occupational percentages (**Table 1**). As confirmation of the data structure consider the following thought experiment. Suppose there are approximately equal numbers of men and women in the age range of 30 - 55. Further, suppose that, with weights, the men and women in our sample are representative samples of those adults age 30 - 55. If both adult sons and daughters give similar reports of the occupations of their mothers and fathers when they were growing up we should expect similar percentages for the parents reported on by sons and parents reported on by daughters.

For occupations with a sufficient number of cases, inspection of **Table 1** shows a quite good level of alignment. One large occupational group for which reporting by sons and daughters coincidentally closely matches is for those in Office and Administrative Support. Aside from this fortuitous alignment, other “big” occupations align quite well. For example, Sales, Management, Healthcare Practitioners, Production and, for women, “Did not work” by mothers aligns closely as reported by either sons or daughters.

Reflected in **Table 1** are general equilibrium factors. Unbalanced growth factors are evident with a substantial drop in the shares of employment in production occupations and farming and fishing. The largest difference as a share of overall employment across generations is in the Production Occupation with the percentage of male sons having fallen from fathers at 13% - 14% to sons at 6.7%, or about 50% less than the percentage of their fathers. The percentage of females in the Production Occupation is 2.8% less than their mothers, a decline of about 44%. With trade and unbalanced economic growth, the strong and continuing productivity growth, aided by information technology, leaves the production sector needing less direct labor to achieve the same and even growing output compared to the previous generation. Consequently, the proportion engaged in industrial production occupations has declined sharply.

Table 1. Occupational percentage male and female across generations.

Code	Occupation	Total	Male	Father of male	Mother of male	Female	Father of female	Mother of female
0	Did not work	12.38%	7.02%	0.94%	44.38%	17.20%	0.95%	44.12%
1 - 43	Management occupations	9.97%	12.87%	14.17%	1.93%	7.35%	14.24%	2.45%
50 - 73	Business operations specialists	2.45%	2.56%	0.98%	0.62%	2.35%	0.46%	0.60%
80 - 95	Financial specialists	2.26%	2.51%	2.43%	0.91%	2.04%	2.03%	1.12%
100 - 124	Computer and mathematical occupations	2.59%	4.02%	1.23%	0.11%	1.31%	1.04%	0.48%
130 - 156	Architecture and engineering occupations	2.02%	3.45%	5.87%	0.21%	0.74%	5.24%	0.13%
160 - 196	Life, physical, and social science occupations	1.65%	1.58%	0.52%	0.29%	1.71%	1.20%	0.27%
200 - 206	Community and social services occupations	1.82%	1.27%	1.15%	0.75%	2.32%	1.01%	0.92%
210 - 215	Legal occupations	1.02%	0.68%	0.76%	0.19%	1.32%	1.08%	0.22%
220 - 225	Education, training, and library occupations	6.70%	3.14%	3.84%	8.49%	9.90%	2.70%	7.04%
260 - 295	Arts, design, entertainment, sports, and media occupations	2.27%	2.26%	1.51%	0.51%	2.27%	1.13%	0.95%
300 - 354	Healthcare practitioners and technical occupations	5.25%	3.01%	1.97%	6.21%	7.26%	2.23%	6.60%
360 - 365	Healthcare support occupations	1.87%	0.39%	0.07%	1.89%	3.20%	0.18%	2.48%
370 - 395	Protective service occupations	2.37%	4.11%	2.81%	0.44%	0.81%	2.31%	0.08%
400 - 416	Food preparation and serving occupations	2.89%	2.00%	0.59%	3.51%	3.69%	0.92%	3.52%
420 - 425	Building and grounds cleaning and maintenance occupations	3.04%	3.88%	1.49%	1.83%	2.28%	2.22%	2.00%
430 - 465	Personal care and service occupations	3.07%	1.17%	0.31%	2.03%	4.79%	0.38%	1.78%
470 - 496	Sales occupations	6.78%	7.60%	8.80%	3.90%	6.05%	10.61%	3.55%
500 - 593	Office and administrative support occupations	11.18%	4.32%	3.51%	13.56%	17.35%	2.61%	13.66%
600 - 613	Farming, fishing, and forestry occupations	0.87%	1.63%	3.92%	0.54%	0.18%	3.97%	0.45%
620 - 676	Construction trades	4.00%	8.29%	9.86%	0.07%	0.15%	9.95%	0.20%
680 - 694	Extraction workers	0.08%	0.16%	0.55%	0.00%	0.00%	0.43%	0.02%
700 - 762	Installation, maintenance and repair workers	3.31%	6.78%	6.84%	0.03%	0.19%	6.38%	0.06%

Continued

770 - 896	Production occupations	5.05%	6.73%	13.04%	6.20%	3.54%	14.06%	6.33%
900 - 975	Transportation and material moving occupations	4.40%	7.22%	9.04%	1.32%	1.87%	9.79%	0.94%
980 - 983	Military specific occupations	0.71%	1.36%	3.78%	0.09%	0.12%	2.89%	0.06%
Total		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Note: Calculated use the individual cross-sectional weight. Observation counts are in the Appendix.

At the same time, evident is a notable rise in STEM occupations. Based on our data from the PSID there are about 4.0% of men now engaged in Computer and Mathematical Occupations (CMO) compared to 1.2% of the father's generation. As of 2012, 1.3% of women work in CMO. In contrast, the percent their mother's generation in the occupation was 0.5%. On a wider definition to include Engineering and Architecture; and Physical, Life and Social Sciences the son's percent of STEM is now 9.1% while for their fathers it was 7.6%. For daughters it is now 3.8% while for their mothers it was about 0.9. Also evident are gender-based differences in occupations. Besides the well-known exodus, based on a matching model we found a positive effect of having a mother who worked in the market on the occupational wage ranking of the sons, and found very limited evidence of a role model effect for women.

The shift from housekeeper (Did Not Work) for women, there is a strong rise in Business Operations and Financial Specialists for women and a strong rise in women in the well-paid legal occupations. Of note for men, as production employment declined, and many moved to Building and Grounds Cleaning and Maintenance—more traditionally male occupations while few migrated to healthcare support, an occupation which, as seen below, pays more than Building and Grounds¹³. We suggest this to be an apparent self-limitation and can be considered a form of self-exclusion. Conceptually, such a pattern promotes lower wages—just as does exclusion by others.

3.3. Descriptive Occupational Statistics—Wages in the New Occupational Structure

Occupational wage rankings as of 2012¹⁴ are created for the 26 destination occupations held by the adult children age 30 - 55. These are set out in **Table 2**. As shown in **Table 1**, 44% of adult sons and of adult daughters reported that their

¹³Based on the familiar migration measure (Blau & Duncan, 1967), the full 26 by 26 occupational transition table (available from the authors upon request), these moves of men to “nearby” traditional, but lower paying occupations are more evident. Though cell counts are modest, there are interesting differences in the growth and contraction of occupations. Farming is declining and legal occupations are rising. For both, there is strong intergenerational persistence. In farming there are very limited inflows, a contrast to legal occupations.

¹⁴These can be seen as relatively stable ranks through time for such broad occupations and may also be considered as anticipated wages for the early career plans of the current 30 - 55 year olds. The hours of housework for the mothers of the adult children look like those of market workers.

Table 2. Sorting occupations by the mean PSID wage rate (2012).

Order	Code	Occupation	Meanwage
0	0	Did not work	0.000
1	600 - 613	Farming, fishing, and forestry occupations	11.61
2	420 - 425	Building and grounds cleaning and maintenance occupations	11.80
3	430 - 465	Personal care and service occupations	12.61
4	400 - 416	Food preparation and serving occupations	13.82
5	360 - 365	Healthcare support occupations	16.66
6	770 - 896	Production occupations	19.10
7	500 - 593	Office and administrative support occupations	20.54
8	200 - 206	Community and social services occupations	21.24
9	900 - 975	Transportation and material moving occupations	21.84
10	620 - 676	Construction trades	22.42
11	220 - 225	Education, training, and library occupations	24.08
12	680 - 694	Extraction workers	25.74
13	700 - 762	Installation, maintenance, and repair workers	26.40
14	260 - 295	Arts, design, entertainment, sports, and media occupations	27.95
15	980 - 983	Military specific occupations	30.43
16	470 - 496	Sales occupations	30.88
17	370 - 395	Protective service occupations	32.69
18	50 - 73	Business operations specialists	36.35
19	100 - 124	Computer and mathematical occupations	37.68
20	80 - 95	Financial specialists	38.27
21	130 - 156	Architecture and engineering occupations	39.34
22	1 - 43	Management occupations	40.25
23	300 - 354	Healthcare practitioners and technical occupations	40.65
24	160 - 196	Life, physical, and social science occupations	41.78
25	210 - 215	Legal occupations	44.83

mother did not work when they were growing up. The wage rankings can be compared to the widely used measure of wages of generational pairs. By including housekeeping as an occupation, we are able to study mobility of women. Occupational rankings provide a measure of the typical or average wage of those age 30 - 55 working in the occupations. It is based on a sample representative of the United States and thereby averages across the cost-of living differences of the urban and rural areas, annual individual earnings and career point. If adult children and their parents live in areas with a similar cost of living this will bias upward the apparent strength of the relationship of economic-wellbeing across the generations. A lim-

itation of occupational rankings is that high or low earnings within the occupations are not captured.

In **Table 3** are presented the descriptive statistics for the occupational mobility measure. Given the large share of the mothers in housekeeping and service occupations, the share of adult women who have moved up is 59.2 percent compared to 25.2 percent having moved downward. For men about 43 % moved up

Table 3. Descriptive statistics for the mobility analysis variables.

Variable's types	Variable's explanation	Variable value	Male	Female	All samples
Dependent variables	Mobility (compared with father's occupation order)	Downward	43.45%	59.24%	51.75%
		Inheritor	13.50%	4.96%	9.01%
		Upward	43.05%	35.80%	39.24%
	Mobility (compared with mother's occupation order)	Downward	19.17%	25.17%	22.33%
		Inheritor	7.00%	15.64%	11.54%
		Upward	73.84%	59.19%	66.13%
	Occupational order child	Mean	12.72	10.11	11.35
Explanatory variables of parents' characteristics	Father's occupational order	Mean	13.09	12.97	13.03
	Mother's occupational order	Mean	5.89	6.01	5.96
Explanatory variables of children's individual characteristics	Education	Mean	13.93	14.17	14.06
	Age	Mean	43.12	43.09	43.11
	Race	0-Non-white	14.51%	17.07%	15.86%
		1-White	85.49%	82.93%	84.14%
	Health	1-Excellent	20.54%	14.78%	17.51%
		2-Very good	38.35%	40.98%	39.73%
		3-Good	29.17%	30.24%	29.74%
		4-Fair	8.99%	11.00%	10.04%
		5-Poor	2.95%	3.00%	2.98%
	Marriage	0-Others (never married, widowed, divorced, annulment, separated)	32.70%	34.80%	33.80%
		1-Married	67.30%	65.20%	66.20%
	Covered by insurance	0-No	18.35%	14.96%	16.57%
		1-Yes	81.65%	85.04%	83.43%
	Employment	0-Others (only temporarily laid off, unemployed, retired, permanently disabled, housewife, keeping house, student, others)	13.78%	25.46%	19.92%
		1-Working now	86.22%	74.54%	80.08%

Note: Statistics are calculated with the individual cross-sectional weight.

compared to their fathers while about 43 percent moved down. In our next analysis a set of explanatory variables will be used, including the occupational wage order of the parents. Given the far greater upward occupational mobility of women, the average wage rank of women is 10.1, about 80 percent of the 12.7 wage ranking of men. The wage ranking of the sons is 12.7 a bit lower than the 13.1 rank of their fathers, a result consistent with the Bergmann general equilibrium factors identified in Section 2.2.

With heterogeneous human capital the study of occupations is critical. On the other hand, placing otherwise diverse occupations on a common metric supports the analysis of occupational change and mobility. Occupational prestige is often used to order the occupations and sometimes to measure intergenerational mobility. Here, we use the hourly wage rate to measure the ranking of remuneration of the individual's primary occupation. As noted above, this is possible based on a variable in the PSID which is the calculated annual wage. The wage definition is very inclusive.

Those working in a farm, unincorporated business or profession are asked for their hours in the business and the share of the net income is allocated based on reported hours. From these measures and reports of overtime, bonuses and other components, an annual average hourly wage is calculated for all men and women active in the labor force in the prior calendar year. In this paper occupations are ordered through the (weighted) average hourly wage rate to provide a measure used to represent an occupational ranking.

After calculating the average hourly wage rate of men and women employed in each occupation, the occupations are sorted according to the average wage rate from high to low. A higher occupational order is defined here by the wage rate. The highest hourly wage rate is in Legal Occupations, and its average hourly rate of pay is \$44.83 with a ranking of 25. Life, Physical, and Social Science Occupations are also highly paid, with an average of \$41.78 per hour. The lowest hourly market rate is Farming, Fishing, and Forestry Occupations which are paid at \$11.61. There is no dollar wage defined for those out of the labor wage but order values for wages in service occupations are also low. Building and Grounds, Cleaning, and Maintenance Occupations, which are paid an average of \$11.80 are occupations just above the bottom.

Within the healthcare occupations are both the Healthcare Practitioners and the Healthcare Support Occupations. Both have grown across the generations but practitioners have a wage ranking of 23 while support occupations have a ranking of 5 as shown in **Table 3**. From **Table 3** compared with the father's occupation, there were 43.4% of men who transitioned downward, and 43.0% of men transitioned upward. Compared with the mother's occupation, there were 25.2% of women flowing downward, with 59.2% of women moving upward. The proportion of women's individual occupations moving upward is greater and in part this is related to substantial exits from unpaid work within the household. It is clear that for both men and women, more of the adult children have experienced up-

ward wage mobility relative to their mothers.

3.4. Statistical Analysis

The variables include a number of background factors many of which are used in robustness checks on the mobility analysis. The average years of completed education are similar: 13.9 in the male subsample and 14.2 for the female subsample. The mean age of the child sample was 43.1. There are 14.5% non-white and 85.5% white in the male subsample and 17.1% non-white and 82.9% white in female subsample. Most of the individuals' self-reported health status is "good" or "very good." More than 80% of individuals were covered by health insurance, and most were employed.

The occupational ranking of sons has declined slightly compared to their father's, from about 13.09 to 12.72 ($t = 3.97$)¹⁵. This is the occupational score of the fathers based on prevailing wages as of 2012 compared to the occupational score of today's sons had they the same occupational composition as their fathers. This modest change is consistent with several factors including a substantial overall reduction of occupational exclusion of women (Bergmann, 1986), rising educational levels and exit from the low occupational rank of householder. One occupation which is just below Production is Healthcare Support. This could have mitigated the occupational wage decline to some extent, yet the migration rate from Production to Healthcare Support has been notably low for men.

4. Movement up Even from Parents of Higher Rank?

4.1. Quantile Regression Analyses

Based on the wage sorting of occupations, we can know whether an individual's occupational order has risen or fallen compared to their father's (mother's) occupation. If the father's (mother's) occupation order is b , and the child's occupational order is a , $a - b > 0$ can be regarded as individual occupational upward mobility. If $a - b < 0$, indicates downward occupational downward mobility. In most intergenerational mobility literature, comparisons are made between sons and fathers' occupations (Xie & Killewald, 1980), or between daughters and mothers' occupation. The wage mobility we refer to in this section considers the mobility of the male compared with their fathers' occupation, and the mobility of the female compared with their mothers' occupation. Based on a matching model we found a positive effect of having a mother who worked in the market on the occupational wage ranking of the sons, and found very limited evidence of a role model effect for women.

Are some individuals able to achieve upward occupational mobility, even from a background of high parental ranking? Are there any central parental characteristics in the group moving still higher? Here the occupational order of the child is used as the dependent variable. Quantile regressions including control variables

¹⁵Data from the Census Bureau also indicate a modest decline. For full time year-round employment the 2012 average was \$49,398. As of 1973 it was \$51,670 (inflation adjusted).

are shown in **Table 4**. The quantile regression results reveal a quite definite pattern. For the son's occupational level, the father's influence on upward mobility first rises and then declines modestly. The coefficient of father's occupation order is 0.018 at the 25% quartile, rises to 0.091 at the 50% quartile, and then decreases to 0.077 at the 75% quartile. The role of the mother's occupation shows a different pattern. The influence rises from 0.018 at the 25% quartile to 0.028 at the 50% quintile, and then increases slightly to 0.029 at the latter quantile. The father's occupational order has its strongest effect on the future generations in the middle-ranking occupational groups. The influence of mother's occupation is the highest for the higher-order groups.

Figure 1 portrays the intergenerational mobility across the full range of parental occupational rank, showing something of an inverted U for men and, after the 40th percentile, something of an inverted V for women. There the inverted shape

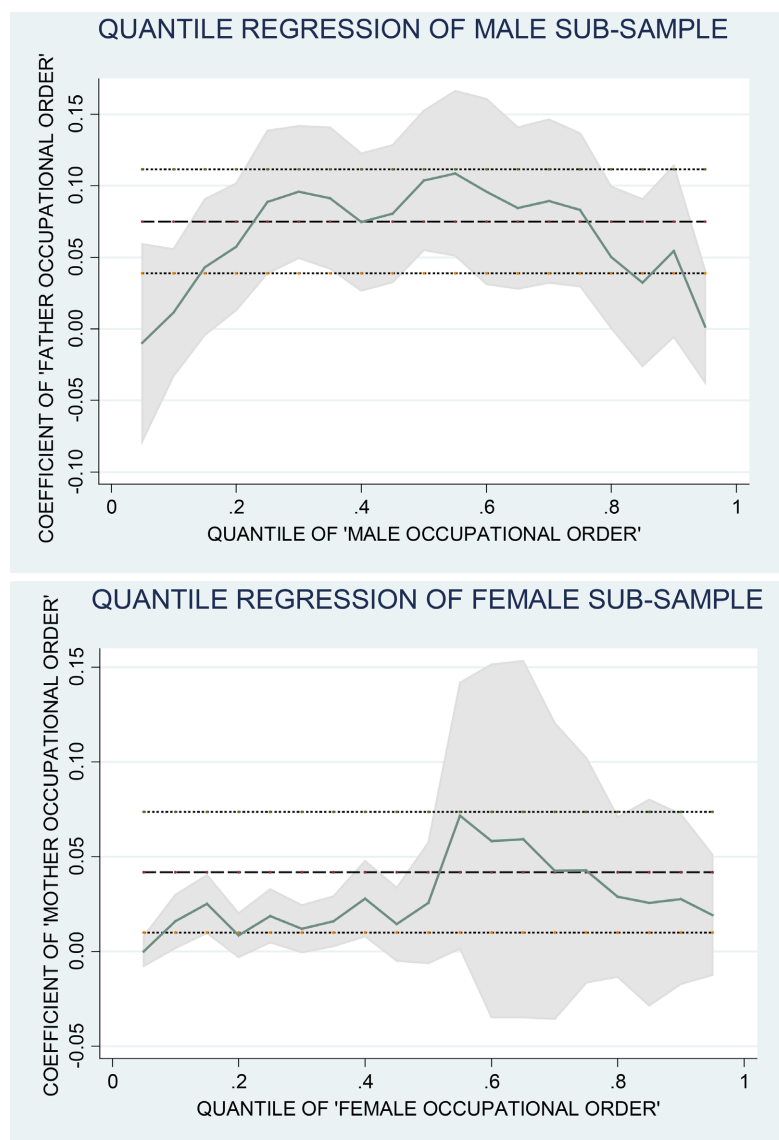


Figure 1. Occupational rank of parents and children.

indicates a low upward mobility effect for fathers at a very low occupational rank, then rising in the middle range and declining again at high levels of occupational rank. For the mother to daughter connection, the relationship is relatively flat over the lower range of quantile order, where mothers had a rank of 0 up to the 4th decile. This is consistent with the 40 plus percent share of mothers as home makers and the fact that their daughters moved to a wide array of market occupations—some well-paying but many paying only modestly above the reference rank value of zero. Then there is a pattern first rising over the 50th - 70th range and falling modestly thereafter. Again, as for men, there is more mobility in the middle of that range.

An interpretation of the greater mobility in the middle is that for the upper quantile values of parents there is little room to move up across the generations. This is partly a mechanical result of an ordinal measure at the top. Moreover, as the underlying distribution upon which the ranks are constructed becomes wider, as with wealth or family income, greater cardinal mobility can occur within the upper rank, with no resulting change in order. Especially for fathers of the prior generation, where they were the main earners, at low levels of occupational order there may have been limited resources to support upward mobility. This has less of a mechanical element but is still partly shaped by the lower bound on income or rank.

Similar patterns of limited mobility at the bottom of the order distribution have been observed for 10-year mobility tables of wealth. Persistence at both low and high decile orders is observed (Hurst, Luoh, & Stafford, 1998). In a similar vein (Mitnik et al., 2015) substantial persistence at both low and high levels of earnings have been shown in other studies. A concern is that the common double log elasticity (Solon, 2014; Gouskova et al., 2010) fails to capture the full range of functional form mobility.

While an elasticity of 0.5 or 0.6 still implies substantial overall mobility as well as regression to the mean, this may obscure the functional form mobility differences over the full range of economic well-being. In the quantile regression of the combined sample, the influence of education on upward mobility (Pfeffer & Hertel, 2015) was also improved, from 0.364 to 1.261, along with the improvement of the individual occupational order. In other words, the higher the occupational order, the greater is the associated relationship of education to upward mobility.

The main patterns shown in Table 4 are apparent in a generalized ordered logit model of mobility. For the full sample there is regression to the mean. The gender matched parent subsamples are more diverse. For the male sample there is limited upward mobility at the lower quantiles. There are alternative interpretations which cannot be identified here, and this is a reduced form not a causal assessment.

The quantile regression estimated standard error is obtained using the bootstrap method repeated 500 times. The other is related to the issues of price measures as noted in Section 2.1. While we have used the average wage in an attempt to mitigate the problem there can be persistence in living in rural low price

level areas to partially offset regression to the mean from below.

4.2. Propensity Score Matching Analyses of Working in the Labor Market by the Mother

Here we examine the relationship of the children's mobility based on whether or not the mother was active in the labor market (McGinn, Castro, & Lingo, 2015). Was there an apparent role model relationship to the mother's market work apart from correlated influences of education and income? Propensity Score Matching (PSM) is our model choice. In the PSM's first-stage estimation, the result depends on the selection of the model and the setting of the parameters. Bias-corrected matching ensures consistency for any given value of the smoothing parameters

Table 4. Quantile regression estimates.

Dependent occupational order	Full sample			Male			Female		
	Q25	Q50	Q75	Q25	Q50	Q75	Q25	Q50	Q75
Father's occupational order	0.018 (0.009)	0.091 (0.021)	0.077 (0.018)	0.089 (0.027)	0.104 (0.028)	0.083 (0.021)	0.001 (0.008)	0.023 (0.017)	0.039 (0.028)
Mother's occupational order	0.018 (0.007)	0.028 (0.015)	0.029 (0.016)	0.020 (0.019)	0.012 (0.023)	0.009 (0.017)	0.019 (0.007)	0.026 (0.016)	0.043 (0.024)
Child's education	0.364 (0.042)	1.012 (0.083)	1.261 (0.059)	0.752 (0.083)	1.465 (0.088)	1.350 (0.071)	0.250 (0.042)	0.762 (0.042)	1.134 (0.084)
Age	0.002 (0.006)	-0.037 (0.014)	-0.008 (0.015)	0.012 (0.019)	0.030 (0.019)	0.024 (0.016)	0.002 (0.006)	-0.016 (0.013)	-0.058 (0.023)
Race	0.350 (0.106)	1.188 (0.243)	1.566 (0.282)	0.677 (0.290)	1.538 (0.330)	1.923 (0.347)	0.178 (0.115)	0.241 (0.206)	0.885 (0.426)
Marriage	0.226 (0.092)	0.832 (0.245)	0.845 (0.285)	0.847 (0.343)	1.326 (0.344)	1.411 (0.349)	0.080 (0.098)	-0.014 (0.157)	0.544 (0.404)
Insurance	0.820 (0.193)	0.161 (0.255)	0.041 (0.379)	0.383 (0.354)	0.298 (0.328)	0.697 (0.451)	1.177 (0.307)	0.229 (0.262)	-0.222 (0.413)
Employment	6.437 (0.112)	7.336 (0.288)	8.502 (0.483)	6.522 (0.328)	6.599 (0.595)	4.409 (0.564)	6.346 (0.122)	6.714 (0.242)	10.785 (0.475)
Health	-0.101 (0.048)	-0.532 (0.110)	-0.400 (0.129)	-0.385 (0.134)	-0.597 (0.151)	-0.233 (0.131)	-0.015 (0.047)	-0.109 (0.089)	-0.549 (0.199)
Cons	-5.867 (0.732)	-9.900 (1.335)	-10.260 (0.905)	-10.455 (1.422)	-17.055 (1.546)	-10.584 (1.181)	-4.768 (0.692)	-8.481 (0.947)	-6.719 (1.510)
R ²	0.254	0.208	0.220	0.209	0.239	0.233	0.284	0.197	0.223
Obs	5695	5695	5695	2522	2522	2522	3173	3173	3173

Note: ***p < 0.01, **p < 0.05, *p < 0.1. Standard errors are in parentheses in the Quantile regression.

Table 5. Results of bias-corrected matching estimators.

		Mother did not work	Mother worked
Observations	All	2180	3515
	Male	979	1543
	Female	1201	1972
Mean of individuals' occupational order	All	10.807	11.777
	Male	12.415	12.962
	Female	9.350	10.714
Sample ATT	All	0.338 (0.190)	
	Male	0.628 (0.270)	
	Female	0.109 (0.260)	

Note: Standard errors in parentheses. The number of matches to be made per observation is 4.

without requiring accurate approximations to either the regression function or the propensity score.

Bias-corrected matching estimators have the advantage of an additional layer of robustness (Abadie & Imbens, 2011; Williams, 2006). For bias-corrected matching with replacement, allowing each unit to be used as a match up to once more, the standard error is also robust under heteroscedastic conditions. Bias-corrected matching estimators were chosen to measure the Average Treatment Effect on the Treated (ATT) under the assumption of no omitted variables and no unobservable factors. Given the small share of fathers who were reported to have been out of the labor market the analysis is for the mothers only and is for both sons and daughters combined.

The results of the bias-corrected matching estimators are shown in Table 5. The sample of mothers who did not work is very large, with 2180 who did not work and 3515 mothers who were in market occupations. The mean of the children's occupational order in the group where the mother worked in the market is higher than for the group where the mother did not work in the market, in the combined male and female sample, but is significant only in the male subsample. For the group in which the mother did not work in the market, the mean of respondents' occupational order is 10.34. But in the mother worked group, mean individuals' occupational order is modestly higher at 10.89. This suggests that the earlier generation mothers labor market activity was not central to their children's upward occupational mobility and differs rather modestly for daughters. Many of today's adult women, active in the labor market, had mothers who were not in the labor market when they were growing up. Possibly non-observable factors, not captured by the matching method played a role. The Male Sam-

ple ATT is 0.628.

5. Discussion and Conclusion

Over recent decades, the occupational structure has changed and been shaped by technology, family and other social factors. These are not possible to simplify into a given primary factor as the most important explanation for the change. The new economic structure has been accommodated by diverse directional flows from the earlier occupational composition. As anticipated by unbalanced growth theory, there has been a shift to industries and related occupations experiencing slower labor productivity growth at both higher and lower skill levels, ranging from Life, Physical and Social Science occupations to Personal Care and Service occupations. Men have been moving from the declining share of work in production occupations via effects of unbalanced economic growth (Baumol, Batey-Blackman, & Wolff, 1985) and trade (Johnson & Stafford, 1998b) and have often migrated to traditional male occupations, further depressing wages there.

Looking forward one can expect a new, yet not well understood process of growth, which will emerge. Just as the dramatic shift from home maker, an example of prior unbalanced growth in the United States is the shift from about 40 percent of the labor force in agriculture as of 1900 to about 4 percent in 1970. This process involved a range of sociotechnical factors, including spatial migration from rural areas as well as occupational migration. There, and more generally, occupations with a net inflow are often catalytic for economic development, recently illustrated by those in STEM, including Computer and Mathematical Occupations (CMO).

Also important are occupations needed for managing in a setting of a rapidly changing economy, such as Management Occupations. Inputs produced from CMO workers have displaced traditional employment, a process which can be considered to be skill extensive technical change. Employment of CMO workers should continue to rise as they continue to implement information and control (AI) systems in diverse settings (Frey & Osborne, 2017).

As shown through quantile regression analysis, the influence of father's occupation for upward mobility of their children is the largest for the middle-ranking group, while mother's occupation influence is higher for the higher order occupational groups. For the earlier generation there was a substantial share of women who did not work in the labor market. We explored the connection to the mothers being in the labor market versus having primarily having been a householder. In part, this reflects the wide range of occupations to which the daughters of home makers moved.

There has been reduced exclusion or reduced crowding (Bergmann, 1986) leading women to highly paid work, with a rising share observed entering other traditionally male occupations, with high or middle range wages, such as Management and Legal occupations. At the same time there has been a growing share of women in occupations traditionally having a high female representation (Levanon et al.,

2009) such as Personal Care and Service and which have a lower wage ranking, barely above our householder occupation¹⁶.

Overall, the wage index for daughters has improved greatly, from 6.01 for their mothers to 10.1. This is a 17 percent increase at the average wage levels. Unlike traditional GDP measures, the 17 percent incorporates reduced non-market value for the daughters. The index remains lower than for sons, 10.1 compared to 12.7, a ratio of 0.80¹⁷. The index which would have prevailed for sons had they the same occupational representation of their fathers has a value of 13.1. This observed pattern of limited overall earnings growth of men has been noted elsewhere using basic median wage measures. Men who are in marriage or marriage like relationships should, on average, be realizing a higher level of family income (with the value of non-market work included or not) as suggested by the perspective of Bergmann and consistent with basic tabulations from the PSID on-line archive.

While not apportioning the contribution of the several general equilibrium factors, our analysis indicates a role for unbalanced growth via skill extensive technical change, notably in selected sectors such as production. In addition, reduced exclusion of women has fostered their entry into occupations largely the prior domain of men. It seems likely that countries high on the GEM index (United Nations, 1995) generally experienced substantially more mobility to the better occupations facilitating economic growth and are also likely to do so going forward. Similar outcomes, via reduced crowding, can be realized for disadvantaged groups.

Related are the economic growth implications of the seeming reluctance of men to enter occupations with a traditionally high share of women, even for better pay. Office Support occupations currently pay somewhat more than does production work (Table 3), but as shown in Table 1, even as the occupation has grown substantially as a share of women's work, it has increased only modestly for men. If such apparent self-exclusion is reduced the occupational ranking of men can rise.

Acknowledgements

We thank seminar participants at the Society of Labor Economics, Raleigh, North Carolina May 5, 2017 and Denver, Colorado on May 1, 2026; The Industry Studies Association, Washington, D.C. May 25, 2017; Society of Economics of the Household, San Diego June 25, 2017; CSWEP Session at the Western Economics Association International, San Diego June 26, 2017 and valuable suggestions by a reviewer. We thank Barbara Anderson, Hoyt Bleakley, Charles Brown, David Card, Gordon Hanson, John Laitner, Alexa Killewald, Peter Orazem, Fabian Pfeffer, and Kevin Shih for suggestions. Data for this project were supported by NIH Grant R01 HD060609 and NSF Award 1157698, and are available on-line at the Data Center of the Panel

¹⁶Householder as an occupation is restricted to core housework activity such as regular cooking, cleaning and clothes washing—activities with well-defined market substitutes and does not include more nuanced family roles.

¹⁷An AI search of the ratio of women's to men's wages on a full-time, annual basis indicates a value of 0.81 - 0.84. Given that the estimate here includes a lower wage for non-market household work, a reasonable alignment is suggested.

Study of Income Dynamics, <https://simba.isr.umich.edu/default.aspx>.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix 1: Observations Occupation Distribution from PSID (Calculated without the Individual Cross-Sectional Weights)

Code	Occupation	All	Male	Father of male	Mother of Male	Female	Father of female	Mother of female
0	Did not work	753	182	36	979	571	48	1201
1 - 43	Management occupations	471	278	299	52	193	356	73
50 - 73	Business operations specialists	130	56	22	14	74	12	18
80 - 95	Financial specialists	119	59	52	23	60	52	30
100 - 124	Computer and mathematical occupations	125	88	24	6	37	27	10
130 - 156	Architecture and engineering occupations	96	78	123	7	18	117	3
160 - 196	Life, physical, and social science occupations	73	31	12	11	42	29	9
200 - 206	Community and social services occupations	119	34	33	23	85	35	33
210 - 215	Legal occupations	48	17	17	5	31	25	7
220 - 225	Education, training, and library occupations	339	70	77	207	269	64	204
260 - 295	Arts, design, entertainment, sports, and media occupations	102	48	33	14	54	38	21
300 - 354	Healthcare practitioners and technical occupations	294	75	39	190	219	58	203
360 - 365	Healthcare support occupations	152	15	5	70	137	9	119
370 - 395	Protective service occupations	143	102	66	8	41	77	10
400 - 416	Food preparation and serving occupations	196	54	24	105	142	42	145
420 - 425	Building and grounds cleaning and maintenance occupations	177	92	61	75	85	108	135
430 - 465	Personal care and service occupations	208	28	9	67	180	15	70
470 - 496	Sales occupations	369	168	192	105	201	257	122
500 - 593	Office and administrative support occupations	677	129	84	320	548	90	398
600 - 613	Farming, fishing, and forestry occupations	41	36	98	13	5	134	18
620 - 676	Construction trades	222	218	275	2	4	382	7
680 - 694	Extraction workers	6	6	16			24	1
700 - 762	Installation, maintenance, and repair workers	182	179	186	2	3	205	6
770 - 896	Production occupations	305	196	345	182	109	469	280
900 - 975	Transportation and material moving occupations	305	246	274	39	59	383	45
980 - 983	Military specific occupations	43	37	120	3	6	117	5
Total		5695	2522	2522	2522	3173	3173	3173

Appendix 2. Flow Index of Male v. Father Note: Direction → Is the Father's Occupational Code; Direction ↓ Is the Male Individual's Occupational Code

	0	1	50	80	100	130	160	200	210	220	260	300	360	370	400	420	430	470	500	600	620	680	700	770	900	980	IN
0	3.179	0.676	0.000	0.264	0.922	0.625	0.000	0.000	2.156	0.508	0.185	0.494	0.258	1.598	0.855	1.039	0.000	0.805	1.122	2.023	1.317	1.213	0.943	1.074	1.777	0.389	0.810
1 - 43	0.050	1.620	2.075	1.650	2.216	0.662	1.803	0.973	1.182	1.617	0.684	1.533	3.714	1.157	1.559	0.987	0.000	0.817	1.066	0.589	0.851	1.692	0.850	0.607	0.521	1.106	1.199
50 - 73	0.000	1.343	2.937	1.164	0.000	1.369	0.000	0.000	0.000	1.188	0.000	1.461	0.000	3.059	0.000	0.000	0.000	2.140	1.165	0.000	0.692	0.000	0.571	0.685	0.790	0.378	0.640
80 - 95	0.000	1.507	0.000	6.206	2.219	0.503	1.284	1.660	1.149	0.915	1.911	0.000	0.000	0.863	4.517	0.000	0.000	1.248	0.031	0.833	0.436	4.925	0.854	0.842	0.283	0.577	1.062
100 - 124	3.073	0.855	2.231	0.557	2.000	1.274	0.423	2.398	0.671	1.401	0.000	0.741	0.000	0.097	0.000	0.000	0.000	0.993	2.804	0.257	1.131	0.812	0.541	0.643	0.894	2.524	0.973
130 - 156	0.000	1.288	2.238	1.289	0.000	2.744	2.607	0.000	3.481	0.197	0.603	0.000	0.000	0.000	0.000	1.050	0.000	0.744	0.629	0.513	0.898	0.163	1.255	0.751	1.201	1.090	0.800
160 - 196	0.000	1.357	5.070	0.000	0.000	3.687	0.000	0.000	4.238	5.117	0.540	2.176	0.000	1.135	1.581	0.000	0.000	0.575	2.244	1.345	0.339	0.000	0.074	0.000	0.000	0.000	1.179
200 - 206	0.000	1.526	0.000	0.000	0.000	1.075	0.000	16.758	0.000	1.585	0.000	0.000	0.000	0.476	1.187	0.000	0.000	0.947	3.373	1.529	0.661	0.000	0.251	0.500	0.408	0.000	0.541
210 - 215	0.000	0.714	0.000	0.000	0.000	0.717	5.913	11.537	16.946	3.593	0.000	1.860	0.000	2.356	0.000	0.000	0.000	0.000	0.000	0.000	0.577	0.000	0.000	0.522	2.190	0.000	1.199
220 - 225	1.834	0.677	1.169	0.847	0.000	0.993	0.000	1.151	0.000	3.381	3.462	1.633	0.000	1.483	0.000	0.000	0.000	0.516	2.200	0.000	1.201	1.309	1.833	0.307	0.927	0.784	0.893
260 - 295	0.000	0.653	0.000	1.543	2.375	1.715	0.000	1.359	5.456	1.807	4.418	1.440	0.000	1.469	3.437	0.000	0.000	1.755	0.000	0.000	0.349	0.000	1.536	1.021	0.037	0.692	1.066
300 - 354	1.024	0.672	0.000	0.478	1.214	2.088	0.000	0.604	0.881	1.320	0.000	5.786	0.000	0.744	0.000	0.994	0.000	1.677	0.000	0.056	0.776	0.000	1.029	0.460	1.088	2.028	0.685
360 - 365	0.469	0.236	0.000	0.000	4.565	0.000	0.000	1.102	0.000	0.224	17.282	0.000	0.000	0.000	0.000	0.000	0.000	3.691	0.000	0.000	0.000	0.000	0.804	0.035	1.577	2.552	1.302
370 - 395	0.116	0.536	1.488	0.883	2.585	0.540	9.730	0.000	0.000	1.226	0.598	1.302	0.000	1.725	0.083	0.143	0.000	1.031	2.148	0.206	0.657	0.000	0.729	1.331	1.619	0.811	1.110
400 - 416	5.370	0.867	0.000	3.106	0.000	1.592	0.000	0.000	0.000	0.000	0.440	0.000	0.000	0.085	1.809	2.432	5.870	0.729	1.272	1.082	1.699	0.000	1.971	0.385	0.868	0.027	1.112
420 - 425	0.860	0.937	0.000	1.263	0.000	0.158	0.000	0.000	0.000	0.526	0.207	0.180	3.690	1.994	2.028	0.085	11.787	0.516	0.541	0.374	1.650	0.000	1.273	1.148	1.469	1.918	1.301
430 - 465	1.663	0.575	0.000	4.746	0.000	3.349	0.000	2.680	0.000	1.229	0.000	0.000	0.000	0.000	0.000	6.049	0.000	0.526	0.588	0.571	0.787	0.000	0.000	0.881	0.944	1.467	1.042
470 - 496	0.016	1.020	2.582	0.793	0.877	1.783	0.000	2.145	0.542	0.993	3.424	0.354	0.000	0.653	0.023	0.234	0.000	2.827	0.121	0.457	1.000	0.029	0.606	0.863	0.201	0.151	0.755
500 - 593	0.803	0.406	1.090	1.085	0.000	1.361	0.000	0.870	1.645	1.257	0.055	0.930	8.178	1.384	2.820	1.564	0.000	0.402	0.941	1.298	1.286	3.039	1.259	1.423	0.660	1.298	1.365
600 - 613	0.000	1.910	0.000	0.000	0.000	0.350	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.647	0.000	10.629	0.000	0.000	1.351	1.085	0.017	0.000	0.214
620 - 676	0.169	1.055	0.842	0.970	1.100	0.583	0.000	0.392	0.000	0.497	0.876	0.394	0.000	0.776	0.000	2.030	2.385	0.748	0.885	1.487	1.658	2.603	0.942	1.130	0.958	0.897	0.869
680 - 694	0.000	1.404	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.810	0.000	5.650	0.000	0.715	0.311
700 - 762	2.333	0.785	0.000	0.361	1.736	0.647	1.311	0.461	0.000	0.275	0.031	0.918	0.000	1.356	0.026	2.943	2.131	0.442	0.503	0.960	1.200	0.430	1.641	1.640	0.682	1.742	0.917
770 - 896	0.121	0.874	0.000	0.381	0.356	0.388	0.000	0.000	1.134	0.113	2.330	0.037	0.000	0.384	3.895	1.058	0.885	0.635	0.558	1.648	0.922	1.557	1.651	1.486	1.720	0.946	0.864
900 - 975	1.478	1.000	0.000	0.000	0.000	0.453	0.000	0.035	0.000	0.143	0.144	1.684	0.103	0.715	0.038	1.120	0.331	0.925	1.875	1.055	0.774	0.000	0.607	1.504	2.245	0.873	0.594
980 - 983	5.043	0.563	0.000	0.000	0.000	1.285	7.315	4.261	0.000	2.505	0.000	3.634	0.000	0.000	0.000	0.000	0.000	1.292	0.000	0.000	0.299	0.000	0.528	1.095	1.121	3.129	1.158
OUT	0.977	0.938	0.751	0.855	0.807	1.088	1.215	1.265	0.901	1.130	1.311	0.831	0.638	0.871	0.882	0.866	0.936	0.952	0.925	0.651	0.780	0.711	0.858	1.023	0.878	0.919	

Appendix 3. Flow Index of Female v. Mother Note: Direction → Is the Mother's Occupational Code; Direction ↓ Is the Female Individual's Occupational Code

	0	1	50	80	100	130	160	200	210	220	260	300	360	370	400	420	430	470	500	600	620	680	700	770	900	980	IN	
0	1.147	0.484	0.189	0.279	0.000	0.000	0.579	0.741	1.410	0.776	0.565	0.827	1.162	1.621	1.069	1.369	1.302	1.020	0.654	2.682	1.192	0.000	0.000	1.267	1.445	0.000	0.825	
1 - 43	1.049	0.652	1.505	0.000	0.678	4.702	0.000	2.972	2.446	0.910	0.394	1.274	0.386	0.176	0.922	0.683	0.888	1.229	1.288	0.000	0.690	0.000	0.000	0.262	0.600	6.755	1.192	
50 - 73	0.668	0.510	5.210	3.743	0.000	0.000	4.924	0.448	0.000	2.514	0.570	1.847	0.107	0.000	0.394	0.379	0.062	0.459	1.603	0.000	0.000	0.000	0.000	0.591	0.000	0.000	0.753	
80 - 95	1.106	1.163	0.000	2.703	0.000	0.000	0.000	0.000	0.000	1.502	0.000	0.874	2.232	19.724	0.042	0.119	0.056	0.500	0.841	0.000	0.000	0.000	0.000	1.273	0.000	0.000	1.177	
100 - 124	0.830	0.320	0.000	0.000	0.000	0.000	0.000	3.232	0.000	2.004	0.000	1.871	0.641	0.000	2.352	0.068	0.000	0.785	1.456	0.000	0.000	0.000	0.000	0.080	0.000	0.000	0.546	
130 - 156	0.672	0.000	0.000	7.747	0.000	0.000	0.000	0.000	0.000	0.726	3.423	1.896	0.000	0.000	0.000	0.000	0.000	1.471	2.067	0.000	0.000	0.000	0.000	1.162	0.000	0.000	0.767	
160 - 196	0.899	0.000	1.358	4.972	0.000	22.684	6.113	2.045	0.000	3.024	0.000	1.498	0.000	0.000	0.000	0.000	0.000	0.000	0.445	0.000	0.000	0.000	0.000	1.626	0.000	0.000	1.542	
200 - 206	0.953	0.000	0.000	1.078	0.000	11.452	0.000	6.257	0.000	0.918	5.173	1.708	1.287	0.000	0.926	1.618	0.000	1.049	0.670	0.000	0.000	0.000	0.000	0.560	0.000	14.831	1.689	
210 - 215	0.602	2.639	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.478	10.271	1.184	0.000	0.000	1.496	0.000	0.188	0.912	1.848	0.000	0.000	0.000	0.000	0.006	5.112	0.000	1.029	
220 - 225	0.921	1.628	1.279	0.737	3.354	0.000	4.153	0.789	0.000	1.635	1.701	0.929	1.003	0.000	0.841	0.301	0.828	0.843	1.297	2.314	0.000	0.000	0.000	0.229	0.381	0.000	0.941	
260 - 295	0.746	1.007	0.000	2.152	0.000	0.000	0.000	0.000	0.000	2.952	1.987	2.527	0.000	0.000	0.000	0.000	1.699	0.919	0.744	0.000	0.000	0.000	18.076	0.675	1.210	0.000	1.308	
300 - 354	0.847	1.406	1.399	0.892	2.739	0.000	3.703	0.039	0.000	1.029	0.000	1.969	0.540	0.360	0.696	0.519	0.638	0.821	1.276	0.000	0.000	0.000	0.000	0.956	2.512	0.000	0.815	
360 - 365	0.774	0.965	0.000	0.118	0.000	0.000	0.000	0.490	0.000	0.416	0.000	1.486	3.858	0.000	1.033	0.751	3.351	1.043	1.118	1.237	0.000	0.000	3.385	1.364	1.246	0.000	0.751	
370 - 395	0.284	0.722	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.079	0.000	1.145	1.478	0.000	6.768	0.953	0.000	3.009	1.029	0.000	0.000	0.000	0.000	3.719	0.000	0.000	0.767	
400 - 416	0.891	1.500	0.000	0.715	9.288	0.000	0.000	0.987	1.530	0.141	0.000	0.463	1.602	0.000	2.201	2.216	1.481	1.409	0.934	0.701	0.000	0.000	0.000	1.174	2.365	0.000	1.096	
420 - 425	1.250	0.772	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.312	0.443	0.670	1.765	0.000	0.640	4.289	0.373	0.372	0.018	0.000	12.155	0.000	0.000	2.545	0.000	0.000	0.853	
430 - 465	1.139	0.850	0.083	2.213	0.000	0.000	0.000	0.817	0.000	0.537	0.000	0.112	1.273	0.000	1.957	0.098	0.742	1.338	0.880	0.000	0.000	0.000	0.000	1.770	0.377	0.000	0.538	
470 - 496	0.936	1.249	0.116	1.212	0.000	0.000	0.000	0.091	0.000	1.163	3.313	0.888	0.852	2.131	1.315	0.447	1.899	1.620	0.992	0.083	0.000	0.000	0.000	0.735	1.896	0.000	0.773	
500 - 593	0.993	1.479	1.194	1.083	0.439	0.000	0.000	1.036	3.003	0.868	0.630	0.764	0.784	0.864	0.576	1.033	1.213	1.010	1.249	1.377	2.576	0.000	0.704	1.014	0.582	0.360	0.943	
600 - 613	2.267	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.091	
620 - 676	0.516	0.000	71.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.411	0.000	0.000	0.000	0.000	0.000	0.000	4.369	0.000	0.000	3.174	
680 - 694																												
700 - 762	1.081	0.000	86.925	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.520		
770 - 896	1.485	0.000	0.000	1.628	0.000	0.000	0.000	1.793	0.000	0.161	1.310	0.265	1.036	0.000	1.756	1.661	0.208	1.018	0.184	0.000	0.573	28.249	10.132	1.008	0.766	0.000	2.089	
900 - 975	1.302	0.906	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.187	0.000	0.049	0.469	0.000	0.717	5.920	0.000	0.000	0.631	0.000	0.000	0.000	0.000	0.000	2.277	0.223	0.000	0.498
980 - 983	0.496	6.821	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.433	0.000	0.000	0.000	0.000	0.000	1.557	0.000	0.000	0.000	0.000	0.000	0.000	78.645	0.932	
OUT	0.908	0.977	6.604	1.143	0.660	1.554	0.534	0.619	0.336	0.868	1.112	0.891	1.242	0.995	0.940	0.862	0.567	0.768	0.861	0.336	0.687	1.130	1.292	1.106	0.740	0.878		