Harmonizing the 2010 and 2002 Census Occupation Coding Schemes

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Abstract

The study of occupations has a long history in the social sciences. The United States Census Bureau creates and updates occupation codes based on the Standard Occupation Classification System to systematically identify similar jobs and classify them into occupations. Periodic updates to occupation codes are necessary for capturing changes in occupations and appropriately reflecting the labor market. While these updates are important for capturing the changing jobs that are performed in the United States, they are changes that make it more complicated for researchers to make appropriate comparisons over time. This paper presents the methodology we use to harmonize 2010 and 2002 Census occupation codes. Our work builds upon the foundation of existing harmonized occupation data available through IPUMS, most notably the variable OCC1990. Combining our contribution with existing IPUMS infrastructure creates a consistent measure of occupation for all seven coding schemes over the 1950-2018 period.

Background

The study of occupations has a long history in the social sciences. Population-level data on occupations are key for used to the study of change in gender and racial occupational segregation (Weeden 1998; Cha 2013), for use as a proxy for socioeconomic status (Hauser and Warren 1997), or as a control in other analyses that have little to do with occupation. The United States Census Bureau (henceforth Census Bureau) creates and updates occupation codes based on the Standard Occupation Classification System to systematically identify similar jobs and classify them into occupations. Periodic updates to occupation codes are necessary for capturing changes in occupations and appropriately reflecting the labor market. While these updates, such as including more detail about information technology occupations and reducing detail about occupations that have been largely replaced by machines, are important for capturing the changing jobs that are performed in the United States, they are changes that make it more complicated for researchers to make appropriate comparisons over time. Making occupation coding schemes comparable over time is labor intensive, requiring extensive exploration of documentation, and many lines of code to translate occupation codes into a common system. It is inefficient for individual

researchers to harmonize occupation codes for their own analyses, and the resulting occupational assignments may differ by researcher. It is preferable to create comparable occupation codes in a consistent way and to make comparable occupation data available to the research community.

The IPUMS Center for Data Integration at the University of Minnesota specializes in harmonizing and disseminating large scale survey and census microdata to researchers at no charge (www.ipums.org). IPUMS has been disseminating harmonized data since 1991. Its freely available databases include integrated microdata that describe 1.4 billion individuals drawn from 750 censuses and surveys. The hallmark of IPUMS is harmonizing variable codes and documentation for consistency across datasets. As a leading disseminator of population-level data, IPUMS is an ideal central location for storing and disseminating harmonized occupation codes. Indeed, IPUMS already offers harmonized occupation data in several databases (e.g., IPUMS USA and IPUMS CPS). The IPUMS variable OCC1950 (Sobek 1995) harmonizes raw occupation codes going back to 1850 into the 1950 Census Bureau occupational classification system. Similarly, the IPUMS variable OCC1990 (Meyer and Osborne 2005) harmonizes occupation codes from 1950 to 2000[1] into the 1990 Census Bureau occupational classification system. Additionally, IPUMS offers the raw occupation codes through the variable OCC, to retain richer detail that is available within each occupational coding scheme for those researchers who do not require a version of occupation to use across changes in the coding schemes. Given its broad reach, free access, and current provision of harmonized occupation information, IPUMS is the logical home for expanded harmonized occupation data.

This paper discusses the methodology IPUMS used to incorporate 2010 Census occupation codes into the variable OCC1990. OCC1990 applies a clear protocol and expert input from the Census Bureau and Bureau of Labor Statistics (BLS) personnel to classify occupations originally coded using the 1960, 1970, 1980, and 2000 Census coding schemes according to the 1990 coding scheme (Meyer and Osborne 2005).

[1] CPS uses the 2000-based occupation coding scheme through 2002.

Using Census Bureau occupation crosswalks that show how occupations are coded in adjacent coding schemes and how they split or are aggregated, we trace occupations through these crosswalks. Original occupation codes are assigned to only one 1990 occupation code based on the modal category. IPUMS offers the following example:

> *Of persons coded as "Gaming managers" in 2000 (2000 code 33), the Census Bureau determined that 35% would have been coded as "Managers, service organizations" in 1990 (1990 code 21), while 65% would have been coded as "Managers, food serving and lodging establishments" (1990 code 17). In OCC1990, we assign original 2000 OCC values of 33 to 17.*

Since OCC1990 was developed in 2005, it did not include changes introduced by the 2010 Census occupation coding scheme. In this paper, we outline the changes in Census occupation codes since 2000, and describe our methodology for coding the 2010 Census occupation codes into the 1990 coding scheme.

Changes to the Census Occupational Coding Schemes

Census occupation codes are based off of the Standard Occupational Classification (SOC). BLS describes the SOC system as "a federal statistics standard used by federal agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data" (BLS 2018). SOC codes are designed to capture work for pay or profit, or among family-owned businesses where family members are not directly compensated; the SOC system excludes occupations unique to volunteers (BLS 2010). BLS and the Census Bureau must be able to collect and report data on occupations if detailed occupations are to be included in the SOC (BLS 2017); revisions to the SOC system allow for updates to the "nature of jobs, changes in terminology, growth and decline of occupations, and the refinement of category composition" (United States Census Bureau 2011b). There are substantial revisions between the 1970 and 1980 coding schemes, and again from 1990 to 2000. The SOC system was last revised in 2010, and the Census occupation codes were updated to use the revised SOC codes.

In addition to changes in the SOC, there are also changes to Census occupation codes. This happened between 2000 and 2002 when Census introduced minor changes to occupation codes. Through 2000, Census occupation codes were three digits wide. In 2002, the Census added a fourth digit to the occupation codes. These revised occupation codes are identical to the three digit codes used in 2000, but incorporate a trailing zero. While this paper will refer to the 2002 coding scheme, it is identical to the 2000 coding scheme other than this trailing zero. This fourth digit introduced in 2002 is used in the 2010 Census occupation coding scheme modifications to convey additional detail and allow for some occupations to be further disaggregated. For example, the 3 digit 2000 occupation code "210: Lawyers" becomes "2100: Lawyers" in the 2002 scheme. This additional digit creates more flexibility in the modifications introduced in 2010, which splits the category "2100: Lawyers" between two new categories "2100: Lawyers, judges, magistrates, and other judicial workers" and "2105: Judicial Law Clerks". While the numeric coding scheme is not adequate for coding new occupations in 2010 to their 2002 counterparts, it signals a clearer connection between the two related codes.

Table 1. Summary of 2010 Census Occupation Code Disposition

	Occupation Code Status			
Type of Difference	**Different Census Occupation code**	**Revised SOC code or label; same Census Code**	**Identical SOC code, label, census occupation code**	**Total**
None		44	427	471
Simple disaggregation (1:many) (Section A)	**25**	--	--	25
Complex disaggregation (many:many) (Section B)	**37**	--	--	37
Aggregation (Section C)	**1***	--	--	1
Combination without aggregation (Section D)	**5**	--	--	5
Total	**68**	**44**	**427**	**539**

**This represents a single occupation code in 2010, which aggregates two distinct occupation codes from the 2002 scheme.*

In 2010, there were changes to the SOC as well as to Census occupation codes that make the 2010 occupation codes not strictly comparable with the 2002 occupation codes. Table 1 outlines the types of changes between the 2002 and 2010 Census occupation coding schemes; Table A1 in Appendix One is a crosswalk that includes the specific occupation codes classified by each type of change. The 2010 Census occupational coding scheme contains 539 occupation codes, including 4 military codes; this is an increase over the 509 occupations included under the 2002 scheme. These changes are primarily concentrated in information technology, healthcare, printing, and human resource occupations (United States Census Bureau 2016). The majority of the 2010 codes (427) have the same SOC code, Census occupation code, and label between the 2002 and 2010 coding schemes and are directly comparable. A further 44 codes have a revised SOC code, or value label, but retain the same Census occupation codes, and can be compared to one another over time according to Census Bureau crosswalks. We have classified the remaining 68 codes that differ between the 2002 and 2010 schemes by the type of change that occurs. The majority (62) of codes with changes are a result of disaggregation between the 2002 and 2010 coding schemes, resulting in new occupations with more detail. Among these disaggregated codes, 25 have a simple, or one-to-many, disaggregation between the 2002 code and the new 2010 codes; these cases have a straightforward change to the Census occupation code, and all new 2010 codes can be directly associated with their single 2002 counterpart. Simple (one-to-many) disaggregation cases are discussed in Section A below. The remaining 37 disaggregated codes that change between 2002 and 2010 cannot be directly associated across schemes; these complex (many-to-many) disaggregation code changes require additional work to be harmonized, and are discussed in Section B below. Section C discusses aggregation of occupation codes; there is a single new 2010 code is an aggregation of two codes in the 2002 scheme. Finally, Section D discusses the anomalous case of combination without aggregation; there are five occupation codes that are combined with other distinct occupation codes to create combined occupation groups, but are not technically aggregated between the coding schemes. Occupation codes that undergo simple disaggregation, complex disaggregation, aggregation, or combination without aggregation comprise 12.6% of occupation codes in the 2010 coding scheme.

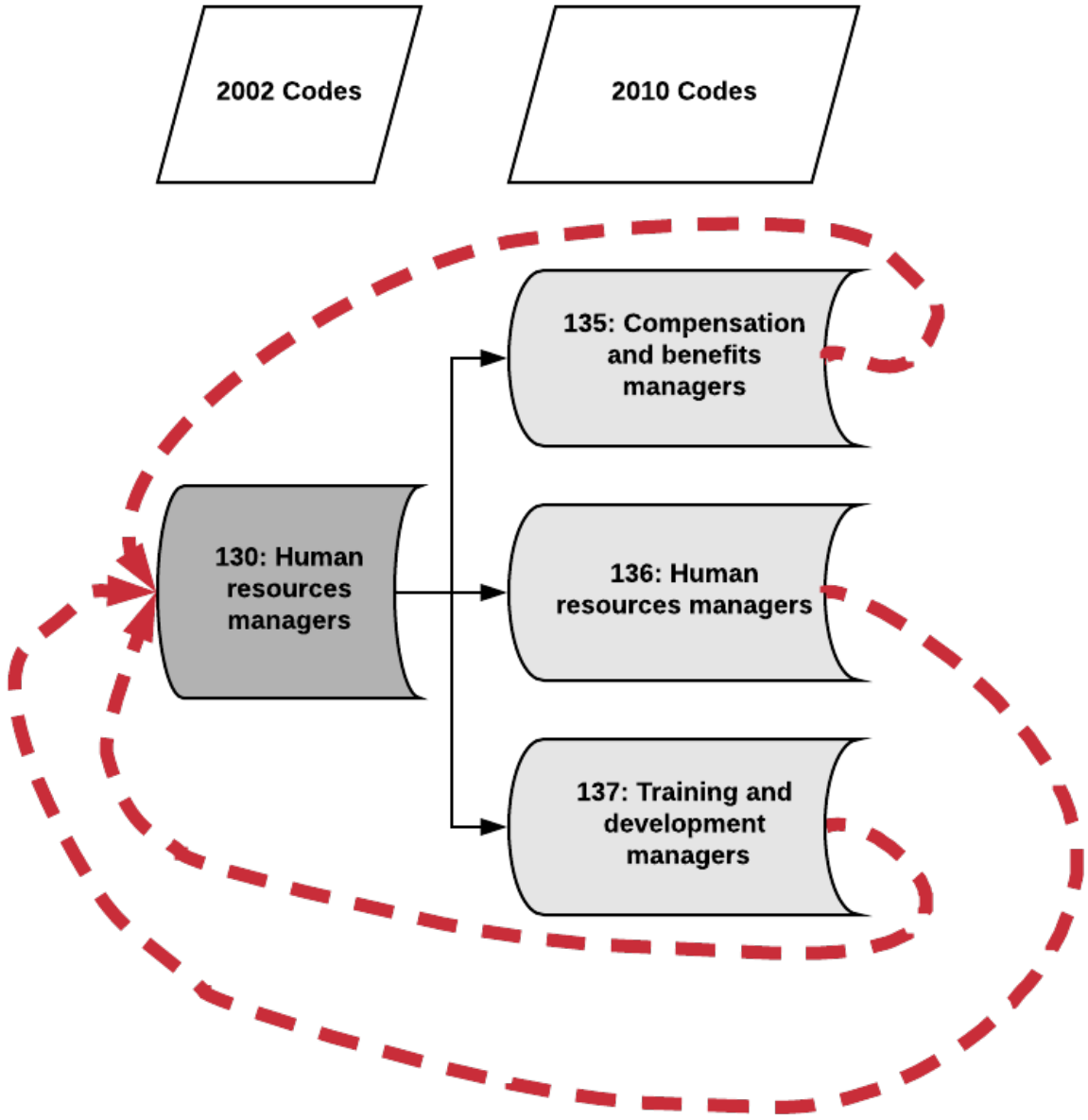
Addressing changes in the occupation coding scheme

The goal of this work is to associate the 2010 occupation codes with the 1990 coding scheme. Because there is no direct crosswalk between the 1990 and 2010 occupation coding schemes, we first code the 2010 occupations to the 2002 coding scheme. We utilize two crosswalks, or documents that map the relationship between the two coding systems: the 2010 Occupation Codes with Crosswalk from 2002 (referred to as the 2002-2010 crosswalk going forward) (United States Census Bureau 2011a), and the 2008-2010 ACS Conversion Rate Crosswalk (referred to as the 2008-2010 conversion rate crosswalk going forward) (United States Census Bureau 2011c). The 2002-2010 crosswalk associates all 2002 occupation codes with a 2010 occupation; this is necessary to identify how codes between the two schemes are related. We use this information to determine which codes do not change between the coding scheme, as well as identifying codes that differ between the coding schemes. The 2002-2010 crosswalk does not identify the proportion of each new 2010 category associated with the 2002 categories, which is necessary for identifying the modal category and appropriately mapping codes to the 2002 coding scheme. Fortunately, the 2008-2010 conversion rate crosswalk identifies the proportion of a 2002 category that is associated with each 2010 occupation code.

Section A: Simple (one-to-many) disaggregation

Updates to the 2010 occupation codes include the addition of new occupations. Newly added occupations often add further definition in the form of multiple occupations, to what was previously a singular, broad category. For example, the 2002 occupation code "130: Human resources managers" was split among "135: Compensation and benefits managers", "136: Human resources managers," and "137: Training and development managers" in 2010. This disaggregation is simple, the newly created occupation codes can be easily traced to their 2002 counterpart. All of the new 2010 occupations are associated with the same 2002 occupation code: 130 (illustrated in Figure 1; the specific example is available in section A-1 of Table A1). This is the simplest type of change between the 2002 and 2010 occupation codes.

Figure 1: Illustration of simple (one-to-many) disaggregation



Section B: Complex (many-to-many) disaggregation

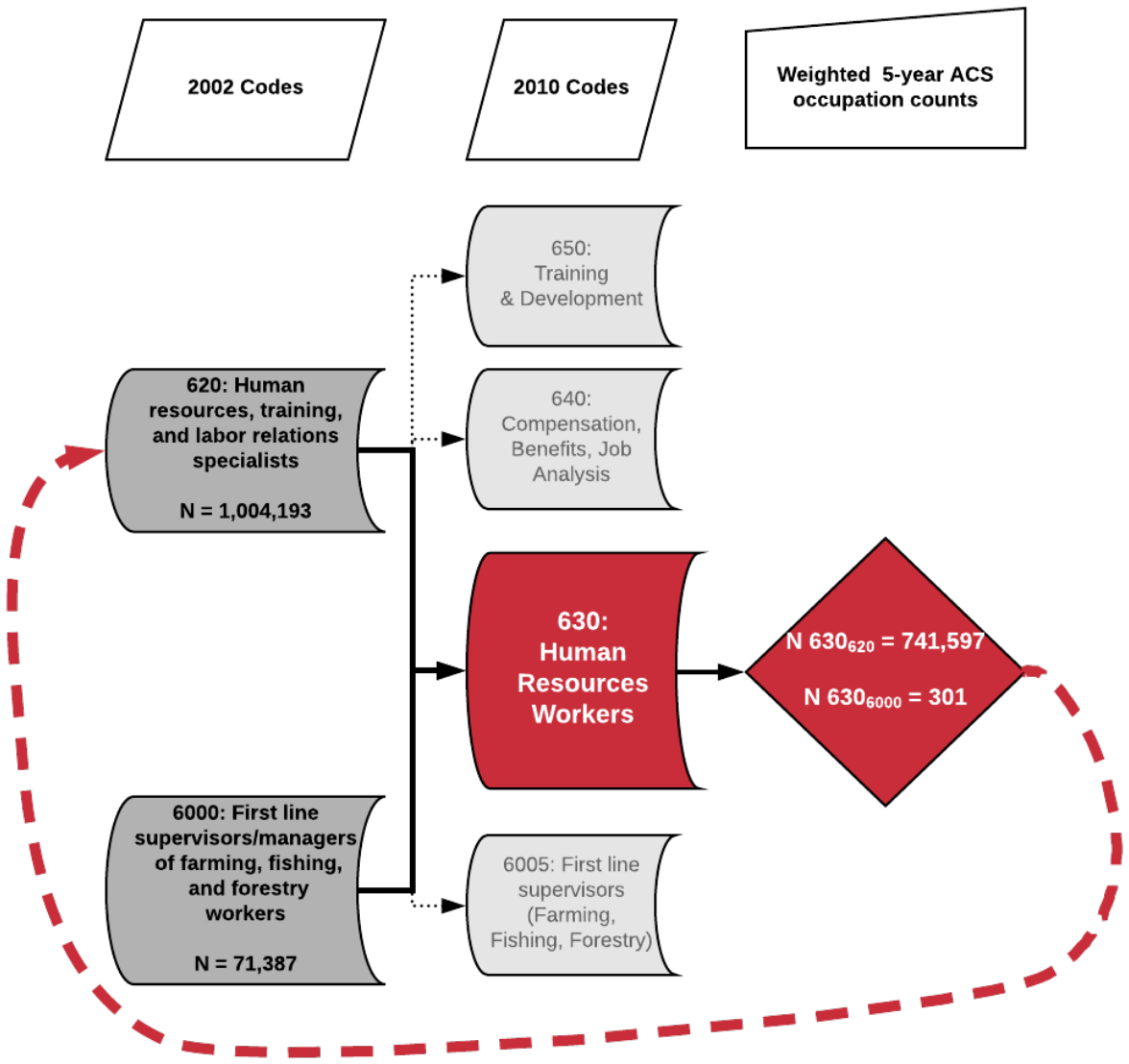
Complex (many-to-many) disaggregation changes occur when a newly added 2010 occupation code is associated with more than one 2002 occupation code. Addressing these changes requires the use of the 2008-2010 conversion rate crosswalk. To incorporate the 2010 codes into OCC1990, the 2010 codes

must be coded back to the 2002 scheme, and then the 1990 scheme. However, the 2008-2010 conversion rate crosswalk provides proportions going forward from 2002 to 2010, but not back in time. We address this limitation by using the 5-year 2005-2009 ACS data from IPUMS (Ruggles et al. 2018) to estimate weighted counts that we use for the modal assignment of 2010 codes to their 2002 counterparts[2]. The 2005-2009 5-Year ACS data use 2002 occupation codes.

First, we identify new 2010 codes that are generated through disaggregation that are also associated with more than one occupation code in 2002. We group together all 2002 occupation codes that are associated with the same 2010 code (referred to as a "common batch" below). We then estimate the total weighted count of each 2002 occupation code in the common batch. Next, we apply the conversion rate from the 2008-2010 conversion rate crosswalk to the weighted 2002 counts, to identify the proportion of each 2002 occupation code that is projected to each 2010 code in the common batch. For example, if there are 10,000 people assigned to a 2002 occupation code and the conversion rate identifies rates of 70% for occupation A and 30% for occupation B in 2010, occupation A is projected to contain 7,000 people and occupation B is projected to contain 3,000 people; this is repeated for each 2002 occupation in the common batch. We have one projection for each 2010 code associated with more than one 2002 code in the common batch (referred to as "2010 subgroups" below). We compare all 2010 subgroups to identify the largest, and assign all cases of that 2010 occupation code to the 2002 code from which the modal 2010 subgroup code was derived. This process is illustrated in Figure 2 using human resources workers and forestry/fishing/farming supervisors (also available in Section B-1 in Table A1).

[2] While unrelated to the first limitation about the direction of the crosswalk, it should be noted that the five year also benefits from a larger sample size than the three years of data used in the 2008-2010 ACS conversion rate crosswalk.

Figure 2: Illustration of complex (many-to-many) disaggregation



Weighted IPUMS 5-Year ACS Data, 2005-2009

Occupation code 630 in the 2010 coding scheme is a simple example of the complexities associated with determining how to map the 2010 coding scheme onto the 2002 coding scheme. Between 2002 and 2010, the occupation category "620: Human resources, training, and labor relations specialists" was split into three new categories:

- 630: Human resources workers,
- 640: Compensation, benefits, and job analysis specialists, and
- 650: Training and development specialists

Similarly, the 2002 occupation category "6000: First line supervisors/managers of farming, fishing, and forestry workers" was split into two categories:

- 6005: First-line supervisors of farming, fishing, and forestry workers, and
- 630: Human resources workers

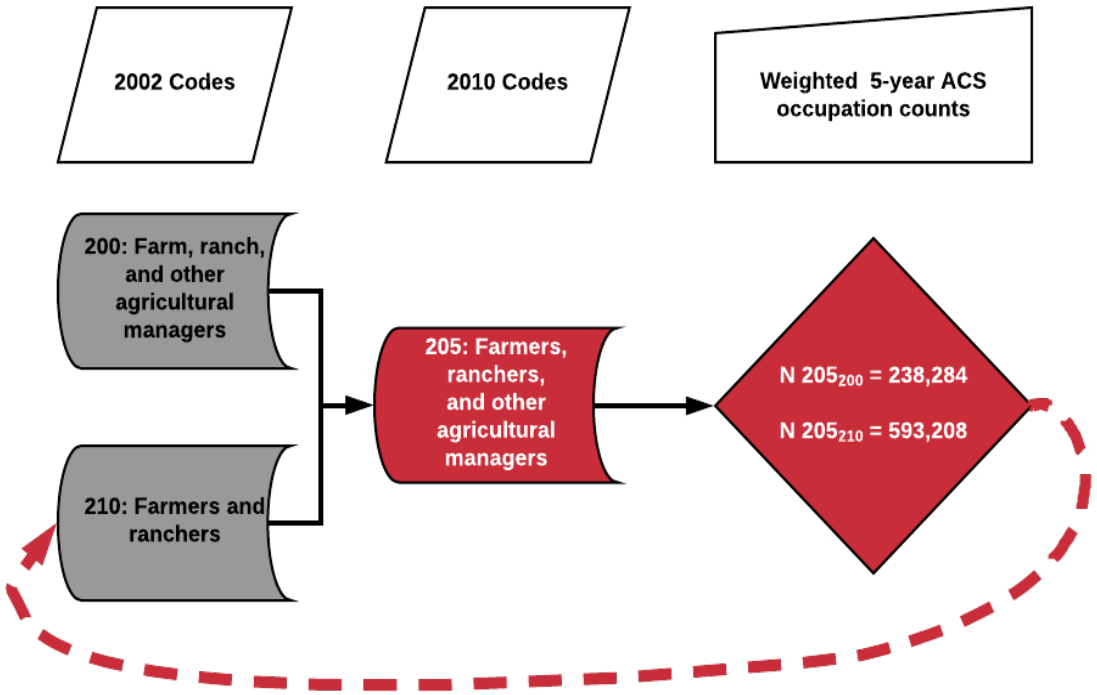
The new 2010 occupation code "630: Human resources workers" includes some cases from both "Human resources, training, and labor relations specialists" and "First-line supervisors/managers of farming, fishing, and forestry workers". Given our modal assignment methodology, we must determine onto which 2002 occupation code (620 or 6000) 2010 code 630 should map. An estimated 1,004,193 persons are assigned to the 2002 occupation code "620: Human resources, training, and labor relations specialists"; 73.85% (741,597) of whom are estimated to be in the shared 2010 occupation code "630". An estimated 71,688 persons are assigned the 2002 occupation code "6000: First-line supervisors of farming, fishing, and forestry workers"; the conversion rate indicates 0.42% (301) would be categorized under the new shared "630" category. Based on the larger estimated size of the 2010 subgroup associated with the 620 code, all 2010 occupation codes of 630 will be associated with the 2002 code "620", and then coded to the corresponding 1990 occupation code.

Some other cases have more overlapping occupations and smaller margins. However, we consistently use modal assignment, and assign all cases of a new 2010 code to the same code in 2002. This systematic approach can be replicated in other datasets, and easily checked by researchers. Additionally, researchers can choose to categorize these new occupations differently if they do not agree with our approach.

Section C: Aggregation

Aggregation of occupation codes occurs when two or more 2002 occupation codes are aggregated to create a single occupation code in the 2010 scheme. In cases of aggregation, we use 5-Year 2005-2009 ACS data from IPUMS to estimate the number of persons in each of the related 2002 occupations, and code all cases of the new aggregated 2010 code to the largest of the related 2002 occupation codes. Figure 3 outlines the process for aggregation, using farming and ranching occupations as an example. Between 2002 and 2010, there is only one case of aggregation. The 2002 occupation code "200: Farm, ranch, and other agricultural managers" was aggregated with "210: Farmers and ranchers" to create the new 2010 occupation code: "205: Farmers, ranchers, and other agricultural managers". In the case of changes to farming and farm manager occupations, there are more "210: Farmers and ranchers" than "200: Farm, ranch, and other agricultural managers", so all persons assigned a 2010 occupation code of "205" are coded to the 2002 code "0210", and then to the corresponding 1990 occupation code.

Figure 3: Illustration of aggregation



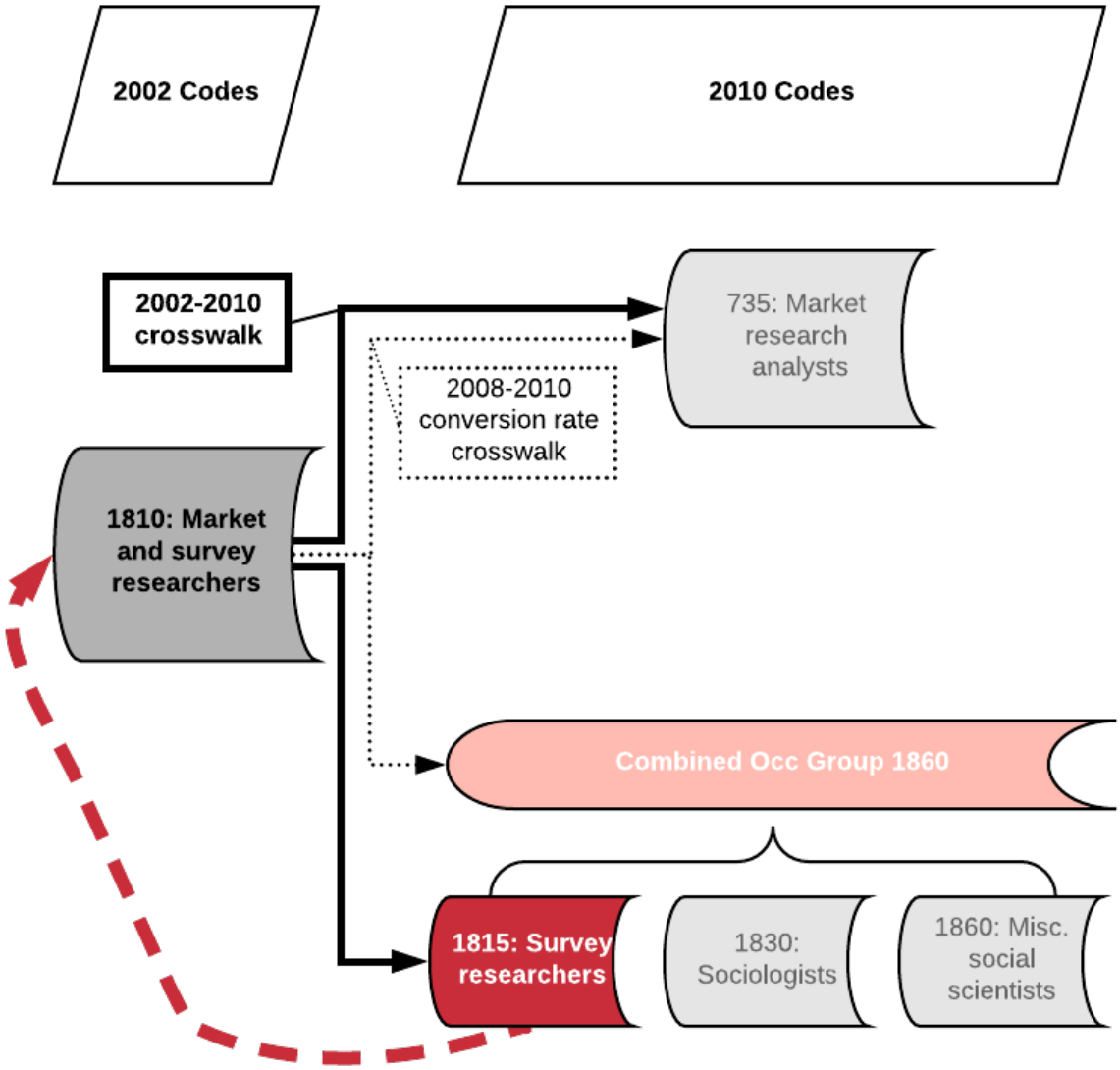
Weighted IPUMS 5-Year ACS Data, 2005-2009

Section D: Combination without aggregation

In some instances, the 2008-2010 conversion rate crosswalk combines multiple unique census codes into a single category; these are not cases of "aggregation" as defined in this paper. Combination without aggregation occurs when multiple occupations retain their distinct Census occupation codes, SOC codes, and labels, but are combined into a group in the 2008-2010 Census conversion rate crosswalk. We will refer to resulting groups of combined occupation codes as "combined occupation groups", and will refer to the individual occupations with unique Census occupation codes as "component codes."

When identifying significant changes to include in Table 1, the combination without aggregation changes only include cases where component codes of a combined occupation group undergo complex (many-to-many) disaggregation between the coding schemes (see Section B above for more detail). Combination without aggregation is best conveyed using an example. Figure 4 illustrates the harmonization of the occupation "Market and survey researchers" as an example of combination without aggregation.

Figure 4: Illustration of complex (many-to-many) disaggregation of component codes in combined occupation groups



The code "1815: Survey researchers" is a new occupation in the 2010 coding scheme; the 2008-2010 conversion rate crosswalk includes it as a component code in the combined occupation group 1860, which also includes component codes "1830: Sociologists" and "1860: Miscellaneous social scientists and related workers". The 2008-2010 conversion rate crosswalk maps the 2002 occupation code "1810: Market and survey researchers" onto two new codes "735: Market research analysts and marketing

specialists[3]" and the combined occupation group 1860 (noted by a dashed arrow in Figure 4). However, the 2002-2010 crosswalk (noted by a solid arrow in Figure 4) instead maps the 2002 occupation code "1810" as being split between "735", and "1815". Comparing both crosswalks highlights that 2008-2010 conversion rate crosswalk associates the 2002 code with the combined occupation group code (1860) instead of the more appropriate component code (1815). We first associate the new 2010 occupation code "1815: Survey researchers" with the 2002 occupation code "1810: Survey researchers", and then with the corresponding 1990 occupation code.

Future Work and Limitations

The next major revision to the SOC system is scheduled for 2018. When data using these revised codes become available, we will review documentation on the SOC and Census occupational system updates, Census crosswalks, and conversion rates. Using this information, we plan to extend the IPUMS harmonized occupation data to include additional years of data under a unique coding scheme.

Incorporating each update to the occupation coding system involves the loss of some detail in an effort to harmonize changes to occupations over time. Despite 1990 occupation codes being the basis for OCC1990, some 1990 occupation codes are not included in the variable to facilitate its comparability over time. While this paper aims to establish straightforward protocol that is clearly documented and can be replicated by other researchers, there may be drawbacks for some research applications. For example, by using the modal category to code 2010 occupation codes to their 2002 counterparts in cases of aggregation or complex (many-to-many) disaggregation, some occupation codes are lost entirely when harmonizing occupations (e.g., beginning with the

[3] The 2010 occupation code 735 is associated with several other 2002 occupations; this is not depicted in Figure 4. Figure 4 illustrates the protocol for codes that are affected by combination without aggregation. For information on complex (many-to-many) disaggregation, see section B and Figure 2.

2010 coding scheme, there will no longer be any cases of the 2002 code "200: Farm, ranch, and other agricultural managers" as described in Section C). Analysts interested in specific subsets of occupations may not find our modifications to the 2010 coding scheme suitable for their work. Similarly, while this approach can be iterated over multiple changes to the occupational coding scheme, researchers should consider how many changes in the coding scheme are appropriate for their analyses. The incorporation of each additional change to the coding scheme will result in further loss of detail.

Conclusion

The ability to compare occupations systematically and consistently over time is central to research that focuses directly on occupations and the labor market, as well as analyses that use occupation as a proxy or control. In this paper, we identify the lack of harmonized occupation data available under the 2010 Census occupation coding scheme, classify changes introduced with the 2010 coding scheme, and define a protocol that addresses these changes to create harmonized occupation data. The result of this research is freely available through the widely used IPUMS Center for Data Integration databases that include the variable OCC1990. Additionally, IPUMS documentation includes the relevant crosswalks, which researchers can apply to non-IPUMS datasets. This paper builds upon the foundation provided by the previous versions of the IPUMS variables OCC1950 and OCC1990. Including the 2010 coding scheme creates opportunities for researchers to utilize recent occupation data with additional years of data, allowing the long history of social science research of occupations to continue uninterrupted.

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Appendix 1

Table A1. Crosswalk, weighted frequencies for justification, and complex change assignment for 2010-2002 Census occupation codes.

Crosswalk						Evidence	Result
2002 Occupation Title	2002 code	2010 code*	2010 Occupation Title	Combined Occupation Group 2010 Code	Combined Occupation Group 2010 Occupation Title	Weighted N in 2002	Final 2002 Code Assignment
Section A: Simple (one-to-many) disaggregation							
A-1 Human resource management							
Human resources managers	130						--
		135	Compensation and Benefits Managers			--	130
		136	Human Resources Managers			--	130
		137	Training and Development Managers			--	130
A-2 Medical and life science occupations							
Medical Scientists	1650						--
		1650	Medical Scientists			--	1650
		1660	Life Scientists, All Other			--	1650
A-2 Social service specialist occupations							
Miscellaneous community and social service specialists	2020						--
		2015	Probation officers and correctional treatment specialists			--	2020
		2016	Social and human service assistants			--	2020
		2025	Miscellaneous community and social service specialists, including health educators and community health workers			--	2020
A-3 Therapy occupations							
Therapists, All Other	3240						--
		3235	Exercise Physiologists			--	3240
		3245	Therapists, All Other			--	3240
A-4 Nursing occupations							
Registered Nurses	3130						--
		3255	Registered nurses			--	3130
		3256	Nurse anesthetists			--	3130
		3258	Nurse practitioners and nurse midwives			--	3130
A-5 Medical assistant occupations							
Medical assistants and other healthcare support occupations, except dental assistants	3650						--
		3645	Medical assistants			--	3650
		3646	Medical transcriptionists			--	3650
		3647	Pharmacy aides			--	3650
		3648	Veterinary assistants and laboratory animal caretakers			--	3650

2002 Occupation Title	2002 code	2010 code*	2010 Occupation Title	Combined Occupation Group 2010 Code	Combined Occupation Group 2010 Occupation Title	Weighted N in 2002	Final 2002 Code Assignment
		3649	Phlebotomists			--	3650
		3655	Healthcare support workers, all other, including medical equipment preparers			--	3650
A-6 Transportation attendant occupations							
Transportation Attendants	4550						
		9050	Flight attendants			--	4550
		9415	Transportation attendants, except flight attendants			--	4550
A-7 Sales occupations							
Sales and related workers, all other	4960						--
		726	Fundraisers			--	4960
		4965	Sales and Related Workers, All Other			--	4960
A-8 Office and administrative support occupations							
Miscellaneous office and administrative support workers including desktop publishers	5930						--
		5165	Financial clerks, all other			--	5930
		5940	Miscellaneous office and administrative support workers, including desktop publishers			--	5930
A-9 Production worker occupations							
Other production workers including semiconductor processors and cooling and freezing equipment operators	8960						--
		7855	Food processing workers, all other			--	8960
		8965	Other production workers, including semiconductor processors and cooling and freezing equipment operators			--	8960
Section B: Complex (many-to-many) disaggregation							
B-1 Human resources and farming/fishing/forestry supervision occupations							
Human resources workers	620						--
		630	Human resources workers			741,597	620
		640	Compensation, benefits, and job analysis specialists			--	620
		650	Training and development specialists			--	620
First-line supervisors of farming, fishing, and forestry workers	6000						--
		630	Human resources workers			301	620
		6005	First-line supervisors of farming, fishing, and forestry workers			--	6000

2002 Occupation Title	2002 code	2010 code*	2010 Occupation Title	Combined Occupation Group 2010 Code	Combined Occupation Group 2010 Occupation Title	Weighted N in 2002	Final 2002 Code Assignment
B-2 Information technology occupations							
Computer scientists and systems analysts	1000						--
		1005	Computer and information research scientists			--	1000
		1006	Computer systems analysts			--	1000
		1106	Computer network architects			14,797	1110
		1107	Computer occupations, all other			--	1000
Computer support specialists	1040						--
		1050	Computer support specialists			507,919	1040
Network and computer systems administrators	1100						--
		1105	Network and computer systems administrators			251,643	1100
Network systems and data communications analysts	1110						--
		1007	Information security analysts			--	1110
		1030	Web developers			--	1110
		1050	Computer support specialists			32,592	1040
		1105	Network and computer systems administrators			66,340	1100
		1106	Computer network architects			100,164	1110
B-3 Legal occupations							
Lawyers	2100						--
		2100	Lawyers			--	2100
		2105	Judicial Law Clerks			9,259	2100
Paralegals and Legal Assistants	2140						--
		2145	Paralegals and Legal Assistants			408,553	2140
Miscellaneous Legal Support Workers	2150						--
		2105	Judicial Law Clerks			1,551	2100
		2145	Paralegals and Legal Assistants			22,023	2140
		2160	Miscellaneous Legal Support Workers			--	2150
B-4 Health diagnosing and technology occupations							
Health Diagnosing and Treating Practitioner Support Technicians	3410						--
		3420	Health Practitioner Support Technologists and Technicians			550,636	3410
Miscellaneous Health Technologists and Technicians	3530						--
		3420	Health Practitioner Support Technologists and Technicians			10,404	3410
		3535	Miscellaneous Health Technologists and Technicians			--	3530

2002 Occupation Title	2002 code	2010 code*	2010 Occupation Title	Combined Occupation Group 2010 Code	Combined Occupation Group 2010 Occupation Title	Weighted N in 2002	Final 2002 Code Assignment
B-5 Protective service occupations							
Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	560						--
		565	Compliance Officers			--	560
		3945	Transportation Security Screeners			18	3920
Security Guards and Gaming Surveillance Officers	3920						--
		3930	Security Guards and Gaming Surveillance Officers			--	3920
		3945	Transportation Security Screeners			24,581	3920
Lifeguards and Other Protective Service Workers	3950						--
		3945	Transportation Security Screeners			832	3920
		3955	Lifeguards and Other Recreational, and All Other Protective Service Workers			--	3950
B-6 Installation (including solar panel) occupations							
Electricians	6350		Electricians				--
		6355				--	6350
		6765	Miscellaneous construction workers, including solar photovoltaic installers, septic tank servicers and sewer pipe cleaners			191	6760
Roofers	6510						--
		6515	Roofers			--	6510
		6765	Miscellaneous construction workers, including solar photovoltaic installers, septic tank servicers and sewer pipe cleaners			32	6760
Miscellaneous construction workers including septic tank servicers and sewer pipe cleaners	6760						--
		6765	Miscellaneous construction workers, including solar photovoltaic installers, septic tank servicers and sewer pipe cleaners			62,917	6760
Heating, air conditioning, and refrigeration mechanics and installers	7310						--
		6765	Miscellaneous construction workers, including solar photovoltaic installers, septic tank servicers and sewer pipe cleaners			127	6760

2002 Occupation Title	2002 code	2010 code*	2010 Occupation Title	Combined Occupation Group 2010 Code	Combined Occupation Group 2010 Occupation Title	Weighted N in 2002	Final 2002 Code Assignment
		7315	Heating, air conditioning, and refrigeration mechanics and installers			--	7310
Other installation, maintenance, and repair workers including commercial divers, and signal and track switch repairers	7620						--
		6765	Miscellaneous construction workers, including solar photovoltaic installers, septic tank servicers and sewer pipe cleaners			223	6760
		7630	Other installation, maintenance, and repair workers, including wind turbine service technicians, and commercial divers, and signal and track switch repairers			--	7620
B-7 Printing related occupations							
Bookbinders and bindery workers	8230						--
		8256	Print binding and finishing workers			47,454	8230
Job printers	8240						--
		8255	Printing press operators			72,077	8260
		8256	Print binding and finishing workers			181	8230
Printing machine operators	8260						--
		8255	Printing press operators			218,245	8260
Section C: Aggregation							
C-1 Farm and ranch occupatons							
Farm, ranch, and other agricultural managers	200	205	Farmers, ranchers, and other agricultural managers			238,284	210
Farmers and Ranchers	210	205	Farmers, ranchers, and other agricultural managers			593,208	210
Section D: Combination without aggregation							
D-1 Funeral occupations							
Funeral Directors	320						--
		325	Funeral Service Managers	430	Miscellaneous managers, including funeral service managers and postmasters and mail superintendents	6,487	320
		4465	Embalmers and Funeral Attendants			45,079	320
Managers, All Other	430						--
		430	Managers, All Other			3,466,961	430
Funeral Service Workers	4460						--

2002 Occupation Title	2002 code	2010 code*	2010 Occupation Title	Combined Occupation Group 2010 Code	Combined Occupation Group 2010 Occupation Title	Weighted N in 2002	Final 2002 Code Assignment
		4465	Embalmers and Funeral Attendants			21,158	430
D-2 Business and social science occupations							
Meeting and Convention Planners	720						--
		725	Meeting, Convention, and Event Planners			51,341	720
Other Business Operations Specialists	730						--
		725	Meeting, Convention, and Event Planners			1,687	720
		735	Market Research Analysts and Marketing Specialists			1,636	1810
		740	Business Operations Specialists, All Other			--	720
		425	Emergency Management Directors			--	730
Public Relations Specialists	2820						--
		725	Meeting, Convention, and Event Planners			2,063	720
		735	Market Research Analysts and Marketing Specialists			5,823	1810
		2825				--	2820
Market and Survey Researchers	1810		Public Relations Specialists				--
		735	Market Research Analysts and Marketing Specialists			172,468	1810
		1815	Survey Researchers	1860	Miscellaneous Social Scientists, including Survey Researchers and Sociologists	5,078	1810
Miscellaneous Social Scientists and Related Workers	1860						--
		1860	Miscellaneous Social Scientists and Related Workers			50,423	1860