Technical Report
Panel Study of Income Dynamics
Construction and Evaluation of the Longitudinal Sample Weights 2011

August, 2013

Steven G. Heeringa, Patricia A. Berglund, Katherine McGonagle, Robert Schoeni
ISR, University of Michigan, Ann Arbor, MI

This document describes the construction of the 2011 Core/Immigrant individual and family longitudinal sample weights for the Panel Study of Income Dynamics (PSID) and compares the associated PSID weighted estimates of population distributions on key estimates to those obtained from the 2011 Current Population Survey.

1. The PSID Sample and Following Strategy in 2011

PSID interviewed 8,907 families in 2011. All of these families are members of the Core or the Immigrant samples[1]. In 2011, the following rule was the same as in the prior 2009 wave[2]. Specifically, sample persons who participated in the previous wave survey were followed. Additionally, the PSID attempted to obtain an interview with sample individuals who did not respond in the prior wave (2009 survey year), but responded in the wave before the prior wave (2007 survey year).

1 The Core sample is the combination of two samples: an area probability sample of households selected from the Survey Research Center 1960 National Sample (SRC) and a subsample of families interviewed in 1967 by the Bureau of the Census for the Office of Economic Opportunity (SEO). The respondents from the Core sample have been interviewed since 1968. In 1997 and 1999 a sample of the post-1968 immigrants was added. Information on the immigrant sample is available under the column "Other Documentation" for years 1997 and 1999 at the following url: http://simba.isr.umich.edu/Zips/ZipMain.aspx.

2 For more detail on the following rules in 1993-2005 survey years see Table 1 in Gouskova et al. (2008) (http://psidonline.isr.umich.edu/data/weights/Long-weights-doc.pdf)

3 Note, that some characteristics are not strictly comparable between the two surveys. For example, in the PSID race is not asked for every household member while in the CPS it is. To calculate proportions of black and non-black individuals in the PSID data, individual race was imputed as equivalent to the race of the family head. Second, the family income measure in the PSID is not directly comparable to the CPS household income measure due to the difference in definition of family unit in PSID and household unit in CPS.

2. Methodological Approach to the 2011 Core/Immigrant Longitudinal Weight Construction

The 2011 weights are attrition-adjusted weights. The last attrition adjustment of the PSID longitudinal weights was done in 2007. The current PSID policy is to apply an attrition adjustment every four years—that is, two biennial waves after the last adjustment was applied. Thus, the construction of the 2011 longitudinal weights starts with the 2007 longitudinal weight as the basis. The 2011 weights are constructed using the same methodological approach as used for the 2007 longitudinal weights, i.e. for those who responded in 2007, the 2011 weights are obtained by multiplying the 2007 longitudinal weight by the attrition adjustment factor, and for new sample members, (sample newborns and those sample persons who moved in) the 2011 weight is calculated as an average of head's and wife's weight in 2011. The detailed description of this approach is provided in Gouskova et al. (2008). To account for attrition between the 2007 and 2011 waves among the sample respondents who participated in the 2007 study, an adjustment factor was calculated.

Table 1 reports the results of the multinomial logistic regression estimating probabilities of three possible states in 2011 for those who responded in 2007: 1. response, 2. non- response and 3. known death. Using the estimates, the probability of response conditional on surviving has been calculated as described in section 4.3 in Gouskova et al. (2008). The inverse of this probability is the adjustment factor that is used to multiply with the 2007 individual weight in order to obtain the 2011 individual weight.

3. Results

3.1 Descriptive Statistics of the Core/ Immigrant Longitudinal Weights, 2011

Tables 2 through Table 5 describe the resulting 2011 Core/Immigrant longitudinal weight. To enable comparison of the longitudinal weights across years, the same set of descriptors is reported for the longitudinal weights from the five prior waves.

Tables 2 and 3 compare the total number of cases with positive, zero, and missing values for individual and family weights with the total numbers of sample and non-sample individuals (families with and without sample members). For individual weights, the number of weights with a positive value is equal to the number of sample persons, and the number of the zero-valued individual weights is the same as the number of non-sample persons (Table 2). As in the 2009 survey, in 2011 all families had at least one sample member (Table 3). As a result, all PSID families in 2011 carry a positive longitudinal family weight.

Tables 4 and 5 report summary statistics for the longitudinal individual and family weights. The summary statistics of the 2011 longitudinal weights are close to those in the five most recent surveys. Across years, the measures of dispersion indicate that there is an increasing trend in variability of the distribution in the individual and family weights.

The 2011 longitudinal weights are stored in the PSID data archive under names provided in Table

3.2 Distributions of Some Demographic and Socioeconomic Characteristics, PSID and CPS

Tables 7, 8, and 9 compare distributions of selected population characteristics, including age, gender, and race in the PSID data obtained with and without the longitudinal weights, to those in the Current Population Survey (CPS, March Supplement) for the 2001 – 2011 PSID survey years. These tables are useful for examining three features of the PSID data: consistency of un-weighted and weighted estimates across years, the effect of the longitudinal weights on the distributions of the characteristics, and, finally, the level of agreement between the PSID estimates and those obtained from the CPS data[3].

The tables show that the PSID weighted distributions are consistent with the un-weighted distributions. Comparisons of the un-weighted and weighted PSID distributions with the CPS distributions reveals that in a majority of cases the weighted estimates are closer to CPS estimates than are the estimates obtained without weights. In addition, the weighted PSID and CPS estimates align fairly closely for most selected demographic variables. It is important to note that unlike many national survey programs, the PSID longitudinal weights for families and individuals are not post-stratified to American Community Survey (ACS) or CPS estimates of household/family or individual population. The comparison of estimated population distributions for the CPS and PSID therefore highlights the ability of the PSID's endogenous (to the PSID sample) nonresponse adjustments to compensate for differential panel attrition across the population categories used in this comparison.

References

Gouskova E., S. Heeringa, K. McGonagle, R. Schoeni, and F. Stafford, 2008. “Panel Study of Income Dynamics Revised Longitudinal Weights 2007”, PSID Technical Report #08-05, ISR, University of Michigan-
http://psidonline.isr.umich.edu/Publications/Papers/tsp/2008-05_PSID_Revised_Longitudinal_Weights_1993-2005%20.pdf

Table 1. Multinomial Logistic Regression Using 2007 Covariates to Predict Response, Non-Response or Died in 2011

	Died before 2011 Interview[1]						Non-Response in 2011 Interview[1]				
	2007 Covariates	**Estimate**	**SE**	**Wald ChiSq**	**P Value**		**2007 Covariates**	**Estimate**	**SE**	**Wald ChiSq**	**P Value**
	Intercept	-1.0888	1.0018	1.1813	0.2771		Intercept	-1.9227	0.4746	16.4148	<.0001
	1st Percentile Income	**-4.0588**	**1.2524**	**10.5025**	**0.0012**		**1st Percentile Income**	0.2041	0.5649	0.1305	0.7179
	Log income	**-0.5646**	**0.0805**	**49.1829**	**<.0001**		**Log income**	-0.0215	0.0418	0.2648	0.6068
	99th Percentile Income	-10.3543	265	0.0015	0.9688		99th Percentile Income	-0.1653	0.3283	0.2535	0.6147
	Age	0.0325	0.0184	3.1009	0.0783		**Age**	**-0.0206**	**0.00497**	**17.1723**	**<.0001**
	Age*Age	**0.000325**	**0.000162**	**4.0078**	**0.0453**		**Age*Age**	**0.000338**	**0.00061**	**30.6038**	**<.0001**
	Midwest	-0.2445	0.2664	0.8422	0.3588		**Midwest**	**-0.2856**	**0.1079**	**6.9993**	**0.0082**
	South	0.0579	0.2486	0.0542	0.8159		South	-0.0442	0.1004	0.1938	0.6597
	West	0.1309	0.2761	0.2248	0.6354		**West**	**-0.3378**	**0.1115**	**9.1714**	**0.0025**
	Male	**0.5534**	**0.1753**	**9.9612**	**0.0016**		**Male**	**0.144**	**0.0699**	**4.25**	**0.0393**
	SMSA	0.216	0.1793	1.4515	0.2283		SMSA	-0.0462	0.074	0.3901	0.5323
	Might Move	-0.2438	0.2234	1.1909	0.2752		**Might Move**	**-0.4149**	**0.0841**	**24.3203**	**<.0001**
	SEO	-2.8201	1.9058	2.1896	0.1389		**SEO**	**-4.0613**	**0.9176**	**19.59**	**<.0001**
	SEO*1st percentile	-10.5879	344.7	0.0009	0.9755		**SEO*1st percentile**	**1.8134**	**0.8825**	**4.2226**	**0.0399**
	SEO*Log Income	0.177	0.1613	1.2052	0.2723		**SEO*Log ncome**	**0.358**	**0.082**	**19.0598**	**<.0001**
	SEO*Age	0.0402	0.0348	1.3367	0.2476		SEO*Age	0.0167	0.0111	2.2794	0.1311
	SEO*Age*Age	-0.00022	0.00031	0.4931	0.4825		SEO*Age*Age	-0.00012	0.00014	0.7045	0.4013
	SEO*Midwest	0.1036	0.6272	0.0273	0.8688		**SEO*Midwest**	**-0.6448**	**0.2558**	**6.3537**	**0.0117**
	SEO*South	-0.4184	0.5764	0.5271	0.4678		**SEO*South**	**-0.8648**	**0.2211**	**15.3028**	**<.0001**
	SEO*West	-0.6717	0.7699	0.761	0.383		**SEO*West**	**-0.7182**	**0.3239**	**4.9172**	**0.0266**
	SEO*Male	0.2137	0.3277	0.4252	0.5144		**SEO*Male**	**0.3372**	**0.1417**	**5.6668**	**0.0173**
	SEO*SMSA	-0.2625	0.3576	0.539	0.4629		SEO*SMSA	0.1574	0.1566	1.0096	0.315
	SEO*Might Move	0.6571	0.3731	3.1012	0.0782		**SEO*Might Move**	**0.5138**	**0.1506**	**11.6439**	**0.0006**
	Immigrant Sample	**-0.9084**	**0.3837**	**5.6052**	**0.0179**		**Immigrant Sample**	**0.4366**	**0.0976**	**19.9948**	**<.0001**

[1]Omitted outcome category is responded in 2011.
Bold indicates significant at the alpha=0.05 level.

Table 2. PSID Longitudinal Individual Weights, 2001-2011

Year	Total number of individuals in the study	Core sample (SRC, SEO) and Immigrant sample					
		Total number of individuals	Total number of sample individuals	Total number of non-sample individuals	Number of cases with positive individual weight	Number of cases with zero individual weight	Number of cases with missing individual weight
2001	21400	21400	15646	5754	15646	5754	0
2003	22290	22290	16012	6278	16012	6278	0
2005	22918	22918	16620	6298	16620	6298	0
2007	23508	23508	16906	6602	16906	6602	0
2009	24385	24385	17471	6914	17471	6814	0
2011	24661	24661	17643	7018	17643	7018	0

Table 3. PSID Longitudinal Family Weights, 2001-2011

Year	Total number of families	Core sample (SRC, SEO) and Immigrant sample				
		Total number of families	Number of families with no sample person	Number of families with positive weight	Number of families with zero weight	Number of families with missing weight
2001	7406	7406	211	7195	211	0
2003	7822	7822	257	7565	257	0
2005	8002	8002	0	8002	0	0
2007	8289	8289	0	8289	0	0
2009	8690	8690	0	8690	0	0
2011	8907	8907	0	8907	0	0

Table 4. Summary Statistics for the PSID Longitudinal Individual Weights, 2001-2011 (Sample Persons Only)

Year	N	Mean	Standard Deviation	Min	Max	Coefficient of Variation
2001	15646	25.07	18.97	0.25	167.68	0.76
2003	16012	25.62	19.54	0.25	173.56	0.76
2005	16620	24.81	19.33	0.23	173.56	0.78
2007	16906	25.38	20.09	0.20	181.45	0.79
2009	17471	24.57	19.90	0.23	181.45	0.81
2011	17643	25.65	21.47	0.25	196.44	0.84

Table 5. Summary Statistics for the PSID Longitudinal Family Weights, 2001-2011 (With 2001 and 2003 Based on Families with Positive Weights Only)

Year	N	Mean	Standard Deviation	Min	Max	Coefficient of Variation
2001	7195	22.03	16.74	0.06	167.68	0.76
2003	7565	22.06	17.06	0.12	132.64	0.77
2005	8002	21.04	16.82	0.12	136.03	0.80
2007	8289	21.32	17.40	0.10	139.34	0.82
2009	8690	20.66	17.28	0.10	139.34	0.84
2011	8907	21.71	18.75	0.12	150.89	0.87

Table 6. Names of the PSID Longitudinal Weight Variables, 1993-2011

	Core Longitudinal Weight	
Year	Individual	Family
1993	ER30864	V23361
1994	ER33119	ER4160
1995	ER33275	ER7000
1996	ER33318	ER9251
	Core/Immigrant Longitudinal Weight	
1997	ER33430	ER12084
1999	ER33546	ER16518
2001	ER33637	ER20394
2003	ER33740	ER24179
2005	ER33848	ER28078
2007	ER33950	ER41069
2009	ER34045	ER47014
2011	ER34154	ER52436

Table 7. Comparison of PSID and CPS Weighted Estimates of Mean and Median Age, 2001-2011

A. Household data (age of head)								
	PSID un-weighted		PSID weighted		CPS weighted		Ratio	
Year	Mean	Median	Mean	Median	Mean	Median	Mean	Median
	[1]	[2]	[3]	[4]	[5]	[6]	[3]/[5]	[4]/[6]
	Years	years	years	years	years	years		
2001	44.91	43.00	49.39	47.00	48.72	46.00	1.01	1.02
2003	44.98	43.00	49.60	48.00	48.69	47.00	1.02	1.02
2005	45.08	44.00	49.96	48.00	49.04	47.00	1.02	1.02
2007	45.04	44.00	50.13	49.00	49.30	48.00	1.02	1.02
2009	45.79	44.00	49.82	49.00	47.60	47.00	1.05	1.04
2011	45.21	43.00	50.60	50.00	48.11	47.00	1.05	1.06

B. Individual data								
	PSID un-weighted		PSID weighted		CPS weighted		Ratio	
Year	Mean	Median	Mean	Median	Mean	Median	Mean	Median
	[1]	[2]	[3]	[4]	[5]	[6]	[3]/[5]	[4]/[6]
	years	years	years	years	years	years		
2001	30.86	29.00	36.30	36.00	35.65	35.00	1.02	1.03
2003	31.25	29.00	36.53	36.00	35.82	35.00	1.02	1.03
2005	31.41	29.00	36.93	36.00	36.17	36.00	1.02	1.00
2007	31.61	29.00	37.35	37.00	36.44	36.00	1.02	1.03
2009	32.30	29.00	37.90	37.00	36.80	36.00	1.03	1.03
2011	31.95	29.00	38.75	38.00	37.00	36.00	1.05	1.06

Table 8. Comparison of PSID and CPS Weighted Estimates of % Population by Gender, 2001-2011

A. Individual data								
	PSID un-weighted		PSID weighted		CPS weighted		Ratio	
Year	Male	Female	Male	Female	Male	Female	Male	Female
	[1]	[2]	[3]	[4]	[5]	[6]	[3]/[5]	[4]/[6]
	%	%	%	%	%	%		
2001	47.93	52.07	48.08	51.92	48.86	51.14	0.98	1.02
2003	47.98	52.02	48.17	51.83	48.92	51.08	0.98	1.01
2005	47.88	52.12	48.23	51.77	49.03	50.97	0.98	1.02
2007	47.88	52.12	48.58	51.42	49.08	50.92	0.99	1.01
2009	47.48	52.52	48.40	51.60	49.10	50.90	0.99	1.01
2011	47.87	52.13	48.74	51.26	49.21	50.79	0.99	1.01

Table 9. Comparison of PSID and CPS Weighted Estimates of %Population by Race, 2001-2011

A. Household data (race of head)								
	PSID unweighted		PSID weighted		CPS weighted		Ratio	
Year	Non-black	Black	Non-black	Black	Non-black	Black	Non-black	Black
	[1]	[2]	[3]	[4]	[5]	[6]	[3]/[5]	[4]/[6]
	%	%	%	%	%	%		
2001	69.60	30.40	87.40	12.60	87.80	12.20	1.00	1.03
2003	68.40	31.60	87.20	12.80	87.90	12.10	0.99	1.06
2005	66.70	33.30	86.10	13.90	87.80	12.20	0.98	1.14
2007	65.70	34.30	85.90	14.10	87.60	12.40	0.98	1.14
2009	64.60	35.40	84.40	15.60	87.50	12.50	0.96	1.25
2011	62.93	37.07	85.18	14.82	87.35	12.65	0.98	1.17

B. Individual data (individual race is proxied by the race of head in PSID data)								
	PSID unweighted		PSID weighted		CPS weighted		Ratio	
Year	Non-black	Black	Non-black	Black	Non-black	Black	Non-black	Black
	[1]	[2]	[3]	[4]	[5]	[6]	[3]/[5]	[4]/[6]
	%	%	%	%	%	%		
2001	67.00	33.00	86.90	13.10	87.30	12.70	1.00	1.03
2003	66.10	33.90	86.60	13.40	87.50	12.50	0.99	1.07
2005	64.60	35.40	86.00	14.00	87.40	12.60	0.98	1.11
2007	64.20	35.80	85.90	14.10	87.40	12.60	0.98	1.12
2009	63.70	36.30	85.20	14.80	86.70	13.30	0.98	1.11
2011	63.35	36.65	84.19	15.81	86.43	13.57	0.97	1.17