Lifecycle Earnings Risk and Government Insurance: New Evidence from Australia

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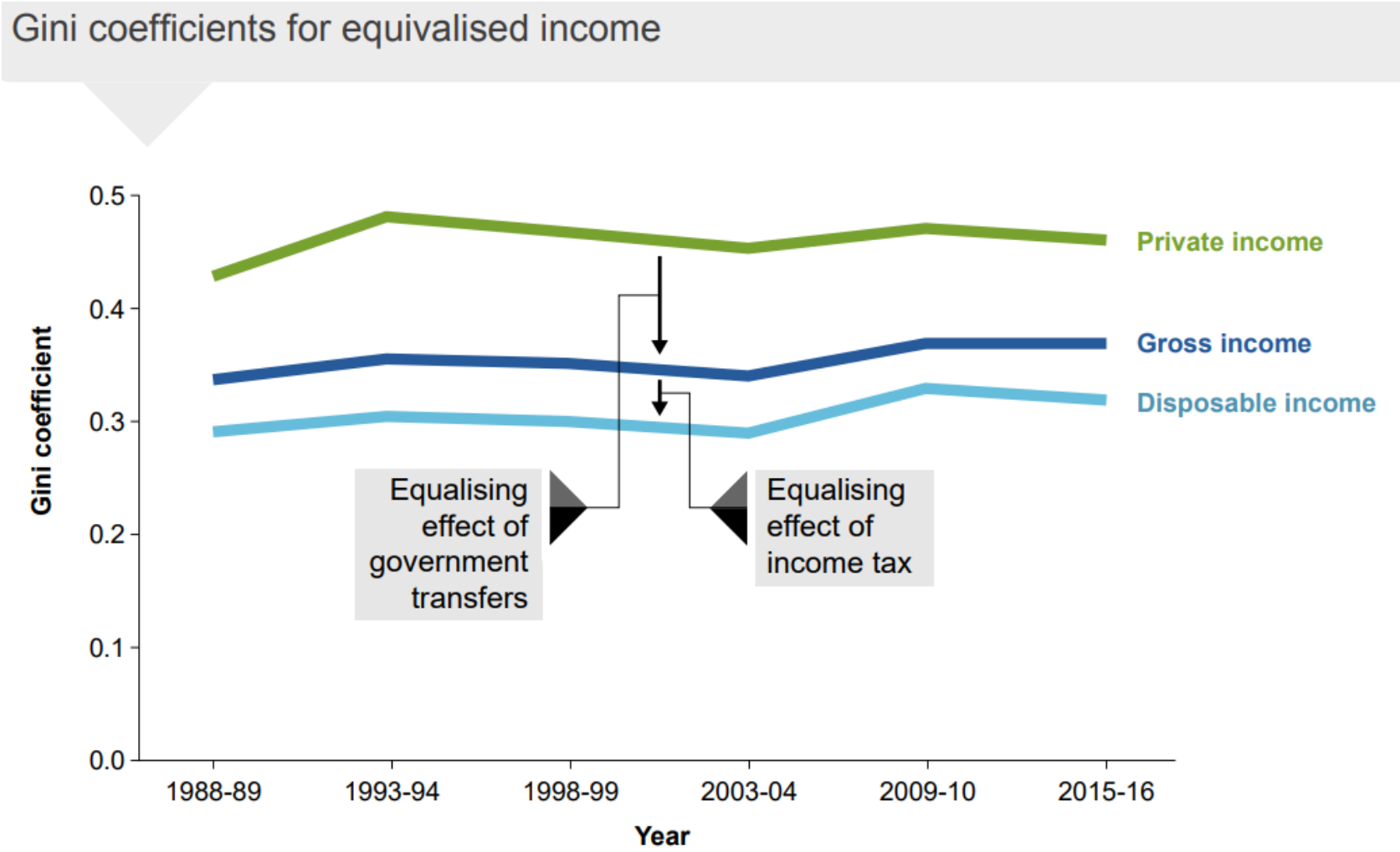
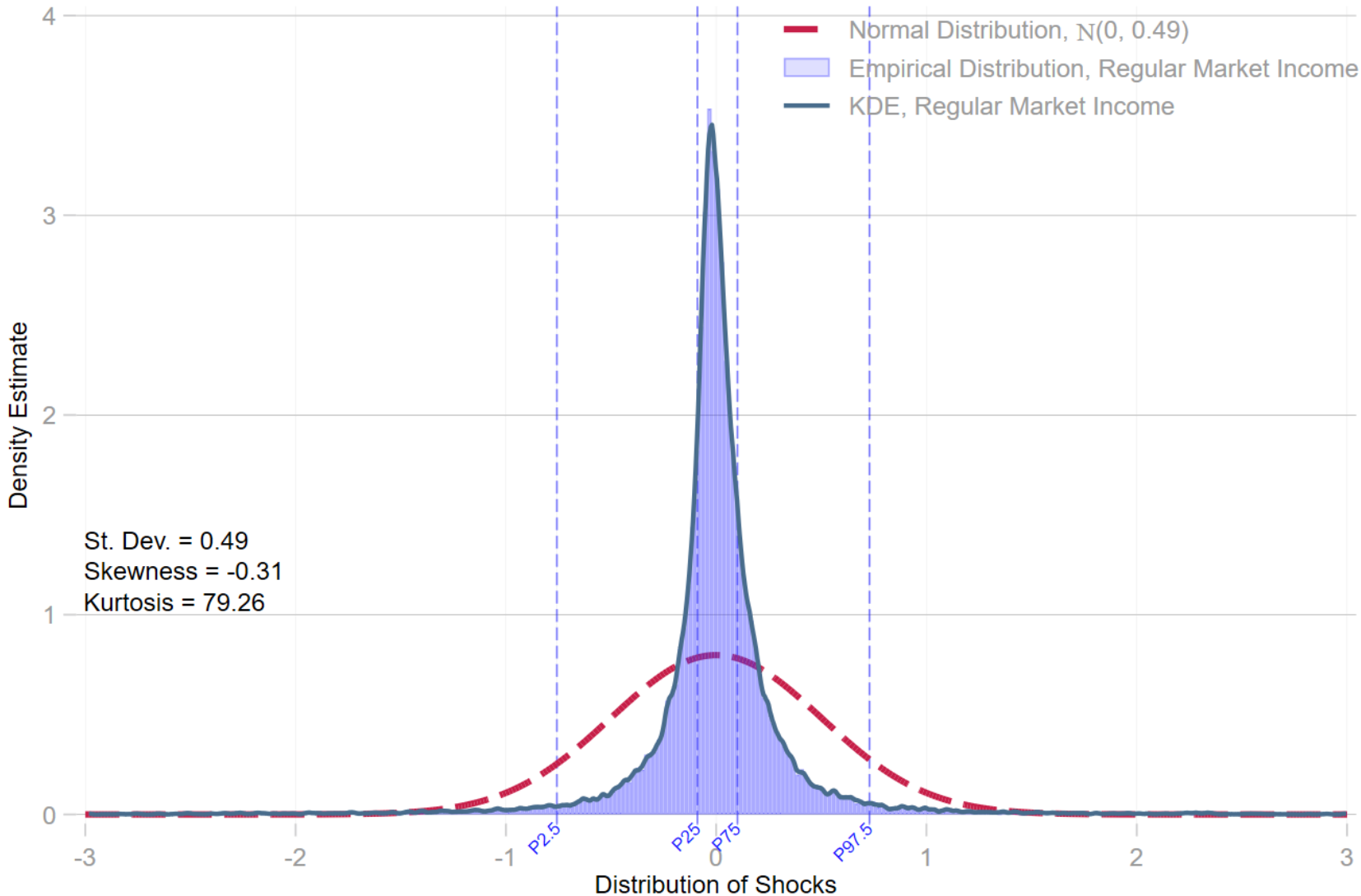
Inequality and the role of government in Australia



Data: ABS (Microdata: Household Expenditure, Income and Housing, 2015-16, Cat. no. 6540.0, released 25/10/17) and ABS HES Basic confidentialised unit record files for years 1988-89 through 2009-10 as available at 25/10/17. **Source**: *Rising Inequality? A stocktake of the evidence (Productivity Commission, 2018).*

See appendix for comparison between average annual income growth figures computed using (i) static distributions by PC, and (ii) our method.

Empirical distribution of annual earnings residual shocks



See 3-year average earnings residual shock distribution in the appendix.

Our study

1. Documents higher-order moments of the income process in Australia;

2. Investigates sources of earnings risks and insurance;

3. A new narrative of the redistributive impact of the transfer system;

Related literature

Non-gaussian properties of earnings dynamics:

- *Guvenen et al. (2015)*: US;
- *Halvorsen et al. (2020)*: Norway;
- *De Nardi et al. (2021)*: US and Netherlands;

Studies in Australia:

- Gaussian shocks:
  - *Chatterjee et al. (2016)*: Wage inequality and unobserved shocks;
  - *Ishakov and Keane (2021)*: Age Pension in life cycle model;
- Level and first moment of income:
  - *Herault and Azpitarte (2015)*: Redistributive impact of tax and transfer;
  - *Tran and Zakariyya (2021)*: Trends in tax progressivity and redistribution.

Data and methodology

Data: HILDA 2001-2018 (133,697 observations).

Sampling criteria: (i) Primary earner, (ii) Employment history.

Methodology: Non-parametric approach following *Guvenen et al. (2019)* and *De Nardi et al. (2021)*.

Analytical framework:

1. Calculate moments of distributions of residual income changes (risks);
2. Decompose the moment estimates to study sources of risks;
3. Examine the degree of insurance by family and government.

See summary statistics of individual and family in 2018 in the appendix.

Derive moments of shocks: Non-parametric approach

Purge age and time effects:

$$\log income_{i,t} = age_{i,t} + age_{i,t}^2 + year_t + \mu_{i,t} \tag{1}$$

Calculate the n^{th}-order differences of $\hat{\mu}_{i,t}$:

$$\Delta^n_{\hat{\mu}_{i,t}} = \hat{\mu}_{i,t} - \hat{\mu}_{i,t-n} \tag{2}$$

Group the residual shocks $\Delta^n_{\hat{\mu}_{i,t}}$ by (i) *age* and (ii) *past income decile*.

Calculate moments of the shock distributions for each group:

$$\tilde{\mu}^k_{\Delta y} = \frac{E\left[(\Delta y - \mu_{\Delta y})^k\right]}{\sigma^k} \tag{3}$$

where $\tilde{\mu}^k_{\Delta y}$:= the k^{th} standardized moment of y shocks (k^{th}-*order risks*).

See derivation of shock moments via parametric approach in the appendix.

Family insurance against 2nd-order risk

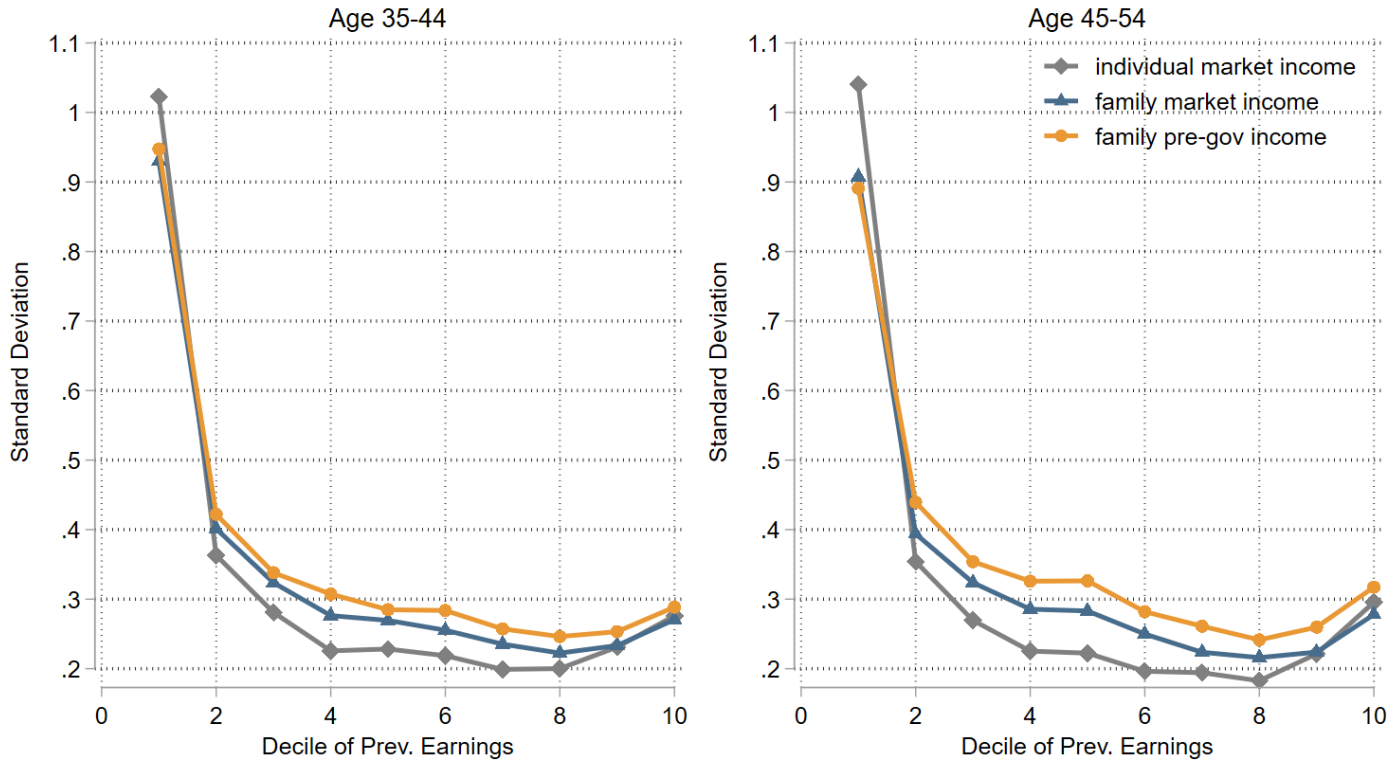


Figure: Standard deviation of the distribution of annual changes of family income (P1-P99) at different levels.

See a more detailed figure in the appendix.

Government insurance against 2nd-order risk

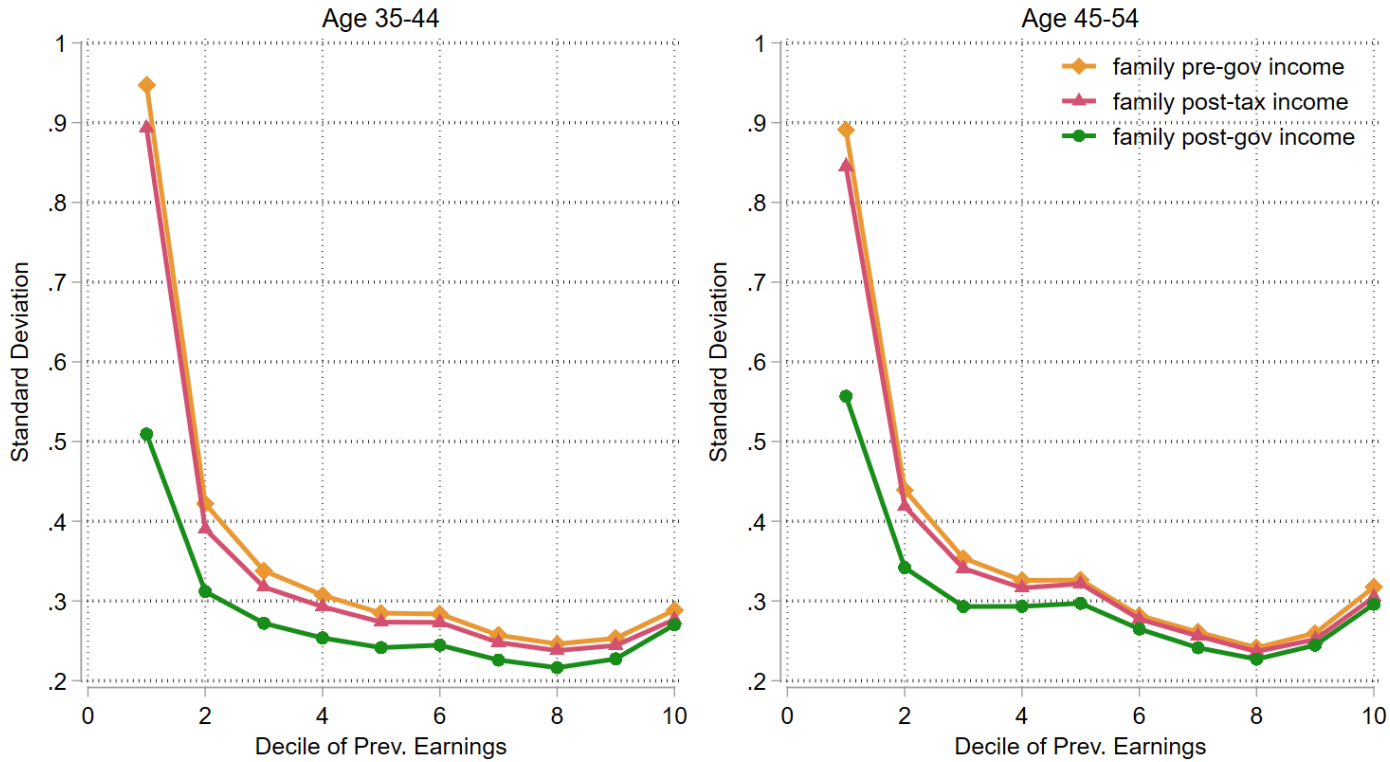


Figure: Standard deviation of the distribution of annual changes of post-tax and disposable (or post-government) family income (P1-P99) at different levels.

See a more detailed figure in the appendix.

Family insurance against 3rd- and 4th-order risks

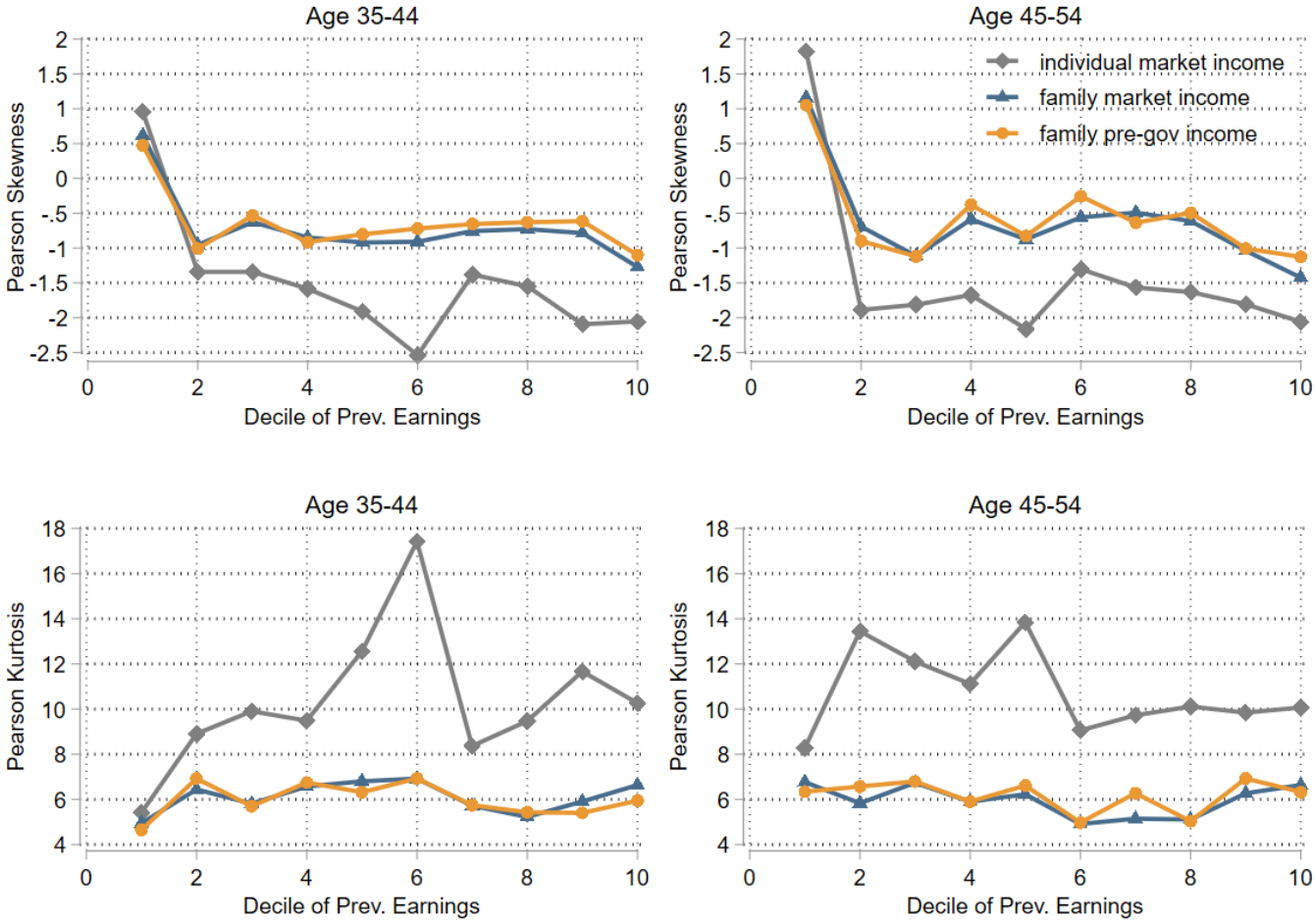


Figure: Standardized Skewness (top) and Kurtosis (bottom) of the distribution of annual changes of family income (P1-P99) at different levels.

See a more detailed figure in the appendix.

Government insurance against 3rd- and 4th-order risks

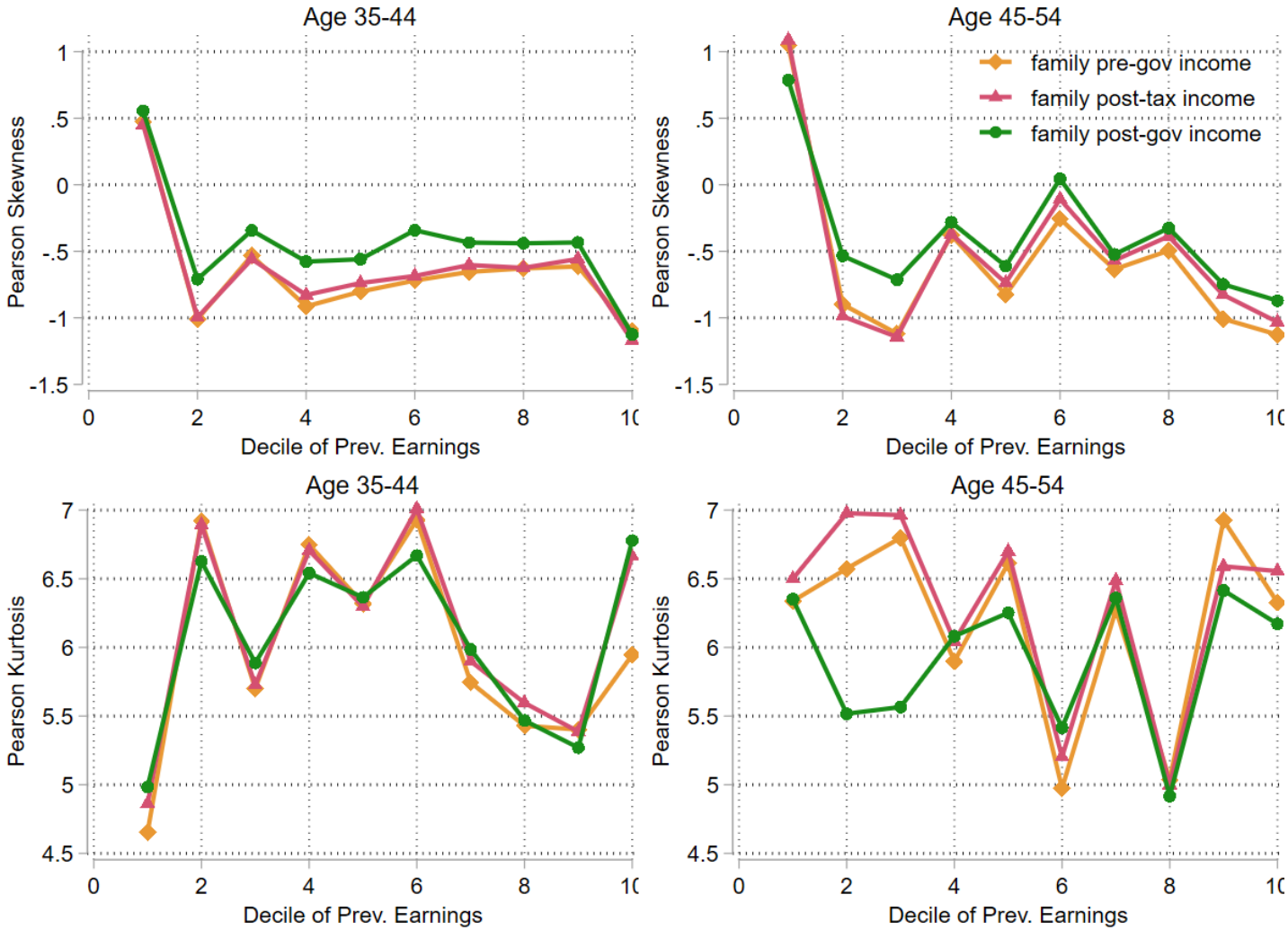


Figure: Standardized Skewness (top) and Kurtosis (bottom) of the distribution of annual changes of post-tax and disposable (or post-government) family income (P1-P99) at different levels.

See a more detailed figure in the appendix.

Insurance against *transitory* shocks: Male vs. Female

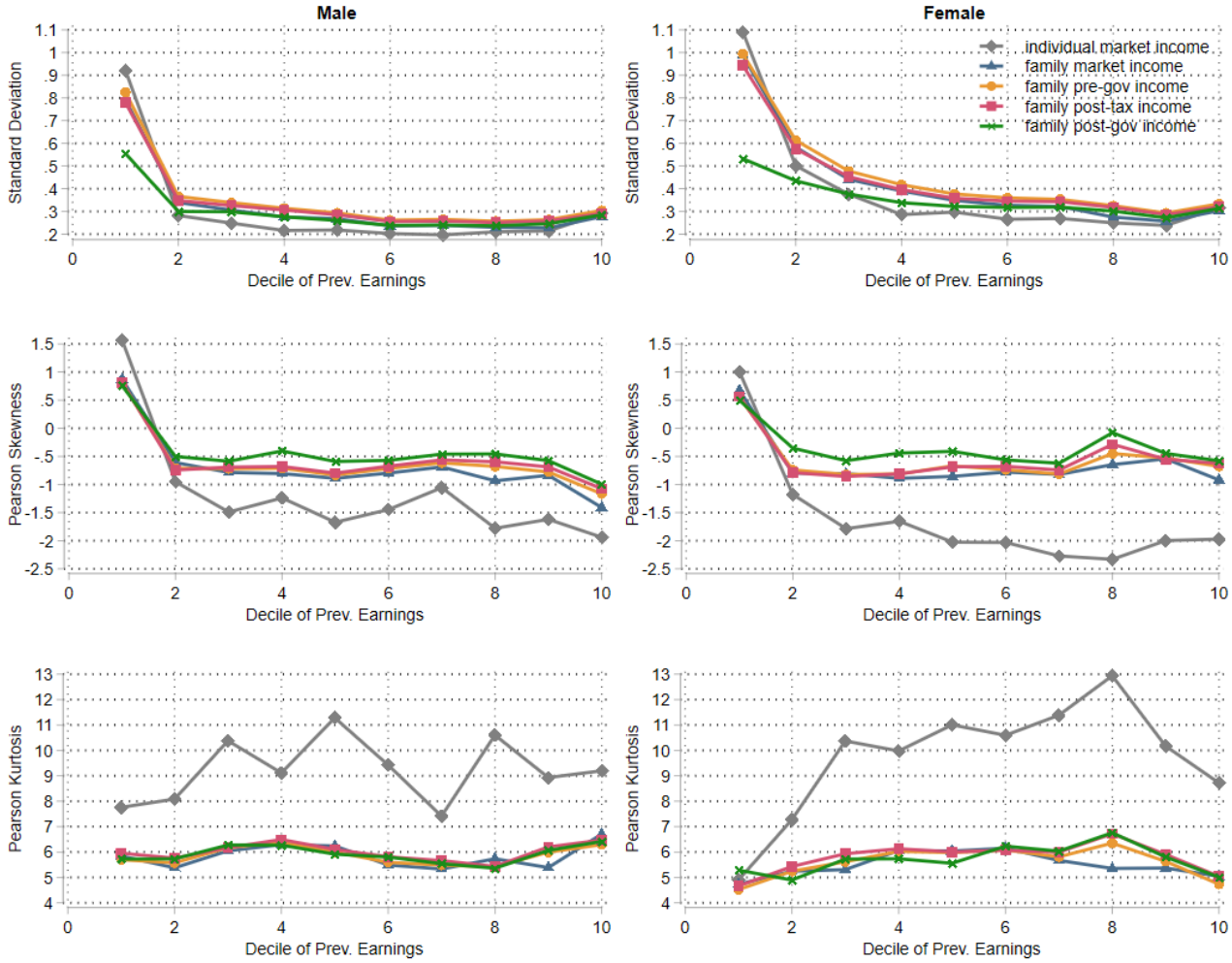


Figure: Moment properties of the distributions of annual income shocks of male (left panel) and female (right panel) primary earners (P1-P99 Pearson statistics).

Insurance against *persistent* shocks: Male vs. Female

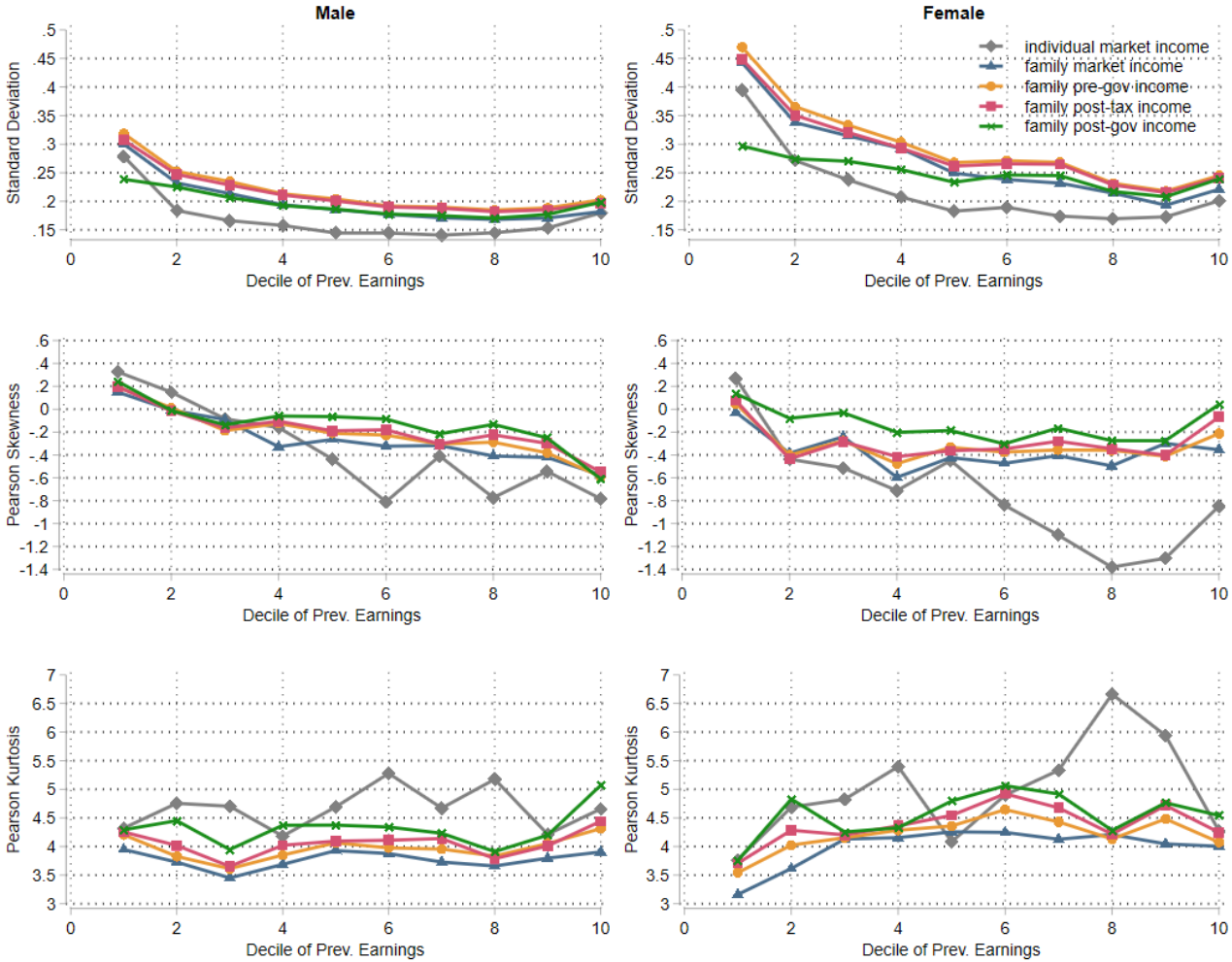


Figure: Moment properties of the distributions of 3-year average income shocks of male (left panel) and female (right panel) primary earners (P1-P99 Pearson statistics)

Spousal response vs Public transfer

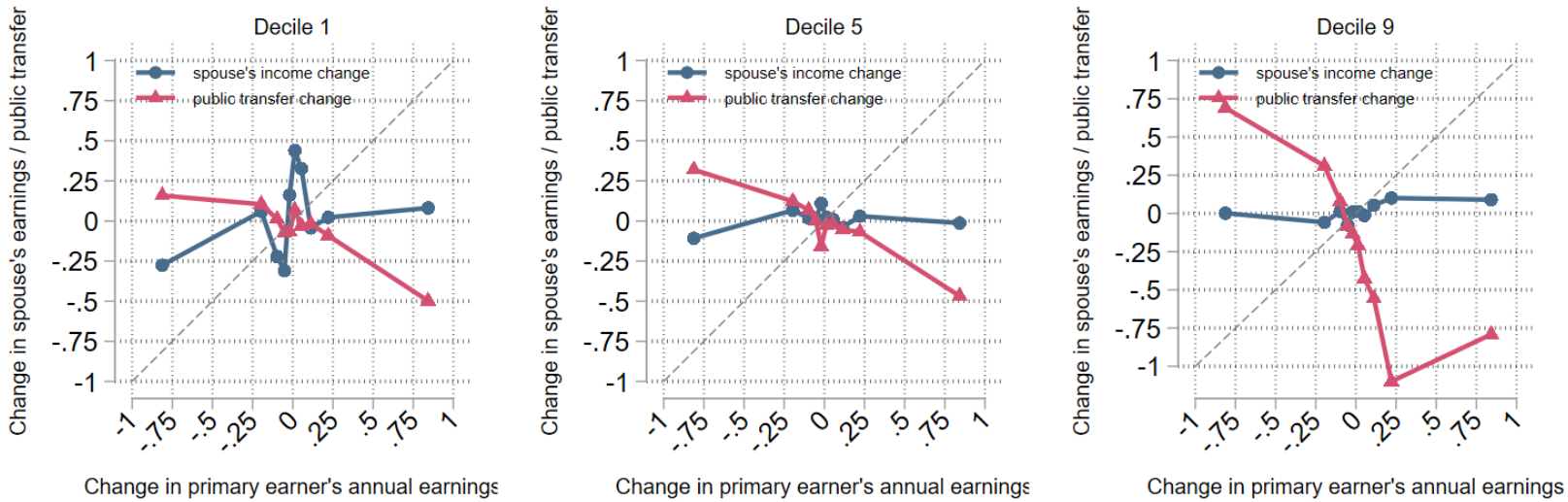


Figure: Annual changes in spousal earnings and public transfers versus decile of annual changes in past market earnings of primary earners in the 1st, 5th, and 9th deciles of past regular market income.

See a more detailed figure in the appendix.

Insurance against *transitory* shocks: Partnered vs. Lone parents

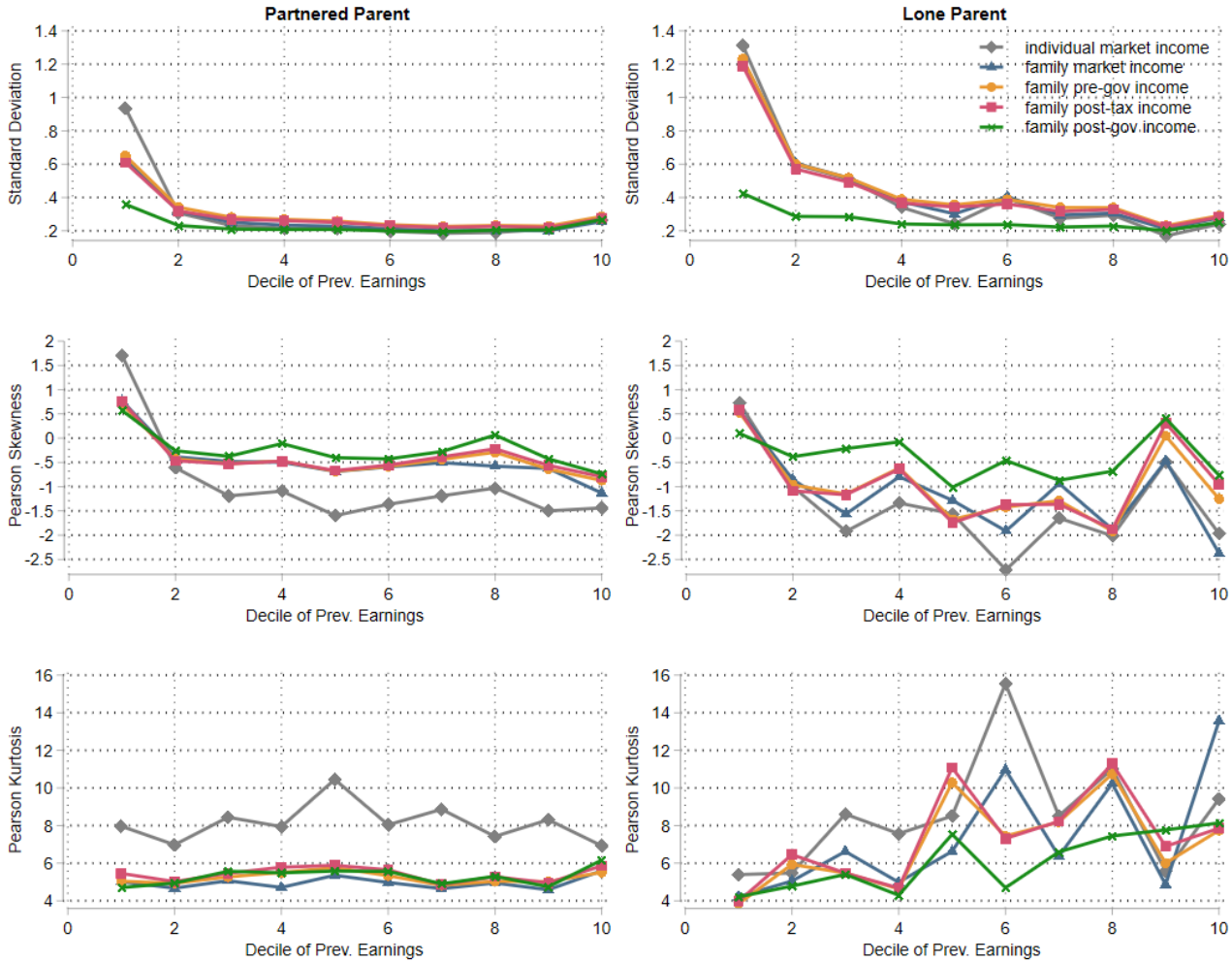


Figure: Moment properties of the distributions of annual income shocks of partnered parent (left panel) and lone parent (right panel) primary earners (P1-P99 pearson statistics)

Comparison with previous studies

Similar to previous studies, results for Australia show:

1. Non-linear and non-Gaussian income dynamics;
2. Substantial government and family insurance against risks.

Differently, we find:

1. Δw drives the $2nd$-order risk (See appendix);
2. Δh drives the $3rd$- and $4th$-order risks (See appendix);
3. Government insurance is dominant against the $2nd$-order risk;
4. Family insurance is dominant against the $3rd$- and $4th$-order risks.

Conclusion

What's new?

1. Risks are persistent for certain groups;
2. Risk equalizing effect of government insurance;
3. Within-country evidence of potential crowding-out effect of government insurance;
4. Kurtosis is complicated to interpret (See appendix).

Future work:

1. Retirees and age pension;
2. Consumption risk;
3. Administrative data;
4. Quantitative macroeconomic model.

Appendix: Summary statistics in 2018

Table 1: Summary statistics 2018

Primary Earner		N	Mean	Median	SD	Min	Max
Age	Individual	6,507	39.32	37	13.75	16	81
	Family	6,507	-	-	-	-	-
Weekly hours	Individual	6,507	38.26	40	12.63	0	130
	Family	6,507	57.34	50	35.03	0	234
Weekly wage	Individual	6,507	1,429.57	1,216.00	1,005.81	0.00	14,527.00
	Family	6,507	2,220.65	1,936.00	1,546.90	0.00	17,777.00
Labour Income	Individual	6,507	74,078.86	64,896.00	57,184.73	0.00	805,757.00
	Family	6,507	117,214.46	92,000.00	79,857.93	0.00	1.29e+06
Market income	Individual	6,507	76,603.26	65,921.00	60,642.27	-25,000.00	1.58e+06
	Family	6,507	127,164.35	109,450.00	99,673.42	-46,170.00	2.12e+06
Private transfer	Individual	6,507	475.65	0.00	3,926.71	0.00	200,000.00
	Family	6,507	1,044.15	0.00	8,021.99	0.00	303,468.00
Total income tax	Individual	6,507	17,252.77	12,723.00	22,461.12	-4,705.00	715,464.00
	Family	6,507	27,283.99	19,662.00	34,459.02	-7,997.00	892,464.00
Public transfer	Individual	6,507	1,966.84	0.00	5,245.99	0.00	52,067.00
	Family	6,507	4,881.84	0.00	9,864.12	0.00	75,125.00

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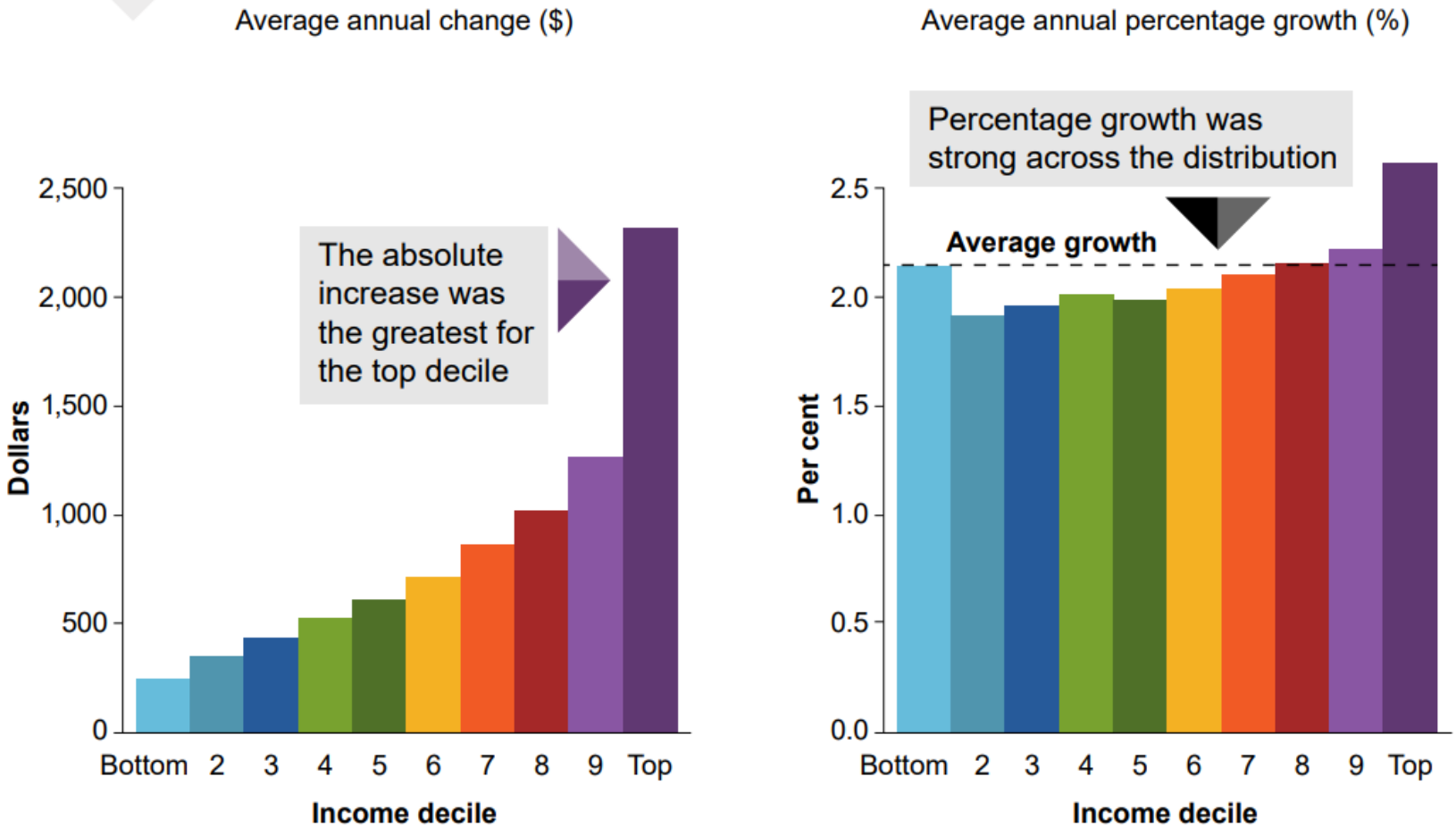
Appendix: Average disposable income growth (*PC*)

Average equivalised disposable income by income decile, 1988-89 to 2015-16



Data: ABS (Microdata: Household Expenditure, Income and Housing, 2015-16, Cat. no. 6540.0, released 25/10/17) and ABS HES Basic confidentialised unit record file for 1988-89 as available at 25/10/17.

Source: *Rising inequality? A stocktake of the evidence (Productivity Commission, 2018).*

Appendix: Average annual growth of residual income by decile using equation 1

Income Decile	N	Individual Labour Income	Individual Market Income	Household Pre-gov't Income	Household Disposable Income
1	9,544	59.75%	56.73%	27.54%	31.35%
2	9,559	6.41%	6.22%	4.05%	2.75%
3	9,541	-0.83%	-0.14%	0.42%	0.28%
4	9,556	-3.12%	-2.60%	-0.37%	-0.55%
5	9,524	-4.50%	-4.06%	-1.33%	1.83%
6	9,571	-4.76%	-4.75%	-2.53%	-1.86%
7	9,509	-4.53%	-4.95%	-2.04%	-1.6%
8	9,564	-3.98%	-4.58%	-1.98%	-1.52%
9	9,526	-5.34%	-6.38%	-3.76%	-2.92%
10	9,534	-7.70%	-10.12%	-7.34%	-5.94%

Table 2: The growth statistics shown are group means of residual changes for employees (not self-employed) age 25-64 after controlling for time and age effects. These figures account for cross-decile mobility over time.

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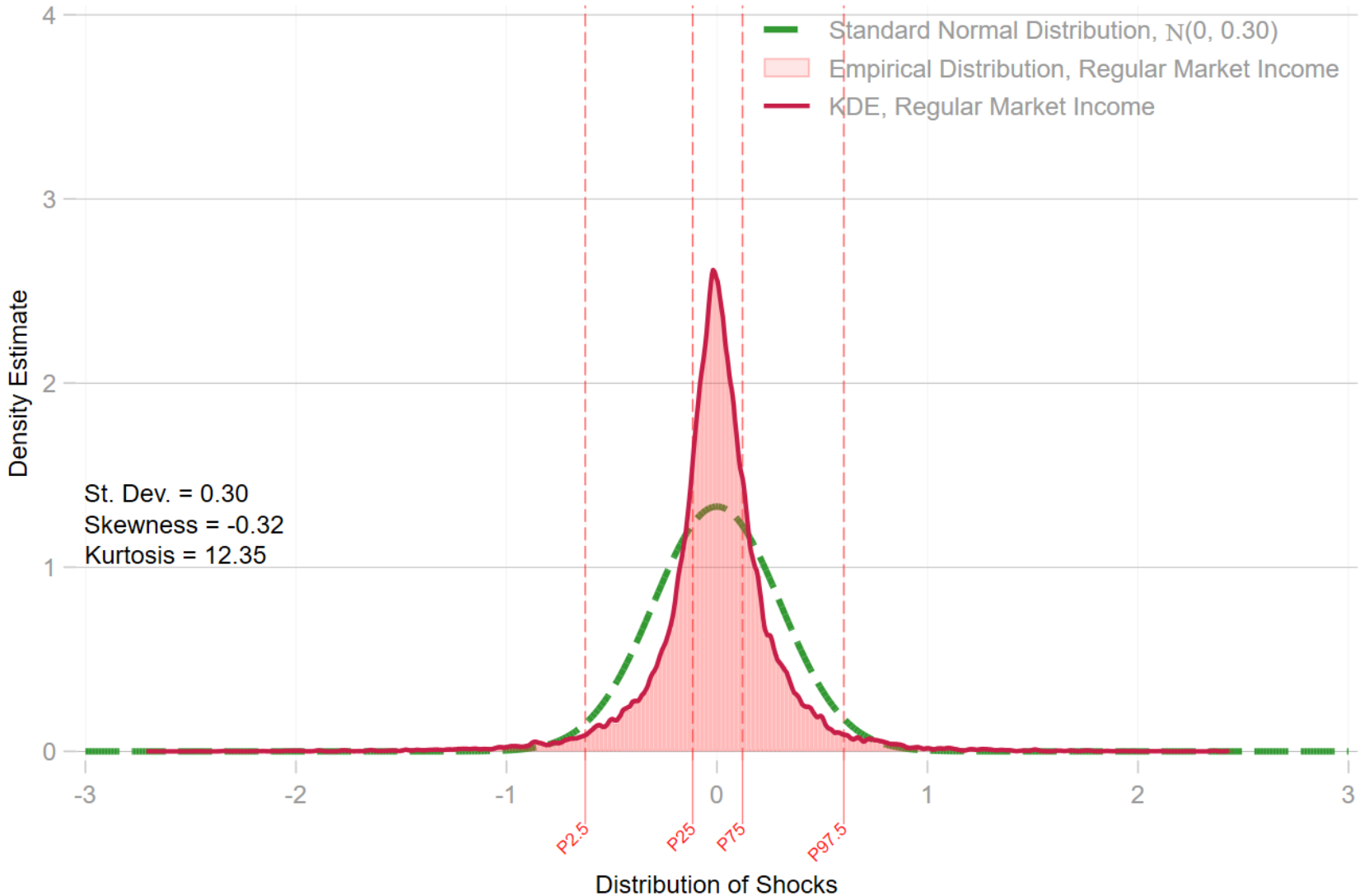
Appendix: Empirical distribution of 3-year average earnings residual shocks



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Appendix: Derive moments of shocks via parametric approach (1)

Consider a parsimonious model for the residual income in equation 1:

$$\hat{\mu}_{i,t} = z_{i,t} + \epsilon_{i,t} \tag{4}$$

$$z_{i,t} = z_{i,t-1} + \eta_{i,t} \tag{5}$$

where $\eta_{i,t}$ and $\epsilon_{i,t}$ are drawn from some distributions $F_\eta \sim (0, \sigma_\eta^2)$ and $F_\epsilon \sim (0, \sigma_\epsilon^2)$, respectively.

The n-year growth of $\hat{\mu}_{i,t}$ is thus:

$$\Delta^n_{\hat{\mu}_{i,t}} = \hat{\mu}_{i,t} - \hat{\mu}_{i,t-n} \tag{6}$$

$$= \sum_{j=t-n+1}^{t} \eta_{i,j} + \epsilon_{i,t} - \epsilon_{i,t-n} \tag{7}$$

Appendix: Derive moments of shocks via parametric approach (2)

Given the parametric model 7, the higher-order moments of the distribution of $\Delta^n_{\hat{\mu}_{i,t}}$ are:

$$\sigma^2_{\Delta^n_{\hat{\mu}_{i,t}}} = n\sigma^2_\eta + 2\sigma^2_\epsilon \tag{8}$$

$$S^n_{\Delta\hat{\mu}_{i,t}} = \frac{n \times \sigma^3_\eta}{(n\sigma^2_\eta + 2\sigma^2_\epsilon)^{\frac{3}{2}}} S_\eta \tag{9}$$

$$K^n_{\Delta\hat{\mu}_{i,t}} = \frac{n \times \sigma^4_\eta}{(n\sigma^2_\eta + 2\sigma^2_\epsilon)^2} K_\eta + \frac{2 \times \sigma^4_\epsilon}{(n\sigma^2_\eta + 2\sigma^2_\epsilon)^2} K_\epsilon \tag{10}$$

Assuming $N_\eta \sim (0, \sigma^2_\eta)$ and $N_\epsilon \sim (0, \sigma^2_\epsilon)$, we can estimate σ_η and σ_ϵ (as in *Chatterjee et al. (2016)*) and work out the three moment statistics.

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Appendix: Additional consideration

We use quantile-based measures of skewness and kurtosis for comparability with the previous studies.

$$S_{kelley} = \frac{(P_{90} - P_{50}) - (P_{50} - P_{10})}{P_{90} - P_{10}} \tag{11}$$

$$K_{crow-siddiqui} = \frac{P_{97.5} - P_{2.5}}{P_{75} - P_{25}} \tag{12}$$

We consider robust moment statistics: *P1-P99*, *P5-P95*, and *P10-P90*.

Alternatively, using Arc-Percent Change method yields similar results.

Appendix: Decompose earnings shocks (1)

We have:

$$y_{i,t} = w_{i,t} \times h_{i,t} \tag{13}$$

$$\Longrightarrow \frac{\%\Delta y_{i,t}}{dt} = \frac{\%\Delta w_{i,t}}{dt} + \frac{\%\Delta h_{i,t}}{dt} \tag{14}$$

which can be simplified as

$$\Delta y = \Delta w + \Delta h \tag{15}$$

Let $\tilde{\mu}_z^k := \mathbb{E}\left(\frac{z - \mu_z}{\sigma_z}\right)^k$ and $\sigma_z := \sqrt{var(z)}$ for a random variable z.

Appendix: Decompose earnings shocks (2)

Second moment:

$$\sigma^2_{\Delta y} = \sigma^2_{\Delta w} + \sigma^2_{\Delta h} - 2cov(\Delta w, \Delta h) \tag{16}$$

Third moment:

$$\begin{aligned}\tilde{\mu}^3_{\Delta y} = & \frac{1}{\sigma^3_{\Delta y}}\left[\sigma^3_{\Delta w}\tilde{\mu}^3_{\Delta w} + \sigma^3_{\Delta h}\tilde{\mu}^3_{\Delta h}\right] \\ & + \frac{3}{\sigma^3_{\Delta y}}\left[\mathbb{E}(\Delta h - \mu_{\Delta h})^2(\Delta w - \mu_{\Delta w}) + \mathbb{E}(\Delta w - \mu_{\Delta w})^2(\Delta h - \mu_{\Delta h})\right]\end{aligned} \tag{17}$$

Fourth moment:

$$\begin{aligned}\tilde{\mu}^4_{\Delta y} = & \frac{1}{\sigma^4_{\Delta y}}\left[\sigma^4_{\Delta w}\tilde{\mu}^4_{\Delta w} + \sigma^4_{\Delta h}\tilde{\mu}^4_{\Delta h}\right] \\ & + \frac{4}{\sigma^4_{\Delta y}}\mathbb{E}\left[(\Delta h - \mu_{\Delta h})^3(\Delta w - \mu_{\Delta w}) + (\Delta w - \mu_{\Delta w})^3(\Delta h - \mu_{\Delta h})\right] \\ & + \frac{6}{\sigma^4_{\Delta y}}\mathbb{E}\left[(\Delta w - \mu_{\Delta w})^2(\Delta h - \mu_{\Delta h})^2\right]\end{aligned} \tag{18}$$

Appendix: Volatility of shocks by income and age

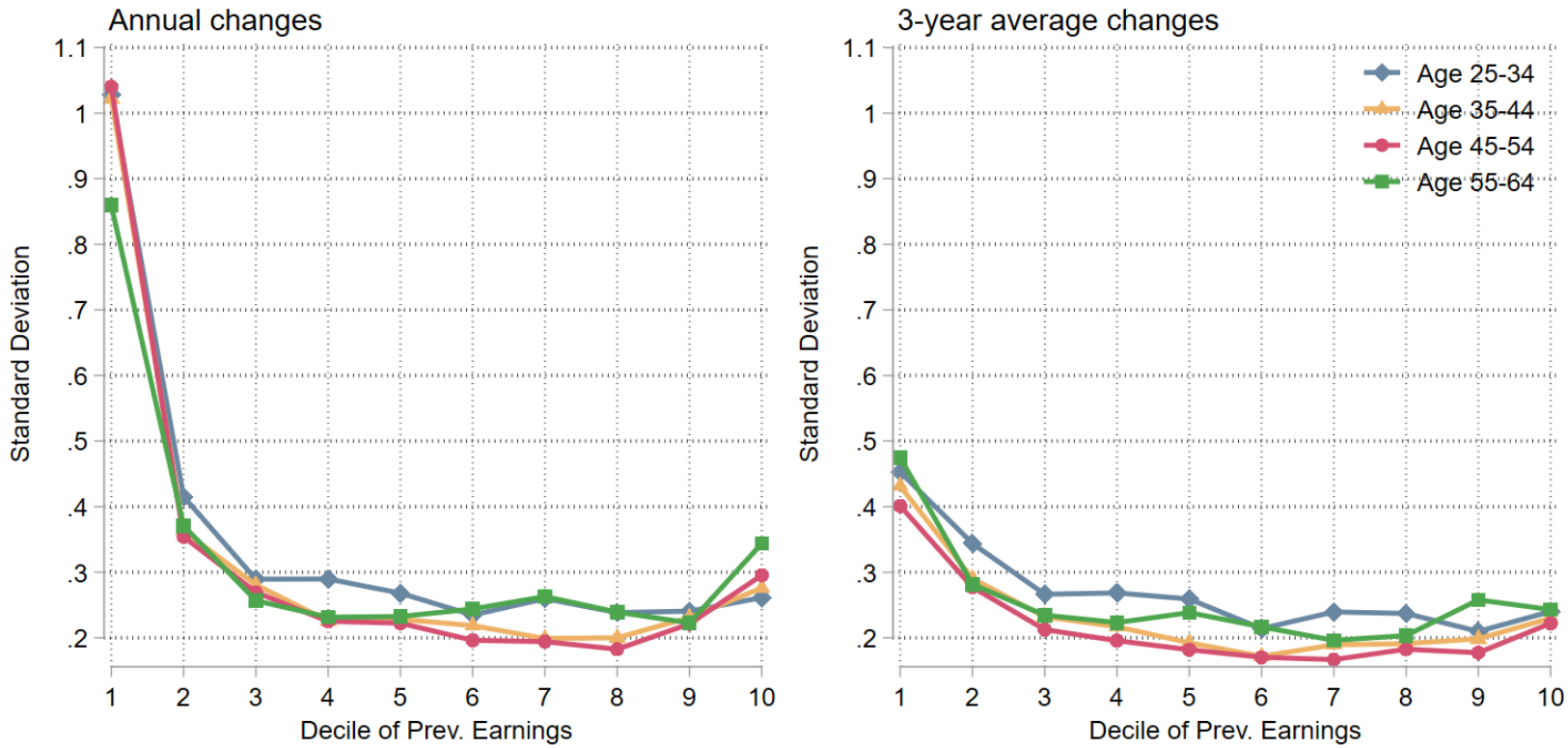

Figure: Standard deviation of the distribution of changes in regular market earnings for primary earner (P1-P99)

Appendix: Decomposition (dispersion)

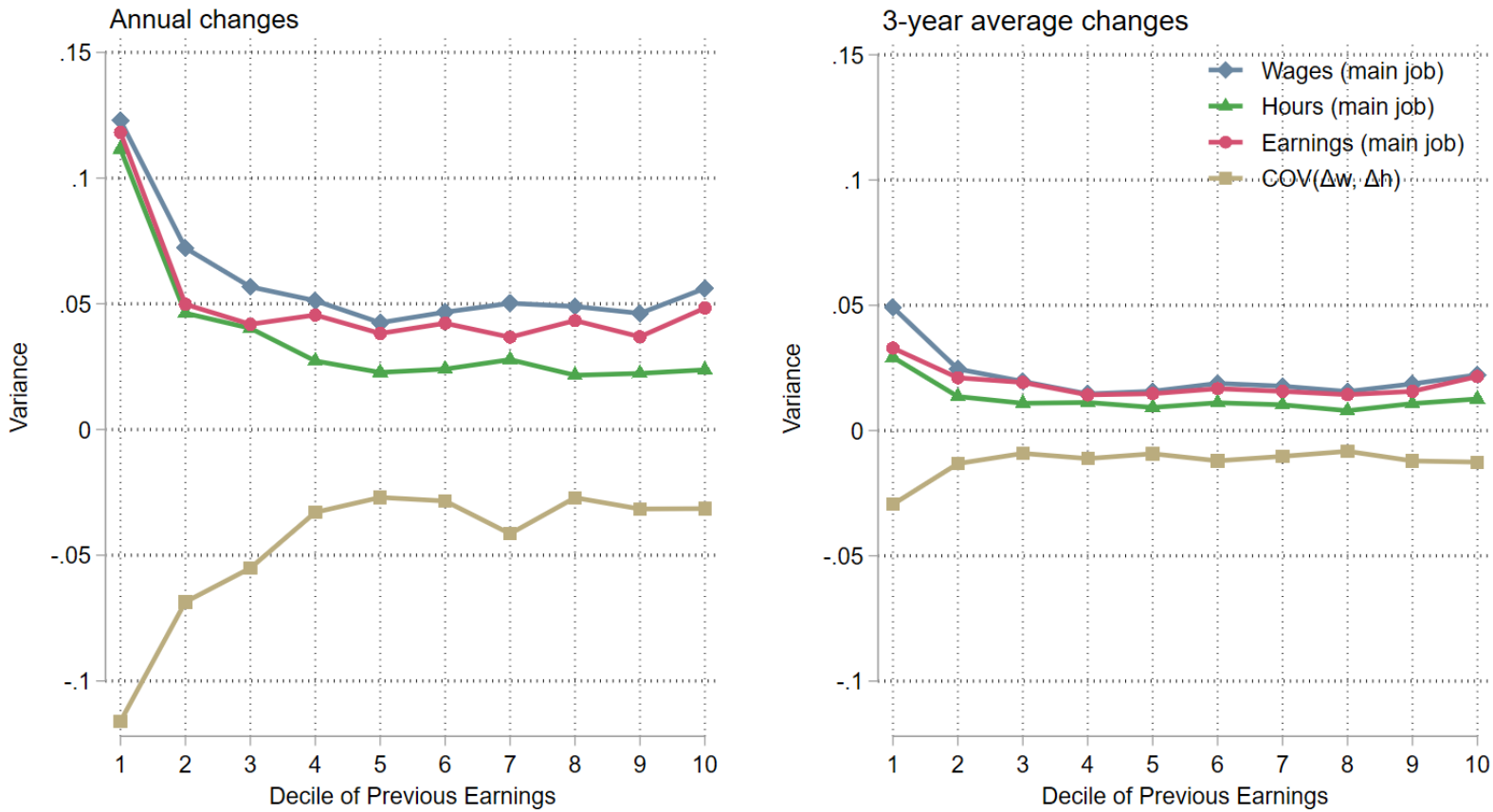

Figure: Variances of annual and 3-year average changes in usual weekly earnings, wages, and hours of primary earners

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Appendix: Decomposition (skewness and kurtosis)

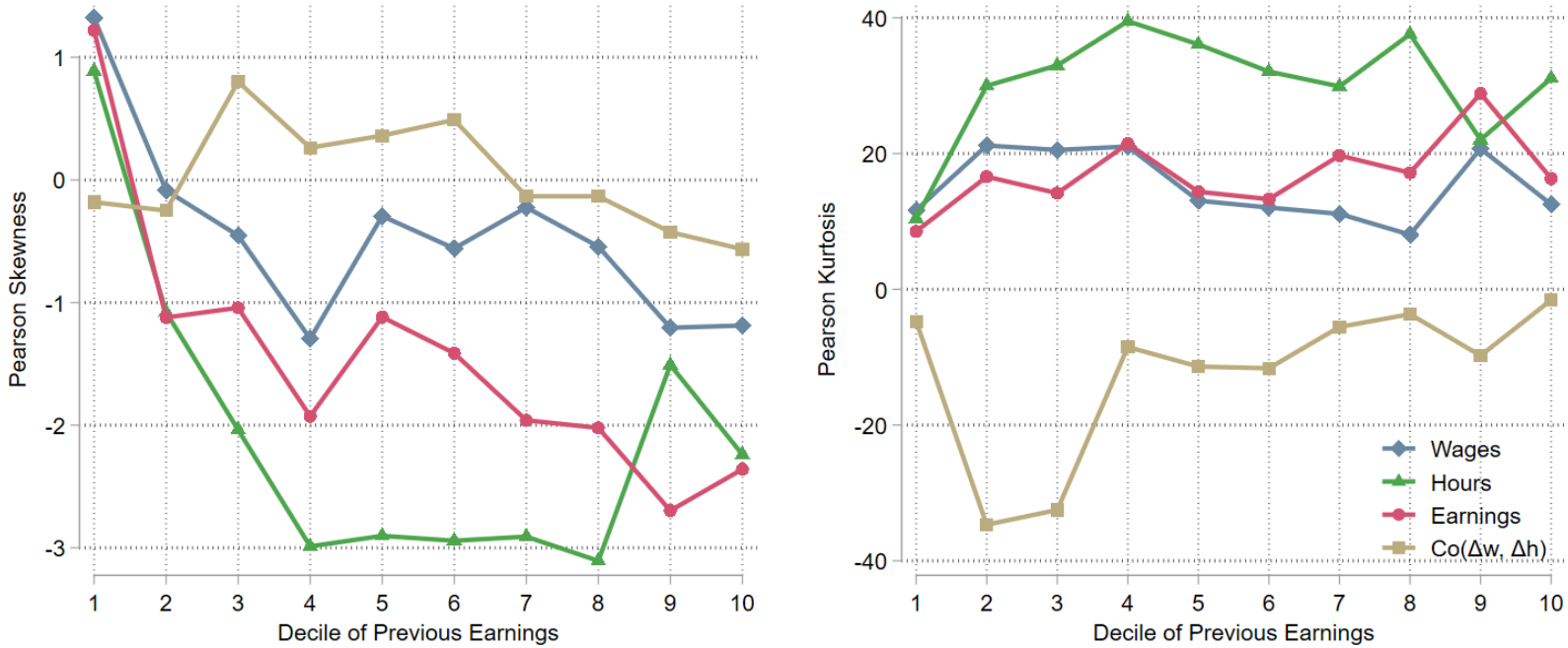

Figure: Pearson Skewness and Pearson Kurtosis of annual average changes in usual weekly earnings, wages, and hours of main job of primary earners (at least 15 years of employment)

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Appendix: Decomposition (skewness and kurtosis)

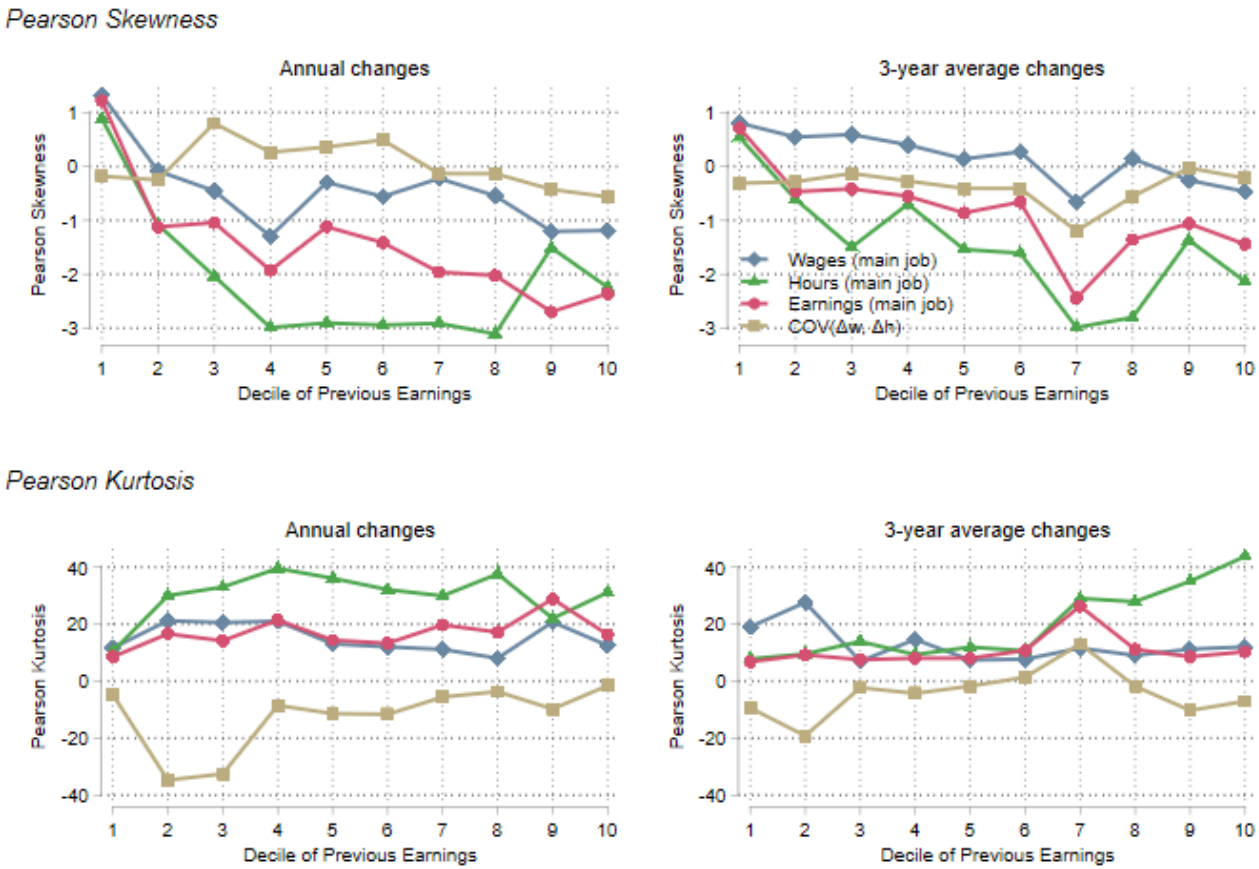

Figure: Pearson Skewness and Pearson Kurtosis of annual average and 3-year average changes in usual weekly earnings, wages, and hours of main job of primary earners (at least 15 years of employment)

Appendix: Wage and Hour changes vs. Earnings changes

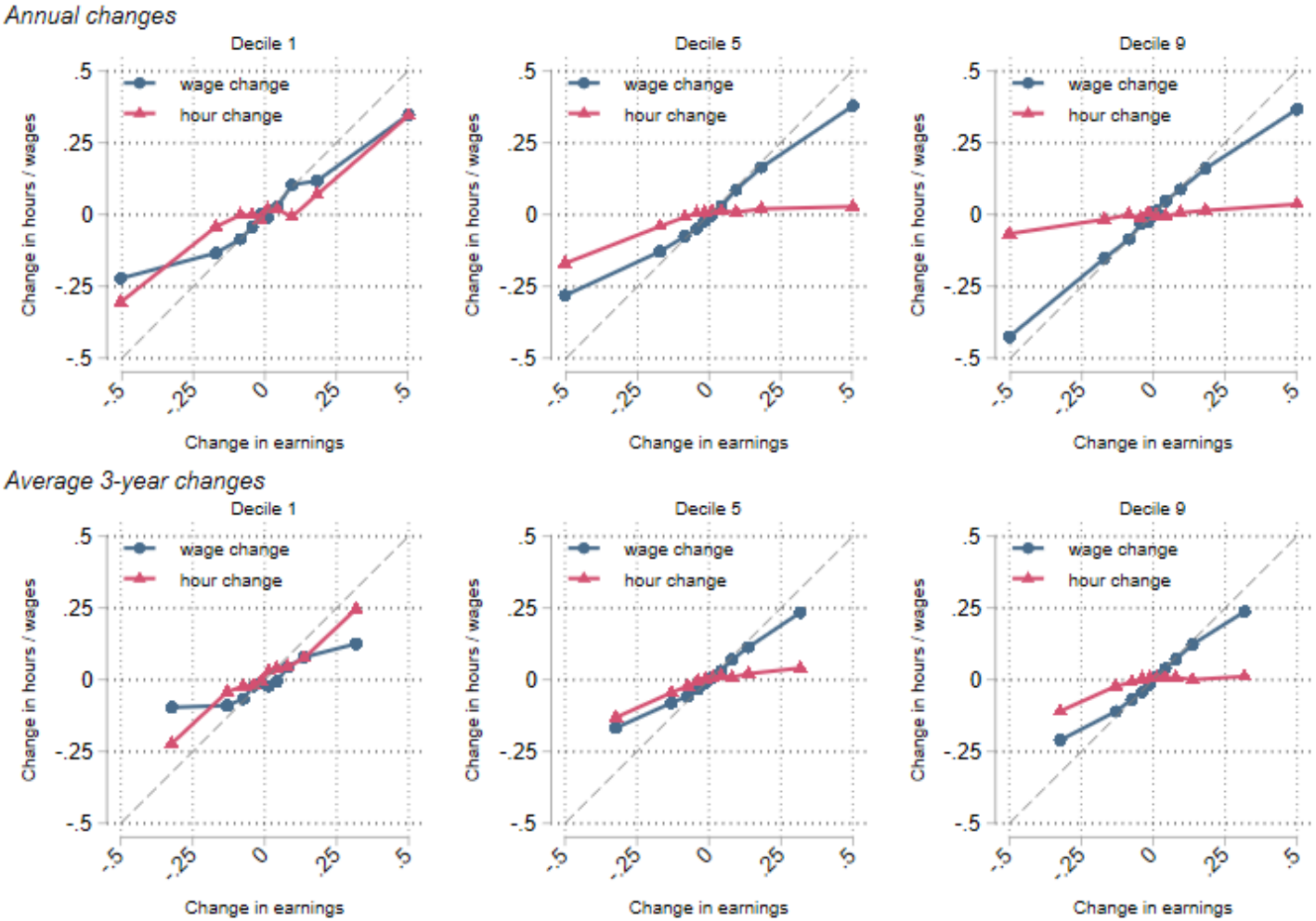

Figure: Changes in residual weekly wages and hours versus decile of changes in residual usual weekly earnings for primary earners in the 1st, 5th, and 9th deciles of past usual weekly earnings

Appendix: Family insurance against 2nd-order risk

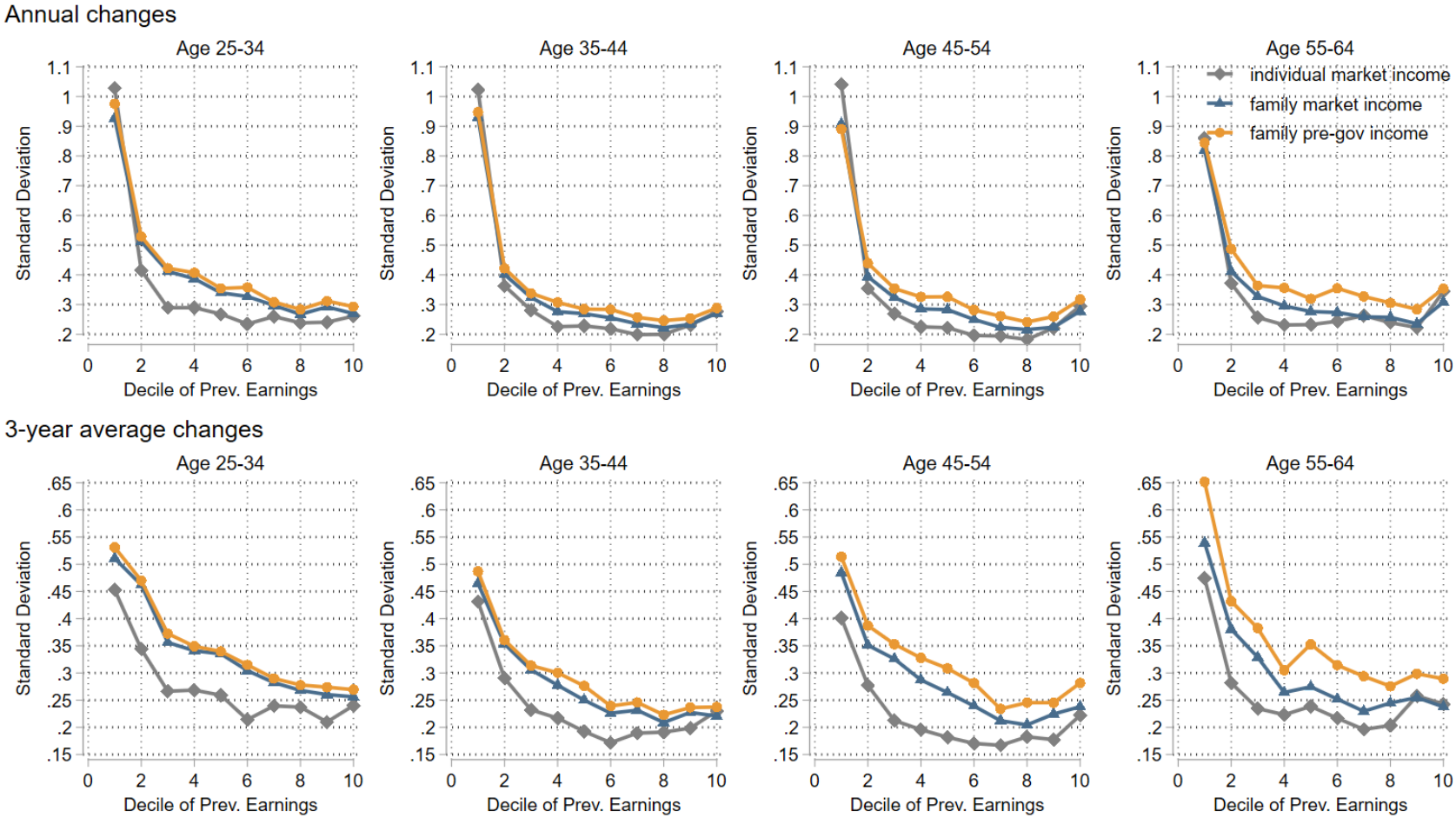

Figure: Standard deviation of the distribution of annual and 3-year average changes of family income (P1-P99) at different levels. The figure captures the relative contribution of family market income and private transfer to the second-order risk of pre-government family income.

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Appendix: Family insurance against 3rd- and 4th-order risks

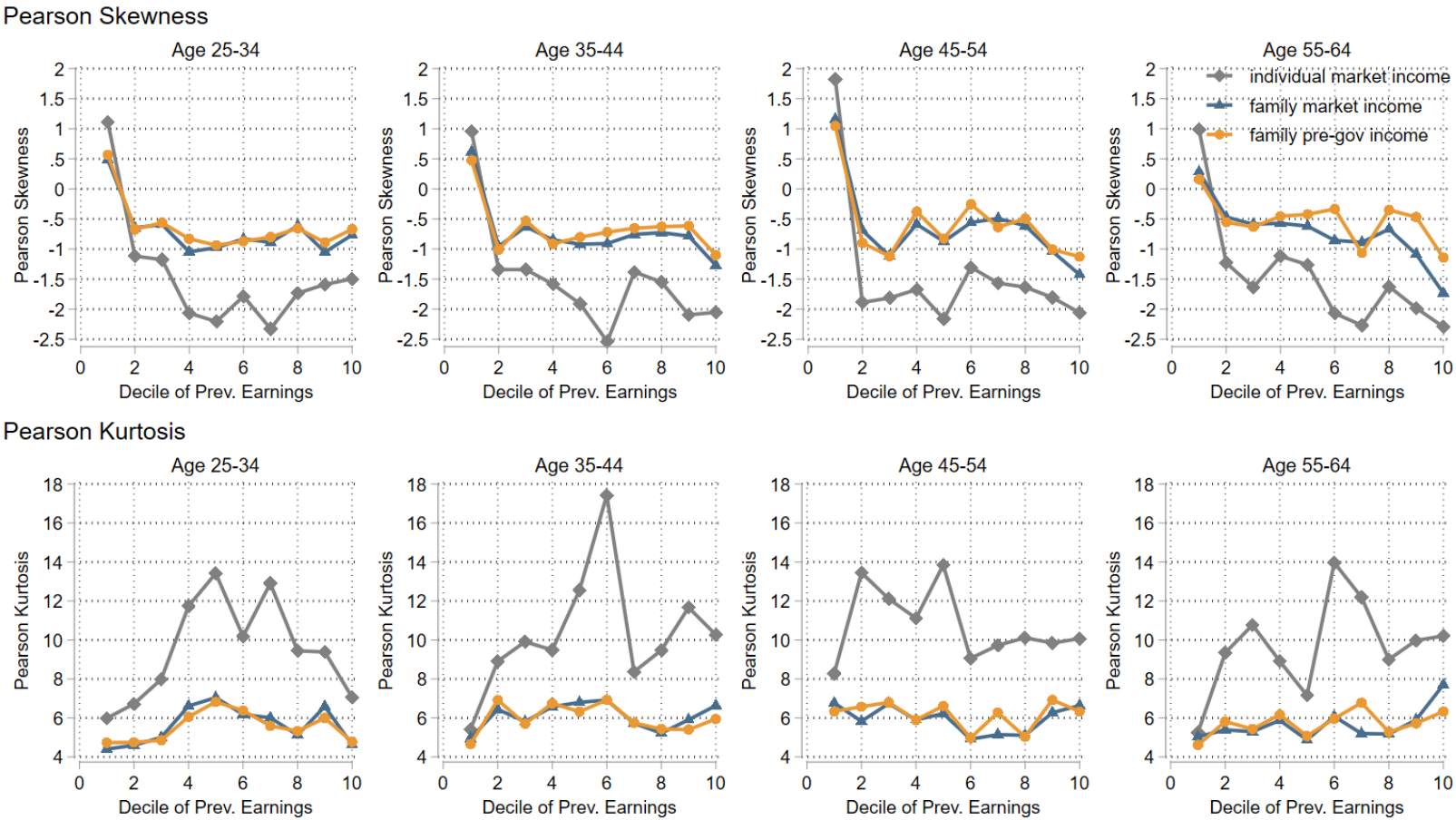

Figure: Skewness (top) and Kurtosis (bottom) of the distribution of annual changes of family income (P1-P99) at different levels. The figure captures the relative contribution of family market income and private transfer to the third- and fourth-order risks of pre-government family income.

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Appendix: Gov't insurance against 2nd-order risks

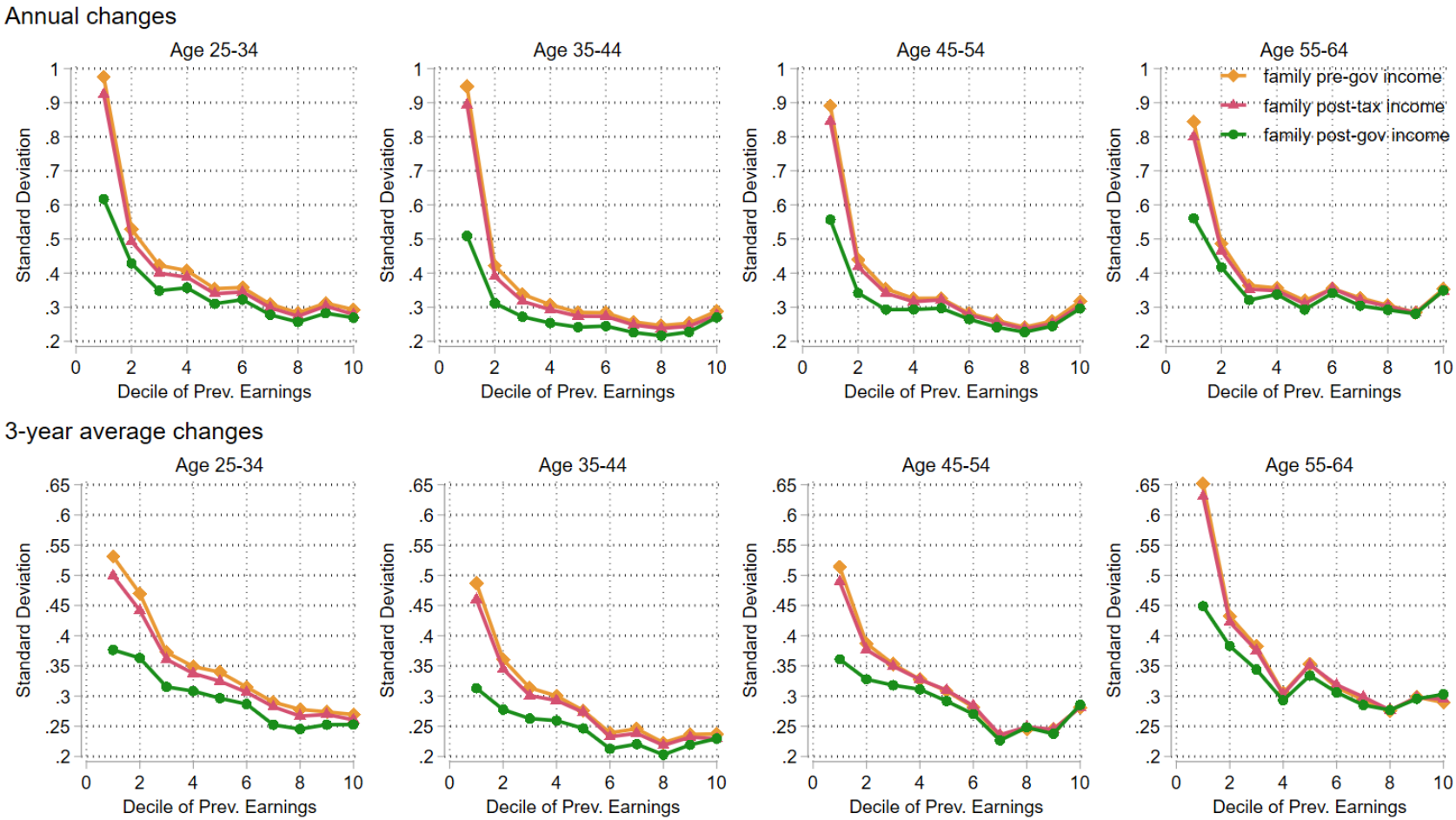

Figure: Standard deviation of the distribution of annual and 3-year average changes of post-tax and disposable (or post-government) family income (P1-P99) at different levels. The figure captures the relative contribution of tax and transfer to the second-order risk of disposable family income.

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Appendix: Gov't insurance against 3rd- and 4th-order risks

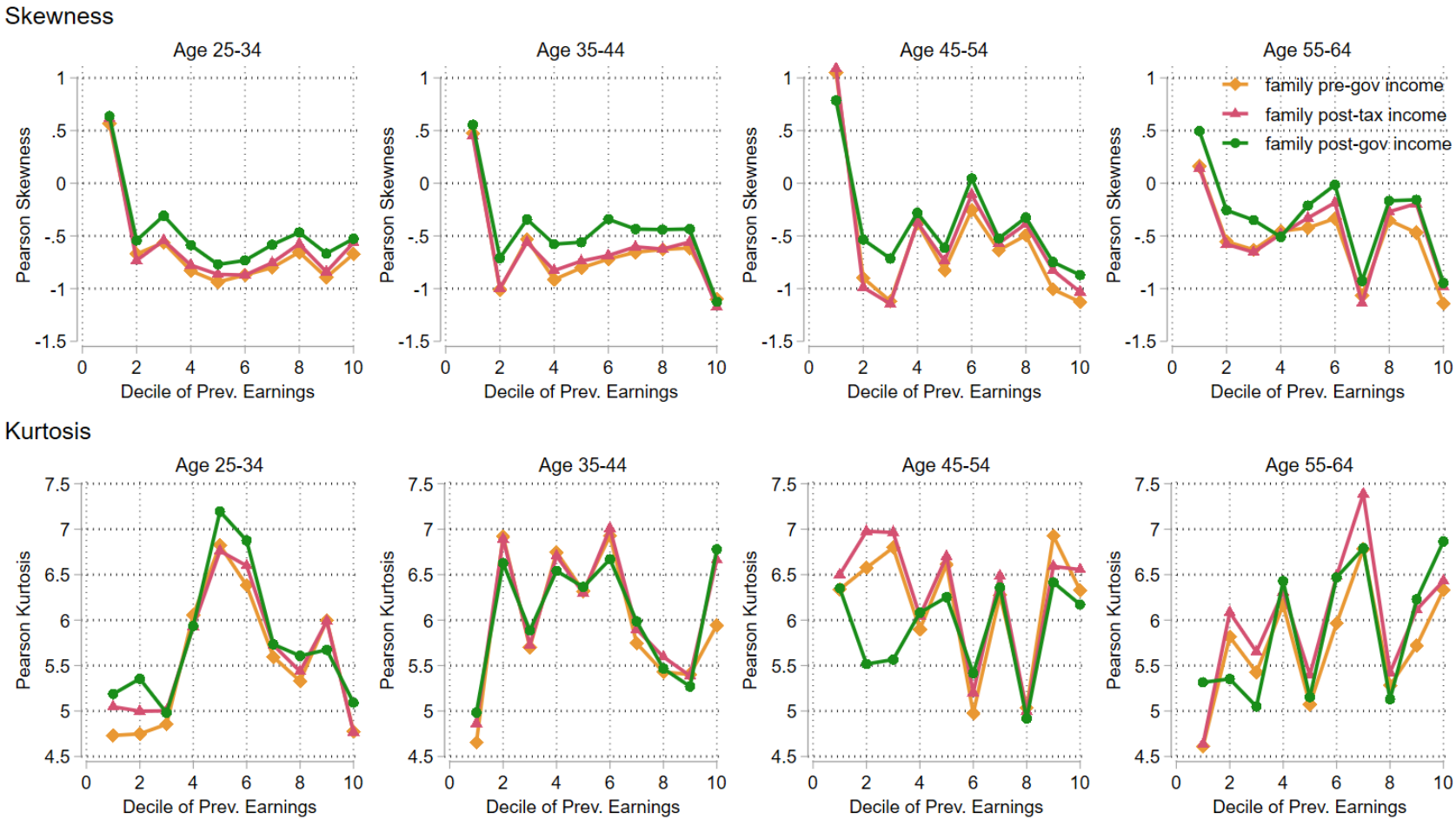

Figure: Skewness (top) and Kurtosis (bottom) of the distribution of annual changes of post-tax and disposable (or post-government) family income (P1-P99) at different levels. The figure captures the relative contribution of tax and transfer to the third- and fourth-order risks of disposable family income.

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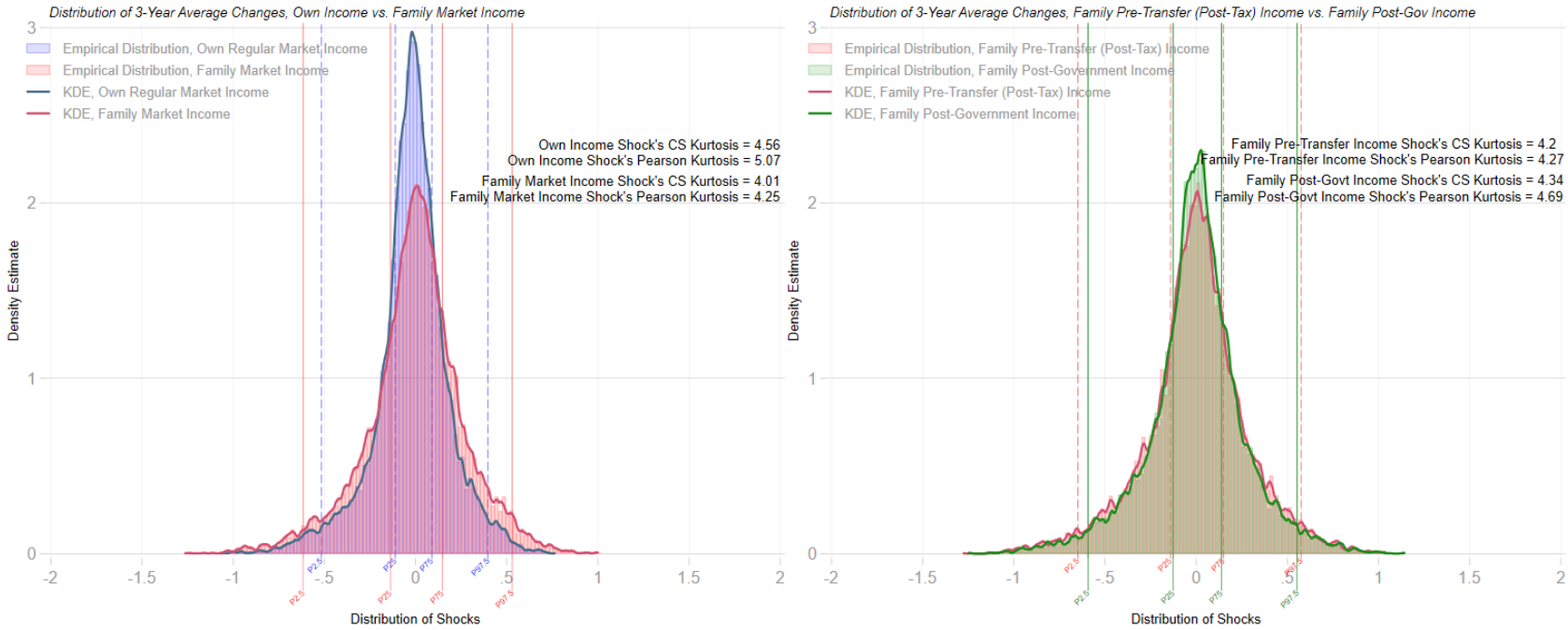
Appendix: A closer look at kurtosis



A smaller kurtosis can originate from either: (i) *the contraction of density mass about the mean* (more households facing moderate shocks), or (ii) *the contraction of mass at the tailends* (fewer households facing extreme shocks). While (ii) is a positive effect on households, (i) is not.

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Appendix: Male vs. Female secondary earners

Secondary Earner		Age	Higher Education	Weekly Hours	Weekly Wage	Annual Market Income	Annual Govt Transfer
1	Male	34.3	44%	29.7	$574	$21,417	$9,352.15
	Female	34.7	47%	25.2	$563	$20,372	$9,935.98
2	Male	37.5	56%	35.6	$809	$39,519	$4,021.98
	Female	36.4	53%	26.6	$651	$28,760	$5,636.72
3	Male	40.7	66%	38.4	$949	$48,841	$2,474.55
	Female	38.7	58%	29.4	$759	$37,230	$3,362.50
4	Male	42.5	73%	40.3	$1,185	$64,725	$1,454.20
	Female	40.2	66%	32.0	$943	$49,256	$1,432.93
5	Male	45.8	81%	41.9	$1,651	$100,803	$872.83
	Female	42.9	75%	33.6	$1,253	$72,570	$994.40

Table 2: Average 18-year Statistics for Male and Female Secondary Earners by Family Market Income Quintiles (All income and transfer values are stated in 2018 Australian dollar)

Appendix: Insurance against *transitory* shocks and parenthood

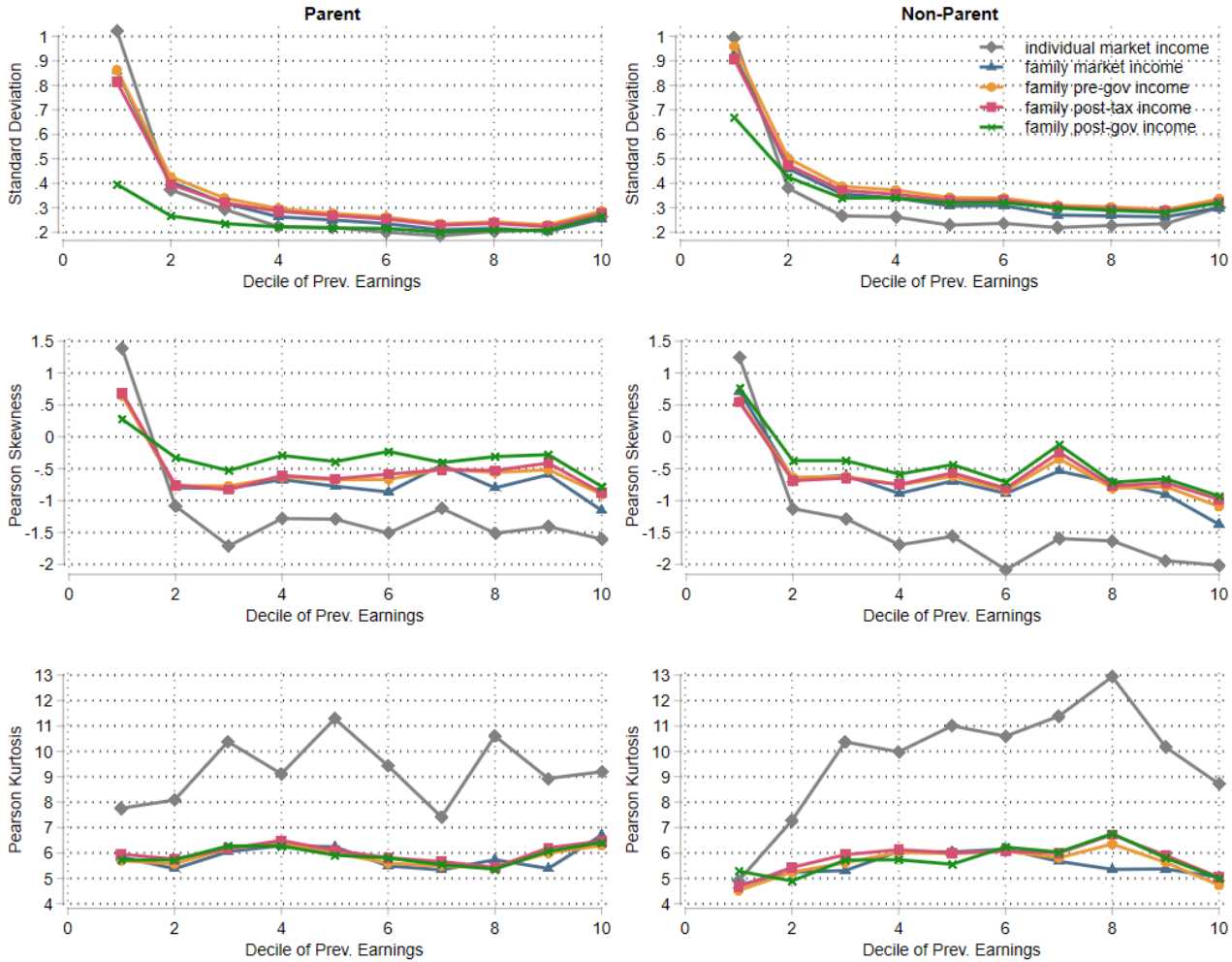

Figure: Moment properties of the distributions of annual income shocks of parent (left panel) and non-parent (right panel) primary earners (P1-P99 pearson statistics)

Appendix: Insurance against *persistent* shocks and parenthood

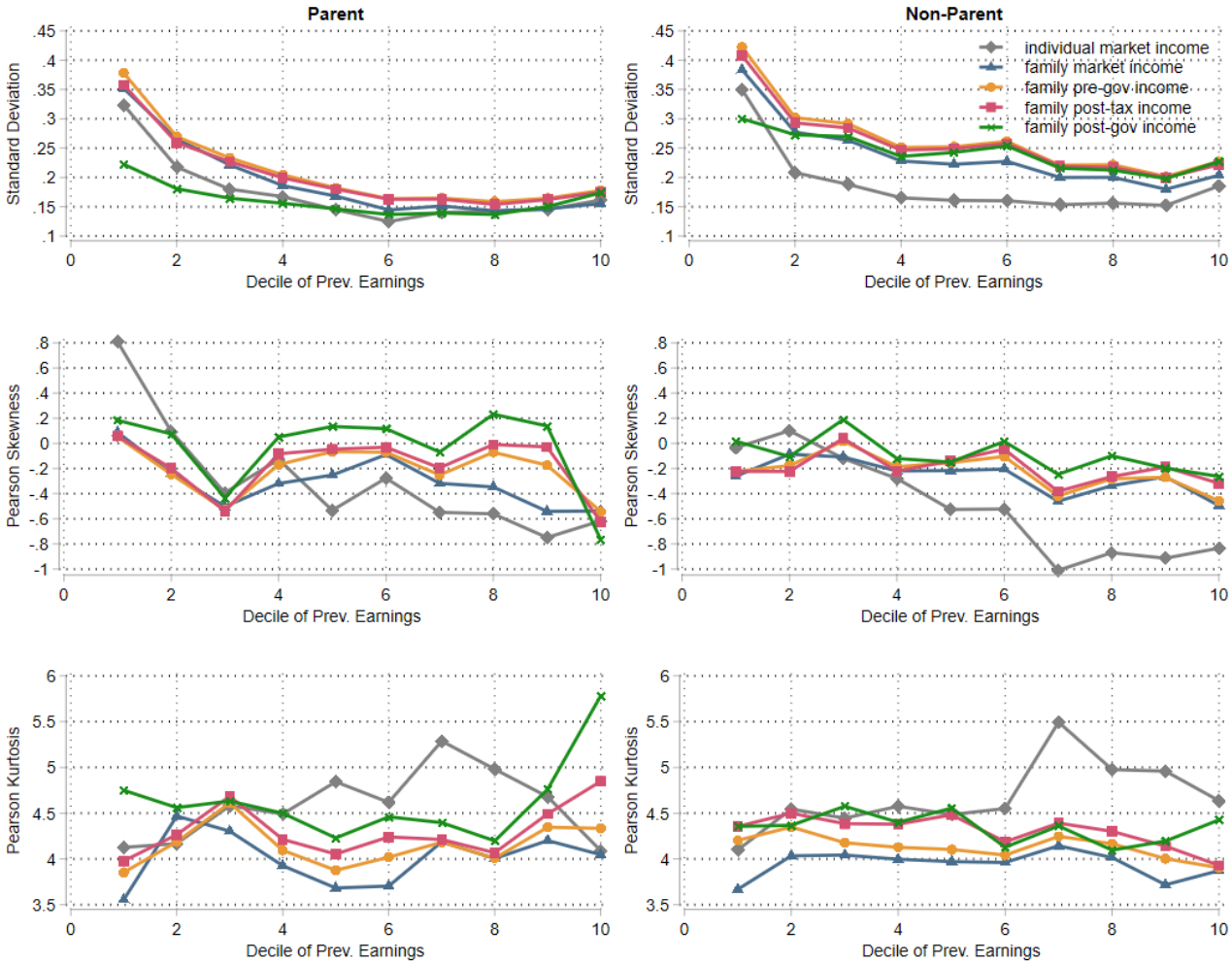

Figure: Moment properties of the distributions of 3-year average income shocks of parent (left panel) and non-parent (right panel) primary earners (P1-P99 pearson statistics)

Appendix: Age-profiles of work hours and LFP rate

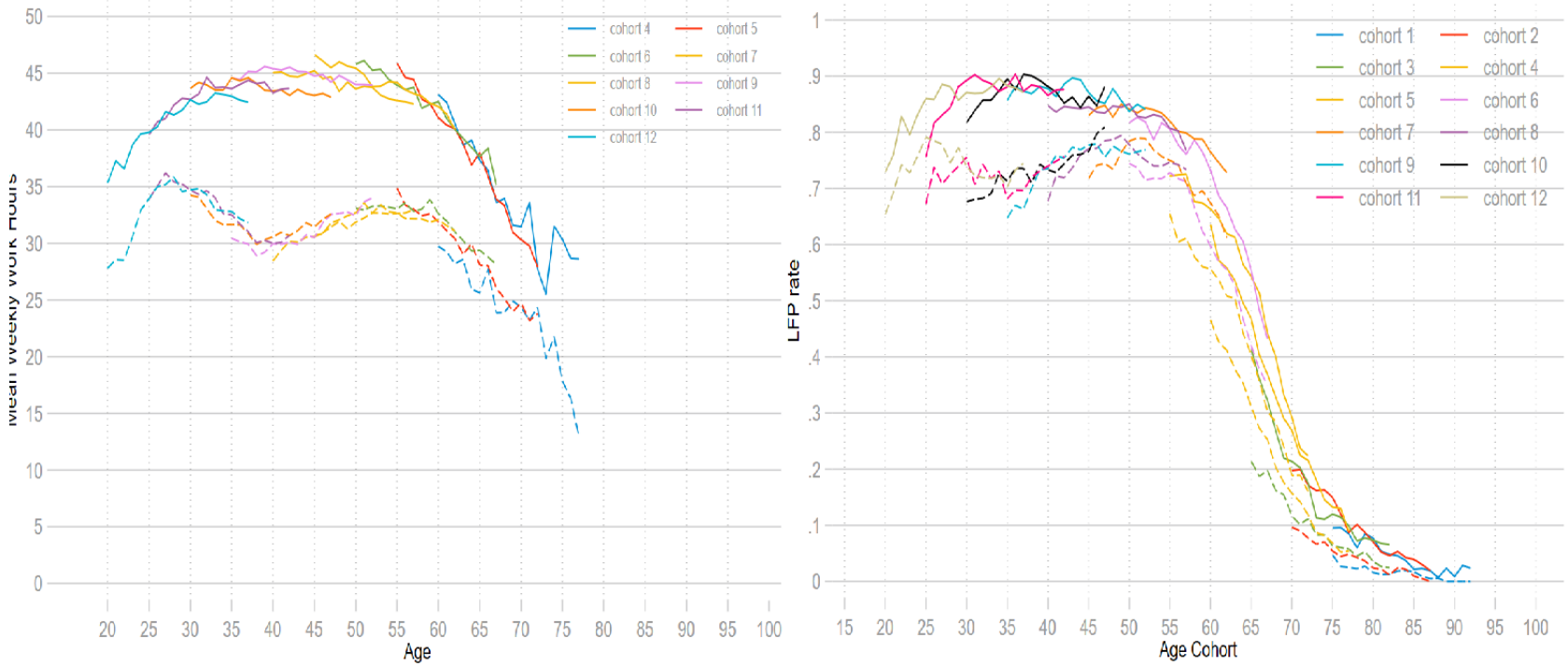

Figure: M-shaped age-profiles of work hours (left panel) and LFP rate (right panel). Solid line for men, dashed line for women.

Appendix: Spousal response vs Public transfer

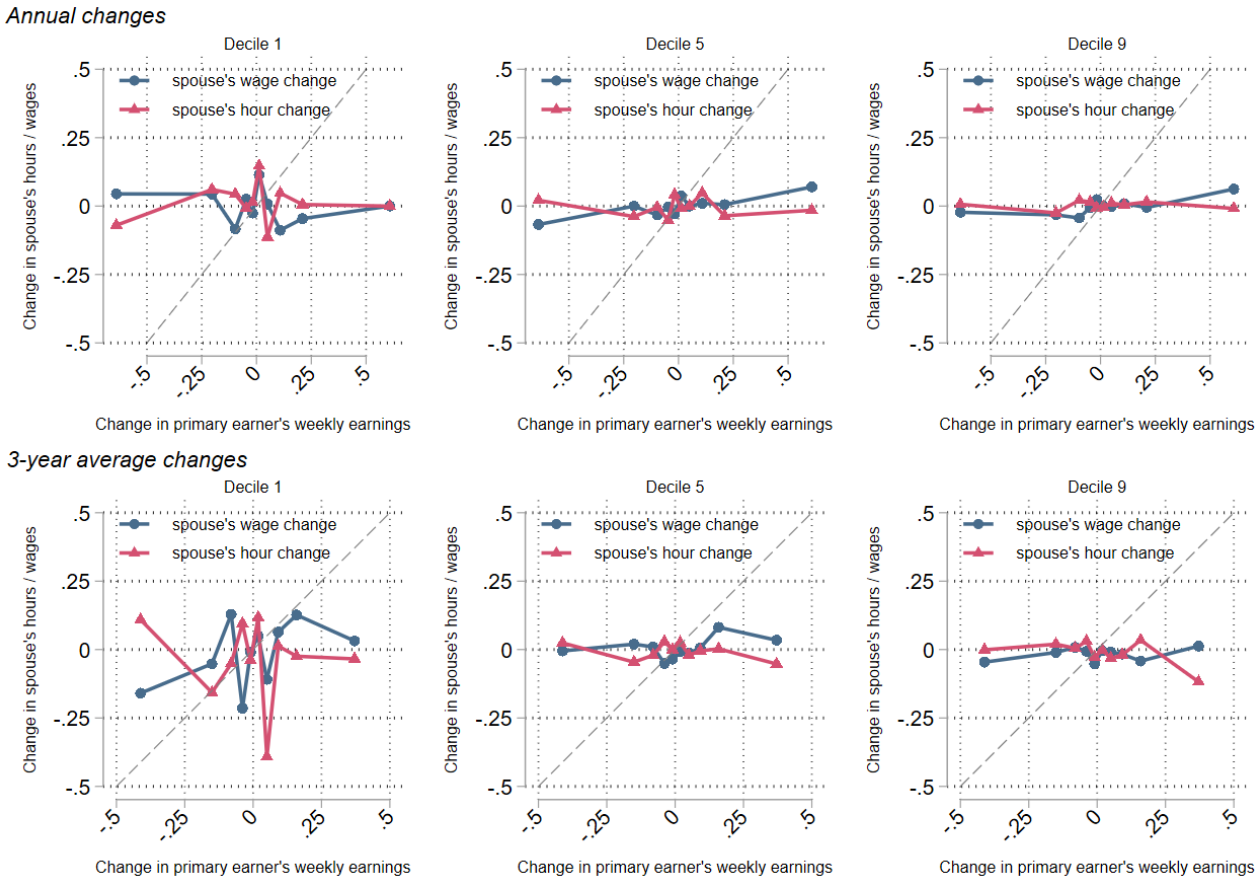

Figure: Changes in usual weekly wages and hours of spouse versus decile of changes in usual weekly earnings (main job) of primary earners in the 1st, 5th, and 9th deciles of past weekly earnings. The top and bottom panels report annual and 3-year average changes, respectively.

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Appendix: Spousal response vs Public transfer

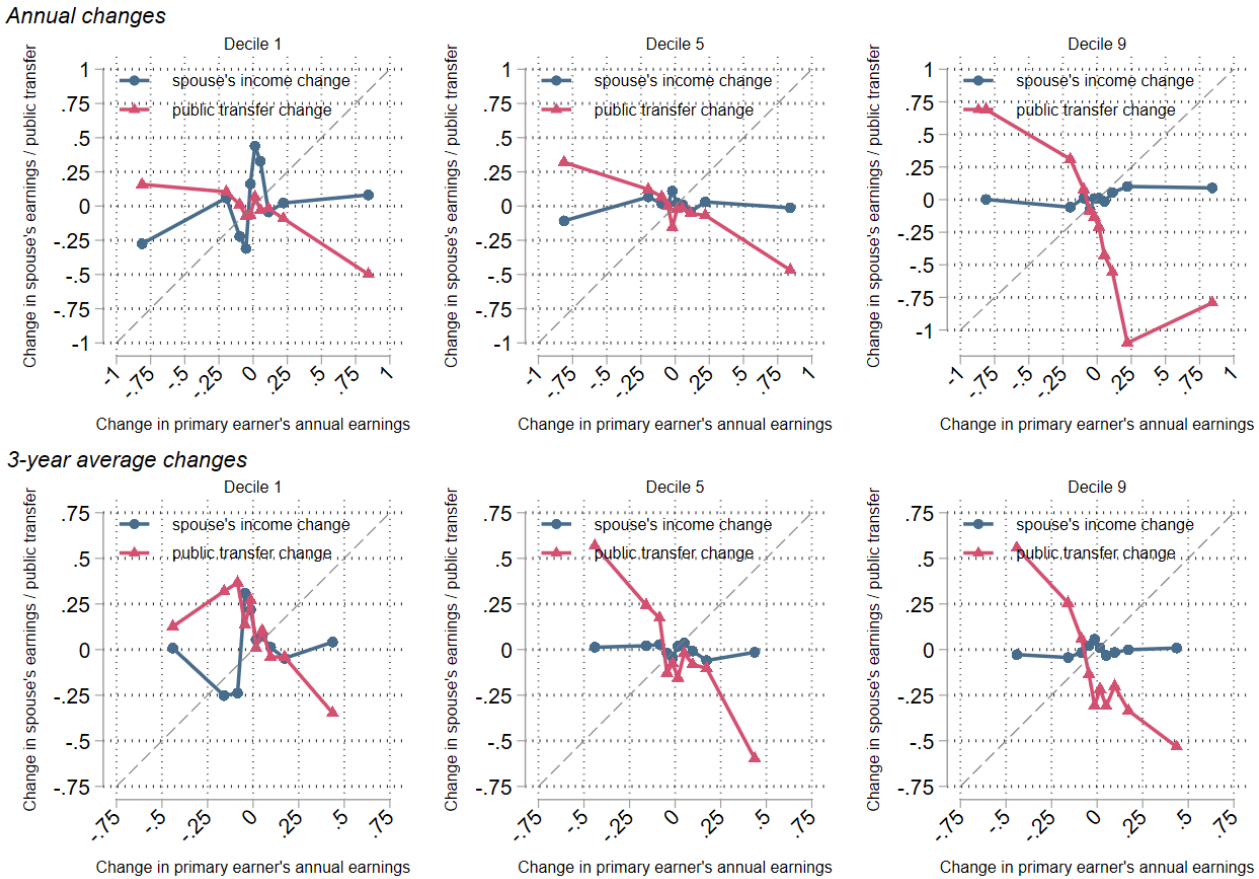

Figure: Changes in spousal earnings and public transfers versus decile of changes in past market earnings of primary earners in the 1st, 5th, and 9th deciles of past regular market income. The top and bottom panels report annual and 3-year average changes, respectively.

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Appendix: Additional statistics

	Age 25-34		Age 35-44		Age 45-54		Age 55-64		
Past decile	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Total
1	231	294	497	309	519	319	396	124	2,689
	50.55%	6.42%	47.93%	3.82%	46.55%	3.85%	46.48%	3.46%	9.61%
	8.59%	10.93%	18.48%	11.49%	19.30%	11.86%	14.73%	4.61%	100.00%
2	66	556	195	688	184	694	125	292	2,800
	14.44%	12.15%	18.80%	8.51%	16.50%	8.38%	14.67%	8.15%	10.00%
	2.36%	19.86%	6.96%	24.57%	6.57%	24.79%	4.46%	10.43%	100.00%
3	51	598	78	789	98	783	95	350	2,842
	11.16%	13.06%	7.52%	9.76%	8.79%	9.45%	11.15%	9.77%	10.15%
	1.79%	21.04%	2.74%	27.76%	3.45%	27.55%	3.34%	12.32%	100.00%
4	34	554	65	782	83	821	54	380	2,773
	7.44%	12.10%	6.27%	9.67%	7.44%	9.91%	6.34%	10.61%	9.91%
	1.23%	19.98%	2.34%	28.20%	2.99%	29.61%	1.95%	13.70%	100.00%
5	21	614	56	871	82	775	66	352	2,837
	4.60%	13.41%	5.40%	10.77%	7.35%	9.36%	7.75%	9.83%	10.14%
	0.74%	21.64%	1.97%	30.70%	2.89%	27.32%	2.33%	12.41%	100.00%
6	20	454	48	967	36	874	48	340	2,787
	4.38%	9.92%	4.63%	11.96%	3.23%	10.55%	5.63%	9.49%	9.96%
	0.72%	16.29%	1.72%	34.70%	1.29%	31.36%	1.72%	12.20%	100.00%
7	16	420	38	889	47	992	23	424	2,849
	3.50%	9.17%	3.66%	11.00%	4.22%	11.98%	2.70%	11.84%	10.18%
	0.56%	14.74%	1.33%	31.20%	1.65%	34.82%	0.81%	14.88%	100.00%
8	10	393	27	911	27	982	19	409	2,778
	2.19%	8.58%	2.60%	11.27%	2.42%	11.86%	2.23%	11.42%	9.93%
	0.36%	14.15%	0.97%	32.79%	0.97%	35.35%	0.68%	14.72%	100.00%
9	4	359	24	916	30	1,064	15	415	2,827
	0.88%	7.84%	2.31%	11.33%	2.69%	12.85%	1.76%	11.59%	10.10%
	0.14%	12.70%	0.85%	32.40%	1.06%	37.64%	0.53%	14.68%	100.00%
10	4	336	9	963	9	978	11	495	2,805
	0.88%	7.34%	0.87%	11.91%	0.81%	11.81%	1.29%	13.82%	10.02%
	0.14%	11.98%	0.32%	34.33%	0.32%	34.87%	0.39%	17.65%	100.00%
Total	457	4,578	1,037	8,085	1,115	8,282	852	3,581	27,987
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	1.63%	16.36%	3.71%	28.89%	3.98%	29.59%	3.04%	12.80%	100.00%

Table 4: Proportion of primary earners in part-time employment by decile of usual weekly wages from main job. The subsample contains primary earners who report positive usual weekly labour earnings for at least 15 years of observation.

Appendix: Additional statistics

		Married		Single		
Income Quintile	Parenthood	Male	Female	Male	Female	Total
Q1	Non-parent	143	455	238	177	1,013
		4.34%	12.14%	21.38%	19.39%	11.17%
		14.12%	44.92%	23.49%	17.47%	100.00%
	Parent	167	809	12	117	1,105
		5.07%	21.58%	1.08%	12.81%	12.18%
		15.11%	73.21%	1.09%	10.59%	100.00%
Q2	Non-parent	200	407	319	217	1,143
		6.07%	10.86%	28.66%	23.77%	12.60%
		17.50%	35.61%	27.91%	18.99%	100.00%
	Parent	234	597	1	32	864
		7.10%	15.93%	0.09%	3.50%	9.53%
		27.08%	69.10%	0.12%	3.70%	100.00%
Q3	Non-parent	327	379	261	179	1,146
		9.92%	10.11%	23.45%	19.61%	12.64%
		28.53%	33.07%	22.77%	15.62%	100.00%
	Parent	399	386	2	19	806
		12.11%	10.30%	0.18%	2.08%	8.89%
		49.50%	47.89%	0.25%	2.36%	100.00%
Q4	Non-parent	361	255	165	120	901
		10.95%	6.80%	14.82%	13.14%	9.93%
		40.07%	28.30%	18.31%	13.32%	100.00%
	Parent	548	219	2	1	770
		16.63%	5.84%	0.18%	0.11%	8.49%
		71.17%	28.44%	0.26%	0.13%	100.00%
Q5	Non-parent	349	129	111	51	640
		10.59%	3.44%	9.97%	5.59%	7.06%
		54.53%	20.16%	17.34%	7.97%	100.00%
	Parent	568	112	2	0	682
		17.23%	2.99%	0.18%	0.00%	7.52%
		83.28%	16.42%	0.29%	0.00%	100.00%
	Total	3,296	3,748	1,113	913	9,070
	%	100.00%	100.00%	100.00%	100.00%	100.00%
	%	36.34%	41.32%	12.27%	10.07%	100.00%

Table 6: Cross-tabulation of frequencies between parenthood, marital status and gender. Since HILDA tracks individuals and their households over time, we present a snapshot of the first cohort entering the survey in 2001. The table suggests a negative assortative matching (or matching of unlike) between higher income males and lower income females.

Appendix: Additional statistics

	Married		Single		
Highest education attained	Male	Female	Male	Female	Total
High school or lower	1,226	2,227	639	494	4,586
	37.20%	59.45%	57.41%	54.11%	50.57%
	26.73%	48.56%	13.93%	10.77%	100.00%
Above high school,	1,741	1,221	424	350	3,736
at most bachelor's degree	52.82%	32.59%	38.10%	38.34%	41.20%
	46.60%	32.68%	11.35%	9.37%	100.00%
Above bachelor's degree,	329	298	50	69	746
at most post-graduate degree	9.98%	7.96%	4.49%	7.56%	8.23%
	44.10%	39.95%	6.70%	9.25%	100.00%
Total	3,296	3,746	1,113	913	9,068
%	100.00%	100.00%	100.00%	100.00%	100.00%
%	36.35%	41.31%	12.27%	10.07%	100.00%

Table 7: Cross-tabulation of frequency between education, marial status, and gender. Since HILDA tracks individuals and their households over time, we present a snapshot of the first cohort entering the survey in 2001. The table suggests a negative assortative matching (or matching of unlike) between higher education males and lower education females. The observed pattern becomes less pronounced in later years of survey, partly due to attrition and the inclusion of new and younger households in the survey.