“Behind a stable poverty rate: Changes in the duration of poverty episodes in the United States since the mid-1980s”

Iryna Kyzyma
Luxembourg Institute for Socio-Economic Research
and the University of Bremen

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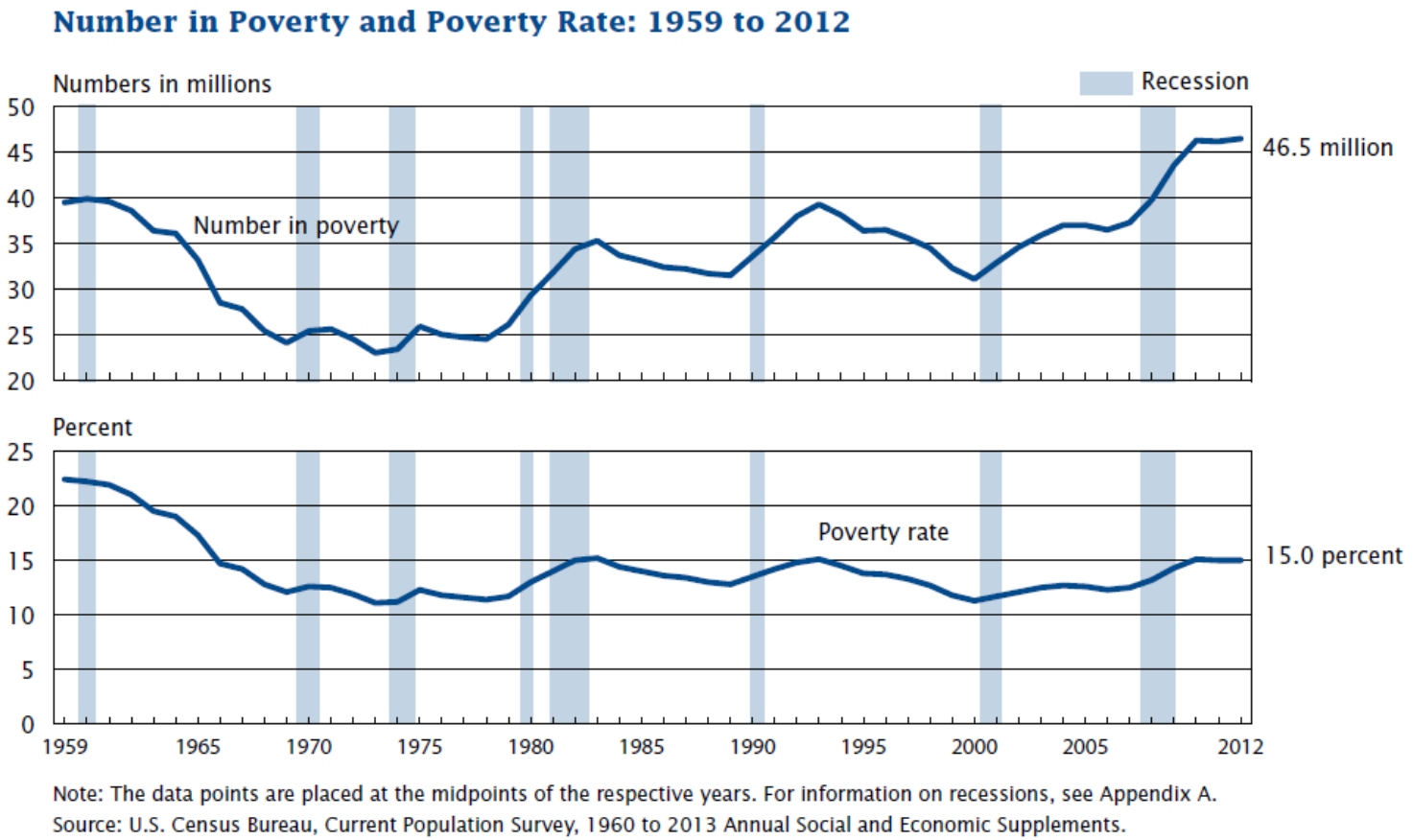
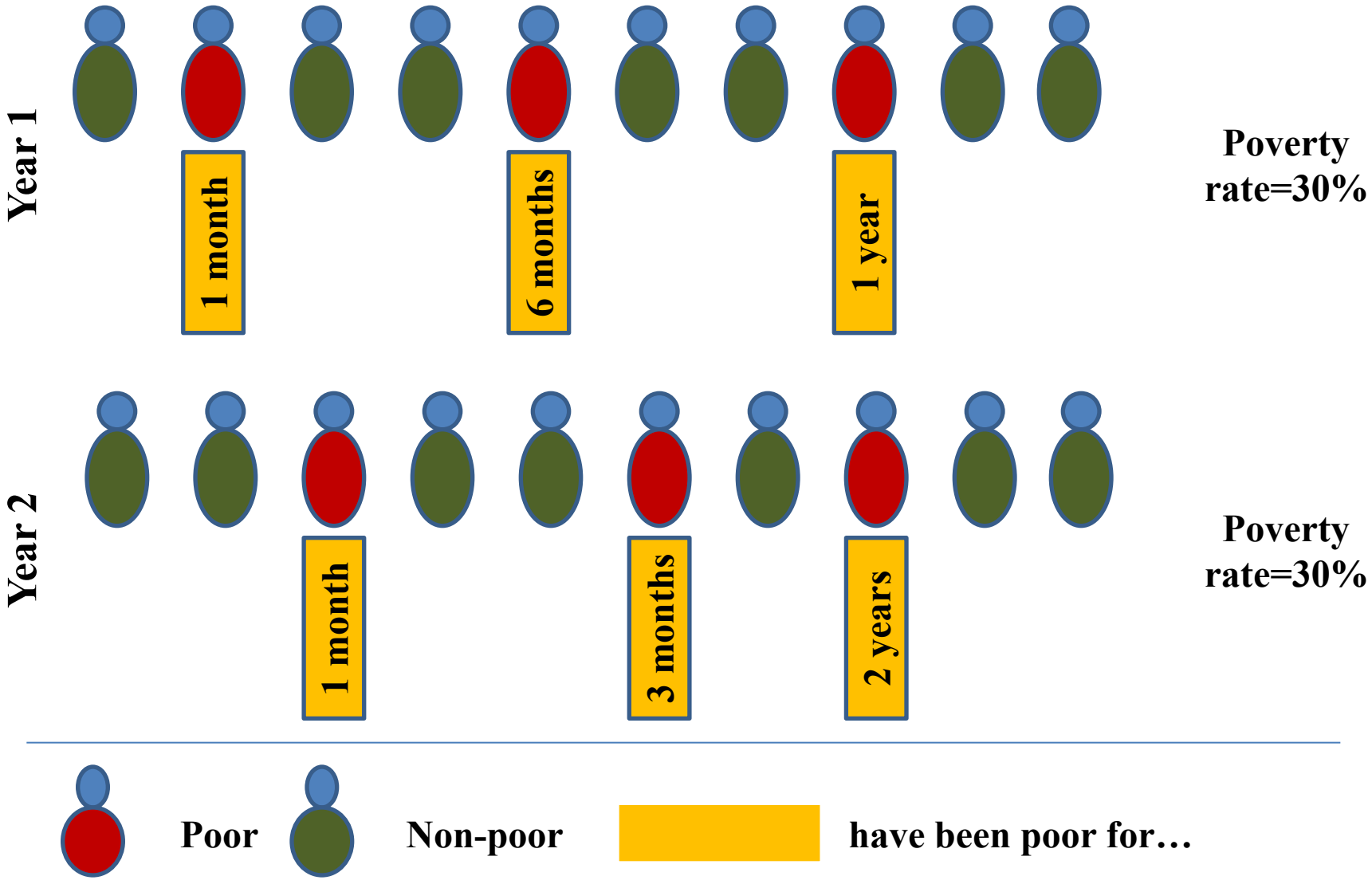
Motivation



Source: DeNavas-Walt et al. (2013).

Distribution of poverty duration



Research questions

How the duration distribution of poverty episodes has evolved in the US since the mid-1980s?

To what extent the observed changes may be attributed to the changes in the composition of the poor and changes in the structure of poverty?

Literature

- General literature on poverty dynamics: correlates of poverty entries and exits, duration of poverty (Bane & Ellwood, 1986; Stevens , 1999; Jarvis & Jenkins, 1997; Jenkins, 2011 etc.)

- Changes in poverty over time (US case):
  - Changes in static poverty (Dickens and Ellwood, 2004; Meyer & Sullivan, 2012)
  - Changes in poverty dynamics and the risk of poverty across the life-course (McKernan and Ratcliffe, 2002; Sandoval et al., 2009)
  - Changes in the duration of poverty (Card and Blank, 2008)

Contribution of this paper

Methodological: Proposes a methodological framework which makes it possible to construct and decompose the entire duration distribution of poverty episodes

Empirical: Provides new evidence about changes in the duration distribution of poverty episodes in the US for the entire adult population

Specification of the unconditional duration distribution of poverty episodes

Conditional hazard function:

$$h_i(t) = \Pr[T_i = t \mid T_i \geq t, X_i] = \Theta(t_i, X_i)$$

The probability density function (PDF) of time spent in poverty:

$$f_i(t) = \Pr[T_i = t \mid X_i] = h_i(t) \cdot \prod_{s=1}^{t-1} (1 - h_i(s))$$

The cumulative distribution function (CDF) of time spent in poverty:

$$F_i(t) = \Pr[T_i \leq t \mid X_i] = \sum_{t=1}^{t} [h_i(t) \cdot \prod_{s=1}^{t-1} (1 - h_i(s))]$$

Estimation

Step 1: Estimate the conditional probability of exiting poverty given a set of observed and unobserved characteristics, for example, using logit specification:

$$\hat{h}_i(t) = \frac{\exp(\lambda_{Dt} + \sum_{m=1}^{M} X_{itM}\beta_{tM} + \theta_i)}{1 + \exp(\lambda_{Dt} + \sum_{m=1}^{M} X_{itM}\beta_{tM} + \theta_i)}$$

Step 2: Recover individual CDF functions

$$\hat{F}_i(t) = \sum_{t=1}^{t}[\hat{h}_i(t) \cdot \prod_{s=1}^{t-1}(1 - \hat{h}_i(s))]$$

Step 3: Aggregate across individuals

$$\hat{F}(t) = \Pr[T = t] = \frac{1}{N^t}\sum_{i=1}^{N^t}\hat{F}_i(t)$$

Aggregate decomposition

$$\Delta F(t) = F^{(1)}(t) - F^{(0)}(t) =$$

$$= [\frac{1}{N^t_{(1)}} \sum_{i\,\varepsilon(1)} \Lambda(\lambda^{(1)}_{Dt} + \sum_{m=1}^{M} X_{i\,tm}\beta_{tm}{}^{(1)} + \theta^{(1)}_i) - \frac{1}{N^t_{(0)}} \sum_{i\,\varepsilon(0)} \Lambda(\lambda^{(1)}_{Dt} + \sum_{m=1}^{M} X_{i\,tm}\beta_{tm}{}^{(1)} + \theta^{(1)}_i)] +$$

$$+ [\frac{1}{N^t_{(0)}} \sum_{i\,\varepsilon(0)} \Lambda(\lambda^{(1)}_{Dt} + \sum_{m=1}^{M} X_{i\,tm}\beta_{tm}{}^{(1)} + \theta^{(1)}_i) - \frac{1}{N^t_{(0)}} \sum_{i\,\varepsilon(0)} \Lambda(\lambda^{(0)}_{Dt} + \sum_{m=1}^{M} X_{i\,tm}\beta_{tm}{}^{(0)} + \theta^{(0)}_i)] =$$

$$= \Delta C + \Delta S$$

Further decomposition of the structure of poverty

$$\Delta S =$$

$$= [\frac{1}{N^t_{(0)}} \sum_{i\,\varepsilon(0)} \Lambda(\lambda^{(1)}_{Dt} + \sum_{m=1}^{M} X_{i\,tm}\beta_{tm}{}^{(1)} + \theta^{(1)}_i) - \frac{1}{N^t_{(0)}} \sum_{i\,\varepsilon(0)} \Lambda(\lambda^{(0)}_{Dt} + \sum_{m=1}^{M} X_{i\,tm}\beta_{tm}{}^{(1)} + \theta^{(1)}_i)] +$$

$$+ [\frac{1}{N^t_{(0)}} \sum_{i\,\varepsilon(0)} \Lambda(\lambda^{(1)}_{Dt} + \sum_{m=1}^{M} X_{i\,tm}\beta_{tm}{}^{(1)} + \theta^{(1)}_i) - \frac{1}{N^t_{(0)}} \sum_{i\,\varepsilon(0)} \Lambda(\lambda^{(0)}_{Dt} + \sum_{m=1}^{M} X_{i\,tm}\beta_{tm}{}^{(0)} + \theta^{(1)}_i)] +$$

$$+ [\frac{1}{N^t_{(0)}} \sum_{i\,\varepsilon(0)} \Lambda(\lambda^{(0)}_{Dt} + \sum_{m=1}^{M} X_{i\,tm}\beta_{tm}{}^{(0)} + \theta^{(1)}_i) - \frac{1}{N^t_{(0)}} \sum_{i\,\varepsilon(0)} \Lambda(\lambda^{(0)}_{Dt} + \sum_{m=1}^{M} X_{i\,tm}\beta_{tm}{}^{(0)} + \theta^{(0)}_i)] =$$

$$= \Delta DP + \Delta EO + \Delta EU$$

Data and sample construction

Data:

- Survey of Income and Program Participation (SIPP)
- Data from 1984 (October 1983 – July 1986) and 2008 (September 2008 – December 2010) panels
- Up to 36 consecutive months of information in each panel

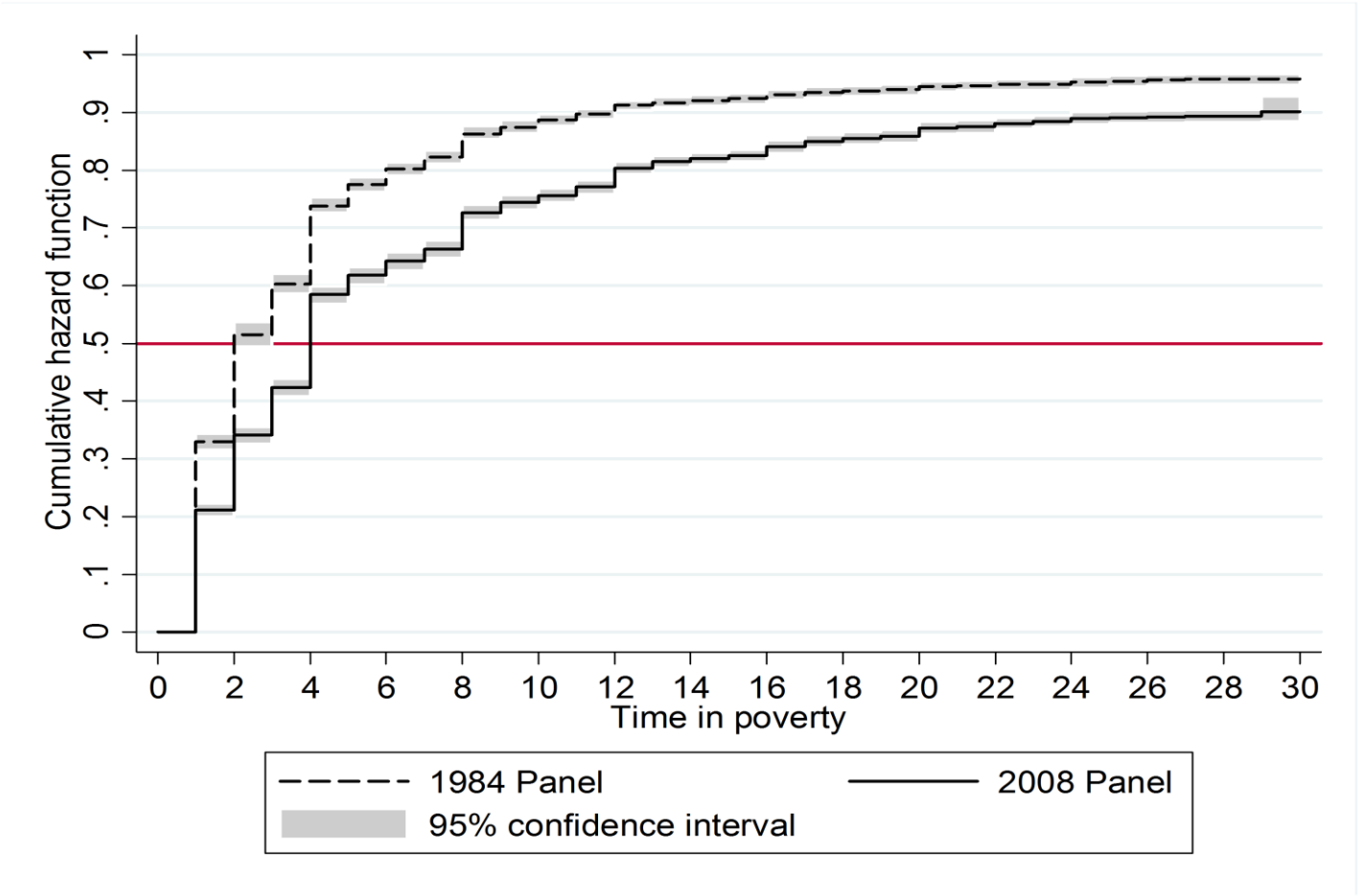
Sample construction:

- balanced sample of adult individuals (18 years and older)
- each individual is observed for all 32 months

Definitions

- Official definition of poverty developed by the Census Bureau
- The spell of poverty begins in the first month total family income falls below the poverty threshold and ends in the first month it moves above the threshold
- Only fresh spells of poverty are included in the analysis

CDFs of uninterrupted poverty episodes by their duration



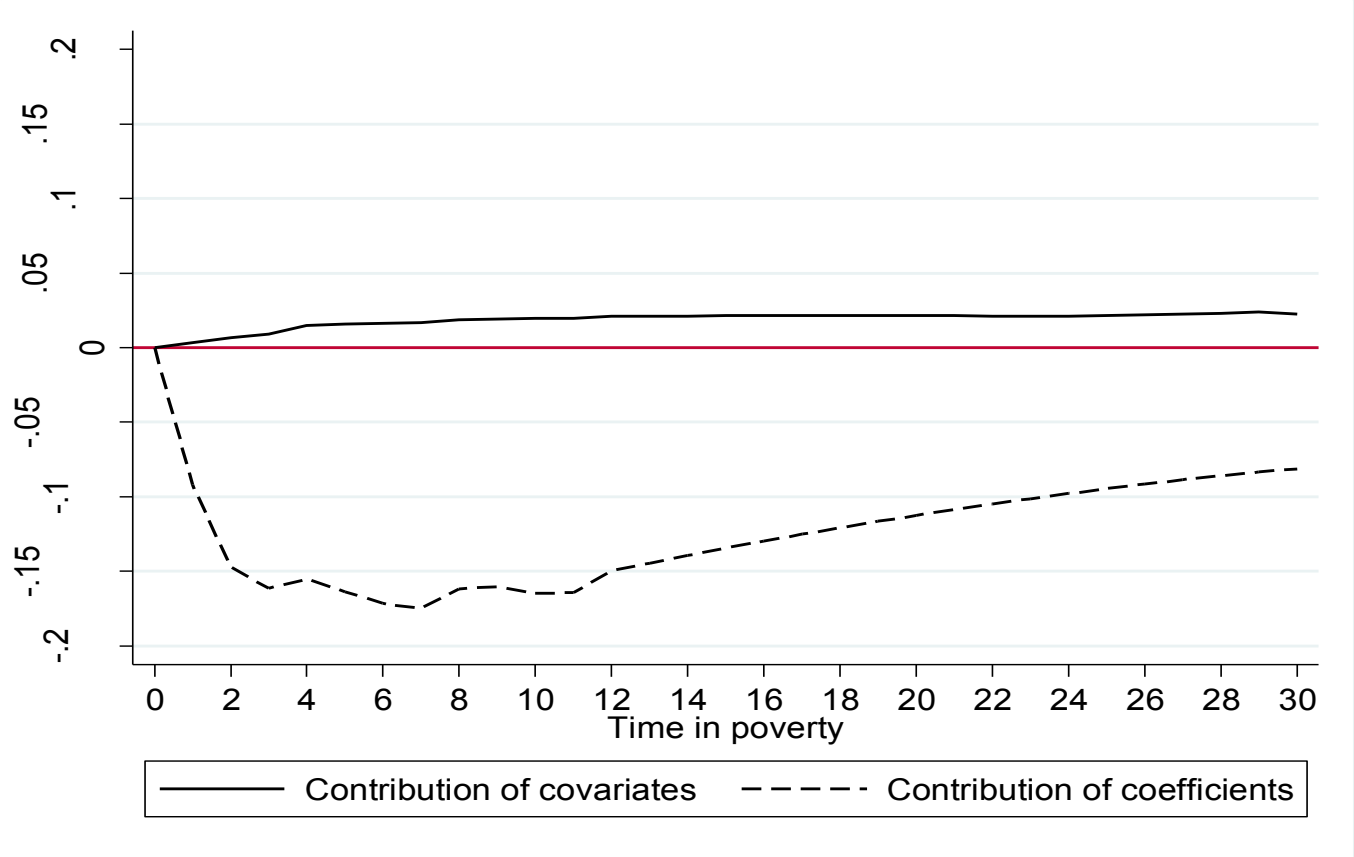
Differences in the duration distribution of uninterrupted poverty episodes by sub-groups

	Mean duration	Median duration	At selected points of the cumulative hazard function			
			t=1	t=12	t=24	t=30
Total	+1.47	+1.161	-0.1178	-0.1087	-0.0619	-0.0567
Age of household head						
< 25	+1.61	+1.923	-0.1321	-0.1044	-0.0729	-0.0642
25-54 years	+1.72	+1.683	-0.1402	-0.1158	-0.0662	-0.0694
55-64 years	+1.32	+2.136	-0.0906	-0.1119	-0.0367	-0.0321
65+ years	+0.92	+0.186	-0.0061	-0.0750	-0.0645	-0.0626
Sex						
Male	+1.73	+1.664	-0.1314	-0.1104	-0.0595	-0.0471
Female	+0.92	+1.146	-0.0795	-0.0833	-0.0466	-0.0468
Race						
Only white	+1.50	+1.513	-0.1160	-0.1012	-0.0553	-0.0461
Only black	+1.49	+2.223	-0.1236	-0.1654	-0.0890	-0.1029
Hispanic or Latino	+1.45	+1.470	-0.1280	-0.0936	-0.0758	-0.0731
Education						
Uncompleted high school	+1.85	+1.318	-0.0883	-0.1395	-0.0947	-0.0927
Completed high school	+1.67	+1.944	-0.1764	-0.1414	-0.0098	-0.1006
College or higher	+1.62	+1.553	-0.1265	-0.1027	-0.0464	-0.0444
Family types						
Single parent	+1.34	+1.985	-0.1425	-0.1530	-0.0932	-0.0812
Single	+1.33	+1.037	-0.0775	-0.0852	-0.0607	-0.0390
Couple	+1.72	+1.511	-0.1201	-0.0898	-0.0547	-0.0603
Other	-0.04	+1.090	-0.0842	-0.0665	-0.0101	-0.0015

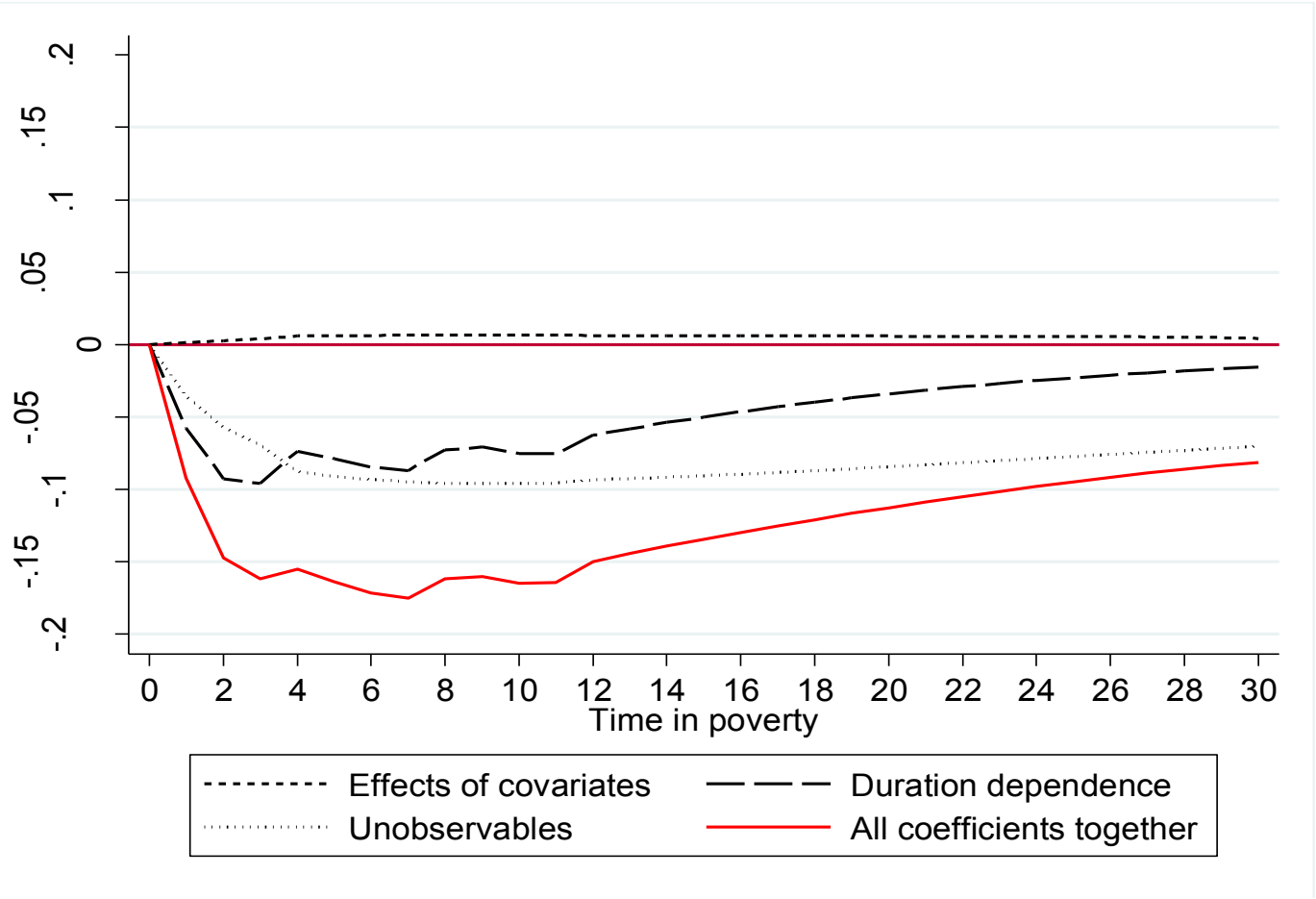
Characteristics of the poor and their change over time

Covariates	1984 Panel	2008 Panel	Difference (2008 to 1984)
Age of household head			
< 25 years old	10.74	7.92	- 2.82*
25-54	60.15	67.21	+7.06***
55-64	14.54	14.77	+0.23
≥ 65	14.57	10.10	- 4.47***
Gender of household head			
Men	59.26	44.18	- 15.08***
Women	40.74	55.82	+15.08***
Race and ethnicity of household head			
Only white	70.84	63.98	-6.86***
Only black	20.08	15.84	-4.24*
Hispanic or Latino	9.08	20.18	+11.10***
Family type			
Single parent	15.43	16.03	+0.60
Single	23.43	31.69	+8.26***
Couple	51.92	42.30	-9.62***
Other	9.22	9.98	+0.76
Education			
Uncompleted high school	45.09	25.27	-19.82***
Completed high school	30.24	26.21	-4.03*
College or higher	24.67	48.52	+21.85***
Monthly state unemployment rate	7.71	9.42	+1.71***

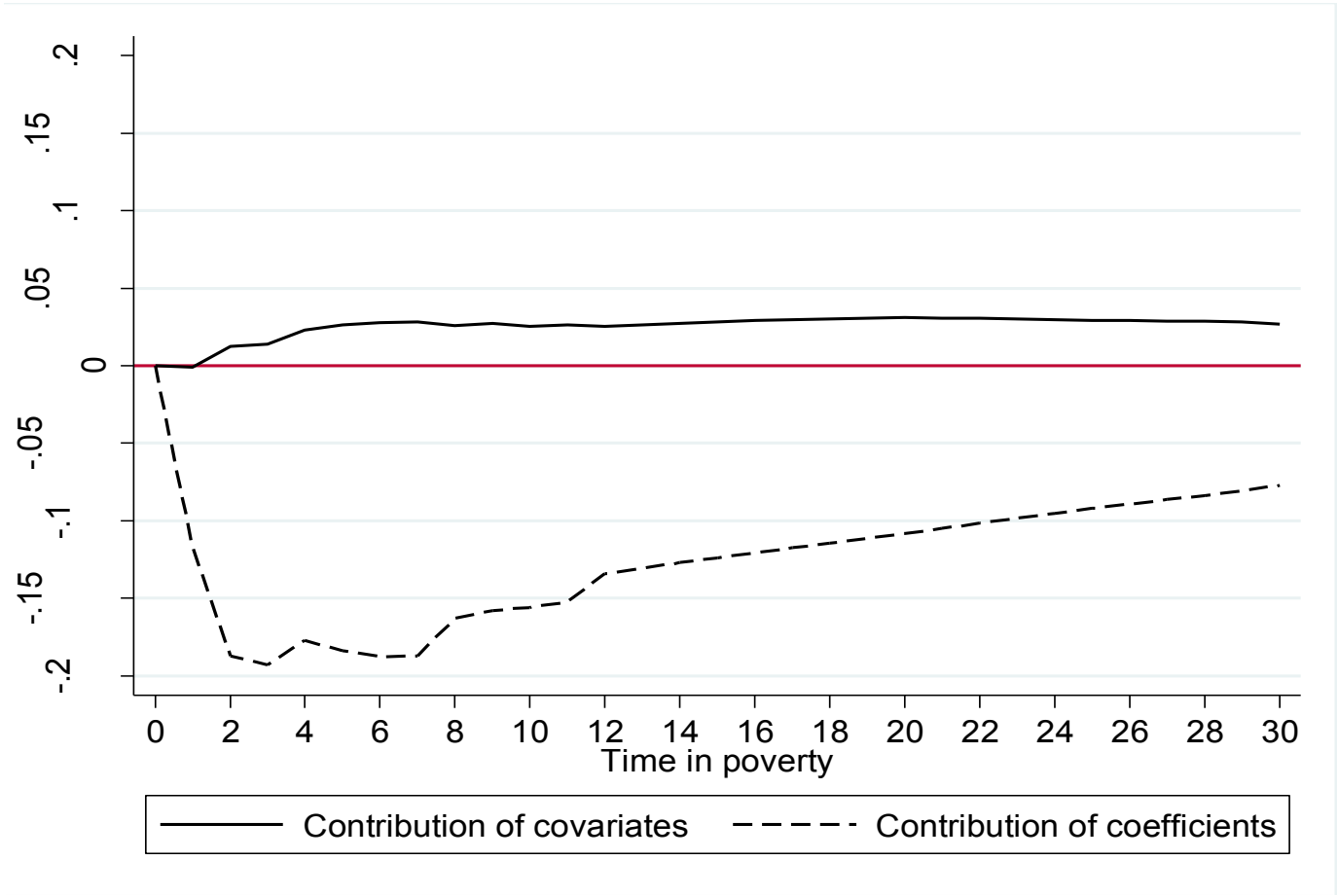
Aggregate decomposition results



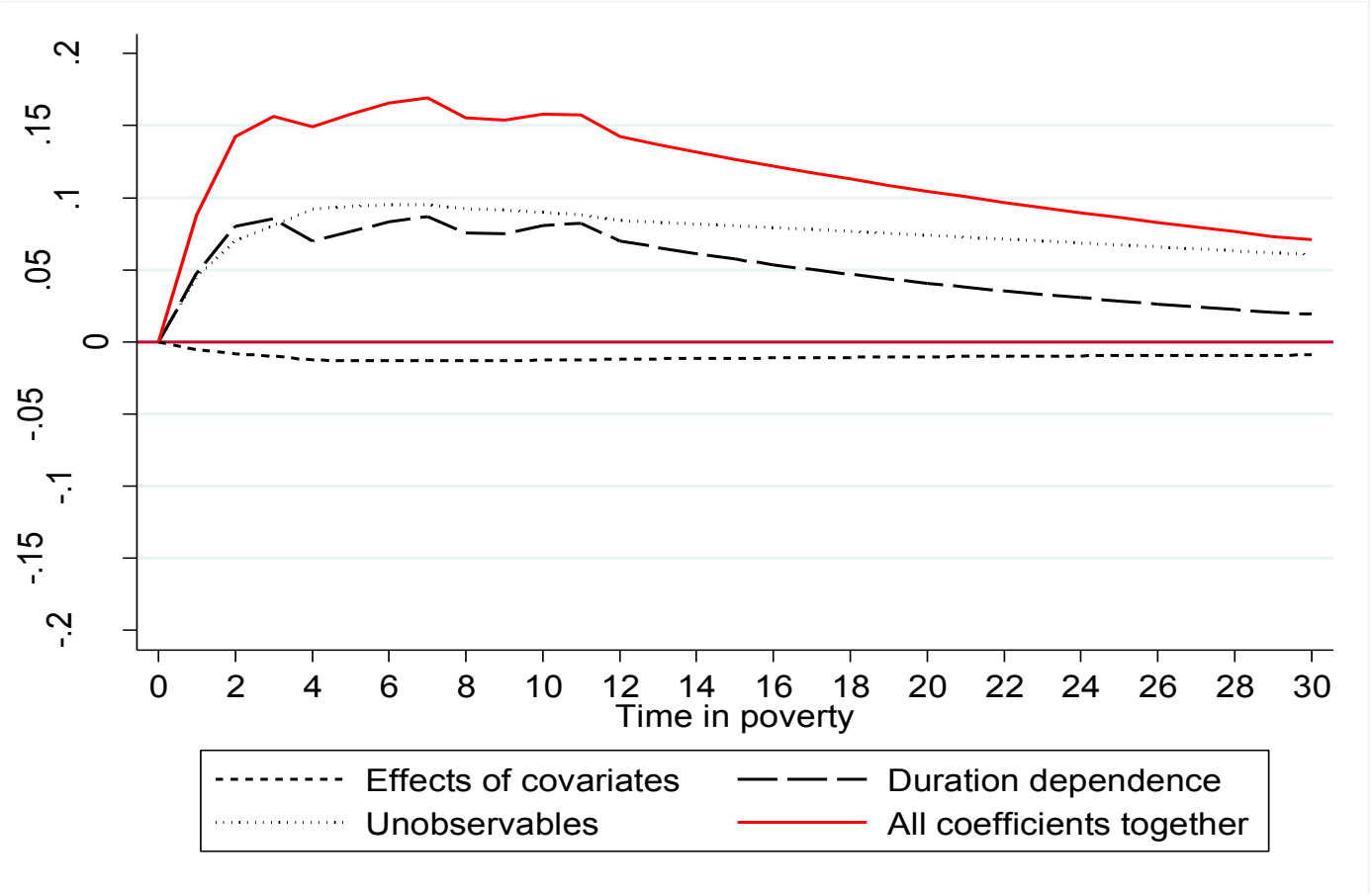
Detailed decomposition of the structure of poverty



Robustness check: heterogeneous effects of observed characteristics



Robustness check: reverse order decomposition



Conclusions / discussion

- Albeit the official poverty rate was relatively constant between the mid-1980s and late 2000s, the duration of poverty has increased

- The increase in the persistence of poverty is driven by the decline in the probabilities of having very short poverty spells (1 to 3-month) with a subsequent increase in the probabilities of having longer spells, especially those lasting beyond 12 months

- The observed changes in the duration distribution of poverty episodes are induced mainly by the changes in the structure of poverty rather than the characteristics of the poor

Thank you for your attention!