The Asset Cost of Poor Health

James Poterba
MIT and NBER
Steven Venti
Dartmouth College and NBER
David A. Wise
Harvard University and NBER

Motivation

- Out-of-pocket medical expenses: Marshall, McGarry and Skinner (2009)--spending in the last years of life:
  - $11,618 on average
  - $49,907 at the 90th percentile
  - $94,310 at the 99th percentile.
- Wealth effect of specific major health events: Smith (1999, 2004), Coile and Milligan (2009)
- Not full cost of poor health:
  - May miss the more indirect cost of health care— home relocation, home alterations, transportation, and the like.
  - Costs not directly associated with specific health events.
  - And poor health is an ongoing condition that may draw on resources over a long period of time.

Our goal

- To estimate the full cost of poor health over an extended time period
- The effect of poor health on the evolution of near- and post-retirement assets, the "asset cost of poor health"
- We intend that the measure be all-inclusive, capturing both out-of-pocket medical expenses as well as other health-related costs.

Outline

- Data and the evolution of assets
  - HRS cohort
  - Two-person households
- Latent health index and properties
- Estimating the "asset cost of poor health"
- Pathways from poor health to asset cost and extensions

Figure 1-1. Mean assets by year, all persons in continuing two-person households age 51-61 in 1992
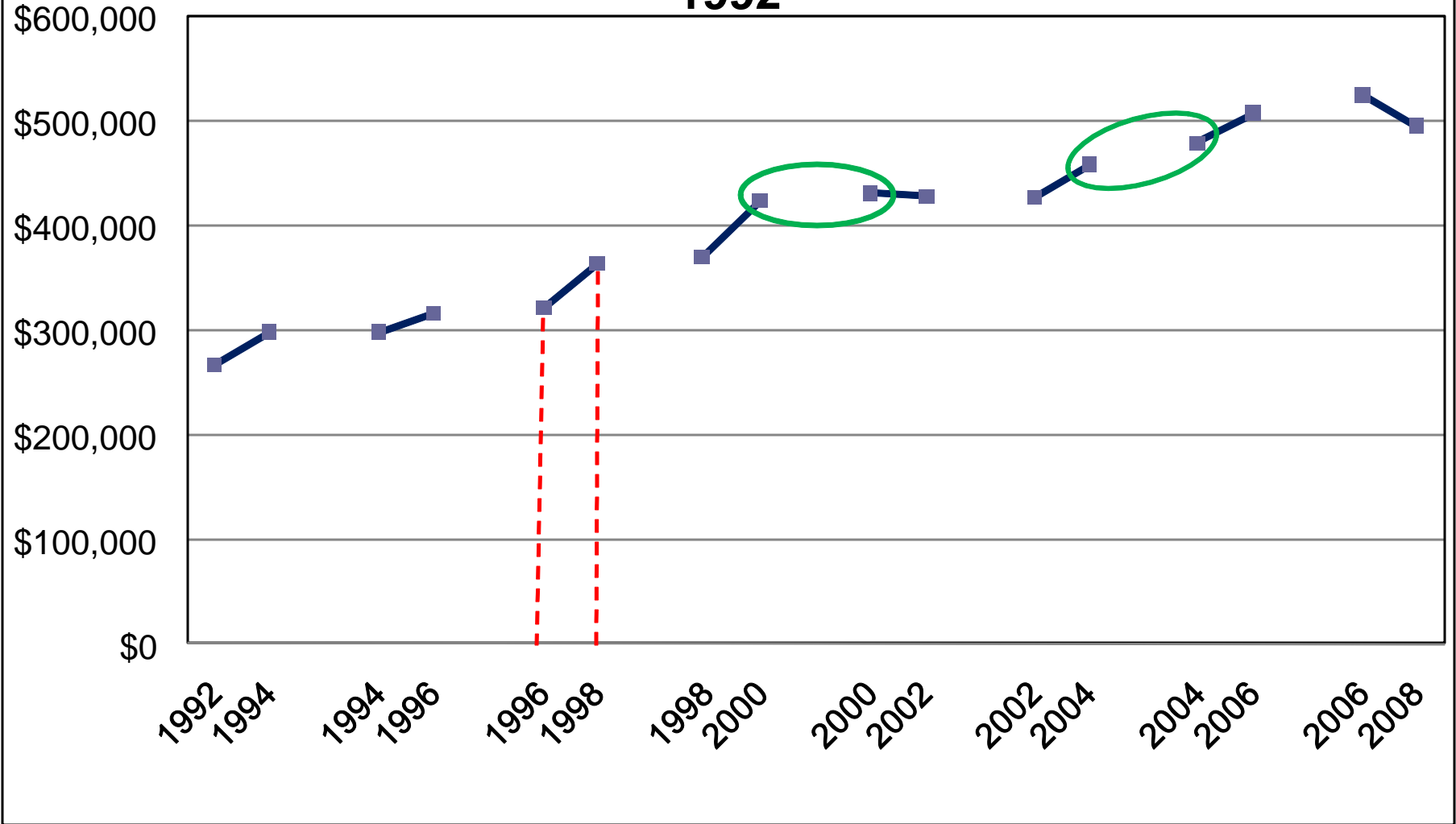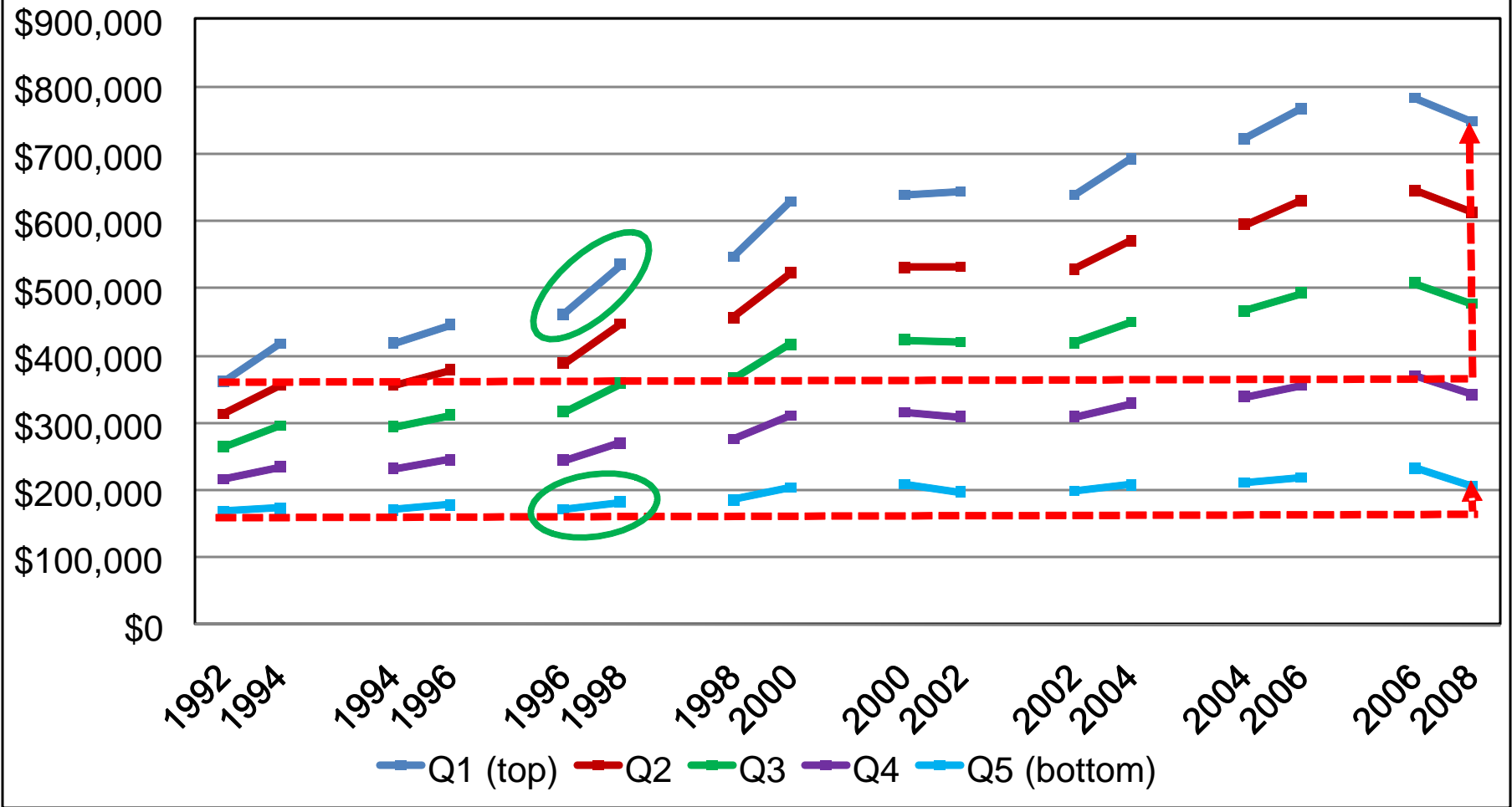
Fig. 3-1. Predicted assets by year, all persons in continuing two-person households, by evolving health quintile, for persons age 51-61 in 1992

Legend: Q1 (top) — Q2 — Q3 — Q4 — Q5 (bottom)

Latent health index

- Based on 27 HRS questions about health and health events—1st principal component

- Properties:
  - Substantial information re assets and evolution of assets
  - Stable over time (age)
  - Strongly related to mortality
  - Strongly predictive of future health events
  - Strongly related to economic outcomes prior to 1992 and well as subsequent outcomes

Table 2-1. Latent health index: weights for selected questions and years

HRS question	1992	2000	2006
Number of periods: health problems limit work	0.29	0.28	0.27
Number of periods with difficulty stoop/kneel/crouch	0.25	0.25	0.25
Ever experience psychological problems	0.14	0.13	0.13
Ever experience lung disease	0.12	0.10	0.10
BMI at beginning of period	0.10	0.10	0.10

Table 2-2. Mortality by latent health quintile in 1992

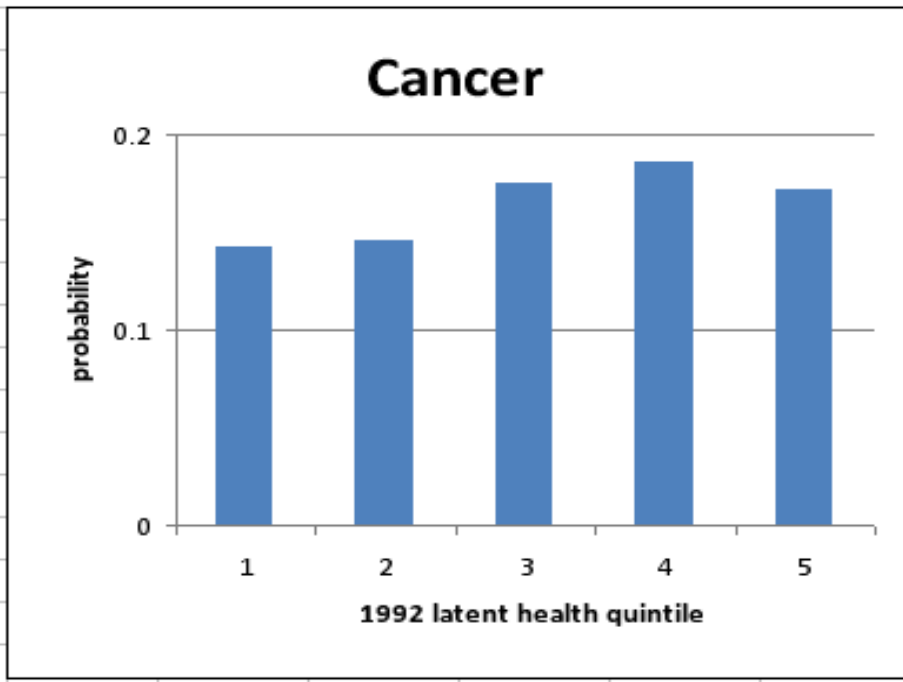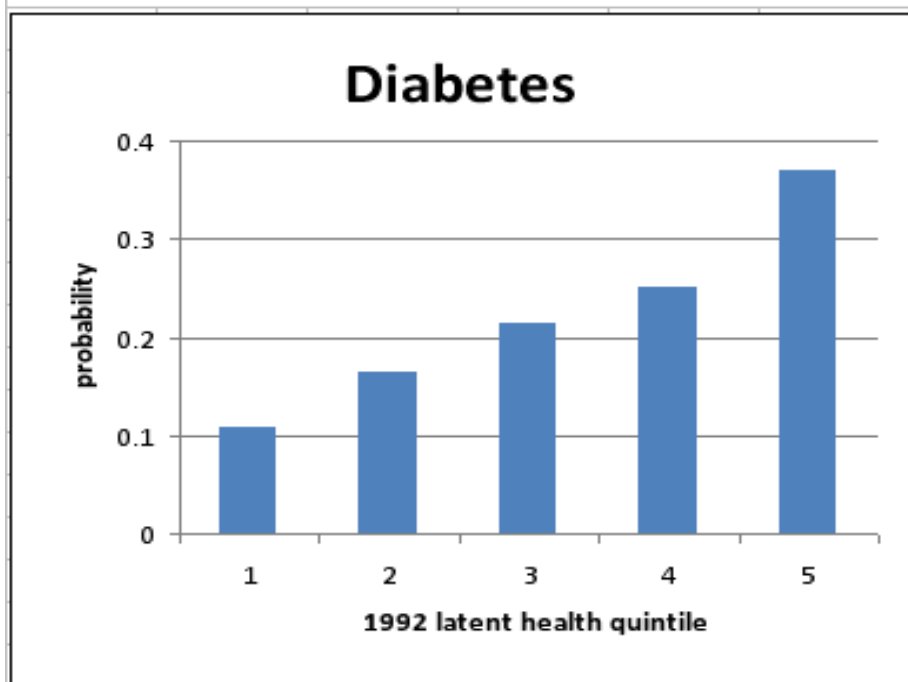| Year	health quintile				
	bottom 5%	1	3	5	top 5%
Men					
1996	1%	1%	2%	6%	10%
2002	7%	7%	9%	25%	33%
2008	**14%**	14%	19%	43%	**57%**
Women					
1996	0%	1%	1%	3%	4%
2002	4%	3%	6%	17%	22%
2008	**7%**	6%	12%	28%	**37%**

Figure 2-1. Probability of health events by 2008 by latent health quintile in 1992, age 51 to 61 in 1992

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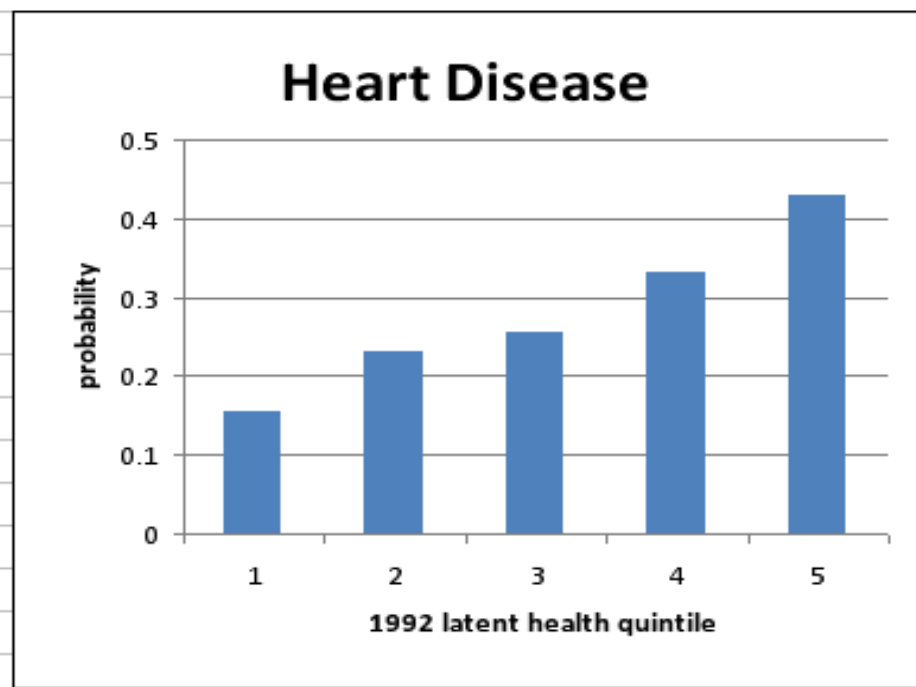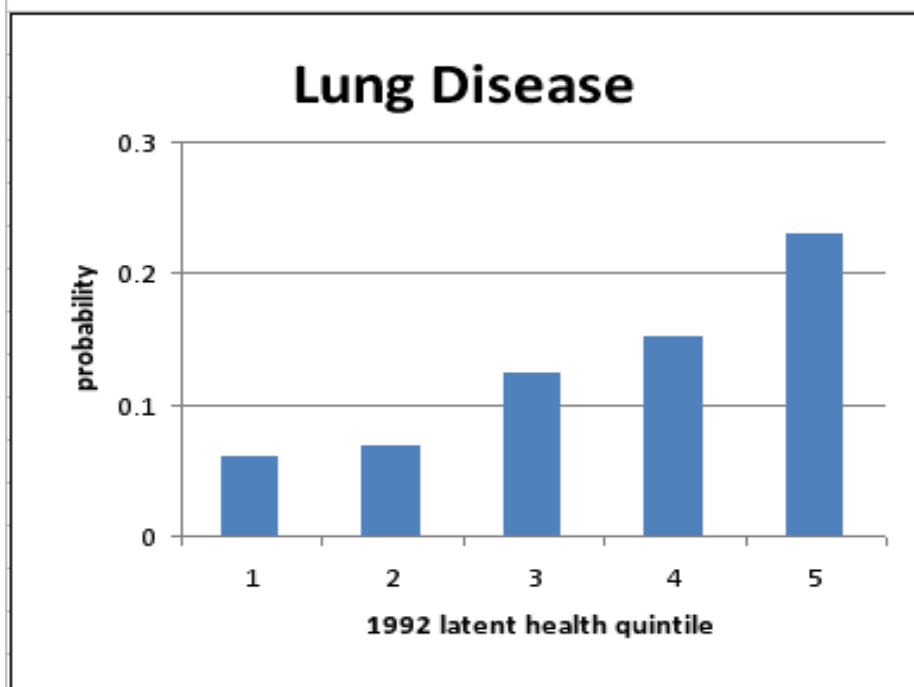
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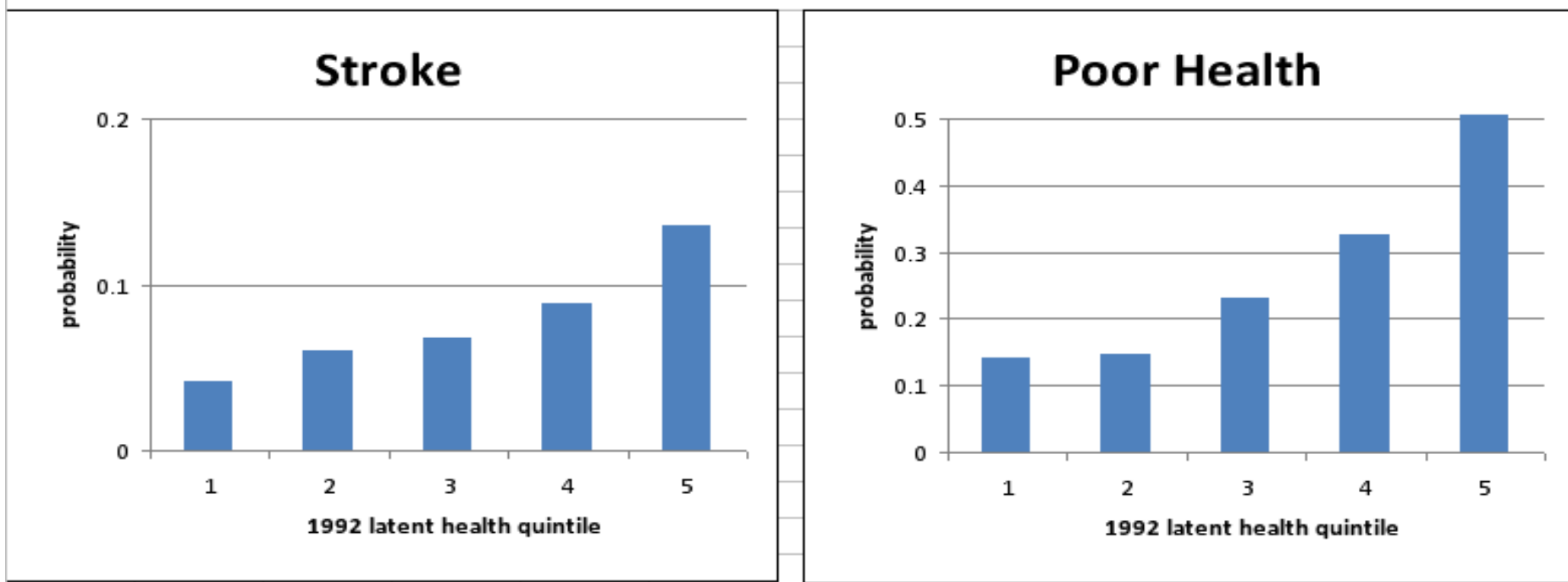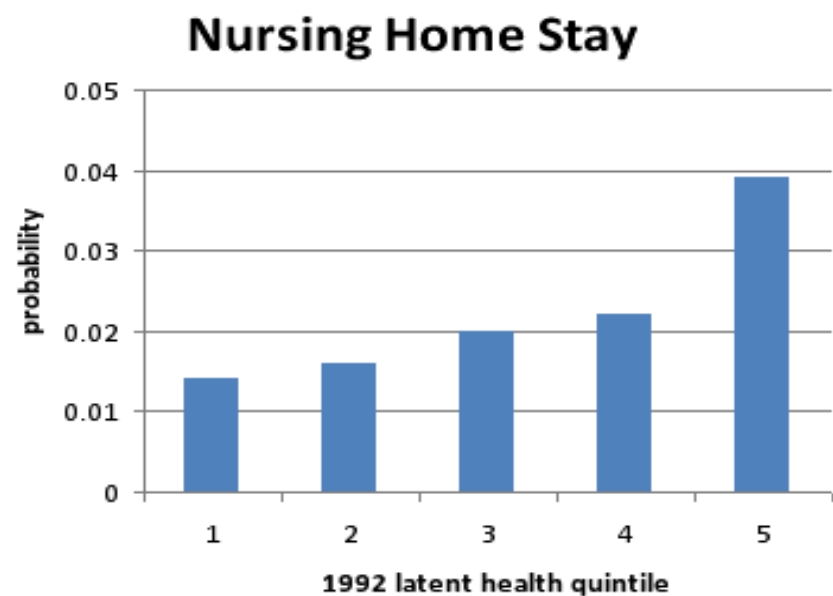
Table 2-3. Latent health, prior earnings & later outcomes, married (2008 dollars)

1992 health quintile	Lifetime SS earnings	Earnings in 1992 (if > O)	Annuity in 2006 (if >0)	Assets in 1992
1st	1,362,434	72,489	41,054	157,070
3rd	1,656,465	120,317	60,706	273,270
5th	1,663,647	152,675	69,113	370,026

The asset cost of poor health

- Two methods of estimation:
  - Difference-in-difference regression method
  - Matching method-- Abadie, Drukker, Herr and Imbens (2004) and Abadie and Imbens (2006)

Table 4-1. Difference-in-difference estimate of the "asset cost" of poor health --example

1992 asset quintile	health tercile	mean of total assets		Differ-ence	diff-in-diff 1992 vs 2008	t-stat
		1992	2008			
	1 (worst)	175,842	263,615	87,773		
3rd	2					
	3 (best)	181,705	405,172	223,467	135,694	4.78

Table 4-1. Difference-in-difference and matching estimates of the "asset cost" of poor health

1992 asset quintile	health tercile	Diff-in-diff		Matching	
		coef-ficient	t-stat	coef-ficient	t-stat
	1 (worst)				
1st (lowest)	2	24,356	1.3	12,629	0.8
	3 (best)	72,295	3.5	53,218	2.2
	1 (worst)				
3rd	**2**	**58,072**	**2.1**	**51,142**	**1.8**
	3 (best)	**135,694**	**4.8**	**126,793**	**3.6**
	1 (worst)				
5th (highest)	2	338,274	1.9	383,639	2.8
	3 (best)	472,117	2.7	585,092	3.6

Preliminary further analysis

- Pathways from poor health to asset cost of poor health
- The effect of annuity income (Social Security) and earned income

Pathways from poor health to low post-retirement asset evolution

Poor Health

(2) → **Low Earnings**

(1) → High post-retirement health-related costs

(2)-a → Low Assets at Retirement

(2)-c → **Low Social Security and Pension Annuity**

(2)-b

Low Post-Retirement Asset Evolution
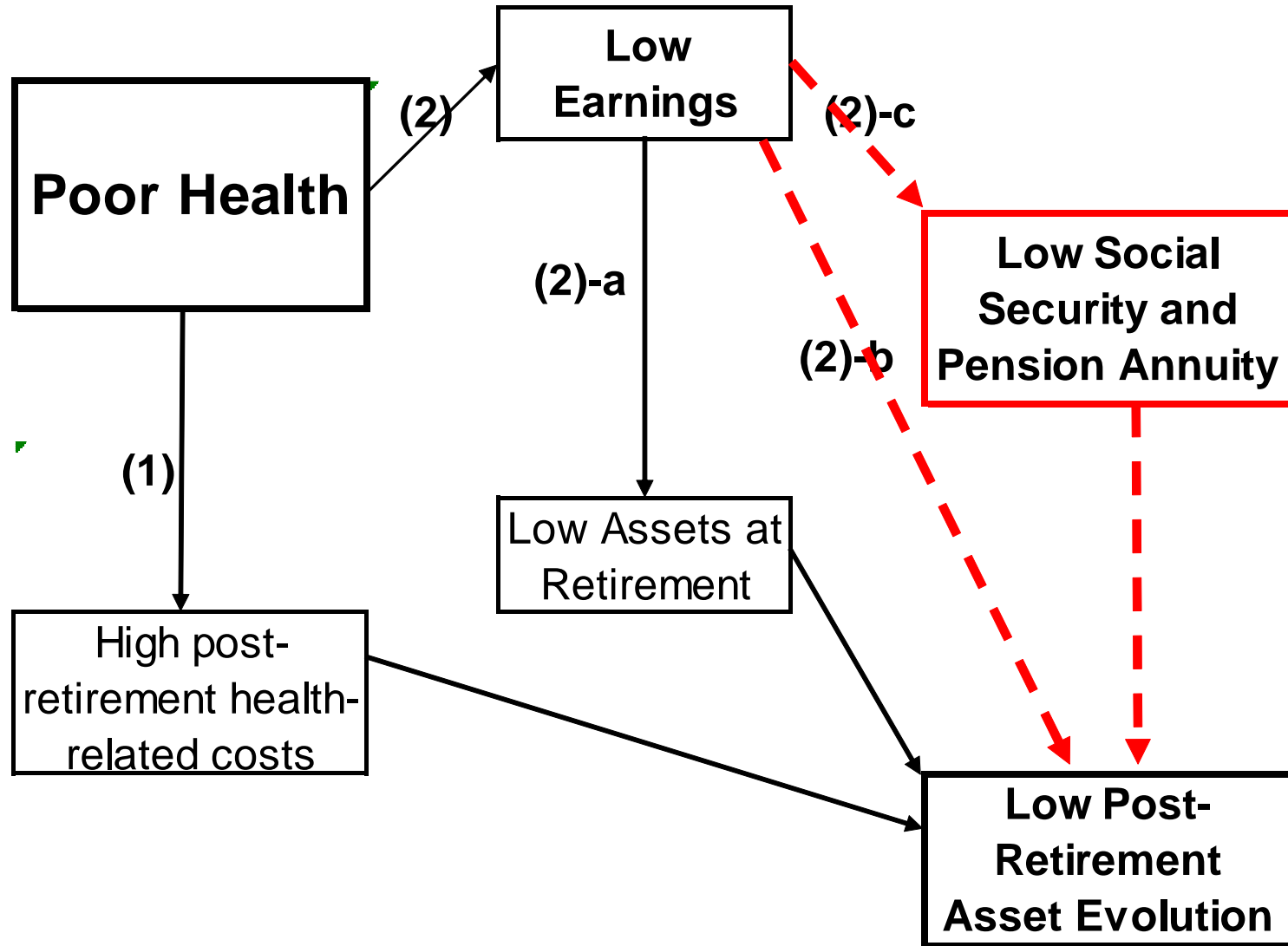
Confirming data

- Latent health and past and future economic outcomes—Table 2-3 again

- Estimation of assets and the effect of:
  - latent health
  - Annuity income
  - Earned income

Table 2-3. Latent health, prior earnings & later outcomes, married (2008 dollars)

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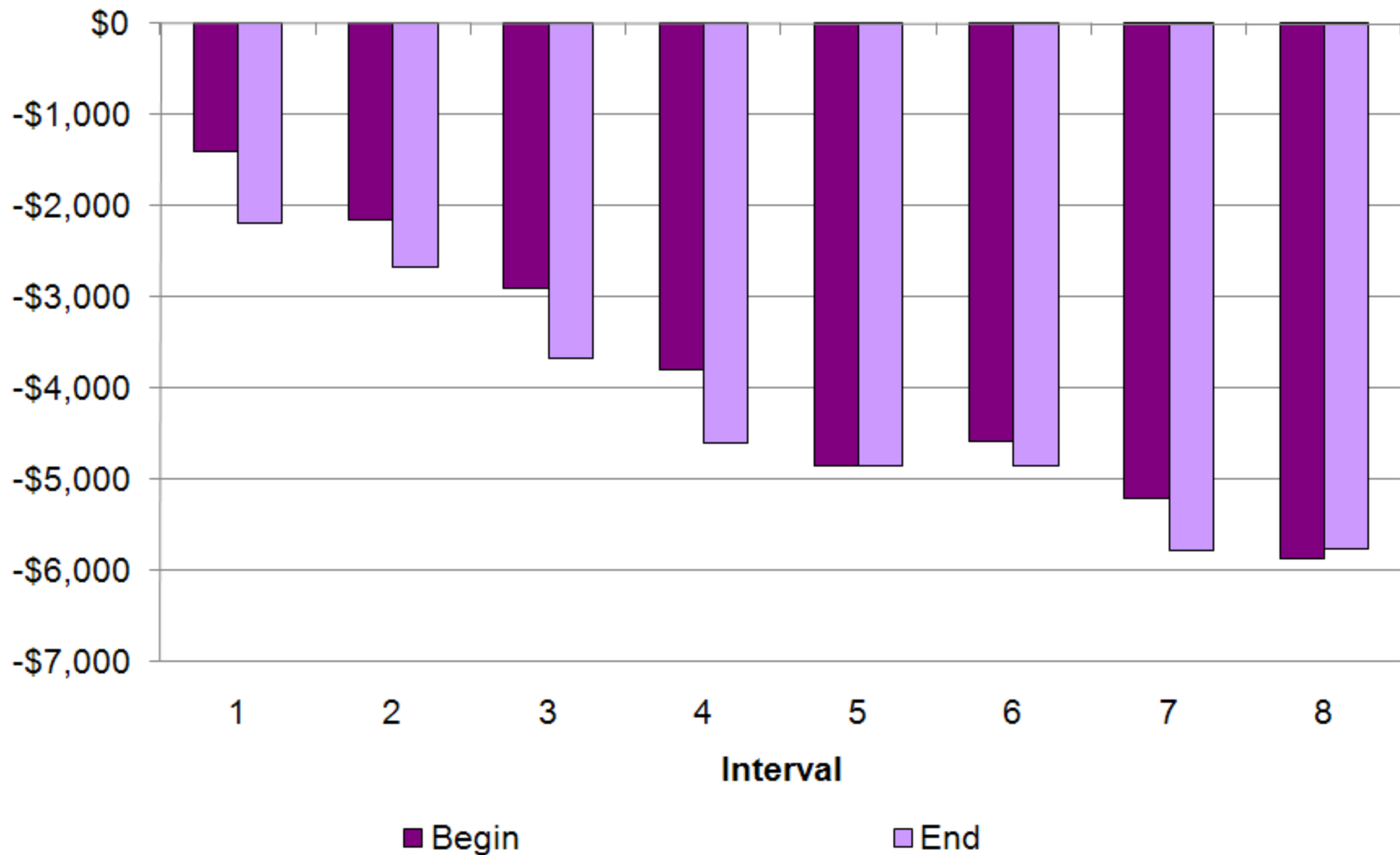**Fig. 3-2. Effect of a one percentile decline in health on beginning and end of interval assets**

Legend: ■ Begin □ End

X-axis: Interval (1–8)

Fig. 3-3. Effect of $1 of annuity income and earned income on beginning and end of interval assets

Legend: ■ Annuity-begin ■ Annuity-end ■ Earned-begin ■ Earned-end

X-axis (Interval): 1992-1994, 1994-1996, 1996-1998, 1998-2000, 2000-2002, 2002-2004, 2004-2006, 2006-2008
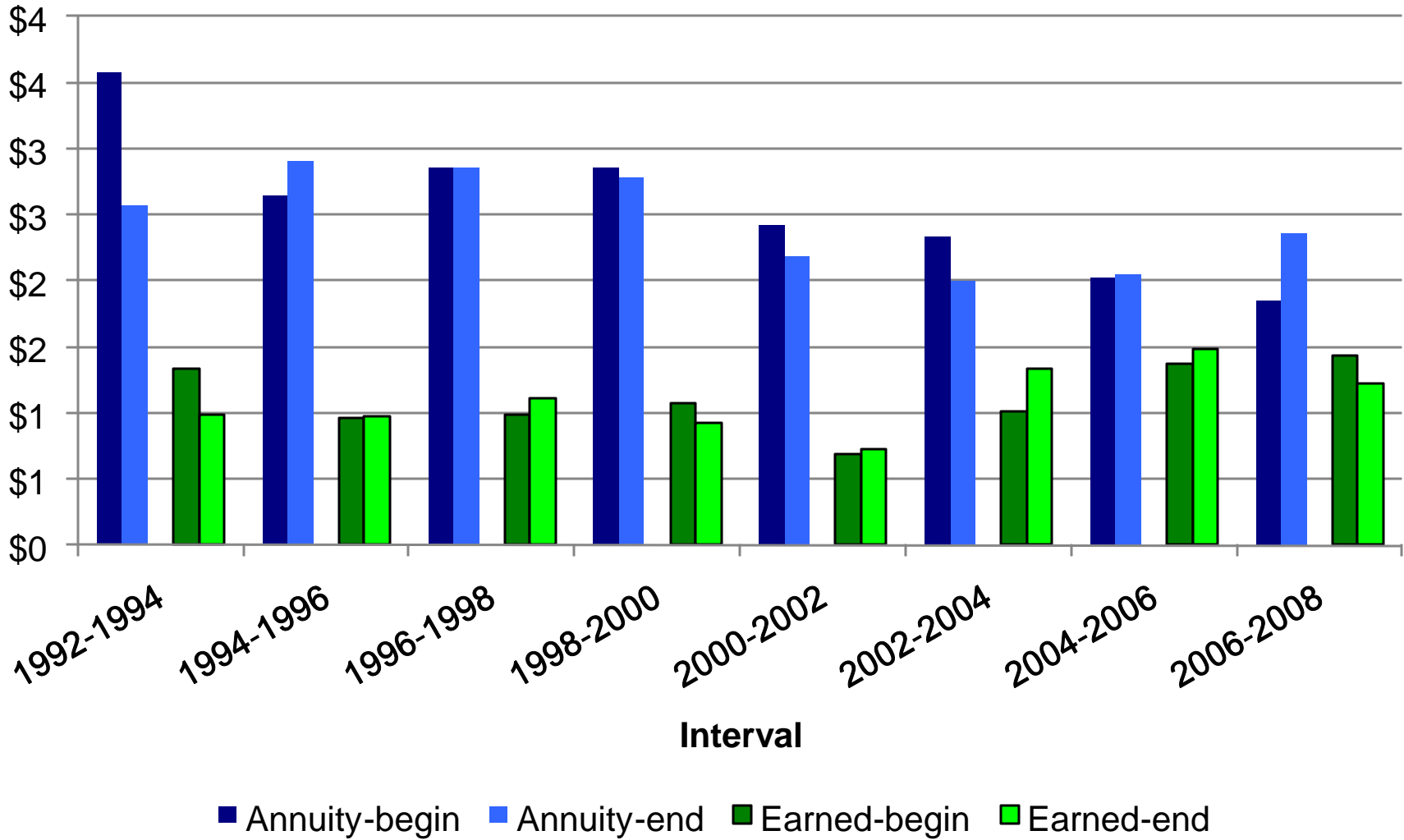
Asset cost and income

- The proportion of asset cost that can be attributed to annuity income and earned income

Table 4-3. Matching estimates of "asset cost" with and without controlling for earned income and annuity income

1992 asset quintile	Health tercile	Matched on **assets in 1992 only**		Matched **also on annuity income and earned income**		
		coefficient	t-stat	coefficient	t-stat	
1st (lowest)	1 (worst)					
	3 (best)	53,218	2.2	32,264	1.5	-39%
3rd	1 (worst)					
	3 (best)	126,793	3.6	100,199	3.2	-21%
5 (highest)	1 (worst)					
	3 (best)	585,092	3.6	328,705	1.9	-44%
All	**1 (worst)**					
	3 (best)	**253,017**	**6.9**	**194,546**	**5.2**	**-23%**

For the future

- More on one-person households
- AHEAD cohort
- Transitions from two- to one-person status
- The effects of Social Security annuity
- Reasons why the asset cost of poor health is so large for high- compared to low-asset households