

# Role of Parental Wealth & Income in Financing Children's College Attendance & Its Consequences

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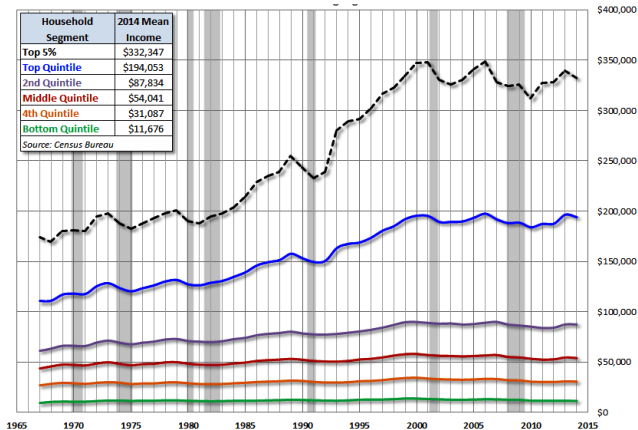
HCEO Conference:  
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# Acknowledgments

- This research and modules included in 2013 Wave of PSID on Transfers & Family Rosters were funded by grant P01AG029409 from the **National Institute on Aging (NIA)**.

Figure 1: Trend in Income Inequality, 1965-2014

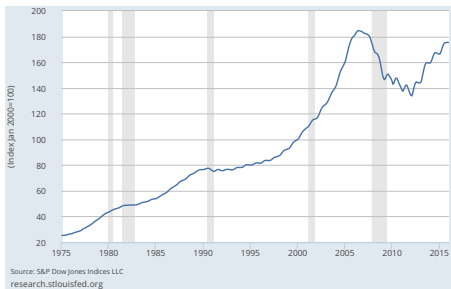
(a) Real Mean Household Income by Quintile & Top 5%



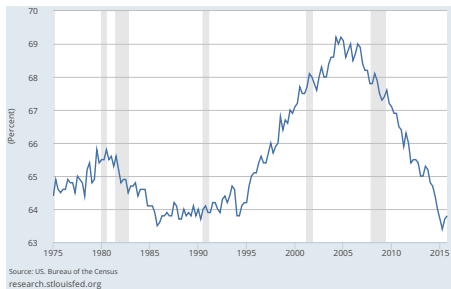
# Trends 2

Figure 2: Trends in Home Prices and Homeownership, 1975-2016

(a) Case-Shiller Home Price Index



(b) Homeownership Rates

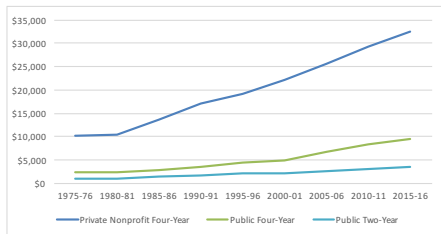


Sources: St. Louis Fed

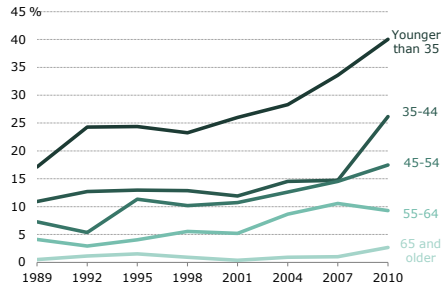
# Trends 3

Figure 3: Trends in Costs of College and Student Debt

(a) Average College Costs (2015 \$)



(b) Households with Outstanding Student Debt by Age



Note: Includes education loans that are currently in deferment and loans in scheduled repayment period.

Source: Pew Research Center tabulations of Survey of Consumer Finances data

Sources: The College Board, Annual Survey of Colleges; Pew Research Center, "Record 1-in-5 Households Now Owe Student Loan Debt," 2012.

# Research Questions

- What is the influence of **parental wealth & income** on whether their children **attend college** & whether **parents help finance it**?
- What consequences do these **college attendance & financing decisions** have on subsequent:
  - **levels of indebtedness** of parents & their children?
  - **consumption & well-being** of parents & children?
- Did these effects differ over time, i.e., **before & after Great Recession**?
  - We will have less to say about this today. Although our tentative answer is: “we don't think so.”

# Related Literatures 1

- Effects of **parental income & wealth**, particularly **housing wealth**, on:
  - **college attendance** (Lovenheim, 2011).
  - **"quality" of college** attended (Lovenheim and Reynolds, 2013; Cooper and Luengo-Prado, 2015).
  - **child's income in adulthood** (Cooper and Luengo-Prado, 2015).
- College attendance & financing as **parental investments in & transfers to children**:
  - Becker and Tomes (1979) model of **parental altruism & investment in children**
  - Importance of **credit constraints & "insufficient altruism"** (Behrman et al., 1995; Cameron and Heckman, 1998, 2001; Keane and Wolpin, 2001; Cameron and Taber, 2004; Lochner and Monge-Naranjo, 2011, 2016)
  - Possibility of **commitment problems** in intergenerational family interactions (Brown et al., 2012).

## Related Literatures 2

- Effects of **wealth on consumption & well-being** of households:
  - Effects of **changes in wealth on consumption** (Skinner, 1996; Case et al., 2005; Campbell and Cocco, 2007; Carroll et al., 2011; Browning et al., 2013; Paiella and Pistaferri, 2013).
  - Effects of **changes in wealth on savings** (Juster et al., 2006).
  - Work focuses on separating effects of **anticipated vs. unanticipated changes** in wealth, especially housing.
  - **In our case:** Does the way children's college education is financed – e.g., by parents with debt or by students with debt – have **lasting effects** on each generation's well-being?
- Effects of **parental resources on home-leaving of younger adults** (Manacorda and Moretti, 2006; Kaplan, 2012; Wiemers, 2014).



# Data

- **PSID Annual Survey**

- Parents' family structure, income, education, etc.
- Parents' home ownership, home value & mortgage info, including *home equity loans*.
- Child's home-leaving status
- Parents' & adult child's consumption (food)

- **PSID Wealth Module**

- Parents' & adult child's non-mortgage debt (credit cards, *student loans*, medical debt, etc.)

- **2013 PSID Roster and Transfers Modules** (Schoeni et al., 2015)

- Parent reports educational attainment of each adult child
- Long-term transfers for post-secondary education for each adult child

- All **monetary variables** are expressed as **10K of 2013\$**.

# Sample

- In 2013 Roster and Transfers Module, PSID Head/Wives reported on **all of their adult children**.
- We **“look back”** in PSID waves to find these children **when they were age 18**
  - link in financial & family characteristics of their biological or adopted father & mother
- Then **“look forward”** in PSID waves for **when child was age 25** and
  - link in financial characteristics, including debt, of parents & child

# Sample

## Sample Sizes

	Full Sample	Homeowners Only
All Parent-Child Pairs	7,857	4,948
<i>Parents:</i>		
with Indebtedness Data	6,137	4,040
with Consumption Data	5,688	3,689
<i>Children who are hshld. heads by age 25:</i>		
with Indebtedness Data	3,325	2,254
with Consumption Data	3,066	2,061

- In descriptive stats below, we distinguish **three periods**:
  - 1975 – 1995 (*Per0*) **pre-Housing Run-up/Boom**
  - 1996 – 2007 (*Per1*) **Housing Boom**
  - 2008 – 2013 (*Per2*) **Great Recession & aftermath**

# College Attendance & Parental Transfers

- Categories for ***Child's College Attendance & Parents' financial help*** choices:
  - *EduFin0*: Child does not attend
  - *EduFin1*: Child attends, parents do not make transfer
  - *EduFin2*: Child attends, parents make a transfer
- Conditional on  $EduFin2 = 1$ , let *CollTrans* denote ***amount of financial help*** or ***transfer*** parent  $i$  provided to child  $j$  in support of attending college.
  - *CollTrans* and all other dollar denominated variables are in 10K of 2013\$.

**Table 1:** Distributions of Child's College Attendance & Parents' Financing when Child Age 18\*

When Child Age 18:	Share of Parents	<i>EduFin0</i>	<i>EduFin1</i>	<i>EduFin2</i>	Amt Transfer, <i>EduFin2 = 1</i>
<b>All Years</b>					
All Parents	1.00	0.51	0.31	0.19	\$2.29
Non-Homeowners	0.37	0.68	0.25	0.07	\$0.91
Homeowners	0.63	0.41	0.34	0.25	\$2.52
<b>1975-1995</b>					
All Parents	1.00	0.47	0.39	0.14	\$1.41
Non-Homeowners	0.32	0.63	0.3	0.06	\$0.84
Homeowners	0.68	0.39	0.43	0.18	\$1.51
<b>1996-2007</b>					
All Parents	1.00	0.49	0.32	0.19	\$2.91
Non-Homeowners	0.36	0.67	0.27	0.06	\$0.97
Homeowners	0.64	0.39	0.34	0.27	\$3.15
<b>2008-2013</b>					
All Parents	1.00	0.58	0.20	0.22	\$1.92
Non-Homeowners	0.45	0.73	0.18	0.09	\$0.90
Homeowners	0.55	0.46	0.21	0.33	\$2.16

\* All tabulations are weighted, using PSID family weights. Dollar amounts are in 10K of 2013\$.

# Parental Home Market Value, Home Equity & Income

Among parents who are homeowners, let:

- $H_{ijmt_{18,j}}$  denote parents' estimate of **market value of home** in year child  $j$  is 18, i.e., year  $t_{18,j}$ .
- $MortBal_{imt_{18,j}}$  denote **remaining balances** on **home mortgages & equity loans**.
- Parents' **home equity** is

$$HEquity_{imt_{18,j}} = H_{imt_{18,j}} - MortBal_{imt_{18,j}}. \quad (1)$$

- Indicator of parent having **positive home equity** in year  $t_{18,j}$ , i.e., can **use home as collateral for loan**:

$$I_{imt_{18,j}}^L = \begin{cases} 1, & \text{if } HEquity_{imt_{18,j}} \geq 0, \\ 0, & \text{otherwise.} \end{cases} \quad (2)$$

And for all parents, let:

- $Y_{imt_{18,j}}$  denotes parents' **household income** in year child  $j$  is 18, ( $t_{18,j}$ ).

**Table 2:** Distributions of Child's College Attendance & Parents' Financing, by Parents' Home Equity when Child Age 18, Among Homeowners\*

When Child Age 18:	Share of Parents	<i>EduFin0</i>	<i>EduFin1</i>	<i>EduFin2</i>	Amt Transfer, <i>EduFin2 = 1</i>
<b>All Years</b>					
Neg. Equity ( $I^L = 0$ )	0.05	0.53	0.31	0.16	\$1.26
Pos. Equity ( $I^L = 1$ )	0.95	0.4	0.34	0.26	\$2.56
Bottom 3rd	0.32	0.53	0.34	0.13	\$1.10
Middle 3rd	0.32	0.39	0.34	0.27	\$2.02
Top 3rd	0.32	0.19	0.36	0.45	\$3.73
<b>1975-1995</b>					
Neg. Equity ( $I^L = 0$ )	0.02	0.61	0.32	0.07	\$3.10
Pos. Equity ( $I^L = 1$ )	0.98	0.39	0.43	0.18	\$1.50
Bottom 3rd	0.33	0.48	0.43	0.08	\$0.89
Middle 3rd	0.33	0.41	0.40	0.19	\$1.09
Top 3rd	0.33	0.24	0.46	0.29	\$2.02
<b>1996-2007</b>					
Neg. Equity ( $I^L = 0$ )	0.04	0.49	0.37	0.14	\$1.42
Pos. Equity ( $I^L = 1$ )	0.96	0.39	0.34	0.27	\$3.20
Bottom 3rd	0.32	0.53	0.35	0.12	\$1.41
Middle 3rd	0.32	0.35	0.34	0.31	\$2.60
Top 3rd	0.32	0.15	0.34	0.52	\$4.51
<b>2008-2013</b>					
Neg. Equity ( $I^L = 0$ )	0.11	0.54	0.26	0.20	\$1.01
Pos. Equity ( $I^L = 1$ )	0.89	0.45	0.20	0.35	\$2.24
Bottom 3rd	0.30	0.59	0.20	0.22	\$0.79
Middle 3rd	0.30	0.44	0.22	0.34	\$1.63
Top 3rd	0.30	0.18	0.20	0.62	\$3.79

\* All tabulations are weighted, using PSID family weights. Dollar amounts are in 10K of 2013\$.

**Table 3: Distributions of Child's College Attendance & Parents' Financing, by Parents' Household Income when Child Age 18, Among All Parents\***

When Child Age 18:	Share of Parents	<i>EduFin0</i>	<i>EduFin1</i>	<i>EduFin2</i>	Amt Transfer, <i>EduFin2 = 1</i>
<b>All Years</b>					
Bottom Quintile	0.15	0.77	0.21	0.03	\$0.94
Bottom Middle	0.16	0.68	0.27	0.06	\$0.72
Middle Quintile	0.19	0.60	0.29	0.11	\$0.80
Top Middle	0.24	0.45	0.35	0.20	\$1.24
Top Quintile	0.26	0.24	0.36	0.40	\$3.26
<b>1975-1995</b>					
Bottom Quintile	0.14	0.74	0.24	0.02	\$0.50
Bottom Middle	0.12	0.66	0.32	0.02	\$1.11
Middle Quintile	0.17	0.54	0.38	0.08	\$0.66
Top Middle	0.26	0.43	0.43	0.14	\$0.75
Top Quintile	0.31	0.27	0.45	0.28	\$1.84
<b>1996-2007</b>					
Bottom Quintile	0.15	0.76	0.22	0.02	\$0.93
Bottom Middle	0.17	0.67	0.28	0.04	\$0.77
Middle Quintile	0.19	0.59	0.31	0.10	\$0.99
Top Middle	0.25	0.44	0.35	0.21	\$1.61
Top Quintile	0.25	0.19	0.37	0.44	\$4.04
<b>2008-2013</b>					
Bottom Quintile	0.16	0.79	0.16	0.05	\$1.11
Bottom Middle	0.20	0.70	0.2	0.01	\$0.62
Middle Quintile	0.21	0.66	0.19	0.15	\$0.65
Top Middle	0.22	0.53	0.22	0.25	\$0.93
Top Quintile	0.21	0.29	0.19	0.52	\$3.06

\* All tabulations are weighted, using PSID family weights. Dollar amounts are in 10K of 2013\$.



**Table 4:** Distributions of Parents' Home Value & Household Income by their Home Equity & Household Income when Child Age 18\*

When Child Age 18:	Share of Parents	$H_{imt_{18,j}}$	$Y_{imt_{18,j}}$
<b>All Years</b>			
All Parents	1.00	5.00	6.18
Non-Homeowners	0.37		3.41
Homeowners	0.63	7.93	7.82
<b>1975-1995</b>			
All Parents	1.00	3.68	4.41
Non-Homeowners	0.32		2.53
Homeowners	0.68	5.39	5.28
<b>1996-2007</b>			
All Parents	1.00	5.45	6.76
Non-Homeowners	0.36	0.01	3.43
Homeowners	0.64	8.48	8.62
<b>2008-2013</b>			
All Parents	1.00	5.66	7.14
Non-Homeowners	0.45		4.09
Homeowners	0.55	10.37	9.68

\* All tabulations are weighted, using PSID family weights. Dollar amounts are in 10K of 2013\$.

# Market Variation in Housing Values & Parental Income

- We use **market-level measures of housing values** to develop “**more exogenous**” measure of **change (or innovations) in parental housing wealth**.
- Let  $HPI_{mt_{18,j}}$  denote FHFA **housing price index** for MSA or rest-of-state market  $m$  in year  $t_{18,j}$ .
- Then

$$\Delta HPI_{mt_{18,j}} \equiv \frac{HPI_{mt_{18,j}} - HPI_{mt_{18,j}-4}}{HPI_{mt_{18,j}}} \quad (3)$$

- We also use **market-level measures of average wages** for “**more exogenous**” measure of **change (or innovations) in parental income**.
- Let  $W_{mt_{18,j}}$  denote **annual average wages** for count  $m$  from QCEW data series.
- Then

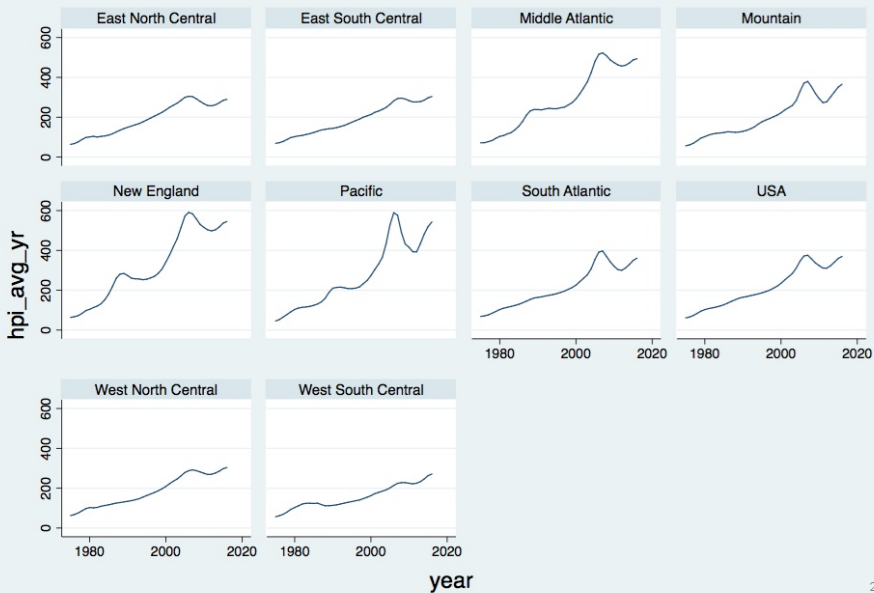
$$\Delta W_{mt_{18,j}} \equiv \frac{W_{mt_{18,j}} - W_{mt_{18,j}-4}}{W_{mt_{18,j}}} \quad (4)$$

**Table 5:** Distributions of Local Changes in Housing Prices & Wages and L&R Measures of Changes in Home Equity & Income when Child Age 18, among Homeowner Parents\*

When Child Age 18:	Share of Parents	$\Delta HPI_{imt18,j}$	"L&R" Measure: $\Delta H_{ijmt18,j}$	$\Delta W_{mt18,j}$	"L&R" Measure: $\Delta Y_{imt18,j}$
<b>All Years</b>					
Neg. Equity ( $I^L = 0$ )	0.05	-3%	-1.35	11%	0.55
Pos. Equity ( $I^L = 1$ )	0.95	14%	2.24	14%	0.82
Bottom 3rd	0.32	12%	0.83	13%	0.57
Middle 3rd	0.32	13%	1.72	13%	0.75
Top 3rd	0.32	18%	5.34	15%	1.34
<b>1975-1995</b>					
Neg. Equity ( $I^L = 0$ )	0.02	6%	0.12	14%	0.45
Pos. Equity ( $I^L = 1$ )	0.98	16%	1.57	17%	0.73
Bottom 3rd	0.33	15%	0.61	16%	0.50
Middle 3rd	0.33	14%	1.08	16%	0.61
Top 3rd	0.33	21%	3.34	19%	1.15
<b>1996-2007</b>					
Neg. Equity ( $I^L = 0$ )	0.04	17%	1.50	13%	0.61
Pos. Equity ( $I^L = 1$ )	0.96	18%	3.62	13%	0.89
Bottom 3rd	0.32	17%	1.43	13%	0.62
Middle 3rd	0.32	19%	3.22	12%	0.86
Top 3rd	0.32	21%	8.46	13%	1.47
<b>2008-2013</b>					
Neg. Equity ( $I^L = 0$ )	0.11	-23%	-4.18	9%	0.53
Pos. Equity ( $I^L = 1$ )	0.89	-2%	-0.05	10%	0.81
Bottom 3rd	0.30	-2%	-0.32	10%	0.56
Middle 3rd	0.30	-5%	-0.81	10%	0.72
Top 3rd	0.30	3%	1.62	11%	1.44

\* All tabulations are weighted, using PSID family weights. Dollar amounts are in 10K of 2013\$.

Figure 4: Trends in HPI in Census Regions, 1980-2015



## College & Financing Choices

Let  $U_{kijm,18}$  denote the utility/payoff to choice  $EduFink_{ij,18}$ ,  $k = 0, 1, 2$  for  $j$ th child of parent  $i$  when child is age 18:

$$U_{kijm,18} = \lambda_{k0} + \lambda_{k1}\Delta H_{ijmt_{18,j}} + \lambda_{k2}\Delta Y_{ijmt_{18,j}} + \lambda_{k5}X_{ij} + \lambda_{k6}Z_{mt_{18,j}} + \phi_{t_{18,j}} + \delta_{ijm} + \zeta_{kij,18}. \quad (5)$$

where

- $\Delta H_{ijmt_{18,j}}$  is change in market value of parents' home in  $t_{18,j}$ ;
- $\Delta Y_{ijmt_{18,j}}$  is innovation in parent income in  $t_{18,j}$ ;
- $X_{ij}$  are demographic characteristics of parents & their  $j^{th}$  child;
- $Z_{mt_{18,j}}$  time-varying characteristics of location  $m$  in  $t_{18,j}$ ;
- $\phi_{t_{18,j}}$  &  $\delta_{ijm}$  year & state-of-residence effects
- $\zeta_{kij,18}$  choice-specific unobservables.

**Only estimated over parents who were/are homeowners in  $t_{18,j}$**  (True of all analyses presented today.)

# College & Financing Choices

Alternative specification of payoff specification takes account of differential impacts of  $\Delta H_{ijmt_{18,j}}$  &  $\Delta Y_{ijmt_{18,j}}$  by whether parents have **positive equity**:

$$\begin{aligned} U_{kij,18} = & \lambda_{k0}^* + \lambda_{k1}^* \Delta H_{ijmt_{18,j}} \cdot I_{imt_{18,j}}^L + \lambda_{k2}^* \Delta Y_{ijmt_{18,j}} \cdot I_{imt_{18,j}}^L \\ & + \lambda_{k3}^* [1 - I_{imt_{18,j}}^L] + \lambda_{k4}^* \Delta H_{ijmt_{18,j}} \cdot [1 - I_{imt_{18,j}}^L] + \lambda_{k5}^* \Delta Y_{ijmt_{18,j}} \cdot [1 - I_{imt_{18,j}}^L] \\ & + \lambda_{k6}^* X_{ij} + \lambda_{k7}^* Z_{mt_{18,j}} + \phi_{t_{18,j}}^* + \delta_{ijm}^* + \zeta_{kij,18}. \end{aligned} \quad (6)$$

where

- $I_{imt_{18,j}}^L$  is indicator of **positive equity**.
- Estimate as **multinomial logit**, with choice  $k = 0$  be base category.

## Dealing with Endogeneity of $\Delta H_{ijmt_{18,j}}$ and $\Delta Y_{ijmt_{18,j}}$

- **Key issue:** Potential *endogeneity* of both  $\Delta H_{ijmt_{18,j}}$  &  $\Delta Y_{ijmt_{18,j}}$  in estimation parameters in (5) & (6).
- We adapt strategy used by Lovenheim and Reynolds (2013)
- Define innovation in parental housing wealth as:

$$\Delta H_{ijmt_{18,j}} \equiv H_{imt_{18,j}} \cdot \Delta HPI_{mt_{18,j}} \quad (7)$$

- Similarly, define innovation in parent *is* household income as:

$$\Delta Y_{imt_{18,j}} \equiv Y_{imt_{18,j}} \cdot \Delta W_{mt_{18,j}} \quad (8)$$

**Table 6:** Distributions of Local Changes in Housing Prices & Wages and L&R Measures of Changes in Home Equity & Income when Child Age 18, among Homeowner Parents\*

When Child Age 18:	Share of Parents	$\Delta HPI_{mt18,j}$	"L&R" Measure: $\Delta H_{ijmt18,j}$	$\Delta W_{mt18,j}$	"L&R" Measure: $\Delta Y_{ijmt18,j}$
<b>All Years</b>					
Neg. Equity ( $I^L = 0$ )	0.05	-3%	-1.35	11%	0.55
Pos. Equity ( $I^L = 1$ )	0.95	14%	2.24	14%	0.82
Bottom 3rd	0.32	12%	0.83	13%	0.57
Middle 3rd	0.32	13%	1.72	13%	0.75
Top 3rd	0.32	18%	5.34	15%	1.34
<b>1975-1995</b>					
Neg. Equity ( $I^L = 0$ )	0.02	6%	0.12	14%	0.45
Pos. Equity ( $I^L = 1$ )	0.98	16%	1.57	17%	0.73
Bottom 3rd	0.33	15%	0.61	16%	0.50
Middle 3rd	0.33	14%	1.08	16%	0.61
Top 3rd	0.33	21%	3.34	19%	1.15
<b>1996-2007</b>					
Neg. Equity ( $I^L = 0$ )	0.04	17%	1.50	13%	0.61
Pos. Equity ( $I^L = 1$ )	0.96	18%	3.62	13%	0.89
Bottom 3rd	0.32	17%	1.43	13%	0.62
Middle 3rd	0.32	19%	3.22	12%	0.86
Top 3rd	0.32	21%	8.46	13%	1.47
<b>2008-2013</b>					
Neg. Equity ( $I^L = 0$ )	0.11	-23%	-4.18	9%	0.53
Pos. Equity ( $I^L = 1$ )	0.89	-2%	-0.05	10%	0.81
Bottom 3rd	0.30	-2%	-0.32	10%	0.56
Middle 3rd	0.30	-5%	-0.81	10%	0.72
Top 3rd	0.30	3%	1.62	11%	1.44

\* All tabulations are weighted, using PSID family weights. Dollar amounts are in 10K of 2013\$.



# College & Financing Choices

Table 7: Marginal Effects of Changes in Wealth and Income on College and Financing Choices

Variable	College and Financing Choices Multinomial Logit						Amount of Transfer OLS	
	<i>EduFin0</i> (1)	<i>EduFin1</i> (2)	<i>EduFin2</i> (3)	<i>EduFin0</i> (4)	<i>EduFin1</i> (5)	<i>EduFin2</i> (6)	<i>EduFin2</i> (7)	<i>EduFin2</i> (8)
$\Delta H_{ijm\tau_{18,j}}$	-0.0021	5.31e-06	0.0021*				0.0560**	
If Pos. Equity ( $I^L = 1$ )				-0.0026	0.0004	0.0022*		0.0570**
If Neg. Equity ( $I^L = 0$ )				0.0070	-0.0051	-0.0019		0.0150
$\Delta Y_{ijm\tau_{18,j}}$	-0.0612	0.0060	0.0552***				0.4480***	
If Pos. Equity ( $I^L = 1$ )				-0.0574	0.0048	0.0527***		0.4480***
If Neg. Equity ( $I^L = 0$ )				-0.2200***	0.0633	0.1570***		0.2710
Pos. Equity ( $I^L = 1$ )				-0.0393	-0.0009	0.0402		0.2000
State Fixed Effects	YES	YES	YES	YES	YES	YES	NO	NO
MSA Fixed Effects	NO	NO	NO	NO	NO	NO	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES

\* Dollar amounts are in 10K of 2013\$.

# College & Financing Choices

## Findings on college attendance & financing choices

- **Exogenous *increases* in housing wealth *increase* likelihood of college enrollments**, though effects are small.
  - **Mechanism operates through parental transfers.**
  - A \$10,000 increase in home equity increases the probability of attending college with transfers by 0.22 percentage points, but only for parents with positive home equity.
- ***Increases* in income have *larger impact* on enrollment & financing decisions than housing wealth.**
  - A \$10,000 increase in parental income increases the probability of attending college with transfers by
    - 5.27 percentage points for parents who have positive home equity,
    - 15.7 percentage points for parents who have negative home equity.
- ***Increases* in home equity & income also *increase* amount of transfers, conditional on giving transfer.**

# Parents' & Child's Subsequent Indebtedness

- Whether child goes to college & how college is funded may affect **indebtedness** of **either parent or child**.

Let

- $Debt_{nht_{24},j}$  denote **debt** of generation  $n$ ,  $n = i$  for parent &  $n = j$  for child of debt type  $h$ , measured at time  $t$  when child  $j$  is age  $a = 24$  (6 years after college decision).
- Types of debt:
  - $h = MortBal$  is mortgage debt of parent, but now when child  $j$  is age 24
  - $h = OthDebt$  is other debt of child  $j$  when she is age 24, including student loans.

# Parents' & Child's Subsequent Consumption

- Using debt to finance children's college education may be **efficient**, if parents or children have **access to capital markets** &/or **can insure against unforeseen changes in wealth/income**.
- But some parents &/or children may not have adequate access to capital markets &/or realize unforeseen shocks to wealth, e.g., housing bust.
- **One way to assess**: Examine impact of financing & debt on **parents' & child's consumption**.

Let

- $Con_{nftj,24}$  denote **consumption** of type  $f$  of household  $n$  measured at time  $t$  when child  $j$  is age  $a = 24$
- Types of consumption:
  - $f = FoodHome$  is ann. expend. for **food eaten at home**
  - $f = FoodOut$  is ann. expend for **food consumed away from home**.

**Table 8:** Distributions of Parents' & Child's Debt when Child Age 25, by Parents' Housing Wealth when Child Age 18, for Homeowning Parents\*

When Child Age 18:	Share of Parents	Parent:		Child:
		$Debt_{i,MortBal,t24,j}$ (10K of \$)	$Debt_{i,OthDebt,t24,j}$ (10K of \$)	$Debt_{j,OthDebt,t24,j}$ (10K of \$)
<b>All Years</b>				
Negative Equity ( $I^L = 0$ )	0.03	7.81	1.09	1.01
Positive Equity ( $I^L = 1$ )	0.97	6.61	1.07	1.13
Bottom 3rd	0.32	4.63	0.92	0.99
Middle 3rd	0.32	6.49	1.26	1.23
Top 3rd	0.32	9.92	1.07	1.20
<b>1975-1995</b>				
Negative Equity ( $I^L = 0$ )	0.02	6.57	1.13	0.37
Positive Equity ( $I^L = 1$ )	0.98	3.92	0.85	0.71
Bottom 3rd	0.33	3.06	0.84	0.60
Middle 3rd	0.33	3.60	1.04	0.64
Top 3rd	0.33	5.38	0.66	0.94
<b>1996-2007</b>				
Negative Equity ( $I^L = 0$ )	0.04	8.01	1.10	1.22
Positive Equity ( $I^L = 1$ )	0.96	8.02	1.18	1.39
Bottom 3rd	0.32	5.30	0.93	1.18
Middle 3rd	0.32	8.34	1.40	1.64
Top 3rd	0.32	12.81	1.37	1.41
<b>2008-2013</b>				
Negative Equity ( $I^L = 0$ )	0.02	10.60	0.56	0.00
Positive Equity ( $I^L = 1$ )	0.98	10.48	1.37	1.35
Bottom 3rd	0.32	6.76	1.28	1.53
Middle 3rd	0.32	8.67	1.48	1.56
Top 3rd	0.32	16.67	1.40	0.51

\* All tabulations are weighted, using PSID family weights. Dollar amounts are in 10K of 2013\$.

**Table 9:** Distributions of Parents' & Child's Annual Food Consumption when Child Age 25, by Parents' Housing Wealth when Child Age 18, among Homeowning Parents\*

When Child Age 18:	Share of Parents	Parent:		Child:	
		$Con_{i,FoodHome,t_j,24}$ (10K of \$)	$Con_{i,FoodOut,t_j,24}$ (10K of \$)	$Con_{j,FoodHome,t_j,24}$ (10K of \$)	$Con_{j,FoodOut,t_j,24}$ (10K of \$)
<b>All Years</b>					
Negative Equity ( $I^L = 0$ )	0.03	0.58	0.43	0.37	0.26
Positive Equity ( $I^L = 1$ )	0.97	0.67	0.37	0.43	0.29
Bottom 3rd	0.32	0.60	0.31	0.44	0.26
Middle 3rd	0.32	0.61	0.32	0.39	0.27
Top 3rd	0.32	0.88	0.54	0.47	0.36
<b>1975-1995</b>					
Negative Equity ( $I^L = 0$ )	0.02	0.49	0.17	0.27	0.16
Positive Equity ( $I^L = 1$ )	0.98	0.55	0.27	0.49	0.31
Bottom 3rd	0.33	0.56	0.23	0.50	0.30
Middle 3rd	0.33	0.53	0.26	0.37	0.22
Top 3rd	0.33	0.56	0.34	0.64	0.46
<b>1996-2007</b>					
Negative Equity ( $I^L = 0$ )	0.04	0.60	0.49	0.40	0.29
Positive Equity ( $I^L = 1$ )	0.96	0.71	0.42	0.40	0.28
Bottom 3rd	0.32	0.61	0.35	0.41	0.24
Middle 3rd	0.32	0.64	0.33	0.40	0.30
Top 3rd	0.32	0.99	0.67	0.38	0.31
<b>2008-2013</b>					
Negative Equity ( $I^L = 0$ )	0.02	0.78	0.34	0.26	0.13
Positive Equity ( $I^L = 1$ )	0.98	0.94	0.41	0.50	0.23
Bottom 3rd	0.32	0.65	0.30	0.60	0.23
Middle 3rd	0.32	0.75	0.51	0.44	0.26
Top 3rd	0.32	1.48	0.49	0.36	0.16

\* All tabulations are weighted, using PSID family weights. Dollar amounts are in 10K of 2013\$.

# Model Specifications

## “Quasi-Reduced Form”:

$$\begin{aligned} Debt_{nht_{24,j}} = & \beta_{nh0} + \beta_{nh1} \Delta H_{ijmt_{18,j}} + \beta_{nh2} \Delta H_{ijmt_{18,j}} \cdot EduFin1_{imt_{18,j}} \\ & + \beta_{nh3} \Delta H_{ijmt_{18,j}} \cdot EduFin2_{imt_{18,j}} \\ & \beta_{nh4} \Delta Y_{ijmt_{18,j}} + \beta_{nh5} \Delta Y_{ijmt_{18,j}} \cdot EduFin1_{imt_{18,j}} \\ & + \beta_{nh6} \Delta Y_{ijmt_{18,j}} \cdot EduFin2_{imt_{18,j}} \\ & + \beta_{nh6} X_{nt_{24,j}} + \beta_{nh7} Z_{mt_{24,j}} + \phi_{t_{24,j}}^D + \delta_{nmt_{24,j}}^D + u_{nht_{24,j}}^D. \end{aligned} \quad (9)$$

for  $n = i$  (parent),  $j$  (child) and  $h = MortBal, OthDebt$ , where  $X_{nt_{24,j}}$  are parent  $i$ 's ( $n = i$ ) & child  $j$ 's characteristics at child age 24 and  $Z_{mt_{24,j}}$  are the corresponding characteristics for location  $m$ .

$$\begin{aligned} Cons_{nft_{24,j}} = & \alpha_{nh0} + \alpha_{nh1} \Delta H_{ijmt_{18,j}} + \alpha_{nh2} \Delta H_{ijmt_{18,j}} \cdot EduFin1_{imt_{18,j}} \\ & + \alpha_{nh3} \Delta H_{ijmt_{18,j}} \cdot EduFin2_{imt_{18,j}} \\ & \alpha_{nh4} \Delta Y_{ijmt_{18,j}} + \alpha_{nh5} \Delta Y_{ijmt_{18,j}} \cdot EduFin1_{imt_{18,j}} \\ & + \alpha_{nh6} \Delta Y_{ijmt_{18,j}} \cdot EduFin2_{imt_{18,j}} \\ & + \alpha_{nh6} X_{nt_{24,j}} + \alpha_{nh7} Z_{mt_{24,j}} + \phi_{t_{24,j}}^C + \delta_{nmt_{24,j}}^C + u_{nft_{24,j}}^C. \end{aligned} \quad (10)$$

for  $f = FoodHome, FoodOut$ .

# Model Specifications

## Effects of College & Financing Choices:

$$\begin{aligned} Debt_{nht_{24,j}} = & \beta_{nh0}^* + \beta_{nh1}^* EduFin1_{imt_{18,j}} + \beta_{nh2}^* EduFin2_{imt_{18,j}} \\ & + \beta_{nh3}^* X_{nt_{24,j}} + \beta_{nh4}^* Z_{mt_{24,j}} + \phi_{t_{24,j}}^D + \delta_{nmt_{24,j}}^D + u_{nht_{24,j}}^D. \end{aligned} \quad (11)$$

for  $n = i$  (parent),  $j$  (child) and  $h = MortBal, OthDebt$ , and

$$\begin{aligned} Cons_{nft_{24,j}} = & \alpha_{nh0}^* + \alpha_{nh1}^* EduFin1_{imt_{18,j}} + \alpha_{nh2}^* EduFin2_{imt_{18,j}} \\ & + \alpha_{nh3}^* X_{nt_{24,j}} + \alpha_{nh4}^* Z_{mt_{24,j}} + \phi_{t_{24,j}}^C + \delta_{nmt_{24,j}}^C + u_{nft_{24,j}}^C. \end{aligned} \quad (12)$$

for  $f = FoodHome, FoodOut$ .



# Model Specifications

## Effects of College Attendance & *ColTrans*:

Let  $Attend_{jmt18,j}$  denote indicator for whether child  $j$  attends college at or after age 18.

$$Debt_{nht24,j} = \beta_{nh0}^\dagger + \beta_{nh1}^\dagger Attend_{jmt18,j} + \beta_{nh2}^\dagger ColTran_{ijmt18,j} + \beta_{nh6}^\dagger X_{nt24,j} + \beta_{nh7}^\dagger Z_{mt24,j} + \phi_{t24,j}^D + \delta_{nmt24,j}^D + u_{nht24,j}^D. \quad (13)$$

for  $n = i$  (parent),  $j$  (child) and  $h = MortBal, OthDebt$ , and

$$Cons_{nft24,j} = \alpha_{nh0}^\dagger + \alpha_{nh1}^\dagger Attend_{jmt18,j} + \alpha_{nh2}^\dagger ColTran_{ijmt18,j} + \alpha_{nh6}^\dagger X_{nt24,j} + \alpha_{nh7}^\dagger Z_{mt24,j} + \phi_{t24,j}^C + \delta_{nmt24,j}^C + u_{nft24,j}^C. \quad (14)$$

for  $f = FoodHome, FoodOut$ .

**Table 10:** Effects of College Attendance, Financing and Changes in Parental Housing Wealth & Income on *Parents' & Child's Indebtedness at Child Age 25\**

Variables All as of Child Age = 18	Parents' Housing Debt	Child's Other Debt
<b>"Quasi" Reduced Form Estimates:</b>		
$\Delta H_{ij}$	0.394**	-0.016
$\Delta Y_{ij}$	0.180	-0.045
$\Delta H_{ij} \times EduFin0_{ij}$	0.258	-0.086***
$\Delta H_{ij} \times EduFin1_{ij}$	0.278*	0.003
$\Delta H_{ij} \times EduFin2_{ij}$	0.472**	-0.006
$\Delta Y_{ij} \times EduFin0_{ij}$	-0.310	-0.218
$\Delta Y_{ij} \times EduFin1_{ij}$	0.024	-0.010
$\Delta Y_{ij} \times EduFin2_{ij}$	0.300	-0.055
<b>Effects of College &amp; Financing Choices:</b>		
$EduFin1_{ij}$	0.091	0.873***
$EduFin2_{ij}$	2.134***	0.855***
<b>Effects of College Attendance &amp; CollTrans:</b>		
Child Attends College	0.472**	0.864***
$CollTrans_{ij}$	0.512**	-0.020

\* Dollar amounts are in 10K of 2013\$.

**Table 11: Effects of College Attendance, Financing and Changes in Parental Housing Wealth & Income on Parents' & Child's Annual Food Consumption at Child Age 25\***

Variables All as of Child Age = 18	Parents'		Child's	
	Eating at Home	Eating Out	Eating at Home	Eating Out
<b>"Quasi" Reduced Form Estimates:</b>				
$\Delta H_{ij}$	0.023	-0.000	-0.002	0.005**
$\Delta Y_{ij}$	-0.090	0.165	0.005	0.000
$\Delta H_{ij} \times EduFin0_{ij}$	0.004	0.010	-0.003	0.002
$\Delta H_{ij} \times EduFin1_{ij}$	-0.007	0.009	-0.003	0.004
$\Delta H_{ij} \times EduFin2_{ij}$	0.050	0.007	-0.001	0.007**
$\Delta Y_{ij} \times EduFin0_{ij}$	-0.049	0.073	0.024*	-0.035***
$\Delta Y_{ij} \times EduFin1_{ij}$	-0.006	0.407	0.006	0.012
$\Delta Y_{ij} \times EduFin2_{ij}$	-0.197	0.012	-0.003	-0.003
<b>Effects of College &amp; Financing Choices:</b>				
$EduFin1_{ij}$	-0.028	0.078**	0.009	0.045**
$EduFin2_{ij}$	0.015	-0.052	-0.030	0.067**
<b>Effects of College Attendance &amp; CollTrans:</b>				
Child Attends College	-0.057	0.044*	-0.019	0.041**
$CollTrans_{ij}$	0.107	-0.014	-0.000	0.008*

\* Dollar amounts are in 10K of 2013\$.

# Parents' & Child's Indebtedness

## Findings on effects of college financing on indebtedness

- **Parents who provide transfers for college have *higher* levels of housing debt when their children are 24 years old.**
  - A \$10,000 increase in housing wealth when children are 18 is correlated with a \$3,940 increase in parental housing debt when children are 24.
  - Correlation is largest for parents who provided transfers for college though differences between groups are not statistically significant.
  - Parents who provide transfers have \$21,340 more in housing debt when their children are 24.
  - Each additional dollar of transfers is correlated with \$0.51 in additional mortgage debt later.
- **Children who go to college have *more* debt at age 24, though there are *no differences* between children whose parents provide transfers and those who do not.**

# Parents' & Child's Consumption

## Findings on effects of college financing on consumption

- **Few consistent patterns in either parental or child consumption.**
- Parents who provide transfers consume more food at home and less food away from home but differences are not statistically significant.
- Results suggest we may have not controlled sufficiently for current economic circumstances of parents and children.

# Next Steps

- **More on relationship between transfers & parental and child Debt**
  - We find parental debt increases with transfers but child debt does not decrease.
  - Are parents' & children's debt-financing of latter's college **substitutes** or **complements**?
  - Do children go to **higher quality** (and more expensive schools)?
  - Are results robust to including children who have not formed their own household?
  
- **More on consequences of financing for *well-being of parents***
  - Are there effects of financing on consumption for parents later in life?
  - Does the debt financing of college by parents affect **parents' retirement**?

# Next Steps

- **More on consequences of college financing on *well-being of adult children***
  - Are our findings of little effect of college financing affecting adult child really true?
  - Need to look more closely at whether college financing affected life-cycle events like **first home purchase**, **age of first marriage**, etc.

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