Accounting for the Rise in Consumer Bankruptcies. Web Appendix

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Abstract

This appendix contains supplementary material for Livshits, MacGee, and Tertilt (2009). In particular, it provides further details on some of the data used, it discusses three additional potential stories that turn out to be of little importance, and we provide a robustness exercise concerning the importance of changes in income uncertainty.

1 Data Details

1.1 Surveys of Bankrupts

While there are several empirical studies of U.S. bankrupts, one must be careful in comparing them due to differences in their approach to sample selection. The best known are those associated with the work of Sullivan, Warren, and Westbrook (1999) and Sullivan, Warren, and Westbrook (2000).

1. Sullivan, Warren, and Westbrook (1999): The 1981 study involved a sample of 1,550 debtors from ten judicial districts in three states: Illinois, Pennsylvania and Texas. This study was based upon what was reported in the bankruptcy file. They converted their raw data to 1997 dollars using the CPI.

2. Sullivan, Warren, and Westbrook (2000): This is a 1991 study of bankrupts in 16 federal districts in Illinois, Pennsylvania, Texas, California and Tennessee. In this study, written surveys were used to collect information on each bankrupt. In addition, financial data on bankrupts in five of the districts were collected from court records. They converted their raw data to 1997 dollars using the CPI.

3. Based on court records, Domowitz and Sartain (1999) examine a sample of households who filed for bankruptcy before and after the 1978 Bankruptcy Law Amendments came into effect. Their data include 580 Chapter 7 households who filed for bankruptcy between October 1978 and March 1979 and 670 Chapter 7 bankrupts who filed between April and September 1980 from Southern and Eastern New York, Southern Ohio, Eastern Kentucky and Central California. They report that the mean income of filers was between $24,300 and $26,600 (in 1991 dollars).

4. Bermant and Flynn (1999) looked at a sample of approximately 2000 Chapter 7 cases closed during the first half of 1998. They restricted attention to no-asset Chapter 7 cases, and report that of the 975,370 consumer Chapter 7 cases filed in 1997 all but 10,000 were closed as no-asset cases.

5. Lown and Rowe (2003) examine a sample of bankrupts in Utah from 1997. Their data are based on a sample of 1486 Chapter 7 and 1081 Chapter 13 filed in U.S. Bankruptcy Court in Utah in 1997. Their data indicate that both the

average and the median debt holdings of Chapter 13 filers were larger than those of Chapter 7 filers. However, both the median and the average debt-to-income ratios were lower for Chapter 13 filers since their average incomes were higher than those of Chapter 7 filers.

1.2 Measurement of Unsecured Debt

One important target in the paper is the amount of unsecured debt in the economy. The two most commonly used numbers for this target in the literature are net worth and gross unsecured debt. While neither measure is ideal, we feel that gross unsecured debt is the better measure for our purpose.

The levels of debt implied by net worth versus gross unsecured debt are very different. Negative net worth, as reported in the SCF, implies household borrowing for the late 1990s on the order of $0.7 - 1.5\%$ of income (the lower bound is the target for Chatterjee, Corbae, Nakajima, and Ríos-Rull (2007) and Sanchez (2008), who look at data from the 2001 and 2004 SCF and divide by GDP rather than personal disposable income). In contrast, our calibration target in this paper is based on the gross amount of unsecured credit outstanding, which we base on the available measure of revolving credit in G.19 (2004): 9% of disposable income (subject to some minor adjustments which we discuss in the paper).

We believe that the gross unsecured credit is a better measure than net worth for our purposes for three reasons:

1. Many household assets are (partially) exempt, and hence net worth underestimates the amount of unsecured debt.

   Asset exemptions in some states are significant. For example, credit card debt in Florida and Texas is completely unsecured for households whose only asset is home equity. Since the public use files of the SCF do not provide us with state of residence, we cannot compute a measure of net worth adjusted for the state-specific asset exemptions. However, the available evidence suggests that this adjustment matters a lot. White (1998) used information on the state of residence of households to compute an estimate of the adjusted household net worth using the 1992 SCF, given state level exemptions.[1] She found that taking the exemptions into account mattered a lot: 15% of households would be able to

[1] White (1998) constructs these estimates for each household in her sample as an input in her analysis, but does not report a measure of the adjusted aggregate net worth in her paper.

discharge unsecured debt in 1992. In contrast, Chatterjee, Corbae, Nakajima, and Ríos-Rull (2007) report that less than 7% of households had negative net worth in the 2001 SCF. This suggests that a measure of negative net worth dramatically underestimates the fraction of households with unsecured debt, and thus underestimates the stock of unsecured debt.

2. It is costly to seize assets, so many debts are effectively unsecured.

   Another practical issue with net worth is that it is costly to seize assets. For example, recent estimates by Standard and Poor of foreclosure costs on mortgages are on the order of $20-30\%$ of the value of the loan.[2] This consideration strengthens the previous point that net worth underestimates the value of outstanding unsecured credit.

3. Some have argued that the SCF credit card debt values are underreported by about 50%.

   There is a well known problem with the level of credit card debt reported in the SCF. Zinman (forthcoming) argues that even after adjusting for differences in definitions, consumer credit card debt reported by households in the SCF is underreported by roughly half. This suggests that net worth measures reported in the SCF likely underestimates unsecured debt.

An indirect measure of the reasonableness of these alternative debt measures can be obtained from some back of the envelope calculations on what they imply for discharge and interest rates. For convenience, suppose we take data from 2004 (which is close to the end of sample targets we use in this paper). The G.19 figure for revolving credit implies that outstanding credit card debt was roughly 9% of disposable income, and credit card charge-offs were on the order of 5%. This implies that total annual charge-offs should be on the order of 0.45% of disposable income. If one used a debt-to-income ratio of roughly 2% (which is at the high end of calibrations based on SCF net worth data), then the implied annual losses of lenders (just on the credit cards) would be nearly 25% of outstanding debt. This implies an interest rate on risky debt on the order of 35% – which is far above the mean interest rate observed for credit card borrowing. This suggests that using negative net worth in the SCF as a measure of unsecured borrowing is likely a significant underestimate of outstanding unsecured consumer credit.

[2] www2.standardandpoors.com/portal/site/sp/en/us/page.article/4,5,5,1,1204835910066.html#ID586.

2 Further Stories

2.1 Family Shocks

Sullivan, Warren, and Westbrook (2000) emphasize the importance of unexpected family-related events for bankruptcy. In their 1991 bankruptcy survey, 22% of respondents cited family factors as a main cause of their bankruptcy. The obvious two causes for sudden family related expenses are divorces and unplanned pregnancies.

Has uncertainty regarding these family events gone up and is this responsible for the increase in bankruptcies? The answer to the first question is no. The number of births has decreased slightly from 15.9 per 1,000 population to 14.3 (see Table 1). The fraction of births that were intended has gone up from 61.9% in 1982 to 69% in 1995. On the other hand, births to unmarried women have gone up by almost 50%. However, since unintended births have declined, it seems hard to interpret the rise in births by unmarried women as an increase in unplanned events. Moreover, births to other demographic groups typically associated with unplanned pregnancies (like the teenage birth rate) have declined slightly since 1980. Similarly, the fact that the divorce rate has declined, from 5.2 per 1,000 population in 1980 to 4.3 in 1998 is well documented (e.g. Goldstein (1999)).[3] While the number of divorced (and not remarried) people has increased, new divorces rather than the stock of divorced people is the relevant measure of uncertainty. Overall, this suggests that "demographic uncertainty" has declined during the last two decades. We therefore conclude that family uncertainty did not play an important direct role in the rising bankruptcy rate.

2.2 Demographic Changes

In this section, we briefly discuss two demographic changes that have sometimes been linked to the increase in bankruptcies: changes in the age composition and marital status of the U.S. population. These changes cannot be evaluated using our framework as the model does not distinguish between different types of households (single vs. married) nor does it allow for changes in cohort size. However, the following calculations suggest that these changes are unlikely to be quantitatively very important.

[3] Goldstein (1999) also shows that the decrease in the divorce rate is not simply driven by the rise of cohabitation and the higher break-up rates for cohabiting couples.

Table 1: Births and Divorces

U.S.	1980	1998
Births per 1,000 population	15.9	14.3
Births per 1,000 women aged 15-44	68.4	64.3
Intended Births*	61.9%	69%
Births per 1,000 unmarried women	29.4	43.3
Births per 1,000 teenagers (15-19 yrs old)	53.0	50.3
Divorces per 1,000 population	5.2	4.3

* Intended birth numbers are for 1982 and 1995 respectively.

Source: U.S. Statistical Abstract, various years.

Bankruptcy rates are hump-shaped over the life cycle as shown in Table 2.[4] Sullivan, Warren, and Westbrook (2000) argue that the aging of the baby-boomers through the "high risk" age groups accounts for a significant fraction of the rise in bankruptcies. Our analysis does not confirm this argument. The main reason is that the change in the age composition of the population was relatively small. Table 2 shows that the fraction of the population between 25 and 44 years of age (which is the age range with the highest filing probability) increased their share of the population by a modest two percentage points, from 29 to 31 percent. Calculating the implied overall bankruptcy rate using a fixed age-specific filings rate (from 1991), for both the early 1980s and the late 1990s, we find a very modest increase of 2%, from 4.19 to 4.28 per 1,000 population.[5]

Bankruptcy filings also differ by marital status. Table 3 shows that singles and especially divorced persons are much more likely to file for bankruptcy than married people. Thus, changes in the marital composition of the population may have contributed to the rise in bankruptcies.[6]

[4]The shape of the profile is fairly stable over time. Numbers for 2001 are given in Sullivan, Thorne, and Warren (2001).
The filing rates reported in the Table differ slightly from those used in the paper as they include Chapter 13 filings.

[5]The discrepancy between our results and Sullivan, Warren, and Westbrook (2000) who argue that 18% of the increase in bankruptcies between 1981 and 1991 can be attributed to the baby-boomers alone, is due to the distinction between an increase in *total filings* and *filings per 1,000 population*. The total number of bankruptcies increases because the U.S. population grew by 17% between 1981 and 1991, but this is unrelated to changes in age composition.

[6]A related argument is based on the dramatic rise in the share of female filers from 15% in 1967 to almost 40% by 1999 (see Sullivan and Warren (1999) and Pollak (1997)). However, filing rates

Table 2: Bankruptcy and Age Composition

Age	< 25	25-34	35-44	45-54	55-64	65 +	implied filings
Filings per 1,000 (1991)	3.4	6.8	6.5	5.2	2.7	0.6	
% Population (1980-84)	40.16	16.98	12.07	9.73	9.50	11.56	4.19
% Population (1995-99)	35.39	14.74	16.38	12.50	8.24	12.75	4.28

Source: Sullivan, Thorne, and Warren (2001), Table 1 (primary petitioners only), U.S. Census Bureau (2000), Table 12.

Table 3: Bankruptcy and Marital Status

		% Population	
Marital status	Filings per 1,000 (1991)	1980	1999
currently married	4.2	78.4	63.9
never married	7.07	4.7	18.3
widowed	1.92	9.5	7.2
divorced	11.97	7.4	10.6
implied filings, holding status-specific rates constant		4.7	5.4

Source: Sullivan, Warren, and Westbrook (2000) for filings rates
U.S. Census Bureau (2003) for population composition

In 1980, 7.4% of American adults age 25 and older were divorced and 4.7% were never married. By 1999, these numbers had increased to 10.6% and 18.3% respectively. Since the filing rate for divorced people is roughly triple the filing rate for married people, small changes in the number of divorced people can potentially lead to large increases in bankruptcy rates. However, the overall effect is not very large. Table 3 gives the implied filings rates for both 1980 and 1999, holding marital-status specific filings rates constant at their 1991 level and using the actual distribution of the population across marital states. We find that changes in the marital composition of the U.S. can account for a modest increase from 4.7 bankruptcies per 1,000 in 1980 to 5.4 in 1999. However, this is a small fraction of the actual increase from 2.2 in 1980 to 7.9 in 2001.[7]

by gender are difficult to interpret because married couples can *choose* to file jointly, separately, or only one spouse could file.

[7]One caveat is in order here. We cannot rule out a combination of more singles together with increased uncertainty particularly for singles.

2.3 Removal of Usury Laws

Until the late 1970's, most states imposed (tight) ceilings on nominal interest rates for consumer loans. These restrictions were relaxed in the early 1980s as a result of the 1978 Supreme Court decision (involving Marquette National Bank of Minneapolis) to permit banks from Nebraska to offer loans to residents of Minnesota at rates in excess of the maximum allowed under Minnesota legislation. This ruling effectively removed the ability of individual states to regulate interest rates of lenders located in other states. Subsequently in the early 1980s, large credit card issuers relocated to states (notably Delaware and South Dakota) with the highest interest rate ceiling (Evans and Schmalnsee (1999)). This was followed by a rapid growth in high interest rate credit card debt, which coincided with the rise in consumer bankruptcies. This has led some to suggest that the *Marquette* decision contributed to the rise in bankruptcy by facilitating the expansion of credit to riskier borrowers.

We report the results of numerical experiments for three alternative ceilings in Table 4, all of which lie below the average borrowing interest rate in the benchmark economy and above the risk-free lending rate of 6%. Even a very tight interest rate ceiling of 7% can only account for roughly half of the rise in filings. This result is driven by the fact that bankruptcies in the model are caused by bad realizations of expense and income uncertainty. A tight borrowing constraint dramatically reduces borrowing (by preventing the extension of credit to "risky" borrowers and placing tight restrictions on the amount that can be borrowed). Lower borrowing in turn reduces the incentive for households to default in response to bad realizations of expense and income shocks. Offsetting this is the fact that tight borrowing constraints associated with low interest rate ceilings significantly limits households ability to borrow to smooth negative shocks. This in turn pushes some households who would not have defaulted in the absence of the tight interest rate ceiling to default, and this limits the effect of interest rate ceilings on defaults.

The numerical experiments indicate that the interest rate deregulation story is not consistent with observed interest rates. While a relaxation of the ceiling is consistent with a rise in the debt-income ratio, it also implies a substantial increase in the average borrowing interest rates. In the data, however, there appears to be little change in the average borrowing interest rate.

There are two additional observations which cast some doubt on the importance of usury laws. First, Canada has also experienced a rapid rise in consumer bankruptcies but did not experience a deregulation of credit markets around the same time (see

Table 4: Experiments: Usury Laws

	Experiment	Ch. 7 Filings	Avg. r^b	Charge-off Rate	Debt / Earnings
1	Benchmark	0.83%	11.36 %	4.9%	9.20%
	U.S. 1995-99	0.83%	10.93 - 12.84%	4.8%	9%
	U.S. 1980-84	0.25%	10.95 - 12.05%	1.9%	5%
2	$\bar{r} = 10\%$	0.68%	7.48 %	1.38%	9.12%
3	$\bar{r} = 8\%$	0.66%	7.43%	1.33%	8.99%
4	$\bar{r} = 7\%$	0.54%	6.77%	0.72%	1.12%

also Ellis (1998)).[8] Second, it is unclear whether interest rate ceilings were effectively binding in the United States. For example, Peterson (1983) argues that one way around interest rate ceilings is for the seller of a good to sell at a higher price on credit. He examines data from 1979 for four states with different interest rate ceilings, and finds that the state with the lowest ceiling (Arkansas) had a higher share of installment credit offered directly by retailers than other states. This argument is consistent with the observed shift of credit away from store-based to general purpose lending after the removal of interest rate ceilings.

Our conclusion is that, while the *Marquette* decision may have contributed indirectly to the rise in bankruptcies by permitting continued lending to high risk consumers, it was not in itself a significant cause of the rise in filings.

3 Changes in Income Uncertainty

Moffitt and Gottschalk (2002) argue that the variance of the permanent shock increased by roughly 50 percent between 1980 and 1996, while the variance of transitory shocks doubled from 1980 to 1985, leveled off until about 1992, after which it declined sharply by about 50 percent. Meghir and Pistaferri (2004), on the other hand, find a sharp increase in the variance of the permanent shock between the mid 70s and 1985, after which it fell and by 1987 was back to its 1978 level. Blundell, Pistaferri, and

[8] Interest rate ceilings on bank loans were formally removed in Canada through the Bank Act of 1967, although these ceilings were largely ineffective, as borrowers were free to "voluntarily" agree to pay higher interest rates in the form of an upfront charge at the time of the loan (Scholnick (2000)).

Preston (2008) find that the variance of the permanent shock doubled between 1980 and 1985, then declined, and that the transitory variance increased by roughly 50 percent from 1980 to 1987, followed by a fall. Finally, Heathcoate, Storesletten, and Violante (2004) analyze log hourly wages, rather than earnings, and decompose them into permanent, persistent, and transitory components for the years 1967 to 1996. Their estimates imply that the variance of the transitory shock increased by 25 to 30 percent (depending on which years one uses), while the variance of the persistent shock remained constant or decreased slightly.

We use the estimates provided by Heathcoate, Storesletten, and Violante (2004) to bound the size of the transitory earnings shock. Although these estimates are for hourly wages rather than earnings, they still provide a useful estimate for our purposes since decompose the income process into the transitory and persistent components (as well as returns to permanent characteristics). Given that hours and wages are positively correlated, the numbers we use are likely an underestimate of the change in earnings volatility. However, as our experiments show, this bias is likely to be quantitatively unimportant for our findings (see Table 3 in the paper).

Since we do not have permanent shocks in the model, we increase the variance of persistent shocks to represent possible increases in both persistent and permanent uncertainty in the data. We choose a reduction of the persistent variance of 60% which is an upper bound combining permanent and persistent shocks from the literature summarized above.

3.1 Changes in Persistence

Table 5: Changes in Persistence of Income (1995-99 Benchmark)

	Experiment	σ_η^2	σ_ϵ^2	Ch. 7 Filings	Avg. r^b	Charge-off Rate	$\frac{\text{Debt}}{\text{Earnings}}$
	Benchmark	0.05	0.025	0.831%	11.35%	4.9%	9.20%
	U.S. 1995-99			0.83%	10.93-12.84%	4.8%	9%
	U.S. 1980-84			0.25%	10.95-12.05%	1.9%	5%
1	$\rho = 0.98$	0.05	0.025	0.934%	15.48%	8.3%	4.82%
2	$\rho = 0.98$	0.05	0.01	0.847%	8.42%	2.3%	10.58%

The recent literature on turbulence (e.g., Kambourov and Manovskii (forthcoming)) suggests that, perhaps, the persistence of income has gone down over the last few decades. Experiments 1 and 2 in Table 5 show little promise in explaining the rise in bankruptcies through this channel. Increasing the persistence without adjusting the variance of the shocks actually increases the number of filings due to the more compressed income distribution under the lower persistence (see experiment 1). Adjusting the variance, to produce the same income dispersion as in the benchmark, brings the number of filings right back to the benchmark level.

3.2 Robustness

We start with a new benchmark parametrization that matches the 1980 bankruptcy rate, interest rate, and debt/gdp ratio and increase income uncertainty. The experiments reported in Table 6 confirm our findings: Plausible changes in uncertainty only generate an tiny increase in filings, from 0.25% to 0.26% while lowering the debt-to-earnings ratio somewhat. We also conduct the following thought experiment: If one wanted to replicate the observed increase in filings solely through a change in income uncertainty, how far does one have to go? Experiment 3 shows that increasing even increasing the variance of the transitory shocks by a factor of 50 does not deliver the desired increase in bankruptcy rates, but implies an average interest rate of almost 50% and charge-offs of 25%. The variance of the persistent shock has to be increased 8-fold to get the bankruptcy rate to increase to the late 90's level. This "success" has the debt level collapsing to 0.46% and the average interest rate exceeding 32%.

4 Life Cycle Savings: Model vs. Data

What does the model imply in terms of levels and changes in the savings rate? Given that there is no growth in our model, the meaningful way to think about savings is asset accumulation over the life cycle. Figure 1 shows how the saving rate changes over the life cycle. On average young people save very little, savings pick up in the prime years where income is the highest and fall again towards retirement. This general pattern of a hump-shaped savings profile is also observed in the data. The level of the saving rate in the data is higher than in the model, which is not surprising since the model abstracts from at least two savings motives: durables (such as housing) and a bequest motive.

Table 6: Changes in Income Uncertainty (1980 Benchmark)

	Experiment	σ_η^2	σ_ϵ^2	Ch. 7 Filings	Avg. r^b	Charge-off Rate	Debt / Earnings
1	Benchmark	0.0375	0.025	0.25%	11.38 %	1.11%	5.02%
	U.S. 1980-84			0.25%	10.95-12.05%	1.9%	5%
	U.S. 1995-99			0.83%	10.93-12.84%	4.8%	9%
2	Transitory 1	**0.05**	0.025	0.259%	11.46%	1.17%	4.86%
3	Transitory 2	**1.93**	0.025	0.76%	47.34%	25.2%	1.62%
4	Persistent 1	0.0375	**0.05**	0.37%	11.94%	1.6%	3.01%
5	Persistent 2	0.0375	**0.2**	0.84%	32.52%	16.9%	0.46%

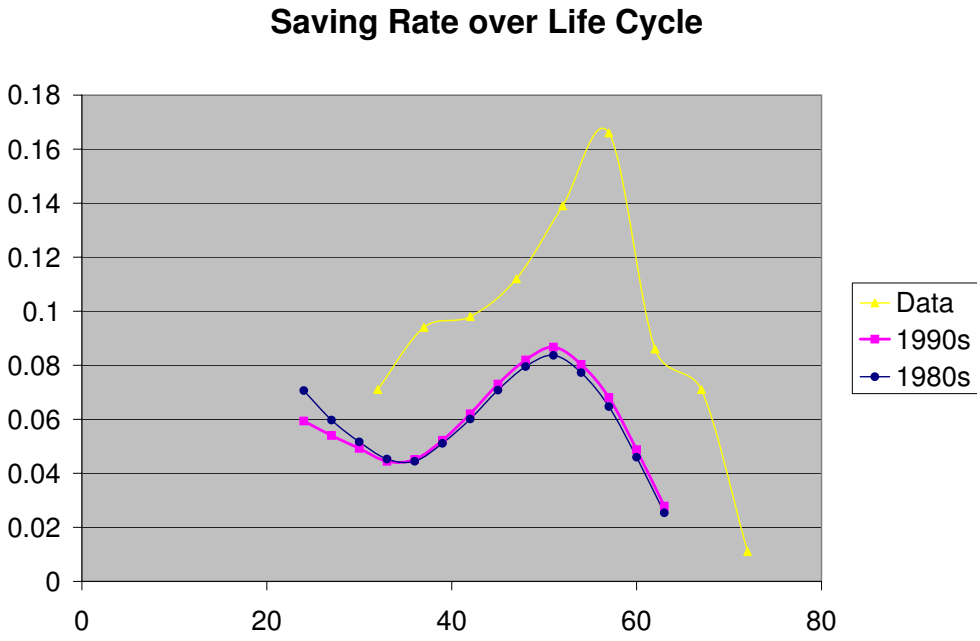

Figure 1: Savings over Life Cycle: Model vs. Data. Data: Personal saving rate based on 1980-90 Consumer Expenditure Survey (CEX) data, see Poterba (1994)

Age-specific saving rates in the model do not vary much between our benchmark experiments. Households in the 1990s save a little bit less when they are young as borrowing is now easier and this is preferred to smooth consumption when young. On the other hand, middle-aged households save at a slightly higher rate in the 1990s experiment to make up for the reduced savings when young. However, the lower

savings rate at the young ages dominates in the sense that total net worth is in fact lower in the 1990s experiment compared to the 1980s results. This can be seen in Figure 2 which shows average net worth over the life-cycle. Here it is evident that the 1980s profile is below the 1990s profile for all ages. This is consistent with the overall fall in median net wealth discussed in the paper.

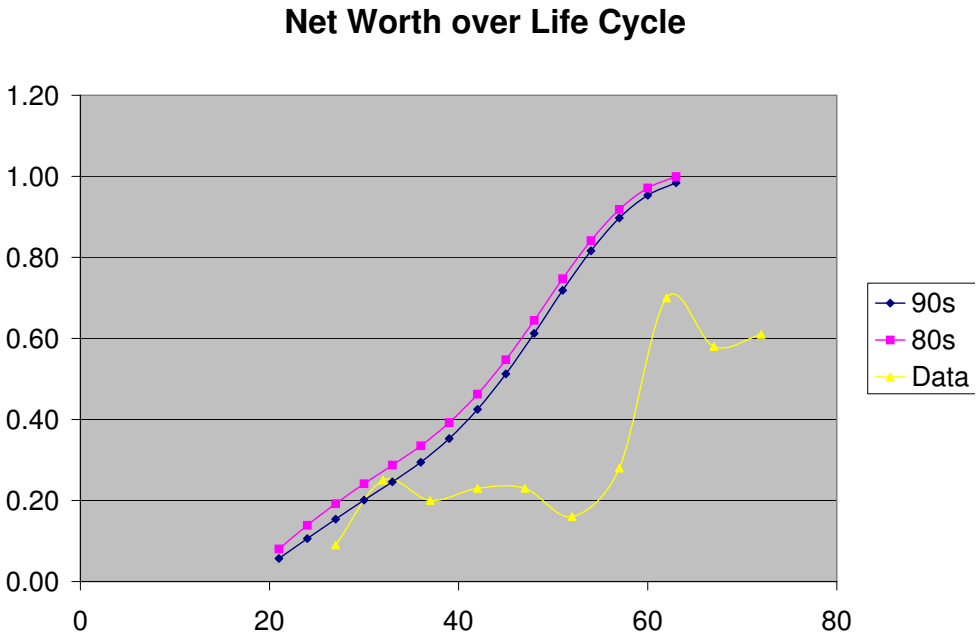

Figure 2: Net Worth over Life Cycle: Model vs. Data. Data: median net financial assets from 1990 CEX, see Poterba (1994).

The magnitudes of the fall in average net worth (by age) is a lot lower compared to the reported fall in median net worth in the paper. The main reason is that higher income households (which contribute a lot to average savings) are less affected by the decline in transactions cost, so their asset position moves very little. The median person in the economy is more sensitive to improved borrowing opportunities and hence saves significantly less when young.

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