The Distribution of Wealth in a Life-Cycle Model with Durables

Master Thesis
in Economics
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Summer Term 2017

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1 Ïntroduction

1.1 UnterÜberschrift

UnterUnterÜberschrift

Hier steht mal ein Text. Eine Möglichkeit des Zitierens ist, direkt im Text die Quelle anzugeben (see Name, 2006, pp.225-369). Andererseits schreiben Mustermann and Musterfrau (2006), dass man auch so zitieren kann.
In der Matheumgebung kann der oben (im Latex-Quellcode) genannte Shortcut verwendet werden, um aus einem normalen β ein fettes $\boldsymbol{\beta}$ zu machen. Wichtige Gleichungen, die nochmal verwendet werden, sollten nummeriert werden, z.B.

$$b = (x'x)x'y \ . \tag{1}$$

Nebensächlicheres, auf das man sich nicht mehr bezieht, bleibt unnummeriert, also

$$a = 1 \ .$$

Nun kann man direkt auf die erste Gleichung als Gleichung (1) verweisen mittels des zugewiesenen labels. In gleicher Weise kann man auf die Graphik 1 bzw. Graphik 2 verweisen. Die Tilde zwischen „Graphik“ und „`\ref{fig:andereGraphik}`“ verhindert, dass bei Zeilenumbrüchen die Zahl als erstes alleine in die neue Zeile rutscht. Ganz analog für die Tabelle 1.

2 Benötigte Programme

unter Windows:

- Miktex (`http://miktex.org/`)
- ein Editor, je nach Geschmack z.B. WinEdt (`http://www.winedt.com/`; kostenpflichtige Studentenversion) oder einen der vielen anderen verfügbaren, z.B. TeXnicCenter (`www.texniccenter.org/`)
- ghostview und ghostscript (`http://pages.cs.wisc.edu/~ghost/`

unter Linux:

- Latex ist in den meisten Verteilungen enthalten, z.B. tetex in Suse (ggf. über yast nachinstallieren)
- als Editor empfiehlt sich z.B. Kile

für die Literatur:
z.B. JabRef (`http://jabref.sourceforge.net/`)

3 Präsentationen

Beispiele für Präsentationen mit dem Beamer-Style:
`http://www.informatik.uni-freiburg.de/~frank/latex-kurs/latex-kurs-3/Latex-Kurs-3.html`

4 Literature Overview

Investigate empirical predictions of the life-cycle incomplete markets model (Gourinchas and Parker (2002); Cagetti (2003); Castaneda, Diaz-Gimenez, and Rios-Rull (2003); Yang (2009); Kaplan and Violante (2010); Hintermaier and Koeniger (2011)), thus contribute to the literature that (note copy paste.... demonstrate that a plausibly parameterized version of their models can quantitatively explain empirical findings as arising from rational choices of consumers facing an increasing wage profile and income uncertainty.) The model is based on the classic income-fluctuation problem in which the consumer faces a stochastic income process and decides in every period how much to save and how much to consume. Important contributions to the literature are Deaton (1991), Carroll (1992,1997), Gourinchas and Parker (2002). (note copy paste... Following Bewley (1986), this problem has been embedded by Huggett (1993) and Aiyagari (1994) into a general equilibrium framework, giving rise to the endogenous determination of the interest rate as well as a nontrivial income, wealth, and consumption distribution at equilibrium.) (Note copy paste... Furthermore, this paper relates to other literature such as: Endogenous borrowing constraint: The specification of the borrowing constraint in FernÃ¡ndez-Villaverde and Krueger (2011) is adapted from the recent endogenous incomplete-markets literature: Kehoe and Levine (1993), Kocherlakota (1996), Krueger and Perri (1999, 2006), and Alvarez and Jermann (2000). Lustig (2004) also has a model with durable assets and an endogenous borrowing constraint to explain the equity premium puzzle, however agents have full access to Arrow securities and are infinitely lived. Literature on optimal portfolio choice in the presence of consumer durables: Grossman and Laroque (1990), Eberly (1994), Chah et al. (1995), and Flavin and Yamashita (2002).)
Note: missing citations, not all of the above are cited properly!!!!!
Literature on wealth distribution!!!!!

5 The Life-Cycle Model

In the following section I discuss the economic model considered and outline the most important considerations made within the literature. Firstly, I discuss the life-cycle

modeling and the literature, which applies life-cycle and to be more exact imperfect markets models in the context of wealth distributions. Secondly, I present my modeling choices and solution methods applied for this particular problem.

5.1 Modeling Literature

5.2 The Model

Before going into a more detailed description of the model at hand it is important to understand the modelling choice. Why a life-cycle model with an imperfect market structure? Why include durables as an additional asset choice to the more standard approach, which does summarize all assets in a one period bond, such as for example Hintermaier and Koeniger (2011)?
To answer the first question I will mainly refer to the the literature. The second will be discussed in a more detailed manner in the following section, which treads the life-cycle profiles and especially the importance of modeling durables.

5.2.1 Imperfect market structure

The choice of an exogenously determined imperfect market structure allows for a straight forward answer. It comes down to the economic question one poses. The aim here is to demonstrate that such a model can quantitatively explain the empirical net-wealth distribution in the US. The role the imperfect market structure, entering as a limited choice of assets to fully insure against idiosyncratic wage shocks, poses, is thus to produce an endogenous wealth distribution. The savings are fist and foremost driven by a precautionary motive to insure for future wage shocks. Knowing that the income may drop in the future consumers save today to achieve a more stable consumption across their live. In a complete market framework consumers could perfectly diversify away idiosyncratic risks (Tideman and Weber, 2010) (and thus would not build a buffer stock of savings for future shocks.) (???????? is this exact?????) The hypothesis of the complete market framework has been rejected by the vast majority of empirical research (Tideman and Weber, 2010). Deaton and Paxson (1994) show that the life cycle profile of consumption inequality is increasing with age, a fact that would be inconsistent with complete markets. While in some rare cases - such as when only studying aggregates, it may still be sufficient to consider a complete market framework, when considering wealth-distributive questions, the imperfect market assumption is both necessary from a theoretical perspective and well-founded from an empirical perspective. It remains to discuss the whether it makes sens to treat distributive issues from a life-cycle point of view.

5.2.2 Life-Cycle

As Deaton and Paxson (1994) show, consumption inequality seems to vary with age. Further empirical research does support these findings, indicating that some of the differences in earnings, income, and wealth across households can be attributed to differences in the household's age Rios-Rull, Kuhn, et al. (2016) (FIND BETTER REFERENCES?). Hintermaier and Koeniger (2011) Show that the average net-wealth increases with wealth and that the dispersion of wealth falls with age. Moreover, there is a vast theoretical literature using a different versions of the life-cycle model to discuss distributive questions. Gourinchas and Parker (2002); Cagetti (2003); Castaneda et al. (2003); Yang (2009); Kaplan and Violante (2010);Hintermaier and Koeniger (2011) (CITE MORE RECENT LITERATURE!!!) while there are also some that use infinite horizon models....

Finally, the choice to study the empirical validity of a life-cycle model, which produces a net-wealth distribution arising from rational choices of consumers subject to income uncertainty, moreover allows for a detailed analysis of consumption and savings behavior over a person's live-cycle. A coherent framework incorporating the behavior of household's over their lifespan is paramount for the study of re-distributive policies. (Cite....) These factors thus support the choice of a life-cycle model.

5.2.3 Partial Equilibrium

Last but not least, partial equilibrium as modeling choice has to be discussed briefly. (??????????????)

5.2.4 Consumer's Problem

As established above, the model in question is a life-cycle model with an imperfect market structure. I closely follow Hintermaier and Koeniger (2011) adding consumption durables to the model. In order to facilitate comparability, I will closely follow the notation used in their paper.

(Copy paste: In this model there is a continuum of risk-averse consumers who have a finite time horizon. These consumers make consumption and savings decisions between age 26 and age 90 when they die with certainty. Befor age 90, the probability of death at age j is $\delta_j < 1$.

Consumers retire with certainty after age 65 is completed. We let T^r denote the first period of retirement. Before retirement, labor income y_{ij} is stochastic as described by Eqs. (1) and (2). After retirement, consumers receive individual-specific retirement benefits b_i. We discuss in detail in the next section how these retirement benefits are determined.

Consumers derive utility from a non-durable good c. The utility function is denoted by $u(c)$ and is assumed to be strictly concave and increasing. Consumers have access to a risk-free asset a which earns interest r so that markets are incomplete given that labor income is stochastic before retirement. As consumers cannot fully diversify their risk, different histories of labor income shocks imply different net worth positions. Moreover, the consumption and savings decision depends on the age of consumers which determines the position in the life cycle. The model is thus well suited to match the empirical facts about net worth mentioned in the previous section since it produces an endogenous net worth distribution for consumers with different histories of income shocks and different age.

The recursive formulation of the household problem

5.2.5 Numerical algorithm

5.2.6 Comparing the simulation output with SCF data

5.2.7 Calibration

6 Life-Cycle Profiles

7 The Wealth Distribution

8 Conclusion

References

Marco Cagetti. Wealth accumulation over the life cycle and precautionary savings. *Journal of Business & Economic Statistics*, 21(3):339–353, 2003.

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JesÃºs FernÃ¡ndez-Villaverde and Dirk Krueger. Consumption And Saving Over The Life Cycle: How Important Are Consumer Durables? *Macroeconomic Dynamics*, 15 (05):725–770, November 2011.

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Vorname Name. name of the article. *the journal's name*, 1:1–2, 2006.

Jose-Victor Rios-Rull, Moritz Kuhn, et al. 2013 update on the us earnings, income, and wealth distributional facts: A view from macroeconomics. *Quarterly Review*, (April):1–75, 2016.

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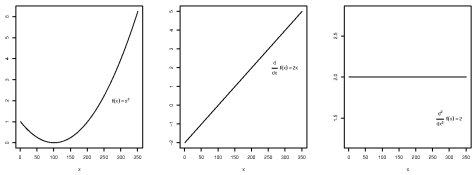
Figure 1: titel der Graphik



die Graphik sollte beschrieben werden, sodass man ohne den Text vorne zu lesen weiß, worum es geht: panel 1 zeigt die Funktion, panel 2 die erste Ableitung und Panel 3 die zweite Ableitung

Figure 2: titel der Graphik

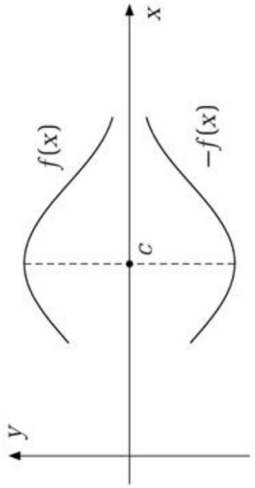


Table 1: Der Title der Tabelle

Eine	kleine	Tabelle
Text links	mittig	oder rechts
	unterstrichen	
über zwei Spalten		dritte Spalte