Backcasting National Transfer Accounts in Sweden from 1800 to 2009

Thomas Lindh[a] Gustav Oeberg[b]
Miguel Sanchez-Romero[b]

[a] Institute for Future Studies
[b] Max Planck Institute for Demographic Research

1 February 2011

Abstract for consideration for "Fourth European NTA meeting," Budapest, May 13, 2011

Abstract

We use a general equilibrium overlapping generations model implemented with realistic demography and historical national accounts to backcast national transfer accounts from 1800 to 2009.

1 Motivation

Surviving microdata samples are scarce before year 1950. In IPUMS International database there are only four countries where microdata from the $19th$ century still survives: Argentina, Norway, UK, and USA.[1] Lack of historical microdata prevent us to reconstruct age profiles of transfers and to create the necessary time-series to explain the evolution of transfers. Unfortunately, a time-series of public and private historical transfers such as health care, education, and infrastructures could shed light on the accumulation of physical and human capital over time; something of extraordinary importance for the so-called endogenous growth theories (Romer, 1986; Lucas, 1988).

Economic environment, demography and especially the household composition are crucial variables for explaining the evolution of transfers. In particular, household composition and transfers within inter- and intra-household members affect not only on the savings capacity of the household but also on the marginal incentives to invest in alternative means (e.g. human capital investment). Detailed demography at the household level can help to understand the basic direction of historical transfer flows and overcome the problem of missing microdata samples. As an example, along the demographic transition both the average household composition and the direction of the transfers have substantially changed. At the end of the $19th$ century in Sweden, a 40 years old adult probably spent on food, clothing, etc. for her surviving offspring the same amount as for her own consumption. Nowadays, the same individual only spends half of her own consumption on her offspring basic needs (see Figure 1). This reduction in the expenditure on basic needs opens an opportunity for investing in physical capital as well as in human capital. Similarly, the number of adult surviving offspring of an individual at age 65 decreased from 2-3 persons in the $19th$ century to one person in year 2000 (see Figure 2(a)). However, since lower infant mortality led to higher population growth rates, outsourcing familial old-age support to a public pay-as-you-go system made sense from an economic standpoint (see Figure 2(b)).

2 Research strategy

The first part of our research is to build a general equilibrium overlapping generations model, which includes realistic demography and transfers. We have divided transfers into three sets. One set of transfers that evolve over time according to a reference value given by historical National Accounts

[1] See https://international.ipums.org

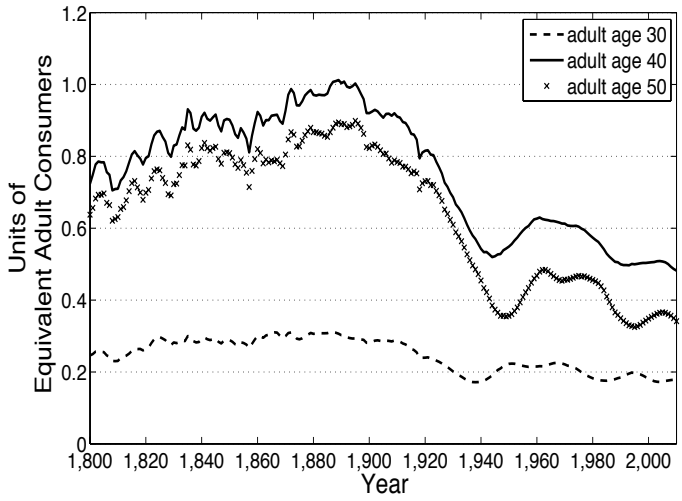
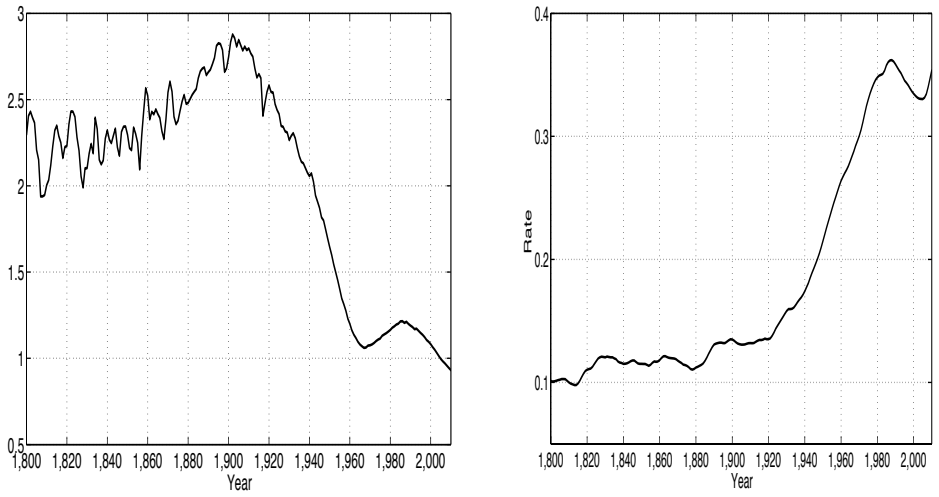


Figure 1: Average number of dependent children per adult in Sweden, 1800-2010.

Source: Own calculations.



(a) Average number of adult surviving offspring at age 65 in Sweden

(b) Old-age dependency ratio in Sweden

Figure 2: Alternative means for old-age support in Sweden, 1800-2010.

Source: Own calculations.

(i.e. total expenditure relative to output). Therefore, these transfers will be exogenously given to the model. Current NTA profiles will be scaled up or down so as to meet the corresponding referenced value. Here, we include public and private education, health care expenditures, and other in-kind public transfers (e.g. infrastructures, defense). In the second set, transfers are endogenously determined by the model. In this category, we include other private transfers (mainly childrearing cost) and unintentional bequests. The amount transferred will be given by the life-cycle theory of consumption and saving with mortality risk (Yaari, 1965). As a consequence, since the behavior of the individual might change over time because of demographic and economic events, transfers, consumption, and savings vary not only by changes in life expectancy but also by changes in fertility. Third, a set of transfers that depends on well-known formulae; e.g. pension benefits, maternity leaves, etc.

Second, we plan to reconstruct the historical accumulation of capital and analyze what factors may explain the discrepancy between the estimated results and actual data. As a second step, we will calibrate the model parameters so as to mimic actual national accounts and national transfers accounts.

The results will be used to create time-series of the main transfers (public and private health care, public and private education, public in-kind transfers) for Sweden from 1800 to 2010. Finally, by performing the estimations, we expect to get knowledge on the necessary data to extend this analysis to other NTA countries.

3 Data

Demographic data are taken from three different sources. Life expectancy at birth, total number of births, total deaths, total population, and the distribution of the population from year 1751 to year 2008 are taken from the Human Mortality Database (HMD). Total fertility rates and age-specific fertility rates from year 1891 to year 2007 are taken from the Human Fertility Database (HFD). Swedish population projections from 2010 onwards rely on data from the UN Population Division.

The data collected on GDP, at purchasers prices, and the stock of capital is taken from the file "Nominal values of consumption, investment, export and import in Sweden 1800-2000" compiled by Rodney Edvinsson following the methodology described in Edvinsson (2005). The data on the total number of employees is taken from the file "Employment 1850-2000" which is in turn compiled following the methodology described in Krantz and Schön (2007). Bequest and wealth data for selected years are taken from Soltow (1985) and

Finansdepartementet (1930:31).

4 References

Edvinsson, R. (2005). Nominal values of consumption, investment, export and import in Sweden 1800-2000 [Data file] . Available: http://www.historia.se/. Last accessed 28th Jan 2011.

Edvinsson, Rodney. Growth, Accumulation, Crisis: With New Macroeconomic Data for Sweden 1800-2000. Ph.D. dissertation, Stockholm University, 2005.

Finansdepartementet (1910). Bouppteckningar efter aflidna, inregistrerade vid vederbörande domstolar åren 1906-1908, Finansdepartementet: Stockholm.

Krantz, O and Schön, L. (2007). Table V [Data file]. Available: http://www.ehl.lu.se/database/LU-MADD/National%20Accounts/default.htm. Last accessed 28th Jan 2011.

Krantz, O. and Schön, L (2007, Swedish Historical National Accounts 1800-2000, Lund, Studies in Economic History 41, Almqvist & Wiksell International 2007.

Lucas, R. (1988). On the mechanics of economic development. *Journal of Monetary Economics 22*, 3-42.

Romer, P. (1986). Increasing returns and long run growth. *Journal of Political Economy 94*, 1002-1037.

Soltow, L (1985). The Swedish Census of Wealth at the Beginning of the 19th Century. *Scandinavian Economic History Review*, 33(1): 1-24.

Yaari, M. (1965, April). Uncertain Lifetime, Life Insurance, and the Theory of the Consumer. *The Review of Economic Studies 5*(3), 304-317.