

# CONSUMPTION AND INCOME INEQUALITY IN SWEDEN: A DIFFERENT STORY

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**ABSTRACT.** This paper analyzes consumption- and income inequality trends in Sweden during the period 1988-2005. Similar studies for the US have found that consumption inequality has increased much less than income inequality in recent decades. Results in this paper indicate that consumption inequality actually decreased in Sweden in spite of considerable overall increase in income inequality. The apparent contradiction can mainly be explained by increased saving and life cycle redistribution among high-income households.

**JEL Classifications:** D12; D31; D63

**Keywords:** Income distribution; earnings; consumption; equality

# 1 Introduction

Income inequality has attracted much interest in the academic literature (for overviews, see e.g., Levy and Murnane, 1992; Burtless, 1995; Gottschalk and Smeeding., 1997), while few studies analyze consumption inequality. This is surprising since it can be argued that household welfare is more adequately measured by consumption rather than income. Consumption might, for example, better measure families' permanent income (Meyer and Sullivan, 2006), the well-being of the poor (Meyer and Sullivan, 2003), and changes in income inequality have welfare implications that depends crucially on the structure of credit and insurance markets (Krueger and Perri, 2006).

A number of US studies (e.g., Cutler and Katz, 1991; Johnson and Shipp, 1997; Johnson et al., 2005; Krueger and Perri, 2006) have analyzed how inequality trends differ depending on whether income or consumption data are used. These studies generally show that consumption inequality in the United States seems to have increased considerably less than income inequality over the last decades, even though both clearly have display a positive trend. Barret et al. (2000), Pendakur (1998), and Gouveia and Tavares (1995) reported similar findings using data from Australia, Canada, and Portugal, respectively. As argued by Meyer and Sullivan (2003, 2006), similarities between aggregate measures of consumption and income inequality might also conceal important differences between sub-groups in the population. Single mothers in the United States were, for example, worse off when inequality was measured by income data rather than consumption data.

Although a number of studies have compared consumption – and income inequality measures, no study has (as far as we know) been able to explain very well *why* measures of inequality

differ when one uses consumption instead of income data. Various conceivable explanations yield quite different interpretations of equality trends. For example, income data may include transitory effects (e.g., capital gains realizations) that do not influence consumption patterns. Consumption may to some extent be based on expectations of future income. Variations in expenditures may merely reflect population aging (Deaton and Oaxson, 1994). Consumption may be heavily influence by changes in the family structure (Barret et al., 2000). In addition there are pure data issues. For example, income data excludes government transfers in kind that are important for income groups in the bottom deciles of the income distribution.

The purpose of this paper is to analyze the difference between measures of consumption inequality and income inequality in Sweden using data from the Swedish Household Expenditure Survey (HUT) during the period 1988-2005. In contrast to previous studies for other countries, the results show that consumption- and income inequality move in opposite directions in Sweden during the observed period. Consumption inequality decreased from 1988 to 2003-2005; whereas income inequality increased. This development can, according to the results presented in the paper, mainly be explained by more consumption smoothing over the lifecycle, in particular among households with higher incomes.

In the next section, trends in income and consumption inequality in Sweden during the study period are analyzed. Possible theoretical explanations why measures of consumption inequality might differ from measures of income inequality are discussed in Section 3, while hypotheses to be tested and descriptive statistics are presented in Section 4. In Section 5, the econometric specification is described; whereas the results are presented in Section 6. Finally, section 7 summarizes and draws conclusions.

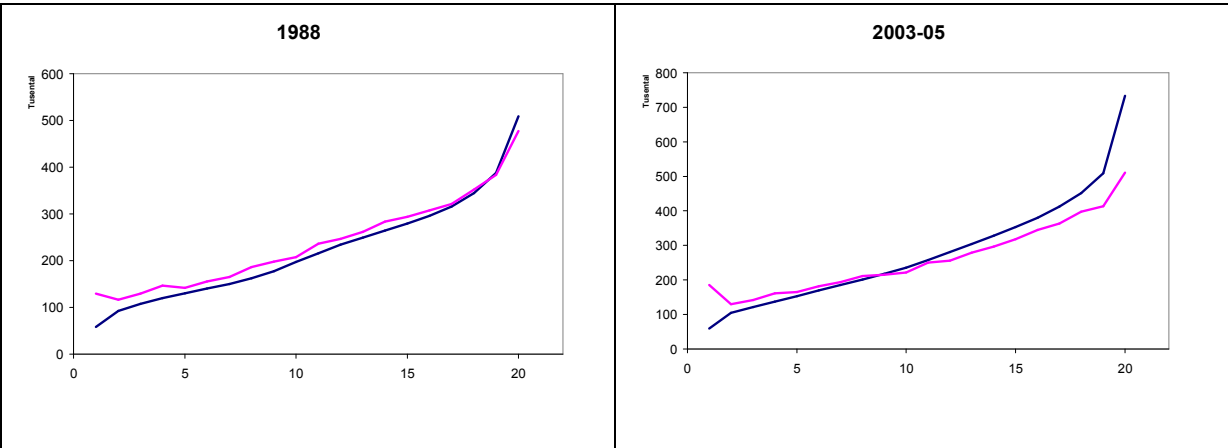
## 2. Income and consumption inequality in Sweden

The income – and consumption inequality trends in Sweden are analyzed using cross-section data for the periods 1988 and 2003-2005 from the Consumer Expenditure Survey (Hushållens utgifter, HUT) provided by Statistics Sweden. The Consumer Expenditure Survey (HUT) is a data base where households residing in Sweden record their expenditures during two weeks. The expenditure data is then complemented by data from public registers, e.g., income statements from the tax register. Note that the income statistics does not include incomes such as allowances and student stipends. Therefore, disposable incomes may be underestimated, particularly in the lower end of the income distribution.

In this paper, the household is chosen as the unit of analysis since we do not have any knowledge of the intra-household allocation of resources. It is, however, reasonable to assume that the household members pool at least some of their incomes and spend it for the collective welfare of the household. Income is measured by disposable income (*DISPINC*); whereas consumption is measured by total expenditures (*TOTEXP*). Households that have reported zero income are excluded from the analysis because these observations include households where tax information and/or the adult household members' incomes are missing. This leaves us with a final sample of 3,764 observations in 1988 and 6,668 observations in 2003-05.

Figure 1 describes the distribution of household disposable income and total expenditures in 1988 and 2003-05. The households have been ranked after disposable income, and grouped into pentiles (5%). The curves plot mean values for these pentiles, for disposable income and total expenditures. Note that the volumes have been adjusted to 2003–2005 year's prices.

Figure 1: Distribution of disposable income and total expenditures in Sweden 1988, 2003-05.



Source: HUT.

We want to study changes in the absolute level of the curves, changes in their steepness, and changes in the relation between them. Generally the curves seem flat in comparison with the outcome for other countries such as the US, indicating relatively small differences in income and consumption for a majority of the households in Sweden during the study period. However, the lowest and the highest pentile stand out. The richest 5 percent of the households have a notably higher share of both income and consumption, whereas the results for the first pentile seem strange. It combines extremely low levels of disposable income with relatively high levels of expenditures. Expenditures actually decrease with the second pentile. As mentioned, measured disposable incomes do not include sources of income that are not reported in official tax returns, such as allowances and stipends. These could be of relative importance in the lowest pentile, wherefore incomes there are underestimated. Another possible explanation is that unreported incomes are more common in the lowest pentile, thereby explaining that expenditures are much higher than expenditures for the low-income households.

In order to study what has happened with relative levels of income and consumption for different income groups during the study period, Table 2 describes the share of total income and consumption, for different pentiles, in 1988 and 2003–2005, as well as changes between these two periods.

As can be seen from Table 2, the low income earners (pentiles 1–8, 0–40%) have lost 1.6 percent of their relative disposable income between 1988 and 2003–05; whereas their share of total expenditures has increased by 1.5 percent. The richest ten percent of the sample (pentiles 19–20, 90–100%) have, on the other hand, increased their share of disposable incomes by 1.6 percent, while decreasing its share of expenditures by 0.5 percent.

Table 2 Shares of pentiles with regard to disposable income and total expenditures, 1988 and 2003–2005.

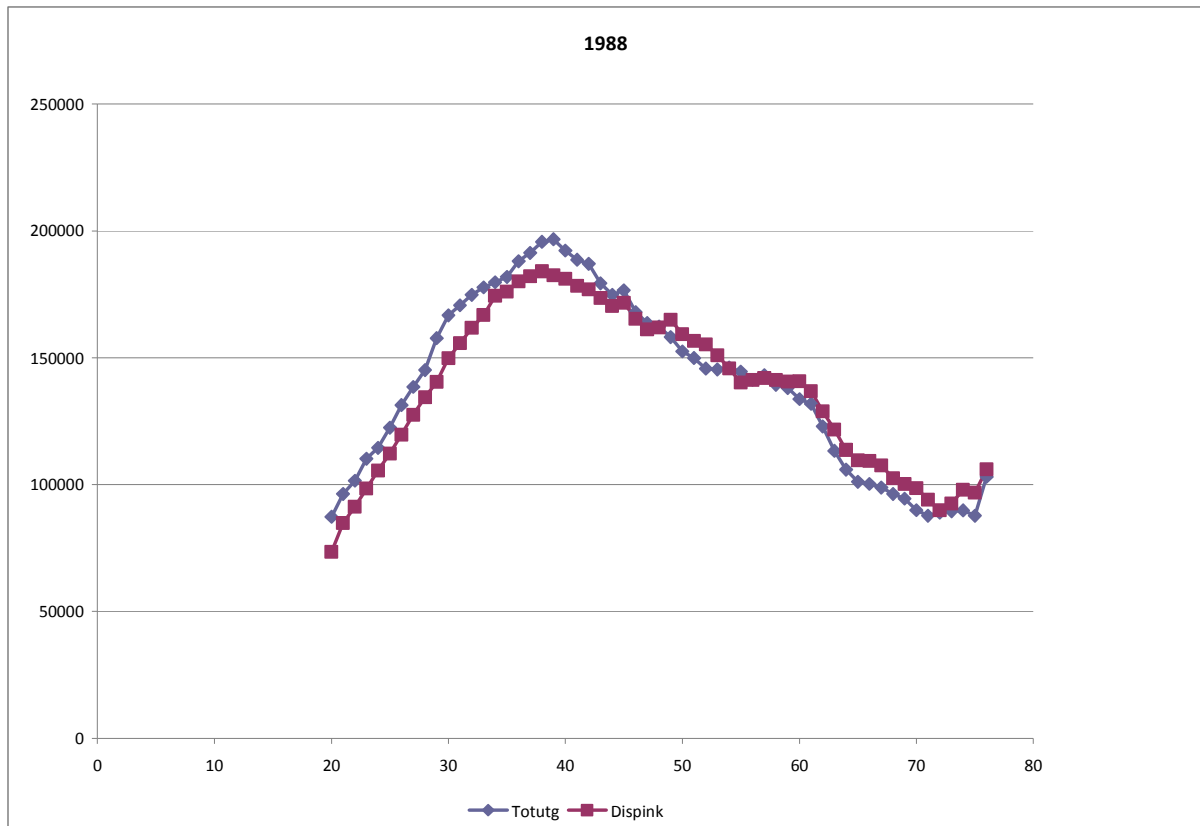
Pentile	Share	Inc 88	Exp 88	Inc 03-05	Exp 03-05	$\Delta$ Income	$\Delta$ Expenditures
1	0-5%	1,3	2,7	1,1	3,5	-0,2	0,8
2	6-10%	2,1	2,5	1,9	2,5	-0,2	0
3	11-15%	2,4	2,7	2,2	2,7	-0,2	0
4	16-20%	2,7	3,1	2,4	3,1	-0,3	0
5	21-25%	2,9	3	2,7	3,1	-0,2	0,1
6	26-30%	3,2	3,3	3	3,5	-0,2	0,2
7	31-35%	3,4	3,5	3,3	3,7	-0,1	0,2
8	36-40%	3,7	3,9	3,6	4	-0,1	0,1
9	41-45%	4,0	4,2	3,9	4,1	-0,1	-0,1
10	46-50%	4,4	4,4	4,2	4,2	-0,2	-0,2
11	51-55%	4,9	5	4,6	4,8	-0,3	-0,2
12	56-60%	5,3	5,2	5	4,9	-0,3	-0,3
13	61-65%	5,6	5,5	5,4	5,3	-0,2	-0,2
14	66-70%	6,0	6	5,9	5,7	-0,1	-0,3
15	71-75%	6,3	6,2	6,3	6,1	0,0	-0,1
16	76-80%	6,7	6,5	6,8	6,6	0,1	0,1
17	81-85%	7,1	6,8	7,4	6,9	0,3	0,1
18	86-90%	7,8	7,4	8,1	7,6	0,3	0,2
19	91-95%	8,7	8,1	9,1	7,9	0,4	-0,2
20	96-100%	11,5	10,1	13,1	9,8	1,6	-0,3

The results presented in Table 2 indicate, moreover, that the income earners within the middle class (pentiles 9–15, 40–75%) have decreased their share of disposable incomes and expenditures by 1.2 percent and 1.4 percent, respectively. In contrast to these findings, the upper middle class (pentiles 16–18 (75–90%)) has increased both its share of disposable incomes by 0.6 percent, as well as its share of expenditures by 0.5 percent.

Overall, there has been an increase in income inequality. The first 14 pentiles (0–70%) lost income relatively by 2,6 percent, while the richest 30 percent increased their income share correspondingly. But at the same time, consumption inequality decreased. The upper half of the income distribution decreased its share of total expenditures by 1.4 percent, while the lower half increased its share correspondingly. The main result is therefore that despite the increase in income inequality, consumption inequality has actually decreased in Sweden during the study period.

The increased consumption equality between 1988 and 2003–05 also seem related to the age distribution. Households with members younger than 45 years of age had, on average, higher expenditures than disposable income in 1988 (Figure 3). Households with older adult members seemed, on the other hand, not to consume all their disposable income.

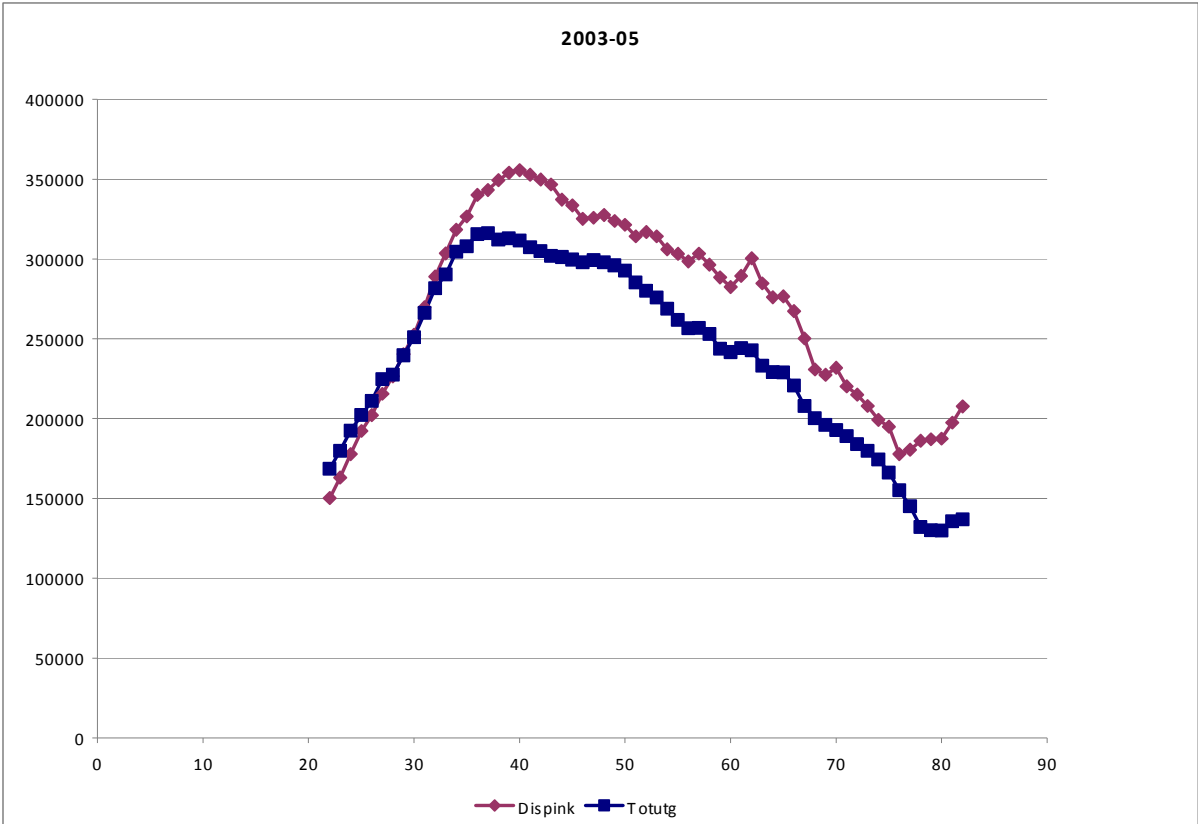
Figure 3 Disposable income, total expenses and working income for Swedish households according to average adult household age, 1988



The age distribution of disposable income and expenditures are very different in 2003-05 (Figure 4) compared to the pattern displayed in Figure 3 for 1988. As can be seen from Figure 4, and in contrast to the results in 1988, young adults (under 30 years of age) tend to consume more than their disposable income; whereas older individuals tend to save a large part of their income.



Figure 4 Disposable income and total expenses for Swedish households according to average adult household age, 2003–05



### **3. Reasons for diverging trends between income and consumption inequality**

Various conceivable explanations for diverging trends between income and consumption inequality can be grouped into three categories: More consumption smoothing over short-term income fluctuation, more lifecycle redistribution, and changing patterns of unreported income. These are described briefly below. The empirical analysis aims thereafter to identify the import of each respective explanation.

#### **3.1 Consumption smoothing over the life cycle**

As a greater share of people hold career jobs incomes are often higher in midcareer and lower during early education and training periods, as well as during post-career periods. As people expect to live longer they need to save more during periods of high incomes and redistribute to old age. This is especially true for high income earners. Many low income earners can expect to maintain their living standards relying on public and negotiated pension schemes regardless of how long they live. Since these schemes generally have a ceiling, high-income earners need to increase their savings much more in order to maintain their living standards as longevity increases.

In line with the life cycle theory, intertemporal redistribution may include bequests to children.<sup>1</sup> If parents accumulate greater wealth some of that will also be bequeathed to children, to some extent already during the parents' lifetime. If incomes become more unevenly distributed, there will presumably be more redistribution within families which

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<sup>1</sup> Since Kotlikoff and Summers (1981), it is widely accepted that intergenerational savings constitute a large part of wealth accumulation, even though the exact magnitude has been subject to considerable controversy.

helps to smooth income. One obvious phenomenon is that parents pay more as young people engage in longer education periods early in life.

Life cycle intertemporal redistribution may also have been facilitated by an easing of liquidity constraints, and tax changes that place less of a penalty on savings. Credit markets have developed. Household wealth has tended to increase over time. Presumably, demand for liquidity is income elastic, meaning that as average incomes increase, households will either rely more on financial institutions and loans or save more in order to reduce their liquidity constraint. Over time this means that consumption smoothing may have become more pronounced.

The age structure would primarily affect the income-consumption gap by changing patterns of observed intertemporal life-cycle redistribution. This is captured by our proxy variables for life-cycle redistribution which depend on age. But we also test whether age has an additional independent effect.

### **3.2 Consumption smoothing over short-term income fluctuation**

A basic result of life cycle income and consumption models is that household's smooth consumption over periods of fluctuating income. It is therefore no surprise that consumption is more evenly spread in a cross-section of the population than incomes. If consumption- and income inequality diverge, a change in the extent of intertemporal income redistribution is an obvious candidate. One possibility is that households smooth consumption more over transitory income fluctuations.

Over the past decades Swedish unemployment has been much more variable than in the post-war period. Unemployment benefits have been curtailed slightly. In particular they have a lower maximum amount, which gives higher income earners stronger reasons to save and smooth consumption. Another cause could be a faster pace of structural change that displaces employees, often claimed to be a result of globalization or more rapid technological change. Further, bonus payments, and capital income, may constitute a larger, and more volatile, share of peoples' income. Also, capital markets have developed and various tax reductions have made saving, and thus consumption smoothing, more attractive.

In addition, living expenses increase temporarily when a household has children, and is possibly even affected by marriage. Birth rates in Sweden have fluctuated greatly over the past decades to the extent that it could have an impact on the gap between consumption and income trends.

### **3.3 Unreported income**

The third category of explanations centres on various sources of unreported incomes. Unreported income is of course in itself a major data issue that casts doubt on studies that merely track income inequality using registered data. Unreported incomes are therefore a relevant argument in favour of analyzing consumption inequality rather than income inequality. They also imply that a household's income-consumption gap may be quite different from its savings ratio.

In some countries households receive significant private consumption support in kind, such as food stamps. In the Sweden, however, in kind support is given extensively in the form of

schooling, health care and similar services that are not included in our measure of private consumption. There are essentially no in kind transfers to households' private consumption.

Instead, unreported income due to tax avoidance may be an important issue in a country like Sweden where income tax rates are among the highest in the world. Non-registered incomes presumably occur in all income categories. If this phenomenon has increased over time, then it would have contributed to diverging trends of income and consumption inequality. According to a number of studies non-registered income is more common among self-employed and on the countryside. Therefore we control for these in the empirical studies.

Note also that purely data related issues may have affected income and consumption inequality trends over time. Attanasio et al. (2004), for example, raise a number of data issues in the US Consumer Expenditure Survey, but their estimates still imply that consumption inequality has increased much less than income inequality. Mostly, these appear to be less important in the Swedish context. Most important, in kind transfers such as food stamps or subsidized housing are common in the US but not in Sweden.

#### 4. Hypotheses and descriptive statistics

To study what determines the difference between income inequality and consumption inequality, the expenditure gap ( $EXPGAP$ )<sup>2</sup> and the log of the difference between disposable income and total expenditures ( $EXPDIFF$ ) are used as dependent variables in the empirical analysis. The choices of independent variables are based on four explanations for diverging trends between income and consumption inequality, i.e., more lifecycle redistribution, more consumption smoothing over short-term income fluctuation, consumption smoothing over temporary rises in living expenses, and changing patterns of unreported income, that were discussed in Section 2.

As people expect to live longer they need to save more during periods of high incomes and redistribute to old age. Many low income earners can expect to maintain their living standards relying on public and negotiated pension schemes regardless of how long they live. Since these schemes generally have a ceiling, high-income earners need to increase their savings much more in order to maintain their living standards as longevity increases. We thus expect that higher disposable income ( $DISPINC$ ) is positively related to the expenditure gap, i.e., high-income households tend to save more than low-income households.

Households might also consume more and save less if they expect that their future income ( $FUTINC$ ) is high, suggesting that future income is negatively related to the expenditure gap. To define expectations of future income, all the households were ranked according to the average age of the adults in the household. The expectation of how future income develops for a given household is then calculated as the average income of all households whose

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<sup>2</sup>  $EXPGAP$ , the expenditure gap, is defined as disposable income divided by total expenditures, i.e.,  $EXPGAP = DISPINC/TOTEXP$ .

average age is older than the actual household. Thus, the proxy for how the future income of household  $i$  develop (where  $i$  indicates the household's rank in the age distribution) is defined as

$$FUTINC = \frac{1}{N-i+1} \sum_j^N DISPINC_j, \text{ for all } j > i \text{ (such that } AGE_j > AGE_i).$$

This means that a household would take account of how income tends to evolve over the life cycle in households that are older than itself.<sup>3</sup>

The income potential is defined as the difference between household disposable income and future income, i.e.,  $INCPOT = DISPINC - FUTINC$ . The variable  $INCPOT$  expresses directly the hypothesis that households with high future income compared to its current income will want to smooth consumption by consuming more out of current income and thus decrease its savings ratio. One might think that age is an important own variable that affects life cycle redistribution. But age enters the calculation of  $INCPOT$ , and is in fact closely correlated with  $INCPOT$ . In the regressions we report below, age is therefore not included as a separate variable (but doing so does not affect the qualitative results).

In the presence of wealth, additional saving may appear less necessary. There are no good measures of wealth, but it is proxied here by the number of rooms in the residence ( $ROOMS$ ).

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<sup>3</sup> Admittedly, this “peerless” way of calculating may be a very rough approximation of how households estimate their future income. In a more refined estimate, households would consider the households would weigh more heavily incomes of households that may be considered their peers, with regard to e. g. socioeconomic group, education and profession.

The variable *INCPOT*, merely captures the average development of incomes over the life cycle. A household will also weigh in its relative position. This is particularly important since pensions and other social insurance schemes have ceilings, so that households' motives save privately increase disproportionately as income exceeds the ceiling. A high relative income (*RELINC*) is thus expected to be positively correlated with the expenditure gap. This variable is included in the model by dividing disposable income with the average disposable income of households in the same age category.

To capture the second explanation, short term fluctuations of income, it would have been desirable to have data on capital income to control for short-term income fluctuations. This information is, however, not present in the data. Instead, an unemployment dummy variable (*DUNEMP*) is included in the model to study whether households that have at least one unemployed household member reduces its expenditures. The variable is thus expected to be negatively related to the expenditure gap. Temporary increases of living expenses due to family composition is proxied by the number of children in the household (*CHILDREN*), whether any of the adult household members is a student (*DSTUD*) and the civil status of the adult household members (*DCIV*).

The third explanation, occurrence of unreported income is proxied by whether any of the household members are self-employed (*DENTREP*) and whether they are residents in a city (*DCITY*).

Means, standard deviations, and definitions for all the variables used in the empirical analysis are displayed in Table 1. The variables included are further discussed in Section 5.



**Table 1: Means, standard deviations, and definitions of variables**

	1988		2003–05		
	Mean	sd	Mean	sd	
<i>EXPGAP</i>	1.080	0.460	1.224	0.600	Disposable income divided by expenditures
<i>DISPINC</i>	140833	74582	280780	191979	Disposable income for household
<i>FUTINC</i>	79008	8338	166722	18218	Average income of all households whose average age is older than household
<i>INCPOT</i>	-4643	31367	-6653	94745	The difference between household disposable income and future income.
<i>RELINC</i>	1.003	0.4557	-0.489	6.458	Disposable income divided by average income for households in the same age.
<i>AGE</i>	42.96	15.77	47.86	15.79	Average age for adult members in
<i>CIVSTAT</i>	0.579	0.494	0.545	0.498	Dummy variable that takes the value one if the household is classified as a single household, otherwise zero.
<i>CITY</i>	0.315	0.465	0.362	0.481	Dummy variable that takes the value one if the household lived in Stockholm, Gothenburg or Malmö, otherwise zero.
<i>ROOMS</i>	4.199	8.363	3.575	1.762	Number of rooms of household habitation.
<i>CHILDREN</i>	0.513	0.909	0.523	0.945	Number of children in household
<i>STUDENT</i>	0.166	0.372	0.183	0.387	Dummy variable that takes the value one if at least one adult household member is a student, otherwise zero.
<i>ENTREP</i>	0.060	0.238	0.084	0.278	Dummy variable that takes the value one if at least one adult household member is self-employed, otherwise zero.
<i>UNEMP</i>			0.060	0.237	Dummy variable that takes the value one if at least one adult household member is unemployed, otherwise zero.

## 5. Empirical model

The results presented in the previous section indicate that income inequality has risen in Sweden from 1988 through 2005, whereas consumption inequality has decreased. The following regression (Model I) is estimated in order to investigate what can explain the observed difference in consumption and income inequality in Sweden during the study period.

$$Y_{it} = \alpha_0 + \alpha_1 \text{DISPINC}_{it} + \alpha_2 \text{FUTINC}_{it} + \alpha_3 \text{RELINC}_{it} + \alpha_4 \text{AGE}_{it} + \alpha_5 \text{DCIV}_{it} + \alpha_6 \text{DCITY}_{it} + \alpha_7 \text{ROOMS}_{it} + \alpha_8 \text{CHILDREN}_{it} + \text{DSTUD}_{it} + \text{DENTREP}_{it} + \text{DUNEMP}_{it} + \varepsilon_{it},$$

where the dependent variable ( $Y_{it}$ ) measures the difference in consumption and income for a given household  $i$  in period  $t$ . This variable is measured using the expenditure gap ( $\text{EXPGAP}$ ) and the log of the difference between disposable income and total expenditures ( $\text{EXPDIFF}$ ). When the log of the difference between disposable income and total expenditures ( $\text{EXPDIFF}$ ) is used as the dependent variable, all independent income variables are also logged.

The independent variables have been discussed above. An unemployment dummy ( $\text{DUNEMP}$ ) is therefore included as an independent variable in the empirical model. This variable does not exist in the data in 1988 and can therefore only be used in the estimations for the 2003-05 sample.

In a second specification, disposable income is omitted from the estimation since it is a linear transformation of  $\text{INCPOT}$ . The estimated model (Model II) can in this case be written

$$Y_{it} = \beta_0 + \beta_1 \text{INCPOT} + \beta_2 \text{RELINC}_{it} + \beta_3 \text{AGE}_{it} + \beta_4 \text{DCIV}_{it} + \beta_5 \text{DCITY}_{it} + \beta_6 \text{ROOMS}_{it} + \beta_7 \text{CHILDREN}_{it} + \beta_8 \text{DSTUD}_{it} + \beta_9 \text{DENTREP}_{it} + \beta_{10} \text{DUNEMP}_{it} + \varepsilon_{it},$$

## 6 Results

We performed two sets of regressions. The first was performed on unlogged variables, using the expenditure gap as the dependent variable; whereas the log difference between disposable income and expenditures was used as the dependent variable in the second regression. With logged variables, coefficients may be compared with each other and assess whether their size have increased or decreased between the years 1988 and 2003–05. The results from the first regression are presented in Table 2.

In Table 2, model II is our preferred specification in line with the framework given above. Model I just a “naïve” regression where disposable income, age and other income variables are entered directly.

As can be seen from the results presented in Table 2, disposable income is highly significant in both 1988 and in 2003–05. The estimated coefficient indicates that the expenditure gap increases when the household have higher disposable income per household member. Thus, high income households tend to spend less of their disposable income (i.e., save more) than households with lower income. This confirms the hypothesis that households with high-income earners save relatively more than low-income earners in order to maintain their living standards as longevity increases.

**Table 2 Regression results using the expenditure gap (*EXPGAP*) as the dependent variable, t-values (Robust-White) in parentheses.**

	Model I	Model II	Model I	Model II
	1988	1988	2003–2005	2003–2005
<i>DISPINC</i>	2.5e-06 (5.9)		2.2e-06 (2.8)	
<i>FUTINC</i>	-1.5e-05 (-3.3)		-6.8e-06 (-1.8)	
<i>INCPOT</i>		-4.17e-06 (-5.7)		-3.7e-06 (-3.2)
<i>RELINC</i>	1.7e-05 (0.7)	1.3e-05 (0.51)	-0.00015 (-0.27)	-0.00015 (-0.39)
<i>AGE</i>	-0.0031 (-1.4)		0.00037 (0.12)	
<i>CIVSTAT</i>	-0.14 (-3.3)	0.10 (4.7)	-0.12 (-1.1)	0.26 (5.7)
<i>CITY</i>	-0.068 (-3.1)	-0.077 (-3.6)	-0.11 (-2.4)	-0.11 (-2.6)
<i>ROOMS</i>	-0.00052 (-0.74)	-0.00017 (-0.26)	-0.065 (-2.5)	-0.050 (-2.1)
<i>CHILDREN</i>	-0.060 (-7.3)	-0.094 (-11)	-0.029 (-2.2)	-0.066 (-5.5)
<i>STUDENT</i>	-0.048 (-2.4)	-0.028 (-0.15)	(-0.025) (-1.3)	0.029 (0.75)
<i>ENTREP</i>	-0.11 (-3.4)	-0.010 (-3.1)	-0.017 (-0.3)	-0.017 (-0.28)
<i>UNEMP</i>			0.080 (1.7)	0.12 (2.0)
<i>CONST</i>	2.2 (5.1)	1.1 53.24	2.1 (2.9)	1.3 (16)
$R^2$	0.12	0.10	0.15	0.14

The results presented in Table 2 indicate, moreover, that the expenditure gap decrease when future income increases, supporting the hypothesis that households with relatively high future income save less money than households that are characterized by relatively low future

incomes. Thus, consumers seem to smooth consumption over the life cycle. Prospective higher future incomes make people save less out of current income. This view is more directly expressed in Model II where the income potential is included in the estimated model instead of disposable – and future income. According to the results, the higher the future income is relative to current income, the less inclined to save will the household be. This suggests that an increase in life-cycle saving may indeed be an important factor behind the diverging trend in income- and consumption equality.

However, our second hypothesis of consumption smoothing over temporary income fluctuations, also receives some support. The coefficients for unemployment are significant and of the right sign. The hypothesis, of smoothing due to temporary fluctuations in living expenses is corroborated as the coefficient estimates for the presence of children and marital status are significant. The expenditure gap decreases if the household lives in the big cities in Sweden or if there are many children present in the household. Households with many children do not save more in order to redistribute income between generations. On the contrary, these households save less than households without children.

The hypothesis concerning unreported income receives mixed support. The coefficient estimate for self-employment is not significant. The coefficient for living in a city is significant, but could pick up other characteristics than unregistered income.

Finally, our proxy for wealth, the number of rooms in the dwelling, is also significant.

To see whether the regression coefficients economic significance have changed between 1988 and 2003-05, Table 3 show results from regressions on logged variables. Unfortunately this

can only be done for Model I since Model II includes the variable INCPOT which is negative for many observations. In the logged version the effects of inflation on coefficient values are discarded. We focus the analysis on whether the estimated income coefficients have changed between 1988 and 2003-05. According to the results, disposable income and future income is still positive and highly significant determined both in 1988 and in 2003–05. High income households thus tend to save more and prospective higher future incomes makes people save less out of current income.

The results indicate that a 1% increase in disposable income in 1988 increased the difference between disposable income and expenditures with 0.53%, while the corresponding increase in 2003-05 was 0.80%. Thus, high-income earners tend to save more of their disposable income in 2003-05 compared to 1988, explaining parts of the observed difference between income and consumption inequality during the study period.

**Table 3 Regression results using the log of the difference between disposable income and total expenditures (*EXPDIFF*) as the dependent variable, t-values (Robust-White) in parentheses.**

	Model I 1988	Model I 2003–2005
<i>ln DISPINC</i>	0.53 (2.9)	0.80 (8.6)
<i>ln FUTINC</i>	2.7 (2.1)	1.4 (2.7)
<i>ln INCPOT</i>		
<i>ln RELINC</i>	0.16 (3.6)	0.16 (6.1)
<i>AGE</i>	0.024 (2.6)	0.016 (4.5)
<i>CIVSTAT</i>	0.14 (0.5)	0.19 (2.0)
<i>CITY</i>	-0.22 (-2.8)	-0.069 (-1.7)
<i>ROOMS</i>	.00059 (0.22)	-0.034 (-2.4)
<i>CHILDREN</i>	-0.17 (-4.5)	-0.056 (-2.8)
<i>STUDENT</i>	0.22 (2.6)	0.063 (1.3)
<i>ENTREP</i>	0.10 (0.64)	0.11 (1.8)
<i>UNEMP</i>		0.25 (2.9)
<i>CONST</i>	-29 (-2)	-17 (-2.9)
<i>R</i> <sup>2</sup>	0.11	0.20

The concentration index (gini coefficient over distribution of income for both disposable income and expenditure) shows that income inequality increased by 12,3 percent between 1988 and 2003, while expenditure inequality decreased by 5,2 percent (Table 4). To quantify how much of the change in the gap between how income- and consumption inequality can be explained by changes the independent variables, we first estimated the predicted expenditure gap for each household in 1988 and 2003-05 using the statistically significant estimated coefficient values in Table 3 (Model I).

The second step in the simulation is to substitute the estimated coefficients of the 2003-05 regression into the equation for the year 1988. Table 5 shows the results. Without the changes in coefficient estimates for *DISP* and *FUTINC*, that capture changes in lifetime income redistribution, consumption inequality would not have declined as much. This was, however, more than compensated by the change in coefficient estimates for the number of children (*CHILDREN*) and self-employment (*ENTREP*). The changes in these coefficient estimates instead help to shrink the gap between income and consumption equality changes over time. In sum, the observed changes in coefficient estimates during the study period do not seem to explain much of the increasing gap between income and consumption inequality.

**Table 4 Simulations of the gini coefficient using coefficients from the 2003 regression in the estimated equation for 1988**

	1988	2003	Change 1988 - 2003
<i>INCOME INEQUALITY</i>	0,27	0,31	12,3%
<i>EXPENDITURE INEQUALITY</i>	0,23	0,22	-5,2%
 <i>PREDICTED EXPGAP</i>	 0,24	 0,22	 -7,8%
Replacing coefficients for			
<i>DISPINC</i>			-6,6%
<i>FUTINC</i>			-7,6%
<i>CHILDREN + CIVSTAT</i>			-10,8%
<i>ENTREP + CITY</i>			-8,1%
<i>ALL</i>			-9,4%

Instead the mystery is resolved by taking into account the changes in the distribution of the independent variables themselves. Two variables have changed much between 1988 and



2003. One is the average age which has increased with five years (similar to life expectancy in Sweden). But the coefficient estimates for age as an explanatory variable is small and hardly significant. The other variable that has changed much is the level and variance of income. Partly this is due to inflation, but real incomes have increased by about 30 percent over the period and the standard deviation has increased much more than the mean. This, then, seems to be the main reason for the diverging development of incomes and consumption.

## **7. Conclusions**

The purpose of this paper has been to study the difference between income – and consumption inequality in Sweden during the period 1988-2005 using data from the Household Expenditure Survey (HUT). This is of importance since it can be argued that consumption better measures families' well-being than income. Income data is, for example, influenced by transitory changes (e.g., capital income), does not take into account expectations of future incomes, and disregards incomes that is not registered (e.g., student allowances); thereby underestimating the well-being of low-income households.

Most previous empirical studies have used data from the US and these studies have in general found that both consumption and income inequality has increased, but consumption inequality seems to have increased less than income inequality. However, the results presented in this paper indicated that the Swedish experience is different. In Sweden, consumption inequality has decreased during the study period in spite of an overall increase in income inequality. It is found that the diverging trends between consumption - and income inequality can to some extent be explained by increased savings among the high income individuals. This is in line

with Dew-Becker and Gordon (2005), who found that the overall increase in income inequality in the US mainly was due to an increase within the richest 10 percent of the population.

Note that we have not been able to control for a number of explanations (see Section 2) that might explain why Swedish consumption has become more equal since 1988, in spite of increasing inequality in registered incomes. Unemployment was, for example, exceptionally low in Sweden up until the early 1990s, but more like in other countries subsequently, giving rise to increased short term income volatility.

Household life cycle redistribution has probably also increased more in Sweden than in the US. Sweden had a relatively low share of young people in college education during the 1980s. This share increased dramatically during the 1990s. At the same time the public pension system was reformed and cut back, increasing interest in retirement saving. A number of changes in the tax system also contributed to an increase in the household savings rate from around zero to around four to five percent of household income after the mid-nineties. These trends might explain why older individuals increased their savings ratio during the study period (Figure 3), whereas expenditures for younger individuals in the end of the period on average were higher than their registered income (Figure 4). Note also that the share of nonregistered income in connection with tax avoidance gradually has increased over time in Sweden; which can explain diverging trends in consumption and income inequality. Much of this has occurred in sectors where it is conceivable that jobless individuals may have been able to earn unregistered income.

This paper can be seen as a first attempt (at least to our knowledge) to discriminate between trends in consumption – and income inequality in Sweden. The discussion above indicates that a lot questions still remain, thereby constituting interesting avenues for further research.

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