INCOME DISTRIBUTION DATA REVIEW – DENMARK

1. Available data sources used for reporting on income inequality and poverty

1.1. OECD reporting:

OECD income distribution indicators for Denmark are computed by the Ministry of Finance from their Law Model micro-simulation model. Data are available at the Danish Ministry annually since 1979, but information before 1983 is scarce. Data are published by OECD from 1985 to 2010 annually for Gini and poverty rate.

Note that data from 1995 onwards were revised in 2012 using a larger sample: 1/3 of the population instead of 1/30 previously.

1.2. National reporting and reporting in other international agencies:

Income distribution and poverty indicators for Denmark are also available from:

- Eurostat's EU-SILC annual survey from 2003.

- Data for 2000 and 2002 are also available from Eurostat based on the EU-SILC predecessor ECHP. Data are not fully comparable.

- LIS database using the Danish Law model in 1987, 1992, 1995, 2000 and 2004

Note that Statistics Denmark's Statistical Yearbook 2012 reports Ginis from the source Eurostat.

The below table presents the main characteristics of those four datasets:

Table 1. Characteristics of dataset, Denmark

	OECD reference series	Ministry of Finance	LIS database	EU-SILC from Eurostat
Name	The Danish Lawmodel system (register data)	The Danish Lawmodel system (register data)	The Danish Lawmodel system (register data)	EU-SILC
Name of the responsible agency	Ministry of Economic Affairs and the Interior	(same as OECD series)	Ministry of Economic Affairs and the Interior	Eurostat
Year (survey and income/wage)	1985 to 2010 annually - all calendar year		1987, 1992, 1995, 2000, 2004	EU-SILC 2004-2011 representing 2003-2010 income, and ECHP before 2003
Period over which income is assessed	annual income (not a survey)		annual income (not a survey)	Annual income for the all year N-1
Covered population	all		all	
Sample size	1/3 of the Danish population from 1993 (1,854,207 persons in 2010), 1/30 before 1993		The sample represents 1/30 of total population (approximately 177,000 individuals, including 30,000 children without income of any kind)	5867 househlods in EU-SILC2010
Sample procedure	-		-	Register based on Central Population Register
Response rate	up to 2 per cent are excluded for several reasons: Persons with non-final income information are deleted - or - Households with oldest member below 18 are deleted.			
Imputation of missing values				
Unit for data collection	individuals		individuals	
Break in series	none			ECHP before 2003; EU-SILC from 2003

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2. Comparison of main results derived from sources used for OECD indicators with alternative sources

2.1   Income

2.1.1 Time series of Gini coefficients and other inequality indicators

According to the income distribution database, income inequality among the total population has been relatively low and stable at 0.22 between the mid80s and the mid90s. Income inequality then increased between 1995 and 2000 to a Gini of 0.25, before decreasing to 0.23 in 2005. Since 2005, inequality has been fluctuating, with a general upward trend, reaching a Gini of 0.25 in 2010.

Data from the Ministry of Finance from the same data source (Law Model) show a somewhat stronger increase in the Gini, mainly due to the fact that it includes imputed rent and negative capital income (see Annex for a detailed comparison between the OECD reference series and the series from the Ministry of Finance provided by the Danish delegate Lars Pantmann)

By contrast, data from LIS show a decline in inequality between 1987 and 1995, then a regular increase up to 2004, as the other two series based on Law Model data.

Since 2003 from which EU-SILC data are available, the EU-SILC Eurostat series shows a similar upward trend in Ginis than the OECD reference series, with slightly higher levels. Then from 2008 onwards, the Eurostat figure is significantly higher that the OECD and the Danish figures. The difference with the OECD series is still to be determined.

Figure 1.1 Trends in Gini coefficient (disposable income)
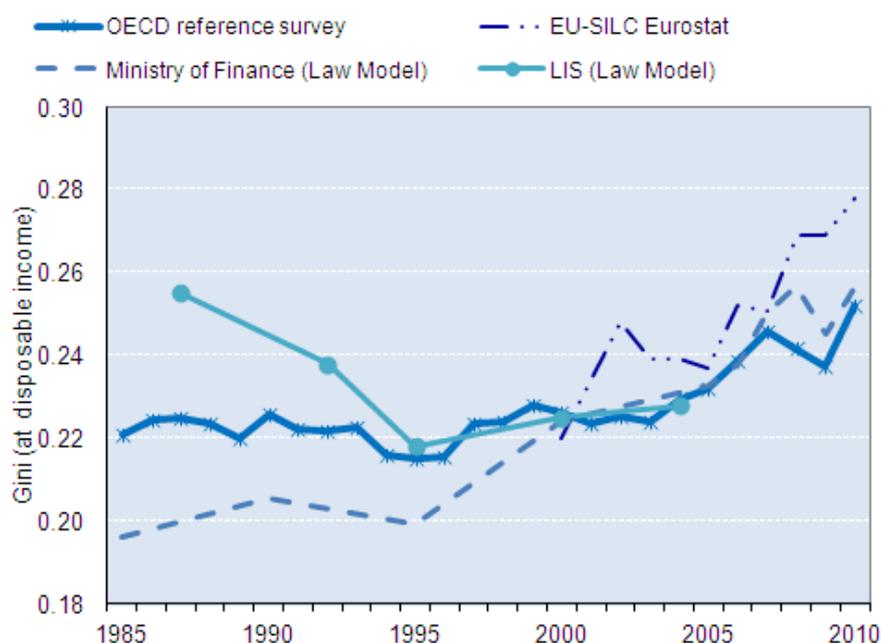
Also, when comparing the income quintile ration (S80/S20) from the OECD reference series and the Eurostat EU-SILC, as for the Gini series, the EU-SILC Eurostat series shows a similar upward trend in

Ginis with slightly higher levels around 2005. Then from 2008 onwards, the Eurostat figure increases to 4.5, compared to 3.5 for the OECD figure. The difference with the OECD series is still to be determined.

Figure 1.2 Trends in S80/S20
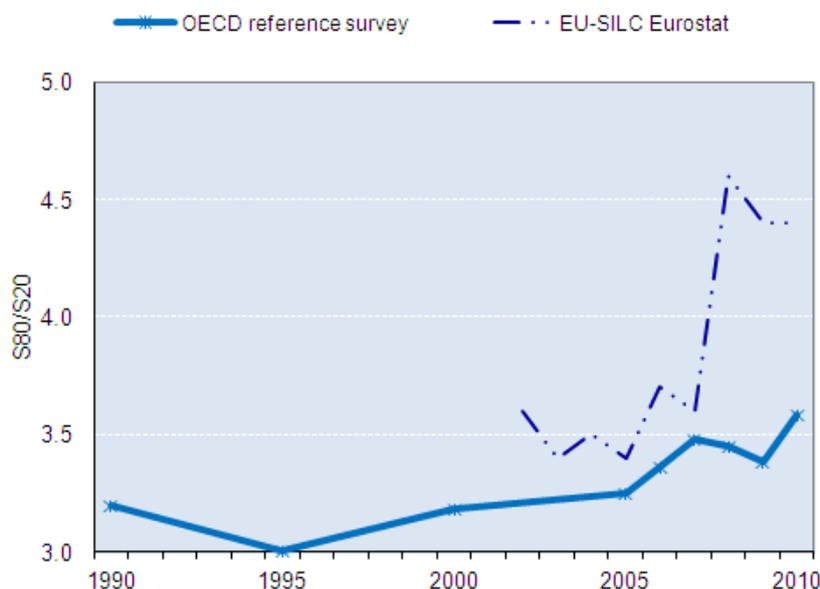
2.1.2 Time series of poverty rates

According to the OECD income distribution database, the share of the Danish population living with less that 50% of the annual median equivalised income (111 757 DKK in 2010) has been fluctuating at around 6% in the last decades. The relative poverty rate decreased from around 7.5% in 1987 to around 5% in 1995-2000. It then increased from 5.6% in 2005 to 6.6% in 2008, before declining again in the last years to 6.0% in 2010.

Data from the Ministry of Finance from the same source (Law Model) shows lower poverty rates, mainly due to the fact that it includes imputed rent and negative capital income (see Annex for a detail comparison between the OECD reference series and the series from the Ministry of Finance provided by the Danish delegate Lars Pantmann). OECD figures do not include as income negative capital income and imputed rent from private housing, which gives an incomplete picture of the income situation, in particular for older people. When an imputed rent is included in the definition of income, the risk of poverty in Denmark for elderly people is much lower.

The LIS series shows higher poverty rates around 1990 but it shows similar rates to the OECD series between the mid90s and the mid2000s. Without taking into account the 4.0% from ECHP in 2000, the EU-SILC series is very similar to the OECD series, again up to 2008 where the EU-SILC series becomes higher. The difference with the OECD series is still to be determined.

Figure 2.1 Trends in poverty rates
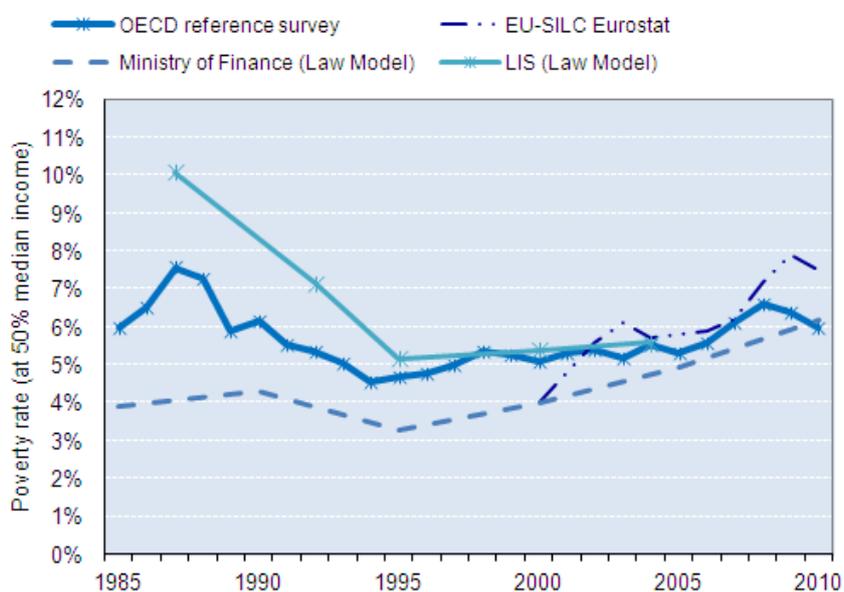
As for child poverty rates, the three series available show similar trends, but the LIS series (except in 2000) and, in particular, the EU-SILC series show rates which are 1 to 2 percentage points higher.

Figure 2.2 Trends in poverty rates among children
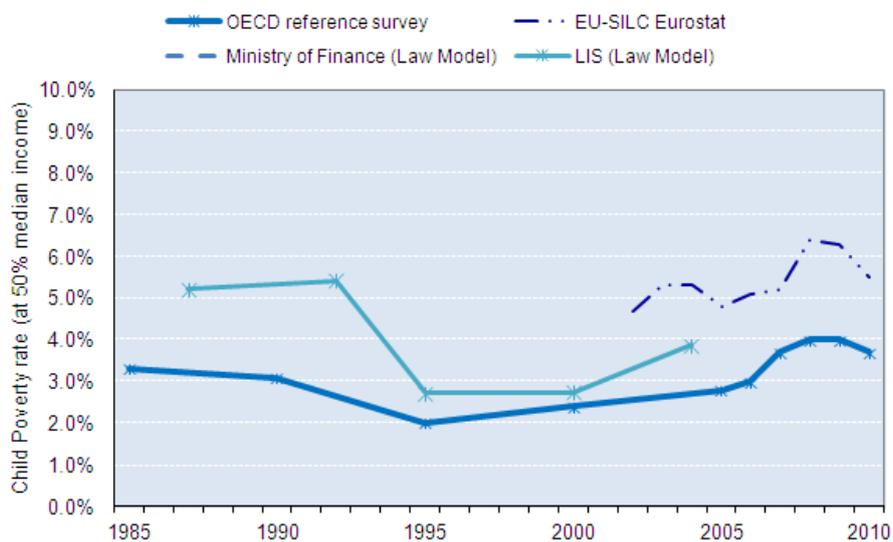
2.2   *Wages*

See Part II of the present Quality Review.

3. Consistency of income components shares with alternative data sources

3.1. Comparison of main aggregates: earnings, self-employment income, capital income, transfers and direct taxes

When comparing the composition of the average equivalised disposable income of the OECD reference series (based from the Law model, DKK) and the EU-SILC series (in Euros), share of income generally match, except for the share of capital (13% in the OECD series, 6% in the EU-SILC series) and that of transfers (22% in the OECD series, 31% in the EU-SILC series).

The shares of taxes are surprisingly similar, as the OECD series would not include social security contributions in taxes.

Table 2. Shares of income components in total disposable income, OECD reference series and EU SILC

	Survey	Year	Unit	Wages	Capital	Self Employment	Transfers	Taxes	Disposable income (HDI)
OECD reference suvery	OECD reference suvery	2008	natcur	231 567	27 426	17 195	47 398	-112 060	211 527
			% av HDI	109%	13%	8%	22%	-53%	
Other INCOME survey	EU-SILC (OECD-ELS)	2008	natcur	31 790	1 753	2 390	8 685	-15 071	27 994
			% av HDI	114%	6%	9%	31%	-54%	

Figure 3 compares the trend in shares of public cash transfers in equivalised disposable income from the OECD reference series with the share of total cash social spending in net national income, reported from the OECD Social Expenditure database (OECD SOCX). OECD SOCX series include pensions, incapacity, family, unemployment, social assistance. Both series show similar trends throughout the period, except for the latest year.

Figure 3. Trends in shares of public social transfers

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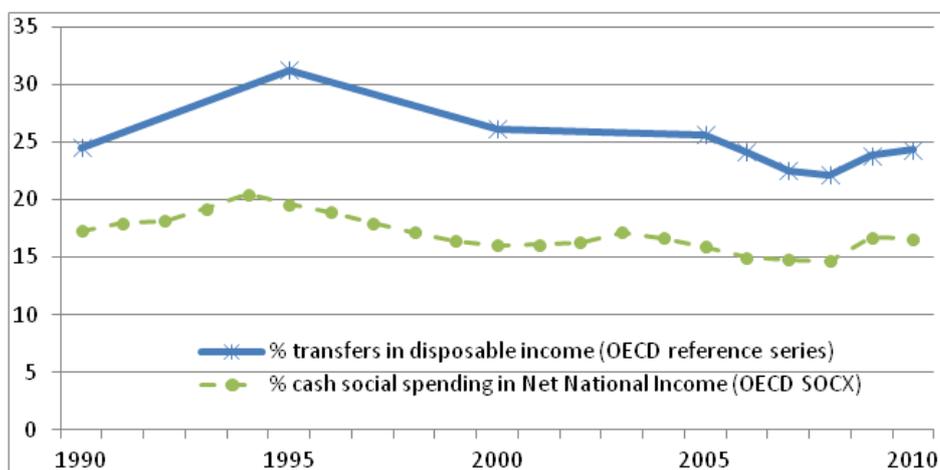
4. Metadata of data sources which could explain differences and inconsistencies

Definitions, methodology, data treatment

Data from the Ministry of Finance from the same source (Law Model) includes imputed rent and negative capital income (see Annex for a detail comparison between the OECD reference series and the series from the Ministry of Finance provided by the Danish delegate Lars Pantmann).

The difference between the OECD series and EU-SILC series from 2008 is still to be determined.

5. Summary evaluation

Overall the OECD series matches reasonably well with the Eurostat series up to 2007. From 2008 onwards, the Eurostat series shows higher levels of both Ginis and poverty rates.

The LIS series also show comparable figures. Unfortunately it is only available until 2004.

Figures from the Law model are now calculated based on a sample accounting for one-third of the Danish population, which minimizes sample errors and gives higher credibility to the figures.

Annex: Methodological Note from Lars Pantmann, Delegate from Ministry of Finance, comparing Danish National figures and OECD figures

OECD Income distribution – Compared to National figures

Figures supplied to the OECD Income distribution study are calculated on the same data source as used in official national income distribution analyses, i.e. The Danish Law model system[20]. However there are a number of methodological differences in the calculation of income.

The following tables summaries some of the resulting differences such as Gini and the share of the population with relative low income (lower than 50 percent of the median income).

Table 1.1

Gini – total population

	1985	1990	1995	2000	2005	2010
OECD	22.09	22.56	21.49	22.72	23.19	25.21
National	19.61	20.56	19.92	22.41	23.28	25.66
Difference	-2.48	-2.00	-1.57	-0.31	0.09	0.45
Due to						
Including negative income elements[1]	-2.15	-1.47	-1.64	-0.76	-0.90	0.37
Including an imputed rent element	-0.25	-0.33	0.12	0.36	0.99	0.40
Including single person households under 18	0.09	0.07	0.07	0.08	0.08	0.08
Equvalence scale (0,5 → 0,6)	-0.32	-0.36	-0.38	-0.31	-0.31	-0.43
Housing unit → Families	0.29	0.41	0.42	0.54	0.54	0.74
Top-/bottom coding	-0.13	-0.33	-0.17	-0.23	-0.31	-0.71

Note: The decomposition of the changes is influenced by the sequence of calculation. In OECD study the persons sharing the same housing unit is regarded as the income sharing unit. In national studies the housing unit can contain more income sharing units (families). A consequence of that is, that children living in another housing unit than there parents have to be excluded in national studies.
1)   In OECD calculations only the positive part of each of the elements Salary income, self employed income, capital income, transfers and taxes are included in the disposable income.
Source: Calculations based on a 33.3 percent sample of the Danish population.

Including negative income elements an imputed rent element has significant effect on the interpretation of the analysis:

- **The trend** – negative net capital income is reduced markedly from 1985 to 2005. This reduction leads to at rise in the national Gini witch isn't reflected in the OECD Gini.

- **The composition of the low-income-group** – negative net capital income lowers the median income and thereby the low-income-threshold. Imputed rent increases the income of the retirement age population (they typically don't have negative capital income any longer). In

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[20]   The Danish Law model system includes very detailed information about 33.3 percent of the population.

national studies about 1 percent of the retirement age population has relative low income where it's about 10-20 percent in OECD studies, see table 2.3.

Negative capital income reduces the income tax. Not including negative capital income therefore introduces a mismatch between income and taxes. A similar situation applies to negative self employed income.

In order to compare income of house owners with tenants an imputed rent of 4 percent of the property valuation is added to the capital income for owners in national studies. The imputed rent has contributed to an increase in the national calculated Gini.

Even though the sample used is large, a few very extreme observations can introduce some noise when the changes over time is analysed. Therefore a disposable income over 20 million Danish kroner or below minus 5 million Danish kroner is excluded from the sample in the national studies.

Looking at the income of those with these very high disposable incomes reveals that the high income is due to equity income or self employed income. It is very likely that these incomes relates to a period longer than one year. Ideally the income should be spread over the total period and not only in the payment year. However that is a serious task – partly because of tax payment.

Table 1.2

Gini – working age population

	1985	1990	1995	2000	2005	2010
OECD	20.89	21.49	20.60	21.90	22.71	24.84
National	19.32	20.73	20.06	22.57	23.58	26.24
Difference	-1.56	-0.76	-0.54	0.66	0.87	1.40
Due to						
Including negative income elements[1]	-1.58	-0.86	-1.02	-0.17	-0.44	0.66
Including an imputed rent element	-0.25	-0.31	0.15	0.41	1.07	0.64
Including single person households under 18	0.00	0.00	0.00	0.00	0.00	0.00
Equvalence scale (0,5 → 0,6)	-0.22	-0.30	-0.30	-0.23	-0.24	-0.35
Housing unit → Families	0.67	0.85	0.85	0.94	0.93	1.23
Top-/bottom coding	-0.18	-0.13	-0.21	-0.29	-0.45	-0.78

Note: See note in table 1.1.
1)   In OECD calculations only the positive part of each of the elements Salary income, self employed income,
        capital income, transfers and taxes are included in the disposable income.
Source: Calculations based on a 33.3 percent sample of the Danish population.

Table 1.3

Gini – Retirement age population

	1985	1990	1995	2000	2005	2010
OECD	19.67	20.06	18.83	20.70	20.55	21.94
National	17.85	18.42	18.13	20.80	21.70	22.28
Difference	-1.83	-1.63	-0.70	0.11	1.15	0.34
Due to						
Including negative income elements[1]	-0.26	1.19	0.13	0.37	0.14	1.12
Including an imputed rent element	-0.16	-0.37	0.06	0.59	1.60	0.79
Including single person households under 18	0.00	0.00	0.00	0.00	0.00	0.00
Equvalence scale (0,5 → 0,6)	-0.70	-0.63	-0.70	-0.68	-0.66	-0.68
Housing unit → Families	-0.65	0.09	-0.05	0.11	0.15	0.14
Top-/bottom coding	-0.05	-1.91	-0.13	-0.28	-0.08	-1.02

Note: See note in table 1.1
1)   In OECD calculations only the positive part of each of the elements Salary income, self employed income,
       capital income, transfers and taxes are included in the disposable income.
Source: Calculations based on a 33.3 percent sample of the Danish population.

Table 2.1

Share of the population with relative low income – total population

	1985	1990	1995	2000	2005	2010
OECD	6.00	6.16	4.73	5.12	5.32	6.00
National	3.92	4.29	3.30	3.98	4.94	6.19
Difference	-2.08	-1.87	-1.42	-1.15	-0.38	0.19
Due to						
Including negative income elements[1]	-2.30	-1.83	-1.43	-1.40	-0.83	-0.40
Including an imputed rent element	-0.23	-0.44	-0.04	0.15	0.23	0.18
Including single person households under 18	0.11	0.09	0.09	0.09	0.10	0.10
Equvalence scale (0,5 → 0,6)	-0.13	-0.25	-0.53	-0.60	-0.44	-0.34
Housing unit → Families	0.56	0.64	0.58	0.73	0.72	1.00
Top-/bottom coding	-0.09	-0.09	-0.10	-0.11	-0.16	-0.35

Note: See note in table 1.1
1)   In OECD calculations only the positive part of each of the elements Salary income, self employed income,
       capital income, transfers and taxes are included in the disposable income.
Source: Calculations based on a 33.3 percent sample of the Danish population.

Table 2.2

Share of the population with relative low income – working age population

	1985	1990	1995	2000	2005	2010
OECD	4.12	4.92	3.95	4.41	5.12	6.30
National	4.38	5.05	4.05	4.91	6.06	7.70
Difference	0.26	0.13	0.10	0.50	0.94	1.40
Due to						
Including negative income elements[1]	-0.33	-0.22	-0.26	-0.29	-0.09	0.17
Including an imputed rent element	-0.07	-0.26	0.05	0.30	0.55	0.59
Including single person households under 18	-0.01	-0.00	-0.00	-0.01	-0.01	-0.01
Equvalence scale (0,5 → 0,6)	-0.27	-0.45	-0.56	-0.57	-0.55	-0.53
Housing unit → Families	1.06	1.17	1.01	1.22	1.27	1.74
Top-/bottom coding	-0.13	-0.11	-0.14	-0.15	-0.24	-0.55

Note: See note in table 1.1
1)   In OECD calculations only the positive part of each of the elements Salary income, self employed income,
         capital income, transfers and taxes are included in the disposable income.
Source: Calculations based on a 33.3 percent sample of the Danish population.

Table 2.3

Share of the population with relative low income – retirement age population

	1985	1990	1995	2000	2005	2010
OECD	19.46	16.56	12.29	12.74	10.12	7.97
National	1.25	1.29	0.78	0.96	1.15	1.22
Difference	-18.21	-15.27	-11.50	-11.79	-8.98	-6.74
Due to						
Including negative income elements[1]	-16.52	-13.70	-9.63	-9.09	-5.79	-3.76
Including an imputed rent element	-1.09	-1.14	-0.19	-0.30	-1.35	-1.86
Including single person households under 18	-0.01	0.00	-0.02	-0.01	-0.01	-0.01
Equvalence scale (0,5 → 0,6)	-0.48	-0.40	-1.68	-2.52	-1.91	-1.24
Housing unit → Families	-0.05	0.08	0.09	0.22	0.16	0.19
Top-/bottom coding	-0.06	-0.11	-0.07	-0.09	-0.08	-0.06

Note: See note in table 1.1
1)   In OECD calculations only the positive part of each of the elements Salary income, self employed income,
         capital income, transfers and taxes are included in the disposable income.
Source: Calculations based on a 33.3 percent sample of the Danish population.