Low inequality with low redistribution?
An analysis of income distribution in Japan, South Korea and Taiwan compared to Britain

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Contents

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Editorial Note

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Acknowledgements

Abstract

This article is a comparative analysis of the sources of income inequality in four countries, namely Japan, South Korea, Taiwan and the United Kingdom. It relies upon decompositions of inequality measures by population groups and income sources (except for Japan because of data limitations). According to national family income and expenditure surveys, income inequality in the three Asian countries is about average among industrialised countries, and less severe than in Britain. The factors influencing income inequality are very different between the three Asian countries on the one hand, and Britain on the other. While they do not differ very much in terms of inequality of earnings, the most equalising factor in the former countries is the favourable distribution of work across households, compared to social security in the latter. Public transfers are still very underdeveloped in Korea and Taiwan, although recent legislation will dramatically change that in the coming decades, while the Japanese social security system does not generate much vertical redistribution. However, income redistribution takes place within the family cell between people with and without work. Compared to the British situation, there are very few workless households in the three Asian countries, thanks to their different co-residence and labour participation patterns.

1.   Introduction

The conventional wisdom holds that industrialised East Asian countries feature rather equal income distributions relative to other advanced economies, despite the weakness of their social security systems. Is that assertion true? And if yes, how is this achieved?

This paper's objective is to identify and compare the main sources of income (in)equality in three East Asian countries, namely Japan, the Republic of Korea and the Republic of China (Taiwan), and one Western country, the United Kingdom. This exercise requires a comprehensive approach to each society, taking into account demographic (e.g., age pyramid), socio-cultural (e.g., labour participation and co-residence patterns), economic (e.g., unemployment and wage dispersion) and policy factors (e.g., fiscal and social policy). The questions this article will seek to answer are which of these factors are the most important, and whether they are important in their own right, or rather in combination with others.

The analysis relies upon the decomposition of inequality measures by population groups defined by age, household structure or earning status, as well as by income sources (e.g., earnings, property income, public and private transfers, taxes and social security contributions). It is based on the methodology of Jenkins (1995) who used it for a time-series rather than cross-section analysis.[1]

This technique requires the use of income data at the household level. These data have long been available for Taiwan and the United Kingdom. The Korean family income and expenditure survey has just been released to the public. On the other hand, access to Japanese family income data sets is still very restricted, so that the results here for Japan are limited to a comparison of quintile shares by income sources, adapted from another study using micro-data.

This article builds upon the work of Kwon (1997) and Jacobs (1998), who used tabulated data to investigate similar questions. It can also be read in parallel with Nishizaki, Yamada and Ando (1997) and Burniaux,

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[1]   This methodology was initially developed by Mookherjee and Shorrocks (1982) and Shorrocks (1982a and 1982b).
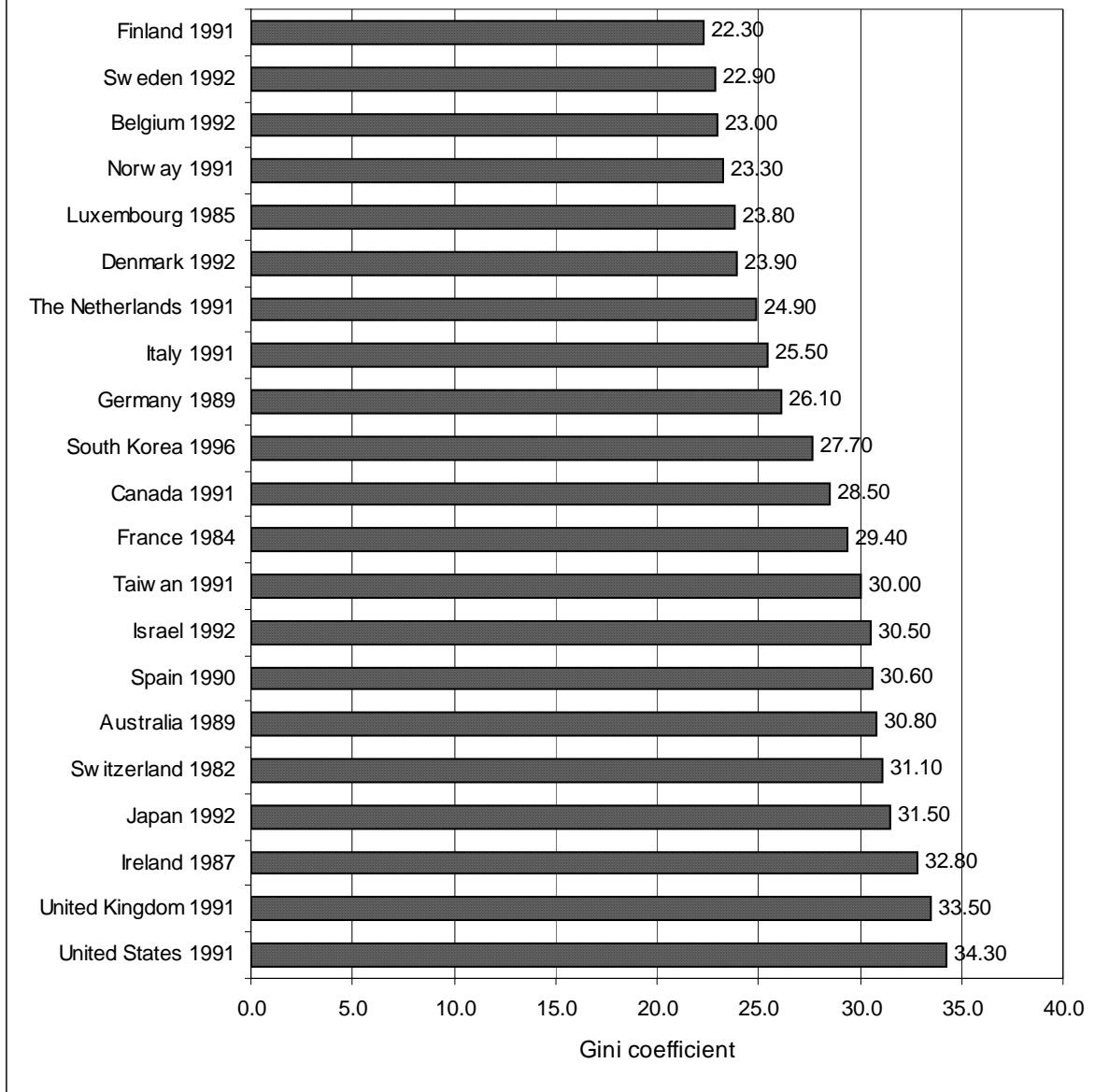
Dang, Fore, Förster, Mira d'Ercole and Oxley (1998) who carried out decomposition analyses for Japan and other OECD countries, although the methodology used here does not allow direct comparison of results.

The second section compares the income inequality of Japan, Korea and Taiwan with that of a large number of industrialised countries, using the data of Gottschalk and Smeeding (1997). The third section reviews the main demographic, socio-cultural, economic and policy factors influencing income inequality and identifies those of special interest in the case of Asian countries based on the past literature, especially Kwon (1997) and Jacobs (1998). The fourth section takes a first look at the structure of income inequality in those three countries plus Britain, by comparing decile and quintile group shares for different income sources. The fifth section presents the income inequality decomposition method. The sixth section summarises the findings of the analysis by population groups and income sources. Some conclusions are drawn in the last section.

2.   Income inequality in Japan, Korea and Taiwan compared to OECD countries

Since the influential work in 1979 of Harvard University's Professor Erza Vogel, "Japan as Number One", the conventional wisdom holds that Japan is a classless, homogeneous society with a very low degree of income inequality. Japan may not have known the same kind of class struggles as Europe has, and Japanese society may indeed be one of the most homogeneous in many respects, but the claim of relative income equality should not be taken at its face value.

Figure 1: Ranking of some developed countries by income equality

Country	Gini coefficient
Finland 1991	22.30
Sweden 1992	22.90
Belgium 1992	23.00
Norway 1991	23.30
Luxembourg 1985	23.80
Denmark 1992	23.90
The Netherlands 1991	24.90
Italy 1991	25.50
Germany 1989	26.10
South Korea 1996	27.70
Canada 1991	28.50
France 1984	29.40
Taiwan 1991	30.00
Israel 1992	30.50
Spain 1990	30.60
Australia 1989	30.80
Switzerland 1982	31.10
Japan 1992	31.50
Ireland 1987	32.80
United Kingdom 1991	33.50
United States 1991	34.30

Source: Gottschalk and Smeeding (1997) and own calculation for South Korea.

Figure 1 shows Gottschalk and Smeeding's (1997) Gini coefficients of equivalised household disposable income using a uniform methodology for 19 countries participating in the Luxembourg Income Study (LIS), plus Japan and Korea.[2] Japan is in the bottom half of the figure, among

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2   The figure for Japan are the results of computations made by a Japanese scholar under the supervision of Gottschalk and Smeeding (1997) and using the Income Redistribution Survey of the Japanese Ministry of Health and Welfare. The one for Korea was computed by the author using Gottschalk and Smeeding's (1997) methodology as well, although not under their supervision.

countries with relatively high income inequality. This contrasts with more publicised results such as those of the OECD, calculated by Nishizaki et al. (1997) and compared to other countries by Burniaux et al. (1998). According to this study, Japan's income inequality appears much lower: among 13 OECD countries, Japan was the sixth most equal in the mid-1990s, with only the Scandinavian countries and the Netherlands performing better, and Belgium, France, Germany, Italy, Canada and Australia all ranking lower. This striking difference is due to the use of different data sources.[3] The OECD study is based on the National Survey of Family Income and Expenditure (NSFIE), which consistently produces much lower inequality measures than the Income Redistribution Survey (IRS) used by Gottschalk and Smeeding (1997). Which of the two surveys is the most reliable one remains unclear. According to Nishizaki et al. (1997), "the IRS allegedly focuses on poor households and results in a relatively heavy weight of such households in its samples compared to the NSFIE" (p.3). To which Ministry of Health and Welfare officials retort that the NSFIE is biased against the poor and the IRS remains the best survey to compute inequality indices. Whether or not Japan is a more or less equal society thus remains uncertain.[4]

Korea and Taiwan also used to be cited as following a path of "equitable growth".[5] However, when compared to OECD countries as in Figure 1, they appear in the middle of the chart, with more inequality than Scandinavian and Benelux countries, but less than in the United Kingdom and the United States. Figure 1 thus suggests that the notion of low income inequality in East Asian countries must be qualified. It only holds for some bilateral comparisons. This should be kept in mind when we compare them with the United Kingdom in the next sections, for the income distribution of the latter country is now particularly unequal.

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3   Of course, many different methodological choices may also contribute to explain the discrepancy. It must be noted, however, that the two studies produce roughly similar rankings for all other countries, with the exception of Italy, which has a very high degree of income inequality according to the OECD study.

4   For more references on income inequality in Japan, see also Bauer and Mason (1992) and Tachibanaki and Yagi (1997).

5   See Bourguignon, Fournier and Gurgand (1999) for a time-series analysis of Taiwan's income distribution, with a special emphasis on the role of education.

3.   Hypotheses: The main factors influencing income distribution

Table 1 presents the hypotheses of this paper, i.e. the factors influencing income distribution in the three Asian countries that are potentially different from Britain. We will focus on the two first columns for the moment. The first one lists the components of household equivalised disposable income (person-weighted), which is the ultimate variable we want to study. That is the household income after taxes and transfers, adjusted for household size in order to reflect the true standard of living and weighted by the number of persons in each household. Based on such a definition of income, what will be compared across countries can be interpreted as the inequality of individual income after intra-household transfers, assuming that all members of a household have equal access to the total household income, an assumption that may not always be verified in reality. The second column identifies the key variables influencing the distribution of each component. The following paragraphs briefly discuss their importance in light of the findings of Kwon (1997) and Jacobs (1998).

Table 1: Main factors influencing income distribution

Structure of household disposable income	Key factors influencing the income distribution	Inequality decomposition
1. Distribution of earnings between individuals who work	- Stratified vs. flexible labour market	- by income source (wages and self-employment income) - "within-group" inequality of all decompositions by population groups
2. Distribution of work between individuals	- Demography (age structure) - Unemployment level - Labour participation of elderly - Labour participation of women - Labour participation of youths	- by age - by earning status
3. Distribution of working individuals between households	- Co-residence patterns of elderly - Co-residence patterns of youth - Proportion of single parent-families	- by family type - by family type and age - by family type and number of earners
⇒ 4. Distribution of earnings between households		
5. Distribution of property income between households	- Propensity to save by income groups	- by income source (property income)
⇒ 6. Distribution of market income between households		
7. Distribution of public transfers between households	- Social security coverage - Maturity of old age pensions - Contributory vs. non-contributory benefits - Actuarially fair insurance vs. vertical redistribution - Family vs. household means-test for public assistance - Lump-sum vs. annuities and horizontal redistribution of pensions - Funded vs. pay-as-you-go systems and intergenerational redistribution of pensions - Replacement rates of pensions - Duration of unemployment benefits - Lack of family/children benefits - Level of user fees for education	- by income source (public transfers)
8. Distribution of private transfers between households	- Importance of family ties - Importance of community welfare	- by income source (private transfers)
⇒ 9. Distribution of gross income between households		
10. Distribution of direct taxes and social security contr. between households	- Progressivity of income tax, share of taxes in GDP	- by income source (taxes and social security contributions)
⇒ 11. Distribution of disposable income between households		

Distribution of earnings: East Asian countries have "stratified" labour markets, as opposed to the "flexible" labour markets in the United Kingdom and the United States or the "rigid" labour markets of continental European countries.[6] In a stratified labour market, "core workers" enjoy the privilege of a rigid manpower management (e.g., lifetime employment, earnings rising with seniority, firm-based unions), although extensive flexibility exists within firms (e.g., overtime, relocation). "Contingent workers" (i.e., part-time and/or temporary workers, small firms' workers) are managed with more flexibility. There is a relatively high degree of equality among workers of the same status, but relatively high inequality between workers of different status (see Tachibanaki, 1996).

Distribution of work between individuals: It is one thing to compare how earnings are distributed between earners, but another to compare the proportion of people who actually earn anything at all. The key variable here is the total dependency rate, which is the proportion of non-workers divided by the total population (see Table 2). Korea and Taiwan have a younger population than Britain or any other Western industrialised countries. This pushes their total dependency rate down. All three Asian countries also had lower unemployment rates, until last year at least in the case of Korea, which has the same effect. On the other hand, their patterns of labour participation have an ambiguous influence: proportionally more old people have a job in the Asian countries than in most industrialised countries, but relatively fewer women and youths (except if compared to France).

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6   These are of course stylised models: there is as much difference if not more between, for instance, Korea and Japan as between the United Kingdom and the United States. Note that the concept of stratified labour market applies less well to Taiwan, where there are few large conglomerates but a wide network of small family-oriented firms. The corporate cultures of the big Korean conglomerates also differ significantly from those of Japanese firms, leaving more room for flexibility, and labour unions are more militant and not always firm-based (see Chang and Chang, 1994). On the other hand, the Korean labour market as a whole is actually more stratified than the Japanese one, with a higher proportion of contingent workers such as employees of small firms, daily labourers and petty self-employed.

Table 2: Total dependency rate and its components (1995)

	Japan	Korea[c]	Taiwan[c]	France	Germany	United Kingdom	United States
Active population rate[a] (% total pop.)	72.8	75.1	69.5	65.8	67.8	63.8	65.2
Labour participation rates (% active pop.)							
- of women 15-65	60.2	53.9	50.4	47.9	63.0	67.8	68.7
- of elderly 65 +	23.9	42.2[d]	8.8	1.4	2.5	5.0	10.7
- of youths 15-25	48.2	36.5[e]	33.9	39.6	50.9	71.0	56.6
- total (male+female, >15)	72.9	62.0	62.4	68.3	72.5	77.4	76.5
Unemployment rate (ILO def.)	3.2	2.0	1.6	11.6	12.9	10.3	6.9
Total dependency rate[b]	48.6	54.4	57.8	60.2	57.8	55.7	53.5

Source: Statistics Bureau (1997), National Statistics Office (1997), Directorate General of Budget, Accounting and Statistics (1997a), International Labour Organisation (1997).
Notes: a. People aged 15-65 plus people over 65 who are employed. b. One minus ratio of those employed over total population. c. 1996. d. Elderly = over 60 instead of 65. e. 1995.

Distribution of working individuals between households: Shinkawa and Pempel (1996) point out that the enduring customs of elderly people living with their children, young people living with their parents until marriage and the relatively low rates of divorce are all factors that foster the potential for income redistribution within the family cell (again, assuming that every household member has access to household income). Smeeding and Sanders (1998) have also highlighted the importance of co-residence patterns as a safety-net for the elderly in Taiwan compared to some OECD countries. The distribution of work between households may indeed be an important factor in understanding income inequality in East Asia, particularly when compared with Britain. In Japan, Korea and Taiwan, there are few households without any working member, and also relatively few households with two "core workers". This contrasts with the British situation, where the proportion of workless households is high. The Asian countries' co-residence patterns nicely combine with their labour participation and individual earnings inequality patterns to produce low inequality of household disposable income. There is typically one and

only one middle-aged male earner per household, and middle-aged men are the category of people who are most likely to be employed at all, and if employed, they are also most likely to be core workers.

Distribution of property income: One might expect property income to be more equally distributed in the Asian countries, because even people who are not well off are induced to save in the absence of a strong social welfare system.

Distribution of public transfers: Kwon (1997) showed that public transfers do not change the distribution of income at all in Korea, and not much in Japan. Jacobs (1998) has suggested a number of reasons explaining this phenomenon, which is expected in Taiwan as well.[7] The following features of their social security programmes can indeed explain both why public transfers are so low and why they are less progressively distributed (i.e., why the poor get a smaller share of the benefits):

➢ *Coverage of social security*: In Korea, only about two thirds of the population is covered by an old age and disability insurance scheme and by unemployment insurance (health care coverage is universal). Coverage in Taiwan is much better, although not quite universal either, especially for unemployment. In Japan, social security coverage is universal.

➢ *Maturity of old age pensions*: The Korean National Pension Programme (NPP) was set up in 1988 and it requires 20 years of contributions to be entitled to a full pension. This means that the current generation of retirees does not have a sufficient pension even if they are insured. The Taiwanese Labour Insurance (LI) and Government Employees Insurance (GEI) schemes are mature. However, the new National Insurance Programme (NPI) that is expected to be adopted in 2000 will have a similar maturation period of at least 10 years (40 years for a full pension). Some Japanese pension schemes are not fully matured yet either.

➢ *Contributory vs. non-contributory benefits*: The whole social security systems of Japan, Korea and Taiwan are contribution-based, except for a few old age allowances in Taiwan (scheduled to be replaced by the NPI) and child benefits in Japan. People who do not work or who have only a "contingent" job that does not entitle them to

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7   For a good discussion of welfare programs in East Asia, see Goodman, White and Kwon (1998).

social security are only entitled to public assistance in case of need, which is not generous.

➢ *Actuarially fair insurance vs. vertical redistribution*: Most income replacement schemes in the three countries are actuarially fair, which means that the insured's expected benefits are more or less equal to their contributions. Generally, both contributions and benefits are proportional to current or past earnings.[8] Korea's NPP is an important exception, however, with an explicit redistribution component in it (but little redistribution takes place now since the scheme is not mature). In other words, income replacement schemes generate redistribution between people of the same income class who face different levels of risks (e.g., from a retiree who dies at 65 to a retiree who dies at 90) but less between people of different income classes.

➢ *Family vs. household means test for public assistance*: The civil laws of Japan, Korea and Taiwan require people to support their family members, including not only children and spouse but also parents and siblings, whether they live together or not. This limits greatly the scope of public assistance programmes.

➢ *Lump-sum vs. annuities and horizontal redistribution of pensions*: Taiwanese pensions under the existing LI and GEI schemes are lump-sum grants, not annuities. This limits the protection of people who live to become very old. In Korea, the NPP will disburse only lump-sum grants to people who contribute for less than 20 years (e.g., including all the workers who retire before 2008). This matters a great deal in terms of our analysis, since lump-sum grants are generally not recorded as income but as capital gains.

➢ *Funded vs. pay-as-you-go systems and intergenerational redistribution of pensions*: The social security systems of the three countries also limit the degree of intergenerational redistribution. In Korea and Taiwan, pension schemes are funded, but they offer fixed benefits and the NPP will actually run into deficit and collapse if the entitlement formula is not changed or the contributions are not raised. In Japan, many occupational pensions are still lump-sum grants as well, notably due to tax incentives (but the National Pension Funds offer annuities).

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8   Japan's first-tier pension (the National Insurance) and the planned NPI of Taiwan will on the contrary have both flat contributions and flat benefits (which does not generate vertical redistribution either).

> ➢ *Replacement rates of pensions*: Besides government officers and the military, all Taiwanese workers receive only very low retirement benefits under the existing LI scheme. This will change if the government implements the NPI (but only slowly due to the maturation period). In Korea, the NPP will offer a good replacement rate, but it is still very low since full pensions are not paid yet.
> ➢ *Duration of unemployment benefits*: Unemployment benefits are not generous in any of the three countries, not so much in their replacement rates but in their short duration.
> ➢ *Lack of family benefits*: Neither Korea nor Taiwan has a child benefit scheme.

Distribution of private transfers: Kwon (1997) has highlighted the important redistribution role of transfers between households in Korea, but not in Japan.

Distribution of taxes and social security contributions: Kwon (1997) has also shown that taxes and social security contributions induce more income redistribution in Japan and Korea than public transfers. However, they represent a very low proportion of income and are less progressive than in Britain.

4. First findings, including Japan

Before going through the decomposition analysis, which has not been carried out for Japan due to the difficulty in accessing appropriate micro-data, this section presents synthetic inequality measures for all four countries. These results give preliminary support to the hypotheses advanced in the previous section.

Tables 3a-3d show the shares of each income source received by decile and quintile groups of each country's population ranked by equivalised disposable income (person weighted). They also include each income source's Gini coefficient, as well as its share of gross income. The following findings can be highlighted:

1. Income inequality is highest in Britain, then in Japan, Taiwan and Korea. This corresponds to the ranking of Table 1, which is reassuring, although the numbers vary slightly due to different methodologies and years of measurement.

2.   The gap between Britain and the three Asian countries can be traced back to the distribution of household earnings, for which the differences in Gini coefficients and quintile shares are very large. In terms of Table 1, this means that the main factors explaining the different income distributions between Britain and the Asian countries must be found at rows 1 to 3, which together generate the distribution of household earnings. The decomposition analysis will allow us to learn more about the relative importance of these factors.

3.   Public transfers decrease income inequality much more in Britain than in the three Asian countries. First, their share of gross income is much more important: 16% in Britain against 8% in Japan, 5% in Taiwan and only 1% in Korea. Second, transfers are better targeted at the poor in the United Kingdom, where the first and especially second quintiles get much more than 20% of the total, while higher quintile groups get increasingly less. The situation in the other countries is very different. In Japan, each quintile group receives roughly an equal share of public transfers, which reflects the lack of vertical redistribution mechanisms in the Japanese social security system discussed in the previous section. Taiwan's results are relatively similar. In Korea, the poorest quintile groups receive an even lower proportion of public transfers. In fact, very few households receive any benefit at all in the Korean sample, and those who do are likely to be either dependent on means-tested benefits, or relatively well-off pensioners such as retired civil servants.

4.   Private transfers between households are an important source of income in both Korea and Taiwan, but not in Britain and Japan. In the former two countries, they are also concentrated in the poorest and richest quintiles. This is probably due to two different kinds of intergenerational transfers: from young working adults to their retired parents within poor families, and from about-to-retire people to their children within wealthy families.

5.   Like public transfers, taxes and social security contributions are much more important in Britain, followed by Japan, Taiwan and Korea. Unlike public transfers, however, they are progressively distributed in the Asian countries, although still not as sharply as in Britain. This confirms the finding of Nishizaki et al. (1997) that taxes are much more effective in curbing inequality in Japan than are cash benefits.

Table 3a: United Kingdom (1995)

Income sources [a]	% of gross income [b]	Gini coefficient [a]	Quantiles shares, % (individuals ranked by household equiv. disp. income)						
			D1	Q1	Q2	Q3	Q4	Q5	D10
Household earnings	70.6%	0.563	0.8	2.0	6.2	16.0	26.5	49.4	30.2
Property income	5.0%	0.888	2.3	4.4	6.7	12.7	16.6	59.6	45.5
Market income	75.5%	0.547	0.8	2.1	6.2	15.8	26.0	49.9	30.9
Public transfers	16.2%	0.563	11.2	28.5	31.7	19.3	12.5	8.0	3.8
Enterprise transfers	7.7%	0.896	1.4	4.2	14.2	20.2	24.6	36.8	24.2
Private transfers	0.6%	0.951	4.9	10.0	16.3	16.7	20.3	36.8	24.3
Gross income	100.0%	0.386	2.4	6.0	10.3	16.6	24.0	43.2	26.7
Taxes and SS contributions	25.9%	0.572	2.0	3.4	6.3	16.0	26.3	48.1	28.6
Disposable income	74.2%	0.344	2.7	7.1	11.8	16.8	23.1	41.3	26.0

Source : See annex 1.
Notes : a. Equivalised, person-weighted ; b. non-equivalised, household weighted.

Table 3b: Japan (1992)

Income sources [a]	% of gross income [b]	Gini coefficient [a]	Quantiles shares, % (individuals ranked by household equiv. disp. income)						
			D1	Q1	Q2	Q3	Q4	Q5	D10
Household earnings	87.7%	..	2.0	6.2	12.6	17.5	23.9	39.9	24.2
Property income	3.0%	..	1.3	3.7	4.1	9.0	13.3	69.9	55.7
Market income	90.7%	0.375	2.2	6.3	12.1	16.8	23.1	41.6	26.2
Public transfers	8.3%	..	8.6	18.9	20.1	20.5	20.5	20.1	11.2
Enterprise transfers	1.0%	..	0.5	1.1	1.6	3.3	3.8	90.2	86.3
Private transfers	..	..	..	..	..	..	..	..	..
Gross income	100.0%	..	2.8	7.4	12.8	17.1	22.9	39.9	25.0
Taxes and SS contributions	16.8%	..	3.6	7.2	10.5	15.0	22.0	45.2	29.7
Disposable income	83.2%	0.311	2.6	7.4	13.2	17.5	23.0	38.8	24.1

Source : See annex 1.
Notes : a. Equivalised, person-weighted ; b. non-equivalised, household weighted.

Table 3c: Korea (1996)

Income sources [a]	% of gross income [b]	Gini coefficient [a]	Quantiles shares, % (individuals ranked by household equiv. disp. income)						
			D1	Q1	Q2	Q3	Q4	Q5	D10
Household earnings	89.9%	0.307	2.8	8.0	14.3	18.4	23.2	36.2	21.5
Property income	5.1%	0.908	5.4	9.4	9.0	11.3	17.7	52.6	40.5
Market income	95.0%	0.304	2.9	8.1	14.0	18.0	22.9	37.0	22.4
Public transfers	0.8%	0.987	10.7	16.5	12.4	15.6	25.8	29.8	18.8
Enterprise transfers	..	..	..	..	..	..	..	..	..
Private transfers	4.2%	0.927	18.6	29.0	13.7	12.5	16.5	28.3	18.4
Gross income	100.0%	0.278	3.5	8.9	14.0	17.8	22.7	36.6	22.2
Taxes and SS contributions	4.3%	0.612	9.0	13.8	13.0	17.3	21.0	35.0	21.3
Disposable income	95.7%	0.277	3.4	8.8	14.0	17.8	22.7	36.7	22.3

Source : See annex 1.
Notes : a. Equivalised, person-weighted ; b. non-equivalised, household weighted.

Table 3d: Taiwan (1995)

Income sources [a]	% of gross income [b]	Gini coefficient [a]	Quantiles shares, % (individuals ranked by household equiv. disp. income)						
			D1	Q1	Q2	Q3	Q4	Q5	D10
Household earnings	82.9%	0.312	3.0	8.0	13.5	17.6	23.1	37.8	22.9
Property income	6.8%	0.703	3.2	7.0	9.2	12.6	19.0	52.2	35.6
Market income	89.7%	0.313	3.0	8.0	13.2	17.3	22.9	38.7	23.8
Public transfers	5.4%	0.379	11.9	21.3	18.1	18.6	18.6	23.3	12.9
Enterprise transfers	..	..	..	..	..	..	..	..	..
Private transfers	4.8%	0.747	15.2	24.3	16.1	16.9	18.1	24.6	13.3
Gross income	100.0%	0.282	3.8	9.2	13.6	17.3	22.5	37.5	22.9
Taxes and SS contributions	6.6%	0.425	2.9	7.7	12.8	17.1	23.1	39.3	24.1
Disposable income	93.4%	0.278	3.9	9.3	13.6	17.3	22.4	37.3	22.8

Source : See annex 1.
Notes : a. Equivalised, person-weighted ; b. non-equivalised, household weighted.

To sum up, public transfers do a great deal to reduce the huge gaps in market income inequality that exist between Britain and the three Asian countries, but the latter do still have a more equal distribution of disposable income.

5.   Methodology: decomposition analysis

The decomposition analysis by population groups consists of dividing the sampled population into groups and separating the proportion of total income inequality that can be attributed to differences between group means from the "left-over" or "within group" inequality, which is a weighted average of the inequality existing within each group. Dividing the population by age groups, for instance, allows us to quantify the effect of a country's age structure on income inequality, by calculating the percentage of an inequality index that is due to income differences between young, prime age and elderly people. Differences in inequality can also be analysed by decomposing the difference between the inequality indices of two different populations. One can thus quantify the proportion of the difference in inequality that can be attributed to the difference in age structures between two countries. Moreover, it is possible to isolate the proportion of inequality differences that is due to differences in means of the various groups between the two countries, from the proportion that can be attributed to the differences in their population shares. In other words, one can determine how much inequality difference can be explained by age, but also whether the age effect is mainly due to the different proportion of elderly people, or rather to the fact that elderly people tend to be richer, relative to their population average, in one country than in the other.

Similarly, the decomposition analysis by income sources consists of calculating the proportion of total inequality that can be attributed to different income sources, such as earnings, property income, public and private transfers and taxes. This proportion is a function of the income source's own inequality index, of its share of disposable income and of its correlation with disposable income.

A decomposition analysis can be carried out with many different inequality measures. The choice of a particular measure is partly dictated by their mathematical properties (e.g., the Gini coefficient is not appropriate), partly a value judgement (as to giving more weight to

income differences at the bottom or at the top of the income distribution), and partly arbitrary. See Cowell (1997) for a comprehensive discussion of this issue. Those used here are those that have become predominant in the literature: the mean logarithmic deviation (MLD) for the decomposition by population groups, and the squared coefficient of variation (SCV) for the decomposition by income sources:

$$MLD = \frac{1}{n} \sum_i \log \left[\frac{\mu}{y_i} \right]$$

$$SCV = \frac{1}{2n} \sum_i \left[\frac{y_i}{\mu} \right]^2 - 1$$

Different inequality indices do not always produce the same inequality ranking of countries. In this case, MLD and SCV indices yield a ranking consistent with the Gini coefficients of the previous sections, except that Taiwan's income distribution appears as more equal than that of Korea according to MLD and SCV, although their Gini coefficients are almost the same (see Table 4). It is also important to keep in mind that due to their different cardinal properties, those measures do not yield the same percentage changes between countries. The absolute percentages are therefore meaningless.[9] In the next section, percentages are used only to compare the relative magnitude of different changes.

The decomposition formulae of the MLD and SCV were first developed by Mookherjee and Shorrocks (1982) and Shorrocks (1982a and 1982b) and are presented in annex 2. Here they are applied in the same way as Jenkins (1995) who made a comprehensive analysis of the evolution of income inequality in Britain, except that they are used for a cross-section analysis between different countries instead of a time-series analysis of a single country.

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9   By analogy, if it is 20°c in one room and 10°c in another, it does not make a lot of sense to say that the temperature is 200% higher in the former, because that would not be the case if Fahrenheit degrees were used instead of Celsius.

Table 4: Different inequality measures and their differences

	Gini	MLD	SCV [a]
Britain	0.344	0.253	0.301
Korea	0.277	0.147	0.218
Taiwan	0.278	0.127	0.173
Differences			
Britain – Taiwan	23.7%	98.8%	74.5%
Britain – Korea	24.1%	72.0%	38.5%
Korea – Taiwan	-0.3%	15.5%	26.0%

Source: See annexes.
Note: a. No bottom coding for negative income.

Besides the choice of inequality measures, it is important to define the population groups carefully, in order to highlight the different factors that are thought to influence the difference in inequality between two countries. The population groups and/or income sources that are relevant to the factors identified in section 3 are listed in the third column of Table 1 and will be discussed in the next section.

6.   Results from the decomposition analysis

The analysis of quintile shares of the different income sources confirmed that the relatively low inequality in Japan, Korea and Taiwan is due to their favourable distribution of household earnings. We can now investigate which of the main variables identified in Table 1 are the most important in producing this result, in the cases of Korea and Taiwan (the data for Japan being unavailable). We have seen that the distribution of household earnings is the product not only of the distribution of individual earnings, but also of the proportion of the population who works and of the extent to which people without work cohabit with people who work. The latter two factors (rows 2 and 3 of Table 1) are examined in the following sub-section, using decompositions by population groups. Inequality of individual earnings (row 1) is analysed in the second sub-section, based on both population group and income source decompositions. The last sub-section is devoted to the role of the other income sources (rows 4 to 11), using decompositions by income sources only.

(a)   Distribution of work between individuals and households

Tables 5 and 6 summarise the findings of the decomposition by population groups. For each decomposition, Table 5 provides the countries' total inequality indices (MLD) and the part that can be attributed to within- and between-group inequality (see formula 1 in annex 2). Table 6 gives the difference in MLD for each pair of countries, as well as the part of this difference that can be explained by within-group inequality, by the groups' population shares and by their mean income relative to the population's mean income (see formula 2 in annex 2).

Let us first examine the importance of the countries' different age structures on their inequality level (first key variable of the second row in Table 1). The relevant way to decompose the population is of course by age.[10] Note however, that the decomposition has been done at the individual level, not household level. Similar studies usually assign all individuals of the same household to the same group, taking the characteristics of the household head (or sometimes spouse). Here on the contrary, individuals of the same household appear in different groups, all with the same amount of equivalised household income. This is necessary because the co-residence patterns between different generations are precisely one of the variables of interest.

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10   The choice of cut-off ages defining the groups may seem odd, but it is imposed by the way the age variable is defined in the Korean data set. It is particularly disappointing that there is no specific group for the very old. Nevertheless, using the British and Taiwanese data reveals that results are very robust whichever age groups are chosen, regardless of their size.

Table 5: Decomposition of inequality index (MLD) by various population groups

Decomposition by :	Country	Total inequality (MLD)	Within-group inequality (% of MLD)	Between-group inequality (% of MLD)
Age	Britain	.253	95	5
	Korea	.147	98	2
	Taiwan	.127	97	3
Family type	Britain	.253	92	8
	Korea	.147	99	1
	Taiwan	.127	99	1
Age & family type	Britain	.253	88	12
	Korea	.147	96	4
	Taiwan	.127	96	4
Earning status	Britain	.253	86	14
	Korea	.147	..	..
	Taiwan	.127	97	3
Family type & number of earners	Britain	.253	74	26
	Korea	.147	93	7
	Taiwan	.127	96	4

Sources: See annexes.
Note: Age groups = 0-13, 14-19, 20-29, 30-39, 40-49, 50-59, 60+. Family type groups = single adult, single adult w/ children, couple, couple w/ children, others (at least 3 adults). Age & family type groups: family type groups combined with 3 age categories (0-29, 30-59, 60+). Earning status groups = employed full-time and positive earnings, employed less than 35 hours and positive earnings, unemployed, out of labour force or employed but earnings equal to 0. Family type & number of earners groups: Family type groups combined with 3 categories of number of earners in household (household with no earning/ households with positive earnings and both spouses working/ other households with positive earnings).

From Table 5, we see that the proportion of total inequality accounted for by differences between age groups is very low in all three countries (less or equal to 5%). Inequality is much more prevalent between individuals of the same age category than between the means of different age groups. In other words, age does not explain much of the observed income inequality in any of the three countries. But what is of greater interest is whether age is a good variable to explain the difference in inequality between countries. Table 6 shows that age can

explain a significant proportion of the difference in inequality between Korea and Taiwan. The population share coefficient is negative, which means that the lower proportion of aged people in Korea tends to push inequality down compared to Taiwan. Yet inequality within age groups is higher enough in Korea that overall inequality is lower in Taiwan, hence a within-group coefficient greater than 100%. On the other hand, age can explain only about 7% of the difference in income inequality between Britain and Taiwan, and 13% between Britain and Korea. Moreover, as far as Taiwan and Britain are concerned, age matters not so much because there are fewer old people in Taiwan, but because the Taiwanese elderly tend to be less poor compared to the Taiwanese average than are the British elderly compared to the British average (compare the coefficients of mean incomes and population shares in Table 6).

Table 6: Decomposition of the differences in inequality index (MLD) by population groups

Decomposition by :	Countries	Differences in MLD (%)	Differences in MLD due to (% of differences in MLD)		
			within groups	groups' population shares	groups' mean incomes
Age	Britain – Taiwan	98.8	93.2	0.7	6.0
	Britain – Korea	72.0	87.3	8.5	4.1
	Korea – Taiwan	15.5	126.3	-32.4	6.1
Family type	Britain – Taiwan	98.8	63.8	10.2	26.0
	Britain – Korea	72.0	63.6	16.4	20.1
	Korea – Taiwan	15.5	64.9	21.1	14.0
Age & family type	Britain – Taiwan	98.8	65.3	9.6	25.0
	Britain – Korea	72.0	57.3	38.0	4.8
	Korea – Taiwan	15.5	81.7	-0.3	18.6
Earning status	Britain – Taiwan	98.8	73.4	-3.0	29.6
	Britain – Korea	72.0	..	..	..
	Korea – Taiwan	15.5	..	..	..
Family type & number of earners	Britain – Taiwan	98.8	23.7	55.6	20.7
	Britain – Korea	72.0	-21.3	116.0	5.3
	Korea – Taiwan	15.5	62.2	11.5	26.3

Sources: See annexes.
Note: Groups' definitions: see Table 5.

This can be seen in more detail in Table 7, where both income means and population shares are reported for each age group, as well as the groups' inequality indices MLD. First, Britain has a much larger proportion of over-60s than Taiwan and especially Korea. Second, the mean income of the old Taiwanese is not as far off its population mean as it is in Britain. Third, it is also interesting to see that income inequality is more prevalent among the middle-aged generations in Britain, but among the older generations in Taiwan and Korea (even in absolute terms, there is more inequality among the over-60s in Korea and Taiwan than in Britain). This is certainly due to the equalising effect of public pensions in Britain. By contrast, not only do pensions hardly exist in Korea and Taiwan, but inequality among old people in those countries is also boosted by their different living arrangements: lone elderly or elderly couples do not enjoy income transfers from other household members who work.

This suggests that demography does not matter so much on its own, but only in combination with co-residence patterns (see row 2 of Table 1). It is then useful to make a decomposition with groups defined both by age and family type. Focusing first on the decomposition by family type only, it is clear that single people and single adults with children, the two disadvantaged family types, are both more prevalent in Britain and relatively worse off (see Table A2 in annex 3, the equivalent to Table 7 for the decomposition by family types). Both elements contribute to a large explanatory power of the decomposition by family type (i.e., a low proportion of within-group inequality). As to the decomposition by both family types and age, we see in Table 6 that it has a higher explanatory power than age alone (i.e., a lower proportion of within-group inequality). On the other hand, in the case of Britain compared to Taiwan, this decomposition has actually a slightly higher proportion of within group inequality than the decomposition by family type alone. That reinforces the conclusion that demography cannot account for the lower inequality in Taiwan, but that co-residence patterns are much more important. In fact, adding age to family type does not provide more explanatory power because both countries have the same proportion of old people among single people, which is the poorest family type (with single parents, but there are no single parents over 60 in the samples of the three countries). Table A3 also reveals that poverty

in Korea is very much concentrated on the old single people.[11] Although there are more elderly people in Korea than in Taiwan, both countries have about the same proportion of old singles. Moreover, the old singles in Korea are relatively much worse off than their counterparts in Taiwan. That explains the high income-mean coefficient and the nil population shares coefficient for the age-and-family decomposition between Korea and Taiwan. It also explains why the proportion of within-group inequality of the age-and-family decomposition between Korea and Taiwan is so much smaller than that of the decomposition by age only.

Besides demography (or age structure), the other variables influencing the distribution of work across individuals that were identified in section 3 were unemployment and the labour participation patterns of the elderly, the youth and women. Their combined effect can be measured with a decomposition by earning status (i.e., employed full time, part time, unemployed and out-of-labour force). Unfortunately, that decomposition cannot be carried out for Korea due to the absence of individual income variables in the survey. Focusing on Britain and Taiwan, we can first note that there is a significant degree of inequality between earning status groups in Britain (14%), but not in Taiwan (see Table 5). Earning status also explains a substantial part (26.6%) of the difference between Britain and Taiwan's MLD (Table 6). However, just like in the case of age, it is not because there are more working people in Taiwan (there are actually proportionally slightly fewer of them, hence a negative sign for the population share coefficient), but because people who are out of work are relatively better off in Taiwan than in Britain. Table A4 provides more details. There are only slightly more unemployed people in the British sample than in the Taiwanese one (the difference in the underlying total population was in fact higher in 1995-96, according to Table 2). But this is compensated by higher participation rates in Britain (especially for women and the youths, but not for the elderly). On the other hand, it is very apparent from Table A4 that the income gap between earners and non-earners is much wider in Britain than in Taiwan.

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11   On poverty among the old elderly and the failure of "Confucian welfare", see Kwon (1999).

Table 7: Inequality indices MLD, population shares and income means by age groups

Persons aged	Population shares	Mean incomes (£ pa) [a]	MLD
Britain			
all ages	100.0	10,331	.253
0-13	20.3	8,653	.239
14-19	7.2	10,249	.207
20-29	13.4	11,030	.256
30-39	15.4	11,122	.264
40-49	13.6	12,659	.275
50-59	10.6	12,120	.331
>60	19.5	8,414	.157
Korea			
all ages	100.0	10,141	.147
0-13	22.8	9,642	.128
14-19	10.2	10,264	.142
20-29	17.1	10,348	.116
30-39	20.1	10,401	.130
40-49	13.2	11,035	.135
50-59	8.5	10,894	.175
>60	8.1	8,070	.270
Taiwan			
all ages	100.0	9,359	.127
0-13	22.8	8,895	.120
14-19	11.6	8,898	.111
20-29	13.2	10,168	.99
30-39	17.3	9,736	.121
40-49	13.7	10,056	.130
50-59	8.8	10,232	.136
>60	12.5	7,876	.158

Sources: See annexes.
Notes: Equivalised household disposable income; not adjusted for purchasing power parity.

The previous decomposition focused on the total proportion of workers in both countries (row 2 of Table 1). But we also discussed the importance of the distribution of workers between households (row 3).

The right decomposition to capture that effect is to combine family type with the number of earners in the household.[12] The results are very interesting. From Table 5, we see that this is the decomposition that yields the highest proportion of between-group inequality for all three countries. Nevertheless, it still remains very small in Taiwan (4%) and to a lesser extent Korea (7%). The details provided in Table A5 reveal that there actually is a large income gap between people living in households with and without earners in those two countries as well, but those gaps do not translate in high between-group coefficients because there are very few people living in households without earner: as little as 2.9% in Taiwan and 4.1% in Korea, compared to 30.6% in Britain. The low figures in the Asian countries are of course related to the co-residence patterns of the youths and the elderly, who tend to stay with working-age adults when they retire, or until they start their own careers. This explains why the within-group coefficient for the difference in inequality between Britain and Taiwan and Britain and Korea is so low (see Table 6). It is even negative in the latter case. It means that there is actually more inequality within groups having the same number of earners and similar family type in Korea than in Britain. This suggests that the underlying income inequality between individuals is actually higher in Korea (row 1 in Table 1), but that the favourable Korean co-residence patterns do more than compensate this market-based inequality.

Table 6 also reveals that the key variable in the Korea-Britain case is really the proportion of people living in households without earners, while the difference in income gaps between people living in households with and without earners matters little. In contrast, all three variables matter in the comparison of Britain with Taiwan: there is still a

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12   Due to the limitations of the Korean data set, the variable "number of earners" used here is imperfect. First, a zero-earner household is a household that has £0 of earning. That is relatively uncontroversial, but remember that the British data set contains only weekly earnings data, although they are supposed to reflect "normal" earnings, not the actual earnings received in the week of survey. There is actually a large proportion of people (5.5% of the whole sample) who are recorded as having an occupation but who live in households with no earnings. That may be due to temporary lapses in employment. Second, a one-earner household is a household with positive earnings and either the household head or spouse having an occupation. This might include households with other members occupied as well. Finally, a two-or-more-earner household is a household with positive earnings and both household head and spouse having an occupation, plus possibly other household members.

significant within-group coefficient, suggesting that even the pure inequality between individuals is lower in Taiwan, there is an important population share coefficient, reflecting the very low proportion of no-earner households in Taiwan, and there is also a substantial income mean coefficient, meaning that Taiwanese workless households are relatively better-off than their British counterparts. The latter result is a bit surprising. Given the weak social security system in Taiwan, one would expect the old singles to be worse off there than in Britain. Table A5 confirms that they are, but the positive and high income mean coefficient is due to two other groups of workless households who are very poor in Britain (in equivalised terms): single parent families and couples with children.

(b)   Distribution of earnings between individuals who work
After having explored the importance of the total amount of workers and their distribution between households (row 2 and 3 of Table 1), we can now focus on the "pure" earnings inequality effect, i.e. inequality of earnings among the individuals who actually work (row 1). Among all the factors that bear upon inequality of household disposable income, this is the one that most closely reflects the impact of market forces. There are several ways to get information about this market-driven inequality. The first one is simply to look at the residual or within-group inequality of decompositions by population groups. We have seen in Table 5 that those coefficients are high for all decompositions. This means that none of the variables studied so far (demography, labour participation and co-residence patterns) is very good at explaining the level of inequality in each country. Unless one can find other variables, market-driven earnings inequality appears as the main factor. On the other hand, we have also discussed the fact that co-residence patterns are very good at explaining the differences in inequality between Britain and the two Asian countries, leaving little importance to residual, market-driven inequality. The within-group coefficients of the Britain-Taiwan and Britain-Korea decompositions by family type and number of earners revealed that "pure" earnings inequality is probably slightly lower in Taiwan but actually higher in Korea than in Britain.

A more direct way of grasping the market force effect is to make a decomposition by income sources. As explained in section 5, the inequality measure SCV can be expressed as the sum of each income source's contribution to inequality. An income source's contribution to inequality can in turn be expressed as a function of the income source's

own SCV index, its share of disposable income and its correlation with disposable income (see formula 3 in annex 2). The income source's contribution to inequality can be either positive or negative, and will be highest if the income source's share and own inequality are high, with a positive and high correlation with disposable income. Table 8 presents the values of those three variables. The income sources' shares have also been expressed in terms of gross income, because the level of direct taxes and social security contributions are so different between Britain and the Asian countries that it is hard to compare the relative importance of income sources on the basis of their share of disposable income (gross income is equal to the sum of all income sources except taxes).

To isolate individual earnings, the household earnings variable has been disaggregated into three components. The first and second ones are individual earnings variables, of wages and self-employment income[13] respectively, which have not been equivalised for household size. They are the real pay that each individual brings into the household. The last one, "earnings from other household members", is the difference between total household earnings equivalised for household size and unequivalised individual earnings (wages plus self-employment income). In other words, it represents the implicit income transfer received or paid to other family members. A child or other inactive household member thus has nil wages and self-employment income, but a positive transfer from other members equal to the household's total equivalised earnings. On the other hand, a person who is a household's only earner would have a negative transfer from other household members, equal to the difference between his or her equivalised and non-equivalised earnings (or to zero if the person is single). Unfortunately, earnings data at the individual level are missing for Korea, such that this disaggregation cannot be done for that country.

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13   The Luxembourg Income Study variables do unfortunately not include self-employment income at the individual level. Total self-employment income has therefore been assigned to all household members who are recorded as being self-employed, using weights by age and sex equal to the relative means of wages of each age and sex group.

Table 8: Total inequality indices SCV and their decompositions by income source

	Shares		Correlation with disposable income	SCV
	of gross income	of disposable income		
United Kingdom				
Household earnings	75.5%	102.7%	0.84	0.638
individual wages	38.2%	52.0%	0.36	1.779
ind. self-employ. inc.	7.2%	9.8%	0.43	20.420
earnings of other household members	30.1%	41.0%	0.38	2.722
Property income	9.8%	13.3%	0.35	4.395
Public transfers	14.0%	19.0%	-0.30	0.551
Private transfers	0.7%	1.0%	0.10	37.950
Taxes and SS contr.	-26.5%	-36.0%	0.63	0.775
Disposable income	73.5%	100.0%	1.00	0.301
Taiwan				
Household earnings	85.3%	91.5%	0.94	0.198
individual wages	32.4%	34.7%	0.32	1.658
ind. self-employ. inc.	10.7%	11.4%	0.17	9.119
earnings of other household members	42.2%	45.3%	0.35	1.336
Property income	6.2%	6.7%	0.46	3.992
Public transfers	5.0%	5.3%	0.12	0.698
Private transfers	3.6%	3.8%	0.04	2.901
Taxes and SS contr.	-6.8%	-7.3%	0.64	0.561
Disposable income	93.2%	100.0%	1.00	0.173
Korea				
Household earnings	90.7%	94.9%	0.91	0.240
individual wages	..	..	..	..
ind. self-employ. inc.	..	..	..	..
earnings of other household members	..	..	..	..
Property income	4.9%	5.1%	0.27	8.016
Public transfers	0.7%	0.7%	0.04	43.546
Private transfers	3.7%	3.9%	0.13	12.749
Taxes and SS contr.	-4.3%	-4.5%	0.18	2.397
Disposable income	95.7%	100.0%	1.00	0.218

Sources to Table 8: See annexes.

Earnings are by far the biggest source of income in all countries, and represent as much as 90.7% of gross income in Korea. As expected from the previous discussion on the importance of co-residence patterns, the share of "earnings from other household members" is substantially higher in Taiwan than in Britain, while wages and self-employment income represent about the same share of gross income. On the other hand, the correlation of total household earnings with disposable income is higher in Taiwan and Korea than in Britain, which highlights the role of taxes and benefits in the latter country. However, the correlation of individual earnings (both wages and self-employment income) is higher in Britain, reflecting the importance of transfers within households in Taiwan. Furthermore, the inequality index SCV of total household earnings is highest in Britain, followed by Taiwan, then Korea. But the inequality of individual wages is not much higher in Britain than in Taiwan. This confirms that the "pure" market-driven inequality is only slightly greater in Britain than in Taiwan. However, the inequality of self-employment income is very big in the United Kingdom.

Table 9: Differences in total inequality indices SCV and their decompositions by income source

Income sources	Britain – Taiwan	Britain – Korea	Korea - Taiwan
Household earnings	127.2%	82.8%	22.3%
individual wages	44.6%	..	..
ind. self-employ. inc.	46.2%	..	..
earnings of other household members	36.6%	..	..
Property income	16.0%	16.0%	-4.3%
Public transfers	-14.7%	-11.0%	-0.8%
Private transfers	1.4%	-2.3%	4.3%
Taxes and SS contr.	-55.5%	-47.8%	5.1%
All income sources	74.5%	37.8%	26.6%

Sources: See annexes.

If we now want to analyse exactly how these findings affect the differences in inequalities between countries, we can look at Table 9, calculated from formula 4 in annex 2. We see that if household earnings were the only source of income making a difference in inequality between Britain and Taiwan, inequality in the former country would actually be 127.2% higher (in terms of SCV) than in the latter. But because public transfers play a much more important equalising role in Britain, her total SCV index is only 74.5% higher. It is also clear that earnings are by very far the biggest contributor towards more equality in Taiwan, with only property income having a significant impact in the same direction. The same conclusions can be drawn from the comparison of Britain with Korea. Moreover, all three components of household earnings have a large impact on the difference between Britain and Taiwan: wages and earnings from other household members because they represent a large share of gross disposable income, and self-employment income because they are much more unequally distributed and better correlated with disposable income in the United Kingdom. The contribution of transfers within households is thus by no means the only source of low inequality in Taiwan.

(c)   *Distribution of property income, public and private transfers, and taxes*

Although earnings are the driving force behind the good performance of Taiwan and Korea, it is also worth looking at the other income sources. Property income is very unevenly distributed in all three countries, especially in Korea, but also more in Britain than in Taiwan. Its share is much higher in Britain, mainly due to the addition of occupational pensions that hardly exist in the two Asian countries (in the form of annuities, at least). As a result, it does significantly contribute to the difference in overall inequality between Britain and Taiwan, as well as Britain and Korea.

Private transfers are another item displaying high levels of inequality in all three countries, but particularly in Britain. They appear not to have much impact at all on the differences in inequality between countries. In fact, it is a residual source of income in the United Kingdom, which does not represent a significant share of any household's income. By contrast, its share of gross income is not negligible in Taiwan and Korea. Its correlation with disposable income is positive but very weak in all three countries, meaning that rich households receive them as well as poor households, and even slightly more. This is particularly the case in

Korea, where transfers are very concentrated on the very rich, and slightly less on the very poor, which explains why they contribute to more inequality in Korea compared to both Britain and Taiwan (see also Table 3d).

The two remaining items, taxes and public transfers, are reverse forces that push British income inequality down compared to the two Asian countries. Both the income shares and the correlation coefficients point strongly towards this result. The United Kingdom has much higher public transfers and proportionally even more taxes than the two other countries. They are also better negatively correlated with disposable income. In fact, public transfers have a positive correlation in both Taiwan and Korea, meaning that rich households benefit more of them on average.

We could compare the relative importance of state welfare to that of "family welfare", as defined by the sum of earnings from other households members and private transfers (which are assumed to be essentially intra-family transfers). The share of the so-defined total family transfers would be 30.7% in the United Kingdom, compared to 45.8% in Taiwan. The difference, 15.1 percentage points, is bigger than the gap in public transfers (but of course, such a result is very sensitive to the choice of equivalence scale). The impact of those "family transfers" on their difference in SCV inequality is also much higher than that of public transfers. However, the very high level of taxation in Britain, which allows financing of public services that are in many respects another form of transfer, appear to have an even bigger effect than either family transfers or public transfers.

7.   Conclusions

There is still some confusion about the extent of income inequality in Japan. This article is based on the Income Redistribution Survey, according to which the Japanese income distribution is fairly unequal compared to most industrialised countries, although still slightly more equal than the British one. However, another source, the National Family Income and Expenditure Survey, suggests that incomes might be much more equally distributed. Korea and Taiwan's own respective national family income and expenditure surveys indicate that income inequality is lower in both countries compared to the United Kingdom,

and about average if compared with a larger set of industrialised countries.

The lower inequality of disposable income in Korea and Taiwan can be traced back to the relatively equal distribution of earnings between households. In the case of Taiwan, this can in turn be explained both by the lower dispersion of earnings among those who work and by a favourable distribution of work between households. While the former element can be essentially attributed to market forces, the latter is due to the persistence of multigenerational households and to the relative lack of single households and single parent families. People who are out of work, essentially youths, women and the elderly, are more likely to cohabit with people who are employed in Taiwan than in Britain. This generates income redistribution inside the family cell, at least under the assumption of equal access to household income by each household member (an assumption that is necessary for analytical purposes but not always verified). There are only about 3% of people living in workless households in Taiwan, compared to 30% in Britain. The intra-household redistribution is such that workless people in Taiwan are relatively better-off than the workless British, even though Taiwanese social security is less generous. On the other hand, it appears that demography (i.e., the lower proportion of elderly people), unemployment and labour participation patterns have little impact on the difference in inequality between both countries. The total proportion of workers in the population is actually slightly lower in Taiwan, because more women and young people are active in Britain. Finally, public transfers and taxes play a major role in reducing the gap in inequality between the two countries, both because they are higher and because they are better targeted at the bottom half of the income distribution in Britain.

Co-residence patterns are also crucial to understand the comparison between Britain and Korea. But Korea differs from Taiwan in several respects. The Korean population is even younger than the Taiwanese, and demography does explain part of the difference in inequality between Britain and Korea. There is also a higher proportion of single people among the elderly in Korea than in Taiwan, and they tend to be worse off. Public transfers appear almost non-existent in Korea (probably partly due to measurement errors), while private transfers are concentrated on the very poor but also on the very rich. Moreover, it seems that the underlying market-driven inequality is higher in Korea than in Taiwan, and indeed than in Britain, although the proper data to

isolate that phenomenon are missing. All those factors contribute to more inequality in Korea than in Taiwan (in terms of MLD and SCV indices).

Lower inequality of household earnings is also the main force behind the lower inequality of disposable income of Japan compared to Britain. A precise analysis of the causes of this finding was not possible due to the lack of access to micro-data. But Japan differs from Korea and Taiwan because of its much higher taxes and social security benefits. As in the two other Asian countries, however, Japanese public transfers do not target the poor (except the very poor), due to the prevalence of income-related social security schemes. Consequently, the bulk of the redistribution effort is carried out by the tax system.

To sum up, the higher degree of income redistribution through public transfers in the United Kingdom does not compensate for its higher inequality of earnings between households. One can therefore conclude that, according to the household surveys that have been used here, it is possible to achieve a low degree of income inequality without resorting to higher public taxes and public transfers. The key is to ensure that people who are out of work benefit from private income transfers within the family cell.

From the point of view of Britain and other European countries, this is hardly a recipe for public policy. It is hard for governments to influence co-residence patterns, and whether such policies would be desirable at all is questionable, considering all their potential side effects and other social policy objectives.

From the point of view of the Asian countries, this conclusion is worrying. For the family is weakening as an instrument of income redistribution. The proportion of elderly Japanese living with their children has been falling slowly but steadily since the 1950s, and is expected to reach European levels in two decades (Hirosima, 1995). A similar nuclearisation trend has begun in Korea and Taiwan. Moreover, Kwon (1999) showed that private transfers between related households do not provide sufficient protection against poverty. There are therefore reasons to believe that some of the differences explored in this paper between those countries and the United Kingdom may slowly disappear in the future.

Annex 1: Data

Data sources:
United Kingdom: Family Expenditure Survey (FES), 1995-96 (from Luxembourg Income Study)
Republic of China (Taiwan): Survey of Family Income and Expenditure in Taiwan Area of the Republic of China (SFIE), 1995 (from Luxembourg Income Study)
Republic of Korea: National Family Income and Expenditure Survey (NFIES), 1996
Japan: Fukawa (1999), based on the Income Redistribution Survey, 1993 (data of 1992). Mr. Fukawa of the National Institute for Population and Social Security Research in Tokyo has kindly re-calculated his Tables to make them comparable with those of the other countries.

Sampling:
All data sets are large samples of the national populations. Reliable sampling methods ensure their representativity, with some caveats. The institutional population is not represented in any country (e.g., soldiers living in barracks, jail inmates, and residents of welfare institutions). However, the Japanese survey does include people living in dormitories with more than 30 residents (they are each treated as one-person households). Foreign nationals are excluded from the Japanese, Taiwanese and Korean data. Household members are usually defined as those people who share at least a certain proportion of their personal income and/or expenses. For Korea, only family members are surveyed (i.e., people related by blood or marriage). Households who employ more than one or four live-in domestic employees are also excluded from the samples of, respectively, Korea and Japan, as well as households who run hostels.

More importantly, this type of surveys is usually biased due to non-response and income under-reporting. In the United Kingdom, the response rate decreases with age, and households without children and the self-employed are under-represented.[14] Korea's statistical office corrects its data for non-response, on the basis of partial information given by the sampled households that refuse to co-operate at the time of

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14   See Banks and Johnson (1998).

the initial contact.[15] However, there are serious doubts about the quality of Korean data as well.[16] Possible biases include the under-reporting of in-kind pay, which represents a high proportion of earnings in all East Asian countries, especially for senior employees who earn more. Household surveys also fail to give a proper picture of the concentration of income at the very top, because the very rich families who own Korea's big conglomerates, for instance, are unlikely to be picked in the samples.

One method usually used to assess the relative quality of household income surveys is to assess the extent to which they under-report income compared to national accounts data. Such an analysis has been carried out in detail by Banks and Johnson (1998) for the United Kingdom. It reveals that property income and the earnings of the self-employed are seriously under-reported (by respectively 40% and 26%).

Table A1 presents some rough estimates for Korea and Taiwan. Aggregate disposable income grossed up to total population represents 94% and 91% of their GDP, respectively. This is not bad at all. Not all income sources are well reported, however. As far as Taiwan is concerned, the sum of public and private transfers reported in the survey overshoots the national accounts by a fifth. However, this difference could be entirely explained by different definitions of private transfers (which are actually more important than public ones). As to Korea, self-employment income is over-reported and property income seriously under-reported. This could also be to different methodologies in the assignment of factor incomes in the two sets of data, since the proportion of self-employed is very high in Korea and it is not always easy to differentiate the part of their income that comes from their work or from their capital. If both factors are combined, the coverage rate becomes 95%. Taxes and public transfers are also seriously under-reported. The under-reporting is more pronounced for means-tested benefits (19%) than for social insurance pensions (26%). Part of it is due to the under-representation of welfare households. 2.58% of the people

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15   36% of households are in fact duplicated households "representing" missing responses. Duplicated households are richer than non-duplicated ones, with a higher standard deviation.

16   See for instance Leipziger et al. (1992) and Kwon (1993), although neither of these authors had access to the new household income survey that is used in the present study and was first carried out in 1991.

sampled by the Korean survey are living in households receiving means-tested benefits, compared to 3.14% of the population reported in the Statistical Yearbook of Korea (excluding recipients living in welfare institutions who would not be sampled by the survey). The other part must be due to the fact that about half the expenditures of the main Korean means-tested scheme consist of reimbursement of services (e.g., tuition fees), which might often not be recorded as income at all. As to pensions, the large under-reporting can be partly explained by the fact that all pensions of the immature National Pension Programme and some pensions of the government officers' scheme are paid as lump-sum grants, and would therefore be recorded as capital gains rather than public transfers. Finally, the under-reporting is more pronounced for taxes (47%) than for social security contributions (60%).

Table A1: Aggregate income reported by household surveys as percentage of national accounts data [a]

	Korea	Taiwan
Wages	100	89
Self-employment income	137	92
Property income	33	.. [c]
Public transfers	23	120
Private transfers [b]	43	.. [d]
Gross income	91	91
Taxes & SS contribution	48	97
Disposable income	94	91

Sources: See annexes 1 and 2, OECD (1998), Directorate General of Budget, Accounting and Statistics (1997b).
Notes: a. The aggregation of household survey data is simply the sum of (unequivalised) income of all sampled households weighted by the grossing factor provided by the surveys themselves. b. Comparing aggregate private transfers between national accounts and household surveys is not reliable due to the very different definitions. In particular, OECD national accounts include two items (i.e., "transfers from abroad" and "casualty insurance claims") that have been included in the property income line, part of which might belong to private transfers in the household surveys. c. Combined with self-employment income. d. Combined with public transfers.

Variable definitions:

➢ Earnings: Gross wages and salaries, self-employment income (farm and non-farm).

➢ Property income: Includes interests from savings, rents and dividends. Excludes imputed rents for homeowners and capital gains. For the decomposition by income sources, occupational pensions and income from private insurance schemes is combined with property income.

➢ Public transfers: All public cash benefits to individuals or households (contributory or not, means-tested or not). Excludes social security contributions paid by the state on behalf of individuals (an important form of transfers in Korea and Taiwan).

➢ Private transfers: Transfers between households (e.g. gifts, children income) or from charities.

➢ Enterprise transfers: For Britain and Japan only,[17] they consist of occupational pensions and annuities from insurance companies, including lump-sum severance pay of Japanese companies. Lump-sum pay should normally be regarded as capital receipts, and only the interests earned from it should be added to current income (under property income). Its inclusion therefore introduces a bias: Japanese households with low current income who happen to receive their lump-sum retirement pay during the survey period will be found at the top of the income distribution. Fortunately, transfers from enterprises represent all together only 1% of gross income.

➢ Taxes and social security contributions: Direct taxes including income and property taxes, plus social security contributions paid by employees and the self-employed. For Taiwan, employee social security contributions have been imputed by LIS.

➢ Market income and gross income are just sub-totals, corresponding respectively to the sum of earnings and property income, and to the sum of market income, public and private transfers.

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17 There is no line for occupational pensions and annuities from insurance in the Korean data set, but they probably represent very little amounts since the Korean insurance market is not very developed. Those data exist in the original Taiwanese data set, but they are strangely missing in LIS. Anyway, they represent less than 0.1% of gross income according to the survey's published report.

Period of Measurement:
The most important discrepancy between the three data sets is the period of measurement. In the British data set, only weekly income is available, as opposed to the yearly data of the Japanese IRS, Taiwanese SFIE and the Korean NFIES (except for Korean taxes and social security contributions, for which only monthly data are released).[18] The British weekly data are actual bookkeeping records, while the Japanese, Taiwanese and Korean yearly data are estimates made upon interviews, with the support of the bookkeeping records of two months. This study is thus based on weekly data for the United Kingdom (multiplied by 52) and on yearly data for the two other countries (except for Korean taxes, which are monthly multiplied by 12). Note that income inequality in the United Kingdom can decrease substantially if weekly data are annualised, as is done in Stuttard (1997).

Top and bottom coding:
In the British data set, some households have negative taxes and disposable incomes. They have been set equal to £1. This does not affect the results at all. Nothing was done to standardise the upper income boundaries that are usually set by the survey administrators to protect the anonymity of respondents, but Gottschalk and Smeeding (1997) assert that it does not affect inequality measures in the case of the LIS countries.

Equivalisation scale:
This study uses one of the equivalisation scales proposed by the Luxembourg Income Study. The conclusions are not sensitive at all to small changes in that equivalence scale. For equivalisation, income variables are divided by:

$$1+C*0.3+(H-C-1)*0.4$$

where   C= number of children (under 18) in the household
                       H= total number of people in the household

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18   Both monthly and yearly income data are collected for the Korean NSFIE, but monthly income data are released only for employee households. On the other hand, taxes and social security contributions are considered as expenditures instead of (negative) income, such that they are only available monthly.

Weighting:
Independently of the equivalisation procedure, the weights provided in the data sets to adjust the samples to their underlying population have been multiplied by the number of persons living in each household. This methodology gives a different picture of income inequality, focusing on individuals rather than households. Typically, person-weighted inequality will be lower where poor households tend to be single-person households (e.g., lone elderly people), because their weight is reduced compared to the "normal" households with working adults and children. This is particularly relevant to the discussion about the importance of household structure as a determinant of inequality.

Annex 2: Inequality measures and their decomposition formulae

(1)   Decomposition of inequality index MLD by population groups (Table 5)

$$MLD = \sum_k v_k * MLD_k + \sum_k v_k * \log\left(\frac{1}{\lambda_k}\right)$$

where:

MLD is the mean logarithmic deviation (see formula in section 5)
k is the population group index
μ_k is the mean income of group k
v_k is the population share of group k
$\lambda_k = \mu_k / \mu$

(2)   Decomposition of differences in inequality index MLD by population groups (Table 6)

$$MLD^i - MLD^j = \sum_k \bar{v_k} * (MLD_k^i - MLD_k^j) \qquad \text{within group inequality factor}$$

$$+ \sum_k \overline{MLD}_k * \left(v_k^i - v_k^j\right) \qquad \text{group shares factors}$$

$$- \sum_k \overline{\log \lambda_k} * \left(v_k^i - v_k^i\right)$$

$$- \log\left[1 - \sum_k \lambda_k^i * \left(v_k^i - v_k^j\right)\right]$$

$$+ \log\left[1 + \sum_k \theta_k^j * \left(\mu_k^i - \mu_k^j\right)/\mu_k^j\right] \qquad \text{group means factors}$$

$$- \sum_k \bar{v_k} * \left(\log \mu_k^i - \log \mu_k^j\right)$$

where:
i and j are the two countries
$\theta_k = v_k * \lambda_k$
a bar over a variable is the arithmetic average of that variable for the two countries

for instance, $\bar{v_k} = \left(v_k^i + v_k^j\right)/2$

(3)   Contribution of income sources to inequality index SCV (functions that relate the income sources' SCV indexes to the SCV index of disposable income in Table 8)

$$SCV = \sum_f S_f$$

and

$$S_f = \rho_f * \chi_f * \sqrt{SCV * SCV_f}$$

where:
SCV is the square coefficient of variation (see formula in section 5)
f is the income source index
S_f is the contribution of income source f to the SCV of disposable income
ρ_f is the correlation between income source f and disposable income
χ_f is the share of income source f

(4)   Decomposition of differences in inequality index SCV by income sources (Table 9)

$$SCV^i - SCV^j = \sum_f SCV_f^i - SCV_f^j$$

Annex 3: Results

Table A2: Inequality indices MLD, population shares and income means by household types groups

Household types	group shares (% pop.)	group means (£ pa)	MLD (*1000)
United Kingdom			
all types	100.0	10,331	253
single	10.7	8,185	273
single parent	7.9	5,767	111
couple	27.0	11,982	267
couple and children	37.4	9,844	244
others	17.0	12,255	188
Taiwan			
all types	100.0	9,359	127
single	2.0	7,469	237
single parent	1.4	7,344	140
couple	6.9	8,922	210
couple and children	34.5	9,622	127
others	55.2	9,369	111
Korea			
all types	100.0	10,141	147
single	4.0	8,707	293
single parent	3.5	8,303	196
couple	9.0	10,614	222
couple and children	50.7	10,118	127
others	32.9	10,413	131

Table A3: Inequality indices MLD, population shares and income means by age and household types groups

Groups	group shares (% pop.)	group means (£ pa)	MLD (*1000)
United Kingdom			
all groups	100.0	10,331	253
young single	1.2	9,478	348
mid-aged single	3.6	10,241	449
old single	5.9	6,649	110
young lone parent	6.0	5,565	101
mid-aged lone parent	1.9	6,406	132
young couple	4.2	13,380	199
mid-aged couple	11.2	14,537	333
old couple	11.6	8,993	168
young couple and children	21.8	9,307	243
mid-aged couple and children	15.3	10,626	242
old couple and children	0.2	8,726	188
young others	7.7	12,122	210
mid-aged others	7.5	12,836	180
old others	1.8	10,423	108
Taiwan			
all groups	100.0	9,359	127
young single	0.2	10,426	84
mid-aged single	0.8	9,890	222
old single	1.0	5,161	170
young lone parent	0.9	7,063	132
mid-aged lone parent	0.5	7,864	152
young couple	0.7	11,474	125
mid-aged couple	2.8	10,742	191
old couple	3.4	6,869	191
young couple and children	19.6	9,306	122
mid-aged couple and children	14.4	10,136	130
old couple and children	0.4	6,665	122
young others	26.1	9,214	105
mid-aged others	21.4	9,777	113
old others	7.7	8,756	123

Korea			
all groups	100.0	10,141	147
young single	1.4	10,131	135
mid-aged single	1.5	10,757	223
old single	1.1	4,125	320
young lone parent	2.4	8,182	190
mid-aged lone parent	1.1	8,566	209
young couple	2.8	11,347	107
mid-aged couple	3.9	11,683	207
old couple	2.2	7,790	341
young couple and children	24.0	10,025	128
mid-aged couple and children	26.3	10,257	124
old couple and children	0.4	6,561	171
young others	6.8	9,678	121
mid-aged others	21.9	10,816	125
old others	4.3	9,519	165

Table A4: Inequality indices MLD, population shares and income means by labour force status groups

Labour force status	group shares (% pop.)	group means (£ pa)	MLD (*1000)
United Kingdom			
all status	100.0	10,331	253
employed, full time	30.3	14,413	145
employed, part time	9.7	11,214	183
unemployed	3.9	6,819	249
out of labour force	56.1	8,220	261
Taiwan			
all status	100.0	9,359	127
employed, full time	35.7	10,428	112
employed, part time	3.5	9,193	144
unemployed	2.9	7,719	127
out of labour force	57.9	8,792	129
Korea			
all status	100.0	10,141	147
employed, full time	..	..	..
employed, part time	..	..	..
unemployed	..	..	..
out of labour force	..	..	..

Table A5: Inequality indices MLD, population shares and income means by groups of household types and number of earners by households

Groups	group shares (% pop.)	group means (£ pa)	MLD (*1000)
United Kingdom			
all groups	100.0	10,331	253
single, 1 earner	3.6	12,421	110
single, no earner	7.1	6,053	264
single parent, 1 earner	2.8	7,760	86
single parent, no earner	5.0	4,644	75
couple, 2+ earners	13.8	15,341	193
couple, 1 earner	2.1	12,599	140
couple, no earner	11.1	7,714	257
couple and children, 2+ earners	31.1	10,926	158
couple and children, 1 earner	0.9	7,799	109
couple and children, no earner	5.4	3,942	410
others, 2+ earners	13.9	13,170	153
others, 1 earner	1.2	11,758	149
others, 0 earner	1.9	5,777	223
Taiwan			
all groups	100.0	9,359	127
single, 1 earner	1.3	9,241	181
single, no earner	0.7	4,300	165
single parent, 1 earner	1.3	7,468	137
single parent, no earner	0.1	5,740	148
couple, 2+ earners	4.1	9,898	206
couple, 1 earner	1.5	9,776	134
couple, no earner	1.4	5,216	162
couple and children, 2+ earners	33.0	9,730	123
couple and children, 1 earner	1.2	7,679	99
couple and children, no earner	0.3	5,362	465
others, 2+ earners	44.8	9,463	113
others, 1 earner	10.0	9,106	96
others, 0 earner	0.4	5,235	132

Korea

all groups	100.0	10,141	147
single, 1 earner	3.0	10,073	191
single, no earner	0.9	4,208	382
single parent, 1 earner	2.5	8,551	169
single parent, no earner	0.9	7,620	266
couple, 2+ earners	2.7	13,791	121
couple, 1 earner	5.1	9,965	178
couple, no earner	1.2	6,363	428
couple and children, 2+ earners	20.1	11,431	115
couple and children, 1 earner	30.0	9,320	109
couple and children, no earner	0.6	5,974	931
others, 2+ earners	12.6	11,143	107
others, 1 earner	19.9	10,043	131
others, 0 earner	0.4	6,437	619

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