

1 Data sources and construction

The paper uses data for 19 OECD countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Korea, Netherlands, Norway, Portugal, Spain, Sweden, U.K., U.S., New Zealand. This Appendix provides the data sources.

Time use data

Time use data record activities at regular intervals (e.g. every 15 minutes) during a 24-hour day. For the purposes of this paper we extracted from time use surveys two numbers, time spent on caring for a child or an adult household member, including related travel time, and other home work time.

Home work in time use surveys includes activities that could be delegated but are done by members of the household, either inside or outside the home. The main activities are shopping, house and garden cleaning and maintenance, cooking, laundry, pet care and car care. Travel time is included with the corresponding activities, e.g. travel time to shops is included in shopping. Childcare is a separate item. Caring for others within the household is a separate item, although some surveys at our disposal did not report separately this item. The item is small, accounting for less than 20% of childcare time, and where missing we constructed a series for it from other information, as explained below. Caring for others outside the family was reported separately by a very small number of surveys but we could not get data for it for most countries. Where reported it was a very small item. Most surveys included it with other small activities in “other voluntary work”, a small item that is part of other home production time.

The main data source for the European countries is the *Harmonised European Time Use Survey* (HETUS: <https://www.testh2.scb.se/tus/tus/>). It was the result of a cooperation between a number of national statistical institutes and Eurostat in the 1990s, with the objective to harmonize time use statistics in the European Union. The HETUS covers 9 of our 19 countries around the year 2000. They are Belgium (1998), Finland (1999), France

(1998), Germany (2001), Italy (2002), Norway (2000), Spain (2002), Sweden (2000, age group 20+) and the United Kingdom (2000). Detailed national tables for each country are downloadable from the HETUS website. Each national table reports time use of population by age. We compute the time use for the 15+ category by weighting each group by its population size, using population data from the United Nations, *World Population Prospects* (<http://esa.un.org/unpp/index.asp?panel=2>).

The HETUS does not report explicitly the time taken for caring for household members. We obtained accurate data from the national source used by HETUS for Finland, Germany, Norway, Spain, and the United Kingdom. For the other countries HETUS reports a residual aggregate of “other household work,” which includes caring for others as one of the main items. For Belgium and Italy we used Spain’s ratio of “caring for others” to the HETUS “other household work” to get the time of caring for others from the HETUS residual. For France the HETUS residual was clearly misreported, as it was 1 minute a day for all age groups. We increased France’s childcare time by Spain’s fraction of caring for others to childcare. Finally, for Sweden we used the average decomposition of “other household work” for Norway and Denmark to obtain the time for caring for others from the HETUS aggregate.

For the remaining 10 countries, we use national time use statistics, as follows (in some cases, as indicated below, it was not possible to obtain data for the 15+ category but for a near age group):

Australia: 1997 Time Use Survey conducted by the Australian Bureau of Statistics (ABS). Tables are available from the publication, *How Australians Use Their Time 1997*, available online through <http://www.abs.gov.au/AUSSTATS>.

Canada: *General Social Survey (GSS)* conducted by Statistics Canada in 1998 and available online through <http://www.statcan.gc.ca/>. Adult care is included in a residual “other household work”. We used the US fractions to decompose this item into caring for others and other items.

Denmark: Data are available only in Danish for 2001, age groups 15-74, translated and tabulated for this paper by Jens Bonker of the Rockwool Foundation Research Unit, Copenhagen (to whom we express our thanks).

Ireland: The *Irish National Time-Use Survey 2005* is a pilot survey conducted by Economic and Social Research Institute for the Department of Justices, Equality and Law Reform. We obtained the time use table from the publication, *Time-Use in Ireland 2005: Survey Report*. Age group 18+. (<http://www.ucd.ie/issda/dataset-info/timeuse.htm>)

Japan: The 2001 Survey on *Time Use and Leisure Activities* conducted

by the Statistics Bureau, Ministry of Internal Affairs and Communications. (<http://www.stat.go.jp/english/data/shakai/2001/unpaid/tabu.htm>)

Korea: Data provided for this paper by the Korea Labor Institute, Seoul, following a visit by one of the authors in 2008 (C Pissarides). Data for 1999, age group 10+ (data also available for 2004 with virtually identical results).

Netherlands: Netherlands Institute for Social Research. At the time of writing detailed tables were available online in English but now discontinued. We obtained our aggregates from Burda et al. (2008), age group 20-74.

New Zealand: *Time Use Statistics 1999* prepared by Statistics New Zealand, tables downloaded from: <http://www.stats.govt.nz/>. Only total family care is available (childcare and adult care).

Portugal: *1999 Time Use Survey*, conducted by Instituto Nacional De Estatistica (INE). Table and document (in Portuguese) are downloadable from: <http://www.ine.pt/>

United States: *The American Time Use Survey 2003* by the Bureau of Labor Statistics (<http://www.bls.gov/tus/>).

Hours of work

Sectoral hours were obtained mainly from the database *Productivity in the European Union: A Comparative Industry Approach* (EU KLEMS), <http://www.euklems.net/>, file extension .08I, released March 2008. The following KLEMS sectors are in each one of our sectors:

Sector 1 includes KLEMS Sectors A (agriculture, hunting, forestry), B (fishing), C (mining and quarrying), D (manufacturing), E (electricity, gas, water), F (construction), G51 (wholesale trade), I62 (air transport), I64 (post and telecommunications), J (financial intermediation), K (real estate, renting and business services), O91 (activities of membership organizations nec) and O921t2 (media activities)

Sector 2 is the KLEMS sector N (health and social work)

Sector 3 includes the KLEMS sectors G50 (sale and maintenance of motor vehicles and motorcycles), G52 (retail trade), H (hotels and restaurants), I60 (inland transport), I61 (other water transport), I63 (other supporting travel activities), O90 (sewage and refuse disposal), O923t7 (other recreational activities), O93 (other service activities)

Three countries are not in KLEMS: Canada, Norway, and New Zealand. We constructed their shares from the KLEMS predecessor, the OECD *Structural Analysis Database* (STAN), following the same sector decomposition.

Some data entries are missing. In all cases the missing entries were for very small subsectors. We constructed the missing data series by assuming that the shares of the missing series within its sector were the same as the corresponding shares in neighboring countries with a similar industrial structure. In most cases the missing data were for media activities (sector O921t2). The “similar” country shares used to construct the media sector in the countries that it is missing were selected as follows: for Denmark we used the media’s hours share for Finland. For Italy we used Spain’s. For Japan we used Korea’s. For the Netherlands we used the UK’s. For Sweden we used Finland’s. The size of this sector affects the allocation of sector O92 into O921t2 (which belongs to sector 1) and O923t7 (which belongs to sector 3). However, given this sector is rather small (it is less than 2% of sector 1 or 3 in all the above countries), alternative ways of imputing its size does not alter the size of sector 1 and 3 and so our results are not sensitive to this imputation.

STAN does not have a breakdown of hours for New Zealand but it has total hours. We obtained employment data for industrial sectors by status (part time or full time) from the website of Statistics New Zealand, to calculate the shares of employment in individual sectors (weighting part-time employment by 25/40), and then multiplied these shares by total weekly hours for the 15+ population to obtain hours in each sector.

For Canada no data are available for the decomposition of sector O, we use US’s shares to allocate hours within sector O sub-sectors. Similarly for Norway, we used Finland’s shares to allocate total sector O hours to its components.

The population aged 15 and above that was used to derive per capita hours was obtained from *World Developments Indicators*.

Taxes

The tax rates were calculated from the data given in Nickell (2006), the OECD/CEP data set. Briefly, they are as follows.

The employment tax rate is defined as $ESS/(IE-ESS)$, with ESS equal to employers’ social security contributions and IE equal to total compensation for employees. ESS is available from the OECD *National Accounts* and IE from the OECD *Revenue Statistics*.

The direct tax rate is defined as DT/HCR , with DT equal to income tax plus employees’ social security contributions and HCR equal to household

current receipts. Income tax and employees' social security contributions were taken from the OECD *Revenue Statistics*. HCR was calculated from the OECD *National Accounts* as the sum of compensation of employees, property income, social contributions and benefits and other current transfers.

The indirect tax rate is defined as $(TX-SB)/CC$, with TX equal to indirect taxes, SB equal to subsidies and CC household final expenditures. All three were taken from OECD *National Accounts*.

For the employment subsidy we obtained total spending on active labour market measures (code 600) from the OECD *Social Expenditure Database* (SOCX) and divided it by total employee compensation from KLEMS. Data are missing for New Zealand, and we set this rate at the Australian rate (generally, this is a very small number for all countries).

The rates used in the paper were averages for 1994-2003. Most countries had complete data sets and all countries had at least some entries for those years, which were used to arrive at averages. The only exception is Korea, for which there were no tax data at all. For this country only we used the tax data available at the OECD *National Accounts: Korea*.

Social subsidies

The social subsidies are available in SOCX, 1980-2003, released 2007. We use data for 1994-2003. Social expenditure are given as a percentage of each country's GDP. We multiplied by GDP from the OECD *National Accounts* to obtain the absolute amounts, and then divided by the gross output of the health and social work sector, available in KLEMS, to obtain the rates. The value of "benefits in kind" for the following social expenditure categories were aggregated to arrive at the social subsidy: old age (code 120), incapacity (code 320), and family (code 520). In all these categories the benefits in kind were for residential or day care and home-help services. The common feature uniting these items was that the employees delivering these "benefits in kind" worked in the health and social work sector. These three series are complete for all countries except for Canada and U.S. In the case of Canada, both old age and incapacity benefits in kinds are missing, so our subsidy includes only family benefits in kind. In the case of the U.S., incapacity benefits in kind are missing. Our broader health and social subsidy adds half of total spending on Health care, (code 420), also available in SOCX.

2 More results on aggregate hours

Time use surveys record “market work” as the aggregate of the number of hours spent at the place of work, time taken to travel to work and any other activities related to market work, such as working at home in evenings or weekends, job search, reading literature connected with the job etc. For this reason market work reported in time use surveys exceeds hours of work reported in household or employer surveys. In the countries of our sample the average difference between market work reported in time use surveys and the total hours reported by employers over a comparable period of time (and including government employment and education) is 27%, with standard deviation 13%. Table A.1 shows the percentage distribution of total hours of work between market and home, making use of the same source, time use surveys. The table shows wide variations across countries, with the central and southern European countries having the smallest percentages of market hours and the two Asian countries the largest market shares.¹

¹The ranking of countries is roughly the same if market hours are measured by EU KLEMS and other employer-based surveys. The only noteworthy difference is that Scandinavian countries report more market-related work at home than the other countries in the sample. The correlation coefficient between the market share reported in Table ?? and the one obtained from KLEMS is 0.9.

Table A.1:
The percentage distribution of total hours of work between market and home

Country	market	home	Country	market	home
Belgium	38	62	Spain	47	53
Germany	41	59	Netherlands	48	52
Italy	43	57	Norway	50	50
France	44	56	Canada	50	50
Finland	45	55	USA	51	49
Australia	45	55	Portugal	53	47
New Zealand	46	54	Denmark	56	44
UK	46	54	Korea	58	42
Ireland	46	54	Japan	60	40
Sweden	47	53			

As an alternative to our preferred measure of the absolute number of hours of work in sectors 2 and 3, we computed an alternative where we used the EU KLEMS sector weights to compute their hours from the total number of market hours reported in time use surveys. This procedure has the advantage that both sets of hours (home and market) come from the same source but it assumes that commuting and home preparation related to one's job is the same across all sectors of economic activity. As this is not likely to be the case (for example, we expect more time spent at home preparing for work by professional people than by workers in unskilled services) we place more confidence in the first of our two marketization series, the one that uses the employer survey for market hours, and this is the one that we report.² Results, however, are very similar with the two series, which is not surprising given the high correlation between the two marketization series. The correlation between the marketization in sector 2 computed with EU KLEMS data and the one computed with time use data is 0.98, and the same correlation for sector 3 is 0.94.

3 Sensitivity analysis

Our baseline results use $\sigma_2 = \sigma_3 = 2.3$. This section considers σ_2 and σ_3 ranging from 1.1 to 10. The results are similar to our baseline results. For the baseline, the correlation between the data and the predicted values of l_2/l_1 and l_3/l_1 are 0.89 and 0.55 respectively. Table A.2 reports the corresponding correlation for alternative values of σ_2 and σ_3 .

²Another problem with the series that uses the time use survey for market hours is that measurement errors lead to higher negative correlations between market hours and home hours. For example, if commuting time for work is misclassified as commuting time for home production, reported home production time rises and market hours fall. But if we use an employer base for market hours, the misreporting of home hours does not impact on the reporting of market hours. We put the model through a more stringent test by taking market hours and home hours from different sources. (Confirming this, results are very slightly better with the marketization data computed from the time use surveys.)

Table A.2: Sensitivity Analysis

σ_2	$\frac{l_2}{l_1}$	σ_3	$\frac{l_3}{l_1}$
1.1	0.898	1.1	0.565
1.5	0.894	1.5	0.557
2.3	0.890	2.3	0.551
5	0.886	5	0.544
10	0.884	10	0.541

Comparing Figure 4a, Figure A.4a_1 to Figure A.4a_4 report the predicted l_2/l_1 against the data for alternative values of σ_2 . Comparing to Figure 4b, Figure A.4b_1 to Figure A.4b_4 report the predicted l_3/l_1 against the data for alternative values of σ_3 .

Figure A.4a_1
Predicted sector 2 share, home production exogenous
Sigma 2 = 1.1

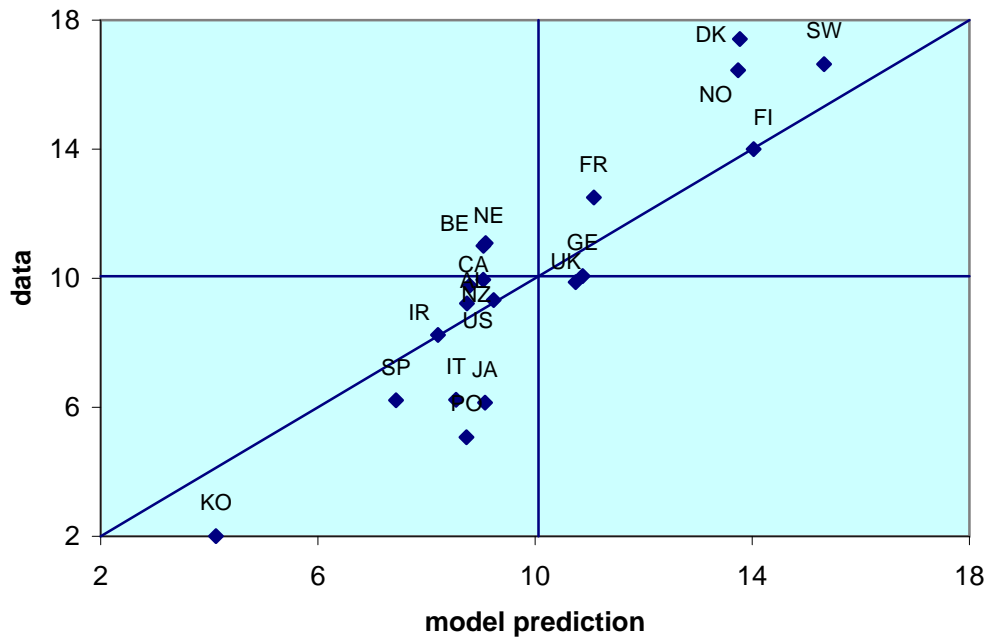


Figure A.4a_2
Predicted sector 2 share, home production exogenous
Sigma 2 = 1.5

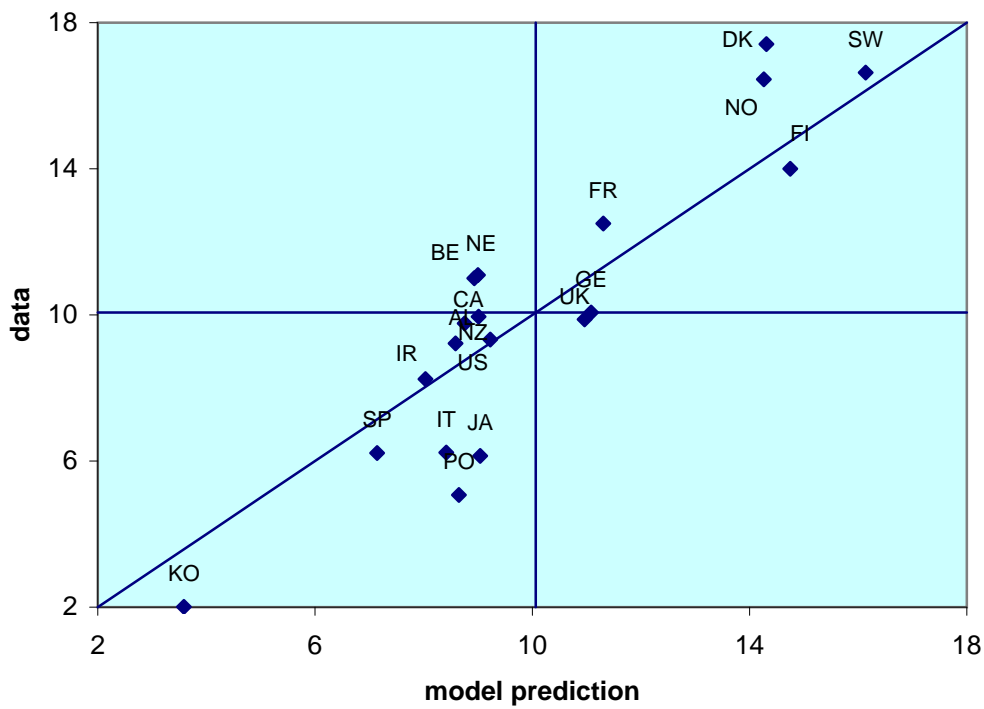


Figure A.4a_3
Predicted sector 2 share, home production exogenous
Sigma 2 = 5

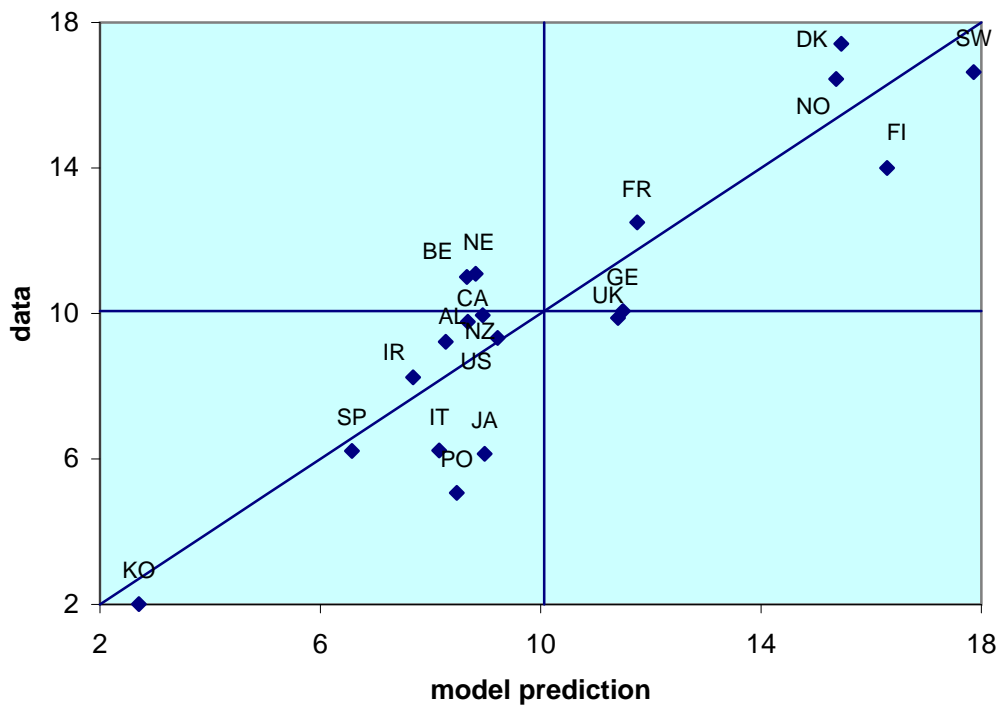


Figure A.4a_4
Predicted sector 2 share, home production exogenous
Sigma 2 = 10

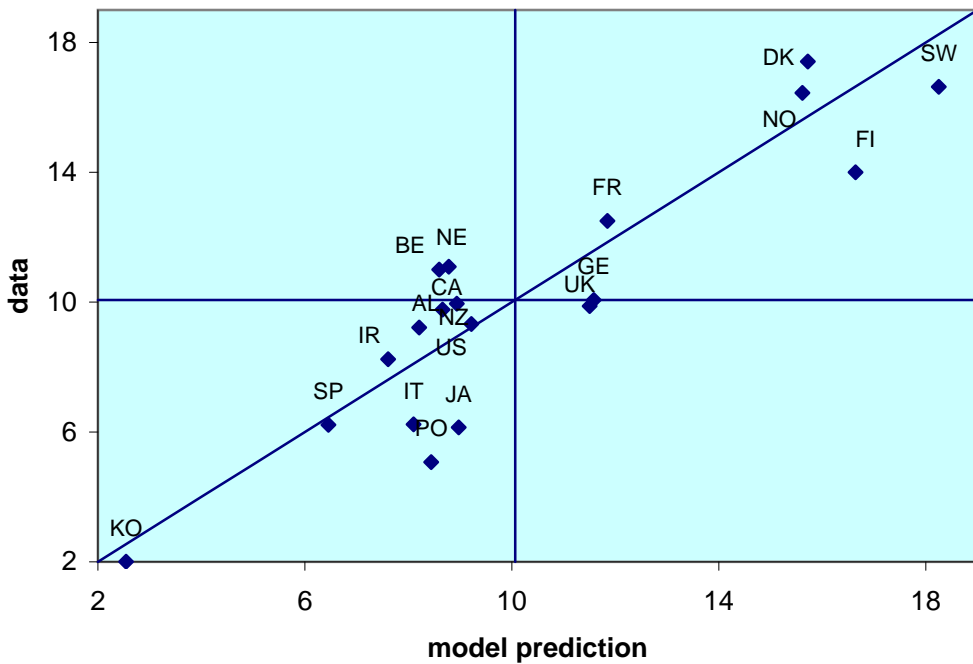


Figure A.4b_1
Predicted sector 3 share, home production exogenous
Sigma 3 = 1.1

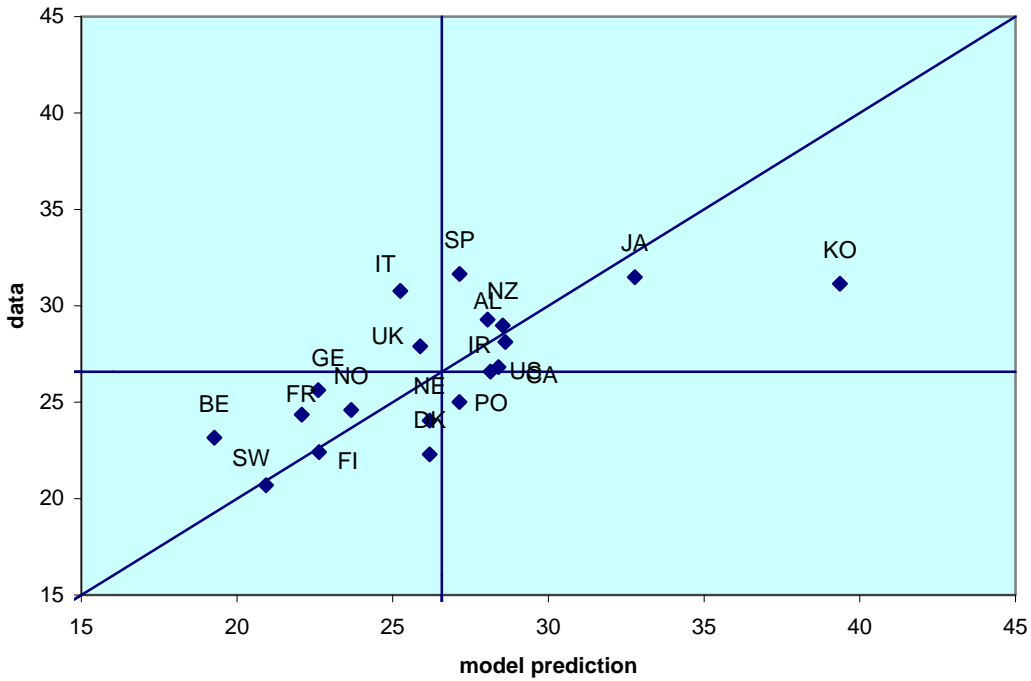


Figure A.4b_2
Predicted sector 3 share, home production exogenous
Sigma 3 = 1.5

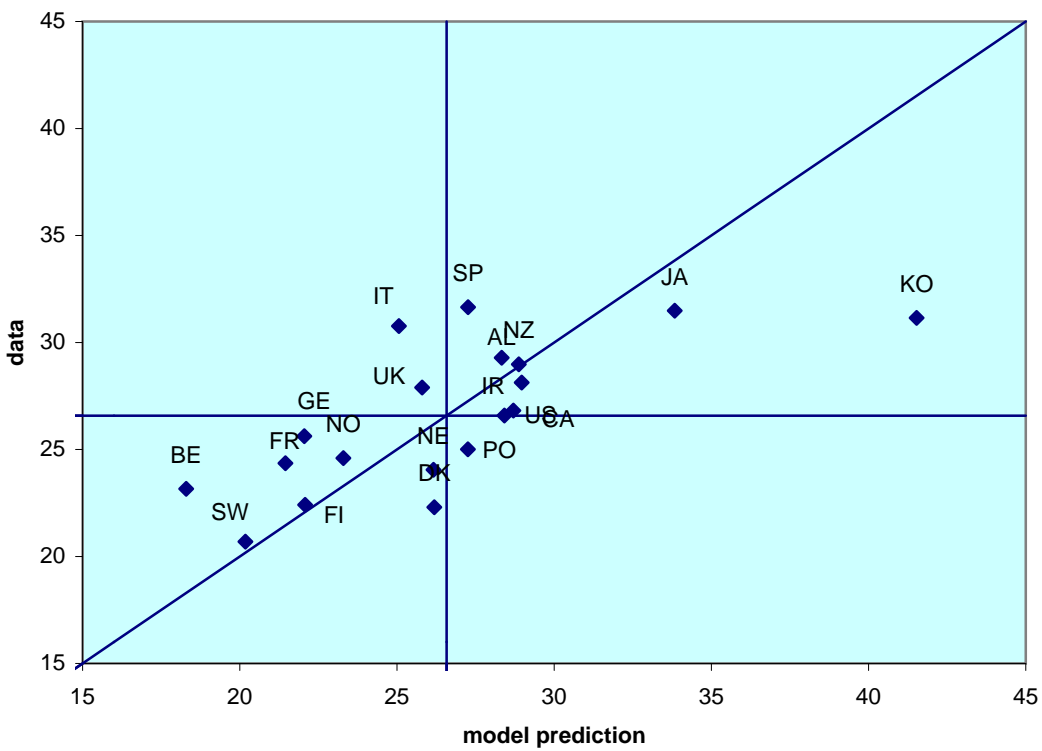


Figure A.4b_3
Predicted sector 3 share, home production exogenous
Sigma 3 = 5

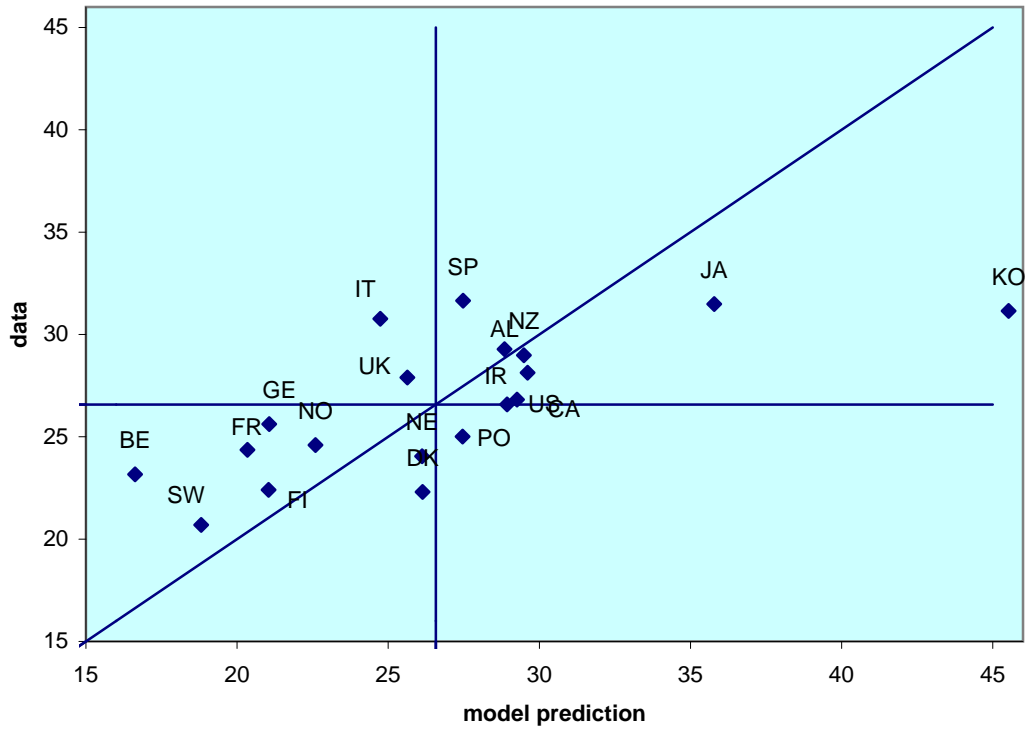


Figure A.4b_4
Predicted sector 3 share, home production exogenous
Sigma 3 = 10

