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Incentives for Women to Work

**A Comparison between the Netherlands, Sweden
and West Germany**

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Economics of Women's Emancipation

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1. INTRODUCTION

One of the goals of the Dutch government is to promote equality between women and men in the labor market and in society as a whole. An important part of this goal is women's economic independency. Shared responsibility for earning family income as well as shared responsibility for upbringing of children between husband and wife is part of this goal.

It is therefore desirable that women's labor force participation in the Netherlands increases. Women will choose to participate in the labor force only if conditions are favorable for the combination of paid and unpaid work.

Women's economic independence can be measured by her share of family income. Her share of family income depends on the participation rate of men and women in the labor market, the number of hours worked, the wage ratios of women relative to men and taxes and social security contributions. One of the conditions which influence women's decision to enter the labor market and remain there is that women by working in the labor market increase family income after tax more than their household production is worth to the family (Gronau 1977, Gustafsson 1985, Hagenars and Wunderink van Veen, 1990).

In this paper we look at the income after taxes and social security contributions from this perspective: How much does the wife contribute to family income? Income taxation and social security contributions may create favorable or unfavorable incentives for sharing the responsibility of earning the family income between husband and wife. Therefore, in the second section, we give a general overview of these systems.

The regulations of Germany, Sweden and the Netherlands are described in section three. In section four, we compare the demographic and labor market situation of women in the three countries by looking at macro data. Demographic and labor market data describe some of the differences in the situation and conditions outside the labor market.

In section six, we calculate the net decrease in total family income if the wife withdraws from the labor market. This measure is interpreted as the wife's contribution to family income. This measure, which varies from zero if the wife does not work in the labor market to one if the wife is the only wage earner, has been computed using three data sets and four tax systems. We use micro data for Sweden, West Germany and the Netherlands. Income taxation and social security contributions in Sweden, in Germany and in the Netherlands before and after the so called Oort tax reform of 1990 have been programmed and used to simulate after tax earnings. We thus use all four tax systems for all three data sets.

2. SYSTEMS OF INCOME TAXATION AND SOCIAL SECURITY CONTRIBUTIONS

Micro-economic analyses suggest that wives' decision to (re)enter the labor market and wives' hours of work are more responsive to changes in the wage rate than men's labor market decisions⁽¹⁾. Systems of income taxation and social security influence the net wage and offer varying financial incentives for splitting paid labor between husband and wife. In a study presented by the OECD tax influences on female parttime work are estimated to cause cross-country differences up to 20 percentage points on overall rates of female labor participation and influence the size of the total labor force by 10% or more⁽²⁾.

The tax and social security systems differ very much between countries. Nevertheless it is possible to classify them by their main characteristics. For example: an element of tax systems which is important for women is the choice of the tax unit. Some countries apply joint taxation to all family income, other countries aggregate a few income sources and

1 Killingsworth, Mark, 1983, Labor Supply. Cambridge University Press, London

2 OECD Employment Outlook 1990 p. 167

apply individual taxation to other income sources. Some countries add the incomes of spouses and split this aggregate income, other countries have mixed systems. In general there is a tendency away from joint taxation in favor of individual taxation⁽³⁾.

Four factors are of importance looking at the incentives or disincentives of these systems on the labor market participation of women⁽⁴⁾:

1. the choice of the tax unit (joint or separate taxation);
2. the method of determining taxable income;
3. allowances and deductions;
4. is the tax rate linear, progressive or degressive ?

1. the choice of the tax unit; is the household or the individual chosen as the unit of tax and social security contributions? If the household is used as tax unit, the incomes of spouses (or unmarried partners) are added together in order to determine the amount of taxable income. After tax income in a system of joint taxation for dual earner couples can be formalised as:

$$X_2 = (W_f H_f + W_m H_m) - t((W_f H_f + W_m H_m) - y) \quad (1)$$

where $t = t(wH)$ and $t' > 0$ because of progressive taxation is the tax rate, W is wage before tax, H is hours of work, m is an index of the main earner and f the index of the secondary earner and y is the tax deduction of a couple.

In the case of the single earner couple this formula is:

$$X_1 = (0 + W_m H_m) - t((0 + W_m H_m) - y) \quad (2)$$

Another variation is to aggregate incomes of spouses, then divide them in two, after which tax is calculated on this quotient and multiplied by two in order to determine the

3 Mennel: "Steuern in Europa, USA, Kanada und Japan 1990" NWB Verlag Berlin 1990, p.7

4 Meulders, D.: "Income taxation and equal treatment for men and women in the member states of the European Community", The Institute for fiscal Studies, London 1986

amount of tax (splitting system)⁽⁵⁾. The purpose of the splitting system is to equalize the net incomes of families with equal gross incomes, independently of the distribution of gross incomes within the families. This is consistent with the view that the family, not the individual, is the tax unit. The result of this system is a decrease of progressivity: the primary and the secondary earner face the same marginal tax rate.

After tax income in a splitting system can be formalised for a dual earner couple as:

$$X_2 = (W_f H_f + W_m H_m) - 2t(0,5((W_f H_f + W_m H_m) - 2y)) \quad (3)$$

where y is the general tax deduction for a single person and $2y$ the tax deduction if the couple is entitled to one tax deduction each and index 2 denotes positive earnings from both the main earner and the secondary earner

For a single earner couple this system is advantageous because the wife's income is 0, so that the formula for the single earner couple is:

$$X_1 = (W_m H_m) - 2t(0,5((0 + W_m H_m) - 2y)) \quad (4)$$

where index 1 denotes positive earnings only from the main earner.

Because the tax rate t is not linear but progressive and because the married man has a double tax deduction, the single person pays more tax than a married man with the same income⁽⁶⁾.

5 Meulders, D. "Income tax in the European Community" Institute for Fiscal Studies, London 1986, p.5-7 and OECD: "Employment Outlook 1990", Geneva 1990, p.163-169

6 Schettkat, R.: "Erwerbsbeteiligung und Politik. Theoretische und empirische Analysen von Determinanten und Dynamik des Arbeitsangebots in Schweden und der Bundesrepublik Deutschland", Wissenschaftszentrum, Sigma Rainer Bonn Verlag, Berlin 1987, p.139; Dengel, A. in: "Comparative tax systems", ed. J. Pechman, Tax Analysts, Arlington, Virginia 1987 p.265; "Op weg naar gelijke fiscale behandeling van de (werkende) gehuwde vrouw en haar man, en van deelgenoten van vormen van samenleven en samenwonen", Tweede Kamer, zitting 1979-1980 15 835 nrs. 1-2 chapter 3.

Individual taxation is less discouraging for the second earner than a system using the couple as the tax unit. Under separate taxation, the marginal tax rate on the husband's earnings is higher as long as his earnings are higher. Thus separate taxation creates an incentive to switch earnings from the husband to the wife, an incentive which is absent under joint taxation or a splitting system. The incentive to do so is higher the higher the progressivity of the tax system. After tax income in a system of individual taxation can be formalised for a dual earner couple as:

$$X_2 = (W_f H_f) - t((W_f H_f) - y) + (W_m H_m) - t((W_m H_m) - y) \quad (5)$$

In the case of the single earner or the single person we have:

$$X_1 = (W_m H_m) - t(W_m H_m - y) \quad (6)$$

or if the person is a woman:

$$X_1 = (W_f H_f) - t((W_f H_f) - y) \quad (7)$$

Social security contributions in Sweden are exclusively paid as a per cent on the sum of wages paid by employers, whereas in Germany and the Netherlands part of social security contributions are individually paid and part of them are paid by the employer.

The part of social security contributions the employee pays is levied on an individual basis. The average rate of social premiums is influenced by ceilings and franchises in the income or by a basic deduction of income on which no social security contributions are paid. The actual tax rates and rates of social security payments in different income brackets are given in the appendices (1)-(4) presenting the tax programs.

Social security premiums paid by the employee are taken together with tax informula's 5-7. Social security premiums paid by the employer are left out, because they have no direct influence on net wage.

2. the method of determining taxable income: there are two main categories of income: earned income, and property- and

capital income. Each country has its own system of classifying different income elements and each country has its own system of determining different stages leading to the tax base. The Swedish tax system is individualized for all sources of income, the German tax system has joint taxation for spouses for all kinds of income, whereas the Dutch system is individualized for labor income with the exception of the joint basic deduction. The partner with the highest labor income in the Netherlands may deduct from his income non labor expenses of the second earner, for instance the payment for her life insurance, her contribution to the political party of which she is a member, the alimony she pays to her parents etc. Under this system the unit for tax deductions is the family, whereas the unit for taxation is the individual. This inconsistency is favorable for one-earner families.

3. allowances and deductions: which allowances and tax deductions are part of the system? Is there for example a tax deduction for a dependent partner? This may be discouraging for the second earner, because the husband loses this deduction if the wife earns her own income. Arrangements whereby the husband is able to use some part of his wife's tax allowances only if she has no income may also enter the calculations.

4. is the tax rate linear, progressive or degressive?

If incomes of spouses are added together and the tax rate is progressive, the income of the second earner is subjected to a high tax rate. The same thing applies to a lesser degree if a splitting system is used. If there is a ceiling on social security contributions, the average rate of social security contributions will be lower for persons with a high income than for persons with a low income. These ceilings create a disincentive for substitution of wife's earnings for husband's earnings. Franchises on the other hand lower the average rate of social security contributions and create an incentive for substitution of wife's earnings.

In most OECD countries the average rate of social security contributions declines around a certain income level because

some contributions are subject to an upper ceiling (OECD 1990). If the wife works part time and consequently earns a small income, her earnings are usually liable to social security contributions at the full rate, while the same income earned as a pay increase by the husband will be subjected to social security contributions at a lower rate. Consequently, ceilings to social security contributions create a disincentive for substitution of wife's earnings for husband's earnings⁷⁾. The German and the Dutch social security contributions have ceilings, in Sweden the employer pays all social premiums. According to the OECD study (1990) incentives created by tax and social security contributions to substitute husband's earnings for wife's earnings, were negative in the late 1970's in France and the Netherlands, whereas in Sweden the effect of taxation and social security on this substitution was the most positive of all 18 countries included in the study. At that time labor market participation of Swedish women was (and still is) the highest in the OECD⁸⁾. The cited OECD study only calculated the tax incentives on substitution of wife's income earned for husband's income earned for an average industrial worker. In this study we compute a similar substitution for the whole distributions of the three countries included.

3. INCOME TAX AND SOCIAL SECURITY CONTRIBUTIONS IN THE NETHERLANDS, GERMANY AND SWEDEN

3.1. The Dutch tax and social security system

The Dutch system is characterized as an individual system for labor income. The single earner is entitled to the general tax deduction of his dependent partner, next to his own general tax deduction. Before 1990 this general deduction applied only to income tax. From January 1990 a new system was introduced to simplify the way tax and social security premiums are levied. After this so called Oort reform, the general deduction (y in our formulas above) applies to income tax as

7 OECD Employment Outlook 1990 p. 166

8 OECD Employment Outlook 1990 p. 166

well as to contributions paid for 4 of the social security contributions (invalidity, child benefits, widow's pension, old age pension and sickness costs), the so called "volksverzekeringen". This means that a single earner couple pays less tax and less social premiums than a dual earner couple or a single person if gross individual income of the breadwinner is the same as the individual income of one of a two earner couple as a single person. This element of joint taxation is a disincentive for the second earner.

The individual system does not apply to non-labor income. Non-labor income is added to the income of the partner with the highest labor income.

The "Oort tax system" for a dual earner couple may be written according to formula (5) as:

$$X_2 = ((W_m H_m - t(W_m H_m - y)) + ((W_f H_f - t(W_f H_f - y)))$$

where X_2 is the after tax income and y the general tax deduction for a single person.

In the case of the single earner this is:

$$X_1 = W_m H_m - t(W_m H_m - 2y) \quad (8)$$

The difference between the tax paid by the first earner ($W_m H_m$) in the first case and the single earner in the second case is: $-ty$. The higher the amount of the general deduction y and the higher the tax rate t , the larger is the element of joint taxation. The amount ty can be seen as an implicit charge on the income of the second earner ($W_f H_f$), since if the second earner enters the labor market, the main earner has to pay more tax and social security contributions.

Basically all employees, are obliged to contribute to social security a certain percentage of their gross salary up to a certain ceiling on incomes in excess of basic deduction that applies to a certain individual. This payment of social security contributions is deducted from their gross income. The employer also pays part of social security premiums. The lower and upper limits of income for which social security contributions are paid differ for each category of social security contributions. We have included those aspects of the Dutch tax system before and after the 1990 tax reform (the Oort reform) in our computations of the after tax incomes.

The influence of linking the incomes of partners in tax and in social security is shown in an analysis of Bekkering⁽⁹⁾. Her analysis is based on a sample of 1050 women from the OSA 1985 study. Micro-simulation shows that individualisation of tax rules and unemployment-welfare-benefit would augment the labor market participation rate of women from 48 to 77%.

Table 1 Tax and social security contributions as per cent of before tax annual income in the Netherlands in Dutch guilders, implicit partner charge included in columns 3-5 1990

Before tax income	1 single person	2 one earner	3 second earner	4 second earner	5 second earner
				<u>implicit partner charge incl.</u> husband receives soc.sec. welfare benefit	
5 000	2	0	33	100	100
10 000	18	2	34	83	100
15 000	23	13	34	66	100
20 000	26	18	34	57	100
25 000	28	22	35	54	99

Source: Bruyn-Hundt and Van der Linden (1989)

Bruyn-Hundt and Van der Linden computed the tax rate inclusive the implicit charge of the second earner for the Netherlands. The implicit partner charge is the loss of a financial advantage for the single earner if his wife enters the labor market⁽¹⁰⁾. Table 1 row 3 shows that a single person earning f 15.000 a year pays 23% tax and social security

9 Bekkering, J. "Vrouwen aan het werk", Stichting voor Economisch Onderzoek Universiteit van Amsterdam, 1988

10 Bruyn-Hundt, M. and Th. van der Linden: "De invloed van materiele prikkels op het arbeidsaanbod van vrouwen", OSA-werkdocument W 65, Den Haag 1989

contributions, a single earner pays 13% and the second earner in a family 34%. If the husband receives a minimum social security benefit he loses a supplement when his wife enters the labor market. Table 1 column 4 shows that for the second earner an income of f 15.000 a year implies a tax plus social security payments of 66 per cent.

The implicit tax charge is extremely severe in cases where couples live on a social welfare benefit. This is the case for 62% of all registered unemployed⁽¹¹⁾. An unemployed person falls in either of two categories:

A. he has the right to unemployment benefits based on previous earnings. The duration of the unemployment benefit increases with the length of the work experience and does never exceed 5 years. When the unemployment benefit is stopped, the person has to apply for welfare benefit

B. he gets the welfare minimum subsistence level.

A spouse cannot claim a social welfare benefit if the other spouse has an income. Because more women than men have a partner with an income, more unemployed women than unemployed men cannot claim a social welfare benefit. There is therefore a poverty trap in the Dutch welfare system which inhibits especially women from adding to family earnings by their own work in the labor market. The spouse has to earn at least f 26.000 a year before she/he can add but one penny to net family income, as is shown in the last column of Table 1.

3.2. The German tax and social security system

The German system is a splitting system. The assessable incomes of both man and wife are added together and divided by two. The basic tax allowance for a married couple is twice as large as the basic tax allowance for a single person. Tax is calculated on half of the taxable income and multiplied by two, as is shown in formula 3. This system favors marriage, especially for those who have only one income or incomes of very different levels. If two different couples have the same before tax income, but one is a single earner family, and the other is a dual earner couple, they pay the same tax. A single person on the other hand, pays a tax as if his taxable income

11 Centraal Bureau voor de Statistiek: "Sociaal Economische Maandstatistiek", november 1990 p. 40

were twice as large as that of a married man with a housewife⁽¹²⁾.

Basically all employees are obliged to contribute to social security a percentage of their gross salary up to a certain ceiling. In 1990 an employee had to pay for: pension insurance (9.35% on a monthly salary up to DM 6,300); health insurance (7.1% on a monthly salary up to DM 4,575) and unemployment insurance (2.15% on a monthly salary up to DM 6,100). Employments with a monthly salary of DM 470 or less and with a weekly working time of 15 hours or less are not subject to the liability to pay social insurance premiums. Part of social security contributions are deducted from the gross wage and the other half the employer pays as a flat rate on wages⁽¹³⁾. In the micro data simulations below we are using data for 1984 and the tax system for 1984. Thus we have not taken account of the recent tax reforms in Germany, that were enacted in three steps 1986, 1988 and 1990 in order to broaden the tax base and decrease the progressivity⁽¹⁴⁾. The tax reform was inspired by the 1986 US tax reform and a similar reform is also about to be enacted in Sweden from January 1991.

However, Germany has made no adjustments in the direction of individualizing its tax system. Incomes of husbands and wives are still treated according to the splitting tariff as described in the formulas (3) and (4) above. The tax system as used in the simulations is described in Gustafsson and Ott (1987)⁽¹⁵⁾ and the actual tax program used in the simulation is presented as appendix 1 below.

12 See Meulders, chapter 4 ; International Bureau of Fiscal Documentation: "Supplementary service to European Taxation" Amsterdam 1990

13 International Bureau of Fiscal Documentation: "Supplementary service to European Taxation", May 1990, section B

14 Van Essen, Ulrich, Kaiser, Helmut and spahn, Bernd, P., 1989, Tax Policy at the Bifurcation Between Equity and Efficiency: Lessons from the German Income tax Reform, Arbeitspapier Sonderforschungsbereich 3, J.W. goethe Universität Mannheim.

15 Gustafsson, Siv and Ott Notburga, Demographic Change, Labor Force Participation of Married women and the Effect of Separate Versus Joint Taxation of Earnings in West Germany and Sweden, Arbeitspapier nr. 241, Sonderforschungsbereich 3, J.W. Goethe Universität Mannheim.

3.3. The Swedish tax and social security system

In 1971 Sweden introduced separate taxation of labor income. Since 1988 all kinds of income is separately taxed. The discussions in Sweden that led to the introduction of separate taxation in Sweden are described in appendix A.

After separate taxation had been politically accepted by the majority, the debate focused on how to ameliorate the adverse effects for single earner couples. The solution was the introduction of a "house wife deduction" which was Skr 1800 a year. It has remained at its nominal value. At the present day exchange rate this is worth about f 600. In 1971 it was a substantial amount which in fact implied that 90% of couples were facing a tax system very similar to the German Splitting Tariff⁽¹⁶⁾. However, this housewife deduction was never increased and its value in real terms has decreased very much over time. In 1990 Sweden in addition to the housewife deduction allowed a tax deduction only for single parents with children under 18 or under 21 if they still were students, otherwise the whole tax system quite to the contrary of the philosophy of the German system is designed to be completely unaffected by the number of persons that depend on a given income⁽¹⁷⁾

Sweden instead has subsidies for those needs like child benefits and housing subsidies. Moreover many subsidies are given in kind: subsidized child care centers and free hot school lunches for all children (Gustafsson 1990⁽¹⁸⁾).

The Swedish tax system consists of local community taxes and state taxes. The individual basic deduction is in 1990 10.000 Skr which is about f 3300. All incomes above this level are liable to community taxes, which are proportional but differ between the 285 communities in Sweden⁽¹⁹⁾. The average

16 Elvander, Nils (1974), Skattepolitik 1945-1970. En studie i partiers och organisationers funktioner, Rabén & Sjögren, Stockholm.

17 Andersson, Krister (1987), Sweden, in Pechman, Joseph A., Comparative Tax Systems, Tax Analysts, Arlington, Virginia.

18 A Swedish Case Study with Comparisons to Germany, Gustafsson, Siv (1990b), The labor force participation and Earnings of Lone Parent Families, in Lone-Parent, The Economic Challenge, OECD, Paris.

19 The number of communities has oscillated around this figure since the centralization reform of 1974 when the previously 2000 communities were merged.

community tax was 30% in 1984.

The State tax is progressive. In 1984, which is the year used for the micro simulations the maximum marginal tax rate was 84%. Sweden, from 1991 will enact a major tax reform, the main purpose of which is to decrease the marginal tax rates on earned income and broaden the tax base⁽²⁰⁾. Most income earners will after the reform pay only the proportional community tax on earned income and the maximum marginal tax rate will be 55%, which is at about the same size as in Germany. The incentives of the Swedish tax system for families are to split paid work between husband and wife. It is better for family income after tax to split hours of work between husband and wife than if the husband increases his hours of work. The advantages for the secondary earner in comparison to a joint tax system are larger the higher the progressivity of the tax system.

The employer pays all social security contributions. The aggregate amount of all premiums was about 37% of wages in 1990. This proportion has not been changed since 1840. Since all social security payments in Sweden are paid as a flat rate paid on the sum of wages by the employer, it does not have any effect on the labor supply decision of the individual although it is very important for the employer's decision on the size of his work force.

4. WOMEN'S DEMOGRAPHIC AND LABOR MARKET SITUATION IN THE THREE COUNTRIES

Labor market behaviour of women in Germany, Sweden and the Netherlands show different patterns. The tax system may be one of the factors influencing women's labor market participation. But labor market participation is also dependent on fertility, which in turn depends on marriage rates and age at marriage. Demographic influences may influence labor market behaviour and vice versa. Moreover a careful analysis of macro data helps us to judge whether the results we get from the micro data are plausible. We therefore

20 SOU 1990: 33 Reformerad inkomstbeskattning (reformed income taxation) Government Report, Stockholm.

start this section by considering differences and resemblances in the demographic and labor market development of the three countries⁽²¹⁾. The most recent figures are collected in Table 2. The development over time is given in the statistical appendix tables.

The average age at first marriage is higher both for men and for women in Sweden. In the 1960s this difference was smaller than in the 1980s. Dutch women and men are younger at first marriage than either German or Swedish couples (Table A.1 Statistical appendix). In the 1970s Swedish couples started their wedding life later and later and also later than German and Dutch couples. Although German and Dutch couples changed their behavior slightly in the eighties and married later until women are now around 25 and men slightly over 27 years of age, Swedish couples continued to postpone their wedding until the average age of women is around 27,5 and the average age of men around 30 years of age. One of the reasons for this change in Sweden is the increased propensity of Swedish couples to live together in consensual unions rather than marrying⁽²²⁾.

In the second half of the sixties and during the seventies the *marriage rate* (Table A.2), although declining, was highest in The Netherlands. Sweden had the lowest rate from the seventies until now. Germany and the Netherlands still have a higher marriage rate than Sweden. In all three countries the marriage rate was declining in the seventies and the first half of the eighties.

Does the *fertility rate* in the three countries differ much? Dutch women bore more children in the 1960s and 1970s, but around 1975 the Swedish fertility rate became the highest of the three countries and still is. Since 1983 Swedish fertility has been rapidly rising, in 1989 it reached 2.00 and is for 1990 estimated to have reached replacement level. The Dutch

21 The tax system may in fact also influence the marriage and divorce rates if there is a marriage gain implicit in the tax system giving married couples an advantage over single persons as is the case in West Germany (Gustafsson and Ott 1987).

22 Hoem, Jan and Rennermalm, Bo: "Cohabitation and social background: trends observed for Swedish women born between 1936 and 1960" in: European Journal of Population, 1985 no.1

fertility rate is rather stable around 1,5 from 1975 until now. The German fertility rate has been declining from 1960 until now and has been the lowest of the three all the time (Table A.3).

A striking difference between the three countries is the difference in *not married mothers*. Nearly half of all mothers in Sweden are not married compared with 10% in Germany and the Netherlands (Table A.3). However 90% of Swedish children are born to couples living together married or unmarried⁽²³⁾. Mothers age at birth of first child in Sweden is lower than women's age at first marriage.

The *divorce rate* (Table A.2) has risen in all three countries during the seventies and the eighties. The divorce rate of Sweden has been the highest of the three countries during this period. It was on its peak in 1982 and 1983: 12 divorces per 1000 married women. The difference between Germany and the Netherlands is not so large: in both countries slightly over 8 divorces per 1000 married women.

The *labor market participation* (Table A.4) of Dutch women was and still is the lowest of the three countries, although rising. From the 1960s on, the rate of labor market participation of Swedish women has been twice as high as that of Dutch women. In Sweden and Holland the participation rate has been rising enormously during this period. In Germany the participation rate has been rather stable. It rose from 47% of all women 15-64 in the sixties to 53% in 1985.

The most striking difference between the three countries is the *labor market participation of mothers with children under 6 years of age*. In Germany 32,5% of these mothers participated in 1972 and 34,4% in 1986, so their behaviour has changed very little. Labor market participation of Swedish mothers with young children has risen from 47,5% in 1970 to nearly 85% in 1986. In the Netherlands working in the labor market is not very popular among mothers with small children; in 1975, 15% participated and although the rate is rising it was only 26% in 1985 (Table A.5). The participation rate of Swedish mothers

23 Gustafsson, Siv: "The labor force participation of lone parents; a Swedish case study with comparisons to Germany, in: "Lone-parent families, the economic challenge", OECD Paris 1990

with young children is therefore nearly 2,5 higher than that of German mothers and more than 3 times as high as that of Dutch mothers.

Another striking difference between women in the three countries is the rate of *parttime work* (Table A 6). 55% of Dutch women worked parttime in 1987, mostly in jobs of less than 20 hours per week. Parttime work is also popular among Swedish women: 45% work parttime in 1987, but the percentage of jobs less than 20 hours is small and declining. In Germany parttime work is not popular: only 30% of all employed women worked parttime in 1987⁽²⁴⁾. The percentage of women working less than 20 hours is relative to the Netherlands low, but higher than in Sweden where parttime work generally means between 20 and 34 hours per week.

Do the *men* in the three countries also differ in their labor market behaviour? In the 1960s the labor market participation rate of men in all three countries was about 90% in 1970. In all three countries it has been declining to 75% in the Netherlands in 1987, 80% in Germany and 84% in Sweden⁽²⁵⁾. Dutch men have the highest percentage of parttime work: 15% in 1987. Few German men work parttime and the figure for Swedish men is in between.

Wage differences between men and women are higher among white collar workers than among blue collar workers. In all three countries wage differences are becoming smaller (Table A.7). The smallest wage differences according to sex are found in Sweden, both for blue collar and white collar work. In 1985 the Swedish female to male wage ratio for manual workers was 90%, for non-manual workers it was 72%. In Germany the blue collar wage ratio was 73% and the sex wage ratio among white collar workers was 64%. The Netherlands had very similar figures to Germany, 74% and 63% in 1985, for blue collar and white collar workers respectively.

To summarize: Dutch women marry earlier and the marriage rate of Dutch women is higher than that of Swedish women. The

24 OECD Employment Outlook 1988 p. 149

25 OECD Employment Outlook 1988 p.214

situation of German women is more like that of Dutch women than like that of Swedish women in this respect. Dutch fertility has declined more since the 1960s than fertility in Germany and Sweden. The labor market participation of Dutch women has doubled since the 1960s, from 26% to slightly over 50%, but 1/3 of all Dutch women has a job of less than 20 hours a week compared to 6% of Swedish women and 19% of German women. The participation rate of German women is rather stable, rising from 47% in the early 1960s to 55% in 1988. The female to male wage ratio is lower in Germany and in the Netherlands than in Sweden.

5. WIFE'S CONTRIBUTION TO FAMILY EARNINGS BEFORE TAX COMPARING MACRO DATA TO OUR MICRO DATA SETS

A hypothesis can be made about the wife's share in family income in the three countries. Three factors influence women's contribution to gross family income: the participation rate of married women and married men in the labor market, the number of hours worked between married women and married men and the wage ratio between women and men. In the micro data analysis both legally married couples and couples living together without marriage are included. However, in macro data there is little information about people living together without marriage.

The participation rate of married Dutch women compared to all Dutch men is $45,0/81,0=0,55$ in 1989. For Germany this is 0,60 in 1988, for Sweden in 1986, the last year for which the Central Bureau of Statistics in Sweden separates between married and not married women the ratio was 0,96.

In the Netherlands, 33,3% of all women worked less than 20 hours a week compared to 7,9 % of the men in 1988. In Germany, 18,9% of all women worked less than 20 hours compared to 1,6% of all men. In Sweden, 6,1 of all women worked less than 20 hours a week compared to 1,9% of all men.

Data about wages of women and men are not available for the Netherlands before 1980. The wage ratio between women and men for blue collar work in the Netherlands was 74% in 1987 and for white collar work 63%. For Germany the blue collar ratio was 73% and the white collar ratio was 64%. In Sweden, the

blue collar wage ratio was 90% in 1987 and the white collar wage ratio was 74%. The macro data are summarized in Table 2.

Table 2. Women's Demographic and Labor Market situation in Germany, Sweden and the Netherlands in 1987 or latest available year

	Germany	Sweden	the Netherlands
Women's age at first marriage	24.9	27.7	24.8
men's age at first marriage	27.5	30.4	27.0
marriages per 1000 population	6.3	4.9	6.0
divorces per 1000 population	9.7	11.4	8.1
total fertility rate	1.34	1.96	1.5
labor force participation of women	54.1	81.1	50.0
labor force participation of women with children aged 0-6	34.6	84.6	26.0
labor force participation of men	82.3	85.7	80.0
Female to male wage ratio; blue collar worker per cent	73.4	89.9	74.6
" " white collar workers	64.1	74.0	63.1
Per cent women working less than 20 hours	18.9	6.1	33.3
Per cent women working more than 20 but less than 35 hours	13.5	37.2	27.1

Sources: See Statistical Appendix

Looking at these macro comparisons one can expect the contribution of Swedish wives to gross family income to be the highest of the three countries because of the high labor market participation of Swedish women and Swedish mothers, the low portion of parttime jobs with short working hours and the high wage ratio.

Although the participation rates of German and Dutch women do not differ much at the end of the 1980s, German women participate more considering the fact that they have fewer parttime jobs with short working hours. The wage ratios in Germany and the Netherlands do not differ very much. We may expect the German women to make a larger contribution to family income, than do the Dutch women.

We use microdata sets for couples from three countries West Germany, Sweden and the Netherlands and compare the effects on women's contribution to family incomes before and after tax for four tax systems, i.e. the Swedish taxes of 1984, the German taxes of 1984 and the Dutch taxes of 1988 and 1990. The Swedish data come from the first wave of a Swedish panel data set called HUS (Klevmarken and Olovsson 1986), the German data come from the first wave of the Sozioökonomische Panel (Hanefeld 1987) and the Dutch data are from the so called SWOKA data. We use an organized sample supplied to us from Siegers with the permission of SWOKA (Lambrieux and Siegers 1990). The Swedish and German data are for 1984 and the Dutch data are for 1988.

For all three countries we have included only couples with employed husbands, living together, married and not married. The reason we include only employed husbands is that the Dutch data has some representativity in this group but not for other groups. We have therefore 613 Swedish couples, 1860 German couples and 275 Dutch couples⁽²⁶⁾. The number of observations

26 From the SWOKA data we have included 284 husbands who have reported gross income and are not selfemployed (occupm and awerkm). But there are 368 husbands with labor market position full time, employed or parttime employed. Missing cases due to missing information on husbands earnings are therefore 268-283=85 cases. Seven cases did not report whether they had children or not and were dropped from the analysis. One woman reported annual earnings of 2 million guilders, which was clearly not plausible. This couple was also dropped from the analysis. Three cases had missing information on education. Thus we end up with 272 cases which were used in the analysis.

included for each data set are given in Table 3 for the subgroups we later analyze. The breakdown of the micro data presented in tables 3-6 have been done in such a way as to give information on breakdowns that usually are correlated with women's career orientation such as existence of children and their age and the education of women.

Table 3 Number of observations in the micro data

	FRG	SWE	NETH
All	1860	613	272
Two earner	868	469	107
Without children	1127	301	127
With youngest child			
age 0- 2	215	78	48
age 3- 6	233	124	40
age 7-12	285	110	57
According to education of wife			
lower	1554	447	213
higher	306	166	59

One way of analyzing whether the micro data are representative for the respective countries is to compare them to the macro data. In Table 4 labor force participation of women in the micro data sets are given, which can be compared to the data on labor force participation given in Table 2. Swedish women participate the most, followed by German women and the smallest labor force participation is shown by Dutch wives. Having children is a major determinant to labor force participation in Germany and the Netherlands but not in Sweden. Specifically women with older children in Sweden participate to the same extent as those without children. All these observations in the micro data conform with what is known from the macro data. We also find higher labor force participation among higher educated women in all three

countries⁽²⁷⁾.

Note that labor force participation of all Swedish wives is about 77% in the micro data compared to 81 per cent for 1984 in Table A 4. For German wives labor force participation is 47% in Table 4 and was 47,5% for married women in 1984 in Table A 4. Labor force participation for Dutch women is 39% in the micro data, which were collected in 1988, whereas labor force participation of married Dutch women was 43% in 1987 according to Table A 4a. Thus we do not get exactly the same figures as in the macro data, which to some extent is due to the fact that the micro data includes only couples with employed husbands, but the size order is close enough for our purpose.

Table 10 Female labor force participation in the micro data

	Germany	Sweden	the Netherlands
All	.467	.765	.393
Two earner	1.0	1.0	1.0
Without children under age 13	.543	.797	.484
With youngest child			
age 0- 2	.251	.641	.260
age 3- 6	.373	.750	.325
age 7-12	.400	.782	.351
According to education of wife			
lower	.449	.736	.477
higher	.556	.843	.502

Labor force participation for Dutch women living together with

27 Higher education in Sweden and Germany means 12 years of education or more. In the Netherlands higher education means people who have completed the following types of education: HAVO, VWO, HBO and WO. Lower education is thus: LO, LBO, MAVO and MBO.

a man has previously been estimated from the OSA 1985 data to be 48% by Bekkering⁽²⁸⁾ and to be 40% by Grift, Nieuwenburg and Siegers⁽²⁹⁾. This difference is probably caused by a difference of definitions: Bekkering included women looking for work so the percentages formed by Bekkering and Grift a.o. can not be compared with each other. Our estimate although based on a small sample comes close to those two previous studies in the Netherlands.

6. THE EFFECT OF THE DIFFERENT TAX SYSTEMS IN WIFE'S CONTRIBUTION TO FAMILY INCOME

To calculate wife's share in family income before and after tax, wages and hours worked by each spouse are the crucial variables. People in all three countries were asked to state their normal hours of work per week and their gross income. In all three countries a micro simulation model was set up containing a standard income tax program and contributions to social security paid by the employee (see appendix 1/4). In Sweden the State income tax and the average Community tax were included. As the Swedish employer pays all social security contributions (37% in 1990) social security contributions have no effect in the simulation of incomes after tax according to the Swedish tax system (see appendix 2).

In Germany the national income tax is included and the part of the social security contributions that the employee paid for sickness, pension and unemployment. When there is joint taxation we compare the family income after tax that the couple pays with that which they would pay if the wife did not work in the labor market. This program was run twice: first with actual earnings of husband and wife and next setting the wife's earnings equal to zero. The difference between the two is the value of the female share of family earnings after tax

28 Bekkering, J.: "Vrouwen aan het werk", Stichting voor Economisch Onderzoek, Universiteit van Amsterdam 1988, p.A33

29 Grift, Y., Nieuwenburg, K. and Siegers, J.: "Fiscus en arbeidsmarktparticipatie door vrouwen" in Economisch Statistische Berichten 1990, p.882

according to the German tax system(see appendix 1).

In the Netherlands, the national income tax is included and the part of social premiums paid by the employee. The tax system and the system of contributions to social security was changed starting from 1.1.1990. For the Netherlands two tax systems, before Oort 1988 and after Oort 1990, were programmed. For the Dutch sample two calculations of income after tax were made. Both programs were run twice: first with actual earnings of husband and wife and next setting the wife's earnings equal to zero, like it was done with the German data (see appendix 3 and 4) to take account of the joint element of the Dutch tax systems present by the fact that one earner couples are allowed a higher basic deduction in comparison to separate taxation.

In the micro data analysis below, we construct a measure of the contribution of the secondary earner, for simplicity assumed to be the woman to family income in the following way. Observed total net family income is denoted by Y_2 . By Y_1 we mean the total net income that would result if the family received only the husband's income. Then the wife's contribution to the family income is defined as $(Y_2 - Y_1) / Y_2$, the net family income loss if she withdraws from the labor market. Index 2 indicates positive incomes from both husband and wife and index 1 indicates positive incomes only from the husband. This measure varies from zero, if the wife does not work, to one if she is the only wage earner (see Table 5).

Table 5 Wife's contribution to earned family income before tax as a proportion of total earned family income

	Germany	Sweden	the Netherlands
All	.150	.288	.119
Two earner	.322	.376	.302
Without children under age 13	.187	.306	.167
With youngest child			
age 0- 2	.072	.246	.066
age 3- 6	.103	.276	.087
age 7-12	.101	.280	.078
According to education of wife			
lower	.142	.270	.092
higher	.195	.336	.215

Next we calculate the actual after tax income of the couple (X_2) according to the programs in the appendici 1/4 for the different tax systems. After tax is defined as after tax and social security contributions paid by the employee. Then we calculate the after tax income of the same couple, but setting wife's earnings to zero (X_1). The contribution of the wife to family income is then $(X_2 - X_1)/X_2$ (see Table 6).

Table 6 Female contribution to family income; after tax

	Tax system:		Dutch	Dutch	Before
	German	Swedish	before Oort 1988	after Oort 1990	Tax
<u>A. German Couples</u>					
All	.124	.166	.138	.147	.150
Two earner	.310	.407	.345	.369	.322
Without children under age 13	.154	.205	.172	.183	.187
With youngest child					
age 0- 2	.060	.082	.065	.071	.072
age 3- 6	.085	.116	.094	.102	.103
age 7-12	.083	.117	.091	.100	.101
According to education of wife					
lower	.117	.156	.129	.139	.142
higher	.159	.216	.179	.189	.195
<u>B. Swedish couples</u>					
All	.237	.311	.264	.282	.288
Two earner	.309	.406	.345	.369	.376
Without children under age 13	.252	.332	.282	.300	.306
With youngest child					
age 0- 2	.205	.262	.225	.242	.246
age 3- 6	.227	.297	.253	.272	.276
age 7-12	.229	.305	.256	.274	.280
According to education of wife					
lower	.223	.290	.249	.265	.270
higher	.274	.368	.306	.330	.336
<u>C. Dutch couples</u>					
All	.102	.135	.107	.116	.119
Two earner	.259	.344	.274	.295	.302
Without children under age 13	.142	.182	.151	.163	.167
With youngest child					
age 0- 2	.057	.078	.060	.065	.066
age 3- 6	.077	.112	.080	.084	.087
age 7-12	.068	.095	.070	.078	.078
According to education of wife					
lower	.079	.105	.083	.090	.092
higher	.185	.245	.197	.209	.215

Results based on this measure as well as estimates of the effects of taxation or incentives for women with a secondary earner status to supply labor to the market has been estimated

comparing Sweden and Germany in Gustafsson⁽³⁰⁾.

Swedish women contribute a much larger proportion of family earnings before tax than do women in the Netherlands and Germany. Wife's contribution before tax was 0.288% of family income in Sweden, 15 per cent in Germany and 11,9 per cent in the Netherlands. This is consistent with the story, that the macro data above tell us, higher female labor force participation and larger female to male wage ratio in Sweden than in the other two countries. Also, comparing two earner couples Swedish women contribute more to family income than do women in the other two countries, but the difference is far smaller with 37,6 per cent for Swedish women, 32.2 per cent for German women. The better female to male wages are partly set off by more parttime work among employed Swedish women than among employed German women. Dutch women contribute considerably less than German women when we include all women in the comparison. Education of the woman is the most decisive factor in increasing wife's contribution to family income in the Netherlands. Higher educated Dutch women contribute more to family income before tax 21.5 per cent than do higher educated German women 19.5 per cent. The presence of children lowers wife's contribution to family income considerably in both Germany and the Netherlands, whereas it has only a minor effect on the contribution to family income of Swedish wives. One of the reasons for this may be the existence of subsidized child care in Sweden⁽³¹⁾. Gustafsson and Stafford (1991) show that lower parental fees increases women's simultaneous decision of demanding childcare and supply labor to the market. Most of the variation between countries, which results from the presence of children comes from differences in labor force participation. Compare Table 10 for the micro data and Table 5 for macro data.

The share of family income after tax, which comes from the

30 Gustafsson, Siv, 1990a, Separate Taxation and Married women's Labor Supply. A Comparison between West Germany and Sweden. Research Memorandum, University of Amsterdam, Economics Department, no. 9016.

31 Gustafsson, Siv and Stafford Frank, 1991, Daycare subsidies and Labor supply in Sweden. revised draft of University of Amsterdam, Department of Economics, Research Memorandum no. 9001.

wife is increased when the Swedish tax system is applied, in comparison to the proportion she contributes before tax. This augmentation applies to Swedish, German and Dutch wives, as shown in Table 6 A, B, C. The reason is the high degree of progressivity in combination with complete separate taxation of earnings in the Swedish tax system. The woman's smaller earnings, because of lower wage and parttime work, are therefore taxed at a considerably lower average tax than the higher earnings of the fulltime working men⁽³²⁾. The Swedish tax system has thus been very effective in creating incentives for the Swedes to be dual earner couples. Of course the system simultaneously has created a disincentive to remain a single earner couple. These incentives created by the introduction of separate taxation of spouses in 1971 have been reinforced over time. Sweden has had considerable inflation in the period since 1971 and one of the effects has been to push up also ordinary earnings into the higher marginal tax brackets. The incentives also for the industrial blue collar worker to encourage his wife to participate in the labor market and add low taxed earnings to the family income therefore has increased over time.

The German tax system invariably lowers the contribution to family income of the second earner. This is so because secondary earnings are taxed on top of the earnings of the main wage earner. The difference is quite substantial.

Wives of Dutch dual earner couples contribute 30.2% to family income before tax. If treated by the Swedish tax system of 1984 those same 30.2% are worth 34.4% after Swedish tax, because if all these women were to leave the labor force family income after tax according to Table 6 C would be lower by 34.4%. If the Dutch dual earner couples would be treated by the German 1984 tax system instead, only 25.9% is the proportion of family income, that the women account for.

Because of the joint taxation element that exists in the Dutch system, women contribute a smaller proportion after Dutch tax

32 Note, however that Sweden since 1984 has lowered the highest marginal tax rate, which was then 84% to 75% and that in January 1991 a major tax reform will cut the highest marginal tax rate to 55% with the majority of wage earners falling in a range of 30% proportional tax.

than before tax. The tax rules of 1988 lowered the value of the wife's contribution from 30.2 to 27.4 per cent and the rules of 1990 only lowered them to 29.5%. A remarkable feature of the Swedish tax system is that it increases the value of the secondary earned income. The system has therefore created strong incentives for wives to work in the market. In a strictly proportional tax system women's contribution before tax would be the same after tax. We may call such a system neutral with respect to secondary earnings. The German system is not neutral but the lack of neutrality is to the detriment of secondary earnings.

The effects of the recent tax changes in the Netherlands is to improve the situation for secondary earners although the contribution to family income after tax still is smaller ??? before tax different from Swedish taxation.

For example Dutch women with higher education on average contributed 33,6 per cent of family income before tax. Before the Oort tax reform of 1990 their contribution after tax was 30,6 per cent and after the reform it is now 33,0 per cent. Of the four tax systems studied the present Dutch system comes closest to neutrality with respect to how much women contribute before tax to family income.

7. CONCLUSIONS

A tax system of completely separate taxation of earnings between husband and wife gives the most favorable treatment of secondary earnings and a tax system of completely joint earnings, gives the least favorable treatment of secondary earnings.

West Germany has chosen for the one extreme with their "splittingstariff", which penalizes dual earner couples and favors one earner couples.

Sweden has chosen for the other extreme with completely separate taxation, which has meant a major incentive for couples to choose the dual earner model. The pro-secondary workers effect has been reinforced by the extremely high progressivity of the Swedish tax system and the reform of 1991 in Sweden is therefore expected to reduce this effect.

The Netherlands because of the right to deduct the basic deduction of a nonworking spouse falls between Sweden and Germany. The Oort reform lowered the basic deduction substantially and hence also diminished the joint taxation element of the Dutch tax system. The Oort reform therefore reduced the negative tax effects on secondary earnings, without introducing the positive effects for secondary earnings present in the Swedish model.

If the basic deductions in the Netherlands would happen to be increased again the negative effects for secondary earnings would again increase. If the Dutch government is serious about equality between women and men in the labor market, the goal of subsidizing single earner couples, has to give way for the goal of treating secondary earners in the same manner as primary earners, i.e. letting them pay tax only on the basis of their own earnings and not on the basis of earnings of their spouse. If the tax systems had been the only difference between the three countries considered and if only the tax incentives had determined married women's labor force participation we would expect labor force participation in Sweden to be the highest followed by the Netherlands and Germany. However Germany has a higher labor force participation of married women than has the Netherlands. Obviously other factors not explicitly treated in this analysis of the tax systems also contribute to explain female labor force participation. The availability and cost of childcare, the demand for female labor, women's legal rights, the rights to parental leave, the possibility to match school hours with mother's working hours, store opening schedules etc. are some possible sources of differences between countries.

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Appendix A THE INTRODUCTION OF SEPARATE TAXATION IN SWEDEN

The discussions and arguments, that preceded the switch from joint to separate taxation in Sweden in 1971, are clearly and informatively analyzed by Elvander(1974). Criticism against joint taxation is almost as old as the system itself. Joint taxation was introduced in 1902 and the first parliament action in the Swedish Riksdag against it was issued in 1904, where it was argued that joint taxation was disruptive to marriage and encouraged "sinful liaisons". In the fall of 1947, there was a strong public opinion against the high marginal taxes on married women's earnings, because the system of tax at source had been introduced, which did not fully consider the marginal taxes on married women's work, so people were charged afterwards for those earnings. A committee to consider the introduction of separate taxation was formed. In this committee, the representative of the conservative party, the female member of parliament, Ebon Andersson argued in favor of a split income taxation system similar to the present German one. The committee decided to keep joint taxation, but introduce a deduction for working married women called "förvärvsavdraget" to acknowledge the fact, that working women could do less of economically important work around the house than could housewives. The tax system introduced in 1952 also incorporated separate scales for married and single people, which in fact meant that 90 per cent of the couples had split taxation like the present German system.

In the mid 1960s, an increasing number of Swedish women had entered higher education, and the prospect of not being able to afford a career seemed to condemn them to lifetime imprisonment within the four walls of a home. Elvander notes, that the debate on separate taxation was not carried out along political party lines, but was enacted by individual women involved in the feminist movement. The governing social democrat party showed little interest in a reform in favor of separate taxation, arguing that it was a luxury problem, which had no impact for the majority of women. Eva Moberg claimed, that the contemporaneous system regarded women as only conditionally liberated, i.e. they were allowed to work, only if they held the upbringing of children and the home as their first duty. Sonja Lyttkens, a female mathematician from the University of Uppsala, showed that the right for the husband to deduct two basic allowances from his income, when his wife does not participate in the labor market, is equivalent to a large marginal tax, and that this has a large discouraging impact on married women's labor supply also for low income couples just like it is the case in present day Dutch taxes. By very active argumentation and private meetings with persons of power, the feminists later persuaded the political parties and the powerful labor market organizations. The representative of the labor union, LO was Rudolf Meidner, then head of LO:s economic research department, and Elvander notes about him: He knew, that he would never have LO agree on separate taxation, but he decided in favor of it, because he

was convinced and hoped, that time would give him right. Today, an overwhelming majority of Swedes think that separate taxation is right. There is no political opinion for joint taxation. Of course, the number of one earner families in present day Sweden is quite small as shown above.

The medium term economic forecast of 1959 stated, that in the face of labor shortage, married women and particularly mothers of young children, were the only important reserve of labor. The medium term survey of 1965 again stated the prospects of a growing shortage of labor. This was the argument that finally convinced the minister of finance of the time Gunnar Sträng. The consequent debate centred on the prospective adverse effects for one earner families. The solution became to compensate them with an extra deduction, "the housewife deduction" which has been kept at its nominal value of Skr. 1800 until today (1990).

STATISTICAL APPENDIX

Table A.1 Average age at first marriage in Germany (FRG), Sweden (SWE) and The Netherlands (NETH)

	FRG		SWE		NETH	
	Women	Men	Women	Men	Women	Men
1968	23.3	25.8	23.5	26.0	22.9	24.9
1969	23.1	25.7	23.8	26.1	22.8	24.8
1970	23.0	25.6	24.0	26.2	22.7	24.7
1971	22.9	25.5	24.2	26.4	22.7	24.7
1972	22.9	25.5	24.4	26.6	22.7	24.6
1973	22.9	25.5	24.6	26.9	22.6	24.6
1974	22.9	25.6	24.8	27.1	22.6	24.6
1975	22.7	25.3	25.1	27.5	22.6	24.8
1976	22.9	25.6	25.3	27.8	22.6	24.8
1977	22.9	25.7	25.5	28.1	22.7	25.0
1978	23.1	25.9	25.8	28.4	22.9	25.2
1979	23.2	26.0	26.2	28.8	23.0	25.3
1980	23.4	26.1	26.4	29.0	23.1	25.4
1981	23.6	26.3	26.6	29.2	23.2	25.5
1982	23.8	26.6	26.9	29.5	23.4	25.7
1983	24.1	26.2	27.1	29.8	23.6	25.9
1984	24.4	27.0	27.3	30.0	24.0	26.2
1985	24.6	27.2	27.5	30.1	24.4	26.6
1986	24.9	27.5	27.7	30.4	24.8	27.0
1987					25.0	27.2

Sources: SOS Befolkningsförändringar del 3. Hela riket länen mm. (Population changes), Statistics Sweden, yearly

Statistisches Bundesamt, Fachserie 1, Bevölkerung und Erwerbstätigkeit, Reihe 2, Bevölkerungsbewegung, Federal Republic of Germany.

Eurostat Demographic Statistics 1989 serie 3, C.B.S. Statistisch Zakboek, 75 jaar Statistiek van Nederland.

Table A.2 Marriage and divorce

Year	Marriages per 1000 of population			Divorces per 1000 of married women		
	FRG	SWE	NETH	FRG	SWE	NETH
1968	7.4	6.6	9.2	4.2	5.9	2.7
1969	7.3	6.1	9.1	4.7	6.3	3.0
1970	7.3	5.4	9.5	5.1	6.7	3.3
1971	7.0	4.9	9.3	5.2	7.1	3.6
1972	6.7	4.8	8.8	5.5	8.0	4.6
1973	6.4	4.7	8.0	5.7	8.5	5.5
1974	6.1	5.5	8.1	6.2	14.5	5.8
1975	6.3	5.4	7.3	6.7	14.3	6.0
1976	5.9	5.5	7.0	6.9	11.7	6.2
1977	5.8	4.9	6.7	4.8*	11.2	6.3
1978	5.4	4.6	6.4	2.1*	11.2	6.5
1979	5.6	4.5	6.1	5.1*	11.3	7.0
1980	5.9	4.5	6.4	6.1*	11.3	7.5
1981	5.8	4.5	6.0	7.2	11.5	8.3
1982	5.9	4.5	5.8	7.8	12.0	9.0
1983	6.0	4.4	5.5	8.1	12.0	9.3
1984	5.9	4.4	5.7	8.7	11.9	9.8
1985	6.0	4.6	5.7	8.6	11.7	9.8
1986	6.1	4.6	6.0	8.3	11.4	8.6
1987	6.3	4.9	6.0	9.7		8.1
1988		5.2	6.0			8.1

Sources: Statistisches Jahrbuch annual from Federal Republic of Germany.

SOS Befolkningsförändringar del 3. Hela riket länen mm. (Population changes), Statistics Sweden.

C.B.S. Statistisch Zakboek, 90 jaar Statistiek van Nederland, Staatsuitgeverij Den Haag 1975.

*) The low divorce rates in Germany from 1977 to 1980 are due to uncertainty about the effects of the new divorce act that was introduced in 1977. Apart from the lower figures in this period there has been an increasing trend. The large divorce rates in Sweden in 1974 and 1975 are explained by the new divorce act in 1974 which made it a lot easier to divorce.

Table A.3 Fertility in Germany (FRG), Sweden (SWE) and The Netherlands (NETH)^{a)}

Year	Total Fertility Rate			Per Cent Not Married Mothers		
	FRG	SWE	NETH	FRG	SWE	NETH
1963	2.51	2.33	3.2	5.2	12.6	1.6
1964	2.54	2.47	3.2	5.0	13.1	1.7
1965	2.50	2.47	3.0	4.7	13.8	1.8
1966	2.53	2.37	2.9	4.6	14.6	2.0
1967	2.48	2.28	2.8	4.5	15.1	2.1
1968	2.38	2.09	2.7	4.4	15.8	2.0
1969	2.21	1.94	2.7	5.0	16.3	2.1
1970	2.01	1.94	2.6	5.4	18.4	2.1
1971	1.92	1.98	2.7	5.8	21.6	2.0
1972	1.71	1.93	2.2	6.0	25.0	1.9
1973	1.54	1.88	1.9	6.2	28.4	1.9
1974	1.51	1.89	1.8	6.2	31.4	2.0
1975	1.45	1.78	1.7	6.1	32.4	2.2
1976	1.46	1.69	1.6	6.4	33.2	2.5
1977	1.40	1.65	1.6	6.5	34.7	2.7
1978	1.38	1.59	1.6	7.0	35.9	3.1
1979	1.38	1.66	1.6	7.1	37.5	3.4
1980	1.44	1.68	1.6	7.6	39.7	4.1
1981	1.43	1.63	1.6	7.2	41.2	4.8
1982	1.41	1.62	1.5	8.5	42.0	5.9
1983	1.33	1.65	1.5	8.8	43.6	7.0
1984	1.29	1.65	1.5	9.1	44.6	7.7
1985	1.28	1.73	1.5	9.4	46.4	8.3
1986	1.34	1.79	1.6	9.6	48.4	8.8
1987		1.84	1.6	9.7		9.3
1988		1.96	1.5			10.1
1989		2.00				

Sources: SOS Befolkningsförändringar del 3. Hela riket länen mm. (Population changes), Statistics Sweden, yearly.

Statistisches Bundesamt, Fachserie 1, Bevölkerung und Erwerbstätigkeit, Reihe 2, Bevölkerungsbewegung, Federal Republic of Germany. Eurostat Demographic Statistics 1989 serie 3, C.B.S. Statistisch Zakboek, 75 jaar Statistiek van Nederland.

a) For Germany only married fertility i.e. first children among all children born to a married couple. For Sweden we have added a column for all children born to the woman.

Table A.4 Labor force participation in West Germany, Sweden and The Netherlands

Year	West Germany age 15-64				Sweden age 15-64			
	Men	Women			Men	Women		
		All	Not Marr'd	Married		All	Not Marr'd	Married
1963	90.9	46.9	79.1	35.9	89.9	54.5	69.6	47.0
1964	90.4	46.8	78.3	36.5	89.6	54.0	68.6	
1965	90.2	46.9	76.9	36.9	89.3	53.8	67.2	47.2
1966	90.6	46.7	74.7	36.3	89.0	55.1	66.7	49.3
1967	89.3	45.6	74.3	37.1	88.1	54.9	65.5	49.8
1968	89.6	45.9	72.4	37.8	88.0	56.4	66.1	51.8
1969	89.2	46.0	69.9	39.1	87.5	57.6	65.9	53.4
1970	88.5	46.2	68.9	40.0	87.0	59.3	65.9	56.1
1971	88.1	46.5	67.4	41.8	86.9	60.9	66.1	58.2
1972	87.4	47.5	64.9	43.2	86.6	62.0	66.1	59.8
1973	86.6	48.2	62.6	43.6	86.8	62.7	65.6	61.2
1974	85.8	48.1	64.4	43.6	87.5	65.2	68.1	63.6
1975	86.0	48.2	62.7	43.9	88.3	67.9	70.8	66.2
1976	85.0	48.3	61.9	44.7	88.6	69.1	71.5	67.7
1977	84.6	48.9	61.5	44.7	88.0	70.6	72.0	69.8
1978	84.5	49.0	62.4	45.2	87.6	72.1	72.5	71.8
1979	84.5	49.7	60.7	46.1	87.8	73.8	73.3	73.8
1980	84.4	50.2	60.6	46.8	87.7	75.1	74.4	75.6
1981	83.5	50.6	59.5	47.4	86.6	76.3	74.4	77.7
1982	83.0	51.0	58.5	47.3	86.3	76.9	74.3	78.9
1983	82.0	50.7	61.4	47.5	86.0	77.6	74.6	80.0
1984	81.4	51.7	58.8	47.5	85.6	78.2	75.0	80.9
1985	81.9	52.7		47.8	86.0	79.2	76.0	82.0
1986	82.0	53.4		48.4	85.9	80.0	76.7	82.9
1987	82.3	54.1		48.5	85.7	81.1	n.a.	n.a.
1988	82.5	55.0		49.4	86.2	81.8	n.a.	n.a.

Sources: Statistics Sweden, Lönner (Wages) part I.

AKU Årsmedeltal, (Labor Force Surveys), yearly.

Statistische Jahrbücher, diverse Jahrgänge, Ergebnisse des Mikrozensus, 1983/84 EG Arbeitskräftestichprobe.

Table A.4 continued Labor force participation in The Netherlands^{a)}

Year	The Netherlands age 15-64			
	Men	Women		
		All	Not married	Married
1960	90.4	25.6	60.4	7.4
1961				
1962				
1963				
1964				
1965				
1966				
1967				
1968				
1969				
1970				
1971	85.1	30.0	57.8	16.7
1972				
1973				
1974				
1975	83.9	34.4	52.9	24.2
1976				
1977	82.3	33.3	50.4	26.4
1978				
1979	78.4	34.5	47.5	28.2
1980				
1981	78.1	38.8	51.5	32.3
1982				
1983	77.9	41.4	52.8	35.2
1984				
1985	76.7	42.5	53.5	42.3
1986				
1987	80.0	50.0		43.0
1988	80.0	52.0	67.0	45.0
1989	81.0	52.0	67.0	45.0

Source: CBS: 1960 and 1971 are data of the Volkstelling. From 1975-1985 data of the Arbeidskrachtentellingen were available every two years. From 1987 data are available for every year of the Enquete beroepsbevolking. Data for the period 1961-1971 and 1972-1975 are not available for women.

Table A.5 Labor force participation of women with children.

Year	All married women with children 0-6		
	FRG	SWE	NETH
1970		47.5	
1971		50.1	
1972	32.5	52.1	
1973	33.9	52.2	
1974	33.6	55.3	
1975	32.9	58.8	14.6
1976	32.9	61.2	
1977	33.6	64.4	14.9
1978	33.4	67.2	
1979	33.8	70.3	17.9
1980	35.1	73.7	
1981	35.6	79.6	20.9
1982	35.7	79.6	
1983		81.3	24.6
1984		82.2	
1985	34.2	84.2	26.0
1986	34.4	84.6	
1987	34.6		
1988			
1989			

Sources: AKU Arsmedetel, (Labor Force Surveys) yearly.
 Statistisches Bundesamt, Bevölkerung und Erwerbstätigkeit, Reihe 3,
 Haushalte und Familien, West Germany.
 CBS: Arbeidskrachtentellingen.
 No data available for the period 1972-1975 and after 1985.

Table A.6 Distribution of Normal Hours of Work in West Germany, Sweden (1984 and 1985) and The Netherlands (1985 and 1987)^{a)}

Year	Hours of Work	FRG		SWE		NETH	
		Women	Men	Women	Men	Women	Men
1984	-20	7.0	1.9	8.5	2.5		
	20-34	25.7	1.5	37.0	8.5		
	35+	67.3	98.0	54.5	92.8		
1985	-20					26.0	2.2
	20-34					28.3	6.2
	35+					45.7	91.6
1987	-20					32.8	7.1
	20-34					26.7	8.1
	35+					40.5	84.8
1988	-20	18.9	1.6	6.1	1.9		
	21-35	13.5	1.3	37.2	5.0		
	35+	67.6	97.1	56.7	93.1		

Sources: Germany: Büchtemann and Schupp 1986, primary source: Statistische Bundesamt: EG Arbeitskräftestichprobe 1984.

Sweden: AKU Årsmedeltal 1974, Statistics Sweden.

The Netherlands: CBS: Arbeidskrachtentelling 1985, Enquete beroepsbevolking 1987.

a) Age range for Germany 16+, for the Netherlands 15-64, for Sweden 1984: 16-74 and for Sweden 1988 16-64.

Table A.7 Wage Ratios Female to Male in Industry in West Germany, Sweden and The Netherlands.

Year	FRG		SWE		NETH	
	Blue Collar	White Collar	Blue Collar	White Collar	Blue Collar	White Collar
1963	67.5	58.0	72.2	51.7		
1964	67.7	58.3	73.6	52.4		
1965	67.5	58.9	74.9	53.2		
1966	68.3	59.5	76.5	53.9		
1967	68.9	60.0	77.6	54.3		
1968	69.0	59.6	78.2	55.8		
1969	68.9	59.4	79.1	57.1		
1970	68.6	59.9	80.0	58.6		
1971	69.1	60.4	82.0	60.7		
1972	69.6	61.2	83.5	61.5		
1973	70.3	62.1	83.9	63.2		
1974	71.3	62.9	83.8	64.5		
1975	72.3	63.6	84.8	67.2		
1976	72.4	63.7	86.6	69.1		
1977	72.7	64.1	87.1	70.0		
1978	72.9	64.5	88.4	70.8		
1979	72.6	64.4	89.1	71.1		
1980	72.4	64.4	89.8	71.4	73.05	
1981	72.5	64.6	89.9	72.1	72.70	
1982	72.7	64.8	90.2	72.7	73.11	60.02
1983	72.2	63.5	90.0	73.5	73.92	61.08
1984	72.3	63.7	89.8	72.2	74.01	63.06
1985	72.8	63.7	89.7	72.4	73.56	64.12
1986	73.1	64.0	90.2	73.6	74.18	62.67
1987	73.4	64.1	89.9	74.0	74.57	63.10
1988			89.8	74.1		

Sources: Germany: Statistisches Jahrbuch annual from Federal Republic of Germany.
 Netherlands: Eurostat: Earnings;
 Sweden: SOS löner del 1, del 2, Statistics Sweden, Stockholm.
 For the Netherlands data are not available for the period before 1980.

```

*This is the German tax system*
drop if hrs_f<0;
gen wagef=dmwage_f;
replace wagef=dmwage_p if dmwage_f==. | dmwage_f==0;
#delimit;
gen inc_f=hrs_f*wage_f*52;
#delimit;
gen inc_m=hrs_m*wage_m*52;
gen gfaminc=inc_f+inc_m ;
drop if gfaminc==.;
drop if gfaminc==0;
* female social security payments;
#delimit ;
gen minc_f=inc_f/12;
gen socsec_f=0;
replace socsec_f=socsec_f+inc_f*0.055
if minc_f>390 & minc_f<=3900;
replace socsec_f= socsec_f+214.5*12
if minc_f>3900;
replace socsec_f= socsec_f + inc_f * .116
if minc_f > 390 & minc_f <= 5200;
replace socsec_f= 603.2*12
if minc_f > 5200;
* male social security payment;
gen socsec_m=0 ;
gen minc_m=inc_m/12;
replace socsec_m=socsec_m+inc_m*0.055
if minc_m>390 & minc_m<=3900;
replace socsec_m=socsec_m + 214.5*12
if minc_m>3900;
replace socsec_m= socsec_m + inc_m * .116
if minc_m > 390 & minc_m <= 5200;
replace socsec_m= socsec_m + 603.2*12
if minc_m > 5200;
* joint taxation
#delimit;
gen faminc=(inc_f+inc_m)-2*(480+600);
replace faminc=0 if faminc<0;
gen x =.99* faminc;
replace faminc=faminc-2*x;
replace faminc=faminc+x-4680
if x >4680;
replace faminc = faminc+x-2340
if x>2340;
replace faminc= faminc-2*(270+564)-432*n_child;
#delimit;
replace faminc=0 if faminc<0;
*notice n_child= children under 13, tax laws give
*reduction for children under 18;
replace x=faminc/2;
gen y=(x-18000)/10000;
gen z=(x-60000)/10000;
#delimit;
gen tax=0 if x <=4212;
replace tax=.22*x-926 if x >4212 & x <=18000;
#delimit ;

```

```
replace tax=(((3.05*y-73.76)*y+695)*y+2200)*y+3034
if x > 18000 & x <=60000;
replace tax=(((.09*z-5.45)*z+88.13)*z+5040)*z+20018
if x > 60000 & x <=130000;
replace tax=.56*x-14837
if x>130000;
#delimit;
gen taxrate=tax*2/(inc_f+inc_m);
netinc_f=inc_f*(1-taxrate)-socsec_f;
netinc_m=inc_m*(1-taxrate)-socsec_m;
gen famnet=netinc_f+netinc_m;
```

*This is the Swedish tax program with forvarvsavdrag and actual;
*community taxes included;

```
replace wagek=0 if wagek==. & hrs_f==0;
replace wagem=0 if wagem==. & hrs_m==0 ;
gen wage_f=pdwage;
gen inc_f=hrs_f*wage_f*52;
gen inc_m=brtink_m;
*female taxes;
*union fee deduction;
replace inc_f= inc_f-500 if inc_f>7500;
* no single parents in this run (deduction=1800 for single;
*parents;
*deduction if there is at least one child less than 16 years of;
*age "foervaervavdraget" and the wife earns less than her
husband;
gen forvarv=0 if ageby<16;
gen deduc=.25*inc_f if ageby<16;
replace forvarv=inc_f-deduc if deduc<=2000 & ageby<16 ;
replace forvarv=2000 if inc_f-deduc>2000 & inc_f ~=. & ageby<16;
replace forvarv=0 if inc_f>inc_m;
```

```
*capital incomes are not included;
*The community tax varies by;
*community. Here I use mean community tax;
gen comtax_f =0.30*(inc_f-7500);
replace comtax_f=0 if comtax_f<0;
*State tax basic amount for the female;
#delimit;
gen sttax_f=0 if inc_f<=7300;
replace sttax_f=0.03*(inc_f-7300)
if inc_f>7300 & inc_f <=29200;
replace sttax_f=657+0.04*(inc_f-29200)
if inc_f > 29200 & inc_f <= 51100;
replace sttax_f=1533+0.07*(inc_f-51100)
if inc_f> 51100 & inc_f <= 58400;
replace sttax_f=2044+0.1*(inc_f-58400)
if inc_f > 58400 & inc_f <= 65700;
replace sttax_f=2744+0.19*(inc_f-65700)
if inc_f> 65700 & inc_f <= 73000;
replace sttax_f=4131+0.23*(inc_f-73000)
if inc_f>73000 & inc_f <= 87600;
replace sttax_f=7489+0.26*(inc_f-87600)
if inc_f > 87600 & inc_f <= 94900;
replace sttax_f=9387+0.29*(inc_f-94900)
if inc_f > 94900 & inc_f <= 102200;
replace sttax_f=11504+0.32*(inc_f-102200)
if inc_f > 102200 & inc_f <= 109500;
replace sttax_f=13840+0.36*(inc_f-109500)
if inc_f > 109500 & inc_f <= 124100;
replace sttax_f=19096+0.38*(inc_f-124100)
if inc_f > 124100 & inc_f <= 138700;
replace sttax_f=24644+0.39*(inc_f-138700)
if inc_f> 138700 & inc_f <= 146000;
replace sttax_f=27564+0.40*(inc_f-146000)
if inc_f> 146000 & inc_f <= 189800;
replace sttax_f=45084+0.41*(inc_f-189800)
```

```

if inc_f > 189800 & inc_f<= 219000;
replace sttax_f=57056+0.44*(inc_f-219000)
if inc_f > 219000;
* The state tax additional amount for the female;
gen adtax_f=0 if inc_f < 116800;
replace adtax_f=0.02*(inc_f-116800)
if inc_f >= 116800 & inc_f< 138700;
replace adtax_f=438+0.03*(inc_f-138700)
if inc_f>= 138700 & inc_f < 146000;
replace adtax_f=657+0.05*(inc_f-146000)
if inc_f >= 146000 & inc_f < 167900;
replace adtax_f=1752+0.07*(inc_f-167900)
if inc_f>= 167900 & inc_f < 189800;
replace adtax_f=3285+0.08*(inc_f-189800)
if inc_f>= 189800 & inc_f< 328500;
replace adtax_f=14381+0.10*(inc_f-328500)
if inc_f>= 328500;
gen totax_f=comtax_f+sttax_f+adtax_f;
#delimit ;
gen snet_f=inc_f-totax_f;
replace snet_f=0 if snet_f==. | snet_f<0;
#delimit ;
*male taxes;
*union fee deduction;
replace inc_m= inc_m-500 if inc_m>7500;
#delimit cr;
*(single parent deduction=1800) not included
*capital incomes are not included
*deduction if there is at least one child less than 16 years of
*age "foervaervavdraget" and the husband earns less than his wife
gen forv=0 if ageby<16
gen ded=.25*inc_m if ageby <16
replace forv=inc_m-ded if ded<=2000 & ageby<16
replace forv=2000 if inc_m-ded>2000 & inc_m ~= . & ageby<16
replace forv=0 if inc_m>inc_f
*The community tax varies by community. Here we have actual
*community tax rates
#delimit ;
gen comtax_m=0.30*(inc_m-7500);
replace comtax_m=0 if comtax_m<0;
*State tax basic amount for the male;
gen sttax_m=0 if inc_m<=7300;
replace sttax_m=0.03*(inc_m-7300)
if inc_m>7300 & inc_m <=29200;
replace sttax_m=657+0.04*(inc_m-29200)
if inc_m > 29200 & inc_m <= 51100;
replace sttax_m=1533+0.07*(inc_m-51100)
if inc_m> 51100 & inc_m <= 58400;
replace sttax_m=2044+0.1*(inc_m-58400)
if inc_m > 58400 & inc_m <= 65700;
replace sttax_m=2744+0.19*(inc_m-65700)
if inc_m> 65700 & inc_m <= 73000;
replace sttax_m=4131+0.23*(inc_m-73000)
if inc_m>73000 & inc_m <= 87600;
replace sttax_m=7489+0.26*(inc_m-87600)
if inc_m > 87600 & inc_m <= 94900;
replace sttax_m=9387+0.29*(inc_m-94900)

```



```
if inc_m > 94900 & inc_m <= 102200;
replace sttax_m=11504+0.32*(inc_m-102200)
if inc_m > 102200 & inc_m <= 109500;
replace sttax_m=13840+0.36*(inc_m-109500)
if inc_m > 109500 & inc_m <= 124100;
replace sttax_m=19096+0.38*(inc_m-124100)
if inc_m > 124100 & inc_f <= 138700;
replace sttax_m=24644+0.39*(inc_m-138700)
if inc_m > 138700 & inc_m <= 146000;
replace sttax_m=27564+0.40*(inc_m-146000)
if inc_m > 146000 & inc_m <= 189800;
replace sttax_m=45084+0.41*(inc_m-189800)
if inc_m > 189800 & inc_m <= 219000;
replace sttax_m=57056+0.44*(inc_m-219000)
if inc_m > 219000;
* The state tax additional amount for the male;
gen adtax_m=0 if inc_m >0 & inc_m < 116800;
replace adtax_m=0.02*(inc_m-116800)
if inc_m >= 116800 & inc_m < 138700;
#delimit ;
replace adtax_m=438+0.03*(inc_m-138700)
if inc_m >= 138700 & inc_m < 146000;
replace adtax_m=657+0.05*(inc_m-146000)
if inc_m >= 146000 & inc_m < 167900;
#delimit;
replace adtax_m=1752+0.07*(inc_m-167900)
if inc_m >= 167900 & inc_m < 189800;
replace adtax_m=3285+0.08*(inc_m-189800)
if inc_m >= 189800 & inc_m < 328500;
replace adtax_m=14381+0.10*(inc_m-328500)
if inc_m >= 328500;
gen totax_m=comtax_m+sttax_m+adtax_m;
gen snet_m=inc_m-totax_m;
replace snet_m=0 if snet_m==.;
#delimit;
gen snet=snet_m+snet_f;
```

*This is the Dutch Pre-Oort tax system
 *Note that all income variables are spelled with k

```
#delimit;
gen wage_f=pdwage;
gen d11child=dumageby;
gen brtink_f=0;
replace brtink_f=hrs_f*wage_f*52;
gen brtink_m=hrs_m*dwage_m*52;
#delimit;
*Wife's incomes and taxes
*start by calculating the taxable income of the wife
*capital incomes are not included
*"belastbaar inkomen";
#delimit;
*Wet arbeidsongeschiktheid;
gen wao_f=0;
replace wao_f=0 if brtink_f<=23660;
replace wao_f=.11*(brtink_f-23660)
if brtink_f>23660 & brtink_f<=68380;
replace wao_f=.11*(68380-23660)
if brtink_f>68380;
*Social security,Ziekenfondswet(ZF), werkloosheidswet(WW)
*en vervroegd uittreden(VUT);
gen socsec_f=0;
replace socsec_f=.0443*brtink_f if brtink_f<=68380;
replace socsec_f=.0443*68380 if brtink_f>68380;
*Part of the social security, ZFW, paid by employer;
gen zfwem_f=0;
replace zfwem_f=.0495*brtink_f if brtink_f<=42640;
replace zfwem_f=.0495*42640
if brtink_f>42640 & brtink_f<=50150;
replace zfwem_f=0 if brtink_f>50150;
*Fiscaalloon=filon_f;
gen filon_f=0;
replace filon_f=brtink_f-wao_f-socsec_f+zfwem_f;
*Grondslag premieheffing volksverzekering=gpvolk_f
*reiskostenafrek(travelexpenses)=trexp_f
*verwervingskosten=vwkst_f;
gen gpvolk_f=0;
gen trexp_f=0;
gen vwkst_f=0;
replace trexp_f=200 if filon_f>200;
replace vwkst_f=.04* filon_f if filon_f<=20000;
replace vwkst_f=.04*20000 if filon_f>20000;
replace vwkst_f=0 if vwkst_f==.;
replace gpvolk_f=filon_f-trexp_f-vwkst_f;
replace gpvolk_f=0 if gpvolk_f<0;
*Algemene ouderdomswet, AOW, algemene weduwen- en wezenwet, AWW;
gen aow_f=0;
replace aow_f=.12*gpvolk_f if gpvolk_f<=65900;
replace aow_f=.12*65900 if gpvolk_f>65900;
*Belastbaarinkomen=belink_f;
gen belink_f=0;
replace belink_f=gpvolk_f-aow_f;
#delimit;
```

```

*Basic deduction, "de belastingvrije voet"=voet_f;
*We are only considering couples;
*1.She has no income, the voet goes to the husband;
gen voet_f=0 if belink_f==0;
*2.He works and she works and she doesnot earn enough
*to deduct the "voet"(+arbeidstoelage,
*for working extern) and they don't have children<12,
*the rest of the voet goes to the husb;
replace voet_f=belink_f if belink_f<=7828
& hrs_f>0 & hrs_m>0 & d11child==0;
*3.He works and she works and she earns enough
*to deduct the voet plus arbeidstoelage and they don't have
*children<12;
replace voet_f=7828 if belink_f>7828 & hrs_f>0
& hrs_m>0 & d11child==0;
*4.She works and he works and they have children
*< 12 years of age
*and she earns enough to deduct the voet;
replace voet_f=8625 if hrs_f>0 & hrs_m>0
& d11child==1 & belink_f>8625;
*5.She works and he works and they have children
*< 12 years of age
*and she doesnot earn enough;
replace voet_f=belink_f if hrs_f>0 & hrs_m>0
& d11child==1 & belink_f<8625;
*basisinkomen=belastbaarinkomen-voet;
gen basink_f=0;
replace basink_f=belink_f-voet_f;
#delimit;
*Income taxes of wife
*Inkomstenbelasting= ib_f;
gen ib_f=0;
replace ib_f=.14*basink_f if basink_f<=9681;
replace ib_f=1355+.24*(basink_f-9681) if basink_f>9681
& basink_f<=17127;
replace ib_f=3142+.32*(basink_f-17127) if basink_f>17127
& basink_f<=31636;
replace ib_f=7784+.41*(basink_f-31636) if basink_f>31636
& basink_f<=44658;
replace ib_f=13123+.51*(basink_f-44658) if basink_f>44658
& basink_f<=65248;
replace ib_f=23623+.60*(basink_f-65248) if basink_f>65248
& basink_f<=91676;
replace ib_f=39479+.66*(basink_f-91676) if basink_f>91676
& basink_f<=121244;
replace ib_f=58980+.69*(basink_f-121244) if basink_f>121244
& basink_f<=230314;
replace ib_f=134252+.72*(basink_f-230314) if basink_f>=230314;
*Ziekenfondspremie werknemer=zfw_f;
gen zfw_f=0;
replace zfw_f=.0315*brtink_f
if brtink_f<=42640;
replace zfw_f=.0315*42640 if brtink_f>42640
& brtink_f<=50150;
replace zfw_f=0 if brtink_f>50150;
*Net income of wife;

```

```

gen netw_f=brtink_f-wao_f-socsec_f-zfw_f-aow_f-ib_f;
*Husband's incomes and taxes;
*Start by calculating the taxable income of the husband;
*Capital incomes are not included;
*"belastbaar inkomen";
*Wet arbeidsongeschiktheid;
gen wao_m=0;
replace wao_m=0 if brtink_m<=23660;
replace wao_m=.11*(brtink_m-23660) if brtink_m>23660
& brtink_m <=68380;
replace wao_m=.11*(68380-23660) if brtink_m>68380;
*Social security, Ziekenfondswet (ZF), werkloosheidswet (WW)
*en vervroegd uittreden (VUT);
gen socsec_m=0;
replace socsec_m=.0443*brtink_m if brtink_m<=68380;
replace socsec_m=.0443*68380 if brtink_m>68380;
*Part of the social security, ZFW, paid by employer;
gen zfwem_m=0;
replace zfwem_m=.0495*brtink_m if brtink_m<=42640;
replace zfwem_m=.0495*42640 if brtink_m>42640
& brtink_m<=50150;
replace zfwem_m=0 if brtink_m>50150;
*Fiscaalloon=filon_m;
gen filon_m=0;
replace filon_m=brtink_m-wao_m-socsec_m+zfwem_m;
*Grondslag premieheffing volksverzekering=gpvolk_m
*Reiskostenaftrek (travelexpenses)=trexp_m
*Verwerkingskosten=vwkst_m;
gen gpvolk_m=0;
gen trexp_m=0;
gen vwkst_m=0;
replace trexp_m=200 if filon_m>200;
replace trexp_m=0 if filon_m<200;
replace trexp_m=0 if trexp_m==.;
replace vwkst_m=.04*filon_m if filon_m<=20000;
replace vwkst_m=.04*20000 if filon_m>20000;
replace vwkst_m=0 if vwkst_m==.;
replace gpvolk_m=filon_m-trexp_m-vwkst_m;
replace gpvolk_m=0 if gpvolk_m<0;
*Algemene ouderdomswet(AOW), algemene weduwen- en wezenwet(AWW);
gen aow_m=0;
replace aow_m=.12*gpvolk_m if gpvolk_m<=65900;
replace aow_m=.12*65900 if gpvolk_m>65900;
*Belastbaarinkomen=belink_m;
gen belink_m=0;
replace belink_m=gpvolk_m-aow_m;
#delimit;
*We consider the husband is working and earns
*enough money to be able to deduct his voet
*from his own earnings. Since we are only considering
*couples we will not have to consider the
*alleenstaande-toeslag or the alleenstaande-oudertoeslag;
gen voet_m=0;
*1. He works and earns enough to deduct the voet
* plus arbeidstoeslag and she doesnot work;
replace voet_m=15243 if hrs_m>0 & hrs_f==0

```

```

& belink_m>15243;
replace voet_m=belink_m if belink_m<=15243
& hrs_m>0 & hrs_f==0;
* This means that the voet of the family is
* 15243 or belink_m;
*2. He works, she works, but she doesnot earn enough to deduct
*.85 of the voet and they don't have children;
replace voet_m=7828+(7828-.85*belink_f)
if hrs_m>0 & hrs_f>0 & d11child==0 & belink_f<=7828*.85
& belink_m>7828+(7828-.85*belink_f);
* This means that the voet of the family is
* 15656+.15 belink_f;
*3. He works, she works and she does earn enough tot deduct
*.85 of the voet and they don't have children < 12;
replace voet_m=7828
if hrs_m>0 & hrs_f>0 & belink_f>7828*.85 & belink_m>7828 &
d11child==0;
* This means that the voet of the family is 15656;
*4. He works and she works and they have a child < 12 years
*and she earns enough to deduct the voet;
replace voet_m=8625 if hrs_f>0 & hrs_m>0
& d11child==1
& belink_m>8625 & belink_f>8625;
* This means that the voet of the family is 17250;
*5. He works, she works, but doesnot earn enough to deduct
*the whole voet and they have a child<12 years;
replace voet_m=8625+(8625-belink_f)
if hrs_m>0 & hrs_f>0
& d11child==1
& belink_f<=8625 & belink_m>(17250-belink_f);
* This means that the voet of the family is 17250;
*The husband has to earn enough to deduct the voet (extra check);
replace voet_m=belink_m if voet_m>belink_m;
*Basisinkomen=belastbaarinkomen-voet;
gen basink_m=0;
replace basink_m=belink_m-voet_m;
#delimit;
*Income taxes of husband
*Inkomstenbelasting=ib_m;
gen ib_m=0;
replace ib_m=.14* basink_m if basink_m<=9681;
replace ib_m=1355+.24*(basink_m-9681) if basink_m>9681
& basink_m<=17127;
replace ib_m=3142+.32*(basink_m-17127) if basink_m>17127
& basink_m<=31636;
replace ib_m=7784+.41*(basink_m-31636) if basink_m>31636
& basink_m<=44658;
replace ib_m=13123+.51*(basink_m-44658) if basink_m>44658
& basink_m<=65248;
replace ib_m=23623+.60*(basink_m-65248) if basink_m>65248
& basink_m<=91676;
replace ib_m=39479+.66*(basink_m-91676) if basink_m>91676
& basink_m<=121244;
replace ib_m=58980+.69*(basink_m-121244) if basink_m>121244
& basink_m<=230314;
replace ib_m=134252+.72*(basink_m-230314) if basink_m>=230314;

```

```
*Ziekenfondspremie werknemer+zfw_m;
gen zfw_m=0;
replace zfw_m=.0315*brtink_m if brtink_m<=42640;
replace zfw_m=.0315*42640 if brtink_m>42640
& brtink_m<=50150;
replace zfw_m=0 if brtink_m>50150;
#delimit;
*Net income of husband;
gen netw_m=brtink_m-wao_m-socsec_m-zfw_m-aow_m-ib_m;
#delimit;
gen dnet=netw_m+netw_f;
```

```

*this is the Dutch Oort tax system
*Note that all income variables are spelled with k

#delimit;
replace brtink_f=hrs_f*pdwage*52;
gen wage_m=dwage_m;
replace brtink_m=hrs_m*wage_m*52;
#delimit;
*Wife's incomes and taxes
*start by calculating the taxable income of the wife
*capital incomes are not included
*"belastbaar inkomen";
#delimit;
*Wet arbeidsongeschiktheid;
gen wao_f=0;
replace wao_f=0 if brtink_f<=23920;
replace wao_f=.1215*(brtink_f-23920)
if brtink_f>23920 & brtink_f<=68900;
replace wao_f=.1215*(68900-23920)
if brtink_f>68900;
*Social security, ziekenfondswet(ZF), werkloosheidswet(WW)
*en vervroegd uittreden(VUT);
gen socsec_f=0;
replace socsec_f=.0277*brtink_f
if brtink_f<=68900;
replace socsec_f=.0277*68900
if brtink_f>68900;
*Part of social security, ZFW, paid by employer;
gen zfwem_f=0;
replace zfwem_f=.0485*brtink_f
if brtink_f<=43160;
replace zfwem_f=.0485*43160
if brtink_f>43160 & brtink_f<=50900;
replace zfwem_f=0
if brtink_f>50900;
*Fiscaalloon=filon_f;
gen filon_f=0;
replace filon_f=brtink_f-wao_f-socsec_f+zfwem_f;
*Basis voor overhevelingstoelage=basov;
*verwervingskosten=vwkst_f;
gen vwkst_f=0;
replace vwkst_f=200 if filon_f<=5000;
replace vwkst_f=.04*filon_f if filon_f<=25000;
replace vwkst_f=1000 if filon_f>25000;
replace vwkst_f=0 if vwkst_f==.;
*basis voor overhevelingstoelage=filon-vwkst;
gen basov_f=0;
replace basov_f=filon_f-vwkst_f;
*basistoelage=10,4% van basov;
gen bastoe_f=0;
replace bastoe_f=.104*basov_f;
*belastbaarinkomen=basov+bastoe;
gen belink_f=0;
replace belink_f=basov_f+bastoe_f;
#delimit;
*Basic deduction "belasingsvrije voet"

```

```

*We are only considering couples
*belastingvrije voet=voet_f;
*voet_f=4568;
gen voet_f=0;
*1. she does not earn enough to deduct her voet
*her husband gets it;
replace voet_f=0 if belink_f<=4568;
*2. she earns enough to deduct the "voet";
replace voet_f=4568 if belink_f>=4568;
*Grondslag ib en premieheffing=belink-voet;
gen gibp_f=belink_f-voet_f;
#delimit;
*Income taxes of wife
*Inkomstenbelasting= ib_f;
gen ib_f=0;
replace ib_f=.351*gibp_f
if gibp_f<=42123;
replace ib_f=14785+.50*(gibp_f-42123)
if gibp_f>42123 & gibp_f<842457;
replace ib_f=414952+.60*(gibp_f-842457)
if gibp_f>842457;
*Ziekenfondspremie werknemer=zfw_f;
gen zfw_f=0;
replace zfw_f=.0305*brtink_f if brtink_f<=43160;
replace zfw_f=.0305*43160 if brtink_f>43160
& brtink_f<=50900;
replace zfw_f=0 if brtink_f>50900;
*Net wage of wife;
gen netw_f=0;
replace netw_f=brtink_f-wao_f-socsec_f-zfw_f+bastoe_f-ib_f;
#delimit;
*Husband's incomes and taxes
*start by calculating the taxable income of the man
*capital incomes are not included
*"belastbaar inkomen";
*Wet arbeidsongeschiktheid;
gen wao_m=0;
replace wao_m=0 if brtink_m<=23920;
replace wao_m=.1215*brtink_m
if brtink_m>23920 & brtink_m<=68900;
replace wao_m=.1215*68900
if brtink_m>68900;
*Social security, ziekenfondswet(ZF), werkloosheidswet(WW)
*en vervroegd uittreden(VUT);
gen socsec_m=0;
replace socsec_m=.0277*brtink_m
if brtink_m<=68900;
replace socsec_m=.0277*68900
if brtink_m>68900;
*Part of social security, ZFW, paid by employer;
gen zfwem_m=0;
replace zfwem_m=.0485*brtink_m
if brtink_m<=43160;
replace zfwem_m=.0485*43160
if brtink_m>43160 & brtink_m<=50900;
replace zfwem_m=0

```



```

if brtink_m>50900;
*Fiscaalloon=filon_m;
gen filon_m=0;
replace filon_m=brtink_m-wao_m-socsec_m+zfwm_m;
*Basis voor overhevelingstoeslag=basov
*verwervingskosten=vwkst_m;
gen vwkst_m=0;
replace vwkst_m=200 if filon_m<=5000;
replace vwkst_m=.04*filon_m if filon_m<=25000;
replace vwkst_m=1000 if filon_m>25000;
replace vwkst_m=0 if vwkst_m=.;
*Basov=filon-vwkst;
gen basov_m=0;
replace basov_m=filon_m-vwkst_m;
*basistoeslag=10,4% van basov;
gen bastoe_m=0;
replace bastoe_m=.104*basov_m;
*belastbaarinkomen=basov+bastoe;
gen belink_m=0;
replace belink_m=basov_m+bastoe_m;
#delimit;
*Basic deduction "belasingsvrije voet"
*We are only considering couples
*belastingvrije voet=voet_m;
*voet_m=4568;
gen voet_m=0;
*1. he earns enough to deduct the "voet";
replace voet_m=4568 if belink_m>=4568;
*2. he works and she doesnot work or she doesnot
earn enough to deduct the voet
*and he earns enough to deduct the voet;
replace voet_m=9136
if belink_f<4568 & belink_m>9136;
*3. he does not earn enough to deduct the double voet
*but enough to deduct his voet and part of hers
replace voet_m=belink_m
if belink_f<4568 & belink_m<9136;
*Grondslag IB en premieheffing=belink-voet;
gen gibp_m=belink_m-voet_m;
#delimit;
*Income taxes of husband
*Inkomstenbelasting= ib_m;
gen ib_m=0;
replace ib_m=.351*gibp_m
if gibp_m<=42123;
replace ib_m=14785+.50*(gibp_m-42123)
if gibp_m>42123 & gibp_m<842457;
replace ib_m=414952+.60*(gibp_m-842457)
if gibp_m>842457;
*Ziekenfondspremie werknemer=zfw_m;
gen zfw_m=0;
replace zfw_m=.0305*brtink_m if brtink_m<=43160;
replace zfw_m=.0305*43160 if brtink_m>43160
& brtink_m<=50900;
replace zfw_m=0 if brtink_m>50900;
*Net wage of husband;

```

```
gen netw_m=0;
replace netw_m=brtink_m-wao_m-socsec_m-zfw_m+bastoe_m-ib_m;
drop wao_m socsec_m zfw_m bastoe_m ib_m;
*Gross family income;
gen brtink_g=0;
replace brtink_g=brtink_f+brtink_m;
*Net family income;
#delimit;
gen onet=0;
replace onet=netw_f+netw_m;
```