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The quantitative productivity of full time working male and female employees in Finland

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Abstract: The European Parliament resolution 2008/2012(INI) states in chapter G 'whereas the pay gap is not based solely on disparities in gross hourly earnings and account should also be taken of factors such as ... productivity, which should be measured not only in quantitative terms (hours when the worker is physically present in the workplace) ...' In Finland data on working hours are collected by two statistics: the Annual Labour Force Survey and the Time Use Survey, which are conducted at ten-year intervals. One part of this study verifies the reliability of these two different statistics to measure annual working hours. According to the Labour Force Survey there are more than 150,000 employees who work for more than 48 hours per week. The factor allowing this is included in the Working Hours Act (605/1996) § 39 and it can be applied among others to any person who is in the foreman position. In Finland 46% of men and 36% of women are in foreman position. Results from the Time Use Survey indicate that approximately 15% of male employees and 5% of female employees work more than 50 hours per week. The annual working hours of full-time working male employees are 17-20% higher than female employees in a normal economic situation.

Key words: annual working hours, the Labour Force Survey, overtime hours, quantitative productivity of men and women, the Time Use Survey

Foreword: Why is it important to measure quantitative productivity (productive working hours)?

The legendary sociological equality research from the year 1968 of Elina Haavio-Mannila states that one reason for the gender pay gap can be differences in the working hours of men and women. Her working hour notice is based on her own study of medical doctors (Haavio-Mannila, page 69).

The European Parliament resolution 2008/2012(INI) states in chapter G 'whereas the pay gap is not based solely on disparities in gross hourly earnings and account should also be taken of factors such as individual pay supplements, job classification, work organisation patterns, professional experience and productivity, which should be measured not only in quantitative terms (hours when the worker is physically present in the workplace) but also in qualitative terms and in terms of the earnings impact of shorter working hours, leave and health-related absences'.

ILO also refers to the need of using working hours in the pay gap verification. ILO UN Global Compact webinar March 2011: Equal Pay for Work of Equal Value: How do we get there?

Why Gender Pay Gap?

Characteristics of individuals and organisations:

- Educational level and field of study
- Work experience and seniority

- Number of working hours
 - Size of organisation and sector activity
- (ILO UN 'Global Compact Webinar', page 10).

ILO states in its KILM-18 report, section 17 'Labour productivity' of working hours: 'Estimates of annual working hours are often unavailable or are relatively unreliable. Even for developed economies, annual working hours are not consistently defined. For example, statistics on working hours often refer to paid hours rather than to hours actually worked, implying that no adjustments are made for paid hours that are not worked, such as hours for paid vacation or sickness, or for hours worked that are not paid for'.

EU Commission states 'In the EU, the gender pay gap is referred to officially as the "unadjusted gender pay gap", as it does not take into account all of the factors that impact on the gender pay gap, such as differences in education, labour market experience, hours worked, type of job, etc.' (European Commission: Tackling the gender pay gap..., page 5).

Denmark has considered several indicators to describe the gender wage gap. In one of them, the annual working hours are noticed and it indicates that the gender wage gap narrow. 'When the income per worked hour is measured, the gender pay gap is considerably lower than when the first three pay concepts are used.' (Petra Foubert, 2010, page 8)

1. What information is gathered from the official existing statistics?

There does not seem to be any study or statistics in Finland, which indicates the number of productive working hours yearly by men and women, whose monthly pay is verified. Today, in Finland 37% of employees are controlled by stamp cards or electronic stamp systems, 34% of employees make reports manually and 29% of employees are followed only by their nearest boss without any reporting system (Akavaaka 2010, page 28). Nevertheless, we can find some clues of the annual productive working hours of full-time working employees.

The Time Use Survey

Table 1: Productive annual working hours of the employees from the Time Use Survey 3/1999–2/2000 of Statistics Finland, (Tilastokeskus, Niemi-Pääkkönen, 2001, pages 21, 67 and 69). The last column is calculated from the first four columns.

	Upper white collar	Lower white collar	Blue collar		All
Men hours	1965	1849	1904		1908.5
Women hours	1442	1563	1479		1515.7
Men thousands	261	211	478		950

Women thousands	236	547	214	997
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The productive working hours of men was approximately 1908 hours and of women was approximately 1516 hours. However, these employees are not the same as in the salary statistics. The part time employees are included. Also employees who were on a long sickness or parental leave up to one year are included (KELA:n tilastollinen vuosikirja 2000, pages 127-134). Lunch time is separated from working time in this survey. In addition, we have to exclude hours from secondary jobs from the annual working hours (Tilastokeskus, 'Työelämän suurten muutosten vuosikymmenet', pages 113-115). When we eliminate the effect of all the aforementioned factors we get the result that full-time working men worked approximately 1940 hours per year and full-time working women approximately 1620 hours during the twelve consecutive months 3/1999–2/2000 in their main job. Men worked for approximately 20% hours more. The amount of hourly paid overtime hours is approximately 35 for men and 15 for women (Vartiainen, 2001, p. 23).

The Labour Force Survey

Table 2: Productive annual working hours from the Labour Force Survey 1999 of Statistics Finland. The last column is calculated from the first two columns.

	Total annual working hours	Employees	Annual hours per employee
Men	1776810	989000	1797
Women	1528138	986000	1550

This statistics does not include the same population of employees as in the salary statistics or those in the Time Use Survey. Here, part-time employees and those temporarily laid-off employees who have still a valid working contract are included. Employees who were on a long sickness or parental leave for not more than three months are included. The working hours in the Labour Force Survey include lunch time if it is defined to be working time in the union or personal contract. Moreover, we have to exclude hourly salaried overtime hours and hours from secondary jobs from the annual working hours to get the same work, which is used in the salary statistics. Existing statistics give us no possibility for all these corrections.

Another result from the Labour Force Survey

From an official survey (Tilastokeskus: 'Työelämän suurten muutosten vuosikymmenet', p. 118), Päivi Keinänen indicates a result that in 2008 full-time working male employees worked for 1800 and female for 1600 hours, according to the Labour Force Survey. Men worked for 12–13% hours more. In the article, there is no explanation regarding the calculation of figures and definition of terms. Unfortunately, 2008 was an abnormal year, Finland experienced recession like the other industrialised countries and the GNP of Finland rose only by 0.9% that year; thus, those figures are not verifiable to years before or after that. In the following

year, 2009, GNP declined to 8.6%. In the previous year, 2007, GNP rose to 4.5%. The 'acceptable normal' situation needs to be 2.5% or more.

Conclusions from the official statistics

It is difficult to state exactly the number of hours that salaried full-time men work more than salaried women because the concept of full-time working employee and the populations are different in different statistics. We get a vision that full time working male employees work 12–20% more than female ones depending on the statistics used and the economy situation.

2. Two new studies from productive working hours in Finland

2.1 Study 1: Working hours of male and female employees 3/1999–2/2000 from the weekly sheet of the Time Use Survey

In this study, the weekly time sheet of the Time Use Survey is used. The Time Use Survey 1999–2000 had a weekly time sheet, which was filled by all employees who had a valid contract with their employer. The employee filled in the sheet what he/she did in 15-minute intervals during seven consecutive days. He/she also filled a time sheet for one week-end day and another day during the week. These sheets were filled in 10-minute intervals. From this double work, the reliability of the weekly time sheet can be verified. The results from both methods are rather equal. According to Pääkkönen, the weekly time sheet method indicates only a little lower working hour difference for men and women (Tilastokeskus: Työajan muutokset, Hannu Pääkkönen, pages 122-125).

Table 3: Data from the weekly sheet of the Time Use Survey 3/1999–2/2000

	Men	Hours	Women	Hours
Weekly hours 0.1–35	332,13	7 857.33	493,50	11 760.35
Weekly hours 36–40	323,86	12 484.02	320,94	12 192.71
Weekly hours 41–44	116,15	4 924.41	93,80	3 975.96
Weekly hours 45–	260,13	14 023.54	105,49	5 431.74
Total	1032,27	39 289.30	1013,73	33 360.76

Note that those who received salary/wage, but who did not work because of holiday or long sickness or parental leave are missing. Furthermore, the table includes working time from hourly salaried/waged overtime hours and working hours from secondary jobs.

In this study the employee him/herself defines if he/she is a part-time worker independent of the weekly working hours. Using this definition the number of part-time employees in 1999 was approximately 7% of men and approximately 17% of women, men working 19.5 hours/week and part-time women 20 hours per week. These figures are used to separate part-time working employees from full-time working ones.

Table 4: Part-time employees separated and with overtime add-on.

	Men	Hours	Women	Hours
Part time	72,26	1 409.05	172,33	3 446.67
Full time 0.1–35	259,87	6 448.28	321,16	8 313.68
36–40	323,86	12 484.02	320,94	12 192.71
41–44	116,15	4 924.41	93,80	3 975.96
Over 45	260,13	14 023.54	105,49	5 431.74
Working (full time)	960,01	37 880.25	841,39	29 914.09
With absent employees	1103,46		1026,09	
With overtime add-on		40 988.33		30 974.47

In Finland, the Working Hours Act (605/1996) states that employees must be paid an add-on for overtime hours. Add-ons are 50% and 100% per hour. Moreover, in Finland there are more than 200 union contracts where can be even better rules. Therefore, here is a rough estimate that hours between 40 and 44 per week are paid with 50% add-on and hours which exceed 44 have a 100% add-on pay. Verified to reality this is an underestimate.

Result 1. Without overtime hours men work for approximately 9.5% more hours than women. Salaried absence rate for men is estimated to be 12% and for women 17% (these figures are from the Labour Force Survey).

Result 2. With overtime hours men work for approximately 18% more hours than women.

Result3. If we value overtime hours as described above (with 50% or 100% add-on) men work for approximately 23% more 'equally valued hours' than women.

Table 5. Summary of weekly working hours and percentages from the Time Use Survey 3/1999–2/2000, full-time employees

	Men	%	Women	%
Short week (0.5–35 hours/week)	260	27.1	321	38.2
Normal week (36–40 hours/week)	324	33.8	321	38.2
Low overtime (41–44 hours/week)	116	12.1	94	11.2
High overtime (45–49 hours/week)	112	11.7	61	7.3
Extreme week (over 50 hours/week)	148	15.4	45	5.4
Total	960	100	841	100

Result 1: 73% and 62% of full-time working men and women worked respectively more than 36 hours per week.

Result 2: Only one week from three was 'normal' (36–40 hours) during the whole year.

Result3: Approximately 39% of men and 24% of women worked for more than 40 hours per week. Overtime begins from 36 to 40 hours per week depending on the

working contract. Overtime figures from the Ministry of Employment and the Economy indicate that approximately 1.3% of working hours are paid on hourly basis as overtime. It makes approximately 0.5 hours per week, men work for approximately 0.7 hours, women approximately work for 0.3 hours per week.

Result 4: Those full-time working men who worked during the survey day at least 10 minutes worked for approximately 11% more hours than women. Those who did not work during the first survey day, but were paid that day or during the following six days are missing from the weekly sheet survey. The Labour Force Survey indicates that the percentage of women being out of work for a whole week is approximately 17 and of men approximately 12 when calculated from the yearly material and without temporarily laid-off employees.

2.2 Study 2. Weekly working hours from the material IV/2007 of The Labour Force Survey

The Labour Force Survey in Finland is conducted throughout the whole year. The material included here is based on the last quarter of 2007 that comprised 12 full weeks, the Independence Day week was 4 working days and the week with Christmas holiday was 2 working days. This constitutes a total of 14 weeks and 67 working days. Because the last quarter of the year is invalid to estimate the holiday weeks of the whole year, the zero-hour employees are not included in this study.

In the Labour Force Survey, the respondent is asked on the phone 'How many hours did you work during the last whole week (or during the whole week before the last)?'

In the original survey material, there are astonishingly many answers, which are above 80 hours per week. Some studies exclude them, however, the same amount of answers that exceed 80 hours is accepted as the ones equal to 80 hours in this study. Thus, answers by four males and three females are rejected. There is a doubt that they have included homework to their answers. In the Time Use Survey, see chapter 2.1, there were 18 men who had worked over 70 hours per week, but no women.

Those employees who did not work and did not get salary/wage are also included. They had a valid working contract, but they were on long sickness (majority were men) or parental leave (majority were women) or they were forbidden to come to work by the employer because of lack of work (majority were men). In the zero rows, there are also those who did not work, but got salary/wage. They were on sickness or parental leave (majority women) or on holiday. Women have yearly more holiday than men. Most of the holiday is spent in the summer time, which is outside this survey material. The figures also include hours from hourly salaried/waged overtime hours and hours from secondary jobs. The working hours in the Labour Force Survey include lunch time if it is defined to be working time in the union or personal contract. Majority of those are women because this type of contract is used, for example, in the social, health, banking and insurance sectors.

Table 6. Summary of weekly working hours and percentages from the Labour Force Survey IV/2007, full-time employees

	Men	%	Women	%
Short week (1–35 hours/week)	170,7	18.9	227,6	28.2
Normal week (36–40 hours/week)	494,3	54.6	444,1	54.9
Low overtime (41–44 hours/week)	48,8	5.4	48,8	6
High overtime (45–49 hours/week)	83,5	9.2	49,2	6.1
Extreme week (over 50 hours/week)	108	11.9	39	4.8
Total	905,3	100	808,7	100

In the 'normal' week (36–40 hours) some employees are also included who work over 36 hours in a 4-day week, if they normally work more than 45 hours per week. Two weeks from 16 weeks were 4-day weeks on IV/2007. Hence, approximately half of the employees worked 'normally' in Table 8.

Result 1: 81.1% and 71.8% of full-time working men and women worked for more than 36 hours per week.

Result 2: Approximately only half of the weeks were 'normal' (36–40 hours).

Result 3: Full-time working men worked for approximately 12% more hours than women, when those who did not work during a survey week were rejected from the material.

There were approximately 5% more women than men who worked zero hours per week but got salary during 2007. Employees who were absent the whole week but were paid include those on holidays, for example, have a long sickness or maternity/paternity leave, take their overtime as free or empty their time bank. The total non-productive working time in Finland is approximately 20% calculated from the normal annual working hours. The difference in working hours of full time working men and women during the fourth quarter of 2007 is approximately 17 % according to the material from the Work Force Study.

3. Verification of the two surveys

3.1 Material

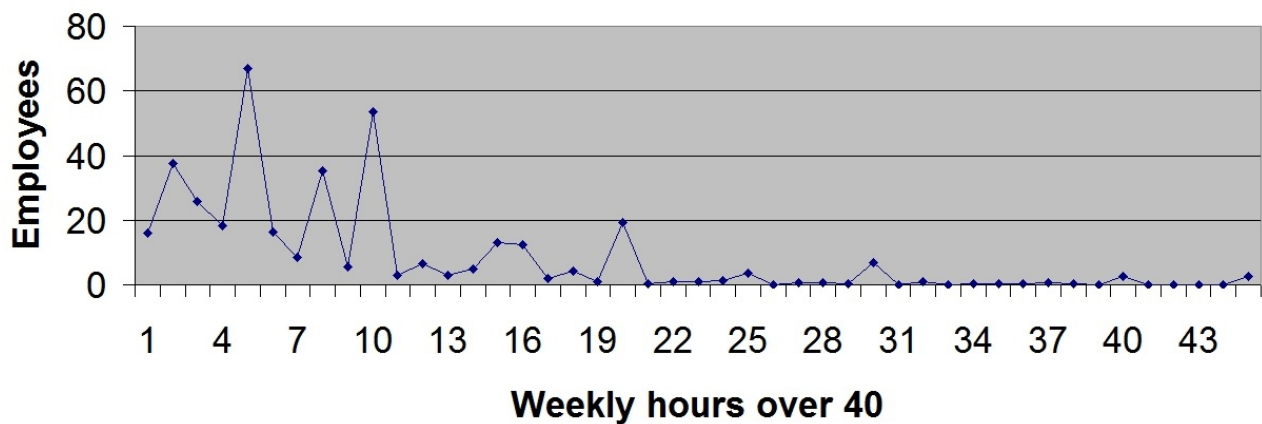
The daily sheet in the Time Use Survey is at 10-minute intervals, the weekly sheet at 15-minute intervals. The accuracy in the Labour Force Survey is one hour.

The material in the Labour Force Survey is very uneven. From the detailed material, you can calculate that the values exceeding 44 hours concentrate on values 45, 50, 55, 60.... They represent 25 % of possible values and they get 174 hits (60%) from 292. The other time values (46, 47, 48, 49, 51, 52...) representing

75% of all values get only 118 hits (40%). Extra high values tell that 6% of men and 3% of women had worked 85 hours per week. In this study two men and one woman are accepted to the calculations. No other corrections are made.

Figure 1. Hours that exceed 40 hours per week in the Labour Force Study

Labour Force Study IV/2007



Both materials have the same problem. From the materials, you cannot see how many employees have not worked during the whole week, but were paid during absence.

3.2 Differences in results

In the following table, the summary of working hours of employees from the Time Use Survey 3/1999–2/2000 and the Labour Force Survey 1999 is verified. The working hours change slightly in a normal economic situation so the difference in time span can be allowed.

Table 7: Verification of results from two different surveys

	All together thousand hours	Men thousand hours	Women thousand hours	Diff. M/N
Time Use Survey	3 324 253	1813116	1511137	+ 20%
Labour Force Survey	3 304 948	1776810	1528138	+ 16%

Noting that the Labour Force Survey includes paid time from lunch for some professions we can say that the Labour Force Survey gives approximately 5% less difference between men and women in annual working hours. In the total sum of working hours of both sexes together, the difference of 0,6% between two statistics is acceptable. In the Labour Force Survey, men seem to underestimate and women seem to overestimate their working hours verified to the Time Use Survey.

As mentioned above, there is a vast difference in these two materials. Male employees, who answer over the phone, perhaps do not remember that they have

worked overtime and female employees perhaps forget that they have been absent from work. Employees answer in the Labour Force Survey that they work in normal week in 55% of all weeks, though the Time Use Survey indicates that they work in a normal week only in 35% of all weeks. Employees in these two surveys are not defined exactly similarly and we have to notice that from both surveys those, who did not work but were salaried/waged in their survey week are missing. Because women have more holidays and have more sickness and maternity leave, they are underrated in these surveys compared to the employees in the salary statics where approximately 48.5% were females in 2000. In Finland, we have up to three month full salaried maternal leaves and up to six month full salaried sickness leaves.

3.3 Which is more reliable, a phone call or the diary method?

Professor Robinson from the USA states '... the burden of evidence clearly points to the strong likelihood that time diaries are the only viable method of obtaining valid and reliable data on activities'. (Robinson, JP 1985, p. 60). A Norwegian researcher Ragni Hege Kitterød states 'There is no dispute that studies based on time diaries form the best data source concerning people's time allocation ...' (Kitterød, 2001, p.146). A Danish Jens Bonke states 'Time-use information is preferably obtained from diaries as this method is considered more reliable than information from questionnaires'. (Bonke, 2005, p. 349).

One reason, why other studies than time diaries are more unreliable, is that the interview method always includes the possibility that the respondent answers how he/she feels to be inside the social acceptable standards (Niemi, Social Indicators Research, number 30, November 1993, p. 230).

Laura Hulkko describes the problems of the Labour Force Survey (phone calls): 1. In practice, the terms are not explained to the answerer during the phone call. 2. The basic problem is the variety of the concept 'work'. Currently many employees are working outside their normal working place, by customer and home. In many professions, they are assumed to work outside their normal working time. 3. The working time in the previous week or the week before the previous is always an estimate. Some employees tell their normal weekly working time despite the fact that they have worked overtime or have sometimes left earlier from work. 4. Bigger abnormalities in one's working week are easier to remember but it is difficult to remember smaller ones (Hulkko, 2004, pages 17–19).

4. Case from one profession in Finland

Above there are verified yearly working hours at the whole nation level. In Finland, there is also a case where only one profession, i.e. medical doctors are studied.

The profession of medical doctors is very strictly ruled. So the verification of salaries and yearly working hours of male and female medical doctors can be seen made so that men and women are doing similar work with a similar education.

Male medical doctors work more and therefore get more earnings per month. It can be read from the magazine number 45/2008 published by Finnish Medical Doctor Association (Suomen Lääkärilehti 45/2008, pp. 3848-3850). There is an article 'Is woman a different kind of a medical doctor?' I have translated from that article: 'According to studies female medical doctors make one fifth less working hours than male doctors. They also use more time per patient, so we need more female medical doctors to do the same work per normal working day than male'. Furthermore, 'Male medical doctors do more hours per day, which also can be seen in their income level'.

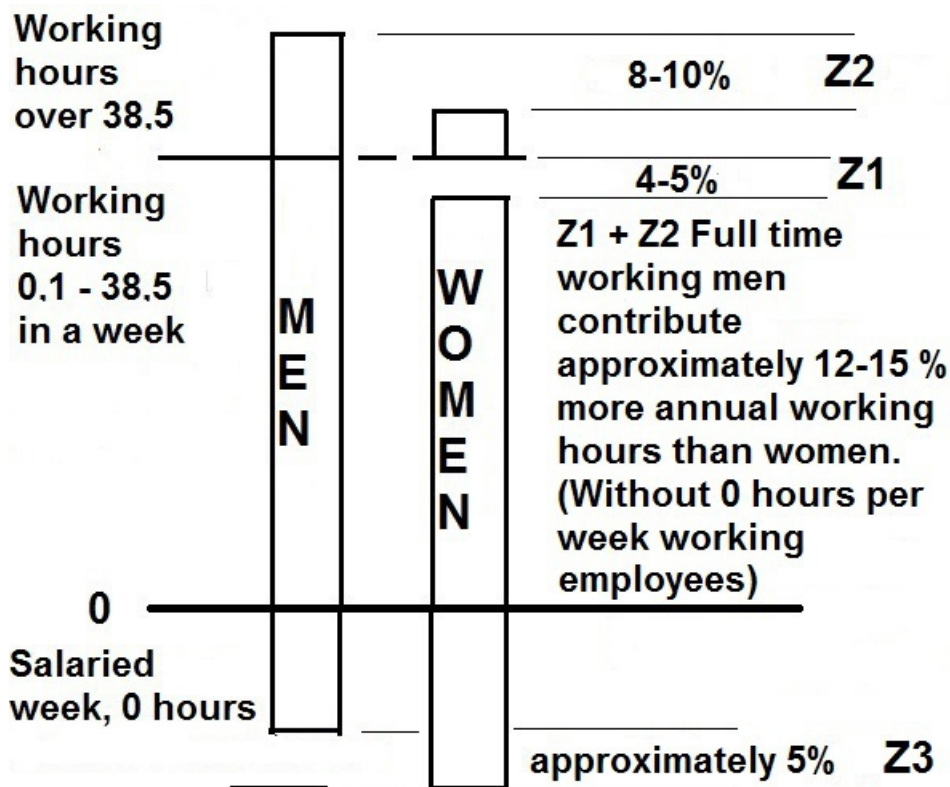
5. Conclusions

In chapter 1, a study is presented, which tells that full-time working men contributed approximately 20% more annual working hours than women based on the data from the daily sheet of the Time Use survey 3/1999–2/2000. In chapter 2.1, another study is presented, which tells that full-time working men contributed approximately 17% more annual working hours than women based on the data from the weekly sheet of the Time Use Survey 3/1999–2/2000. In chapter 2.2, there is yet another study which tells that full-time working men contributed approximately 17% more working hours than women based on the phone call data from the Labour Force Survey IV/2007. In last two results, the average absence of whole weeks of men and women is calculated from the whole year material of the Labour Force Survey. Figure 2: Different parts which declare the difference in working hours of full-time working men and women. In the zero hour week figures, here is relied to the Labour Force Survey. It should be easy to remember, if you have been away the whole week from the work.

Z1 = Difference in working hours in a normal week (0.1–38.5 hours), The Time Use Survey

Z2 = Difference in working hours which exceed 38.5 hours per week, The Time Use Survey

Z3 = Difference in absence of whole weeks which are salaried/waged, The Labour Force Survey



When we divide the difference in annual productive working hours of full-time working men and women into three categories we get the following result: Men work more in all three categories. Approximately, half of the difference (8–10 percentage units compared to all working hours) comprise hours which exceed 38.5 hours per week. Approximately, one quarter (4–5 percentage units) comprise the difference in the normal working week when employees are working ½–38.5 hours per week. Approximately, one quarter (approximately 5 percentage units) comprise the whole week salaried absence from work.

The difference in the annual productive working hours of full-time working men and women seems to be unchanged in a normal economic situation. It seems to be somewhere between 17% and 20%. The results from the Time Use Survey from 2009, when the GNP declined to 8.6%, indicate that the regression lowers the working hours of men significantly more than the working hours of women.

To get the exact figure from an economically normal situation, one should make a Time Use Survey or a survey that is as reliable and connects the data on the employee level with the salary/wage data of the same month and verify that the employee gets salary/wage from the whole month. Because the working hours are dependent on the economy situation, the proper time to do this is in a 'normal' economy situation when the GNP increases approximately to 2.5–3% a year which is seen to be a satisfactory growth in Finland.

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