HOW TO CLOSE THE GENDER PENSION GAP IN GERMANY

AN ANALYSIS FOR

THE FEDERATION OF GERMAN STATUTORY PENSION INSURANCE INSTITUTES (VDR)

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ANIKA RASNER
MASTER OF PUBLIC POLICY CANDIDATE

SUPERVISOR: PROF. HELEN LADD

TERRY SANFORD INSTITUTE OF PUBLIC POLICY

DUKE UNIVERSITY

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1. EXECUTIVE SUMMARY

Women in Germany have considerably lower average public pension benefits than men. In West Germany, the gender pension gap amounts to 53% in average pension levels between men and women. The difference in average public pension benefits is less pronounced in East Germany and amounts to 'only' 37%. Since the public pension benefit is the main source of old-age income for a majority of Germans, low independent public pension benefits of women pose a substantial problem.

The main reason for the large gap in average public pension benefits between men and women in Germany lies in the employment orientation of the German pension system. Individuals collect entitlements for their future public pension benefit when they are gainfully employed and pay contributions into the public pension system. The individual's final pension benefit depends on the number of years employed, their average earnings and the age of retirement. The design of the German pension formula is beneficial for those individuals that work continuously for more than 40 years and earn above average earnings. For individuals with such a continuous employment history, the replacement rate guarantees the standard of living that has been achieved during working life.

However, the majority of German women do not have such an employment history. The reasons for discontinuous employment histories of women are manifold. Women enter the labor market in jobs below their qualification levels. Women earn lower wages in comparable jobs in equally sized companies. Women are more likely to work in part-time or marginal part-time jobs, where they earn below average earnings. Women are more likely to interrupt employment when they give birth to a child and exit the labor market for the child rearing years while the children are small. And they are more affected by the problem of reconciling work and family duties than their male counterparts. In addition, generous social policies as well as joint income taxation set substantial disincentives that inhibit particularly married women from entering the labor market or encourage them to only work part-time.

Against the background of the large gender pension gap and the multitude of reasons that are likely to affect the independent public pension benefits of women, my client, the Federation of German Statutory Pension Insurance Institutes (*Verband Deutscher Rentenversicherungsträger*), requested this analysis to answer the following question: What measures, if any, should be proposed to the legislature in order to improve the independent pension benefits for women within the German public pension system?

A multi-method approach was used to answer the question. First, a pooled cross-section analysis of data from the survey on "Old-Age Pension Systems in Germany" (*Alterssicherung in Deutschland* – ASID) identified the determinants of public pension benefits in East and West Germany. The regression results then guided my search for policy options that aim to increase the independent pension benefits for women. The focus was on policy options within the pension system ifself. The search tried to identify best practices from other pension systems that could be applied to the German public pension system. Each policy option was then simulated for different biography profiles that were empirically derived from a survey on "Retirement Pension Provision in Germany" (*Altersvorsorge in Deutschland 1996* – AVID 1996). The biography profiles reflect differences in labor market behavior among women. By simulating the policy options for each biography profile, I was able to assess the effect of each policy option for different types of women. By calculating the independent pension benefit under the status quo, it was possible to estimate the effects of

each policy option from the micro- and macro-perspective. First, it allows us to compare how different policy options affect the individual's independent pension benefit. Second, it allows us to approximate the economic costs of each policy option for the public pension system itself.

Three policy options were simulated. The first policy option applied the Swedish system of crediting women for periods of child rearing. Sweden is the only country that has designed three different methods for childcare credits. Each method is tailored towards different employment paths among women. Childcare credits are paid for the first four years of a child's life. The simulation exercise revealed that the family-oriented and co-earner biography profile would benefit from a shift to the Swedish system of childcare credits, even though the increases in independent pension benefits would be minimal. However, women in the two employment-oriented biography profiles would be worse off from a shift to the Swedish system. Compared to the status quo, women in these profiles would suffer losses in their pension benefits. Women in the two employment-oriented biographies are better off under the German system, because it allows for the combination of earning points from childcare credits and employment up to a maximum limit of 2.0 earning points per year. In addition, mothers that are employed during the early years of their children benefit from an upgrading of social insurance contributions resulting from below average earnings during that time. Given the importance of employment for independent public pension benefits, I suggest that a shift to the Swedish childcare credit system would be a step in the wrong direction even though it would reduce the overall costs for the German pension system. It would be wrong, because incentives for women to combine the years of child rearing with employment would be removed.

The second policy simulated the German system with the incorporation of the Swiss system of mandatory pension splitting. Mandatory pension splitting would replace the generous survivor's benefits in the German pension system. Changes in independent public pension benefits were calculated for two scenarios: one assuming that the husband is alive and the other assuming that the husband died. The results showed that pension splitting among spouses is a cost-neutral way to increase the independent pension benefits of women when the husband is alive. Women in each biography profile would benefit from the higher entitlements of their husband that would be partly credited to the woman's account as a result of the splitting. Even though the resulting pension benefits are not truly independent, they would reflect the joint decision making practiced in households during periods of employment also during periods of retirement.

Pension splitting is cost-saving if the husband dies, because the pension insurance would no longer pay generous survivor's benefits. The widow would receive the same amount in pension benefits as prior to the death of the husband. Women in each biography profile would be worse off from a shift to mandatory pension splitting because the current survivor's benefits amounts to 55% of the deceased husband's individual pension benefit. I argued that the current co-existence of voluntary pension splitting and generous survivor's pension benefits in the German pension system does not make sense as long as there are no incentives for pension splitting in place and as long as the survivor's benefit is that generous. It is questionable whether the abolition of the survivor's pension benefit would be politically feasible, given that a large share of women relies on the derived benefits from their husband. From an equity perspective, it needs to be asked, whether it is justified to pay generous survivor's pensions to married women independent from their income situation, whereas single and divorced women need to rely on the means-tested minimum pension in case they

have insufficient funds to support themselves. A shift to mandatory pension splitting would have no impact on the independent pension benefits of single and divorced women, but only changes the benefit levels of married women.

The third policy option simulated the Swedish guarantee pension into the German pension system. The replacement of the German means-tested minimum pension with a guarantee pension would increase the independent pension benefits for women in all biography profiles substantially. In particular married women in the family-oriented and co-earner biography profiles would benefit from the guarantee pension since they are not eligible for a means-tested minimum pension as long as their husband or partner has a sufficiently high pension to support the couple. But also women with comparatively high pension entitlements would still benefit from a shift to the Swedish system because of the gradual phase-out of the guarantee pension benefit. The design of the guarantee pension would therefore set incentives for female labor supply and potentially draw certrain groups into the labor market, which would be beneficial for the individuals, but also for the pension system itself, because the number of individuals paying social insurance contributions into the pension system would increase. The German means-tested minimum pension benefit as it is now does not set any incentives for labor supply among women because every additional Euro in pension benefits decreases the means-tested minimum pension by one Euro. From the cost perspective, the costs under the status quo are approximately 20% lower than the costs incurred from a shift to the Swedish guarantee pension. Against the background of recent legislative changes that are likely to reduce the replacement level of public pensions in the near future, the guarantee pension would be able to offset at least part of the reductions in individual pension benefits. Given that the guarantee pension in Sweden is administered by the same institution like the income-based pension, the bureaucratic procedure for receiving the benefit would be facilitated, because individuals are eligible for the guarantee pension as soon as their entitlements in the income-based scheme fall short of a certain minimum threshold. Under the current German system, individuals need to be aware that they are eligible for the benefit, and then apply for the benefit at the Federation of German Statutory Pension Insurance Institutes (VDR). The VDR then verifies the eligibility. If approved, the benefit is paid by the responsible social assistance office. For these reasons, I recommend to integrate the guarantee pension benefit into the German public pension system, because it would be much more effective in preventing hidden old-age poverty than the current means-tested minimum pension benefit. However, the high costs are a downside to the third policy option. It shows that large increases in independent pension benefits can only be realized with very cost-intensive policy alternatives.

Due to the fact that substantial increases in independent pension benefit of women come at a very high cost, I argued that it is much more useful to look for policy solutions in the labor market itself. Given that the gender pension gap is primarily caused by disadvantages or disincentives women face in the labor market, it is better to solve the problem where is occurs. The current public pension system offers a sufficient number of compensation mechanisms that try to correct for differences in male and female employment paths. Policies that try to correct for these differences as individuals retire need to offer high benefits so that the gender pension gap can be narrowed. Therefore I suggest that the Federation of German Statutory Pension Insurance Institutes supports legislation that tries to correct for the adverse effects that negatively affect the labor market supply of German women. Solving the problem where is occurs, namely in the labor market, is the best way to close the gender pension gap in the German public pension system.

2. INTRODUCTION

2.1. RESEARCH QUESTION

The client for this Master's project, the Federation of German Statutory Pension Insurance Institutes (*Verband Deutscher Rentenversicherungsträger* (VDR)), is interested in the following question: **What measures, if any, should be proposed to the legislature in order to improve independent pension benefits for women within the German public pension system?** Independent pension benefits stand in contrast to derived pension benefits, such as survivor's pensions. Independent pension benefits are entitlements that have been collected by the individual through gainful employment, whereas derived benefits are based on the benefits of the deceased spouse.

2.2. THE GERMAN PENSION SYSTEM

Germany has the oldest social security system in the world. It was introduced by Chancellor Bismarck in 1889. The German pension system was originally fully funded. In 1957, the German parliament decided to gradually convert the pension system into a pay-as-you-go (PAYG) scheme. In the PAYG scheme, individuals currently in the workforce pay contributions that finance the pensions of the current generation of retirees. This financing scheme has been maintained until today. The pension system is "employment-centered" in that public pensions in Germany are intended to guarantee the standard of living achieved during the work life. During their working lives, employees are required to pay contributions, a certain fixed amount of their earnings, into the social security system up to some maximum amount. The employer matches the contributions.[1] By paying contributions into the system, employees accumulate entitlements that guarantee their pension as they retire. The final pension benefit depends on the number of years of employment and the average earnings achieved during this time. Therefore, public pensions are roughly proportional to the individual's labor income and are still the main source of old-age income for a majority of Germans (Salthammer and Serries 2002, p. 258).

Eighty-two percent of the working force is insured in the public pension insurance (*Gesetzliche Rentenversicherung*), including blue-collar workers, white-collar employees, and miners. Several special pension schemes provide benefits to farmers, civil servants, and employees in liberal professions that are organized in chambers (e.g. medical doctors, pharmacists, architects, or attorneys) (Stahl 2003, p.59). This Master's project deals with the question of how to close the gender pension gap and focuses on the public pension insurance for blue-collar workers, white collar employees, and miners. However, it is important to keep in mind that low pension benefits in the main scheme of the statutory pension insurance can be the result of pension entitlements in other schemes. This applies equally to men and women.

[1] For 2004, the contribution level is 19.5% paid in equal parts by employee and employer.

2.3. THE PENSION FORMULA

To fully appreciate the German pension system and why women are at a disadvantage, one must understand the different factors that determine the individual pension benefit. This is also important with respect to the different reform options, which are presented in Section 8.

The old-age pension benefit $B_{t,i}$ is based on the following four factors, with the factors explained below (Börsch-Supan, Reil-Held et al. 2003)[2]:

$$B_{t,i} = PV_t * EP_i * AA_i$$

where,

$B_{t,i}$ - Benefits of pensioner $_i$ in year $_t$

PV_t - Current pension value in year $_t$

EP_i - Number of individual earning points collected by pensioner $_i$ until retirement

AA_i - Actuarial adjustment dependent on the retirement age of pensioner $_i$

Pension Value (PV_t): The pension value is recalculated each year with the help of the benefit indexation formula. For 2004, the pension value amounted to 26.13 Euro (West Germany) and 22.97 Euro (East Germany)[3]. The indexation has changed several times during the last years. Until 1992, pensions were indexed according to the growth in gross wages. Between 1992 and 1999, pensions were indexed according to wages net of taxes. Pensions were supposed to grow in line with the change in growth of the economy. Since 1999, pensions were indexed according to the rate of inflation. This type of adjustment links the changes in pension payments to changes in prices.

Earning Points (EP_i): The individual earning points describe the earnings position of an individual relative to the average earnings of all the individuals that pay contributions into the public pension system:

$$EP_i^t = \frac{Y_i^t}{\overline{Y}^t}$$

Y stands for the i^{th} individual's earnings in a given year t. For any year t, the earning point (EP) equals 1 if the i^{th} individual earns as much as the average of contributors ($\overline{Y}$) in time period t. The earning points are summed up over the entire working life of an individual and determine the final pension benefit. The total sum of the earning points, where n is the number of years of employment or equivalent periods of pension credits is then used for the calculation of the final pension benefit:

[2] The adjustment factor is also considered in the calculation of pension benefits, however only of partial interest for the subject matter. The adjustment factor varies according to the type of pension the individual applies for and lies between 1 (old-age pension) and 0.25 (orphan pension). The adjustment factor for survivor's pension is 0.55.

[3] West Germany refers to the *old* Federal states, whereas East Germany refers to the *new* Federal states.

$$\sum_{t-1}^{n} EP_i$$

Hence, the lower income of women noted above, puts the earning points of most women below the overall average, which then results in a lower total pension benefit.

Actuarial Adjustment (AA_i): If the individual retires at age 65 (statutory retirement age), the actuarial adjustment factor equals 1. In case of early retirement, the actuarial adjustment factor is smaller than 1.

The following two examples illustrate how the pension formula works.

Example I: A typical West German male worker has worked for 40 years and always earned the average wage and retires at age 65. He therefore receives 40 individual earning points. Since he retires at the statutory retirement age there is no actuarial adjustment and the factor equals 1. Given the pension value of € 26.13 Euro in 2004, which is multiplied by the sum of his earning points (40), he will receive a monthly benefit of € 1,045.20 (compare to Börsch-Supan, Reil-Held et al. 2003).

Example II: A typical West German women has worked 25 years and earned 70% of the average wage and retires at age 65. She receives 17.5 earning points. Since she retires at the statutory retirement age, there is no actuarial adjustment and the factor equals 1. Given the pension value of € 26.13 Euro in 2004, which is multiplied by the sum of her earning points (17.5), she will receive a monthly benefit of € 457.27 (compare to Börsch-Supan, Reil-Held et al. 2003).

The German pension formula illustrates why long contribution periods and above average wages lead to high pension benefits. Career breaks as well as wages below average earnings that mainly apply to women result in lower pension benefits compared to their male counterparts.

3. BACKGROUND – THE GENDER PENSION GAP

The emphasis of the German pension system on employment results in considerable differences in average pension levels between men and women. Even though the German pension insurance is considered to be one of the most generous public pension systems in the world, this is only true if the so-called 'standard pensioner' (*Eckrentner)*[4] is taken into account. If the individual's wage was equal to the average wage earned in Germany each year for the last 45 years, the pension benefit for a standard pensioner amounts to an annuity fixed at roughly 70% of the final annual wage. In 2003, the annual gross pension benefit for the standard pensioner was €13,817 and €12,744 after taxes[5] (Verband Deutscher Rentenversicherungsträger 2004, p. 239). However, the 'standard pensioner' is not at all representative for the 'standard female pensioner'. In addition, there are considerable differences between women in East and West Germany. The full-time orientation and shorter

[4] The standard pension level is a statistic, which describes the relative income position of pensioners compared to the average income of the workforce in a given year.
[5] Pensioners have to pay contributions to the statutory health- and long-term care insurance.

interruptions after the birth of a child lead to more continuous employment careers and consequently higher pension benefits among East German women.

Table 1 shows how the distribution of average pension payments differs between men and women in East and West Germany for the years 2001 and 2002.

TABLE 1: Average Pension Payments (in Euro) for Old –Age Pension From the Statutory Pension Insurance in 2001 and 2002

	Year	West Germany		East Germany	
		Men	Women	Men	Women
Mean	2001	982	456	1,060	635
	2002	997	466	1,085	654
Median	2001	1,037	372	1,007	608
	2002	1,055	382	1,030	627
Mode	2001	1,175	175	975	675
	2002	1,175	175	975	675

Source: (Viebrok 2004)

Table 1 shows that for men in East and West Germany, the mean, median, and mode are all lying very close together. This indicates that the variance in earning points and duration of employment is rather small. The small variance can be explained by the standard employment path of a majority of German men that work for 40 years in full-time employment, as well as small wage differentials. For West German men the distribution is skewed to the right, whereas skewed to the left for East German men. The mean for East German men is higher compared to West German men (for 2002: € 1,085 in East Germany compared to € 997). In 2002, 50% of the average pension payments were below € 1,055 (median) in West Germany and € 1,030 in East Germany respectively.

Viebrok's more thorough analysis shows that the majority of West German males earned on average 1.0 to 1.2 earning points per year and worked between 40 to 50 years. For East German men the variance is even smaller. The majority earned 1.0 to 1.1 earning points and worked between 40 and 45 years (Viebrok 2004).

The position of mean, median, and mode in the distribution of average pension payments among West German women indicates a higher variance compared to East German women. The mean for 2002 lies at € 466, whereas the modus is only € 175. This is far below the levels of East German women. In East Germany there are only very small differences between median and mean (for 2002: € 654 compared to € 627), with a mode value at € 675 indicating a distribution skewed to the right. Fifty percent of West German women have average pension payments below € 382 (median), whereas in East Germany half the women have pension payments below € 627.

Viebrok shows that the distribution of pension payments for West German women has two concentrations: the first at 0.7 to 0.8 earning points for 35 to 40 years of employment, the second at 0.5 to 0.6 earning points with 5 to 15 years of employment. Half of East German women worked between 40 and 45 years and earned on average 0.6 to 0.7 earning points per year.

Men in East and West Germany come closest to the notional pension benefit of the 'standard-pensioner' mentioned above. Women's average pension benefits differ considerably

from the notional pension benefit of the 'standard-pensioner' because of lower average earning points and shorter periods of employment. For 2003, the average pension payment for men in West Germany was € 978 after 39.5 years of contributions paid. In comparison, women received on average € 479 after 25.0 years of employment (Verband Deutscher Rentenversicherungsträger 2004).

The evidence shows that there is a considerable gap in average pension levels between men and women. For 2003 it approximately amounted to 51%. The pension gap is defined as follows:

$$1-\left\{\frac{APB_F}{APB_M}\right\}*100,$$

where,

APB_F is the average pension benefit of women

APB_M Is the average pension benefit for men

Although the same rules apply to past earnings, the situation is different in East Germany. For 2003, the average pension payment for men amounted to € 1,031 after 44.5 years of paid employment. Because more women in the East Germany participated in the labor market and worked for longer times, they received on average € 655 after 41.0 years of employment. The pension gap in East Germany is therefore significantly smaller at 37% than in West Germany.

The figures show that the current system rewards those who pay high contributions over a long period of time. Longer interruptions in employment due to the birth of a child, the upbringing of children or long-term care of older family members as well as part-time work or low paid employment result in comparatively low pension payments. Men and women are affected by the 'employment-centered' German pension system; however as the evidence suggests, women are adversely affected because of long interruptions in employment and below average earnings.[6]

Depending on the household's context, low pension benefits can pose a considerable problem in terms of old-age security. Low pension benefits for women are less of a concern for policymakers if they are the result of joint decision making in the household. If a couple decides that one partner can stay at home and take care of children and the household, because the other partner earns enough money and can therefore provide old-age security for both, it is very difficult to intervene from a policymaker's perspective. However, if low pension benefits are the result of single mothers not being able to reconcile work and family duties in a way that they receive sufficient old-age income as they retire, policymakers should be concerned.

The problematic situation can be further aggravated by overly optimistic assumptions of future pension benefits. Overall, 75% of German women between 30 and 59 years will have insufficient old-age income to maintain their living standard as they retire according to a study of the German Institute for Old-Age Provision (*Deutsches Institut für Altersvorsorge*).

[6] Men are increasingly affected due to longer periods of unemployment or early retirement arrangements with their employers.

Overall, two thirds overestimate their pension entitlements, 21% overestimate it by more than 50% (Deutsches Institut für Altersvorsorge 2004). Single mothers are especially affected by the lack of information about their future pension entitlements, since they cannot fall back on any alternative income source.[7] Married women are mostly relying on the on average higher pension income of their partner, which makes the overrating of their expected pension income less problematic.

3.1. RECENT REFORMS

During the last 5 years the German statutory pension insurance faced strong financial pressures. In 2001, only 74% of the pension insurance budget was financed through current contributions of workers. The rest of the pension outlays had to be financed through a federal subsidy out of general tax revenues (Bundesregierung 2003). Without adjustments within the pension system, contribution levels for employers and employees or the federal subsidy would further grow. Both of these measures are politically and economically contested. Demographic challenges, such as increasing life expectancy and growing shares of the older (65 years and older) and oldest-old population (80 years and older) paired with one of the lowest fertility rates in the industrialized world, threaten the financial sustainability of the pension system. The looming crisis would have disequilibrated the financing scheme in the near future. Therefore the legislature passed several reforms.

The 'Old-Age Assets' (*Altersvermögensgesetz*) passed in 2001. Its goal is the promotion of private and occupational pensions. The law tries to relieve the pressures on the public pension insurance by changing the composition of old-age income. It stresses the individual's responsibility for complementing the public pension benefit by other forms of old-age income. The law subsidizes the investment in private pension or occupational accounts for low and medium income individuals and families. Employees can invest in a range of schemes offered by private insurers, including private-pension insurance companies, investment funds, life insurance funds, and saving accounts (Czada 2004, p. 21). In order to receive the subsidy, the providers need to be certified by the government. The private pension benefit cannot be paid prior to age 60 or before the individual receives his/her first public pension benefit (Viebrok 2004).

The 'Sustainability Law' (*Nachhaltigkeitsgesetz*) passed in 2004, modified the benefit indexation formula. From July 1st 2005 the benefit indexation formula will be extended by the so-called 'sustainability factor'. The integration of the sustainability factor in the benefit indexation formula aims to secure the future sustainability of the public pension system. The sustainability factor takes into account changes in the relation between those individuals in the workforce who pay social insurance contributions ('contributors') and those individuals who retired and receive a pension ('beneficiaries') in two time periods. The ratio of contributors to beneficiaries ('the pensioner quotient') determines the annual indexation of the pension value.

The sustainability factor will reduce the annual pension indexation and therefore the average replacement level. Projections show that the average replacement rate[8] will decrease from 69% in 2003 to 58.5% in 2030 (Reimann 2004, p. 16). These substantial changes

[7] The problem is partially solved because the Pension Insurance Institutes send out an information letter informing clients annually about their individual entitlements from age 27 on.
[8] The replacement level is the ratio of the benefit to average lifetime earnings.

manifest a paradigmatic shift since public pensions will no longer guarantee that a retiree's public pension will be sufficient to maintain the his/her standard of living achieved during employment. The reform is particularly harmful for individuals relying solely on public pensions as old-age security.

Another component of the 'Sustainability Law' was the abolition of credits for secondary education. Until 2004, up to three years of secondary education were considered in the calculation for the individual's pension benefit. Individuals retiring after January 1st 2009 will no longer receive credits for education periods (0.75 earning points for three years)

Simulations by Viebrok assessed the consequences of the reforms on the income situation of future retiree cohorts (Viebrok 2004). He has simulated the effects of legislative changes on different types of biographies based on the optimistic assumption that individuals increasingly invest in private pension funds.[9] As Viebrok found, primarily women of older cohorts (1955 to 1965) are affected by the reform measures since they do not have enough time to build up sufficient private pension funds to supplement the reduced public pensions before they retire. Single mothers from older cohorts run risk of ending up with a net replacement rate of less than 40%. This group has neither time, nor resources to compensate for losses in public pensions due to the recent legislative changes and might fall below the poverty threshold.

Younger cohorts of women however, will benefit from recent reform measures that take the differences in male and female life-courses into account. These reforms have strengthened the position of women and enabled them to increase their independent pension benefits. These measures are described in Section 3.2.

3.2. Recent Reforms that Increased Women's Independent Pensions

The German pension system already recognizes career breaks for raising children by crediting pension rights or by counting such years towards the number of years required for obtaining the entitlement to a pension. These regulations increase primarily the independent pension benefits of women by compensating for the loss of income due to the birth, the upbringing of children, or the care of family members in need.

Childcare credits: The pension system awards pension entitlements for child rearing. For children born prior to 1992, women receive childcare credits for one year per child assuming 75% of average earnings during that period. For all children born thereafter, the childcare credits have been increased to 3 years per child assuming average earnings during that period (Hase 2002), thereby increasing the number of earning points collected over the life-course by 3 points per child. The contributions are paid out of general tax revenues through a yearly subsidy of the federal government to the pension insurance system.[10] The entitlements can be used to achieve the minimum contribution period (which varies according to different types of

[9] This assumption is problematic, since recent experiences have shown that individuals do not invest as much in private pension arrangements as needed to compensate for losses in the public pension system. In addition, women are disadvantaged given lower wages and therefore lesser resources to spent on private pensions and lower benefits because of higher life expectancy.

[10] In 2003, 74% (€ 169,424 billion) of the pension insurance budget is financed through contributions of the current working generation. The contribution rate has been at 19.5% and is equally shared by employees and employers. The remainder (26% or €61,173 billion) in pension outlays is financed by a subsidy from the federal government including the childcare credit contributions (Verband Deutscher Rentenversicherungsträger 2004).

pension benefits) in order to receive pension payments, which is very important for women with very short periods of employment over the life-course. All women benefit from the recognition of childcare credits in the number of earning points, since it increases their pension entitlements. Entitlements from employment during these three years can be added to the childcare credits up to the salary cap of a combined 2.0 earning points (Verband Deutscher Rentenversicherungsträger 2003, p. 9).

Recognition of periods of child rearing: In order to receive a pension benefit, an individual has to fulfill a certain qualifying period that varies depending on the type of pension she receives. The German pension insurance recognizes up to ten years of child rearing that are counted towards the qualifying period. The periods of child rearing do not increase the pension benefit per se.

Upgrading of individual contributions: If the woman's earnings are below the overall average earnings when she is working between ages 4 and 10 of her children, her pension insurance contributions are upgraded. Example: If a mother earns €1,000 a month and pays the corresponding contributions in the pension system, which is equivalent to 0.66 earning points, €1,500 (assumed average income for a given year, equivalent to 1 earning point) is considered in the calculation of the pension when she retires. In order to qualify for the upgrading, women must prove 25 years of contribution payments (Verband Deutscher Rentenversicherungsträger 2003, p. 9). The 25 years requirement can be met before and after the period of child upbringing.

Survivor's pension: Women are entitled to a survivor's pension upon the death of their spouse if they are above age 45, incapable of gainful employment, or if they are raising a child below age 18. Women receive 55% of the deceased spouse's pension. The upbringing of children entitles women to additional earning points in the calculation of their survivor's pension benefit. They receive two earning points for the first child and an additional point for each subsequent child (Hase 2002, p. 28).[11]

Care credits:[12] The pension system awards pension entitlements for caretaking of family members in need of care in the form of care credits. If a person works more than 14 hours a week for the care of a family member, contributions will be paid out of the long-term care insurance into the pension system. Care credits amount to 75% of the average earnings and are considered in the calculation of pension benefits when the woman retires. The recognition of care periods depends on the duration of care and the degree of need for care of family members (Hase 2002, p. 24).[13]

Pension splitting: Couples can opt out of the survivor's pension by splitting their pension entitlements. Their entitlements are first added and then split in half as soon as both partners have retired. The option was introduced with the pension reform in 2001 and applies to all marriages after December 31st 2001. If the husband has higher pension entitlements than the wife, half of the difference in entitlements is transferred to the wife, which increases her

[11] In the 2001 reform of the survivor's benefit, the replacement level was cut from 60 to 55%. The cut in absolute benefits does only affect women without children. For women with children, the cuts in benefits are offset by the recognition of children in the calculation of pension benefits if the women has one child.

[12] Individuals are not credited automatically for their care periods. It requires a complicated bureaucratic process to receive entitlements for these periods.

[13] The degree of need of care is determined by the long-term care insurance, which distinguishes three different levels of need for care.

pension benefit. These pension benefits do not expire if the woman marries again. With the survivor's pension still existing, there are very few income constellations where pension splitting renders higher benefits than the survivor's pension.[14]

Maintenance settlement in case of divorce: The entitlements that have been acquired during the marriage will be split in case of a divorce. The spouse that earned higher entitlements has to transfer half of the difference in entitlements to his/her spouse. Women are the primary beneficiaries of this regulation.

Means-tested minimum pension: Since January 1st 2003, all German residents who are permanently disabled or have reached the age of 65 and have insufficient old-age income, qualify for a means-tested minimum pension paid out of general tax revenues. The means-tested pension is equivalent to the level of social assistance. Social assistance differs for each federal state (mean: € 291.44 per month). Fifteen percent of this standard level is added as a lump sum payment for utility costs and health and long-term insurance contributions. These monthly benefits amount on average to €340 in West Germany and € 325 in East Germany. Individuals and couples are also entitled to housing allowances (on average € 255 for individuals and € 343 for couples). Adding the various benefits up, singles receive on average € 590, and couples receive € 911. Since the benefits are means-tested, the payment varies with the income situation of the individual or the household (compare to Viebrok 2004, p. 25).

The following table and the explanations provide an overview of how some of these measures affect the independent pension benefits of women by comparing their situation with and without the recognition of childcare responsibilities.

TABLE 2: EXPLANATION OF MODEL BIOGRAPHY

BIOGRAPHY EPISODES	ENTITLEMENTS FOR OLD-AGE PENSION WITHOUT THE RECOGNITION OF CHILD-UPBRINGING	Entitlements for old-age pension including the recognition of child-upbringing
17-19 years **High school** 20-23 years **Technical school** 24 years **Employment** 25-37 years **Birth and upbringing** 38-45 years **Part-time Employment** 46-65 years **Full-time Employment**	**Statutory contributions:** 23.7 earning points **Periods counting towards the qualifying period:** 1.3 **Sum:** 25.0	**Statutory contributions:** 31.0 earning points **Periods counting towards the qualifying period:** 2 **Sum:** 33.0 **Difference:** 8 **→ Old-age pension is increased by 209 Euro.** **→ Survivor's pension will be increased by 78 Euro.**

Source: (Verband Deutscher Rentenversicherungsträger 2003)

[14] The replacement rate of the survivor's pension gets reduced if the couple's combined income exceeds a maximum threshold

Explanation:
After high school and four years at a technical college, Mrs. Schmidt is employed for one year before she gives birth to her first child. For the next 12 years she stays at home, bearing another child and being responsible for the upbringing of the two children (the children are born after 1991 and three years apart from each other). At age 38 she returns to the labor market and works part-time for the next 7 years. After that she works full-time for another 19 years and retires at age 65.

Mrs. Schmidt receives 8 earning points for child upbringing. Assuming that each earning point is worth 26.13 Euro (rate of July 2004), this increases her monthly pension benefit by Euro 209. Six earning points are the result of increased childcare credits. The upgrading of contributions during periods of child upbringing will add 1.3 earning points. 0.7 points can be attributed to the consideration of child-upbringing for the fulfillment of the qualifying period. If Mr. Schmidt dies the survivor's pension of Mrs. Schmidt will increase by 78 Euro due to the recognition of children in the survivor's pension.

4. WOMEN AND THE GERMAN LABOR MARKET

When thinking about measures that could help to increase the independent pension benefits of women, we need to take into account that the gender pension gap is a result of a multitude of factors occurring over the life-course. The accumulation of pension entitlements starts with the entrance into working life[15] and ends with retirement. In between these two events, several factors affect pension entitlements of women and contribute to the observable pension gap in the German public pension system. Against the background that several factors affect the individual's pension benefit has a major implication when it comes to the policy options available. Since the gender pension gap cannot be pinpointed to one specific factor, it will be insufficient to rely on one measure to solve the problem. There are several policy options and it depends on their interplay, whether the gender pension gap can be closed. It is the complex system of factors in different labor markets, in different firms, legal and institutional rules and regulations, diverse family- and household- structures that are relevant in determining employment of women and the old-age pensions they will receive as they retire (Schmähl 2000, p. 17).

This section reflects the importance of the life-course perspective by focusing on all the factors that have been considered to be crucial in explaining the gender pension gap in Germany. It will not only focus on rules within the pension system itself, but also on other policy areas that are closely intertwined with pension policy, such as the labor market, tax policies, family & gender policies. Low independent pension benefits for women need to be seen in a larger context. Employment is often seen as the key to higher pensions. If women are disadvantaged in the labor market, these disadvantages will translate into lower pensions. It is indispensable to takes these factors into account, because they contribute to the differences between men and women, which then accumulate over the life-course.

[15] For some cohorts, the accumulation of entitlements starts with secondary education.

4.1. ENTERING THE LABOR MARKET

If the gender pension gap is conceived from a life-course perspective, the first relevant stage in an individual's life is the entrance into the labor market, because the accumulation of pension benefits starts at this point.

During the last decades, increases in years of schooling and secondary education for a growing share of individuals delayed the entrance into the labor market. Without doubt, the accumulation of human capital is important for both men and women. However, longer periods of education shorten the average working life if the retirement age remains unchanged, and therefore decreases the time during which entitlements can be acquired. As mentioned above, the 'Sustainability Law' abolished the education credits within the pension insurance. Individuals retiring after January 1st 2009 will no longer receive credits for periods of secondary education, which will reduce the average pension benefits by approximately € 55 (Verband Deutscher Rentenversicherungsträger 2004, p. 14).[16] The discontinuation of educational credits is particularly harmful for women, because they lose a relatively higher share of their final pension benefit than their male counterparts.

Although differences in educational attainment between men and women in Germany decreased particularly in secondary education, several studies have shown that women enter the labor market much more often in jobs below their educational and skill level. Büchel and Weißhuhn document in their longitudinal study that this trend increased during the 1990s. The fact that women enter the labor market below their educational and skill level indicates that (secondary) education does not necessarily yield the same expected returns for men and women (Büchel and Weißhuhn 1997; Büchel and Weißhuhn 1998). The entrance in the labor market is therefore already characterized by gender segregation that is likely to determine the subsequent career paths of men and women and in part contributes to the gaps in average pension income.

The economic literature suggests that wage differences can be traced back to different career aspirations and different levels of human capital. Empirical studies in the US and Scandinavia have shown that there are only very small wage differences between men and women if one controls for type of job/occupation and company (Petersen, Meyersson Milgrom et al. 2003; Petersen and Saporta 2004). For Germany, in contrast, a recent study by Hinz and Gartner shows that wage differences do not disappear when controlling for job and company. Even though the gap in wages decreased from 17 to 15% between 1993 and 2001[17] (Hinz and Gartner 2005, p. 3), it is still considerable compared to other countries. When controlling for human capital indicators such as education and duration of experience in the job, in the whole labor market (this means not differentiated according to sector of economy or company), the wage difference decreases from 15% to 11.4% (Hinz and Gartner 2005, p. 22).[18]

Allmendinger also stresses that differences in salaries between men and women are a very important explanatory factor with respect to the gender pension gap. It cannot be argued that the differences in earnings are the result of different skill levels. Even when comparing

[16] The consideration periods for education (8 years) will not be abolished, they will still count towards the qualifying period in order to fulfill eligibility criteria for an old-age pension.
[17] The authors emphasize that the high wage difference compared to other countries can be partly the result of peculiarities in the dataset.
[18] The wage difference turns out to be smaller if the sector of the economy is held constant.

men and women working the same amount of hours in jobs that require the same skill set, wage differences still prevail. It is important to notice that these wage differences translate into the gender pension gap. The income levels determine the amount of contributions that have to be paid in the pension insurance. The acquired entitlements in turn determine the level of future pension benefits (Allmendinger 2000, p. 76).

The evidence might suggest that disadvantages of women start with the entrance in the job and potentially continues over the entire career. The report of the 'Ministry for Family, Senior Citizens, Women and Youth' shows that women in West Germany earn 75.8% of the gross salary of men for comparable work. This gap is far smaller in East Germany where women earn 94% of the gross salary of men.[19] During the last 20 years, the wage gap has decreased by only 3% (Bundesministerium für Familie 2002).

4.2. GENDER GAP IN EMPLOYMENT = GENDER PENSION GAP?

From a life-course perspective, the entrance into the labor market is followed by a long period of employment. This section discusses the potential factors that affect the gender pension gap in the labor market. As it has been shown in the background section, pension benefits are largely determined by the earning points collected during employment. The earnings potential of women compared to their male counterparts is restricted for several reasons: a) lower overall participation in the labor market; b) high prevalence of part-time and marginal part-time employment (*geringfügige Beschäftigung*); and c) interruptions of employment for periods of care for children or elderly family members.

4.2.1. Labor Force Participation

In general, female labor force participation increased during the 1990s. In 2003, 44.7% of the labor force were women (compared to 41.5% in 1991) (Statistisches Bundesamt 2004, p. 39). However, the rates developed quite differently in East and West Germany. In West Germany labor force participation rates increased, whereas the labor market situation deteriorated for women in East Germany, even though labor market participation is still significantly higher than in the West. The employment gap for all of Germany between men and women got smaller between 1991 and 2003, falling from 16.8% to 10.6% (Statistisches Bundesamt 2004).[20] This decline is the result of two opposing trends, growing female labor market participation, but also decreasing labor market participation of men due to persistent unemployment since the German reunification (Allmendinger 2000).

[19] The net gap is wider due to the characteristics of the German tax system which is described below.
[20] Over the same period, the gender employment gap dropped from 19.2 in 1991 to 11.2 percentage points in 2003 for West Germany, and increased slightly from 7.0 to 7.2 percentage points in East Germany.

4.2.2. High Prevalence of Part-Time and Marginal Part-Time Employment

The increase in female labor force participation is mainly the result of increases in part-time and marginal part-time[21] employment. About 41.4% of women worked part-time in 2003, compared to 30.2% in 1991. The share of individuals in marginal part-time employment increased by 22% between 2000 and 2005 and will soon break the threshold of 5 million. Seventy-five percent of the labor force in marginal part-time employment are women. This trend is likely to continue in the future (Institut für Arbeitsmarkt- und Berufsforschung 2004). A closer look at the structure of female employment reveals that the increase in participation rates is not accompanied by an increase in hours worked. Between 1991 and 2001, "the average time worked by each gainfully employed person decreased by 6%, resulting in a 5% decrease in the volume of work" (Bach and Koch 2003, p. 4). This implies that the increase in labor force participation is a result of redistribution of working time among women so that former full-time jobs are now substituted by several part-time or marginal part-time jobs.

The increasing labor force participation among women is, without doubt, a positive development. Nevertheless, long periods of part-time employment result in drastic reductions in old-age pensions relative to full-time work (Allmendinger 2000). Part-time work yields on average 0.4 earning points per year. Assuming 25 years of part-time employment and a pension value of € 26.13, a woman receives a monthly pension benefit of € 250 as she retires, which is approximately 15% less than the average social assistance benefits for 2004. If women do not have any other source of old-age income or a husband with a high pension benefit, they are eligible for the means-tested minimum pension that is equivalent to the annually adjusted social assistance benefit.

In this context, recent labor market legislation might have alarming implications for future pension benefits. The stimulation of the low-wage employment sector with '1 Euro'-jobs[22], 'Mini'- and 'Midi' jobs might decrease the unemployment rate, but at what price? Individuals working in these jobs acquire no or very low entitlements within the statutory pension insurance. Considering independent pension benefits of women, the development is only positive if women are drawn from outside the labor force into the labor market, but negative if low-paid employment substitutes full-time employment because of lower labor costs (Bäcker 2000, p. 143). Empirical evidence suggests at least some substitution between regular employment and subsidized low-wage jobs (Steiner and Wrohlich 2004). It is impossible to make a living from the salaries earned in these jobs. They need to be supplemented either by a second wage income of a spouse/partner or welfare payments. Individuals working in these low paid jobs are also disadvantaged when it comes to savings in private pension accounts. The 'working poor' might end up in poverty as they retire. These are the unintended consequences of German labor market legislation with potentially severe consequences for future pension benefits of primarily women and the development of old-age poverty. Low pension benefits raise less concern if women start to work in part-time or marginal part-time employment to complement the wage of their husband. If earnings from part-time and marginal part-time employment are the only source of income, policymakers need to be concerned.

[21] In so-called "Mini Jobs", one type of marginal part-time employment, individuals can earn up to €400, where only the employer pays 22% in contributions for health care and pension insurance. The €400 are exempt from income tax and employee contributions.

[22] "1 Euro" jobs are for individuals receiving unemployment benefits. The unemployed can work for one Euro an hour and without facing cuts in their unemployment compensation.

Even though women with no or very little pension entitlements might be eligible for the minimum means-tested pension benefit, two important things need to be considered. First, the minimum means-tested pension benefit lifts women only slightly above the poverty threshold. Second, the problem of hidden old-age poverty keeps women from claiming the means-tested benefit although they are eligible. There are three potential explanations for why women do not claim their minimum pension benefit: 1) they are not aware that they are eligible; 2) a stigma is attached to the minimum pension; 3) they are afraid that their children would need to pay for them. This problem has received academic and political attention, but it is difficult to comprehend its magnitude, because the number of affected individuals is unknown (Bundesregierung 2005).

4.2.3. Interruptions of Employment

Interruptions of employment due to the birth of children or childcare duties are still primarily the domain of women. Interruptions lead to an immediate loss of wages, but also to drastic reductions in old-age pensions (Allmendinger 2000, p. 72 f.). Ninety percent of West German women take the full three years of parental leave, following the birth of a child (Dingeldey and Reuter 2003, p. 662). This absence makes the re-integration of women into the labor market very difficult. The accumulation of job-specific skills is interrupted if women opt out of employment due to pregnancy or childcare duties. The interruption in the accumulation of job-specific skills results in a depreciation of acquired knowledge and qualifications (Althammer and Pfaff 1999). It forces women to re-enter the labor market in jobs below their qualification level at much lower wages. They often take on part-time or marginal part-time jobs without being able to return into stable long-term full-time employment (Maier 2000, p. 84).

4.3. THE COMPATIBILITY OF WORK AND FAMILY

An important prerequisite for female labor market participation is the compatibility of work and family. Until recently, this topic has not attracted much attention among policymakers.[23] Families with children below the age of 3, who cannot rely on relatives to take care of their children, face a particularly difficult situation in West Germany because only 2% of children younger than 3 years have access to childcare facilities. Among those with children aged 3 to 6 years, 90% have access to childcare facilities. The situation in East Germany is much better. Prior to the German reunification, the social policy institutions followed a more egalitarian employment orientation supporting full-time employment of both spouses. They provided an extensive infrastructure with childcare facilities that facilitated the fast re-entry of women into the labor market after they gave birth to a child (Dingeldey 2000, p. 34). Nearly 90% of children between 0 and 6 years had access to childcare. The facilities were open from 6am to 6pm Mondays to Fridays. If necessary, care was also provided on Saturdays. School children were able to go to an all-day-home during the school vacation. The costs for childcare were highly subsidized by the government. The costs borne by parents were minimal. The good childcare facility infrastructure served the indoctrination of ideological values at the earliest stage of a child's life and the high level of female labor market participation was promoted to satisfy the demand for full-time[24] labor of the former

[23] A law introduced by the government coalition, aiming at an increase in childcare facilities for children below age 3 and all-day schooling is currently pending in the Upper House of Parliament ("Bundesrat").
[24] Part-time jobs were an exception and were reserved to older women.

East German economy (Hank, Tillmann et al. 2001, p. 2). Due to the different financing structure after reunification, it was impossible to maintain the same childcare infrastructure. Access to childcare in East Germany declined, but is still much higher than in West Germany.

The availability and flexibility of childcare facilities and schools aggravate the problem of reconciling work and family duties for women. Facilities are generally opened from 8am to 1pm. Mothers can either work part-time or need to find private childcare arrangements (OECD 2001; Bundesministerium für Forschung und Bildung 2003). The inflexible opening hours of the majority of childcare facilities are an important reason for the drop in employment rates among women aged 25 to 45. Maier points out that there are considerable differences in employment rates between low-skilled and high-skilled women. Only 28% of low-skilled women with children were employed, whereas employment is as high as 71% among high-skilled women. She stresses that the differences in employment rates for different skill levels might indicate inequalities in the ability to combine family and work responsibilities (Maier 2000, p. 86). Otherwise these differences might suggest that the opportunity costs of staying at home are higher for high-skilled women than for low-skilled women. And it is much easier for high-skilled women to find, and even more importantly, to pay for childcare during the time they work.

The UK greatly expanded the provision of private childcare facilities in the early 90s. This in turn had positive employment effects for women (Dingeldey and Reuter 2003). An expert's report for the German "Ministry for Family, Senior Citizens, Women and Youth" projects similar results for the childcare sector in Germany. The report found that the expansion of all-day childcare facilities would have two parallel effects. First, women would be able to work full-time. Second, the expansion in childcare would create approximately 430,000 new jobs (Bundesministerium für Familie 2002). The expansion of all-day childcare facilities could give a lot of women, especially single mothers, the opportunity to work full-time, which in turn would improve their independent pension benefits.

4.4. Unintended Consequences of Social Policies

The employment patterns, especially of West-German women, are still very similar to the "three-phase" model propagated by Myrdal in 1957. According to that model, women enter the labor market after they have completed their education, then they interrupt employment for the phase of 'active' motherhood. In the third phase, after 15 to 20 years, they return to work once the children are grown up and independent. This model has been embedded in a net of welfare provisions that fostered the male breadwinner/ female caretaker model. One strand of literature suggests that generous child allowance payments and maternity leave regulations can have unintended consequences and provide disincentives for mothers to reenter the labor market. Gustafsson et al. have predicted time spent at home for first-time mothers in the UK, the Netherlands, Sweden, and Germany. The average time mothers spent at home after the birth of the first child for the years 1980 and 1990 dropped in the UK from 24.6 to 14.0 months, in the Netherlands from 12.3 to 9.3 months, and increased in Sweden from 9.5 to 12.6 months. These three countries converged in their trend. In comparison, German mothers average time spent at home after the birth of the first child increased from 22.3 months to 32 months between 1980 and 1990. "Germany sticks out as the particular housewife country and the direction of change is making the country more exceptional rather than more like other countries" (Gustafsson, Kenjoh et al. 2002, p. 17). An

interruption of nearly three years makes the re-integration of women into the labor market much more difficult.

A generous net of welfare transfers has supported the male breadwinner/ female caretaker model. Mothers receive their full salary 6 weeks before they go into labor, and 8 weeks after they gave birth to the child. The woman's job is protected for 36 months.[25] Parents also receive monthly child rearing payments and can opt to reduce their weekly working hours. The childrearing payments are income tested. If the annual net earnings for a family lie below € 30,000 (€ 23,000 for single parents) they receive € 300 for the first six months. The benefit is paid for another 18 months, but only for families and single parents who fall below a much lower earnings threshold (Bundesministerium für Familie 2004). Child rearing payments are complemented by monthly child allowances of € 154 for the first two children and € 179 for every additional child. These benefits are financed out of general tax revenues. They are paid until the child reaches age 18, but can be extended up to age 27, if children are receiving professional training or secondary education (Thenner 2000, p. 113).

The presence of these generous transfers might discourage German women from working. The low labor market participation of women with children might support Becker's theory about specialization within the household. If one spouse has a comparative advantage in homework and the other spouse has a comparative advantage in market production, then the families utility will be maximized by specialization in the time allocation of both partners (Becker 1973; Becker 1991). Naz has shown that the introduction of a € 400 childcare subsidy in Norway decreased women's labor force participation (Naz 2004).[26] The welfare provisions in Germany substitute for the wage of women as they care for children and might therefore postpone the re-entry into the labor market. The long absence of women from the labor market shortens the time during which they can earn pension entitlements and therefore results in lower future pension benefits.

If high female labor participation is the goal, policies need to be designed in a way that they encourage the fast re-entry of women into the labor market. Recent pension legislation is an instructive example how policies can set incentives to work. As mentioned in the background section, women receive childcare credits for every child (three earning points per child assuming average earnings during that period). If women decide to work during their parental leave period, the earning points derived from employment can be added to the childcare credits awarded within the pension insurance (up to a salary cap of 2.0 times the average earnings).

4.5. THE NEED FOR TAX REFORM

The male breadwinner/female caretaker model is further supported by the structure of the German tax system. Germany is one of the few countries that maintain strict joint taxation of spouses.[27] The unit of taxation is the married couple. The wage income of the primary earner, mostly the husband, is taxed at a low rate of progression, whereas the additional income of the spouse, mostly the wife, is taxed at a high rate. In addition, social insurance contributions (pensions, health care, unemployment insurance, and long term care) are levied

[25] For civil servants job protection can be as high as 13 years.
[26] Interestingly, labor force participation of highly educated women decreased more than among less educated mothers.
[27] The number of children is not considered.

on the wage of the working spouse if he/she earns more than € 400. The marginal tax rate for the co-earner is high compared to the primary earner (Dingeldey 2000; Dingeldey 2000). This type of taxation is most advantageous if one partner earns very little (so that the social security contribution do not apply) or nothing. The wage of the lower earning partner would be taxed at a very low marginal tax rate. The tax burden is greatest for the married couple or cohabiting partners if both partners earn similar wages. Due to the higher wage elasticity of the labor supply of women, it can be expected that a high marginal tax rate has a larger negative impact on the labor supply decisions of married women than on their husbands and therefore discourages female labor market participation (Ehrenberg and Smith 2003). Joint taxation can therefore be interpreted as a barrier to the participation of married women in the labor market. The non-individualization of the tax system combined with gender inequalities in the labor market result in a situation where a large number of women withdraws from the labor market or never enters it at all. The fact that women do not enter the labor market creates not only a dependency on their partner's earnings, but also on benefits received from the social insurance system, such as health insurance for dependents or survivor's pensions (Jespen, Meulder et al. 1997).

An interesting simulation study by Gustafsson applied the Swedish tax code on the household income of German married couples and vice versa. The results show that the household income of German households with only one employed person would be significantly lower, whereas Swedish household incomes would be significantly higher. The labor force participation rates of German women in the early 90s would have increased from 50.3 to 60%, whereas the application of the German tax code would have decreased labor force participation of Swedish women from 80.2 to 60.4% (Gustafsson 1992).[28]

4.6. Early Retirement Trends and Increases in the Retirement Age

The German pension system illustrates the interplay of early retirement and population aging. According to Börsch-Supan, the German pension system is "a Model under Siege" (Börsch-Supan 2000). When the German retirement insurance started as a fully funded system in 1889 the mandatory retirement age was 70 years. Life expectancy at birth for males was below 45 years at this time. In 2002, life expectancy exceeds 75 years, but the average retirement age has dropped to 60.4 years and even below age 60 in East Germany (Verband Deutscher Rentenversicherungsträger 2003).[29] In addition, the average duration of the receipt of pension benefits increased by 66% between 1960 and 2002. The duration of the receipt of pension benefits is likely to increase further as the life expectancy at birth continues to grow (Stahl 2003, p. 78).

For a long time, the German pension system created incentives for early retirement because of its lack of adjustment factors. The pension reform of 1972 failed to include explicit penalties for workers retiring earlier than age 65. If an individual worked for 40 years and always had average earnings, retiring one year earlier decreases the pension benefit by 2.5%. If the person decides to postpone taxation for one year at age 60, retirement benefits increase by 5.5%. If the person postpones retirement for one year at age 65, increases the retirement benefits by 8% (Börsch-Supan 2000, p. 30). Börsch-Supan shows that the accrual function of the German public pension system has three distinctive kink points at ages 60, 65, and 66.

[28] The effect of the labor supply effects of the study might have been overestimated because the progressivity of the tax rate has not been considered.

[29] The average retirement age is the average age of workers receiving public pension for the first time.

The negative accrual rate has the effect of an implicit tax on labor. This implicit tax creates disincentives for labor supply and results in reduced old-age labor force participation. The "Sustainability Law" adjusted the actuarial fairness in the areas of partial retirement and retirement due to unemployment, but the debate about an increase in the retirement age continues. Against the background that individuals postpone the entrance into the labor market because of longer periods of education, it seems indispensable to increase the statutory retirement age so that individuals can make up for the reduced number of years employed.

5. ANALYSIS AND METHODOLOGY

I use a multi-method approach to answer the question of how to increase the independent public pension benefits of women in the public pension system. First, a pooled cross-section analysis of data from the survey on 'Old-Age Pension Systems in Germany' (*Alterssicherung in Deutschland – ASID*) identifies the determinants of public pension benefits in East and West Germany. The regression results then guide my search for policy options that aim to increase the independent pension benefits for women. The policy options focus on solutions within the public pension system itself. The search tries to identify best practices from other public pension systems that could be applied to the German public pension system. Three different policy options are then simulated for different biography profiles in order to assess the effects of a policy change on different employment paths. The simulation enables us to assess the changes in benefits at the individual level, but also the change in costs from the perspective of the public pension system.

5.1. THE QUESTION

The pooled cross-section analysis answers the following question: What are the determinants of public pension benefits for women in East and West Germany? Section 4 showed that different women choose different life-courses, which implies that the reasons for low pension benefits can be manifold. Even though the previous sections suggested that employment is central to the receipt of public pensions, it was not possible to look at multiple factors that influence public pension benefits. The multiple regression analysis tries to estimate which factors determine public pension benefits in West and East Germany.

Two separate equations for East and West German women are estimated. The p-value for the t-test that tested whether public pension benefits are equal for East and West German women was 0.000, which was below the critical value of 0.05. The p-value indicates that pension benefits for women in these two regions in Germany are not the same and requires the estimation of two separate equations.

5.2. THE DATA

The data analysis is based on the representative survey on 'Old-Age Pension Systems in Germany' *(Alterssicherung in Deutschland* - ASID), which was conducted for the fourth time in 1999 (after 1986, 1992, and 1995) by *Infratest Sozialforschung*. The survey was commissioned by the Federal Ministry of Labor and Social Affairs. The survey collects data on type and level of income available to individuals and married couples and links this

information to factors that determine old-age income, such as socio-demographic information, employment related information, etc.

The sample population was aged 55 and over and it included institutionalized population and foreign borns. The representative sample was randomly drawn from register data of the register offices. The target persons of the study included both men and single women (i.e. widowed, divorced, or never married). After the married man was interviewed, data were also collected for the spouse. The spouses can be younger than 55. For each widowed woman, data on the deceased husband was collected. The unit of observation of the survey is either the individual or the married couple.

The data consists of independently pooled cross sections (1992, 1995, and 1999). 1986 data is excluded because this wave was collected prior to German reunification and is therefore not comparable to the later waves. Male respondents have been excluded from the analysis. Females who stated they were not retired at the time the interview was conducted were dropped as well. I only used variables that were collected in all three waves. Due to differences in turn-out rates, the waves have different number of observations. After excluding men and women who stated they were not retired when the survey was conducted, my sample includes 45,296 cases (number of cases per wave: 1992:16,753; 1995: 15,581; 1999:12,962). I use the ordinary least squares (OLS) estimation method to estimate the determinants of public pension benefits in East and West Germany.

Pooled cross-section is the appropriate method of analysis, because the methodological concept for all three waves remained largely unchanged, in terms of the structure of the survey, its methods, the questionnaire, and the ways in which data were verified and extrapolated. Unfortunately some of the employment-related variables collected in earlier waves, were not surveyed for 1999, which makes it impossible to include the variables into the regression models. This pertains in particular to two variables: one asking whether a person was part-time employed for at least a year and another one asking for how many years a person was part-time employed.

One of the major benefits of the dataset is that it links information on type and level of income for individuals and married couples with information on the factors determining (old-age) income. The ASID is the only study in Germany that enables researchers to combine income variables with factors determining the income of individuals and married couples. This type of data is neither available in the statistics of the Federation of Statutory Pension Insurance Institutes nor in other official statistical surveys.[30] Another benefit of using ASID data lies in the fact that it asks about 25 different types of income. This enables researchers to make statements about the composition of household income. Furthermore, the structure of the dataset allows for an analysis on the individual and household level.

One of the major limitations is the limited number of questions collecting information on the employment history of individuals. Unfortunately, information about interruptions in the employment history, or the incidence of part-time employment as well as the duration of

[30] One exception is the survey on "Retirement Pension Provision Schemes" (*Altersvorsorge in Deutschland 1996* - AVID) which has been conducted in 1996. AVID is projecting entitlements and future pension benefits from the Statutory Pension Insurance and other supplemental forms of retirement income. The data provides the possibility to estimate the effects of gaps in the insurance biography on the amount of future pension benefits. Unfortunately the data was not accessible for my project because of the obligation of my client to guarantee the confidentiality of the information provided by the respondents.

part-time employment, is not available for all three years. The structure of the dataset makes it impossible to reconstruct the entire employment history of the women, which might cause omitted variable bias in some of the results. Variables related to the employment history are likely to explain at least parts of the variation in public pension benefits. Another limitation lies in the unreliability on self-reported income, which cannot be controlled for. (Old-age) income is a sensitive issue and not every individual is willing to disclose information about his or her income situation. Individuals might also tend to report higher incomes than they actually have, which might be a potential source for upward bias in the regression estimates.

5.3. THE CONCEPTUAL FRAMEWORK

Based on Sections 3 & 4, I assume that the main determinants of old-age income of women are employment-related factors. Besides the employment related information, the regression model also controls for socio-demographic information and the husband's (old-age) income or derived benefits in form of survivor's benefits. In order to see whether there are time trends, year indicator variables are included into the regression model. In case the effects of key explanatory variables change over time, these variables can be interacted with the year dummies.

The first group of variables entered into the regression model are employment related. One variable describes the professional training received by individuals after graduating from school. Depending on the type of school, individuals can pursue different occupational paths. The variable describing the professional training received by individuals has been split up into eight indicator variables defined in the following overview:

Variable Name	Variable Definition
proftraining	
proftraining1	No apprenticeship
proftraining2	Apprenticeship/ Trade test
proftraining3	Full-time vocational school
proftraining4	Master craftsman or technician
proftraining5	Engineering school/ advanced vocational schools/technical college
proftraining6	University degree
proftraining7	Training for civil servants
proftraining8	Other types professional training

The higher the level of training, the higher level the position at which individuals enter the labor market. The same relationship is expected between level of training and the individual's old-age pension income.

It is important to control for the amount of pension benefits received from other pension schemes because low public pension benefits can be the result of high pension benefits in another pension schemes. If the respondent was a civil servant for the longest time of her employment career, she receives little or no public pension benefits, but a high pension from the Civil Servants' Pension Scheme. The *other* variable is the sum of all the other individual pension benefits received aside from the public pension insurance. The following overview summarizes the different pension benefits that are subsummed under the variable *other*.

Variable Name	Variable Definition
BAV +	Benefits from Employee Pension Scheme in Private Industry
ZOED +	Benefits from Supplementary Scheme for Public Service
BV +	Benefits from Civil Servants' Pension Scheme
AdL +	Benefits from Farmers' Old-Age Pension Scheme
BSV	Pension Funds for the Liberal Professions
Other	Sum of all the benefits

The variable *years* measures the number of years employed. It is an important indicator for the level of public pension benefit. It is expected that the longer the respondent has been employed, the higher the individual's old-age public pension benefit. The variable *neveremployed* indicates whether an individual has never been gainfully employed.

The variable *sector* describes the sector in which the individual was mainly employed. It is split up in seven indicator variables that are defined in the following overview.

Variable Name	Variable Definition
sector	
sector1	Agriculture, forestry, and fishing
sector2	Mining
sector3	Manufacturing, energy industry
sector4	Construction, crafts
sector5	Domestic trade, transportation, services
sector6	Public enterprises, such as postal services, railway, etc.
sector7	Public service

The second group of variables that enter the regression model control for socio-demographic characteristics of the respondent, such as marital status, educational attainment, children, age of the respondent, and the number of persons living in the household.

Four indicator variables describe the marital status of the women: *married, widow, divorce,* and *single*. Educational attainment is another variable in the set of socio-demographic indicators. The German educational system provides different paths for students according to their individual ability. After the completion of four years in elementary school, teachers recommend students to different types of schools each preparing for different career paths.[31] The *Hauptschule/Volksschule* (a total of 9 years of schooling) qualifies for vocational and apprenticeship training. The *Realschule* (total of 10 years of schooling) enables students go into part-time vocational schools, higher vocational schools or to continue studying at the Gymnasium. The Gymnasium (a total of 13 years of schooling) is the highest track; its completion qualifies students for university studies. Students can switch between schools, however diffusion is rather uncommon. Three indicator variables enter the multiple regression, each indicating a different level of schooling. It is expected that old-age income increases with the level of schooling completed.

Variable Name	Variable Definition
school	
school1	Hauptschule/Volksschule equivalent to 9 years of completed schooling
school2	Realschule equivalent to 10 years of completed schooling
school3	Gymnasium equivalent to 13 years of completed schooling

[31] The recommendation of the teacher is not binding for the parents of the student.

Section 4 has shown that because birth and upbringing of children have a considerable impact on the labor market behavior of women, old-age income of women is expected to decrease with the number of children. The variable *child* indicates whether the respondent has a child or not.

The age of the respondent at the time of the interview is added as a control variable (*age)*. Old-age income is expected to increase with age. Another variable controls for the number persons living in the household (*person*).

The third group of variables controls for the income of the husband (pension and other types of income) or derived benefits in form of survivors' pensions in case the husband deceased. The variable *total* sums the husband's net income in DM. The variable *derived* sums the derived benefits a widow receives from her deceased husband.

Based on the conceptual framework, I specify the following equation. The first equation estimates the determinants of public pension benefits for West German women, the second equation estimates the determinants of public pension benefits for East German women.

$$PPB_{West} = \beta_0 + \delta_1 d95_t + \delta_2 d99_t + \beta_1 employment + \beta_2 socio-demographic + \beta_3 income_m + \beta_4 APB + u \quad (1)$$

$$PPB_{East} = \beta_0 + \delta_1 d95_t + \delta_2 d99_t + \beta_1 employment + \beta_2 socio-demographic + \beta_3 income_m + \beta_4 APB + u \quad (2)$$

In Equation (1) PPB_{West} is the individual's pension benefit in West Germany, $d95_t$ is the year indicator variable for 1995, $d99_t$ is the year indicator variable for 1999, *employment* is the vector of employment-related variables, $socio-demographic$ is the vector of variables related to the socio-demographic status of the woman, $income_m$ is the vector of the husband's income variables or the derived pension benefits of the deceased husband, and APB being the summed alternative pension benefits from other pension schemes. Equation (2) is equivalent to Equation (1) but estimates the determinants for public pension benefits of women in East Germany.

Table 3 gives an overview of the variables considered in the data analysis. I listed the variable names in column 1. The variable names correspond to the names appearing in the regression outputs. Column 2 gives a description of each variable. Column 3 indicates the unit of measurement for each variable.

TABLE 3: VARIABLE DESCRIPTIONS AND UNIT OF MEASUREMENT

Variable Name	Variable Description	Unit of Measurement
DEPENDENT VARIABLE		
GRV	monthly pension benefit from statutory pension insurance	in DM[32]
EMPLOYMENT-RELATED INDEPENDENT VARIABLES		
Sector	sector of the economy in which the individual was employed	0-1 indicator variables
proftraining	type of professional training the respondent received after graduating from school	0-1 indicator variables
neveremployed	indicates that the individual was never gainfully employed	0-1 indicator variable (1= neveremployed)
Years	years of gainful employment	number of years
Other	sum of other pension benefits excluding public pension benefit	in DM
SOCIO-DEMOGRAPHIC INDEPENDENT VARIABLES		
Widow	respondent is widowed	indicator variable (1=widow)
Divorce	respondent is divorced	indicator variable (1=divorced)
Single	respondent is single	indicator variable (1=single)
Married	respondent is married	indicator variable (1=married)
School	type of school respondent graduated from	indicator variables
Child	number of children	indicator variables (1=has child/children)
Person	number of persons living in the respondent's household	number of persons
Age	age of the respondent	number of years
INCOME VARIABLES FOR HUSBAND		
Derived	derived monthly pension benefit from partner	in DM
netincome	personal net income of partner	in DM
OTHER VARIABLES		
d92	respondent was interviewed in 1992	indicator variable
d95	respondent was interviewed in 1995	indicator variable
d99	respondent was interviewed in 1999	indicator variable

Table 4 presents the descriptive statistics of the variables considered in the regression analysis. For binary variables the sample mean is reported. For all other variables, the minimum and maximum values, as well as standard deviation and mean are reported.

[32] ASID data was collected prior to the start of the European Monetary Union (EMU) and the implementation of the common currency in the EU member states. One Euro is equivalent to 1.96 DM and 1 DM is equivalent to € 0.51.

TABLE 4: SUMMARY STATISTICS

Variable	Mean	Standard Deviation	Number of Observations	Min	Max
DEPENDENT VARIABLE					
GRV	943.51	534.901	45,296	27	4,329
EMPLOYMENT-RELATED INDEPENDENT VARIABLES					
Agriculture, Forestry, and Fishing (*sector1*)	.108	.311	44,694	0	1
Mining (*sector2)*	.010	.099	44,694	0	1
Manufacturing, Energy Industry (*sector3*)	.264	.441	44,694	0	1
Construction, Crafts (*sector4)*	.089	.285	44,694	0	1
Domestic Trade, Transportation, Services (*sector5)*	.323	.468	44,694	0	1
Public Enterprises, such as Postal Services, Railway, etc. (*sector6*)	.077	.266	44,694	0	1
Public Service (*sector7*)	.128	.334	44,694	0	1
No apprenticeship (*proftraining1*)	.400	.490	44,070	0	1
Apprenticeship/ Trade test (*proftraining2*)	.349	.477	44,070	0	1
Full-time vocational school (*proftraining3*)	.149	.356	44,070	0	1
Master craftsman or technician (*proftraining4*)	.013	.115	44,070	0	1
Engineering school/ advanced vocational schools (*proftraining5*)	.025	.155	44,070	0	1
University degree (*proftraining6*)	.029	.169	44,070	0	1
Training for Civil Servants (*proftraining7*)	.004	.060	44,070	0	1
Other types professional training (*proftraining8)*	.031	.174	44,070	0	1
Neveremployed	.056	.229	45,296	0	1
Years	24.71	13.91	40,089	1	72
Other	72.76	437.13	31,575	5	10,804
SOCIO-DEMOGRAPHIC INDEPENDENT VARIABLES					
Widow	.26	.438	45,296	0	1
Divorce	.050	.219	45,296	0	1
Single	.056	.230	45,296	0	1
Married	.634	.482	45,296	0	1
Hauptschule/Volksschule (*school1*)	.808	.394	45,019	0	1
Realschule (*school2*)	.147	.354	45,019	0	1
Gymnasium (*school3*)	.046	.209	45,019	0	1
Child	2.374	1.345	39,193	1	8
Person	1.941	0.861	44,171	1	7
Age	66.904	9.321	45,296	28	99
INCOME VARIABLES FOR HUSBAND					
Derived	1170	708.05	11,437	17	9,859
Netincome	2759.83	1714.09	28,679	5	40,369
OTHER VARIABLES					
D92	.37	.483	45,296	0	1
D95	.344	.475	45,296	0	1
D99	.286	.452	45,296	0	1

6. RESULTS

6.1. DESCRIPTIVE ANALYSIS

Section 6 presents and discusses the results of the data analysis. It is divided into two parts. The first part presents tables and graphs to illustrate the relationship between the dependent variable and key explanatory variables. The second part presents and interprets the results of the regression analysis.

Table 5 shows the percentage of women who receive a public pension benefit or a self-acquired pension benefit[33] in East and West Germany. It is much more common in West Germany to not have any pension benefits at all. 38.28% have no public pension benefit and 36.89% have no self-acquired pension benefit at all. Less than 20% of East German women have no public pension or no other pension benefit. Consequently, East German women receive a public pension or another type of self-acquired pension much more often than West German women.

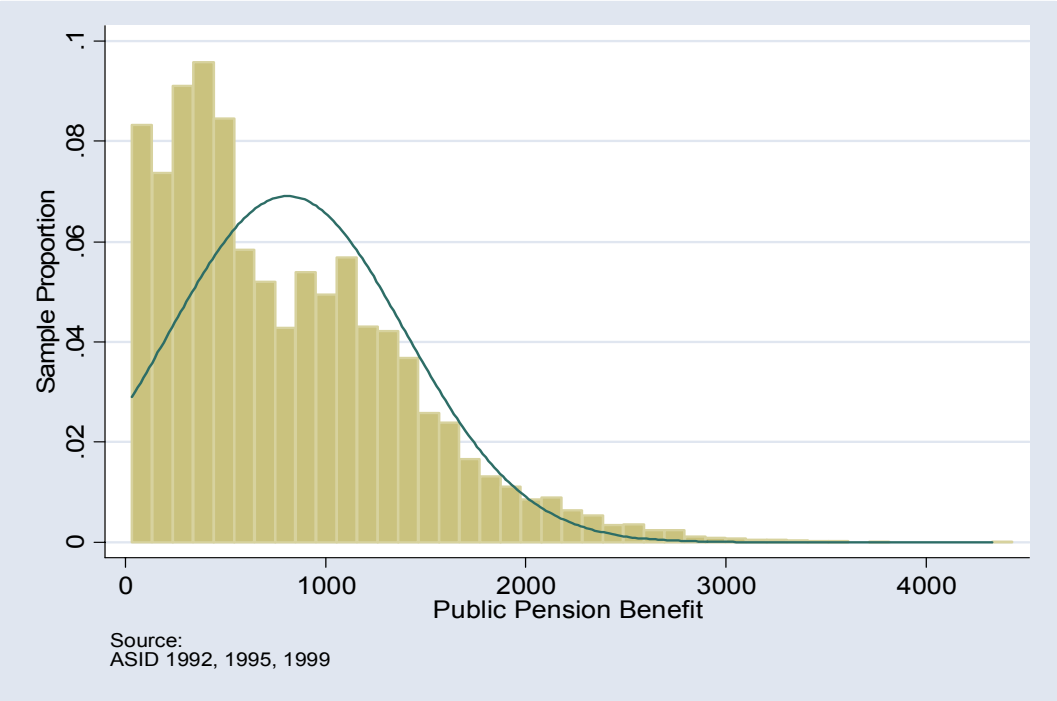
TABLE 5: PREVALENCE OF PUBLIC & SELF-ACQUIRED PENSIONS AMONG WOMEN BY REGION (IN %)

TYPE OF PENSION	PUBLIC PENSION BENEFIT		ANY TYPE OF PENSION	
Region	**West**	**East**	**West**	**East**
NO	38.28	19.8	36.89	19.63
YES	61.72	80.20	63.11	80.37

Graph 1 and Graph 2 compare the distribution of public pension benefits for West and East German women. There are clear differences in the distribution of public pension benefits. In West Germany the distribution is highly skewed to the right with high concentration at lower amounts of pension benefits. The average pension benefit is 810 DM.[34] The distribution of public pension benefits among East German women is much more centered, however still slightly skewed to the right. The average pension benefit for women in East Germany is 1,100 DM and therefore higher than for their West-German counterparts.

[33] Self-acquired benefit sums up pension benefits over different pension schemes. The different types of benefits subsumed under the name "self-acquired benefit" are listed under Appendix A, Table II.
[34] Only individuals who receive a public pension benefit are considered in the calculation and in Graph 1 & 2.

GRAPH 1: DISTRIBUTION OF PUBLIC PENSION BENEFITS FOR WEST GERMAN WOMEN



GRAPH 2: DISTRIBUTION OF PUBLIC PENSION BENEFITS FOR EAST GERMAN WOMEN

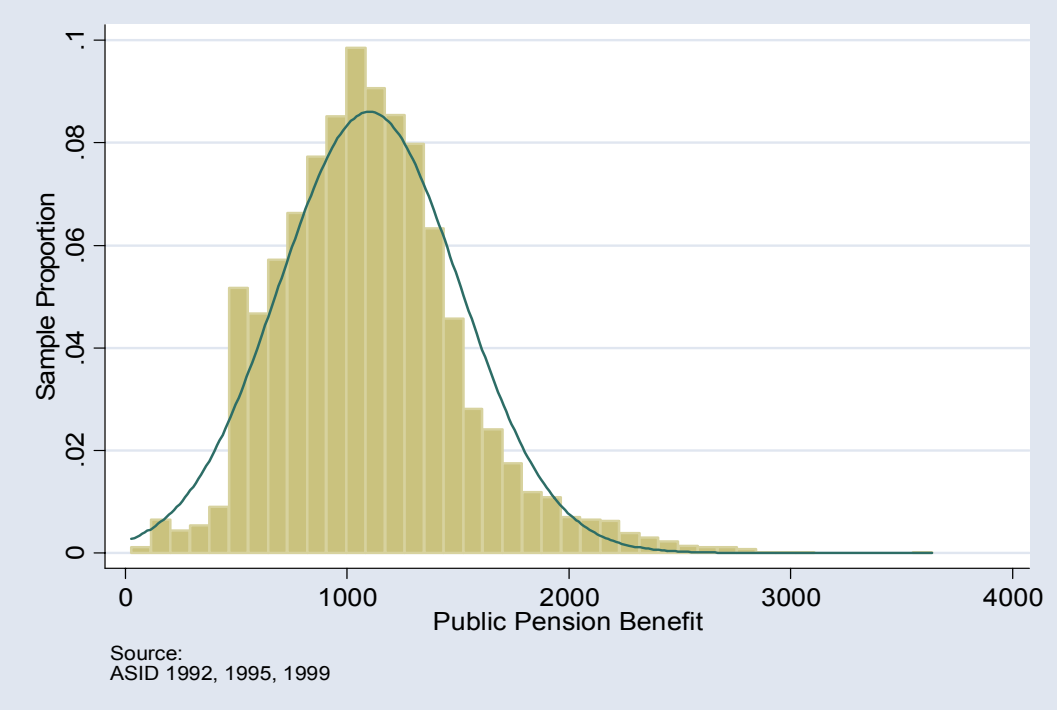


Table 6 summarizes average pension benefits for some of the employment related variables, such as skill levels[35] and professional training. Each indicator variable is defined in the second column of the table. The pattern across different skill levels corresponds with the expectation that average pension benefits increase as the skill level increases. Public pension benefits are still considerably higher in East Germany compared to West Germany as well as the increments of increase between skill levels. The average public pension benefits across different levels of professional training is increasing for the first five levels of professional training. Individuals with a university degree or the training for civil servants often receive benefits from other pension schemes, such as the Civil Servants' Pension Scheme, which explains the drop in average public pension benefits for these two groups in West Germany.

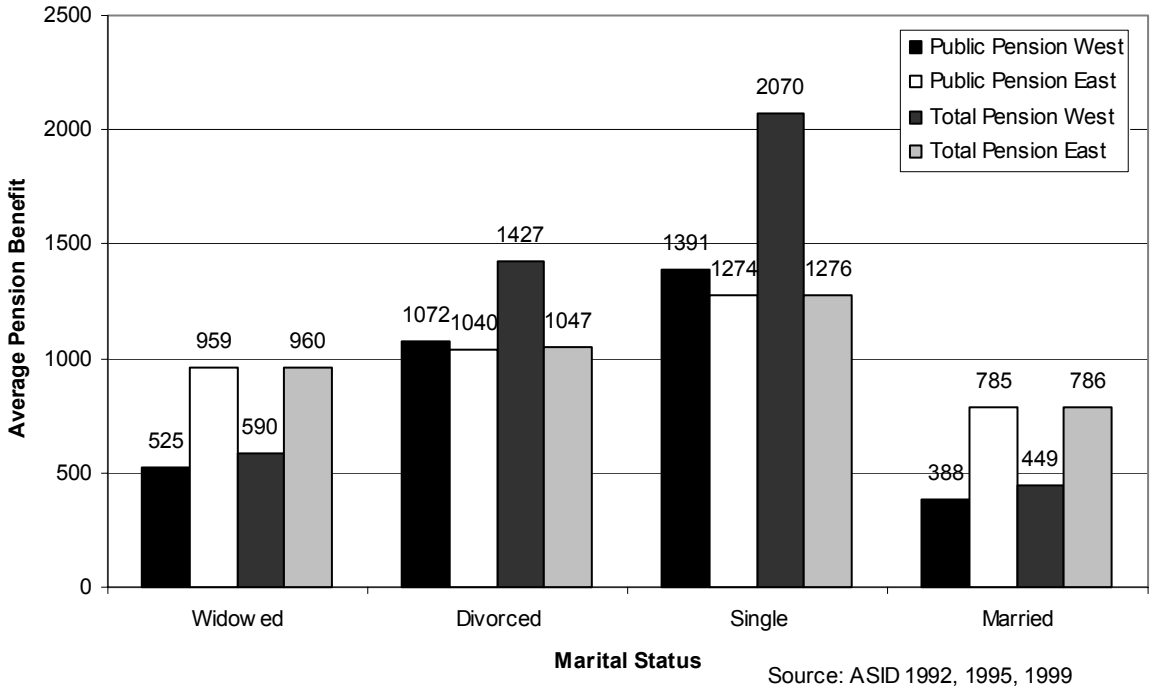
TABLE 6: AVERAGE PUBLIC PENSION BENEFITS FOR WOMEN ACCORDING TO SKILL LEVELS (IN DM)

VARIABLE	VARIABLE DEFINITION	WEST	EAST
Skills			
skills1	Semi-skilled workers and salaried employees	467	979
skills2	Skilled wage-earners, ordinary salaried employees, ordinary civil service	444	1,035
skills3	Master craftsman/intermediate position/intermediate civil service	752	1,279
skills4	Higher intermediate position/higher intermediate civil service	858	1,523
skills5	Senior salaried employee/higher civil service	959	1,725
Professional Training			
proftraining1	No apprenticeship	452	833
proftraining2	Apprenticeship/ trade test	476	830
proftraining3	Full-time vocational school	633	910
proftraining4	Master craftsman or technician	628	1,005
proftraining5	Engineering school/ advanced vocational schools/technical college	734	1,104
proftraining6	University degree	478	1,350
proftraining7	Training for Civil Servants	205	only 4 observations

Graph 3 compares average public pension benefits and average total pension benefits according to marital status for East and West Germany. For West Germany there are striking differences in benefits by marital status. The pension benefits are particularly low among married (388 DM) and widowed (525 DM) women, whereas the average public pension benefit for divorced women is three times as high (1,072 DM) and for single women four times as high (1,391 DM) as for their married counterparts. The differences are even larger when comparing the average total benefit of married women (449 DM) with divorced (1,427 DM) and single (2,070 DM) women. In East Germany, the differences between the average public pension benefits and the average total benefit are less distinct, which implies that the payment of benefits from other pension schemes is more rare. The pattern in terms of average pension payments is quite similar to West Germany. Married (785 DM) and widowed women (959 DM) receive lower average pension benefits, whereas single women (1,274 DM) receive the highest benefits.

[35] The dummies describing different skill levels is not included into the regression model due to a high number of missing values, which would have reduced the number of observations by nearly 40%.

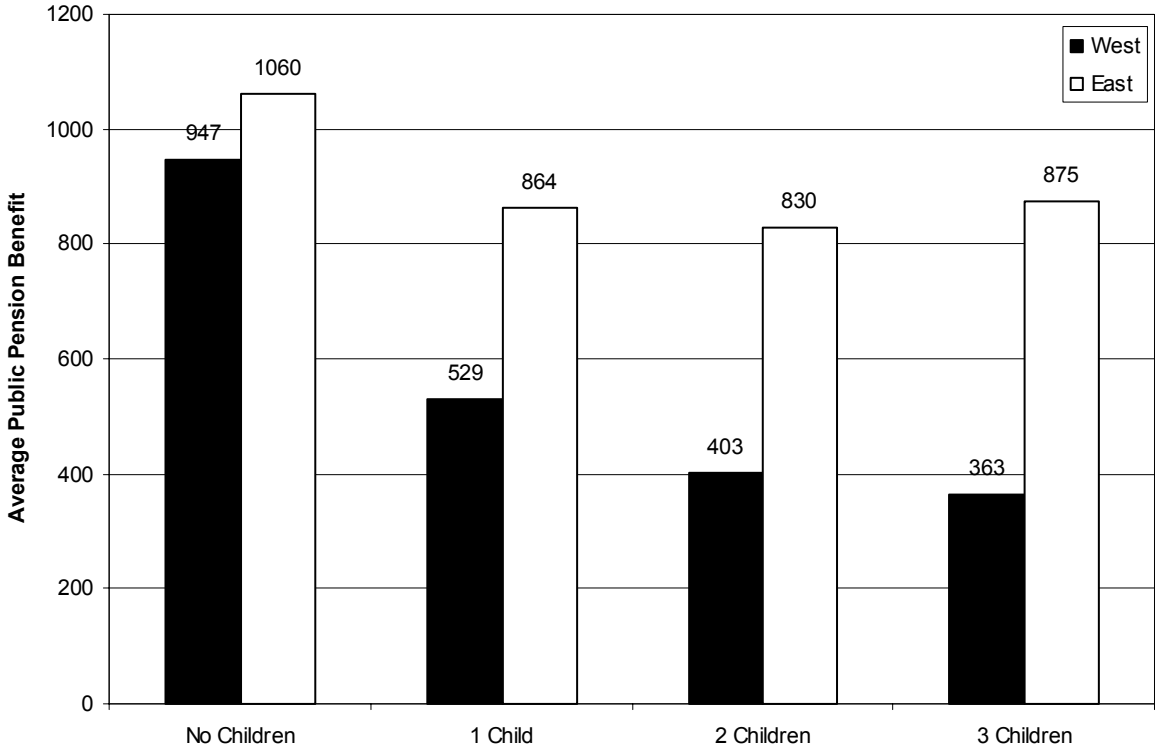
GRAPH 3: AVERAGE PENSION BENEFITS FOR WOMEN BY MARITAL STATUS AND REGION (IN DM)



Source: ASID 1992, 1995, 1999

Graph 4 shows the differences in average pension benefits by the number of children. The most significant drop can be observed when comparing the average benefit of women with no children to those with one child. In West Germany, pension benefits drop from 947 DM to 529 DM. In East Germany, the drop is not as drastic, the average benefit decreases from 1,060 DM to 864 DM. For East Germany, it is also noticeable that the average public pension benefit does not dip much further even if the women have two or three children, whereas in West Germany the benefits continue to decrease.

GRAPH 4: AVERAGE PUBLIC PENSION BENEFITS FOR WOMEN BY NUMBER OF CHILDREN (IN DM)



Source: ASID 1992, 1995, 1999

6.2. REGRESSION ANALYSIS

This section presents the results of the regression analyis. Two equations have been estimated, one for West German women (number of observations: 23,526) and another for East German women (number of observations: 15,447). A total of three models has been estimated for each region. The first model includes only employment related variables and the year indicator variables to control for structural changes over time. The second model adds the socio-demographic variables. The third model also includes variables related to the husband's income. I only present the results of the complete model that includes all the explanatory and control variables (Model 3 for West and East Germany).[36]

The top number in each cell is the regression coefficient, the number in parenthesis the standard error. The asterics indicate statistical significance, with the different significance levels being noted at the bottom of the table. The results for the joint hypothesis tests for the variables *sector*, *professional training,* and *years* are reported in the last three rows.

[36] The results of the Model 1 & 2 can be requested from the author.

TABLE 7: ORDINARY LEAST SQUARES REGRESSION RESULTS

VARIABLE NAME	VARIABLE DEFINITION	MODEL WEST	MODEL EAST
DEPENDENT VARIABLE: MONTHLY INDEPENDENT PUBLIC PENSION BENEFIT			
EMPLOYMENT-RELATED VARIABLES			
neveremployed	1 if never gainfully employed	-37.85**	12.49
		(17.03)	(22.49)
years	number of years employed	21.11***	12.33***
		(0.245)	(0.37)
other	sum of self-acquired monthly pension from other schemes	-0.108***	-0.17**
		(0.006)	(0.08)
sector1	1 if working in agriculture, forestry, or fishing	-468.87***	14.11
		(11.72)	(13.10)
sector2	1 if working in mining	189.38***	146.47***
		(48.67)	(28.69)
sector3	1 if working in manufacturing, energy industry	omitted	omitted
sector4	1 if working in construction, crafts	-142.71***	-50.71***
		(10.88)	(16.33)
sector5	1 if working in domestic trade, transportation, services	-85.68***	-40.55***
		(7.41)	(10.82)
sector6	1 if working in public enterprises, such as Postal Services, Railway, etc.	132.90***	110.69***
		(13.61)	(14.82)
sector7	1 if working in public service	151.92***	44.08***
		(11.22)	(12.27)
proftraining1	1 if no apprenticeship	omitted	omitted
proftraining2	1 if Apprenticeship/ trade test	48.11***	64.17***
		(7.29)	(9.96)
proftraining3	1 if full-time vocational school	84.56***	116.35***
		(9.36)	(13.31)
proftraining4	1 if master craftsman or technician	5.75	151.80***
		(28.17)	(31.19)
proftraining5	1 if engineering school/ advanced vocational schools/technical college	106.82***	256.77***
		(26.40)	(21.79)
proftraining6	1 if university degree	-153.25***	466.33***
		(27.33)	(26.17)
proftraining7	1 if training for civil servants	-514.80***	481.41*
		(39.26)	(273.15)
proftraining8	1 if other type of professional training	5.45	92.28***
		(16.31)	(26.31)
Significance Levels	*0.10 ** 0.05 ***0.01		

TABLE 7 (CONTINUED)

VARIABLE NAME	VARIABLE DEFINITION	MODEL WEST CONTINUED	MODEL EAST CONTINUED
DEPENDENT VARIABLE: MONTHLY INDEPENDENT PUBLIC PENSION BENEFIT			
SOCIO-DEMOGRAPHIC VARIABLES			
widow	1 if widow	-98.99***	25.38
		(14.75)	(20.65)
divorce	1 if divorced	284.02***	30.90
		(18.00)	(20.60)
married	1 if married	omitted	omitted
single	1 if single	362.98***	128.41***
		(16.93)	(23.63)
school1	1 if Hauptschule	omitted	omitted
school2	1 if Realschule	74.68***	-10.02
		(8.65)	(12.98)
school3	1 if Gymnasium	107.02***	37.70
		(18.78)	(24.14)
child	1 if respondent has child or children	-65.18***	-22.27*
		(9.90)	(13.20)
person	number of persons living in household	-52.20***	-34.88***
		(3.83)	(6.24)
age	age of respondent when interviewed	12.18***	24.80***
		(0.375)	(0.51)
HUSBAND'S INCOME			
netincome	sum of husband's netincome	-0.02***	-0.026***
		(0.002)	(0.006)
derived	sum of derived benefits from deceased husband	-0.03***	-0.16***
		(0.007)	(0.017)
d92	1 if year 1992	omitted	omitted
d95	1 if year 1995	37.58***	290.84***
		(6.77)	(9.74)
d99	1 if year 1999	89.41***	373.86***
		(7.55)	(11.17)
adjusted R^2		0.4938	0.3532
number of observations		23031	15056
Results of Joint Hypothesis Test			
sector indicator variables		yes	yes
professional indicator variables		yes	yes
year indicator variables		yes	yes
Significance Levels	*0.10 ** 0.05 ***0.01		

6.3. DISCUSSION

The regression model presented in Table 7 includes variables related to employment, the socio-demographic situation of the women, and variables related to the husband's income. It controls for structural changes by including indicator variables for the years the data was collected.

For the West model, the coefficient indicating that a woman has never been gainfully employed (*neveremployed)* is statistically significant at the 5% level. The coefficient of -37.85 implies that women that have never been gainfully employed have on average a 37.85 DM lower pension benefit. The coefficient for *years* is 21.11. It has the expected positive sign and is significant at the 1% level, with a very high t-statistic of 86.16. The coefficient implies that a year of additional employment increases the average monthly public pension benefit by 21.11 DM. The coefficient for *other*, describing whether a woman receives pension benefits from other pension schemes, such as the Civil Servants' Pension Scheme or the Farmers' Old-Age Pension Scheme, is -0.108 (standard error 0.006). The variable is highly significant at the 1% level and indicates that if pension benefits from other pension schemes increase by 1 DM, the public pension benefit decrease by 0.10 DM per month.

For the East model, the coefficient for *neveremployed* has an unexpected positive sign. This implies that the public pension benefit increases if the woman was never gainfully employed. However, the coefficient is not significant. It's possible that the small number of never gainfully employed women in East Germany makes the result less robust. The coefficient for *years*, indicating the number of years a women has been employed, is highly significant at the 1% level. Holding everything else constant, a one year increase in the number of years employed increases the monthly public pension benefit on average by 12.33 DM. A 1 DM increase in other pension benefits decreases the public pension benefit by 0.17 DM. The coefficient for *other* is significant at the 5% level.

The indicator variables for the sector of employement (*sector*) and professional training (*proftraining*) are jointly significant for the West and the East model. The F-statistic tests whether the coefficients of the indicator variables are all jointly equal to 0. For both groups of indicator variables the p-value was 0.000, which indicates that the coefficients are significantly different from 0. In the West model, all the *sector* variables are highly significant at the 1% level. The coefficients for the *sector* variables are all compared to the reference category of women employed in manufacturing or the energy industry. The public pension benefit of women employed in the agricultural sector is on average 468.87 DM lower than for women in manufacturing. This can be explained by the fact that these women are likely to receive their pension from the Farmers' Old-Age Pension Scheme. Women working in construction and crafts have on average a 142.71 DM lower pension benefit compared to the reference category of women working in manufacturing. Women working in public enterprises, such as postal services or railways, in mining, and the public service have on average higher pensions than women working in manufacturing.

In the East model, all the *sector* coefficients are significant except the coefficient for women employed in the agricultural sector. Compared to the reference group of women employed in manufacturing and the energy industry, women employed in public enterprises (110.69 DM) and in mining (146.47 DM) have higher average pension benefits, holding everything else constant. Women employed in construction and crafts (-50.71 DM) and in domestic trade, transportation, and services (-40.55 DM) receive a lower pension benefit than

women in manufacturing. Even though the signs of the coefficients are the same for both models, the magnitude of the coefficients for the *sector* indicators is stronger for the West model.

With respect to the *professional training* indicator variables, I expected the public pension benefit to be higher, the higher the level of professional training. The omitted category are women that did not complete an apprenticeship. In the West model, all the coefficients are highly significant at the 1% level, despite the coefficient for women who completed professional training for master craftsmen or technicians. Compared to West German women who did not complete an apprenticeship, the public pension benefit of women with an apprenticeship (*proftraining2*) is 48.11 DM higher. Women who completed vocational school (84.56 DM for *proftraining3*) or advanced vocational school (106.82 DM for *proftraining4*) have even higher pension benefits. Women who earned a university degree or received training for civil servants have significantly lower public pension benefits (-153.25 DM and -514.80 DM). A possible explanation for the lower pension benefits for these two groups is that these individuals draw pension benefits mainly from other pension schemes.

In the East model, all the coefficients are statistically significant. It is true, that the higher the level of professional training, the higher the public pension benefit. Overall, the coefficients in the East model are stronger in magnitude than in the West model. Compared to the West German model, the coefficients for women who earned a University degree or received training for civil servants in East Germany are positive and highly significant. Women with a university degree receive on average a 466.33 DM higher pension benefit than women who did not complete an apprenticeship, holding everything else constant. Women who received training for civil servants receive 481.41 DM more in monthly public pension benefits than the reference group. The striking difference in the coefficients for *proftraining6* and *proftraining7* between East and West can be explained with the fact that there are very civil servants in East Germany. Even though these women work in comparable jobs to their West German counterparts they do not receive their benefits from the Civil Servants' Pension Scheme.

In addition to employment-related variables, the regression model controls for socio-demographic information. Interesting differences can be observed between the West and East German model. The indicator variables describing the marital status of the respondent reveal striking differences in terms of the magnitude and the signs of the coefficients. In the West model, all the indicator variables for marital status are highly significant at the 1% level. Compared to the reference category of married women, only divorced women fare worse. On average, divorced women receive 98.88 DM less in public pension benefits than married women. The public pension benefits for divorced and single women are significantly higher than for married women. Divorced women have on average a 284.02 DM higher independent public pension benefits and single women receive even 362.98 DM more than married women. These results might indicate that marriage sets disincentives for women to go to work and therefore result in low average pension benefits. Divorced women might be forced to work after they separated from their husband and therefore receive higher pension benefits. For East Germany, only the coefficient for the indicator variable single is significantly different from 0. Single women have on average a 128.41 DM higher public pension benefit than their married counterparts. The coefficients for widowed and divorced women are not statistically significant. Marital status seems to be less powerful in explaining the variation in public pension benefits in the East model when compared to the West model.

The same is true for the variables describing educational attainment. The coefficients for the *school* indicator variables are highly significant at the 1% level in the West model. Compared to the reference group of women who went to the Hauptschule, which is equivalent to nine years of schooling, women who completed 10 years of schooling (Realschule – *school2*) received 74.68 DM more in public pension benefits. Women who completed 13 years of schooling (Gymnasium – *school3*) received on average 107.02 DM more in public pension benefits than women who only completed 9 years of schooling. This is in line with the expectation, that the earnings potential increases with higher educational attainment, which results in higher public pension benefits. Both coefficients for *school2* and *school3* are not significant in the East model. These differences in the coefficients might be the result of differences in the education systems in the former German Democratic Republic (East) and the Federal Republic of Germany (West).

The coefficient for the variable *child* has the expected negative sign in both models. In the West German model the *child* coefficient is significant at the 1% level. Having a child, decreases the woman's public pension benefit by 65.18 DM. In the East model, having a child decreases the public pension benefit by 22.27 DM. The coefficient is significant at the 10%. The smaller magnitude and the smaller significance level for the *child* coefficient in the East model might reflect the better infrastructure with childcare facilities in East German that made it easier for women to reconcile family and work duties.

The *age* coefficient has the expected positive sign in both models. A one-year increase in age increases the public pension benefit by 12.18 DM. The t-statistic is very high (32.48) and the coefficient is therefore highly significant. In the East model, the magnitude of the *age* coefficient is even stronger (24.80) and the t-statistic is even higher (48.62). The coefficient is also significant at the 1% level.

The variables related to the husband's income (*netincome* and *derived*) are expected to be negatively related to the dependent variable public pension benefits. This is true for both coefficients in the West and the East model. A 1 DM increase in husband's netincome decreases the public pension benefit by approximately 0.02 DM in both models. The coefficient is highly significant at the 1% level. The coefficient for *derived* is higher in the East model. A 1 DM increase in derived pension benefits decreases the independent public pension benefit by 0.16 DM with a t-statistic of 10 indicating a significance level of 1%. In the West model, the same increase decreases the independent public pension benefit by 0.03 DM. The coefficient is significant as well.

The coefficients for the year indicator variables are jointly significant in the East and the West model, which implies structural change over time. The p-value of the F-test is 0.0000, indicating that the coefficients are significantly different from 0. In the East model, the coefficient for 1995 is 290.84 and 373.86 for 1999. Compared to the reference year 1992, the increases in pension benefits exceed the annual indexation of the pension value by far. The coefficients might suggest that the economic circumstances in East Germany have improved drastically over the course of 7 years.

The coefficients for the year indicator variables in the West model are more moderate and more in line with the adjustment of the pension value. The coefficient for 1995 is 37.58 and 89.41 for 1999. The estimates are highly significant at the 1% level.

The R^2 statistic indicates how much variation in public pension benefits can be explained by the model. The West model explains 49% of the variation, whereas the East model explains 35% of the variation in the dependent variable.

Overall, the regression analysis has shown that the coefficients of the explanatory variables for independent public pension benefits are mostly in line with the expectations outlined in the conceptual framework. The employment-related factors play an important role in determining the public pension benefits of women. The coefficients for the indicator variables for sector of employment and professional training completed by the individuals are quite similar for the East and the West model, even though the magnitude of the coefficients is higher in the West model.

Interesting differences can be seen for the socio-demographic variables. In the West model, the marital status indicator variables seem to be more powerful determinants of the independent public pension benefit. In particular, being married or widowed results in a considerable decrease in public pension benefits received by women, which supports the assumption that marriage works as a strong disincentive for employment among West German women. As mentioned earlier, a total of three models has been estimated for both regions. The coefficients for the marital status indicator variables in the second East model, before controlling for husband's income, were similar to the results in the third West model. All coefficients were highly significant at the 1% level. The coefficients for *divorce* and *single* were positive, whereas the coefficient for *widow* was negative. However, when controlling for the husband's netincome and the derived pension benefits received from the survivor's pension, the effect of the marital status indicator variables diminishes. The coefficients for *widow* and *divorce* are no longer significant in Model 3. Similarly, the coefficient for *child* is much stronger in the West than in the East model (- 65.18 compared to -22.27).

The variables related to the husband's income are in line with the expectations outlined in the conceptual framework. Increases in the netincome of the husband result in a decrease in the independent public pension benefit, the same relation is true for increases in the derived benefits from the survivor's pension. These relationships hold for both models.

7. How To Increase the Independent Public Pension of Women?

The policy options that are proposed in the following sections are based on the findings from the regression analysis. The results guided my research in finding best practices from other countries that appeared to be superior to the German pension system. The policy options aim to increase the independent public pension benefits of women. The discussion so far suggests that the solution can be either found in the labor market or in the pension system itself.

This paper focuses on policy options within the pension system itself. I searched for best practices in other countries and applied these practices to the German pension system. The results of the regression analysis give guidelines for potential points of intervention. Results such that being married or being employed in the 'domestic trade, transportation, and services' sector lower the public pension benefit of women are informative, however the potential for intervention within the pension system itself is rather limited. Whereas knowing

that having children reduces the monthly public pension benefit for women substantially offers a point of intervention. The same is true for the fact that the receipt of survivor's benefits from a deceased husband reduces the average public pension benefit of a woman. Current pension legislation can be modified to increase the independent public pension benefits of women by reforming the system of childcare credits or by reforming the survivor's pension.

7.1. THE BIOGRAPHY PROFILES

In order to assess the effects of the best practices on the independent pension benefits of women, one has to acknowledge that the policy options affect different women in different ways. We know that the reasons for lower average pension benefits among women are manifold and affect women differently over the life-course. Diverse life-courses of women reflect differences in labor-market behavior. This means that not all the determinants of the gender pension gap affect women similarly. For example, high paid women can solve the compatibility problem between work and family easier than low earners, whereas high earning women with wages similar to their spouse are adversely affected by the joint income taxation.

The best practices discussed in the subsequent sections are simulated for different biography profiles. We know how often each biography profile occurs in the 1936 to 1940 cohort in Germany. In 1996, this cohort was the closest to retirement. Projections about their life-courses produce the smallest statistical error and the empirically supported biography profiles can be used with higher certainty. The information about the employment biographies and about the prevalence of each biography profile makes it possible to estimate the effects of the policy change on the individual level by comparing the independent public pension benefit under the status quo with the independent public pension benefit after the simulation of a policy option. Furthermore, it enables us approximate the changes in costs for the pension system itself.

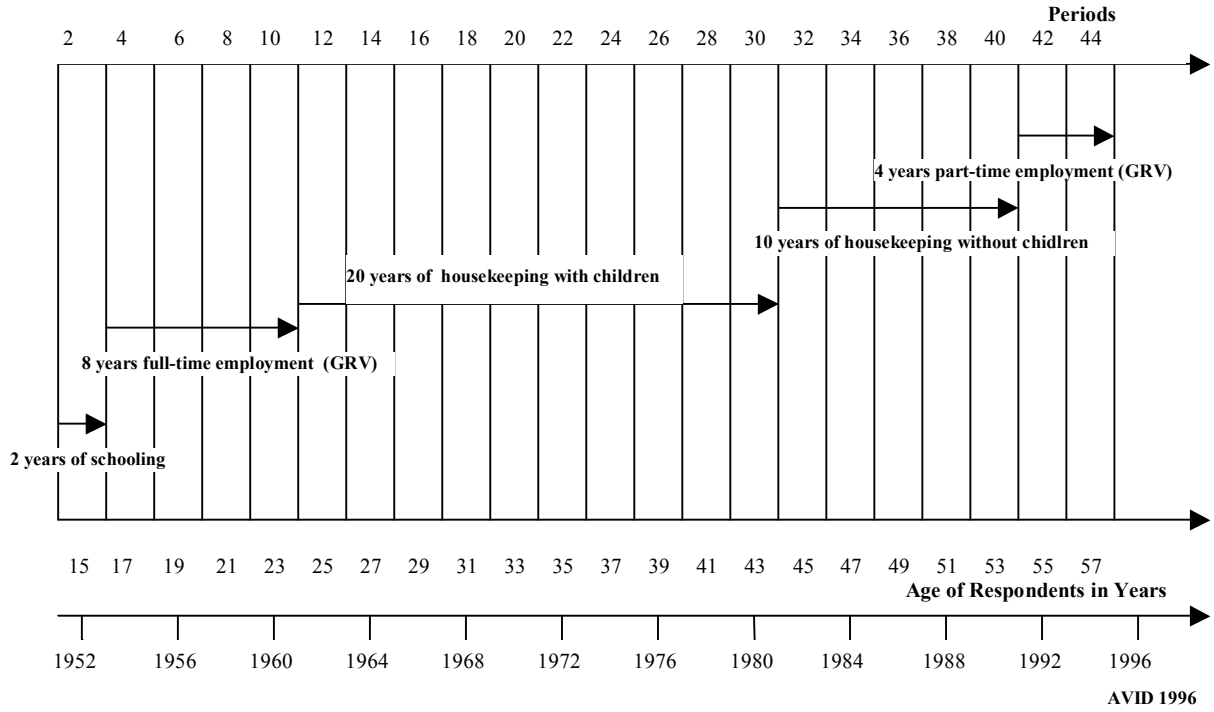
The biography profiles are empirically derived and can be observed frequently among individuals and couples in East and West Germany. It is important to distinguish between East and West Germany because of the different labor market situation and significant differences in labor market behavior of women discussed above (Himmelreicher and Viebrok 2002, p. 29). The biography profiles are the result of a special analysis of data from the survey on 'Retirement Pension Provision in Germany 1996' (*Altersvorsorge in Deutschland 1996* – AVID) conducted in 1996. The special analysis was commissioned by the Center for Social Policy Research at the University of Bremen. The profiles were based on the frequency of the occurrence of certain episodes (such as 'housekeeping with children') and the highest concentration of the distribution with respect to the duration of these episodes. Himmelreicher and Viebrok stress that it was impossible to determine exactly when certain episodes occurred over the life-course. The authors timed the episodes based on empirical findings and plausible assumptions. The profiles do not cover every employment biography, but they are a useful way to estimate the effects of certain policy options for different types of female life-courses. Three types of episodes are considered (Himmelreicher and Viebrok 2002, p. 31):

- *Employment periods subject to social insurance contributions (GRV)*[37]: These are periods of paid employment during which social insurance contributions have been paid. An episode is counted if the number of monthly periods amounts to 1 year.
- *Employment periods not subject to social insurance contributions*: Civil servants, self-employment, marginal part-time employment, or family workers do not pay social insurance contributions while they are employed. An episode is counted if the number of monthly periods in employment not subject to social insurance contributions amounts to 1 year.
- *Periods of non-employment:* This episode includes periods of schooling and secondary education; housekeeping with and without children below the age of 18; periods of care of family members, relatives or others; longer periods of sickness; limited employment; and unemployment. Again, a one year episode of non-employment is counted if an individual was not employed for 12 months.

The following section describes three typical biography profiles for West German women and one typical biography profile for East German women. In addition, a typical employment biography for West and East German men is used to simulate reform options related to survivors' pensions.

[37] The type of employment subject to social insurance contribution will be abbreviated as GRV.

BIOGRAPHY PROFILE I: FAMILY-ORIENTED BIOGRAPHY, WEST GERMANY

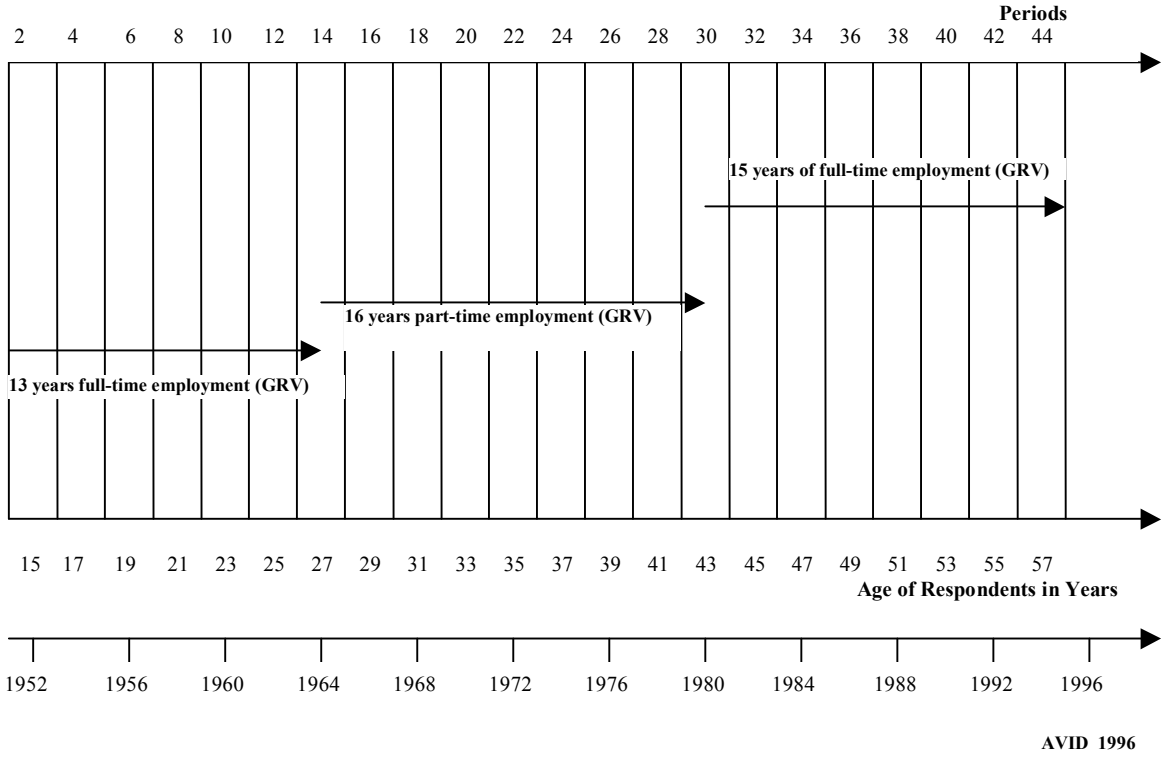


Legend	GRV	Employment subject to social security contributions
	Full-time	Thirty-six hours or more per week
	Part-time	Less than 36 hours per week
	Housekeeping with children	Housekeeping with children younger than 18 years
	Housekeeping without children	Housekeeping without children younger than 18 yrs.

Source: AVID 1996 – Special analysis for Centre for Social Policy by Infratest Sozialforschung (Himmelreicher and Viebrok 2002)

PREVALENCE: In the 1936-1940 cohort 48% of women worked full- and part-time during their employment biography. Forty percent of these women worked for less than 15 years. Nearly all women in this cohort have periods of non-employment, i.e. periods of housekeeping with children (86%) or without children less than 18 years (56%). **Fifteen percent of West German women can be found in this family-oriented employment biography.**

BIOGRAPHY PROFILE II: EMPLOYMENT-ORIENTED BIOGRAPHY, WEST GERMANY

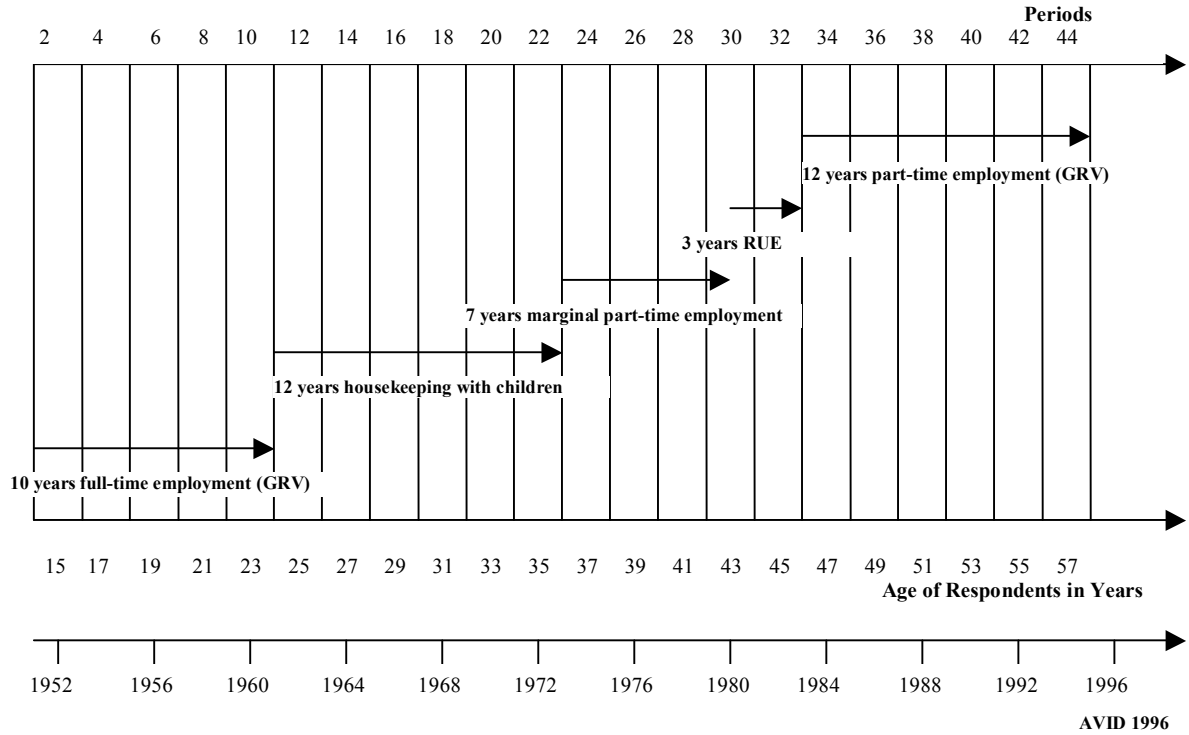


Legend	GRV	Employment subject to social security contributions
	Full-time	Thirty-six hours or more per week
	Part-time	Less than 36 hours per week

Source: AVID 1996 – Special analysis for Centre for Social Policy by Infratest Sozialforschung (Himmelreicher and Viebrok 2002)

PREVALENCE: Forty-eight percent of the cohort of women born between 1936 and 1940 were full-time and part-time employed in their employment biography. One out of seven women was permanently employed, two thirds in full-time and one third in part-time employment. **Approximately 10% of women in West Germany have an employment-oriented biography.**

BIOGRAPHY PROFILE III: CO-EARNER BIOGRAPHY, WEST GERMANY



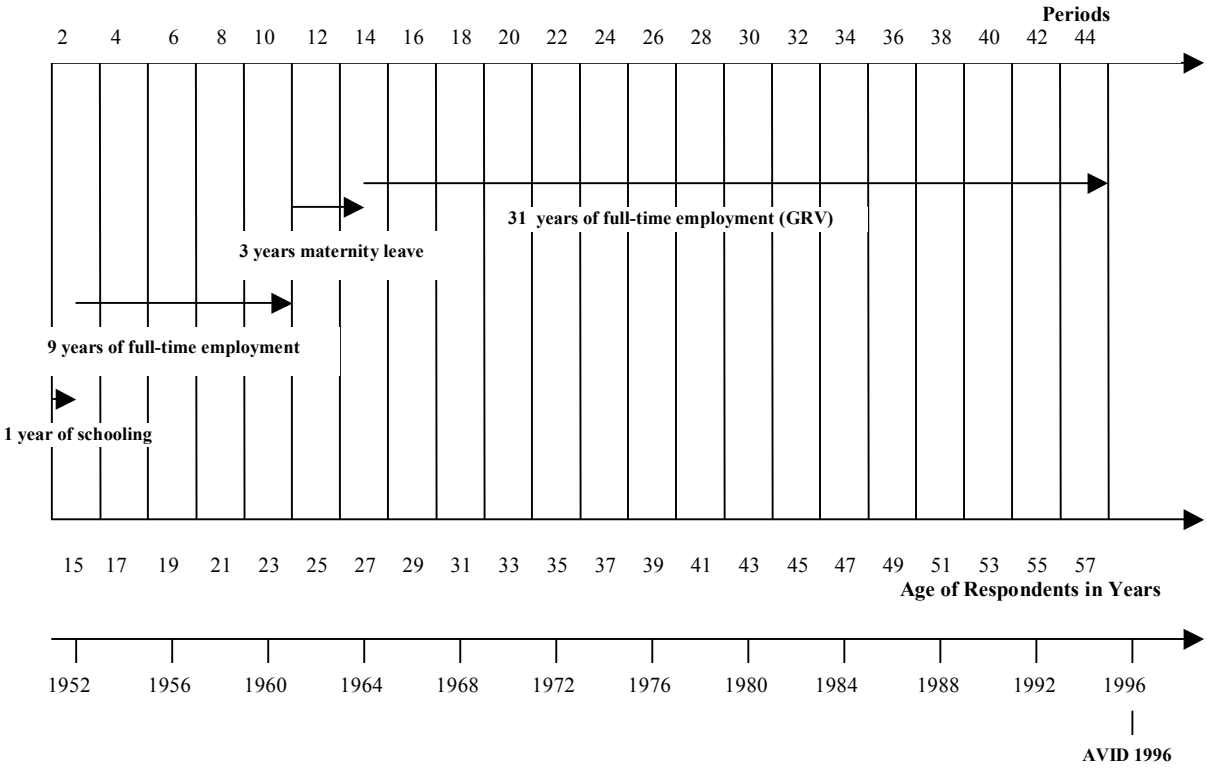
Legend		
	GRV	Employment subject to social security contributions
	Full-time	Thirty-six hours or more per week
	Part-time	Less than 36 hours per week
	Marginal part-time	Earns less than €400 and pays no contributions
	Housekeeping with children	Housekeeping with children younger than 18 years
	RUE	Registered unemployment

Source: AVID 1996 – Special analysis for Centre for Social Policy by Infratest Sozialforschung (Himmelreicher and Viebrok 2002)

PREVALENCE: Co-earner biographies are mostly the complement of the German male-breadwinner biography. Co-earners mainly work in part-time or marginal part-time employment. Approximately 11% of West German women in the 1936-1940 cohort have periods of marginal part-time employment with an average duration of 6.8 years in their employment biographies.[38] Twenty-five percent of West German women in this cohort have an episode of registered unemployment in their biography. **Ten percent of women in West Germany have a co-earner employment biography.**

[38] Episodes of marginal part-time are less prevalent in East Germany. Only 3% of the cohort worked in marginal part-time employment.

BIOGRAPHY PROFILE IV: EMPLOYMENT-ORIENTED BIOGRAPHY, EAST GERMANY

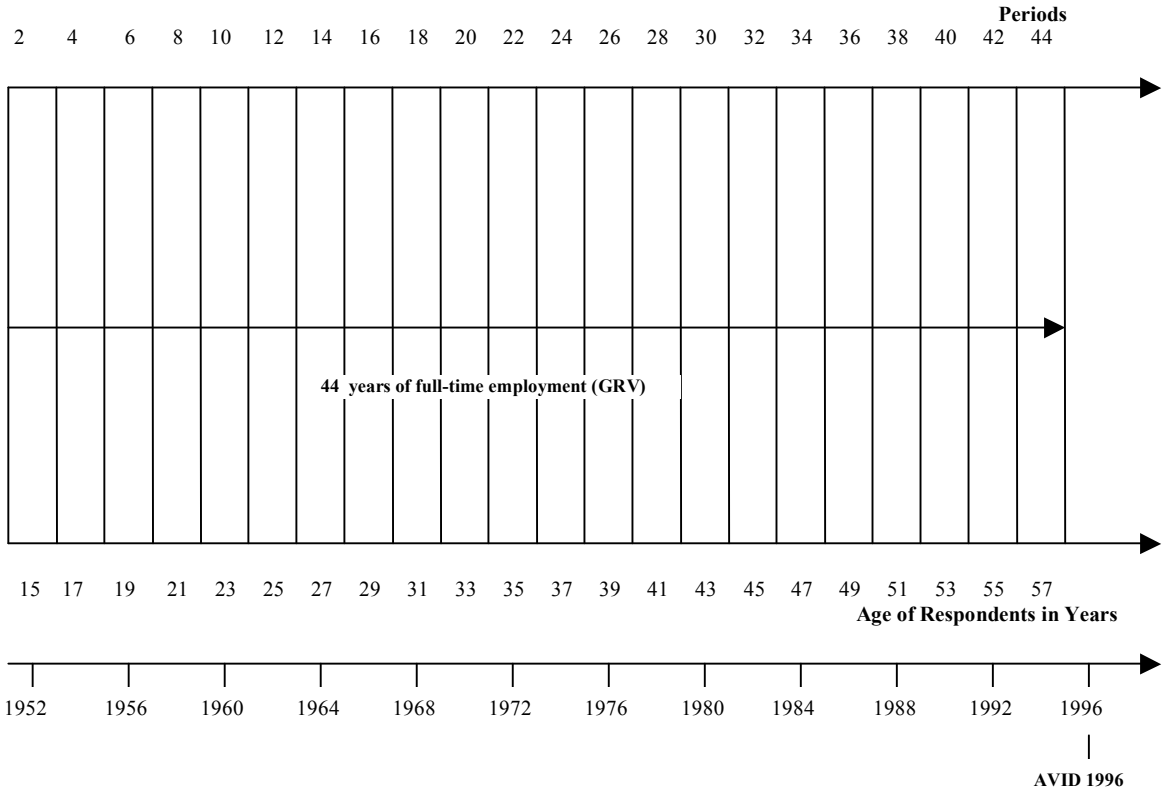


Legend	GRV	Employment subject to social security contributions
	Full-time	Thirty-six hours or more per week

Source: AVID 1996 – Special analysis for Centre for Social Policy by Infratest Sozialforschung (Himmelreicher and Viebrok 2002)

PREVALENCE: The employment-oriented biography of women is dominant in East Germany. Forty percent have worked for 40 years in full-time. Over 80% of women interrupted employment for an episode of housekeeping with children younger than 18 years, which lasted on average 3 years. **About 50% of women in East Germany have this type of employment-oriented biography.**

CONTINUOUS EMPLOYMENT BIOGRAPHY PROFILE FOR MEN IN EAST AND WEST GERMANY



Legend	GRV	Employment subject to social security contributions
	Full-time	Thirty-six hours or more per week
	Part-time	Less than 36 hours per week

Source: AVID 1996 – Special analysis for Centre for Social Policy by Infratest Sozialforschung (Himmelreicher and Viebrok 2002)

PREVALENCE: The continuous employment biography describes full-time employment subject to social insurance contributions without episodes of non-employment or episodes of employment not subject to social insurance contributions. Nearly 100% of men born in the cohort 1936 to 1940 show only periods of full-time employment subject to social insurance contributions. Forty-six percent of West German (37% of East German) men have no periods of non-employment in their employment biographies. Eighty-three percent of West German (90% of East German) men have no episodes of employment not subject to social insurance contributions in their biographies. **About 25% of West and East German men have this type of continuous employment biography.**

8. THE POLICY OPTIONS

This section discusses possible policy solutions to the problem of low independent pension benefits of women. It focusses on policy solutions within the pension system itself by presenting three best practices from other countries that have the potential to increase the independent pension benefits for women. Each policy option is then simulated for the different biography profiles presented in Section 7.

The first policy option modifies the crediting of childcare periods within the pension system. The regression analysis revealed that having children decreases the independent pension benefits for women significantly. Graph 4 compared the average pension benefits by number of children and illustrates the dramatic drop in benefits from not having children to having one child and the further decline in benefits as the number of children increases. In this context, I will look at the way the Swedish pension system credits parents for periods of child rearing. The Swedish system acknowledges four years for periods of child rearing. There are three different methods of crediting, each tailored to different employment paths and consequently to different earning profiles of women.

The second policy option introduces the Swiss method of mandatory pension splitting among married partners and abolishes the survivor's pension. Regression results, such as the strong negative coefficients for being married, or the negative impact of the husband's net income on the independent pension benefits of women seem to support the assumption that marriage works as a disincentive for labor supply among women. We have seen that the family context is important, and that joint decisionmaking is common in many German households, resulting in one partner, mostly the husband, working in the marketplace and the other, mostly the wife, working at home. However, policymakers can hardly force women to work, especially if not working is a "rational" decision.[39] In this context, I want to look at mandatory pension splitting models rather than voluntary pension splitting, which is already optional for married couples in Germany (see Section 3.2.). Even though the resulting pension benefits are not truly independent, they would reflect the joint decisionmaking practiced in households during periods of employment also during periods of retirement.

The third policy option simulates the Swedish guarantee pension benefit into the German pension system. We have seen that a large share of German women has very low independent entitlements in the public pension system. The guarantee pension in the Swedish system provides benefits to women who don't work at all or who work very few hours. Unlike the German means-tested minimum pension benefit, the Swedish guarantee pension is paid by the Swedish National Insurance Institute. Benefits in both countries are financed over general tax revenues. The amount of the Swedish guarantee pension depends on the amount of entitlements the individual collected in the income-based pension scheme (the second tier of the Swedish pension system) and marital status. Unlike the German minimum means-tested benefit which covers the subsistence level, the Swedish guarantee pension is very generous for individuals with low or no entitlements. The design of the Swedish guarantee pension creates work incentives because benefits from the guarantee pension can be added to the income-based pension, which makes working women better off.

[39] In Becker's "Theory of the Family" specialization in market and household production is considered to be a rational decision. The inherent disincentives within German tax and social policies that have been illustrated in the section "German women and the Labor Market" cut back the labor supply of married women.

8.1. Simulation of Policy Options

In this section, the proposed policy options are applied to the German pension system and simulated for the different biography profiles presented in Section 7.1. The current German pension law is applied. First, I am going to calculate the individual pension benefit for each biography profile under current German law. The calculation of pension benefits under the status quo makes it possible to estimate the micro- and macro effects of potential changes in pension legislation. First, it allows us to compare how policy options affect the individual's pension benefits (micro effect). Second, it also allows us to approximate the economic costs of each policy option for the pension insurance itself (macro effect).

I illustrate the simulation method in detail with poliy option I that applies the Swedish system of childcare credits to the German pension system. The simulations for policy option II and III can be found in the Appendix.

9. Policy Option I: Modifying the Crediting System For Periods of Child Care

Sweden passed one of the most far-reaching pension reforms, which overhauled the existing system in 1994. The reform was supported by five of the seven parties in the parliament. Some minor details were passed by subsequent Social Democratic minority governments in 1998 and later (Anderson and Meyer 2004, p.11). The most important change was the substitution of the 'old' flat-rate basic pension with a 'new' means-tested guarantee pension, and the replacement of the 'old' earnings-related ATP pension with two defined contribution systems.[40]

Under the old system, parents did not receive any credits for child rearing periods. The lack of compensation was due to the fact that the individual's pension benefit under the ATP system was based on the best 15 of 30 years of employment (best in terms of highest earnings). Periods of child rearing did not negatively affect the calculation of the pension benefit under the old system. The new system bases the calculation of pension benefits on life-time earnings, which required some form of compensation for periods of child rearing (Christensen 1999). The crediting system for periods of childcare provides pension rights for the first four years of the child's life. Compared to the current German system, childcare credits are paid for one more year. In both countries they are financed out of general tax revenues and not out of the pension insurance budget. Pension entitlements derived from periods of child rearing are meant to compensate for the loss of earnings because one parent stays at home or works less hours. The credits should not compensate for the costs occurring due to the birth of the child. The parents decide which partner receives the childcare credits. Usually they are credited to the woman's pension account.

Unlike the German system, the Swedish system offers three different methods for crediting periods of childcare, which are tailored towards different employment paths and consequently different earning profiles of women. The credit depends on how much the

[40] The first of the two is the so-called income pension, which is a notionally defined contribution system that provides the major part of the individual's pension income, and the second is the so-called premium pension, which is a fully-funded private account system.

parent earned prior and after the birth of the child, which leads to some variation in the amount of credits a parent can receive. For the calculation of the final pension benefit, the National Social Insurance Institute chooses the method that renders the highest entitlements for the parent (Heese 2003, p. 249).

Method I: The first method is most beneficial for women who had above average earnings prior to the birth of the child and quit work for the period of child rearing. The entitlement is based on the difference in earnings one year prior to the birth of the child and the earnings after the birth of the child.

I illustrate this method referring to the earning points used in German pension formula. The woman had above average earnings prior to the birth of the child. We assume 1.2 earning points in year *t*. Then the women quits her job because of the birth of the child, which leaves her with 0 earning points for year *t+1*. The difference between years *t* and *t+1* is 1.2. Since she receives this credit for the first four years of the child's life, the total of childcare credits amounts to 4.8 earning points.

Method II: The second method is most beneficial for women who had very small earnings or no earnings at all prior to the birth of the child. The entitlement is based on the difference of the parent's earnings in the year the child was born, to the 75% of the average earnings of all the individuals that pay contributions into the pension system in this year.

For this type of women we assume 0.2 earning points in the year the child was born. These earnings are compared to 75% of the average earnings in this year, which is technically equivalent to 0.75 earning points. The difference between the woman's entitlement of 0.2 and 0.75 is 0.55. This difference is added to the entitlement she receives from being employed, so she ends up with 0.75 earning points for the first four years of the child's life (a total of 3.0 earning points), assuming that her level of work remains constant.

Method III: The third method is most beneficial for woman who had average or above average earnings prior to the birth of the child and who continue to work after the birth of the child and after they have taken their parental leave period of one year. Woman are expected to work the same amount or slightly less than prior to the birth of the child. Under this method woman receive pension entitlements equal to an annually adjusted base amount from the Statutory Pension Insurance Institute that is added to the entitlements gained from working. The total entitlement is therefore higher than in prior years.

We assume that the woman returns to work after the maternal leave period and earns average earnings in her job. This entitles her to 1.0 earning point per year. In addition, she would receive entitlements from the base amount paid by the National Social Insurance Institute. The base amount for 2005 is equal to 43,300 Swedish krona per year (equivalent to approximately € 4800). Expressed in terms of earning points, the base amount adds about 0.2 earning points to the 1.0 earning point received from being employed. The woman would therefore receive a total of 1.2 earning points. Under this scenario the women would receive a total of 4.8 earning points credited to her pension account for the first 4 years of the child's life.

Women are only eligible for these credits if they worked at least 5 years and earned above a certain minimum treshold. The eligibility requirements can be fulfilled prior or after

the period of care-taking so that the majority of women with children in Sweden benefits from the credits.

The calculation of benefits under the status quo and under policy option I is based on the following assumptions.

ASSUMPTIONS FOR POLICY OPTION I:

- The woman is married to our male complementary biography and has one child.
- The woman retires at the statutory retirement age in 2004.
- Even though the new rules for childcare credits in Germany are only applied to children born after 1992, the new childcare credit system is considered to be the status quo. Low contributions due to child rearing are upgraded to the average from the 4th to the 10th year of the child's life.
- The 2004 pension value is applied. For West Germany, the value is fixed at € 26.03 and for East Germany it is fixed at € 22.97.
- One year of marginal employments renders 0.2 earning points; one year of part-time employment renders 0.5 earning points; one year of full-time employment renders 0.8 earning points per year.
- For the East German employment-oriented biography 1.0 earning points is assumed for full-time employment.
- Women with an employment-oriented biography profile in East Germany take 1 year of maternity leave and return to work full-time.
- During periods of registered unemployment, the unemployment insurance pays the contribution. They are equivalent to 80% of the gross wage received in the job prior to unemployment.

9.1. DISCUSSION

The first table describes the status quo for the family-oriented biography profile under the current German system. Women would receive 1 earning point for three years for each child. The childcare credits are added to the entitlements the woman receives from 8 years of full-time employment prior to the birth of the children and 4 years of part-time employment after the episode of housekeeping without children.

STATUS QUO

Biography Profile I: Family-Oriented, West Germany	
EPISODES	**EARNING POINTS**
8 years of full-time employment	8*0.8 earning points
20 years of houskeeping with children First child	3*1 earning points as childcare credit
10 years of housekeeping without children	No earning points
4 years of part-time employment	4* 0.5 earning points
	SUM OF EARNING POINTS: 11.4
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	11.4
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 296.74**

The woman with the family-oriented biography profile earns 11.4 earning points over her life-course, which is equivalent to an independent public pension benefit of € 296.74. The next table simulates the Swedish childcare crediting system into the woman's life course. It depends on the employment pattern of the woman, which method of crediting appears to be the most beneficial. For the family-oriented woman, Method I is most beneficial. Under Method I the childcare credit amounts to the difference between earnings one year prior to the birth of the child and during the first year of the child's life. For the first biography profile, the difference is 0.8 earning point that will be credited to the woman's account for the first four years of the child's life.

POLICY OPTION I (METHOD I)

Biography Profile I: Family-Oriented, West Germany	
EPISODES	**EARNING POINTS**
8 years of full-time employment	8* 0.8 earning points
20 years of houskeeping with children - First child	4* 0.8 earning points for first child
10 years of housekeeping without children	No earning points.
4 years of part-time employment	4* 0.5 earning points
	SUM OF EARNING POINTS: 11.6
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	11.6
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 301.98**

West German woman with a family-oriented biography profile would benefit very little from the Swedish system of childcare crediting. The monthly independent public pension benefit of the woman would increase from € 296.74 to € 301.98, an absolute increase of € 5.24. The Swedish system of childcare crediting does not make much of a difference with

respect to the outcome of independent public pension benefits for women with a family-oriented employment biography.

West German woman who have the employment-oriented biography work part-time as they raise their child. It is assumed that the child is born at the beginning of the part-time employment period. Under the status quo, the woman benefits from the possibility that earning points from employment can be added to the childcare credits up to the limit of 2.0 earning points. The woman does also benefit from the upgrade of below average contributions. For the calculation of the upgrade, the monthly earnings of the women is divided by the average annual earnings. The resulting earning points are increased by 50%. In this example, the upgrade amounts to an additional 0.15 earning points until the youngest child reaches age 10, which is for 7 years.

STATUS QUO

Biography Profile II: Employment-Oriented, West Germany	
EPISODES	**EARNING POINTS**
13 years of full-time employment	13 * 0.8 earning points
16 years of part-time employment	16 * 0.5 earning points
First child	3*1 earning points as childcare credit
Upgrade of below average contributions	7* 0.15 earning points
15 years of full-time employment	15 * 0.8 earning points
	SUM OF EARNING POINTS: 34.45
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	34.45
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 896.73**

Under the status quo, women with an employment-oriented biography receive an independent monthly independent pension benefit of € 896.73. The women benefit from the possibility that earning points from employment can be added to earning points from childcare credits and from the upgrade of below average earnings, which amount to 0.15 per year.

Under the Swedish system, the second childcare crediting method is most beneficial for the employment-oriented biography profile in West Germany. Under Method II, below average earnings are upgraded to 75% of the average earnings. For our biography profile, the upgrade amounts to 0.25 earning points for four years per child.

POLICY OPTION I (METHOD II)

Biography Profile II: Employment-Oriented, West Germany	
EPISODES	**EARNING POINTS**
13 years of full-time employment	13 * 0.8 earning points
16 years of part-time employment	16 * 0.5 earning points
First child	4*0.25 childcare credits for first child
15 years of full-time employment	15 * 0.8 earning points
	SUM OF EARNING POINTS: 31.4
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	31.4
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 817.34**

Under Method II of the Swedish childcare crediting system, the independent monthly public pension benefit of our employment-oriented biography profile amounts to € 817.34. The employment-oriented woman fares worse under the Swedish crediting system. The independent pension benefit would actually decrease from € 896.73 to € 817.34, an absolute decrease of € 79.39 or 8.9%. The woman would benefit much more under the Swedish system if she worked not at all (Method I: 0.8 earning points for four years per child) or the same amount as prior to the birth of the child (0.8 earning points plus entitlements from base amount equivalent to 0.2 earning points for four years per child). It can be expected that changes in the rules for childcare credits would result in behavioral changes among women, so that they maximize the amount of credits they receive from the pension insurance. Unfortunately, these behavioral changes cannot be predicted.

West German women with a co-earner biography profile do not continue to work as they give birth to the child. Under current German law, this results in 1 earning point per child for three years.

STATUS QUO

Biography Profile III: Co-Earner, West Germany	
EPISODES	**EARNING POINTS**
10 years of full-time employment	10*0.8 earning points
12 years of housekeeping with children First child	 3*1 earning points as childcare credit
7 years of marginal part-time employment	7* 0.2 earning points
3 years of registered unemployment (contributions are paid worth 80% of the last gross income)	3* 0.1 earning points
12 years of part-time employment	12*0.5
	SUM OF EARNING POINTS: 18.7
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	18.7
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 486.76**

The West German female co-earner receives an independent public pension benefit of € 486.76. Since she stays at home after she gave birth to the child, she cannot benefit from rules, such as the upgrading of below average pension benefits or the possibility to add earning points from childcare credits to earning points from employment.

When applying the Swedish childcare crediting system to the West German co-earner biography profile, Method I is the most beneficial. The childcare credit amounts to the difference between earnings one year prior to the birth of the child and during the first year of the child's life. This difference is paid for the first four years of the child's life. Since the woman under the co-earner biography worked full-time prior to the birth of the first child and stopped working after the first child, she receives 0.8 earning points per year for the first four years of the child's life (a total of 3.2 earning points per child).

POLICY OPTION I (METHOD I)

Biography Profile III: Co-Earner, West Germany	
EPISODES	**EARNING POINTS**
10 years of full-time employment	10*0.8 earning points
12 years of housekeeping with children First child	4* 0.8 earning points for first child
7 years of marginal part-time employment	7* 0.2 earning points
3 years of registered unemployment (contributions are paid worth 80% of the last gross income)	3* 0.1 earning points
12 years of part-time employment	12*0.5
	SUM OF EARNING POINTS: 18.9
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	18.9
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 491.97**

The monthly co-earner independent public pension benefit would increase from € 486.76 to € 491.97. The co-earner could only increase her benefit by continuing to work full-time after she gave birth to her child. Then she would receive an additional 0.2 from the crediting of the annual social insurance base amount.

For the East German employment-oriented biography I assume 1.0 earning points for full-time employment. Before the birth of the child, the woman worked full-time. Then she gives birth to her child and continues to work full-time after the period of maternity leave.

STATUS QUO

Biography Profile IV: Employment-Oriented, East Germany	
EPISODES	**EARNING POINTS**
9 years of full-time employment	9* 1 earning points
Maternity leave	
First Child	3 * 1 earning points
31 years of full-time employment	31*1 earning points
	SUM OF EARNING POINTS: 43
Pension Value for 2004 (PV)	€ 22.97
Earning Points (EP)	43
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 987.71**

The East German employment-oriented woman receives an independent public pension benefit of € 987.71 under the German system.

When applying the Swedish model of childcare crediting, Method III is the most beneficial, since the mother continues to work after the period of maternity leave. In addition to the earning points from employment, she receives entitlements from the base amount paid by the Statutory pension insurance that is worth 0.2 earning points per year. The employment-oriented East German woman therefore receives 1.2 earning points per year for the first four years of the child's life.

POLICY OPTION I (METHOD III)

Biography Profile IV: Employment Oriented, East Germany	
EPISODES	**EARNING POINTS**
9 years of full-time employment	9* 1 earning points
First child Full-time employment after maternity leave	4* 1.2 earning points for the first child
27 years of full-time employment	27* 1 earning points
	SUM OF EARNING POINTS: 40.8
Pension Value for 2004 (PV)	€ 22.97
Earning Points (EP)	40.8
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 937.18**

The monthly independent pension benefit of the employment-oriented East German women would decrease from € 987.71 to € 937.18, an absolute decrease of € 50.53. Under the current German system, the employment-oriented woman benefits from generous rule that earning points from childcare credits can be added to earning points from employment up to a limit of 2.0 earning points per year. The bonus Swedish women receive when they continue to work after they gave birth to a child, is less generous than the bonus for German women.

9.2. CONCLUSION

Even though the Swedish pension system seems to be more generous because it credits periods of childcare for four instead of three years like Germany, the simulation of the crediting system for different biography profiles leads to a different conclusion. Despite the fact that the Swedish system tailored three different methods of crediting that were all related to different employment biographies, a shift to this system wouldn't increase the independent pension benefit of women substantially.

The policy option can be assessed from two different perspectives: changes in the individual's benefit and costs for the pension insurance.

From the individual's perspective, the Swedish system would bring slight improvements for the family-oriented and co-earner biography profile for West German women. The monthly independent public pension benefit for women of the two employment-oriented biography profiles for East and West Germany would actually decrease as a result of a shift from the German to the Swedish system of crediting periods of childcare in the public pension insurance. The decrease for the latter two profiles is larger than the increase for the first two biography profiles.

The main reason for the higher benefits of woman with an employment-oriented biography under the German regime lies in the generous rules concerning the additivity of earning points from employment with childcare credits up to a maximum limit of 2.0 earning points per year. Another reason for why employment-oriented women are better off under the German system is the upgrading of below average earnings during periods of child rearing if the child is between 4 and 10 years old. In particular, the West German employment-oriented biography benefited from this option, since she continues to work part-time after her first child was born.

The discussion so far stressed the importance of incentives aiming at an increase in the labor supply of women with children. A shift to the Swedish system, under which both employment oriented biography profiles are worse off, would send a wrong signal, because not working after the birth of a child appears to be more beneficial with respect to the final monthly pension benefit. Thus, the Swedish system would be a step backwards with respect to incentives for female labor supply. But unlike the German system that has several inherent disincentives for labor supply among married women, Sweden is far ahead in promoting female labor market participation in many other areas (e.g. tax policies, childcare policies, etc.). It can be assumed that the adoption of the Swedish childcare credit system might cause different behavioral changes in the two countries.

Overall, from the individual's perspective, the German system is more successful in increasing the independent public pension benefit for woman, in particular for women with employment-oriented biography profiles.

The costs for the public pension insurance are calculated based on data from the AVID study. Since the biography profiles were derived from the 1936-1940 cohort of the AVID study, costs can only be assessed for the number of females in this cohort. Given that we know the prevalence of each biography profile, we are able to calculate the absolute number of women in each profile. Knowing how many women are in each profile, enables us to calculate the costs of the profile under the status quo and under policy option I. The 1936 to 1940 cohort of West German women consists of 1,966,282 individuals. The East German cohort consists of 580,320 individuals.

Table 8 compares the costs of each profile under the status quo and the Swedish system of childcare credits. The decrease in the costs for the employment-oriented biographies is larger than the increase in costs for the family-oriented and co-earner biography. Hence, a shift from the German to the Swedish system would save money for the German public pension system. Total costs would actually decrease by approximately 5% for the number of individuals that can be subsummed under each biography profile. However, given that the drop in costs would be caused by decreases in benefits for women who try to combine the period of child rearing with employment, a shift from the German to the Swedish system of childcare crediting would probably send wrong incentives. For this reason, a shift to the Swedish system is not recommended.

TABLE 8: BENEFITS FOR INDIVIDUAL BIOGRAPHIES AND COSTS PER PROFILE UNDER POLICY OPTION I

BIOGRAPHY PROFILES	MONTHLY BENEFITS STATUS QUO (PER PERSON)	MONTHLY BENEFITS POLICY OPTION I (PERSON)	PRE-VALENCE OF PROFILE	NUMBER OF RECIPIENTS	COSTS PER PROFILE STATUS QUO	COSTS PER PROFILE POLICY OPTION I
West Germany				**Total West** 1,996,282		
Family	€ 296.74	€ 301.98	15%	299,442	€ 88,856,419	€ 90,425,495
Employment	€ 896.73	€ 817.34	10%	199,628	€ 179,012,416	€ 163,163,950
Co-Earner	€ 486.76	€ 491.97	10%	199,628	€ 97,170,925	€ 98,210,987
East Germany				**Total East** 580,320		
Employment	€ 987.71	€ 937.18	50%	290,160	€ 286,592,934	€ 271,932,149
Total Costs for Pension Insurance System					€ 651,632,694	€ 623,732,581

10. POLICY OPTION II: INTRODUCING MANDATORY PENSION SPLITTING

The Swiss pension system is based on three pillars, combining a public, an occupational, and private pension scheme (Becker 2003, p. 257). The public pension insurance and the invalidity insurance (AHV/IV) make up the first pillar of the pension system. Unlike the German pension system, the first pillar is intended to cover the basic living costs. The benefits are quite generous. In case the first pillar does not cover the basic living expenses, supplementary benefits can increase the benefits to a certain threshold. The first pillar is compulsory for all residents of Switzerland, independent from whether they are gainfully employed or not. The occupational pension scheme is the second pillar of the Swiss pension system. It offers old-age pension benefits, invalidity, and survivors' benefits for the gainfully employed. The first and second pillar are supposed to add up to a replacement rate of at least 60%. Only salaried employees are covered under the second pillar of the Swiss pension system (Federal Social Insurance Office 2004). The third pillar, the private pension insurance, is optional and works like a private account system. Unlike other private account systems, the third pillar is promoted from the federal government and the Swiss cantons through tax breaks (Becker 2003, p. 258).

The 1997 reform of the first pillar introduced mandatory pension splitting for married couples in an attempt to promote gender equity between men and women. Until 1997, the public pension insurance was based on the traditional male breadwinner/ female caretaker model. It was assumed that marriage is a life-long bond that offers old-age security to women, even though rising divorce rates suggested a different reality. The increases in divorces led to the problem that many divorced women received very small pensions from the first pillar, which then needed to be complemented by supplementary benefits (Rechsteiner 2001, p. 14). In contrast, married women were exempt from the obligation to pay social insurance contributions and were treated preferentially compared to non-married women. As a consequence, the 1997 reform introduced mandatory pension splitting in the first pillar of the Swiss pension system. Contributions of both partners that are paid into the public pension insurance during the marriage, are split in half and credited to the public pension account of each partner. Both partners do now receive their own pension under the new system. The level of the pension benefit depends on the number of years of employment and the level of earnings achieved by both partners. Pension credits, for example in form of childcare credits, are also split in half (Rechsteiner 2001). At the household level, splitting comes into effect if both partners reach the statutory retirement age or if the couple files for divorce. If the husband retires prior to his wife, his pension benefit is calculated based on his lifetime earnings and on the number of years he was employed. As soon as the wife retires, the pension splitting comes into effect and the pension benefit of the husband has to be re-calculated (Becker 2003, p. 270)

The main difference between the German and Swiss method of pension splitting is that the pension splitting is mandatory within the first pillar of the Swiss pension system, whereas splitting is optional in the German system. Under the German system, couples who paid contributions into the pension system for more than 25 years, can jointly decide that the pension entitlements accrued during their marriage are first added and then split in half. This rule applies to all couples that got married after December 31st 2001. Couples who got married prior to that date can opt for pension splitting if they are both under age 40 at this point. Pension splitting comes into effect as soon as both partners retire. In case one partner deceases prior to this event, the surviving spouse may opt for pension splitting. Most importantly, once opted for pension splitting, the couple gives up their entitlements for

survivor's benefits. As mentioned above, under the current state of German pension law there are very few individual circumstances under which pension splitting renders higher independent pension benefits than receiving the survivor's benefit. Pension splitting under the current German system is only attractive for couples with very high assets that would lead to cuts in the woman's survivor's benefit.

10.1. DISCUSSION

Table 9 summarizes the results of the second policy simulation. The detailed tables can be found in the Appendix. Table 9 compares the pension benefits under the status quo with the pension benefits under the Swiss pension splitting system. The benefits are compared from the woman's perspective. Two scenarios have been simulated for the status quo and policy option II. The first scenario assumes that the husband with a continuous employment history is alive, the second scenario assumes that the husband deceased.

TABLE 9: COMPARISON OF PENSION BENEFITS UNDER STATUS QUO AND PENSION SPLITTING

	BIOGRAPHY PROFILE I FAMILY WEST	BIOGRAPHY PROFILE II EMPLOYMENT WEST	BIOGRAPHY PROFILE III CO-EARNER WEST	BIOGRAPHY PROFILE IV EMPLOYMENT EAST
FROM WOMAN'S PERSPECTIVE				
Status Quo – Husband alive	€ 296.74	€ 896.73	€ 486.76	€ 987.71
Status Quo – Husband deceased	€ 1,104.65	€ 1,615.82	€ 1,294.67	€ 1,700.70
Pension Splitting – Husband alive	€ 835.51	€ 1,135.51	€ 930.52	€ 1,100.27
Pension Splitting – Husband deceased	€ 835.51	€ 1,135.51	€ 930.52	€ 1,100.27

From the woman's perspective, the comparison of independent pension benefits under the status quo with the benefits under the Swiss pension splitting if the husband is still alive, reveals that pension splitting increases the independent pension benefits of women considerably. For each biography profile, independent pension benefits increase when pension splitting is applied. For example, the independent pension benefit of the family-oriented biography profile increases from € 296.74 under the status quo to € 835.51 under pension splitting. Since we assume a continuous employment biography of the 'complementary' husband, his independent pension benefit is higher than for the woman in each biography profile. Therefore, the independent pension benefits for women that can be subsummed under the four biography profiles end up being higher under pension splitting than under the status quo as long as the husband is alive. If the increase in independent pension benefits is the most important criterion, pension splitting turns out to be quite effective.

The assessment of pension splitting from the woman's perspective changes when the pension benefits are compared after the husband dies. Under the status quo, the woman receives a survivor's pension, which is equivalent to 55% of her husband's pension benefit plus two additional earning points for her child,[41] in addition to her own independent pension

[41] The acknowledgement of children in the calculation of survivor's pension benefits has been introduced with the pension reform of 2001. The survivor's benefit was cut from 60% to 55% of the husband's pension benefit. The loss in pension payments was offset by the acknowledgement of children in the calculation of the 'new' benefit through additional earning points. Only woman who did not have any children are worse off after the reform of the survivor's pension.

benefit. For biography profile I, the pension benefit after the husband dies amounts to € 1,104.65 Under the Swiss pension splitting system, the pension benefit of the woman remains unchanged after the husband dies, which is equal to € 835.51.

When deciding for pension splitting, the woman foregoes the right to receive a survivor's pension. The fact that the receipt of the survivor's pension in addition to her own independent pension benefit is always more attractive than pension splitting explains why hardly anyone makes use of the option for voluntary pension splitting in the German pension system. As mentioned above, pension splitting is only an attractive option if the woman's survivor's pension would be cut because the couple's available assets exceeded a maximum threshold. Overall, widow's in all biography profiles would be worse off after a shift from the status quo to the Swiss system of mandatory pension splitting. However, since we are interested in an increase in the independent pension benefits of woman, pension splitting is more effective than keeping derived survivor's benefits in place.

Table 10 compares the pension benefits under the status quo with the pension benefits under the Swiss pension splitting system from the couple's perspective.

TABLE 10: COMPARISON OF PENSION BENEFITS FOR COUPLES UNDER STATUS QUO AND PENSION SPLITTING

	BIOGRAPHY PROFILE I FAMILY WEST	BIOGRAPHY PROFILE II EMPLOYMENT WEST	BIOGRAPHY PROFILE III CO-EARNER WEST	BIOGRAPHY PROFILE IV EMPLOYMENT EAST
FROM COUPLE'S PERSPECTIVE				
Status Quo – Husband alive	€ 1,671.02	€ 2,271.01	€ 1,846.04	€ 2,200.53
Status Quo – Husband deceased	€ 1,104.65	€ 1,651.82	€ 1,294.67	€ 1,700.70
Pension Splitting – Husband alive	€ 1,671.02	€ 2,271.01	€ 1,846.04	€ 2,200.53
Pension Splitting – Husband deceased	€ 835.51	€ 1,135.51	€ 930.52	€ 1,100.27

When both partners are alive, the shift from the status quo to pension splitting does not change the economic situation of the household. Under the status quo, the household under the family-oriented biography profile receives € 296.74 in independent pension benefits from the wife, and € 1,374.28 in independent pension benefits from the husband, which totals to € 1,671.02 for the household. Under pension splitting, husband and wife would both receive € 835.51, which also amounts to a total pension benefit of € 1,671.02 for the household. The sum of pension benefits remains the same, which implies that pension splitting is a cost-neutral alternative to the current German system at the household level if both partners are alive. This brings us to the cost side of the second policy option.

A shift to the Swiss system of mandatory pension splitting would hold the costs constant if both partners are alive, but it would save costs for the pension system if the husband dies. The cost savings are due to the fact that the woman is no longer entitled to survivor's benefits under the pension splitting system. Table 11 compares the costs for the pension system under each scenario for the status quo situation and the Swiss pension splitting model. The costs per profile when the husband is still alive are calculated for the household. The costs per profile when the husband deceased are calculated for the women. It is assumed that the prevalence of the profile does not change when the biography profiles for the women are combined with the complementary biography profile of the men.

It needs to be stressed that the calculation of the costs is rather crude. In order to fully capture the cost effects of the abolition of survivor's benefits under the Swiss pension splitting model, a present value analysis that takes into account the average life expectancy, the average duration of the receipt of pension benefits for men and women, as well as the average duration of the receipt of survivor's benefits would be more appropriate.

TABLE 11: COSTS PER PERSON AND COSTS PER PROFILE OF POLICY OPTION II

BIOGRAPHY PROFILES	PRE-VALENCE OF PROFILE	NUMBER OF RECI-PIENTS	COSTS PER COUPLE STATUS QUO HUSBAND ALIVE	COSTS PER PROFILE STATUS QUO HUSBAND ALIVE	COSTS PER COUPLE PENSION SPLITTING HUSBAND ALIVE	COSTS PER PROFILE PENSION SPLITTING HUSBAND ALIVE
West Germany		**Total West** 1,996,282				
Family	15%	299,442	€ 1,671.02	€ 500,373,570.80	€ 1,671.02	€ 500,373,570.80
Employment	10%	199,628	€ 2,271.01	€ 453,357,184.30	€ 2,271.01	€ 453,357,184.30
Co-Earner	10%	199,628	€ 1,846.04	€ 372,114,577.10	€ 1,846.04	€ 372,114,577.10
East Germany		**Total East** 580,320				
Employment	50%	290,160	€ 2,200.53	€ 638,505,784.80	€ 2,200.53	€ 638,505,784.80
Total Costs for Pension Insurance System				€ 1,964,351,117.00		€ 1,964,351,117.00

BIOGRAPHY PROFILES	PRE-VALENCE OF PROFILE	NUMBER OF RECI-PIENTS	COSTS PER WIDOW STATUS QUO HUSBAND DECEASED	COSTS PER PROFILE STATUS QUO HUSBAND DECEASED	COSTS PER WIDOW PENSION SPLITTING HUSBAND DECEASED	COSTS PER PROFILE PENSION SPLITTING HUSBAND DECEASED
West Germany		**Total West** 1,996,282				
Family	15%	299,442	€ 1,104.65	€ 330,778,605.30	€ 835.51	€ 250,186,785.40
Employment	10%	199,628	€ 1,615.82	€ 322,562,915.00	€ 1,135.51	€ 226,679,590.30
Co-Earner	10%	199,628	€ 1,294.67	€ 258,452,382.80	€ 930.52	€ 185,757,846.60
East Germany		**Total East** 580,320				
Employment	50%	290,160	€ 1,700.70	€ 493,475,112.00	€ 1,100.27	€ 319,254,343.20
Total Costs for Pension Insurance System				€ 1,405,269,015.00		€ 981,878,565.50

The first block of Table 11 shows that the costs per profile do not change as a result of the shift to the Swiss pension splitting model when the husband is alive. Pension splitting does not change the amount of entitlements of a couple, it only redistributes the entitlements between husband and wife. Under the 'husband alive' scenario, pension splitting is a cost-neutral alternative. The second block of Table 11 compares the costs under the 'husband deceased' scenario. A shift to the Swiss pension splitting model would decrease the monthly costs for the pension insurance system considerably. The total costs would drop by 31%. A shift to mandatory pension splitting together with the abolition of the survivor's pension would save nearly one third of the costs for the share of women that can be subsummed under the four biography profiles.

10.2. CONCLUSION

We have seen that the independent pension benefits for the women in the different biography profiles increase as a result of the shift to the Swiss model of mandatory pension splitting if the husband is still alive. If the increases in independent pension benefit is the only criterion, pension splitting is a very effective policy option. Even though it needs to be questioned, whether the pension benefits under pension splitting can be truly defined as independent.

A transition to mandatory pension splitting would abolish the survivor's benefits in case the spouse deceases. Pension entitlements would be split as both partners retire, and the right to a survivor's pension would be forfeited. Under the scenario that the husband dies, the shift to the Swiss model of mandatory pension splitting would decrease the pension benefits considerably for all biography profiles. If independent pension benefits are preferred over derived pension benefits, a shift to mandatory pension splitting seems to be a good policy alternative. However, the regression analysis showed that the average pension benefit for widows is significantly smaller than for single, divorced, and married women, even when controlling for the amount of derived pension benefits the woman receives. The regression results call into question, whether the abolition of the survivor's pension is feasible.

From the cost side, the abolition of the survivor's pension would save a considerable amount of money for the public pension insurance system. A shift to the mandatory pension splitting under the scenario that both partners are alive would be cost-neutral.

Under the current German pension system, pension splitting is already an option for couples. However, it is rare that pension splitting renders higher pension benefits than the survivor's pension, therefore very few couples opt for pension splitting. Without any further incentives, pension splitting will remain an unattractive alternative to the survivor's pension. Thus, the co-existence of the survivor's pension and voluntary pension splitting needs to be questioned. If the abolition of survivor's pension benefits is the ultimate goal of policymakers, then pension splitting needs to become more attractive. One possibility are additional earning points for each partner according to the number of children if a couple opts to split their pensions. On the other side, the survivor's pension needs to become less generous, for example by further decreasing the replacement rates.

It is important to remember that a shift to pension splitting would only make a difference for married and widowed women. Single and divorced women would remain unaffected by the policy change. The regression results indicate that the average pension benefits for married and widowed women are significantly lower than for single and divorced women. The results have been interpreted so that marriage sets disincentives for women to work and that low independent pension benefits of woman might be the results of joint decisionmaking and specialization within the household. If this is true, one needs to ask whether generous survivor's pensions are justified, in particular if single and divorced women need to rely on the means-tested minimum pension which hardly guarantees a life at the subsistence level in case their pension benefits are not sufficient. The increasing number of divorces and the increasing share of cohabiting couples in Germany, calls into question whether the money spent on survivor's pension benefits could be used in other ways.

11. POLICY OPTION III: REFORM THE MEANS-TESTED MINIMUM PENSION

As mentioned before, the Swedish pension system was overhauled during the last decade. In 2003, Sweden's basic flat-rate pension was replaced by the so-called guarantee pension. The new benefit is means-tested. It is reserved to individuals who have no or very small entitlements in the two earnings-related defined contribution systems.

Under the old Swedish pension system, all residents of Sweden, independent of their citizenship and employment status, were eligible for the basic flat-rate pension. Residents only needed to be registered in the social insurance system. The benefit of the basic flat-rate pension was differentiated according to the marital status of the recipients. Individuals started to receive benefits when they turned 65.[42] It was financed over contributions and tax revenues. In the late 1990s, the budget for the basic flat-rate pension suffered from a serious deficit. The increasing financing gap finally led to the reform of the first pillar of the Swedish pension system (Heese 2003, p. 244 ff.)

In 2003, the basic flat-rate pension was replaced by the guarantee pension. Individuals are eligible for the benefit at age 65 and if they lived in Sweden for at least 3 years. In order to receive the full benefit, the person had to reside in Sweden between ages 25 and 64. For every year less, the pension benefit is cut by 1/40. The amount of the guarantee pension depends on the marital status of the individual and the amount of benefits received from the earnings-related pension scheme (Heese 2003, p. 247). Both men and women are eligible for the benefit, but mostly housewives and part-time working women receive benefits from the guarantee pension (Christensen 1999, p. 667)

The calculation of the guarantee pension is based on the social insurance base amount. The annual base amount for 2005 is 43,300 Swedish krona, which is equivalent to € 4,800. The monthly base amount is 3,608 Swedish krona or € 395. The base amount is adjusted annually. Unlike the benefits from the income-based pension scheme that are indexed according to changes in wages, the base amount for the guarantee pension is indexed to changes in prices (Scherman 2004, p. 163).

Single individuals that do not have any entitlements in the income-based pension scheme are eligible for a maximum guarantee pension that amounts to 2.13 times the social insurance base amount, which is equal to € 841.35 in 2005. Single individuals that have entitlements in the income-based pension system that amount to less than 1.26 times of the social insurance base amount or € 498 also receive the maximum amount of the guarantee pension (€ 841.35).

The maximum amount of the guarantee pension is lower for married individuals. Married individuals that do not have any entitlements in the income-based pension scheme are eligible for a maximum guarantee pension that amounts to 1.9 times the social insurance base amount, which is equal to to € 750.50 in 2005. Married individuals that have entitlements in the income-based pension scheme of less than 1.14 times the base amount or less than € 450 also receive the maximum amount of the guarantee pension.

[42] Benefits were cut when individuals retired early (0.5% for each month the individual retired prior to age 65) and increased when the individual decided to postpone retirement (0.7% increase for each month the individual retired after age 65).

The amount of the guarantee pension decreases if the benefits from the income-based pension scheme increase. The calculation of the benefit differs for single and married individuals (Heese 2003, p. 247).

Single individuals with an income-based pension benefit between 1.26 and 3.07 base amounts (between € 498 and € 1,212.65) receive a reduced guarantee pension. The guarantee pension benefit is calculated according to the following formula:

$$\text{Guarantee pension}_{\text{single}} = 0.87 * \text{base amount} - 48\% \text{ (income-based pension} - 1.26* \text{base amount)}$$

Example: We assume that a single individual earned entitlements equal to 1.75 base amounts in the income-based pension scheme. The base amount is equal to € 395.

$$\text{Guarantee pension}_{\text{single}} = 0.87 * 395 - 48\% \text{ (691.25 - 1.26* 395)} = € 250.74$$

The single individual would receive a guarantee pension of € 250.74 in addition to her entitlements from the income-based pension scheme. Her total benefit from the two schemes amounts to € 941.99.

Married individuals with an income-based pension benefit between 1.14 and 2.7 base amounts (between € 450 and € 1,067) receive a reduced guarantee pension. The guarantee pension benefit is calculated according to the following formula:

$$\text{Guarantee pension}_{\text{married}} = 0.76 * \text{base amount} - 48\% \text{ (income-based pension} - 1.14* \text{base amount)}$$

Example: We assume that a married individual earned entitlements equal to 1.75 base amounts in the income-based pension scheme. The base amount is equal to € 395.

$$\text{Guarantee pension}_{\text{married}} = 0.76 * 395 - 48\% \text{ (691.25 - 1.14* 395)} = € 184.54$$

The married individual would receive a guarantee pension of € 184.54 in addition to her entitlements from the income-based pension scheme. Her total benefit from the two schemes amounts to € 875.79, which is slightly lower than the benefit of the single women.

The following table summarizes the rules of eligibility for the guarantee pension for different earning groups. The benefit level is expressed in base amounts (e.g. a 1.0 base amount is equal to a pension benefit of € 395 in 2005). The equivalent cash amounts are noted in parantheses below the base amounts. The benefit levels are distinguished for married and single individuals.

TABLE 12: CALCULATION OF THE GUARANTEE PENSION

	INCOME-BASED PENSION IN BASE AMOUNTS	GUARANTEE PENSION IN BASE AMOUNTS
Single	0	2.13 (equivalent to € 841.35)
Married	0	1.9 (equivalent to € 750.50)
Single	below 1.26 (below € 498)	2.13 (equivalent to € 841.35)
Married	below 1.14 (below € 450)	1.9 (equivalent to € 841.35)
Single	between 1.26 and 3.07 (equivalent to € 498 and € 1,212.65)	0.87 * base amount -48% * (income-based pension – 1.26 * base amount)
Married	between 1.14 and 2.7 (equivalent to € 450 and € 1,067)	0.76 * base amount -48% * (income-based pension – 1.14 * base amount)

The Swedish guarantee pension is more generous compared to its predecessor, the basic flat-rate pension. The increased benefits in the guarantee pension are supposed to compensate certain groups for the losses in benefits resulting from stricter rules in the income-based pension scheme that were introduced with the 1994 pension reform.

The Swedish guarantee pension is much more generous than the German means-tested minimum pension. The amount of the German minimum pension is approximately equivalent to the social assistance benefit. The minimum pension is calculated on an individual basis. It consists of several different components. In order to determine the amount of the benefit, the social assistance offices calculate the basic needs of an individual. The basic needs include a certain base amount[43], costs for rent and utilities, social contributions for health and long-term care insurance, additional needs, etc. The sum of these components constitute the basic needs of an individual. Earnings, income, assets, etc. are credited against the amount of basic need. The minimum pension benefit covers the difference between the individual's basic needs and the individual's own income. The benefit is calculated according to the following formula:

Minimum benefit $_{individual}$ = individual's basic need – individual's income

The income of the husband is considered in the calculation of the minimum benefit.

Example: Mrs. Schmidt lives alone and has low entitlements in the public pension insurance and no other income. We assume that the social assistance office calculates a basic need of € 700 for Mrs. Schmidt. Mrs. Schmidt receives a pension (€ 400) and a housing allowance (€ 100) that amount to € 500. The income is credited against her basic needs. The final benefit from the means-tested minimum pension amounts to € 200. If Mrs. Schmidt had no pension income and no housing allowance, her minimum benefit would amount to her basic need of € 700.

The German means-tested minimum pension does not set any incentives for women to work. Additional income, earnings or assets of the individual or of the husband/partner automatically reduce the amount of the minimum pension (Dünn and Rüb 2004, p. 616). Thus the individual receives the 'highest' minimum pension when she does not have any other income. Whereas the Swedish system benefits women that work at least some hours, so they

[43] Since January 2005, the base amount € 345 for West Germany and € 331 for East Germany respectively.

can add the full amount of the guarantee pension to their entitlements in the income-based pension system. The benefits are individualized, so even if the husband or partner has a high income, earnings, or assets, the benefit level of the woman remains unchanged.

11.1. DISCUSSION

Table 13 summarizes the results of the third policy simulation. The detailed tables can be found in the Appendix. Table 13 compares the pension benefits under the status quo with the pension benefits after the introduction of the Swedish guarantee pension. The benefits are compared from the perspective of the woman in each biography profile. Two total benefits have been calculated for each biography profile: one for a single individual and one for a married individual. I have also added the amount of the minimum pension each biography profile would receive under the status quo and the amount of the guarantee pension each biography profile would receive under policy option III.

TABLE 13: COMPARISON OF PENSION BENEFITS UNDER STATUS QUO AND POLICY OPTION III

	BIOGRAPHY PROFILE I FAMILY WEST	BIOGRAPHY PROFILE II EMPLOYMENT WEST	BIOGRAPHY PROFILE III CO-EARNER WEST	BIOGRAPHY PROFILE IV EMPLOYMENT EAST
FROM WOMAN'S PERSPECTIVE				
Status Quo – Single	€ 687.99	€ 896.73	€ 693.94	€ 987.71
Amount of minimum pension	€ 381.99	€ 0	€ 207.18	€ 0
Policy Option III- Single	€ 736.85	€ 1,048.85	€ 835.66	€ 1,096.16
Amount of guarantee pension	€ 440.11	€ 152.12	€ 348.90	€ 108.45
Status Quo – Married	€ 296.74	€ 876.73	€ 486.76	€ 987.71
Amount of minimum pension	€ 0	€ 0	€ 0	€ 0
Policy Option III – Married	€ 670.40	€ 982.50	€ 769.32	€ 1,029.81
Amount of guarantee pension	€ 373.66	€ 85.77	€ 282.56	€ 42.09

Each biography profile would benefit from a shift to the Swedish guarantee pension. The independent pension benefits increase when policy option III is simulated into the German system. Table 13 shows that the lower the independent public pension benefit the higher the amount of the guarantee pension. The family-oriented and the co-earner biography would receive the highest guarantee pension, if the Swedish system was applied. In the family-oriented biography profile, single individuals receive a guarantee pension of € 440.11 (total pension benefit: €736.85), married individuals receive a guarantee pension of € 373.66 (total pension benefit: € 670.40). In the co-earner biography, single individuals receive a guarantee pension of € 348.90 (total pension benefit: € 835.66), married individuals receive a guarantee pension of € 373.66 (total pension benefit: € 769.32). But even the two employment-oriented biography profiles for East and West Germany (Profile II and IV) would still receive a small amount from the guarantee pension, despite their above average pension benefits. Women that have an employment-oriented biography in West Germany would receive a guarantee pension of € 152.12 if they are single and € 85.77 if they are married. In East Germany the guarantee pension benefit would amount to € 108.45 for single women and € 42.09 for married women. The higher guarantee pension benefits for single women can be explained by the differences in the pension formulas of single and married women.

A shift to the Swedish guarantee pension would make the biggest difference for married women. Under current German law, married women, within the respective biography profiles, would not be eligible for a means-tested minimum pension because the husband's pension benefit would be credited against their basic need. Since the husband has a continuous employment biography, and therefore a high independent pension, the household's income exceeds a certain threshold so that the woman is no longer eligible for the minimum benefit. Therefore none of the married women under the status quo is eligible for the means-tested minimum pension in addition to her own pension income. This is one of the key differences between Germany and Sweden. In Sweden, the majority of benefits is individualized so that higher earnings or income of the husband or partner cannot be counted against the woman. Whereas in Germany, the notion of the male breadwinner and female caretaker model that is present in a majority of welfare policies, leads to the fact that welfare benefits are only paid if the husband or partner is not able to support his wife. Single women in each biography profile would receive higher benefits from the guarantee pension. However, the difference in benefits between the status quo and policy option III is not as high as for married individuals, because single women would also be eligible for a minimum pension benefit under the German pension scheme. The single woman under the family-oriented biography profile receives a minimum pension benefit of € 381.99. The single woman under the co-earner biography profile receives a minimum pension benefit of € 207.18. Women in the two employment-oriented biography profiles are not eligible for a means-tested minimum pension because their pension income exceeds the eligibility limit.

Every benefits comes at a cost. Table 14 summarizes the costs of a shift to the Swedish guarantee pension. The costs are calculated separately for married and single individuals. The distribution of individuals according to their marital status has been taken from the AVID data (Verband Deutscher Rentenversicherungsträger 1999, p. 36).[44]

TABLE 14: COSTS PER PERSON AND COSTS PER PROFILE UNDER POLICY OPTION III

BIOGRAPHY PROFILES BY MARITAL STATUS	PRE-VALENCE OF PROFILE	NUMBER OF RECI-PIENTS	COSTS PER PERSON STATUS QUO	COSTS PER PROFILE STATUS QUO	COSTS PER PERSON POLICY OPTION III	COSTS PER PROFILE POLICY OPTION III
West Germany						
Family	15%					
Single		50,605	€ 687.99	€ 34,815,733.95	€ 736.85	€37,288,294.25
Married		248,836	€ 296.74	€ 73,839,594.64	€ 670.40	€ 166,819,654.40
Employment	10%					
Single		33,737	€ 896.73	€ 30,252,980	€ 1,048.85	€ 35,385,052.45
Married		165,891	€ 876.73	€ 145,441,616.40	€ 982.50	€ 162,987,907.50
Co-Earner	10%					
Single		33,737	€ 693.94	€ 23,411,453.78	€ 835.66	€ 28,192,661.42
Married		165,891	€ 486.76	€ 130,516,403.20	€ 769.32	€ 127,623,264.10
East Germany						
Employment	50%					
Single		46,425	€ 987.71	€ 45,854,436.75	€ 1,096.16	€ 50,889,228
Married		227,195	€ 987.71	€ 224,402,773.50	€ 1,029.81	€ 233,967,683
TOTAL COSTS FOR PENSION INSURANCE SYSTEM				€ 708,534,992.20		€ 843,153,745.12

[44] Widowed and married individuals are subsummed under the married category, whereas divorced and single individuals are subsummed under the single category.

A shift to the Swedish guarantee pension system would increase the total costs by 19% for the women that can be subsummed under the four biography profiles.

11.2. CONCLUSION

Overall, we have seen that the integration of the Swedish guarantee pension would make women in each biography profile, whether single or married, better off. In particular married women would benefit from the Swedish guarantee pension, since they are not eligible for a means-tested minimum pension benefit in the German pension scheme, even if their entitlements for an independent public pension are very low (family-oriented and co-earner). They are not eligible because of the high pension benefits received by their husband. Table 14 shows that the costs for the shift to the Swedish guarantee pension would increase the monthly costs of the pension insurance by 19%. Nevertheless, there are several reasons for why this considerable increase in costs is worth it.

First, the design of the Swedish guarantee pension sets incentives for women to work. The benefits from the guarantee pension decrease if the entitlements in the income-based scheme increase, but even women in the two employment-oriented biography profiles do still benefit from the guarantee pension benefit, because of its gradual phase-out. The benefit is not designed in a way that a 1 Euro increase in the independent public pension benefit decreases the guarantee pension by 1 Euro as it is the case in the German pension system. If an individual's independent pension benefits exceed a certain maximum, which is equivalent to the individual's basic needs, no means-tested benefits are paid anymore. The labor supply incentives inherent in the guarantee pension might actually draw certain groups from not being in the labor force into the labor market, which would in turn increase the number of individuals that pay social contributions into the pension system.

Second, the design of the Swedish guarantee pension is most beneficial for single mothers. The regression analysis has shown that single women have comparatively high average pension benefits compared to their married, divorced and widowed counterparts. The regression results did not suggest that we should be particularly worried about single women because they had the highest average pension benefits. However, single women in older cohorts, like the ones interviewed in the ASID survey, might be different from young single women today. In general, single mothers are financially worse off than married women. It is much more difficult for single mothers to work full-time and accumulate entitlements for a sufficient pension benefit. Differences in the pension formulas for married and single women that render higher benefits for single individuals are justified and address a problem that is likely to become more severe in the future as the share of single mothers continues to grow.

Third, a guarantee pension designed according to the Swedish model might offset the reduction in public pension benefits that is likely to occur due to the integration of the sustainability factor in the German pension formula (see Section 3.1.). The sustainability factor will reduce the annual pension indexation and therefore the average replacement rate substantially. Projections show that the replacement level will drop from 69% to 58.5% in 2030. The generosity of the Swedish guarantee pension is a result of the reform of the income-based pension in the Swedish system. The 1994 pension reform in Sweden manifested the shift from a defined-benefit to a defined-contribution system that reduced the benefits from the income-based pension scheme. The more generous guarantee pension benefit was meant to offset the losses for low-income groups. The integration of the guarantee

pension into the German system might help to reduce the losses for low-income groups that result from changes in the benefit indexation formula.

Fourth, the calculation of the Swedish guarantee pension is very transparent and the process to receive the pension benefit is comparatively easy. The benefit depends on the marital status and the entitlements in the income-based pension scheme. The guarantee pension and the income-based pension are both administered by the National Social Insurance Institute. The calculation of the German means-tested minimum pension is tedious. The basic need that determines the level of the minimum benefit is calculated on an individual basis. The individual has to apply for the minimum pension benefit. The application is verified by the Federation of German Statutory Pension Insurance Institutes (VDR). If approved, the benefit is paid by the responsible social assistance office. However, recent changes related to the law regulating the means-tested minimum pension do no longer require the VDR to inform individuals whether they are eligible for the minimum pension (Dünn and Rüb 2004, p. 622). It can be expected that several individuals are eligible without being aware of that. It is questionable, whether the problem of hidden old-age poverty can be solved effectively under these circumstances. A shift to the Swedish guarantee pension would facilitate the process for the receipt of the means-tested benefit and would remove the stigma since it would be no longer paid as a welfare benefit from the social assistance office.

Despite the increase in costs involved in a shift to the Swedish guarantee pension, I highly recommend the policy change for the reasons mentioned in the previous paragraphs.

12. FINAL CONCLUSION

This Master's project tried to answer the following question: What measures, if any, should be proposed to the legislature in order to improve independent pension benefits for women within the German public pension system?

Section 2 documented that there is a considerable gap in average pension benefits between men and women in Germany. The gap is more distinct in West than in East Germany. The main reason for the differences in average pension payments lies in the fact that the German pension system is employment-centered. Pension benefits intend to guarantee the standard of living that has been achieved during working life. The structure of the German pension formula shows why the system rewards those individuals that pay high contributions over a long period of time. A high number of service years with above average earnings guarantees a high individual pension benefit. Both men and women are affected by the employment-orientation of the German pension system, but women are adversely affected. Women enter the labor market in jobs below their qualification levels. Women earn lower wages in comparable jobs in equally-sized companies. Women are more likely to work in part-time or marginal part-time jobs, where they earn below average earnings. Women are more likely to interrupt employment when they give birth to a child and exit the labor market for the child rearing years while the children are small. And they are more affected by the problem of reconciling work and family duties than their male counterparts. In addition, generous social policies as well as joint income taxation set substantial disincentives that inhibit particularly married women from entering the labor market or encourage them to only work part-time.

The descriptive analysis of the ASID dataset as well as the regression results confirmed the importance of employment factors, such as years of gainful employment or the level of professional training completed. The regression analysis also revealed interesting differences between East and West Germany. The coefficients for certain socio-demographic variables differed considerably. Having a child reduces the average independent pension benefit significantly in both models, but the magnitude of the coefficient is stronger in the West German model. Marital status is a very strong predictor for independent pension benefits in the West German model. Women who are married or widowed have significantly lower independent pension benefits than the reference group of single women. In the East German model, marital status was a less powerful predictor. At least for West Germany, I suggested that marriage might actually function as a strong disincentive for female labor supply and that the low pension benefits are rather the result of specialization in the household with the husband working in the marketplace and the women working in the household. In both models increases in the husband's income reduced the independent pension benefits of women.

The discussion of the reasons for lower average independent pension benefits among women as well as the regression results guided my research for best practices in other countries. The solution to the problem of low independent pension benefits for women can be found either in the labor market or in the pension system itself. I searched for policy options in the pension system. Since the life-courses and employment paths of women are not homogeneous, I presented four different female biography profiles that are representative for a share of women in Germany. These biography profiles were used for a simulation exercise to assess the effects of a policy change from two perspectives: on the benefit side, from the woman's perspective (micro-effect), and on the cost side, from the perspective of the German pension insurance system (macro-effect).

Three policy options have been simulated for the four biography profiles. The first policy option presented the Swedish system of crediting women for periods of child rearing. Sweden is the only country that has designed three methods of childcare crediting based on differences in female labor market behavior. The simulation exercise revealed that only women in the family-oriented and co-earner biography profiles would be better off, whereas the two employment oriented biography profiles would be worse off. The employment-oriented biography profiles were benefiting from the generous rules in the German pension system that allows for the combination of earning points from employment and childcare credits up to 2.0 earning points per year and the upgrading of below average contributions for women with small children who continue to be employed. Given the importance of employment for the individual's pension benefit, I considered the German way of crediting for periods of childcare as superior to the Swedish system, even though the overall costs for the pension system would be reduced.

The second policy option simulated the German system with the incorporation of the Swiss system of mandatory pension splitting. The independent pension benefits have been calculated for two different scenarios: one assuming that the husband is alive and the other assuming that the husband died. Pension splitting among spouses is a cost-neutral way to increase the independent pension benefits of women when the husband is alive. Women in each biography profile would benefit from the higher entitlements of their husband that would be partly credited to the woman's account as a result of the splitting. The main question is, whether these benefits can in fact be seen as independent pension benefits. Pension splitting is cost-saving if the husband dies, because the pension insurance would no longer pay generous

survivor's benefits. The widow would receive the same amount in pension benefits as prior to the death of the husband. Women in each biography profile would be worse off from a shift to mandatory pension splitting. I argued that the co-existence of voluntary pension splitting and generous survivor's pension benefits in the German pension system does not make sense as long as there are no incentives for pension splitting in place and as long as the survivor's benefit is that generous. It is questionable whether the abolition of the survivor's pension benefit would be politically feasible, given that a large share of women relies on the derived benefits from their husband. It is also important to notice that a shift to mandatory pension splittig has only an impact on the independent pension benefits of married women. Single and divorced women would be unaffected by this policy change.

The third policy option simulated the Swedish guarantee pension into the German pension system. The replacement of the German means-tested minimum pension with a guarantee pension would increase the independent pension benefits for women in all biography profiles substantially. In particular married women with a family-oriented or co-earner biography profile would benefit from the guarantee pension since they are not eligible for a means-tested minimum pension in Germany. If they have low entitlements in the public pension insurance, but a husband with a sufficiently high pension to support both partners, women are no longer eligible. But also women with comparatively high pension entitlements would still benefit from a shift to the Swedish system because of the gradual phase-out of the guarantee pension benefit. The design of the guarantee pension would therefore set incentives for female labor supply and potentially draw certrain groups into the labor market, which would be beneficial from the individual's perspective with respect to their independent pension benefits, but also from the pension system's perspective because the number of individuals paying contribution into the pension system would increase. However, the high costs involved in a shift from the German means-tested minimum pension to the guarantee pension are a downside to the third policy option. It shows that large increases in independent pension benefits can only be realized with very cost-intensive policy alternatives.

The fact that substantial changes in independent pension benefits of women come at a high cost for the pension system raises the question whether it is useful to look for policy solutions within the pension system itself. One has to ask whether ex-post compensation is a useful mechanism to correct for the differences in employment paths between men and women and the disadvantages women face in the labor market as they retire. Ex-post compensation describes mechanisms of social balancing that benefit individuals who were unable to accumulate their own pension entitlements because of special circumstances. This does not suggest to abolish the compensation mechanisms that are in place, but is raises the question, whether the German pension insurance needs to put even more compensation mechanisms into place. In particular if low pension entitlements are the result of a conscious decision of women that opted to engage in home production rather than to work in the market place. It is also important to stress that the list of compensating mechanisms within the German pension system is extensive and generous in comparative perspective, but also in comparison to the other components of the German social insurance system (i.e. health insurance and long-term care insurance).

Against this background, it seems as if policy solutions in the labor market might be more effective in increasing the low independent public pension benefits of women. I recommend that my client should support policies that set incentives for female employment, particularly among married women and policies that facilitate the integration of women in the

German labor market. The impact of policy changes in the labor market need to be assessed in a separate analysis.

However, policymakers need to be aware that recent labor market legislation pushes women into the low-paid sector of the labor market by promoting part-time and marginal part-time employment. Even though these changes might pull certain groups into the labor market, it has serious implications for the future pension benefits of these groups. If marginal part-time employment is a substitute for full-time employment, then the gender pension gap will continue to grow. It is most important that policy solutions in the labor market set incentives for full-time employment, since this is the key to higher independent pension benefits. Only well-designed labor market policies will help to achieve this goal. We should try to solve the problem at the time it occurs, namely during the employment phase, and not try to correct for the problem when it is already too late. That's the only way to decrease the gender pension gap in the long-run.

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APPENDIX

SIMULATION OF POLICY OPTION II: INTRODUCING MANDATORY PENSION SPLITTING

ASSUMPTIONS FOR POLICY OPTION II:

- The woman is married to our male complementary biography and has one child.
- Both husband and wife retire at the statutory retirement age in 2004. They are both retired and the husband dies prior to his wife.
- If the entitlements of the couple are split, both partners forego the right to receive survivor's benefits if one partner dies.
- The assets of the couple do not exceed the maximum amount, so that the widow received the full survivor's pension benefit.
- Child care credits are acknowledged as under Policy Option I. Child credits are also acknowledged in the calculation of the survivor's benefit
- The 2004 pension value is applied. For West Germany the value is fixed at € 26.03 and for East Germany it is fixed at € 22.97.
- One year of marginal employments renders 0.2 earning points; one year of part-time employment renders 0.5 earning points; one year of full-time employment renders 0.8 earning points per year.
- Full-time employment in the employment-oriented biography profile renders 1.0 earning points for woman.
- One year of full-time employment among West and East German man renders 1.2 earning points.
- During periods of registered unemployment, the unemployment insurance pays the contribution. They are equivalent to 80% of the gross wage received in the job prior to unemployment.
- Under the status quo, I calculate two different benefits: first, the monthly independent public pension benefit for wife and husband; second, the monthly derived public pension benefit of the wife as the husband deceases.

STATUS QUO – HUSBAND ALIVE

Biography Profile I: Family-Oriented, West Germany	
EPISODES	**EARNING POINTS**
2 years of schooling	No earning points. Earning points are only credited for secondary education (e.g. vocational school).
8 years of full-time employment	8*0.8 earning points
20 years of houskeeping with children First child	3*1 earning points as childcare credit
10 years of housekeeping without children	No earning points
4 years of part-time employment	4* 0.5 earning points
	SUM OF EARNING POINTS: 11.4
Pension Value for 2004	€ 26.03
Earning Points	11.4
Actuarial Adjustment	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT WOMAN	**€ 296.74**
+	
CONTINUOUS EMPLOYMENT BIOGRAPHY OF WEST GERMAN MAN	
EPISODES	**EARNING POINTS**
44 years of full-time employment	44 * 1.2 earning points
	SUM OF EARNING POINTS: 52.8
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	52.8
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT MAN	**€ 1,374. 28**
TOTAL PENSION BENEFIT WOMAN + TOTAL PENSION BENEFIT MAN **= TOTAL PENSION BENEFIT OF THE COUPLE**	**€ 296.74** **+ € 1,374.28** **= € 1,671.02**

STATUS QUO – HUSBAND DECEASED

Biography Profile I: Family-Oriented, West Germany	
Pension Value for 2004	€ 26.03
Earning Points	11.4
Actuarial Adjustment	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT OF WOMAN	**€ 296.74**
+	
DERIVED PENSION BENEFIT OF DECEASED HUSBAND	
(TOTAL PENSION BENEFIT OF HUSBAND*0.55) + 2 ADDITIONAL EARNING POINTS FOR CHILD **= TOTAL SURVIVOR'S PENSION FOR WIDOW**	**€ 1,374.28 * 0.55 = € 755.85** **+ 52.06** **= € 807.91**
INDEPENDENT PENSION BENEFIT OF WOMAN + DERIVED PENSION BENEFIT HUSBAND **= TOTAL PENSION BENEFIT WIDOW**	**€ 296.74** **+ € 807.91** **= € 1,104.65**

POLICY OPTION II – PENSION SPLITTING

Biography Profile I: Family-Oriented, West Germany	
Pension Value for 2004	€ 26.03
Earning Points	11.4
Actuarial Adjustment	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT WOMAN	**€ 296.74**
+	
Pension Value for 2004	€ 26.03
Earning Points	52.8
Actuarial Adjustment	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT MAN	**€ 1,374. 28**
PENSION BENEFIT WOMAN + PENSION BENEFIT MAN **= TOTAL PENSION BENEFIT OF COUPLE DIVIDED BY 2**	**€ 296.74** **+ € 1,374. 28** **= € 1,671.02** **= € 1,671.02/2 = 835.51**
INDEPENDENT PENSION BENEFIT FOR EACH AS BOTH HAVE RETIRED	**€ 835.51**
INDEPENDENT PENSION AS HUSBAND DECEASES	**€ 835.51**

STATUS QUO – HUSBAND ALIVE

Biography Profile II: Employment-Oriented, West Germany	
EPISODES	**EARNING POINTS**
13 years of full-time employment	13 * 0.8 earning points
16 years of part-time employment	16 * 0.5 earning points
First child	3*1 earning points as childcare credit
Upgrade of below average contributions	7* 0.15 earning points
15 years of full-time employment	15 * 0.8 earning points
	SUM OF EARNING POINTS: 34.45
Pension Value for 2004	€ 26.03
Earning Points	34.45
Actuarial Adjustment	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT OF WOMAN	**€ 896.73**
CONTINUOUS EMPLOYMENT BIOGRAPHY OF WEST GERMAN MAN	
EPISODES	**EARNING POINTS**
44 years of full-time employment	44 * 1.2 earning points
	SUM OF EARNING POINTS: 52.8
Pension Value for 2004	€ 26.03
Earning Points	52.8
Actuarial Adjustment	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT OF MAN	**€ 1,374. 28**
TOTAL PENSION BENEFIT WOMAN + TOTAL PENSION BENEFIT MAN **= TOTAL PENSION BENEFIT OF THE COUPLE**	**€ 896.73** **+ € 1,374.28** **= € 2271.01**

STATUS QUO – HUSBAND DECEASED

Biography Profile II: Employment-Oriented	
Pension Value for 2004	€ 26.03
Earning Points	34.45
Actuarial Adjustment	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT OF WOMAN	**€ 896.73**
+	
DERIVED PENSION BENEFIT OF DECEASED HUSBAND	
(TOTAL PENSION BENEFIT OF HUSBAND*0.55) + 2 ADDITIONAL EARNING POINTS FOR CHILD **= TOTAL SURVIVOR'S PENSION FOR WIDOW**	**€ 1,374.28 * 0.55 = € 755.85** **+ 52.06** **= € 807.91**
INDEPENDENT PENSION BENEFIT OF WOMAN + DERIVED PENSION BENEFIT HUSBAND **= TOTAL PENSION BENEFIT WIDOW**	**€ 896.73** **+ € 807.91** **= € 1,615.82**

POLICY OPTION II – PENSION SPLITTING

Biography Profile II: Employment-Oriented, West Germany	
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	34.45
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT OF WOMAN	**€ 896.73**
+	
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	52.8
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT OF HUSBAND	**€ 1,374. 28**
PENSION BENEFIT WOMAN + PENSION BENEFIT HUSBAND **= TOTAL PENSION BENEFIT OF COUPLE DIVIDED BY 2**	**€ 896.73** **+ € 1,374. 28** **= € 2,271.01** **= € 2,271.01/2 = 1135.51**
INDEPENDENT PENSION BENEFIT FOR EACH AS THEY HAVE BOTH RETIRED	**€ 1,135.51**
INDEPENDENT PENSION AS HUSBAND DECEASES	**€ 1,135.51**

STATUS QUO – HUSBAND ALIVE

Biography Profile III: Co-earner-Oriented, West Germany	
EPISODES	**EARNING POINTS**
10 years of full-time employment	10*0.8 earning points
12 years of housekeeping with children First child	 3*1 earning points as childcare credit
7 years of marginal part-time employment	7* 0.2 earning points
3 years of registered unemployment (contributions are paid worth 80% of the last gross income)	3* 0.1 earning points
12 years of part-time employment	12*0.5
	SUM OF EARNING POINTS: 18.7
Pension Value for 2004	€ 26.03
Earning Points	18.7
Actuarial Adjustment	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT WOMAN	**€ 486.76**
+	
CONTINUOUS EMPLOYMENT BIOGRAPHY OF WEST GERMAN MAN	
EPISODES	**EARNING POINTS**
44 years of full-time employment	44 * 1.2 earning points
	SUM OF EARNING POINTS: 52.8
Pension Value for 2004	€ 26.03
Earning Points	52.8
Actuarial Adjustment	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT MAN	**€ 1,374. 28**
TOTAL PENSION BENEFIT WOMAN + TOTAL PENSION BENEFIT MAN **= TOTAL PENSION BENEFIT OF THE COUPLE**	**€ 486.76** **+ € 1,374.28** **= € 1,861.04**

STATUS QUO – HUSBAND DECEASED

Biography Profile III: Co-Earner-Oriented, West Germany	
Pension Value for 2004	€ 26.03
Earning Points	18.7
Actuarial Adjustment	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT OF WOMAN	**€ 486.76**
+	
DERIVED PENSION BENEFIT OF DECEASED HUSBAND	
(TOTAL PENSION BENEFIT OF HUSBAND*0.55) + 2 ADDITIONAL EARNING POINTS FOR CHILD **= TOTAL SURVIVOR'S PENSION FOR WIDOW**	**€ 1,374.28 * 0.55 = € 755.85** **+ 52.06** **= € 807.91**
INDEPENDENT PENSION BENEFIT OF WOMAN + DERIVED PENSION BENEFIT OF HUSBAND **= TOTAL PENSION BENEFIT WIDOW**	**€ 486.76** **+ € 807.91** **= € 1,294.67**

POLICY OPTION II – PENSION SPLITTING

Biography Profile III: Co-Earner-Oriented, West Germany	
Pension Value for 2004	€ 26.03
Earning Points	18.7
Actuarial Adjustment	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT OF WOMAN	**€ 486.76**
+	
Pension Value for 2004	€ 26.03
Earning Points	52.8
Actuarial Adjustment	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT OF HUSBAND	**€ 1,374. 28**
PENSION SPLITTING	
PENSION BENEFIT WOMAN + PENSION BENEFIT HUSBAND **= TOTAL PENSION BENEFIT OF COUPLE** **DIVIDED BY 2**	**€ 486.76** **+ € 1,374. 28** **= € 1,861.04** **= € 1,861.04 = € 930.52**
INDEPENDENT PENSION BENEFIT FOR EACH	**€ 930.52**
INDEPENDENT PENSION AS HUSBAND DECEASES	**€ 930.52**

STATUS QUO – HUSBAND ALIVE

Biography Profile IV: Employment-Oriented, East Germany	
EPISODES	**EARNING POINTS**
9 years of full-time employment	9* 1 earning points
Maternity leave	
First Child	3 * 1 earning points
31 years of full-time employment	31*1 earning points
	SUM OF EARNING POINTS: 43
Pension Value for 2004	€ 22.97
Earning Points	43
Actuarial Adjustment	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT WOMAN	**€ 987.71**
+	
CONTINUOUS EMPLOYMENT BIOGRAPHY OF EAST GERMAN MAN	
EPISODES	**EARNING POINTS**
44 years of full-time employment	44 * 1.2 earning points
	SUM OF EARNING POINTS: 52.8
Pension Value for 2004	€ 22.97
Earning Points	52.8
Actuarial Adjustment	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT MAN	**€ 1,212.82**
TOTAL PENSION BENEFIT WOMAN + TOTAL PENSION BENEFIT MAN **= TOTAL PENSION BENEFIT OF THE COUPLE**	**€ 987.71** **+ € 1,212.82** **= € 2,200.53**

STATUS QUO – HUSBAND DECEASED

Biography Profile IV: Employment-Oriented, East Germany	
Pension Value for 2004	€ 22.97
Earning Points	43
Actuarial Adjustment	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT OF WOMAN	**€ 987.71**
+	
DERIVED PENSION BENEFIT OF DECEASED HUSBAND	
(TOTAL PENSION BENEFIT OF HUSBAND*0.55) + 2 ADDITIONAL EARNING POINTS FOR CHILD **= TOTAL SURVIVOR'S PENSION FOR WIDOW**	**€ 667.05** **+ € 45.94** **= € 712.99**
INDEPENDENT PENSION BENEFIT OF WOMAN + DERIVED PENSION BENEFIT OF HUSBAND **= TOTAL PENSION BENEFIT WIDOW**	**€ 987.71** **+ € 712.99** **= € 1,700.70**

POLICY OPTION II – PENSION SPLITTING

Biography Profile Iv: Employment-oriented, East Germany	
Pension Value for 2004	€ 22.97
Earning Points	43
Actuarial Adjustment	1 (because retired at statutory retirement age)
INDEPENDENT PENSION BENEFIT OF WOMAN	**€ 987.71**
+	
Pension Value for 2004	€ 22.97
Earning Points	52.8
Actuarial Adjustment	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT HUSBAND	**€ 1,212.82**
PENSION SPLITTING	
PENSION BENEFIT WIFE + PENSION BENEFIT HUSBAND = TOTAL PENSION BENEFIT OF COUPLE DIVIDED BY 2	**€ 987.71** **+ € 1,212.82** **= € 2,200.53** **= € 2,200.53 /2= € 1,100.27**
INDEPENDENT PENSION BENEFIT FOR EACH AS BOTH HAVE RETIRED	**€ 1,100.27**
INDEPENDENT PENSION AS HUSBAND DECEASES	**€ 1,100.27**

SIMULATION OF POLICY OPTION III: REFORMING THE MEANS-TESTED MINIMUM PENSION

ASSUMPTIONS FOR POLICY OPTION III:

- The pension benefit is calculated for married and single women. The married woman is married to our male complementary biography. The couple has one child that is no longer living with the couple. Both husband and wife retire at the statutory retirement age in 2004.
- The Swedish base amount is assumed for the calculation of pension benefits.[45]
- The income-based pension benefit is calculated according to the German pension formula and is equivalent to the calculation of benefits in the other simulations.
- The amount of the minimum pension benefit under the status quo is calculated according to the current state of law (as of January 1st 2005).
- The individual's basic need includes the following components: a basic rate, costs for rent and utilities, social contributions for health and long-term care insurance, and additional needs.[46]
- For 2005, the basic rate is € 345 for West Germany and € 331 for East Germany.
- We assume the following costs to calculate the basic need: rent costs of € 200; utility costs of € 70; health and long-term insurance contributions (depending on the pension benefit); and an additional need of € 40.
- Single individuals and married couples have no other income or assets.
- The 2004 pension value is applied. For West Germany the value is fixed at € 26.03 and for East Germany it is fixed at € 22.97.
- One year of marginal employments renders 0.2 earning points; one year of part-time employment renders 0.5 earning points; one year of full-time employment renders 0.8 earning points per year.
- Full-time employment in the employment-oriented biography profile renders 1.0 earning points for woman.
- One year of full-time employment among West and East German man renders 1.2 earning points.

[45] I decided to apply the Swedish base amount for the simulation because Germany and Sweden have comparable standards of living and the average annual earnings are quite similar. However, the benefit levels for Germany, when applying the Swedish base amount, might be slightly overstated because the costs of living are higher in Sweden and the base amount is anually adjusted to changes in prices.

[46] The eligibility for housing allowances is not considered in the simulation.

STATUS QUO - SINGLE

Biography Profile I: Family-Oriented, West Germany	
EPISODES	**EARNING POINTS**
8 years of full-time employment	8*0.8 earning points
20 years of housekeeping with children First child	3*1 earning points as childcare credit
10 years of housekeeping without children	No earning points
4 years of part-time employment	4* 0.5 earning points
	SUM OF EARNING POINTS: 11.4
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	11.4
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 296.74**
BASIC NEED OF THE INDIVIDUAL	Basic rate: € 345 + Rent costs: € 200 + Utility costs: € 70 + Health and long-term care contributions (7.15% and 0.85% of pension benefit): € 23.73 + Additional costs: € 40 **= € 678.73**
Basic Need of the Individual - Total Pension Benefit **= MEANS-TESTED MINIMUM PENSION**	678.73 - 296.74 **= € 381.99**
TOTAL PENSION BENEFIT	**€ 678.99**

STATUS QUO – MARRIED

Biography Profile I: Family-Oriented, West Germany	
EPISODES	**EARNING POINTS**
8 years of full-time employment	8*0.8 earning points
20 years of housekeeping with children First child	3*1 earning points as childcare credit
10 years of housekeeping without children	No earning points
4 years of part-time employment	4* 0.5 earning points
	SUM OF EARNING POINTS: 11.4
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	11.4
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 296.74**
MEANS-TESTED MINIMUM PENSION	Individual is not entitled because of high pension benefit received by the husband (€ 1,374.28).
TOTAL PENSION BENEFIT	**€ 296.74**

POLICY OPTION III – SINGLE

Biography Profile I: Family-Oriented, West Germany	
INCOME-BASED PENSION	
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	11.4
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL INCOME-BASED PENSION BENEFIT	**€ 296.74**
Guarantee pension single = 0.87 * base amount – 48% (income-based pension – 1.26* base amount) **TOTAL GURANTEE PENSION BENEFIT**	Guarantee pension single = 0.87*395 – 0.48 * (296.74-497.70) = 440.11 **€ 440.11**
TOTAL PENSION BENEFIT	**€ 296.74+ € 440.11= € 736.85**

POLICY OPTION III – MARRIED

Biography Profile I: Family-Oriented, West Germany	
INCOME-BASED PENSION	
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	11.4
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL INCOME-BASED PENSION	**€ 296.74**
Guarantee pension single = 0.76 * base amount – 48% (income-based pension – 1.14 * base amount) **TOTAL GURANTEE PENSION BENEFIT**	Guarantee pension single = 0.76*395 – 0.48 * (296.74-450) = 373.66 **€ 373.66**
TOTAL PENSION BENEFIT	**€ 296.74+ € 373.66= € 670.40**

STATUS QUO - SINGLE

Biography Profile II: Employment-Oriented, West Germany	
EPISODES	**EARNING POINTS**
13 years of full-time employment	13 * 0.8 earning points
16 years of part-time employment	16 * 0.5 earning points
First child	3*1 earning points as childcare credit
Upgrade of below average contributions	7* 0.15 earning points
15 years of full-time employment	15 * 0.8 earning points
	SUM OF EARNING POINTS: 34.45
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	34.45
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 896.73**
MEANS-TESTED MINIMUM PENSION BENEFIT	Individual is not entitled because her independent pension benefit exceeds her basic needs.
TOTAL PENSION BENEFIT	**€ 896.73**

STATUS QUO - MARRIED

Biography Profile II: Employment-Oriented, West Germany	
EPISODES	**EARNING POINTS**
13 years of full-time employment	13 * 0.8 earning points
16 years of part-time employment	16 * 0.5 earning points
First child	3*1 earning points as childcare credit
Upgrade of below average contributions	7* 0.15 earning points
15 years of full-time employment	15 * 0.8 earning points
	SUM OF EARNING POINTS: 34.45
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	34.45
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 896.73**
MEANS-TESTED MINIMUM PENSION BENEFIT	Individual is not entitled because her independent pension benefit exceeds her basic needs.
TOTAL PENSION BENEFIT	**€ 896.73**

POLICY OPTION III - SINGLE

Biography Profile II: Employment-Oriented, West Germany	
INCOME-BASED PENSION	
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	34.45
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL INCOME BASED PENSION BENEFIT	**€ 896.73**
Guarantee pension single = 0.87 * base amount – 48% (income-based pension – 1.26* base amount) **TOTAL GURANTEE PENSION BENEFIT**	Guarantee pension single = 0.87*395 – 0.48 * (896.73-497.70) = 152.12 **€ 152.12**
TOTAL PENSION BENEFIT	**€ 896.73+ € 152.12= € 1048.85**

POLICY OPTION III - MARRIED

Biography Profile II: Employment-Oriented, West Germany	
INCOME-BASED PENSION	**EARNING POINTS**
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	34.45
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL INCOME-BASED PENSION BENEFIT	**€ 896.73**
Guarantee pension single = 0.87 * base amount – 48% (income-based pension – 1.14* base amount) **TOTAL GURANTEE PENSION BENEFIT**	Guarantee pension single = 0.76*395 – 0.48 * (896.73-450) = 85.77 **€ 85.77**
TOTAL PENSION BENEFIT	**€ 896.73 + € 85.77 = 982.50**

STATUS QUO - SINGLE

Biography Profile III: Co-Earner, West Germany	
EPISODES	**EARNING POINTS**
10 years of full-time employment	10*0.8 earning points
12 years of housekeeping with children First child	 3*1 earning points as childcare credit
7 years of marginal part-time employment	7* 0.2 earning points
3 years of registered unemployment (contributions are paid worth 80% of the last gross income)	3* 0.1 earning points
12 years of part-time employment	12*0.5
	SUM OF EARNING POINTS: 18.7
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	18.7
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 486.76**
BASIC NEED OF THE INDIVIDUAL	Basic rate: € 345 + Rent costs: € 200 + Utility costs: € 70 + Health and long-term care contributions (7.15% and 0.85% of pension benefit): € 38.94 + Additional costs: € 40 **= € 693.94**
Basic Need of the Individual - Total Pension Benefit **= MEANS-TESTED MINIMUM PENSION**	693.94 - 486.76 **= € 207.18**
TOTAL PENSION BENEFIT	**€ 693.94**

STATUS QUO - MARRIED

Biography Profile III: Co-Earner, West Germany	
EPISODES	**EARNING POINTS**
10 years of full-time employment	10*0.8 earning points
12 years of housekeeping with children First child	 3*1 earning points as childcare credit
7 years of marginal part-time employment	7* 0.2 earning points
3 years of registered unemployment (contributions are paid worth 80% of the last gross income)	3* 0.1 earning points
12 years of part-time employment	12*0.5
	SUM OF EARNING POINTS: 18.7
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	18.7
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 486.76**
MEANS-TESTED MINIMUM PENSION	Individual is not entitled because of high pension benefit received by the husband (€ 1,374.28).
TOTAL PENSION BENEFIT	**€ 486.76**

POLICY OPTION III - SINGLE

Biography Profile III: Co-Earner, West Germany	
INCOME-BASED PENSION	
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	18.7
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
INCOME-BASED PENSION	**€ 486.76**
Guarantee pension single = 0.87 * base amount – 48% (income-based pension – 1.26* base amount) **GURANTEE PENSION**	Guarantee pension single = 0.87*395 – 0.48 * (486.76-497.70) = 348.90 **€ 348.90**
TOTAL PENSION BENEFIT	**€ 486.76 + € 348.90= € 835.66**

POLICY OPTION III - MARRIED

Biography Profile III: Co-Earner, West Germany	
INCOME-BASED PENSION	
Pension Value for 2004 (PV)	€ 26.03
Earning Points (EP)	18.7
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL INCOME-BASED PENSION BENEFIT	**€ 486.76**
Guarantee pension single = 0.76 * base amount – 48% (income-based pension – 1.14* base amount) **TOTAL GURANTEE PENSION BENEFIT**	Guarantee pension single = 0.76*395 – 0.48 * (486.76-450) = 282.56 **€ 282.56**
TOTAL PENSION BENEFIT	**€ 486.76 + € 282.56 = € 769.32**

STATUS QUO - SINGLE

Biography Profile IV: Employment-Oriented, East Germany	
EPISODES	**EARNING POINTS**
9 years of full-time employment	9* 1 earning points
Maternity leave	
First Child	3 * 1 earning points
31 years of full-time employment	31*1 earning points
	SUM OF EARNING POINTS: 43
Pension Value for 2004 (PV)	€ 22.97
Earning Points (EP)	43
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 987.71**
MEANS-TESTED MINIMUM PENSION	Individual is not entitled because her pension benefit exceeds her basic needs.
TOTAL PENSION BENEFIT	**€ 987.71**

STATUS QUO - MARRIED

Biography Profile IV: Employment-Oriented, East Germany	
EPISODES	**EARNING POINTS**
9 years of full-time employment	9* 1 earning points
Maternity leave	
First Child	3 * 1 earning points
31 years of full-time employment	31*1 earning points
	SUM OF EARNING POINTS: 43
Pension Value for 2004 (PV)	€ 22.97
Earning Points (EP)	43
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL PENSION BENEFIT (PV*EP*AA)	**€ 987.71**
MEANS-TESTED MINIMUM PENSION	Individual is not entitled because her pension benefit exceeds her basic needs.
TOTAL PENSION BENEFIT	**€ 987.71**

POLICY OPTION III - SINGLE

Biography Profile IV: Employment-Oriented, East Germany	
INCOME-BASED PENSION BENEFIT	
Pension Value for 2004 (PV)	€ 22.97
Earning Points (EP)	43
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL INCOME-BASED PENSION BENEFIT	**€ 987.71**
Guarantee pension $_{single}$ = 0.87 * base amount – 48% (income-based pension – 1.26* base amount) **TOTAL GURANTEE PENSION BENEFIT**	Guarantee pension $_{single}$ = 0.87*395 – 0.48 * (987.71-497.70) = 108.45 **€ 108.45**
TOTAL PENSION BENEFIT	**€ 987.71 + € 108.45 = € 1,096.16**

POLICY OPTION III - MARRIED

Biography Profile IV: Employment-Oriented, East Germany	
INCOME-BASED PENSION BENEFIT	
Pension Value for 2004 (PV)	€ 22.97
Earning Points (EP)	43
Actuarial Adjustment (AA)	1 (because retired at statutory retirement age)
TOTAL INCOME-BASED PENSION BENEFIT	**€ 987.71**
Guarantee pension $_{single}$ = 0.76 * base amount – 48% (income-based pension – 1.14* base amount) **TOTAL GURANTEE PENSION BENEFIT**	Guarantee pension $_{single}$ = 0.76*395 – 0.48 * (987.71-450) = 42.10 **€ 42.10**
TOTAL PENSION BENEFIT	**€ 987.71 + € 42.10 = € 1029.81**