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Careers with double interruption: standard simulations for MIGAPE WP2

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Abstract - This project note is a follow-up to earlier work in the context of WP2 (Dekkers and Van den Bosch, 2020). The general setup of the scenarios in Dekkers and Van den Bosch put the focus on the effect of full- and parttime career interruptions of 6 years due to care activities on the resulting pension benefit at retirement. Specifically, the interruption due to childcare is assumed to begin at age 30 and another interruption to care for an older relative starts at age 54. The additional simulations presented in this brief report reflect careers with double interruptions, the first at the age of 30 and the second at the age of 54.

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1. Introduction

This note is a follow-up to the deliverable “Project MIGAPE: Work Package 2: Results of the Standard Simulations for Belgium”, by Gijs Dekkers and Karel Van den Bosch, and the deliverable “Impact on pension outcomes of life events: standard simulations from five European countries” by Dekkers et al (2020). These reports can also be found on the MIGAPE website http://www.migape.eu/results_standard.htm

The pension that one can expect to receive after retirement is a function of previous labour market circumstances and decisions, together with the – possibly compensating – elements of the existing pension system (Dekkers, Hoorens and Van den Bosch, 2019). This report is based on standard simulations to demonstrate the impact of choices that women commonly make on the pension benefit that they later receive. The decisions on which we focus concern complete or part-time career interruptions in response to care responsibilities for a child or an older parent.

The general setup of the scenarios in the previous reports put the focus on the effect of full- and parttime career interruptions of 6 years due to care activities on the resulting pension benefit at retirement. Specifically, childcare is assumed to begin at age 30 and care for an older relative at age 54. This was compared to the same careers and the same 6-year interruptions, but without taking up a care task, and hence without eligibility for the compensating systems of time credit and thematic leave.

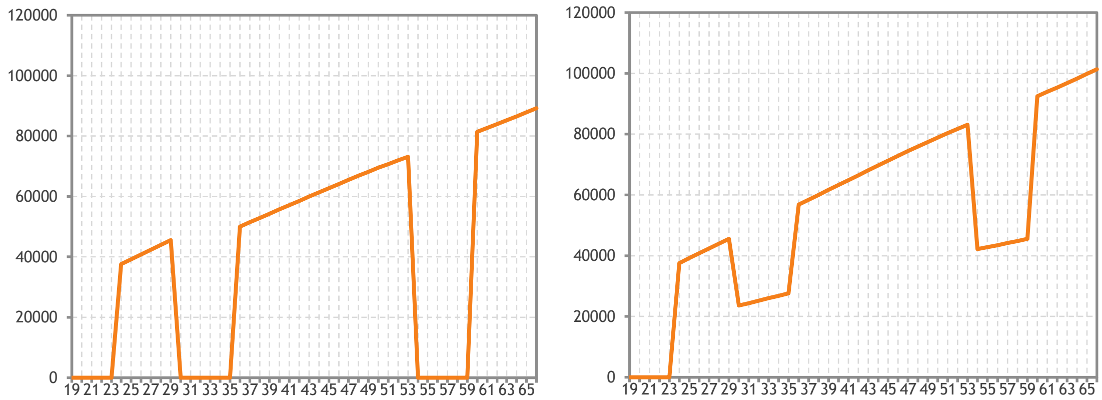
In broad lines, the conclusions were that working part time for six years, when the person is eligible for time credit/thematic leave during this period, results in only negligible reductions in the later pension. Secondly, the loss associated with a career interruption is lower when taken later rather than earlier in the career, because wage growth flattens out as people get older. Third and finally, the loss associated with an unemployment spell can be considerable and may exceed those of working part time for a longer period, especially for the groups with higher education levels.

During the discussion of the results of these papers, as well as following the discussions with the Belgian and European Stakeholder groups, the idea was launched to make additional simulations reflecting shorter careers by simulating double interruptions. In order to limit the number of simulations, and to maintain comparability with the previous simulations, these scenarios took the form of two labour market decisions, the first at the age of 30 and the second at the age of 54. Furthermore, we assume that the choice is between a full interruption or 50% part time, both for 6 years, and that the same decision is taken at 30 and at 54.

2. Description of the scenarios

Graph 1 shows the average earnings profile in the case of a woman with high education[1]. The horizontal axis represents her age and the vertical axis her annual earnings in constant prices. The left graph shows the profile in case she interrupts her career twice, at the age of 30 and 54, and each time for 6 years. During these interruptions, her (labour market) earnings are zero. The right graph describes the situation where she does not completely interrupt her career but works part time (50%) instead. Note that if the woman interrupts the career, the earnings in the year before retirement ends up lower than if she had continued to work full or part time. This is because we assume that the earnings penalty applies only to full interruptions, and not to working part time (see Dekkers and Van den Bosch, 2020 for a detailed description of the earnings penalty).

Graph 1 earnings profile with full interruption (left) or 50% interruption (right; woman; high level of education), by age



In the previous report, the simulations described the situation if an individual uses to the full extent the available compensation schemes that allow employees in the private sector to temporarily reduce their activity on the labour market to take up a task as a carer for a child *or, alternatively,* a sick adult in their household or family.

In this brief report, we simulate what happens if the individual in our standard simulations uses to the full extent the available compensation schemes that allow employees in the private sector to temporarily reduce their activity on the labour market in order to take up a task as a carer for a child *and, in addition,* a sick adult in their household or family. There are two systems, the system of Time Credit (*tijdskrediet*), and the system of Thematic Leaves (*thematische verloven*), which are both open for employees, and we assume that (s)he uses them to the fullest extent.

The system of Time Credit is accessible for employees and can be taken up to take care of a child younger than 8, for palliative care or care for an ill family member, a handicapped child younger than 21, or to

[1] The pension legislation in Belgium has no gender-specific rules. Hence the only difference between men and women in these simulations arise because of differences in wage profiles -like is the case for the comparison between education groups- and the stronger impact of the earnings cap for men.

follow education or training. The maximum duration of the Time Credit for care reasons is 51 calendar months (RVA, 2020)[2], hence irrespective of whether work is interrupted for 100% or 50%. Importantly, this duration limit applies to a person's lifetime as a whole; spells taken at different ages are added up.

Besides time credit for employees in the private sector, employees as well as civil servants can also apply for so-called thematic leaves (*thematische verloven*). These include i) parental leave (*ouderschapsverlof*), ii) leave for palliative care (*verlof voor palliatieve zorg*), and iii) leave for medical assistance (*verlof voor medische bijstand*). See Dekkers and Van den Bosch (2020, section 3.3, page 13) for an extended discussion and references. Time taken off with any of these Thematic Leaves is not subtracted from the maximum duration of Time Credit. In case of childcare, we assume that Time Credit and Thematic Leave are taken after the obligatory period of 15 weeks (3.75 months) of Mothers' full-time leave.

Parental leave allows the claimant to partially or fully cease to work to care for a child younger than the age of 12. The maximum duration depends on the nature of the interruption. If the claimant takes full parental leave, the maximum duration is 16 weeks (i.e. 4 months) for each child. In case of 50% parental leave, the maximum duration is 8 months, and in case of 20% parental leave, the maximum duration is 20 months, to be taken up in clusters of 5 months.

The second option is leave for *palliative care*. This can be taken up full time, half-time and part-time (20%), under the same conditions as in case of time credit. The maximum duration is 3 months.

The third option is leave for *medical assistance*. This leave can be taken up to care for related or blood-related family members to the 2nd degree, as well as unmarried partners. Like in the other cases, leave for medical assistance can be taken up full time, half-time and part-time, under the same conditions as in case of time credit. The maximum duration is 12 months in case of a full-time interruption, or 24 months if the reduction is 50% or 20%.

In the previous applications of the model, the scenarios described the choices between taking up time credit and thematic leave for child care at 30 *or* for medical care at the age of 54. In these cases, the following maximum terms are being used.

1. Care benefits due to childcare (taken up at 30): full interruption; 3.75 months Mothers' leave plus 51 months Time Credit plus 4 months of Parental leave is rounded to 5 years. For the part time interruption scenario (50% interruption, and 50% work) the duration is 3.75+51+8 months again rounded to 5 years. Finally, for the 20% interruption (i.e. 80% part time work), the total duration is 3.75+51+20 months rounded to 6 years.

   In short, for both the full interruption and part time interruption (50%) scenarios, the duration is again rounded to 5 years.

2. Care benefits due to medical care (taken up at 54); 51+12 months, or 5 years and 3 months; rounded to 5 years in case of a full interruption. For the part time and 20% scenario (i.e. work 50% and 80%) the total number of months is 51+24, or 6 years and 3 months; rounded to 6 years.

[2] For the education/training motive, the maximum duration is 36 months.

In short, the maximum duration is 5 years for the full interruption scenario, and 6 years for the part time scenario (i.e. work 50%).

In the previous simulations, we assumed that an individual takes a labour market decision (interruption/working part time) at 30 *or* at 54, because of care responsibilities and applied for the systems of time credit and thematic leave. In the simulations reported here, by contrast, we assume that the individual fully or partially interrupts her/his career at 30 *and* at 54, the first time to care for a child, and at 54 to care for a sick relative. Furthermore, we assume either a full interruption or a 50% part time interruption at the age of 30, as well as 54.

Here there are two situations, the first one being the most realistic.

The first situation assumes that an individual takes up a childcare responsibility at the age of 30 and uses up both Time Credit and Thematic Leave to that end. Hence, the maximum duration is again 5 years, assuming a full or 50% interruption, and including again the compulsory full-time Mothers' leave. Next, he or she takes up a care task at the age of 54. In this case, (s)he obviously is no longer eligible for Time Credit, so the maximum duration now becomes 12 months (full interruption) and 24 months (part time 50%), hence 1 and 2 years, respectively.

Alternatively, and maybe less realistic, *the second situation assumes that an individual takes up a childcare responsibility at the age of 30 but does not use the Time Credit for that end, for (s)he foresees using this at the age of 54 in combination with a care responsibility.* Hence at the age of 30, the maximum duration for full-time Mothers' leave and Thematic Leave is 3.75 + 4 months. This is rounded to 1 year. For the part time interruption scenario (50% interruption, and 50% work) the duration is 3.75+8 months, which is also rounded to 1 year. Finally, at the age of 54, the individual is eligible to both Time Credit and Thematic Leave for a maximum duration of 5 years (in case of a full interruption) or 6 years (in case of a 50% interruption).

In the next section, the results of taking a full interruption or a 50% part time interruption at the age of 30, as well as 54 are presented. Finally, we limit ourselves to presenting the results for women.

3. Results

3.1. Upbuilding of the pension

In the employees' scheme, the maximum career length is 45 years, and this results in a gross pension benefit that equals 60% of the earnings base. Hence the normal accrual rate is 60%/45 = 1.33% per year. So each year, the pension upbuilding is equal to the earnings subject to a cap, and that upbuilding is multiplied by 1.33% to reach the pension gathered in that particular year. This allows us to see how the pension upbuilding at each age of the career is affected by the labour market choices that the individual takes at the age of 30 and 54.

Graph 2 shows the annual earnings and pension upbuilding in the first situation, where the woman fully interrupts her career at 30 and 54 and exploits all possibilities (i.e. take up Time Credit) at the age of 30. Note that, like in the previous simulations (Dekkers and Van den Bosch, 2020), these simulations are in real terms (constant euros).

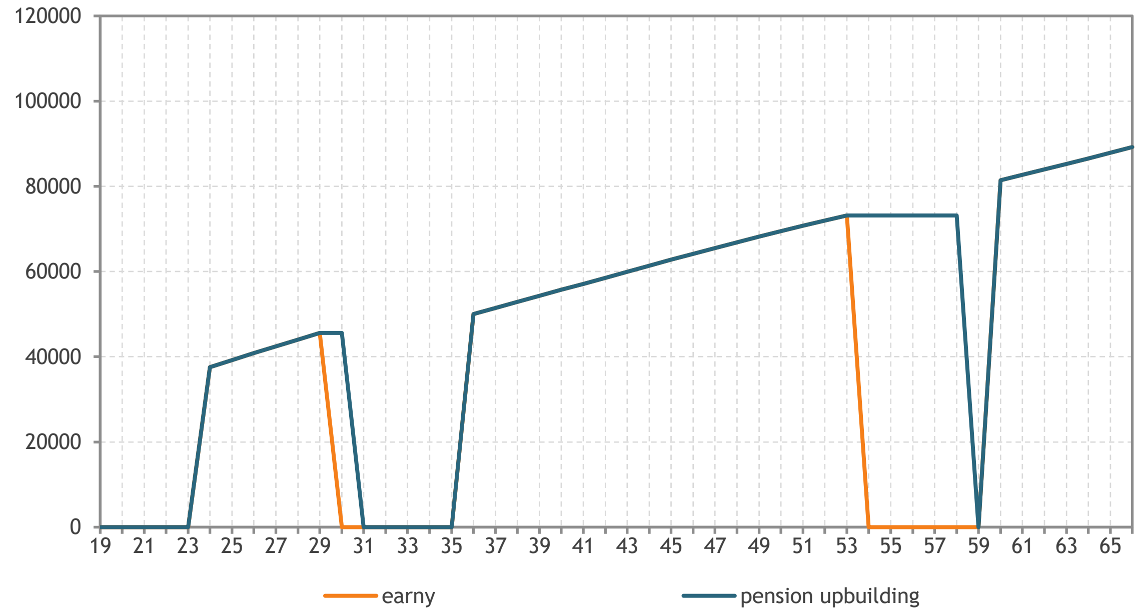
Graph 2 **Earnings and pension upbuilding (woman, high education): full exploitation at 30; full interruption**

In the original scenario, when the woman interrupted her career, her earnings are reduced to zero. However, in this case, she is eligible to the system of Time Credit and Thematic Leave, and so her earnings in the upbuilding of the pension benefit are replaced by the equivalent earnings, which are equal to the last earnings before the work interruption. Hence the earnings (in real terms) become a flat line for the maximum duration of the combined Time Credit and Thematic Leave, which is 5 years. As her work interruption is 6 years, this leaves one year where her earnings included in the pension upbuilding are reduced to zero. Next, she arrives at the age of 54 and interrupts her career again. However, in this case the maximum lifetime duration for eligibility to the systems of Time Credit is already reached, and so she is only eligible to Thematic Leave for a care task. As we discussed before, the maximum duration for this is 1 year in case of a full interruption.

Graph 3 describes the second situation where the woman who has interrupted her career at the age of 30, using only Thematic Leave, interrupts her career again at the age of 54, and applies to the system of Time Credit and Thematic Leave only then. In this scenario and as explained in the introduction, we assume that she chooses not to apply to the systems of Time Credit during the interruption at age 30 so that she keeps her eligibility at 54. As a result of this, the maximum duration during the first interruption at 30 is 1 year only, while the maximum duration at 54 is again 5 years.

Graph 3

Graph 3 Earnings and pension upbuilding (woman, high education): full exploitation at 54; full interruption

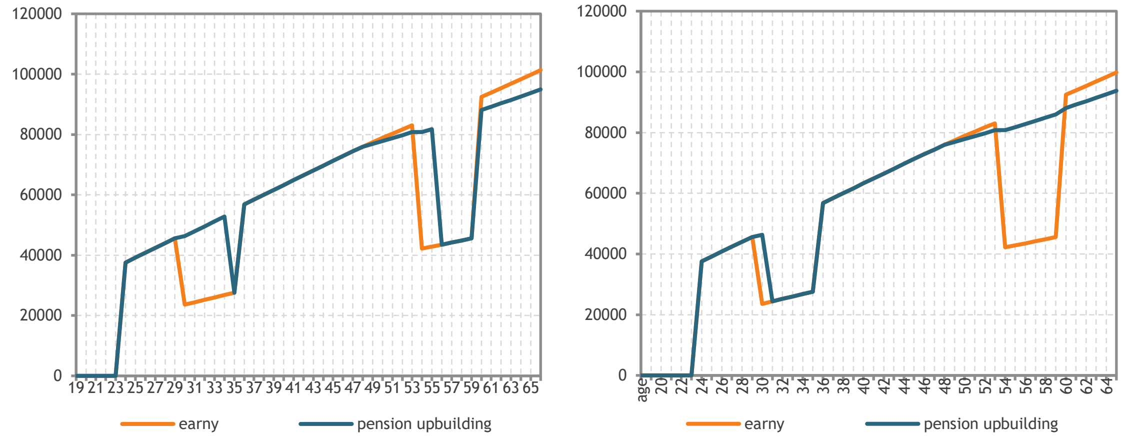


The left and right panels of Graph 4 show the situation where the woman does not completely interrupt her career to take up a care task, but instead works for 50% during the intervals. Hence her earnings are halved. However, if she is eligible to the systems of Time Credit and/or Thematic Leave, then 50% of her earnings in the upbuilding of the pension benefit are replaced by the (constant) equivalent earnings.

The left panel shows the situation where the woman takes up both Time Credit and Thematic Leave at 30, which means an eligibility period of 5 years, hence leaving one year without eligibility. Then, at the age of 45, she has only the eligibility left for Thematic Leave for a care task, which has a maximum duration of 2 years (parttime). The right panel of Graph 4 shows the situation that the woman takes up only Thematic Leave (maximum duration 1 year) at age 30 and uses the full Time Credit and Thematic Leave (maximum duration 6 years) at age 54.

Furthermore, working part time is assumed not to result in a wage penalty, and so earnings after 36 are higher than in the case of the full interruption scenarios. In fact, earnings in full time equivalent increase above the ceiling by which they are included in the pension system, and so they are limited to this ceiling. Hence, actual earnings become higher than the annual upbuilding of pensions, and as the earnings increase by productivity, which in the long run converges to 1.5% per year, while the ceiling is assumed to increase by 1.25% per year only, the ceiling lags behind earnings and so the difference between the former and the latter is reinforced over time.

Graph 4 Earnings and pension upbuilding (woman, high education): 50% interruption at 30 and 54; full exploitation of rights at 30 (left) and 54 (right)



3.2. The resulting pension benefits

As the reference set in the previous report was the woman, the below Tables 1 and 2 present the resulting pension amounts assuming a full interruption at the age of 30 or at age 54, but not both.

Table 1: Reference set; care credit at age 30: pension amounts and percentages relative to the base scenario

	Education		
Option	Low	Medium	High
Base (FT work, no interruption)	26902	30995	39484
PT 50% 6 years	26647 (99.05)	30705 (99.07)	39063 (98.93)
No work 6 years (no wage penalty)	26308 (97.79)	30301 (97.76)	38428 (97.33)
No work 6 years (wage penalty)	25649 (95.34)	28307 (91.33)	35360 (89.55)

Reference set: Woman, age at interruption 30, pension credit for work interruptions, no unemployment, wage penalty, retirement at statutory retirement age. Results previously presented in Table 2-1 and 2-2, page 19 in Dekkers and Van den Bosch, 2020.

Table 2: Reference set; care credit at age 54: pension amounts and percentages relative to the base scenario

	Education		
Option	Low	Medium	High
Base (FT work, no interruption)	26902	30995	39484
PT 50% 6 years	26868 (99.87)	30934 (99.81)	39484 (100)
No work 6 years (no wage penalty)	26005 (96.67)	29764 (96.03)	38118 (96.54)
No work 6 years (wage penalty)	25972 (96.54)	29438 (94.98)	38118 (96.54)

Reference set: Woman, age at interruption 54, reason for interruption childbirth, no unemployment, wage penalty, retirement at statutory retirement age. Results previously presented in Table 8-1 and 8-2, page 26 in Dekkers and Van den Bosch, 2020.

The first data cell of Table 1 shows that a woman with low level of education who earns the average of her group over her career and works full time, retires at the SRA with a retirement benefit in constant prices equal to €26902 per year. If she decides to work part time at 50% for 6 years at the age of 30, while applying for Time Credit and Thematic Leave, then her pension at the SRA ends up at €26647 or 99.05% of the benefit in the reference scenario. These above results were presented and discussed in Table 2.1 and Table 8.1 of the first report, so we are not going to discuss them again.

To briefly recapitulate, we assume two situations. The first situation assumes that an individual takes up a childcare task at 30 and uses up both Time Credit and Thematic Leave to that end. Next, he or she takes up a care task at the age of 54. In this case, (s)he obviously is no longer eligible for Time Credit and the eligibility is therefore limited to the system of Thematic Leave. The next results show the impact of the career scenario with two interruptions in the case of this first assumed situation.

Table 3: Interruptions at 30 *and* 54; full exploitation of care credit at 30: pension amounts and percentages relative to the base scenario

	Education		
Option	Low	Medium	High
Base (FT work, no interruption)	26902	30995	39484
PT 50% 2 x 6 years	25649 (95.34)	28057 (90.52)	35818 (90.72)
No work 2 x 6 years (no wage penalty)	23939 (88.99)	25003 (80.67)	31677 (80.23)
No work 2 x 6 years (wage penalty)	23559 (87.57)	23143 (74.67)	29180 (73.90)

Reference set: Woman, full career, no unemployment, wage penalty, retirement at statutory retirement age.

These are the retirement benefits that come out of the scenarios described in the above Graph 2 and the left panel of Graph 4. Note that percentages are relative to the base scenario amounts in the first line of Table 1 and Table 2 so the case with a full and fulltime career.

The second situation assumes that an individual takes up a childcare task at 30 but does not use the Time Credit for that end. Hence, at 30, she uses only Thematic Leave, and uses eligibility for both Time Credit and Thematic Leave at 54 only.

Table 4: Interruptions at 30 *and* 54; full exploitation of care credit at 54: pension amounts and percentages relative to the base scenario

	Education		
Option	Low	Medium	High
Base (FT work, no interruption)	26902	30995	39484
PT 50% 2 x 6 years	25649 (95.34)	29470 (95.08)	37354 (94.60)
No work 2 x 6 years (no wage penalty)	23939 (88.99)	26835 (86.58)	33957 (86.00)
No work 2 x 6 years (wage penalty)	23939 (88.99)	24643 (79.51)	31018 (78.56)

Reference set: Woman, full career, no unemployment, wage penalty, retirement at statutory retirement age.

These are the retirement benefits that come out of the scenarios described in the above Graph 3 and the right panel of Graph 4. Note again that percentages are relative to the base scenario amounts so the case with a full and fulltime career.

A first and straightforward conclusion is that taking up a care task twice during the career, considerably lowers the retirement benefit. The comparison of the results of Tables 1 and 3 show that working part time at 30 while taking Time Credit and Thematic Leave results in a pension benefit varying between 99.1% (middle education level) and 98.9% (high education level) of the reference value if the remainder of the career is kept at full time employment. But in combination with a 6-year part time care task at 54, while applying for Thematic Leave, the retirement benefit at SRA ends up between 95.3% and 90.7% of the reference value. In case of a full career interruption, the retirement benefit drops from 95.3 to 89.6% in Table 1 to 87.6% to 73.9% in Table 3[3].

The same conclusions hold for when the main decision is taken at age 54. The comparison of the results of Tables 2 and 4 show that working part time at 54 while taking Time Credit and Thematic Leave results in a pension benefit being almost equal to 100% of the reference value if the earlier career is kept at full time employment. But in combination with a 6-year part time care task at 30, while applying for Thematic Leave only, the retirement benefit at SRA ends up around 95% of the reference value. In case of a full career interruption, the retirement benefit drops from between 95 and a bit less than 97% in Table 2 to 89% to about 79% in Table 4.

The main conclusion from these simulations of double interruptions is therefore that the effect of two six-year interruptions for care reasons is much larger than the sum of the effects of single interruptions. This is due to the life-time limit on the duration of Time Credit to 51 months.

Another conclusion that can be drawn from the above tables is that the later pension benefit is higher if the individual saves her Time Credit rights until the age of 54 and does not use them at age 30. This is the case for when the individual fully interrupts the career as well as when she works part time. The reason for this is straightforward: the various programs replace the earnings loss (either completely or 50% of earnings) by imputed earnings in the calculation of the future pension. These imputed earnings are set equal to the earnings in the year before the interruption or reduction. As the earnings profiles (Dekkers and Van den Bosch, 2020, Graph 1, page 9) increase with age, the earnings at 53 exceed that at 29, , so the imputed earnings are higher at age 54 than at 30, as a comparison between Graph 2 and Graph 3 (but also the comparison between the left and right panels of Graph 4) shows.

[3] The comparison also shows that the wage penalty associated with the interruption has a strong impact on these results. Without the wage penalty, the pension benefit would decrease to almost 89% for the lowest education level to about 80% for the highest education level. The impact of the wage penalty therefore increases with the educational attainment level of the typical individual. Besides the minimum pension (that limits the impact for the individual with the lowest educational attainment level), this is because the earnings of men and women with higher educational attainment levels increase faster at younger ages (See Dekkers and Van den Bosch, 2020, Graph 1). So the wage penalty is also higher, especially at younger ages. Note, finally, that the impact of the wage penalty on the results is comparable between the middle and highest education level. This is somewhat counterintuitive, as it is especially the earnings curve of these two groups that are different. This is because the impact of the earnings penalty for the typical individual with the highest educational attainment level is dampened by the earnings ceiling. This limits earnings in case of no wage penalty, and therefore partially neutralises the impact of applying the wage penalty.

4. References

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