Creating flexibility indicators for the Dutch education system

Maastricht University

ROA

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Research Centre for Education and the Labour Market
Maastricht University
P.O. Box 616, 6200 MD Maastricht, The Netherlands
T +31 43 3883647

secretary-roa-sbe@maastrichtuniversity.nl
www.roa.nl

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Introduction

This technical report comprises a description of the data and the code to create flexibility indicators for the Dutch Education system. The data that is used to make the indicators with is the Netherlands Cohort Study of Education (Nationaal Cohortonderzoek Onderwijs, NCO) (Haelermans et al., 2020), which is available at Statistics Netherlands' (CBS) secured Remote Access environment (RA), which access is granted under certain conditions for statistical and scientific research (see Statistics Netherlands, 2023).

NCO consists of education registers (Basis Register Onderwijs, or BRON) and social statistical datasets (SSD) (Bakker, van Rooijen, & van Toor, 2014), accompanied by information on schools. It contains the complete population of students in governmental funded primary (from 2007/2008 onwards) and secondary education (from 2010/2011 onwards) in the Netherlands.

The flexibility indicators are made as a part of the NRO project "How the flexibility of the Dutch educational system affects (social inequality in) educational outcomes" (henceforth 'Flexibility'), (NRO, grant 405-17-305) whose aim is to develop and analyse in concert all those possibilities within an education system to cater for the educational needs of its students. As discussed in their conceptual paper, Wessling and van der Velden (2021, p. 8) define the concept as follows:

> *leeway for changes in standard learning pathways for individuals throughout their educational career that are explicitly facilitated by the education system (i.e. macro level) and organisation of learning in schools and classrooms (i.e. meso-level) (Wessling & van der Velden, 2021, p. 8).*

The development of the indicators and discussion of them can be found in Bles, van der Velden, and Weßling (2023) and Bles and van der Velden (2023).

The remainder of this technical report consists of a description of the data, the way to get access to the data, a short description of the Dutch Education System and the data preparations. We finish with a global description of the STATA code, of which the full do-files accompany this report. The data preparations and code are split between primary and secondary education.

Data access

The dataset with flexibility indicators is available in the highly secure environment of Statistics Netherlands. The schools in question are not identifiable as the data is pseudonymised. Access is granted after:

1) the institution has authorisation from Statistics Netherlands. In case the institution has not yet been authorised to access CBS microdata.
2) the institution has been authorised, and have submitted a project application by sending a description of the intended research to NCO and CBS Microdata Services. It is assessed on a number of criteria, primarily the admissibility and feasibility of your research.

3) a meeting with experts in which the project is discussed, and in which a cost overview by Statistics Netherlands is shared.
4) a project agreement (contract) and confidentiality statements will be signed.

For more information about the procedure at Statistics Netherlands, please visit the CBS Microdata Services website or send an email to: microdata@cbs.nl. For other questions, please visit the NCO-page on the NCO website or send an email to: info@nationaalcohortonderzoek.nl.

Dutch Education System

The primary education system is mainly differentiating by age-grade. It comprises two kindergarten grades and six regular grades. The compulsory schooling age for primary school is five, though the vast majority start when they turn four.

During the last year of primary education, in grade 6, a report about which track suits the student's abilities best is compiled. That track recommendation determines the eligibility for secondary education tracks. This eventual recommendation is based on the results of a standardised national exit test in primary education and discretion of the primary school teacher, which bases their opinion on the student's overall performance as well as behavioural characteristics and motivation (Oomens, Scholten, & Luyten, 2017; Timmermans, de Boer, Amsing, & van der Werf, 2018). After the school year 2014/2015, the recommendation from the primary school teacher was issued before the national end-test was conducted. The recommendation had to be reconsidered if the student scored higher on the exit test than the recommendation equivalent. If changed, it only could be changed to a higher track. A further alteration concerned the mandatory nature of the exit test, which became obligatory for every student. Moreover, multitude of national exit tests were introduced, from which the school had to pick one (Oomens et al., 2017).

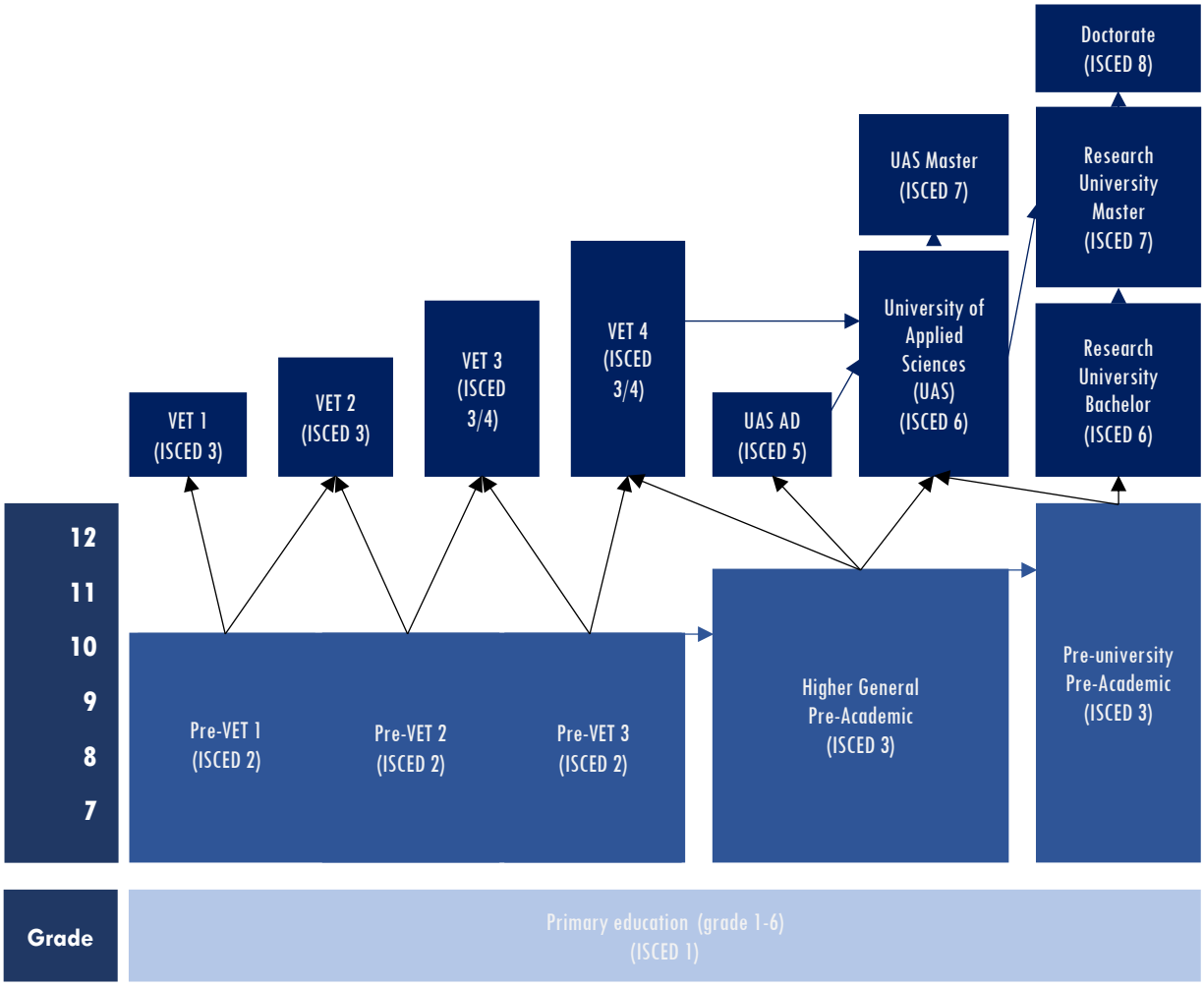
The transition from primary to secondary school takes place between grade 6 and 7, when the majority of the students are around 12 years old (see Figure 1). Secondary education is divided into five different tracks. Schools have the autonomy to decide which tracks they offer in a school, given certain preconditions. Moreover, schools can offer mixed tracks, in which students of different tracks are combined in the same classroom (Korpershoek, Naayer, & Bosker, 2017).

In general, the system can be divided in pre-vocational and pre-academic part. The pre-vocational part consists of three 4-year pre-vocational education tracks (in Figure: level 1, 2 & 3; in Dutch: VMBO-b, VMBO-k and VMBO-gt), which prepare for upper secondary vocational education tracks (in Figure: VET; in Dutch: MBO). The pre-academic part comprises of a 5 or 6 year pre-academic track. The 5-year preparatory academic track (in Figure: higher general; in Dutch: HAVO) gives access to bachelor-level studies at the universities of applied sciences (in Figure: universities of applied science; in Dutch: HBO); the 6-year preparatory academic track (in Figure: pre-university; in Dutch: VWO) prepares for bachelor level studies at a research university (in Figure: research universities; in Dutch: WO). All tracks in secondary education are concluded with central exams.

The VET system is build-up out of four different levels. VET 1 is a one-year study. VET 2 studies usually take two years, giving a 'starting qualification' for the labour market. VET 3 usually taking three years, which educates students to be a so-called independent craftsperson. The last VET track, which takes four years, the VET 4 is meant to specialise in a craft or to prepare for universities of applied science. There is the possibility of stacking certificates, meaning that having a VET certificate makes you eligible to enter the next VET level.

Higher education falls apart in universities of applied science and research universities. A Bachelor's at a university of applied science, opens up for a Master's at a university of applied science However, those are not offered for every field of study. Next to that, a research university Master is in reach if one follows an extra year of education. After a Bachelor study at a research university students can continue by entering a research universities Master. Lastly, a doctorate is a possibility once a Master's is obtained.

Figure 1. Dutch Education System



Data

The Netherlands Cohort Study of Education (Nationaal Cohortonderzoek Onderwijs, NCO) (Haelermans et al., 2020) allows us to develop and create empirical indicators for both the primary and secondary education sectors of the Dutch education system.

The do-files contain code that use entry cohorts and follow those students further into either primary or secondary education. As time progresses, there will be more data available and more entry cohorts might be constructed. This is, of course, up to the discretion of the researcher. In this part we will explain which data we use for our entry cohorts and why.

Primary Education

Constructing entry cohorts in primary education can result in lopsided cohorts. That is, the vast majority enters at 4, but the compulsory age is 5. Therefore, we use the exit cohorts of the NCO dataset, and with the birth year and birth month, we construct pseudo-entry cohorts.

In Table 1 below, the rows show the entry and exit school years in the case of a standard 8-year primary education period. The columns show school years. The cells are filled with the primary school grade for each cohort. We show with a solid line the register data we have used (2010/2011 to 2020/2021) and with a dash-dotted line which pseudo-entry cohorts we have constructed (2004/2005 to 2010/2011). Due to the COVID-19 pandemic tests were not administered in 2019/2020, and recommendations are not comparable for the years 2019/2020 and 2020/2021 with the years prior (indicated by the light blue colour in Table 1).

Therefore, we only use data until 2018/2019. Effectively, this means that using all students in the exit cohorts available, while using their birth year and birth month, our first pseudo-entry cohort is 2003/2004. By using the fact that the primary education takes 8 years 2010/2011 – 7 = 2003/2004. In turn 2003/2004 - 4 = 1999/2000.

Table 1. Using exit cohort data to construct pseudo-entry cohorts.

		years																
	ENTRY	EXIT	2003/2004	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
	2003/2004	2010/2011	1	2	3	4	5	6	7	8										
	2004/2005	2011/2012		1	2	3	4	5	6	7	8									
	2005/2006	2012/2013			1	2	3	4	5	6	7	8								
	2006/2007	2013/2014				1	2	3	4	5	6	7	8							
	2007/2008	2014/2015					1	2	3	4	5	6	7	8						
cohort	2008/2009	2015/2016						1	2	3	4	5	6	7	8					
	2009/2010	2016/2017							1	2	3	4	5	6	7	8				
	2010/2011	2017/2018								1	2	3	4	5	6	7	8			
	2011/2012	2018/2019									1	2	3	4	5	6	7	8		
	2012/2013	2019/2020										1	2	3	4	5	6	7	8	
	2013/2014	2020/2021											1	2	3	4	5	6	7	8

Secondary Education

In secondary education, we do not encounter such construction constraints and use a 'first-time-observed' approach. In Table 2, we show which cohorts to which we tailored our do-files. Some variables use the test and recommendation that are used for secondary education placement purposes. As such, our earliest opportunity is to use the secondary education entry cohort of 2011/2012 as 2010/2011 is the earliest opportunity to observe test and recommendation. The track duration is maximally six years for the pre-university track and, ideally, a year extra for retaining students, which makes our last opportunity to use an entry cohort is the school year 2013/2014, before the COVID-19 pandemic might influence outcomes of the cohorts.

Table 2. Cohort structure of secondary education

	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20
Entry cohort 2011/2012	T	x	x	x	x	x	x	+		
Entry cohort 2012/2013		T	x	x	x	x	x	x	+	
Entry cohort 2013/2014			T	x	x	x	x	x	x	+

Note: T = test obtained; x = regular school year; + = extra school year

Flexibility indicators

Table 3 provides an overview of the flexibility indicators operationalised for primary and secondary education.

Table 3. Flexibility indicators across analysis level by primary and secondary education

Flexibility Indicator	Variable
Primary Education	
Retention	Retention: students being more than eight years in primary education
Acceleration	Acceleration: students being less than eight years in primary education
Teacher recommendation < Test Score	Percentage stringent recommendations; test score higher than initial teacher recommendation
Secondary Education	
Retention	Retention: students for whom their first and retained years are in the same track
Acceleration	Acceleration: students for whom first and skipped years are in the same track
Stacking degrees	Stacked certificates: students for whom the next certificate is neither lower, equal, nor the regular next certificate in further education.
Mobility	Downward mobile: student is at a lower track in a certain year compared to the previous year Upward mobile: student is at a higher track in a certain year compared to the previous year with the next year
Mixed tracks	Mixed tracks – 1 year: students at a school in a mixed track in the first year Mixed tracks – 2 years: students at a school in a mixed track in the first and second year Mixed tracks – 3 years: students at a school in a mixed track in the first, second and third year
Offered tracks	Number of tracks: a count of the number of tracks offered in the first year of secondary education.
	Retention: students for whom their first and retained years are in the same track

Code

In this section a brief description is made to illustrate was has been done in the Flexibility project. The do-files can be found in the appendix of this technical report. It is of course to de discretion of the research using these files to make other decisions and deviate from the process as described below. The paths of the file locations that are made by the project have been replaced with a placeholder (@LOCATION) in the do-files, which is to be changed to a location of the researcher's choosing. There might be subfolders in this @LOCATION folder, which are shown in the code.

Primary Education

Do-file 1: Merging data.

In this do-file, the original yearly NCO-datafiles are called up from the so-called MAATWERK folder (Maatwerk/NCOV5/) and are provided with a merge key (variable: *sleutel*). These files are the NCO backbone file (NCOPOUITRUG), the primary school information (NCOBRINPO), primary education students information

(NCOPO), special education (NCOSO), and student background information (NCOACHTERGRONDSTABIEL). Subsequently, to each exit cohort, all the year files are merged by using both variables *sleutel* and *rinpersoons*. Lastly, all the exit cohorts are stacked together. The year files, which are not used further, are erased.

Do-file 2: Variable preparation

In this do-file both auxillary variables and flexibility variables are made. Different options to construct the school-level percentage are considered. All the variables that belong to those choices are kept, so that the researcher can make other decisions. The variables that are made are listed in Table 4.

Table 4. Variables that are made in do-file 2.

Variable	Description
system_year_first	First year observed in the data that is not only grade 6
system_year_last1	First time observed in grade 6
system_year_last2	Last time observed in grade 6
yearsinsystem1	Difference between first year observed and first time observed in grade 6
yearsinsystem2	Difference between first year observed and last time observed in grade 6
pseudo_entrance_cohort	For each yearly period between October year t and September year t+1, those born four years earlier are given a numeric year as value.
pseudo_entrance_cohort1	For each yearly period between October year t and September year t+1, those born four years earlier are given a string two-year combination as value.
compare_pseudo_real_entry	A variable with three values on whether the first time observed in kindergarten grade 1 is the same as it would be based on the date of birth: 1 if the value of system_year_first is smaller than the value of pseuo_entrance_cohort 2 if the value of system_year_first equals the value of pseuo_entrance_cohort 3 if the value of system_year_first is larger than the value of pseuo_entrance_cohort
compare_pseudo_real_exit	A variable with three values on whether the last time observed in grade 6 is 8 years apart from the year the student was in kindergarten grade 1: 1 if the value of sytem_year_last1 is smaller than the value of pseuo_entrance_cohort 2 if the value of sytem_year_last1 equals the value of pseuo_entrance_cohort 3 if the value of sytem_year_last1 is larger than the value of pseuo_entrance_cohort
years_1, years_2, years_3	Dummies of the compare_pseudo_real_exit variable
compare_pseudo_real_exit2	A variable with three values on whether the last time observed in grade 6 is 8 years apart from the first time observed in kindergarten grade 1:: 1 if the value of sytem_year_last2 is smaller than the value of pseuo_entrance_cohort 2 if the value of sytem_year_last2 equals the value of pseuo_entrance_cohort 3 if the value of sytem_year_last2 is larger than the value of pseuo_entrance_cohort
years2_1, years2_2, years2_3	Dummies of the compare_pseudo_real_exit2 variable
testscore	Test score of primary school exit test, taken the last test observation if multiple exist.
testtype	Indicates which test is taken, taken the last test type observation if multiple exist.
testscore_std	Within test year standardized test score of primary school exit test, taken the last test observation if multiple exist.

testscore_first	Test score of primary school exit test, taken the first test observation if multiple exist.
testtype_first	Indicates which test is taken, taken the first test type observation if multiple exist.
testscore_std_first	Within test year standardized test score of primary school exit test, taken the first test observation if multiple exist.
recommendation	Primary school teacher recommendation; the last one is taken if multiple exist.
rec_first	Primary school teacher recommendation; the first one is taken if multiple exist.
ladder_teacherrec	The primary school teacher recommendation expressed as a grade ladder score. See Appendix for the grade ladder score. The last recommendation is taken if more than one is observed.
ladder_teacherrec_first	The primary school teacher recommendation expressed as a grade ladder score. See Appendix for the grade ladder score. The first recommendation is taken if more than one is observed.
test_rec_2010 until test_rec_2020	Test score equivalent of the teacher recommendation. These could vary by test year and test type.
rec_test_teacher	A variable with three values on whether the teacher recommendation higher, equal or lower than the test score equivalent: 1 test score lower than teacher recommendation 2 test score equal to teacher recommendation 3 test score higher than teacher recommendation
p_rcnsdr_rec_f	Takes a 1 if the test score is higher than the teacher recommendation, and a 0 if not, but for the first time the test score is observed.
p_rcnsdr_rec_l	Takes a 1 if the test score is higher than the teacher recommendation, and a 0 if not, but for the last time the test score is observed.
schoolid_firstgrade6	The school identifier of the school the first observed time in grade 6
schoolid_lastgrade6	The school identifier of the school the last observed time in grade 6
keep_cases_first	Variable takes value of 1 if according to whether the first time observed in grade 6 compared to the first year observed in the registers is 7, 8 or 9 years apart. It takes a value of 0 if not. This means that students can only accelerate or retain one year maximum.
keep_cases_last	Variable takes value of 1 if according to whether the last time observed in grade 6 compared to the first year observed in the registers is 7, 8 or 9 years apart. It takes a value of 0 if not. This means that students can only accelerate or retain one year maximum
above10_grade6first	Whether the school in which the student were observed for the first time, had more than 10 cases in that year.
above10_grade6last	Whether the school in which the student were observed for the last time, had more than 10 cases in that year.

Do-file 3: Aggregate to schools

In this do-file takes the data file made in do-file 2, selects one entry cohort (keep if pseudo_entrance_cohort == `i') and aggregates in three statistics separately (mean, count, sum) on two different school identifiers (schoolid_firstgrade6 and schoolid_lastgrade6) and does so for entry cohorts 2004/2005 to 2010/2011. Furthermore, not only statistics for each school are calculated, but also for each cohort.

First, only the variables that were derived from the students that were for the first time observed in grade 6 are aggegated: p_rcnsdr_rec_f, years_1, years_2, years_3, testscore_std_first, ladder_teacherrec_first. The

variable by which is aggregated to the school is the schoolid_firstgrade6 variable. Three different statistics – mean, count and sum – are calculated in three separate aggregates. In other words, the average, the number of students that have a valid value on the aggregated variables and the number of students that have a 1 on the variable aggregated are temporarily aggregated to three different files.

The second part aggregates variables that are derived from students that were last observed in grade 6: p_rcnsdr_rec_l, years2_1, years2_2, years2_3, testscore_std_last, ladder_teacherrec_last. The variable by which is aggegrated is schoolid_lastgrade6 and again the mean, count and sum are the statistics that are aggregated separately.

So, after the two parts using either the students observed for the first time in grade 6 or for the last time in grade 6, there are three separate files for the three statistics, for seven entry cohorts and both at the school level and the cohort level. This makes 2*3*6*2 = 72 files. At the end of the do-file, these are merged together, albeit still separate for first time grade 6 and last time grade 6 students. In the end, those files are thus a school*cohort*statistic file.

Do-file 4: School level data

The first step in this do file is to reshape, so that each statistic is a different variable and that there is one row for a school in a particular entry cohort (school*cohort). The second step is to rename the variables to more easy understandable names, also indicating the different statistics they represent. The third step is to make a new set of variable which are a standardization of the school level values. Furthermore, another set of variables is made in which all values below and above three standard deviations are deleted. In the last step, the unnecessary variables are deleted, and the remaining ones have gotten a variable label. Furthermore, schools with values that are based on less than 10 cases are set to missing.

Secondary Education

Do-file 1: Creating cohort structure.

In this do-file, the original yearly NCO-datafiles are called up from the so-called MAATWERK folder (Maatwerk/NCOV5/) and are provided with a merge key (variable: *sleutel*). With the NCO backbone file (NCOVORUG), the other files are merged. Those files are the secondary school information (NCOBRINVO), secondary education students information (NCOVO), VET education (NCOMBO), university of applied sciences (NCOHBO), research universities (NCOWO), special education (NCOSO), adult education (NCOVAVO), primary school test and recommendation (NCOPO), and student background information (NCOACHTERGRONDSTABIEL). Subsequently, to each exit cohort, all the year files are merged by using both variables *sleutel* and *rinpersoons*. Lastly, all the exit cohorts are stacked together.

Do-file 2: Making indicators

In this do-file both auxillary variables and flexibility variables are made. Different options to construct the school-level percentage are considered. All the variables that belong to those choices are kept, so that the researcher can make other decisions. The data on which the variables are made, are the entry-cohorts. Which are looped over all variable-making code. Within the entry-cohort, variables that concern one school year are suffixed with the first year of the school year (so 2011 for 2011/2012) to the variable name. The auxiliary variables that are made, either one or a group of variables, listed in Table 5.

Table 5. Auxiliary variables

Variable	Description
educ_level	Out of the register variables (wectypeto, onderwijssoortvo, iltcode, onderwijssoortvavo, typeonderwijshbo, typeonderwijswo) a general variable is made indicating the level of education in each year of the entry cohort.
educ_level_insp	The same variable as educ_level, apart from some levels that are taken together. This makes it adhere to rules the Inspectorate of Education follows.
cert_level	Out of the register variables (onderwijssoortvodipl, niveaumbodipl, onderwijssoortvavo, soortdiplsoorthohbo, soortdiplsoorthowo) a general variables is made indicating the level of the certificate for each year.
recommendation	The register variable is recoded to indicate a nominal scale on which al recommendation levels are expressed for each year.
rec_revised	The register variable is recoded to indicate a nominal scale on which al recommendation that are revised, compared to the initial recommendation, are expressed for each year.
test_rec	The test scores of all the test types are converted into recommendations that are equivalent in meaning to the teacher recommendation for each year separate.
ladder_seclevel	The variable educ_level is transformed into a grade ladder score, which places it on a scale that indicates the distance in years to obtain another certificate by comparing to it grade ladder score recommendation for each year separate.
ladder_cert	The variable cert_level is transformed into a grade ladder score for each year separate.
ladder_teacherrec	The variable recommendation _level is transformed into a grade ladder score for each year separate.
ladder_revised_teacherrec	The variable cert_ revised is transformed into a grade ladder score for each year separate.
ladder_testrec	The variable test _level is transformed into a grade ladder score for each year separate.
group_	This group of variables indicate whether a student for a minimum of one year has had education at that level. There are five groups, of the five main tracks in the system: pre-VET 1, 2 & 3, higher general, and pre-university. Due to mixed tracks and mobility, these groups have considerable overlap.
cert_number	Number of certificates obtained by student.
cert_firstinsec	Using the variables of the group cert_level, the level of the first certificate in secondary education obtained is taken.
cert_firstinsec_year	Using the suffix of variables of the group cert_level, the year of the first certificate in secondary education obtained is taken.
cert_firstinsec_ladder	Grade Ladder Score equivalent of cert_firstinsec
cert_secondinsec	Using the variables of the group cert_level, and the variable cert_firstinsec_year, the level of the second certificate in secondary

	education obtained is taken by looking at the register the years after the first one is obtained.
cert_secondinsec_year	Using the variables of the group cert_level, and the variable cert_firstinsec_year, the year of the second certificate in secondary education obtained is taken by looking at the register the years after the first one is obtained.
cert_firstinsec_ladder	Grade Ladder Score equivalent of cert_secondinsec
cert_thirdinsec	Using the variables of the group cert_level, and the variable cert_secondinsec_year, the level of the third certificate in secondary education obtained is taken by looking at the register the years after the second one is obtained.
cert_thirdinsec_year	Using the variables of the group cert_level, and the variable cert_secondinsec_year, the year of the third certificate in secondary education obtained is taken by looking at the register the years after the second one is obtained.
cert_firstinsec_ladder	Grade Ladder Score equivalent of cert_thirdinsec
cert_fourthinsec	Using the variables of the group cert_level, and the variable cert_thirddinsec_year, the level of the fourth certificate in secondary education obtained is taken by looking at the register the years after the third one is obtained.
cert_fourthinsec_year	Using the variables of the group cert_level, and the variable cert_thirdinsec_year, the year of the fourth certificate in secondary education obtained is taken by looking at the register the years after the third one is obtained.
cert_firstinsec_ladder	Grade Ladder Score equivalent of cert_fourthinsec
cert_highestinsec	From the variables cert_firstinsec, cert_secondinsec, cert_thirdinsec & cert_fourthinsec the highest value is taken.
cert_highestinsec_year	From the variables cert_firstinsec_year, cert_secondinsec_year, cert_thirdinsec_year & cert_fourthinsec_year the highest value is taken.
ladder_cert_highestinsec	Grade Ladder Score equivalent of cert_highestinsec
schoolswap	Group of variables that flags a student if the brin_crypt and vobrinvest are different from one year to the other. The first year is suffixed to the variable name. The student can be changing only locations within the same school, or change to a completely different school.
schoolswap1	Group of variables that flags a student if the brin_crypt and vobrinvest are different from one year to the other. The first year is suffixed to the variable name. The student can be changing only locations within the same school, or change to a completely different school. The changing of locations option is adjusted for those schools in which more than 50% of the students change to the same different location or school.

Table 6. Flexibility indicator variables

Variable	Description
retention	Based on the grade in which the student is (voleerjaar), if the student is observed in the same grade it is flagged as retention. This is a yearly variable if suffixed by a year indication, if not it covers the whole cohort.
retention_samelevel	Based on the grade in which the student is (voleerjaar), if the student is observed in the same grade and it is at the same track level, it is flagged as retention. This is a yearly variable if suffixed by a year indication, if not it covers the whole cohort.
acceleration	Based on the grade in which the student is (voleerjaar), if the student is observed in a grade with more than one grade difference it is flagged as retention. This is a yearly variable if suffixed by a year indication, if not it covers the whole cohort.
acceleration_samelevel	Based on the grade in which the student is (voleerjaar), if the student is observed in a grade with more than one grade difference and it is at the same track level, it is flagged as retention. This is a yearly variable if suffixed by a year indication, if not it covers the whole cohort.
hetero_year	This group of variables indicates if the student is in a mixed track or not. Suffixed 1 means that it is the first year of the entry cohort; a 2 the second year and a 3 the third year.
hetero_level_year	This group of variables indicates what the combination of tracks is in if the the student is in a mixed track. Suffixed 1 means that it is the first year of the entry cohort; a 2 the second year and a 3 the third year.
next_year_level	With the group of variables from educ_level two adjacent years are compared to look whether there has been downward or upward mobility. This is done for the pre-VET tracks for five years, for the higher general for six years and for the pre-university for seven years. These variables are made on a yearly basis if they have a year suffix, that year being the first year in the comparison.
downward_free	Indicates whether downward mobility occurs in the entry cohort. With the yearly next_year_level variables, only the downward mobility cases are flagged if occurring in one of the years of the entry cohort.
donward_nr_free	Indicates the number of times downward mobility occurs in the entry cohort. With the yearly next_year_level variables, only the downward mobility cases are counted if occurring in one of the years of the entry cohort.
upward_free	Indicates whether upward mobility occurs in the entry cohort. With the yearly next_year_level variables, only the upward mobility cases are flagged if occurring in one of the years of the entry cohort.
upward_nr_free	Indicates the number of times upward mobility occurs in the entry cohort. With the yearly next_year_level variables, only the upward mobility cases are counted if occurring in one of the years of the entry cohort.
rec_high_free_hl_	This group of variables indicates for each recommendation type, whether the students certificate is higher, equal or lower than the recommendation. This is done by comparing a derivative of the cert_level and the recommendation variables. The recommendation type is suffixed to the variable name.
rec_cert_free_highest	This is a variable in which all the separate values of the recommendation-suffixed variables are taken together. As there is only on value in the recommendation variable, this should be not overwriting earlier made comparisons.
stack_year_	A group of variables indicating when a certificate has been stacked. It uses the group of variables cert_level and cert_firstinsec, etc etc. If there are two yearly cert_level variables and the second one is higher than the first one,

	there is stacking going on. It considers all school indicators, whether only location or different school.
stack_w_year_	A group of variables indicating when a certificate has been stacked. It uses the group of variables cert_level and cert_firstinsec, etc etc. If there are two yearly cert_level variables and the second one is higher than the first one, there is stacking going on. It considers two different certificate variables within the same school.
stack_a_year_	A group of variables indicating when a certificate has been stacked. It uses the group of variables cert_level and cert_firstinsec, etc etc. If there are two yearly cert_level variables and the second one is higher than the first one, there is stacking going on. It considers two different certificate variables across two different schools.

Do-files 3. Collapse by Flexibility Indicator

This section is accompanied by multiple do-files. As the aggregation of the individual data to school or cohort level takes much computing time, partitioning them is for timesaving purposes.

Table 7. List of do-files for collapsing

Do-file	Description
3. Collapse - Acceleration	Contains acceleration variable
3. Collapse – Certificate & Exam Result	Contains grade ladder score of highest obtained certificate and the within-track standardised central exam result
3. Collapse – Mixed Tracks	Contains whether and the combination of the mixed tracks offered in the first, second and third year.
3. Collapse – Mobility	Contains the upward and downward variables.
3. Collapse – Recommendations	Contains the variables indicating whether the highest certificate is lower, equal or higher than the teacher recommendation.
3. Collapse – Retention	Contains the retention variable.
3. Collapse – Stacking certificates	Contains the variable indicting whether students stacked certificates.
3. Collapse – Track Composition	Contains dummies of the tracks the school offer.

In these do-files, not only aggregation takes place, but we also do data preparation to account for the fact that multiple flexibility indicators might be employed at different schools if the student changes schools. All do-files, however, have the same build-up. First, we construct variables that indicate the last year a student should be in the system, according to the nominal duration of the track the student is in (*lastyear*). Based on the variable schoolswap, made in do-file number 2, we construct the year in which the student swapped schools (*swap_year*).

We decided to look at three different schools within a student's education career. To this end, we construct variables for the first, second and third spell at a school. We construct a school identifier of the first spell school (*brin_crypt_first* and *vobrinvest_first*), a variable indicating the year in which the first spell ends (*first_end_year*) and the second year started (*second_start_year*). Then the pattern repeats in the construction of variables: the second spell school (*brin_crypt_second* and *vobrinvest_second*), the year in which that ended (*second_end_year*), and the third started (*third_start_year*), the third spell school identifier (*brin_crypt_third* and *vobrinvest_third*).

Hereafter, the coding becomes more variable specific. Three separate variables are made for each spell that is only filled if the student has a valid second or third school identifier and for which the year in which the flexibility indicators are employed match with the correct year in which the student is at the school.

Subsequently, these three variables are reshaped so that there is a student*spell data format. After some data cleaning missing data, the variables are aggregated separately for three statistics (mean, count, sum) and does so for entry cohorts 2011/2012 to 2013/2014. Furthermore, not only statistics for each school are calculated, but also for each cohort. This method means that the N of the schools on which is aggregated is the largest possible N in the whole cohort period and students are counted for each separate school, meaning that they can be part of multiple schools statistics.

Do-file 4: Merge collapsed files

After the eight separate do-files in which various flexibility indicators are aggregated to the school and cohort level, there are numerous smaller .dta files as a result. There are three separate files for the three statistics, for three entry cohorts and both at the school level and the cohort level. This makes 8*3*3*2 = 144 files. First the files are called-up separately to adjust the merging key and to give some basic variable labels, if need be. Subsequently, these are merged together, resulting in a school*cohort*statistic data file.

Do-file 5: School level data

In this do-file some last preparations are made on the school level numbers. Cohort level numbers are not part of this do-file.

The first step in this do file is to rename and keep key variables, so that reshaping is possible and does not result in unnecessary variables. Thereafter, there is a reshape, so that each statistic is a different variable and that there is one row for a school in a particular entry cohort (school*cohort). The second step is to rename the variables to more easy understandable names, also indicating the different statistics they represent. Furthermore, some variables statistics are meaningless and deleted. However, they might useful for other research purposes, which is at the discretion of the researcher.

The third step is to make a new set of variable which are a standardization of the school level values. Furthermore, another set of variables is made in which all values below and above three standard deviations are deleted.

In the last step, the some unnecessary variables (e.g. z-scores of dummies) are deleted, and the remaining ones get a variable label. Furthermore, schools with values that are based on less than 10 cases are set to missing.

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Appendix

Primary Education

Do-file 1: Merging data

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* 1. Merging data
* Purpose: making a data file that contains all the cohort information from the National Cohort Study of
Education (NCO)
****************************************


// Each exit-cohort is opened to make a backbone file, which includes a key to merge them later on (sleutel).
clear
foreach year in 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020  {

usespss "G:\Maatwerk\NCOV5\NCOPOUITRUG\NCOPOUITRUG`year'.SAV"
renvars _all, lower
keep rinpersoons rinpersoon onderwijsnr_crypt

generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons

save "@LOCATION\NCOPOUITRUG_`year'.dta", replace
}

// All information on the schools is saved as .dta and a key is made (sleutel)

clear

foreach year in DEF2010 DEF2011 DEF2012 DEF2013 DEF2014 DEF2015 DEF2016 DEF2017 DEF2018 DEF2019 VRL2020  {

usespss "G:\Maatwerk\NCOV5\NCOBRINPO\NCOBRINPO`year'.SAV"

renvars _all, lower
renvars wpobrin_crypt wpobrinvest poaantalbrinbestuur pogembrinvest postedgembrinvest podenominatie
poschoolgrootte percgewicht , map("@" + "_" + substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)

keep rinpersoons rinpersoon onderwijsnr_crypt wpobrin_crypt_`addyear' wpobrinvest_`addyear'
poaantalbrinbestuur_`addyear' pogembrinvest_`addyear' ///
postedgembrinvest_`addyear' podenominatie_`addyear' poschoolgrootte_`addyear' percgewicht_`addyear'

generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons

save "@LOCATION\NCOBRINPO_`addyear'.dta", replace
}

clear

// All information on the students is saved as .dta and a key is made (sleutel)
* From 2010 to 2014
foreach year in DEF2010 DEF2011 DEF2012 DEF2013 DEF2014 {

import spss using "G:\Maatwerk\NCOV5\NCOPO\NCOPO`year'.SAV", clear

renvars _all, lower

renvars wpoadviesvo wpocodeeindtoets wpoleerjaar wpouitslageindtoets, map("@" + "_" + substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)

keep rinpersoons rinpersoon onderwijsnr_crypt wpoadviesvo_`addyear' wpocodeeindtoets_`addyear'
wpoleerjaar_`addyear' wpouitslageindtoets_`addyear'
```

```
generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons

save "@LOCATION\NCOPO_`addyear'.dta", replace
}

* From 2015 onwards
clear

foreach year in DEF2015 DEF2016 DEF2017 DEF2018 DEF2019 VRL2020  {

import spss using "G:\Maatwerk\NCOV5\NCOPO\NCOPO`year'.SAV", clear

renvars _all, lower

renvars wpoadviesvo wpoadviesherz wpocodeeindtoets wpoleerjaar wpouitslageindtoets, map("@" + "_" +
substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)

keep rinpersoons rinpersoon onderwijsnr_crypt wpoadviesvo_`addyear' wpoadviesherz_`addyear'
wpocodeeindtoets_`addyear' wpoleerjaar_`addyear' wpouitslageindtoets_`addyear'

generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons

save "@LOCATION\NCOPO_`addyear'.dta", replace
}


// All information special education is saved as .dta and a key is made (sleutel)
clear

foreach year in DEF2008 DEF2009 DEF2010 DEF2011 DEF2012 DEF2013 DEF2014 DEF2015 DEF2016 DEF2017 DEF2018 DEF2019
VRL2020  {

import spss using "G:\Maatwerk\NCOV5\NCOSO\NCOSO`year'.SAV", clear

renvars _all, lower
renvars wectypepo, map("@" + "_" + substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)

keep rinpersoons rinpersoon onderwijsnr_crypt wectypepo_`addyear'

generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons

save "@LOCATION\NCOSO_`addyear'.dta", replace
}



// All information stable background information is saved as .dta and a key is made (sleutel)
clear

import spss using  "G:\Maatwerk\NCOV5\NCOACHTERGRONDSTABIEL\NCOACHTERGRONDSTABIELDEF2020.SAV"

renvars _all, lower

generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons

save "@LOCATION\NCO_BACKGROUND.dta", replace


/// For each exit cohort (indicated with local `year') the information of all available years (indicated with
local `i') is merged to yearly exit cohort files.
clear
```

```
forvalues year = 2010(1)2020 {

use "@LOCATION\NCOPOUITRUG_`year'.dta", clear

forvalues i = 2010(1)2020 {
merge 1:1 sleutel rinpersoons using "@LOCATION\NCOPO_`i'.dta", keep(master match)
drop _merge
}

forvalues i = 2010(1)2020 {
merge 1:1 sleutel rinpersoons using "@LOCATION\NCOBRINPO_`i'.dta", keep(master match)
drop _merge
}

forvalues i = 2010(1)2020 {
merge 1:1 sleutel rinpersoons using "@LOCATION\NCOSO_`i'.dta", keep(master match)
drop _merge
}

merge 1:1 sleutel rinpersoons using "@LOCATION\NCO_BACKGROUND.dta", keep(master match)
drop _merge

save "@LOCATION\Primary Education\NCO_POUIT_`year'.dta", replace
}

/// The yearly exit cohort files are merged, for which a variable is made indicting which exit cohort that is.
use "@LOCATION\Primary Education\NCO_POUIT_2010.dta", clear
generate exitcohort = 2010

merge 1:1 sleutel rinpersoons using "@LOCATION\Primary Education\NCO_POUIT_2011.dta", gen(_merge)
replace exitcohort = 2011 if _merge == 2 | _merge == 3
drop _merge

merge 1:1 sleutel rinpersoons using "@LOCATION\Primary Education\NCO_POUIT_2012.dta", gen(_merge)
replace exitcohort = 2012 if _merge == 2 | _merge == 3
drop _merge

merge 1:1 sleutel rinpersoons using "@LOCATION\Primary Education\NCO_POUIT_2013.dta", gen(_merge)
replace exitcohort = 2013 if _merge == 2 | _merge == 3
drop _merge

merge 1:1 sleutel rinpersoons using "@LOCATION\Primary Education\NCO_POUIT_2014.dta", gen(_merge)
replace exitcohort = 2014 if _merge == 2 | _merge == 3
drop _merge

merge 1:1 sleutel rinpersoons using "@LOCATION\Primary Education\NCO_POUIT_2015.dta", gen(_merge)
replace exitcohort = 2015 if _merge == 2 | _merge == 3
drop _merge

merge 1:1 sleutel rinpersoons using "@LOCATION\Primary Education\NCO_POUIT_2016.dta", gen(_merge)
replace exitcohort = 2016 if _merge == 2 | _merge == 3
drop _merge

merge 1:1 sleutel rinpersoons using "@LOCATION\Primary Education\NCO_POUIT_2017.dta", gen(_merge)
replace exitcohort = 2017 if _merge == 2 | _merge == 3
drop _merge

merge 1:1 sleutel rinpersoons using "@LOCATION\Primary Education\NCO_POUIT_2018.dta", gen(_merge)
replace exitcohort = 2018 if _merge == 2 | _merge == 3
drop _merge

merge 1:1 sleutel rinpersoons using "@LOCATION\Primary Education\NCO_POUIT_2019.dta", gen(_merge)
replace exitcohort = 2019 if _merge == 2 | _merge == 3
drop _merge

merge 1:1 sleutel rinpersoons using "@LOCATION\Primary Education\NCO_POUIT_2020.dta", gen(_merge)
replace exitcohort = 2020 if _merge == 2 | _merge == 3
drop _merge

// Some variables are saved in the right format.
* Auxillary variable: birth year
gen birthyear = substr(gebdatum, 5, 4)
destring birthyear, replace ignore("----")

* Auxillary variable: birth month
gen birthmonth = substr(gebdatum, 3, 2)
destring birthmonth, replace ignore("----")
```

```
* Destring
destring wpoleerjaar_2010 wpoleerjaar_2011 wpoleerjaar_2012 wpoleerjaar_2013 wpoleerjaar_2014 wpoleerjaar_2015
wpoleerjaar_2016 wpoleerjaar_2017 wpoleerjaar_2018 wpoleerjaar_2019 wpoleerjaar_2020, replace

destring wpouitslageindtoets_* wpocodeeindtoets_*, replace

forvalues i = 2010(1)2020 {
destring wpoadviesvo_`i', replace
label variable wpoadviesvo_`i' "Teacher's recommendation in year `i'"
}


// Data is saved.
save "@LOCATION\Primary Education\NCO_POUIT.dta", replace


// Erase year-files which we do not use further.
forvalues i = 2010(1)2020 {
erase "@LOCATION\Primary Education\NCO_POUIT_`i'.dta"
}
```

Do-file 2: Variable preparation

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* 2. Variable preparation
* Purpose: preparing for aggregate to school level

// variables made in this file will not be all needed. At the end only the aggregated are kept.
// various choices have been made in this file, other options are also shown.
****************************************

use "@LOCATION\Primary Education\NCO_POUIT.dta", clear

	set scheme plotplainblind

*************************
*** YEARS IN EDUCATION
*************************
	generate system_year_first = .
	forvalues i = 2020(-1)2010 {
	replace system_year_first = `i' if wpoleerjaar_`i' != . & wpoleerjaar_`i' != 8 // because originally it
where exitcohorts, we have to exclude the first time in registers in grade 6
	}

	generate system_year_last1 = .
	forvalues i = 2010(1)2020 {
	replace system_year_last1 = `i' if wpoleerjaar_`i' == 8 & system_year_last1 == .
	}
	generate system_year_last2 = .
	forvalues i = 2010(1)2020 {
	replace system_year_last2 = `i' if wpoleerjaar_`i' != .
	}

	generate yearsinsystem1 = (system_year_last1 - system_year_first) + 1
	generate yearsinsystem2 = (system_year_last2 - system_year_first) + 1
	fre yearsinsystem1 yearsinsystem2

*************************
*** PSEUDO ENTREE COHORTS
*************************
	set trace on // The gap is for years as children allowed at school at age 4, but compolsory at age 5.
		generate pseudo_entrance_cohort = .
		generate str pseudo_entrance_cohort1 = ""
		forvalues i = 1997(1)2010 {
			local z = `i' + 1
			local start =  `i' + 5
			local end =  `i' + 6
			replace pseudo_entrance_cohort1 = "`start'-`end'" if ((birthyear == `i' & birthmonth > 9)
| (birthyear == `z' & birthmonth <= 9))
			replace pseudo_entrance_cohort = `start' if ((birthyear == `i' & birthmonth > 9) |
(birthyear == `z' & birthmonth <= 9))
			}
	set trace off

	tab pseudo_entrance_cohort birthyear
	tab system_year_first birthyear


* does it match the data?
	* Is year started the same as the pseudo-entrance?
	fre pseudo_entrance_cohort1 system_year_first
	tab pseudo_entrance_cohort1 system_year_first
	tab pseudo_entrance_cohort1 system_year_first if wpoleerjaar_2010 == 1

	egen sameyear = diff(pseudo_entrance_cohort system_year_first)
	fre sameyear

	generate compare_pseudo_real_entry = .
	replace compare_pseudo_real_entry = 1 if pseudo_entrance_cohort > system_year_first
	replace compare_pseudo_real_entry = 2 if pseudo_entrance_cohort == system_year_first
	replace compare_pseudo_real_entry = 3 if pseudo_entrance_cohort < system_year_first
	fre compare_pseudo_real_entry
	tab compare_pseudo_real_entry system_year_first

*************************
```

```
*** PACE THROUGH SYSTEM
*************************

	* First time in groep 8
	fre pseudo_entrance_cohort1 system_year_last1
	tab pseudo_entrance_cohort1 system_year_last1
	tab pseudo_entrance_cohort1 system_year_last1 if wpoleerjaar_2010 == 1

	generate temp = pseudo_entrance_cohort - system_year_last1
	fre temp

	label define pseudo_pace 1 "Assumed less than 8 years" 2 "Assumed 8 years" 3 "Assumed more than 8 years"

	generate compare_pseudo_real_exit = .
	replace compare_pseudo_real_exit = 1 if temp > -7
	replace compare_pseudo_real_exit = 2 if temp == -7
	replace compare_pseudo_real_exit = 3 if temp < -7
	label values compare_pseudo_real_exit pseudo_pace

	drop temp
	tab pseudo_entrance_cohort1 system_year_last1
	tab compare_pseudo_real_exit system_year_last1
	tab compare_pseudo_real_exit system_year_last1 if wpoleerjaar_2010 == 1

	list wpoleerjaar_2010 wpoleerjaar_2011 wpoleerjaar_2012 wpoleerjaar_2013 wpoleerjaar_2014
wpoleerjaar_2015 wpoleerjaar_2016 wpoleerjaar_2017 wpoleerjaar_2018 wpoleerjaar_2019 wpoleerjaar_2020 ///
	compare_pseudo_real_exit system_year_last1 birthyear birthmonth pseudo_entrance_cohort if
(compare_pseudo_real_exit == 1 | compare_pseudo_real_exit == 2) & pseudo_entrance_cohort == 2011 in 1/1000

	* Second time in grade 8
	generate temp = pseudo_entrance_cohort - system_year_last2
	fre temp

	generate compare_pseudo_real_exit2 = .
	replace compare_pseudo_real_exit2 = 1 if temp > -7
	replace compare_pseudo_real_exit2 = 2 if temp == -7
	replace compare_pseudo_real_exit2 = 3 if temp < -7
	label values compare_pseudo_real_exit2 pseudo_pace

	drop temp
	tab pseudo_entrance_cohort1 system_year_last2
	tab compare_pseudo_real_exit2 system_year_last2

	tab compare_pseudo_real_exit pseudo_entrance_cohort

	tab compare_pseudo_real_exit, gen(years_)
	fre years_1 years_2 years_3

	tab compare_pseudo_real_exit2, gen(years2_)
	fre years2_1 years2_2 years2_3


*************************
*** TEST SCORES
*************************

	* test
	label define testtype_lab ///
	   01 "Cito Eindtoets (tm 2014)"   02 "Drempelonderzoek 678 (tm 2010)"  03 "Eduforce Drempeltest (tm
2014)"  04 "GPC Schooleindonderzoek, Intelligentie (tm 2014)" ///
	 05 "GPC Schooleindonderzoek, Schoolvorderingen (tm 2014)"  06 "Intelligentie Schoolvorderingen
Interesse (ISI) (tm 2014)"  07 "Intelligentie Schoolvorderingen Interesse (ISI) (tm 2014)"  08 "Overige toetsen"
///
	  09 "Drempeltest (tm 2014)"  10 "Drempelonderzoek"  11 "Centrale eindtoets (CET)"  12 "ROUTE 8"  13
"ICE Eindevaluatie Primair Onderwijs (IEP)"  14 "Dia (vanaf 2016)" 15 "Cesan (vanaf 2016)"  16 "AMN (vanaf
2016)"

	forvalues i = 2010(1)2020 {
	generate testscore_`i' = wpouitslageindtoets_`i'
	generate testtype_`i' = wpocodeeindtoets_`i'
	replace testtype_`i' = 999 if wpocodeeindtoets_`i'  == .

	levelsof testtype_`i', local(toetsen)
		foreach type of local toetsen {
		egen testscore_`i'_std_`type' = std(testscore_`i') if testtype_`i' == `type' // 2019 does not
work as there are not test types
		replace testscore_`i'_std_`type' = . if testtype_`i' == 999
```

```
		}

	egen testscore_`i'_std = rowmax(testscore_`i'_std_*)
	drop testscore_`i'_std_*
	replace testtype_`i' = . if wpocodeeindtoets_`i'  == .
	}

* Last test score
	generate testscore = .
	generate testtype = .
	generate testscore_std = .
	generate test_year = .
	forvalues i = 2020(-1)2010 {
	replace testscore = testscore_`i' if testscore == .
	replace testtype = testtype_`i' if testtype == .
	replace testscore_std = testscore_`i'_std if testscore_std == .
	replace test_year = `i' if testscore_`i' != . & test_year == .
	}

	label values testtype testtype_lab

	sum testscore testtype testscore_std test_year

	tabstat testscore_std, by(testtype) stat(mean sd N min max)

* First test score
	generate testscore_first = .
	generate testtype_first = .
	generate testscore_std_first = .
	generate test_year_first = .
	forvalues i = 2010(1)2020 {
	replace testscore_first = testscore_`i' if testscore_`i' != . & testscore_first == .
	replace testtype_first = testtype_`i' if testtype_`i' != . & testtype_first == .
	replace testscore_std_first = testscore_`i'_std if testscore_`i'_std != . & testscore_std_first == .
	replace test_year_first = `i' if testscore_`i' != . & test_year_first == .
	}

	tabstat testscore_std_first, by(testtype) stat(mean sd N min max)

*************************
*** RECOMMENDATIONS
*************************
	forvalues i = 2010(1)2020 {
	recode wpoadviesvo_`i'
(0=.)(1=1)(10=1)(20=2)(21=2)(22=3)(23=3)(24=4)(25=4)(26=4)(27=4)(28=14)(29=15)(30=5)(31=5)(32=6)(33=6)(34=6)(35=
6)(36=7)(37=16) ///
	(40=8)(41=8)(42=8)(43=8)(44=9)(45=10)(50=8)(51=8)(52=9)(53=10)(60=11)(61=12)(70=13)(80=17),
generate(recommendation_`i')
	label variable wpoadviesvo_`i' "Teacher's recommendation in year `i'"
	}

	label define rec_lab 1 "vso/pro" 2 "vmbo bb" 3 "vmbo bb/kb" 4 "vmbo bb/kb/(g)t" 5 "vmbo kb" 6 "vmbo
kb/(g)t" 7 "vmbo kb/(g)t/havo" 8 "vmbo (g)t" 9 "vmbo (g)t/havo" ///
	10 "vmbo (g)t/havo/vwo" 11 "havo" 12 "havo/vwo" 13 "vwo" 14 "vmbo bb/kb/gt/havo" 15 "vmbo
bb/kb/gt/havo/vwo" 16 "vmbo kb/gt/havo/vwo" 17 "overig", replace
	label values recommendation_* rec_lab
	fre recommendation_*

	egen recommendation = rowlast(recommendation_20*)
	label values recommendation recommendation_20* rec_lab
	fre recommendation
	tabm recommendation_20*

	egen rec_first = rowfirst(recommendation_20*)
	label values rec_first recommendation_20* rec_lab
	fre rec_first

	list recommendation rec_first recommendation_20* in 1/100


* Teacher recommendation
	forvalues i = 2010(1)2020 {
	recode wpoadviesvo_`i'
(0=.)(1=0.5)(10=0.5)(20=2)(21=2)(22=2.5)(23=2.5)(24=3)(25=3)(26=3)(27=3)(28=3.5)(29=4)(30=3)(31=3)(32=3.5)(33=3.
5)(34=3.5)(35=3.5)(36=4)(37=4.5) ///
	(40=4)(41=4)(42=4)(43=4)(44=4.5)(45=5)(50=4)(51=4)(52=4.5)(53=5)(60=5)(61=5.5)(70=6)(80=.),
generate(ladder_teacherrec_`i')
```

```
        label variable ladder_teacherrec_`i'  "Grade Ladder Score for teacher's recommendation in year `i'"
        }
        fre ladder_teacherrec_*

        egen ladder_teacherrec = rowlast(ladder_teacherrec_20*)
        egen ladder_teacherrec_first = rowfirst(ladder_teacherrec_20*)

* Test recommendation
        forvalues i = 2010(1)2013 {
        generate test_rec_`i' = .
        replace test_rec_`i' = 2 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >=500 &
wpouitslageindtoets_`i' <=518
        replace test_rec_`i' = 3 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >518 &
wpouitslageindtoets_`i' <=525
        replace test_rec_`i' = 4 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >525 &
wpouitslageindtoets_`i' <=528
        replace test_rec_`i' = 6 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >528 &
wpouitslageindtoets_`i' <=532
        replace test_rec_`i' = 7 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >532 &
wpouitslageindtoets_`i' <=536
        replace test_rec_`i' = 10 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >536 &
wpouitslageindtoets_`i' <=539
        replace test_rec_`i' = 11 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >539 &
wpouitslageindtoets_`i' <=544
        replace test_rec_`i' = 12 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >544 &
wpouitslageindtoets_`i' <=550

        }

        ***** 2014 (change of tests available, including cito (11), route8 (12) and iep (13).
        generate test_rec_2014 = .
        replace test_rec_2014 = 2 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 <=518
        replace test_rec_2014 = 3 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >518 &
wpouitslageindtoets_2014 <=525
        replace test_rec_2014 = 4 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >525 &
wpouitslageindtoets_2014 <=528
        replace test_rec_2014 = 6 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >528 &
wpouitslageindtoets_2014 <=532
        replace test_rec_2014 = 7 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >532 &
wpouitslageindtoets_2014 <=536
        replace test_rec_2014 = 10 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >536 &
wpouitslageindtoets_2014 <=539
        replace test_rec_2014 = 11 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >539 &
wpouitslageindtoets_2014 <=544
        replace test_rec_2014 = 12 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >544 &
wpouitslageindtoets_2014 <=550
        replace test_rec_2014 = 0 if wpocodeeindtoets_2014 == 12 & wpouitslageindtoets_2014 <141
        replace test_rec_2014 = 2 if wpocodeeindtoets_2014 == 12 & wpouitslageindtoets_2014 >=141 &
wpouitslageindtoets_2014 <=168
        replace test_rec_2014 = 4 if wpocodeeindtoets_2014 == 12 & wpouitslageindtoets_2014 >168 &
wpouitslageindtoets_2014 <=190
        replace test_rec_2014 = 8 if wpocodeeindtoets_2014 == 12 & wpouitslageindtoets_2014 >190 &
wpouitslageindtoets_2014 <=210
        replace test_rec_2014 = 10 if wpocodeeindtoets_2014 == 12 & wpouitslageindtoets_2014 >210 &
wpouitslageindtoets_2014 <=234
        replace test_rec_2014 = 12 if wpocodeeindtoets_2014 == 12 & wpouitslageindtoets_2014 >234
        replace test_rec_2014 = 3 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >=50 &
wpouitslageindtoets_2014 <=61
        replace test_rec_2014 = 5 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >61 &
wpouitslageindtoets_2014 <=70
        replace test_rec_2014 = 8 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >70 &
wpouitslageindtoets_2014 <=76
        replace test_rec_2014 = 9 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >76 &
wpouitslageindtoets_2014 <=81
        replace test_rec_2014 = 10 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >81 &
wpouitslageindtoets_2014 <=86
        replace test_rec_2014 = 11 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >86 &
wpouitslageindtoets_2014 <=92
        replace test_rec_2014 = 12 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >92 &
wpouitslageindtoets_2014 <=100

        ***** 2015.
        generate test_rec_2015 = .
        replace test_rec_2015 = 2 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 <=518
        replace test_rec_2015 = 3 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >518 &
wpouitslageindtoets_2015 <=525
```

```
	replace test_rec_2015 = 4 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >525 &
wpouitslageindtoets_2015 <=528
	replace test_rec_2015 = 6 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >528 &
wpouitslageindtoets_2015 <=532
	replace test_rec_2015 = 7 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >532 &
wpouitslageindtoets_2015 <=536
	replace test_rec_2015 = 10 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >536 &
wpouitslageindtoets_2015 <=539
	replace test_rec_2015 = 11 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >539 &
wpouitslageindtoets_2015 <=544
	replace test_rec_2015 = 12 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >544 &
wpouitslageindtoets_2015 <=550
	replace test_rec_2015 = 0 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 <141
	replace test_rec_2015 = 2 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=141 &
wpouitslageindtoets_2015 <=169
	replace test_rec_2015 = 3 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=170 &
wpouitslageindtoets_2015 <=180
	replace test_rec_2015 = 4 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=181 &
wpouitslageindtoets_2015 <=186
	replace test_rec_2015 = 5 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=187 &
wpouitslageindtoets_2015 <=194
	replace test_rec_2015 = 6 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=195 &
wpouitslageindtoets_2015 <=202
	replace test_rec_2015 = 7 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=203 &
wpouitslageindtoets_2015 <=211
	replace test_rec_2015 = 10 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=212 &
wpouitslageindtoets_2015 <=218
	replace test_rec_2015 = 11 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=219 &
wpouitslageindtoets_2015 <=228
	replace test_rec_2015 = 12 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >228
	replace test_rec_2015 = 3 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >=50 &
wpouitslageindtoets_2015 <=61
	replace test_rec_2015 = 5 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >61 &
wpouitslageindtoets_2015 <=70
	replace test_rec_2015 = 8 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >70 &
wpouitslageindtoets_2015 <=76
	replace test_rec_2015 = 9 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >76 &
wpouitslageindtoets_2015 <=81
	replace test_rec_2015 = 10 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >81 &
wpouitslageindtoets_2015 <=86
	replace test_rec_2015 = 11 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >86 &
wpouitslageindtoets_2015 <=92
	replace test_rec_2015 = 12 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >92 &
wpouitslageindtoets_2015 <=100

	***** 2016.
	generate test_rec_2016 = .
	replace test_rec_2016 = 2 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 <=518
	replace test_rec_2016 = 3 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >518 &
wpouitslageindtoets_2016 <=525
	replace test_rec_2016 = 4 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >525 &
wpouitslageindtoets_2016 <=528
	replace test_rec_2016 = 6 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >528 &
wpouitslageindtoets_2016 <=532
	replace test_rec_2016 = 7 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >532 &
wpouitslageindtoets_2016 <=536
	replace test_rec_2016 = 10 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >536 &
wpouitslageindtoets_2016 <=539
	replace test_rec_2016 = 11 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >539 &
wpouitslageindtoets_2016 <=544
	replace test_rec_2016 = 12 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >544 &
wpouitslageindtoets_2016 <=550
	replace test_rec_2016 = 0 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 <141
	replace test_rec_2016 = 2 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=141 &
wpouitslageindtoets_2016 <=169
	replace test_rec_2016 = 3 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=170 &
wpouitslageindtoets_2016 <=180
	replace test_rec_2016 = 4 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=181 &
wpouitslageindtoets_2016 <=186
	replace test_rec_2016 = 5 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=187 &
wpouitslageindtoets_2016 <=194
	replace test_rec_2016 = 6 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=195 &
wpouitslageindtoets_2016 <=202
	replace test_rec_2016 = 7 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=203 &
wpouitslageindtoets_2016 <=211
	replace test_rec_2016 = 10 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=212 &
wpouitslageindtoets_2016 <=218
```

```
	replace test_rec_2016 = 11 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=219 &
wpouitslageindtoets_2016 <=228
	replace test_rec_2016 = 12 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >228
	replace test_rec_2016 = 2 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=50 &
wpouitslageindtoets_2016 <=53
	replace test_rec_2016 = 3 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=54 &
wpouitslageindtoets_2016 <=58
	replace test_rec_2016 = 4 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=59 &
wpouitslageindtoets_2016 <=64
	replace test_rec_2016 = 5 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=65 &
wpouitslageindtoets_2016 <=70
	replace test_rec_2016 = 6 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=71 &
wpouitslageindtoets_2016 <=76
	replace test_rec_2016 = 7 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=77 &
wpouitslageindtoets_2016 <=81
	replace test_rec_2016 = 10 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=82 &
wpouitslageindtoets_2016 <=86
	replace test_rec_2016 = 11 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=87 &
wpouitslageindtoets_2016 <=92
	replace test_rec_2016 = 12 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=93 &
wpouitslageindtoets_2016 <=100

	***** 2017.
	generate test_rec_2017 = .
	replace test_rec_2017 = 2 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 <=518
	replace test_rec_2017 = 3 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >518 &
wpouitslageindtoets_2017 <=525
	replace test_rec_2017 = 4 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >525 &
wpouitslageindtoets_2017 <=528
	replace test_rec_2017 = 6 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >528 &
wpouitslageindtoets_2017 <=532
	replace test_rec_2017 = 7 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >532 &
wpouitslageindtoets_2017 <=536
	replace test_rec_2017 = 10 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >536 &
wpouitslageindtoets_2017 <=539
	replace test_rec_2017 = 11 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >539 &
wpouitslageindtoets_2017 <=544
	replace test_rec_2017 = 12 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >544 &
wpouitslageindtoets_2017 <=550
	replace test_rec_2017 = 0 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 <141
	replace test_rec_2017 = 2 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=141 &
wpouitslageindtoets_2017 <=169
	replace test_rec_2017 = 3 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=170 &
wpouitslageindtoets_2017 <=180
	replace test_rec_2017 = 4 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=181 &
wpouitslageindtoets_2017 <=186
	replace test_rec_2017 = 5 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=187 &
wpouitslageindtoets_2017 <=194
	replace test_rec_2017 = 6 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=195 &
wpouitslageindtoets_2017 <=202
	replace test_rec_2017 = 7 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=203 &
wpouitslageindtoets_2017 <=211
	replace test_rec_2017 = 10 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=212 &
wpouitslageindtoets_2017 <=218
	replace test_rec_2017 = 11 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=219 &
wpouitslageindtoets_2017 <=228
	replace test_rec_2017 = 12 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >228
	replace test_rec_2017 = 1 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=50 &
wpouitslageindtoets_2017 <=53
	replace test_rec_2017 = 2 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=54 &
wpouitslageindtoets_2017 <=65
	replace test_rec_2017 = 3 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=66 &
wpouitslageindtoets_2017 <=67
	replace test_rec_2017 = 4 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=68 &
wpouitslageindtoets_2017 <=71
	replace test_rec_2017 = 5 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=72 &
wpouitslageindtoets_2017 <=73
	replace test_rec_2017 = 6 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=74 &
wpouitslageindtoets_2017 <=77
	replace test_rec_2017 = 7 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=78 &
wpouitslageindtoets_2017 <=81
	replace test_rec_2017 = 10 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=82 &
wpouitslageindtoets_2017 <=87
	replace test_rec_2017 = 11 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=88 &
wpouitslageindtoets_2017 <=91
	replace test_rec_2017 = 12 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=92 &
wpouitslageindtoets_2017 <=100
```

```
       replace test_rec_2017 = 2 if wpocodeeindtoets_2017 == 14 & wpouitslageindtoets_2017 >=333 &
wpouitslageindtoets_2017 <=349
       replace test_rec_2017 = 3 if wpocodeeindtoets_2017 == 14 & wpouitslageindtoets_2017 >=350 &
wpouitslageindtoets_2017 <=354
       replace test_rec_2017 = 8 if wpocodeeindtoets_2017 == 14 & wpouitslageindtoets_2017 >=355 &
wpouitslageindtoets_2017 <=361
       replace test_rec_2017 = 10 if wpocodeeindtoets_2017 == 14 & wpouitslageindtoets_2017 >=362 &
wpouitslageindtoets_2017 <=370
       replace test_rec_2017 = 12 if wpocodeeindtoets_2017 == 14 & wpouitslageindtoets_2017 >=371 &
wpouitslageindtoets_2017 <=391
       replace test_rec_2017 = 2 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=14 &
wpouitslageindtoets_2017 <=107
       replace test_rec_2017 = 3 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=108 &
wpouitslageindtoets_2017 <=181
       replace test_rec_2017 = 4 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=182 &
wpouitslageindtoets_2017 <=254
       replace test_rec_2017 = 5 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=255 &
wpouitslageindtoets_2017 <=313
       replace test_rec_2017 = 8 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=314 &
wpouitslageindtoets_2017 <=413
       replace test_rec_2017 = 9 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=414 &
wpouitslageindtoets_2017 <=517
       replace test_rec_2017 = 10 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=518 &
wpouitslageindtoets_2017 <=658
       replace test_rec_2017 = 11 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=659 &
wpouitslageindtoets_2017 <=811
       replace test_rec_2017 = 12 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=812 &
wpouitslageindtoets_2017 <=1000

       ***** 2018.
       generate test_rec_2018 = .
       replace test_rec_2018 = 2 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 <=518
       replace test_rec_2018 = 3 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >518 &
wpouitslageindtoets_2018 <=525
       replace test_rec_2018 = 4 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >525 &
wpouitslageindtoets_2018 <=528
       replace test_rec_2018 = 6 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >528 &
wpouitslageindtoets_2018 <=532
       replace test_rec_2018 = 7 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >532 &
wpouitslageindtoets_2018 <=536
       replace test_rec_2018 = 10 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >536 &
wpouitslageindtoets_2018 <=539
       replace test_rec_2018 = 11 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >539 &
wpouitslageindtoets_2018 <=544
       replace test_rec_2018 = 12 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >544 &
wpouitslageindtoets_2018 <=550
       replace test_rec_2018 = 0 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 <141
       replace test_rec_2018 = 2 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=141 &
wpouitslageindtoets_2018 <=169
       replace test_rec_2018 = 3 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=170 &
wpouitslageindtoets_2018 <=180
       replace test_rec_2018 = 4 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=181 &
wpouitslageindtoets_2018 <=186
       replace test_rec_2018 = 5 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=187 &
wpouitslageindtoets_2018 <=194
       replace test_rec_2018 = 6 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=195 &
wpouitslageindtoets_2018 <=202
       replace test_rec_2018 = 7 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=203 &
wpouitslageindtoets_2018 <=211
       replace test_rec_2018 = 10 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=212 &
wpouitslageindtoets_2018 <=218
       replace test_rec_2018 = 11 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=219 &
wpouitslageindtoets_2018 <=228
       replace test_rec_2018 = 12 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >228
       replace test_rec_2018 = 1 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=50 &
wpouitslageindtoets_2018 <=53
       replace test_rec_2018 = 2 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=54 &
wpouitslageindtoets_2018 <=65
       replace test_rec_2018 = 3 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=66 &
wpouitslageindtoets_2018 <=67
       replace test_rec_2018 = 4 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=68 &
wpouitslageindtoets_2018 <=71
       replace test_rec_2018 = 5 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=72 &
wpouitslageindtoets_2018 <=73
       replace test_rec_2018 = 6 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=74 &
wpouitslageindtoets_2018 <=77
```

```
	replace test_rec_2018 = 7 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=78 &
wpouitslageindtoets_2018 <=81
	replace test_rec_2018 = 10 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=82 &
wpouitslageindtoets_2018 <=87
	replace test_rec_2018 = 11 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=88 &
wpouitslageindtoets_2018 <=91
	replace test_rec_2018 = 12 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=92 &
wpouitslageindtoets_2018 <=100
	replace test_rec_2018 = 2 if wpocodeeindtoets_2018 == 14 & wpouitslageindtoets_2018 >=333 &
wpouitslageindtoets_2018 <=346
	replace test_rec_2018 = 3 if wpocodeeindtoets_2018 == 14 & wpouitslageindtoets_2018 >=347 &
wpouitslageindtoets_2018 <=353
	replace test_rec_2018 = 8 if wpocodeeindtoets_2018 == 14 & wpouitslageindtoets_2018 >=354 &
wpouitslageindtoets_2018 <=361
	replace test_rec_2018 = 10 if wpocodeeindtoets_2018 == 14 & wpouitslageindtoets_2018 >=362 &
wpouitslageindtoets_2018 <=370
	replace test_rec_2018 = 12 if wpocodeeindtoets_2018 == 14 & wpouitslageindtoets_2018 >=371 &
wpouitslageindtoets_2018 <=391
	replace test_rec_2018 = 1 if wpocodeeindtoets_2018 == 16 & wpouitslageindtoets_2018 >=300 &
wpouitslageindtoets_2018 <=306
	replace test_rec_2018 = 3 if wpocodeeindtoets_2018 == 16 & wpouitslageindtoets_2018 >=307 &
wpouitslageindtoets_2018 <=331
	replace test_rec_2018 = 5 if wpocodeeindtoets_2018 == 16 & wpouitslageindtoets_2018 >=332 &
wpouitslageindtoets_2018 <=367
	replace test_rec_2018 = 7 if wpocodeeindtoets_2018 == 16 & wpouitslageindtoets_2018 >=368 &
wpouitslageindtoets_2018 <=412
	replace test_rec_2018 = 11 if wpocodeeindtoets_2018 == 16 & wpouitslageindtoets_2018 >=413 &
wpouitslageindtoets_2018 <=460
	replace test_rec_2018 = 12 if wpocodeeindtoets_2018 == 16 & wpouitslageindtoets_2018 >=461 &
wpouitslageindtoets_2018 <=500

	* 2019.
	* Geen eindtoets.
	generate test_rec_2019 = .

	* 2020.
	generate test_rec_2020 = .
	replace test_rec_2020 = 1 if wpocodeeindtoets_2020 == 11 & wpouitslageindtoets_2020 <=504
	replace test_rec_2020 = 3 if wpocodeeindtoets_2020 == 11 & wpouitslageindtoets_2020 >=505 &
wpouitslageindtoets_2020 <=524
	replace test_rec_2020 = 5 if wpocodeeindtoets_2020 == 11 & wpouitslageindtoets_2020 >=525 &
wpouitslageindtoets_2020 <=532
	replace test_rec_2020 = 7 if wpocodeeindtoets_2020 == 11 & wpouitslageindtoets_2020 >=533 &
wpouitslageindtoets_2020 <=539
	replace test_rec_2020 = 11 if wpocodeeindtoets_2020 == 11 & wpouitslageindtoets_2020 >=540 &
wpouitslageindtoets_2020 <=544
	replace test_rec_2020 = 12 if wpocodeeindtoets_2020 == 11 & wpouitslageindtoets_2020 >=545
	replace test_rec_2020 = 1 if wpocodeeindtoets_2020 == 12 & wpouitslageindtoets_2020 <=158
	replace test_rec_2020 = 3 if wpocodeeindtoets_2020 == 12 & wpouitslageindtoets_2020 >=159 &
wpouitslageindtoets_2020 <=182
	replace test_rec_2020 = 5 if wpocodeeindtoets_2020 == 12 & wpouitslageindtoets_2020 >=183 &
wpouitslageindtoets_2020 <=202
	replace test_rec_2020 = 7 if wpocodeeindtoets_2020 == 12 & wpouitslageindtoets_2020 >=203 &
wpouitslageindtoets_2020 <=219
	replace test_rec_2020 = 11 if wpocodeeindtoets_2020 == 12 & wpouitslageindtoets_2020 >=220 &
wpouitslageindtoets_2020 <=232
	replace test_rec_2020 = 12 if wpocodeeindtoets_2020 == 12 & wpouitslageindtoets_2020 >=233
	replace test_rec_2020 = 1 if wpocodeeindtoets_2020 == 13 & wpouitslageindtoets_2020 <=51
	replace test_rec_2020 = 3 if wpocodeeindtoets_2020 == 13 & wpouitslageindtoets_2020 >=52 &
wpouitslageindtoets_2020 <=68
	replace test_rec_2020 = 5 if wpocodeeindtoets_2020 == 13 & wpouitslageindtoets_2020 >=69 &
wpouitslageindtoets_2020 <=76
	replace test_rec_2020 = 7 if wpocodeeindtoets_2020 == 13 & wpouitslageindtoets_2020 >=77 &
wpouitslageindtoets_2020 <=84
	replace test_rec_2020 = 11 if wpocodeeindtoets_2020 == 13 & wpouitslageindtoets_2020 >=85 &
wpouitslageindtoets_2020 <=91
	replace test_rec_2020 = 12 if wpocodeeindtoets_2020 == 13 & wpouitslageindtoets_2020 >=92
	replace test_rec_2020 = 1 if wpocodeeindtoets_2020 == 14 & wpouitslageindtoets_2020 <=337
	replace test_rec_2020 = 3 if wpocodeeindtoets_2020 == 14 & wpouitslageindtoets_2020 >=338 &
wpouitslageindtoets_2020 <=350
	replace test_rec_2020 = 5 if wpocodeeindtoets_2020 == 14 & wpouitslageindtoets_2020 >=351 &
wpouitslageindtoets_2020 <=356
	replace test_rec_2020 = 7 if wpocodeeindtoets_2020 == 14 & wpouitslageindtoets_2020 >=357 &
wpouitslageindtoets_2020 <=363
	replace test_rec_2020 = 11 if wpocodeeindtoets_2020 == 14 & wpouitslageindtoets_2020 >=364 &
wpouitslageindtoets_2020 <=369
	replace test_rec_2020 = 12 if wpocodeeindtoets_2020 == 14 & wpouitslageindtoets_2020 >=370
```

```
	replace test_rec_2020 = 1 if wpocodeeindtoets_2020 == 16 & wpouitslageindtoets_2020 <=305
	replace test_rec_2020 = 3 if wpocodeeindtoets_2020 == 16 & wpouitslageindtoets_2020 >=306 &
wpouitslageindtoets_2020 <=326
	replace test_rec_2020 = 5 if wpocodeeindtoets_2020 == 16 & wpouitslageindtoets_2020 >=327 &
wpouitslageindtoets_2020 <=370
	replace test_rec_2020 = 7 if wpocodeeindtoets_2020 == 16 & wpouitslageindtoets_2020 >=371 &
wpouitslageindtoets_2020 <=427
	replace test_rec_2020 = 11 if wpocodeeindtoets_2020 == 16 & wpouitslageindtoets_2020 >=428 &
wpouitslageindtoets_2020 <=463
	replace test_rec_2020 = 12 if wpocodeeindtoets_2020 == 16 & wpouitslageindtoets_2020 >=464

	label define test_rec_lab 0 "pro" 1 "pro/vmbo bb" 2 "vmbo bb" 3 "vmbo bb/kb" 4 "vmbo kb" 5 "vmbo kb/tl"
6 "vmbo gl/tl" 7 "vmbo gltl/havo" 8 "vmbo tl" 9 "vmbo tl/havo" 10 "havo" 11 "havo/vwo" 12 "vwo"
	label values test_rec_* test_rec_lab
	fre test_rec_*

**** Test recommendation and teacher recommendation
** Comparing test recommendation with teacher recommendation

	forvalues i = 2010(1)2020 {

	generate rec_test_teacher_`i' = .
	replace rec_test_teacher_`i' = 2 if test_rec_`i' == 0 & (recommendation_`i' == 1)
	replace rec_test_teacher_`i' = 1 if test_rec_`i' == 0 & (recommendation_`i' >= 2 & recommendation_`i' <=
13)

	replace rec_test_teacher_`i' = 3 if test_rec_`i' == 1 & (recommendation_`i' == 1)
	replace rec_test_teacher_`i' = 1 if test_rec_`i' == 1 & (recommendation_`i' >= 2 & recommendation_`i' <=
13)

	replace rec_test_teacher_`i' = 3 if test_rec_`i' == 2 & (recommendation_`i' == 1)
	replace rec_test_teacher_`i' = 2 if test_rec_`i' == 2 & (recommendation_`i' == 2)
	replace rec_test_teacher_`i' = 1 if test_rec_`i' == 2 & (recommendation_`i' >= 3 & recommendation_`i' <=
13)

	replace rec_test_teacher_`i' = 3 if test_rec_`i' == 3 & (recommendation_`i' == 1 | recommendation_`i' ==
2)
	replace rec_test_teacher_`i' = 2 if test_rec_`i' == 3 & (recommendation_`i' == 3)
	replace rec_test_teacher_`i' = 1 if test_rec_`i' == 3 & (recommendation_`i' >= 4 & recommendation_`i' <=
13)

	replace rec_test_teacher_`i' = 3 if test_rec_`i' == 4 & (recommendation_`i' >= 1 & recommendation_`i' <=
3)
	replace rec_test_teacher_`i' = 2 if test_rec_`i' == 4 & (recommendation_`i' >= 4 & recommendation_`i' <=
5)
	replace rec_test_teacher_`i' = 1 if test_rec_`i' == 4 & (recommendation_`i' >= 6 & recommendation_`i' <=
13)

	replace rec_test_teacher_`i' = 3 if test_rec_`i' == 5 & (recommendation_`i' >= 1 & recommendation_`i' <=
5)
	replace rec_test_teacher_`i' = 2 if test_rec_`i' == 5 & (recommendation_`i' == 6)
	replace rec_test_teacher_`i' = 1 if test_rec_`i' == 5 & (recommendation_`i' >= 7 & recommendation_`i' <=
13)

	replace rec_test_teacher_`i' = 3 if (test_rec_`i' == 6 | test_rec_`i' == 8) & (recommendation_`i' >= 1 &
recommendation_`i' <= 7)
	replace rec_test_teacher_`i' = 2 if (test_rec_`i' == 6 | test_rec_`i' == 8) & (recommendation_`i' == 8)
	replace rec_test_teacher_`i' = 1 if (test_rec_`i' == 6 | test_rec_`i' == 8) & (recommendation_`i' >= 9 &
recommendation_`i' <= 13)

	replace rec_test_teacher_`i' = 3 if (test_rec_`i' == 7 | test_rec_`i' == 9) & (recommendation_`i' >= 1 &
recommendation_`i' <= 8)
	replace rec_test_teacher_`i' = 2 if (test_rec_`i' == 7 | test_rec_`i' == 9) & (recommendation_`i' == 9)
	replace rec_test_teacher_`i' = 1 if (test_rec_`i' == 7 | test_rec_`i' == 9) & (recommendation_`i' >= 10
& recommendation_`i' <= 13)

	replace rec_test_teacher_`i' = 3 if test_rec_`i' == 10 & (recommendation_`i' >= 1 & recommendation_`i'
<= 9)
	replace rec_test_teacher_`i' = 2 if test_rec_`i' == 10 & (recommendation_`i' >= 10 & recommendation_`i'
<= 11)
	replace rec_test_teacher_`i' = 1 if test_rec_`i' == 10 & (recommendation_`i' == 12 | recommendation_`i'
== 13)

	replace rec_test_teacher_`i' = 3 if test_rec_`i' == 11 & (recommendation_`i' >= 1 & recommendation_`i'
<= 11)
	replace rec_test_teacher_`i' = 2 if test_rec_`i' == 11 & (recommendation_`i' == 12)
	replace rec_test_teacher_`i' = 1 if test_rec_`i' == 11 & (recommendation_`i' == 13)
```

```
        replace rec_test_teacher_`i' = 3 if test_rec_`i' == 12 & (recommendation_`i' >= 1 & recommendation_`i'
<= 12)
        replace rec_test_teacher_`i' = 2 if test_rec_`i' == 12 & (recommendation_`i' == 13)
        }

        egen rec_test_teacher = rowlast(rec_test_teacher_*)

        label define rec_test_teacher_lab 1 "eindtoets onder schooladvies" 2 "eindtoets gelijk aan schooladvies"
3 "eindtoets boven schooladvies"
        label values rec_test_teacher_* rec_test_teacher rec_test_teacher_lab

        fre rec_test_teacher_* rec_test_teacher

****** Percentage reconsider & Percentage revised
        fre rec_test_teacher_2015 rec_test_teacher_2016 rec_test_teacher_2017 rec_test_teacher_2018
rec_test_teacher_2019 rec_test_teacher_2020

        forvalues i = 2010(1)2020 {
            capture {
        generate p_reconsider_rec_`i' = 1 if rec_test_teacher_`i' == 3
        replace p_reconsider_rec_`i' = 0 if rec_test_teacher_`i' == 1 | rec_test_teacher_`i' == 2

        fre p_reconsider_rec_`i'
               }
        }

        generate p_rcnsdr_rec_f = .
        forvalues i = 2010(1)2020 {
            capture {
        replace p_rcnsdr_rec_f = p_reconsider_rec_`i' if test_year_first == `i'
               }
        }

        generate p_rcnsdr_rec_l = .
        forvalues i = 2010(1)2020 {
            capture {
        replace p_rcnsdr_rec_l = p_reconsider_rec_`i' if test_year == `i'
               }
        }

*************************
*** SCHOOL IDENTIFIER
*************************

* schoolid
        forvalues i = 2010(1)2020 {
        egen schoolid_`i' = concat(wpobrin_crypt_`i' wpobrinvest_`i')
        }

* on the basis of observation in grade 6
        generate str schoolid_firstgrade6 = ""
        generate str schoolid_lastgrade6 = ""
        forvalues i = 2010(1)2020 {
        replace schoolid_firstgrade6 = schoolid_`i' if system_year_last1 == `i'
        replace schoolid_lastgrade6 = schoolid_`i' if system_year_last2 == `i'
        }

////////////////////////////////////////////////////////////////////////////////////////////////////////////
///////////
/////////////////////////////////////////////////////// Selection
/////////////////////////////////////////////////////
////////////////////////////////////////////////////////////////////////////////////////////////////////////
///////////

        // SELECTIONS ARE BASED ON THREE CRITERIA:
        // 1. Students belonging to the pseudo-entry cohorts are all present given the underlying exit cohort
data.
        // 2. Students in the pseudo-entry cohort having a test score
        // 3. Students do maximally retain or accelerate one year.
        // 4. On the school unit, schools should have more than 10 students.

        // All the above criteria can be calculated based in being for the first time in grade 6 or being for
the second time in grade 6.


        // Ad 1.
```

```
	tab pseudo_entrance_cohort1 // given this table, we would select pseudo-entry cohorts from 2004/2005 to 2012-2013

	// Ad 2.
	tab pseudo_entrance_cohort1, summarize(testscore_std_first)  // based on this table, we would select pseudo-entry cohorts from 2004/2005 to 2010/2011

	// Ad 3.
	tab pseudo_entrance_cohort1 system_year_last1
	tab pseudo_entrance_cohort1 system_year_last2

		// The selection happens on the basis of the first OBSERVED year in grade 6 (system_year_last1)
		generate temp = system_year_last1 - pseudo_entrance_cohort
		tab pseudo_entrance_cohort1 system_year_last1, summarize(temp) means

		generate keep_cases_first = .
		replace keep_cases_first = 1 if temp == 8 | temp == 7 | temp == 6
		fre keep_cases_first

		tab pseudo_entrance_cohort1 system_year_last1, summarize(keep_cases_first) means
		tab pseudo_entrance_cohort1 system_year_last1
		tab pseudo_entrance_cohort1 system_year_last1 if keep_cases_first == 1

		// The selection happens on the basis of the last OBSERVED year in grade 6 (system_year_last2)
		generate temp2 = system_year_last2 - pseudo_entrance_cohort
		tab pseudo_entrance_cohort1 system_year_last2, summarize(temp2) means

		generate keep_cases_last = .
		replace keep_cases_last = 1 if temp2 == 8 | temp2 == 7 | temp2 == 6
		fre keep_cases_last

		tab pseudo_entrance_cohort1 system_year_last2, summarize(keep_cases_last) means
		tab pseudo_entrance_cohort1 system_year_last2
		tab pseudo_entrance_cohort1 system_year_last2 if keep_cases_last == 1

	// Ad 4.
	generate n_temp = 1

	** On the basis of the registy of grade
	generate above10_grade6first = .
	generate above10_grade6last = .
	forvalues i = 2002(1)2015 {
		bys schoolid_firstgrade6: egen n_sch_grade6first_`i' = total(n_temp) if pseudo_entrance_cohort == `i' & keep_cases_first == 1
		bys schoolid_lastgrade6: egen n_sch_grade6last_`i' = total(n_temp) if pseudo_entrance_cohort == `i' & keep_cases_last == 1
		generate above10_grade6first_`i' = 1 if n_sch_grade6first_`i' > 10 & pseudo_entrance_cohort == `i' & keep_cases_first == 1
		generate above10_grade6last_`i' = 1 if n_sch_grade6last_`i' > 10 & pseudo_entrance_cohort == `i' & keep_cases_last == 1
		replace above10_grade6first = above10_grade6first_`i' if above10_grade6first_`i'  == 1
		replace above10_grade6last = above10_grade6last_`i' if above10_grade6last_`i' == 1
		}

	// SELECTIONS

	keep if pseudo_entrance_cohort >= 2004 & pseudo_entrance_cohort <= 2010

	// The other selections need to be done when analysing, as it depends on the year of the test. A counter on the basis of the aggregate will be made in the next do-file.

	tab keep_cases_first keep_cases_last, m
	tab above10_testfirst above10_testlast, m

	// variable selections
	keep pseudo_entrance_cohort ///
	schoolid_firstgrade6 schoolid_testfirst schoolid_recfirst p_rcnsdr_rec_f years_1 years_2 years_3 testscore_std_first ladder_teacherrec_first above10_testfirst keep_cases_first ///
	schoolid_lastgrade6 schoolid_testlast schoolid_reclast p_rcnsdr_rec_l years2_1 years2_2 years2_3 testscore_std ladder_teacherrec above10_testlast keep_cases_last

	save "@LOCATION\Primary Education\PO Pseudo-cohort stacked.dta", replace
```

Do-file 3: Aggregate to schools

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* 2. Aggregate to schools
* Purpose: aggregate to school level and cohort level

****************************************

*******************************************************************************
* AGGREGATE
*******************************************************************************

use "@LOCATION\Primary Education\PO Pseudo-cohort stacked.dta", clear

***************
* Collapse for first time in grade 6
***************

* School
forvalues i = 2004(1)2010 {
preserve
	keep if pseudo_entrance_cohort == `i'
	collapse	(mean) p_rcnsdr_rec_f years_1 years_2 years_3 testscore_std_first ladder_teacherrec_first,
by(schoolid_firstgrade6)
	generate type_stat = "mean"
	save "@LOCATION\Primary Education\school_mean_first_`i'.dta", replace
restore
preserve
	keep if pseudo_entrance_cohort == `i'
	collapse	(count) p_rcnsdr_rec_f years_1 years_2 years_3 testscore_std_first ladder_teacherrec_first,
by(schoolid_firstgrade6)
	generate type_stat = "count"
	save "@LOCATION\Primary Education\school_count_first_`i'.dta", replace
restore
preserve
	keep if pseudo_entrance_cohort == `i'
	collapse	(sum) p_rcnsdr_rec_f years_1 years_2 years_3 testscore_std_first ladder_teacherrec_first,
by(schoolid_firstgrade6)
	generate type_stat = "sum"
	save "@LOCATION\Primary Education\school_sum_first_`i'.dta", replace
restore
}

* Cohort
forvalues i = 2004(1)2010 {
preserve
	keep if pseudo_entrance_cohort == `i'
	collapse	(mean) p_rcnsdr_rec_f years_1 years_2 years_3 testscore_std_first ladder_teacherrec_first
	generate wpobrin_crypt_`i' = "cohort `i'"
	generate type_stat = "mean"
	save "@LOCATION\Primary Education\cohort_mean_first_`i'.dta", replace
restore

preserve
	keep if pseudo_entrance_cohort == `i'
	collapse	(count) p_rcnsdr_rec_f years_1 years_2 years_3 testscore_std_first ladder_teacherrec_first
	generate wpobrin_crypt_`i' = "cohort `i'"
	generate type_stat = "count"
	save "@LOCATION\Primary Education\cohort_count_first_`i'.dta", replace
restore

preserve
	keep if pseudo_entrance_cohort == `i'
	collapse	(sum) p_rcnsdr_rec_f years_1 years_2 years_3 testscore_std_first ladder_teacherrec_first
	generate wpobrin_crypt_`i' = "cohort `i'"
	generate type_stat = "sum"
	save "@LOCATION\Primary Education\cohort_sum_first_`i'.dta", replace
restore
}

***************
* Collapse for last time in grade 6
***************
* School
```

```
forvalues i = 2004(1)2010 {
preserve
        rename testscore_std testscore_std_last
        rename ladder_teacherrec ladder_teacherrec_last
        keep if pseudo_entrance_cohort == `i'
        collapse       (mean) p_rcnsdr_rec_l years2_1 years2_2 years2_3 testscore_std_last ladder_teacherrec_last,
by(schoolid_lastgrade6)
        generate type_stat = "mean"
        save "@LOCATION\Primary Education\school_mean_last_`i'.dta", replace
restore
preserve
        rename testscore_std testscore_std_last
        rename ladder_teacherrec ladder_teacherrec_last
        keep if pseudo_entrance_cohort == `i'
        collapse       (count)     p_rcnsdr_rec_l     years2_1     years2_2     years2_3     testscore_std_last
ladder_teacherrec_last, by(schoolid_lastgrade6)
        generate type_stat = "count"
        save "@LOCATION\Primary Education\school_count_last_`i'.dta", replace
restore
preserve
        rename testscore_std testscore_std_last
        rename ladder_teacherrec ladder_teacherrec_last
        keep if pseudo_entrance_cohort == `i'
        collapse       (sum) p_rcnsdr_rec_l years2_1 years2_2 years2_3 testscore_std_last ladder_teacherrec_last,
by(schoolid_lastgrade6)
        generate type_stat = "sum"
        save "@LOCATION\Primary Education\school_sum_last_`i'.dta", replace
restore
}
* Cohort
forvalues i = 2004(1)2010 {
preserve
        rename testscore_std testscore_std_last
        rename ladder_teacherrec ladder_teacherrec_last
        keep if pseudo_entrance_cohort == `i'
        collapse       (mean) p_rcnsdr_rec_l years2_1 years2_2 years2_3 testscore_std_last ladder_teacherrec_last
        generate wpobrin_crypt_`i' = "cohort `i'"
        generate type_stat = "mean"
        save "@LOCATION\Primary Education\cohort_mean_last_`i'.dta", replace
restore

preserve
        rename testscore_std testscore_std_last
        rename ladder_teacherrec ladder_teacherrec_last
        keep if pseudo_entrance_cohort == `i'
        collapse       (count) p_rcnsdr_rec_l years2_1 years2_2 years2_3 testscore_std_last ladder_teacherrec_last
        generate wpobrin_crypt_`i' = "cohort `i'"
        generate type_stat = "count"
        save "@LOCATION\Primary Education\cohort_count_last_`i'.dta", replace
restore

preserve
        rename testscore_std testscore_std_last
        rename ladder_teacherrec ladder_teacherrec_last
        keep if pseudo_entrance_cohort == `i'
        collapse       (sum) p_rcnsdr_rec_l years2_1 years2_2 years2_3 testscore_std_last ladder_teacherrec_last
        generate wpobrin_crypt_`i' = "cohort `i'"
        generate type_stat = "sum"
        save "@LOCATION\Primary Education\cohort_sum_last_`i'.dta", replace
restore
}


*************************
*** PSEUDO-ENTRY COHORTS
*** First time in grade 6
*************************


***** Merge school indicators
*****************************
* mean
use "@LOCATION\Primary Education\school_mean_first_2004.dta", clear
        generate cohort = 2004

forvalues i = 2005(1)2010 {
        preserve
```

```
		use "@LOCATION\Primary Education\school_mean_first_`i'.dta", clear

		generate cohort = `i'
		save "@LOCATION\Primary Education\school_mean_first_v2_`i'.dta", replace
	restore

	append using "@LOCATION\Primary Education\school_mean_first_v2_`i'.dta"

	erase "@LOCATION\Primary Education\school_mean_first_v2_`i'.dta"
}

drop if schoolid_firstgrade6 == ""
order schoolid_firstgrade6  cohort type_stat
save "@LOCATION\Primary Education\Pseudo-entry school mean first 2004-2010.dta", replace


* count
use "@LOCATION\Primary Education\school_count_first_2004.dta", clear

	generate cohort = 2004

forvalues i = 2005(1)2010 {
	preserve
		use "@LOCATION\Primary Education\school_count_first_`i'.dta", clear
		generate cohort = `i'
		save "@LOCATION\Primary Education\school_count_first_v2_`i'.dta", replace
	restore

	append using "@LOCATION\Primary Education\school_count_first_v2_`i'.dta"

	erase "@LOCATION\Primary Education\school_count_first_v2_`i'.dta"
}

drop if schoolid_firstgrade6 == ""
order schoolid_firstgrade6  cohort type_stat
save "@LOCATION\Primary Education\Pseudo-entry school count first 2004-2010.dta", replace

* sum
use "@LOCATION\Primary Education\school_sum_first_2004.dta", clear

	generate cohort = 2004

forvalues i = 2005(1)2010 {
	preserve
		use "@LOCATION\Primary Education\school_sum_first_`i'.dta", clear
		generate cohort = `i'
		save "@LOCATION\Primary Education\school_sum_first_v2_`i'.dta", replace
	restore

	append using "@LOCATION\Primary Education\school_sum_first_v2_`i'.dta"

	erase "@LOCATION\Primary Education\school_sum_first_v2_`i'.dta"
}

drop if schoolid_firstgrade6 == ""
order schoolid_firstgrade6  cohort type_stat
save "@LOCATION\Primary Education\Pseudo-entry school sum first 2004-2010.dta", replace

*** All stats

use "@LOCATION\Primary Education\Pseudo-entry school mean first 2004-2010.dta", clear
append using "@LOCATION\Primary Education\Pseudo-entry school count first 2004-2010.dta"
append using "@LOCATION\Primary Education\Pseudo-entry school sum first 2004-2010.dta"
save "@LOCATION\Primary Education\Pseudo-entry school first 2004-2010.dta", replace


***** Merge cohort indicators
*****************************
* mean
use "@LOCATION\Primary Education\cohort_mean_first_2004.dta", clear

	rename wpobrin_crypt_2004 schoolid_firstgrade6
	generate cohort = 2004

forvalues i = 2005(1)2010 {
	preserve
		use "@LOCATION\Primary Education\cohort_mean_first_`i'.dta", clear
```

```
		rename wpobrin_crypt_`i' schoolid_firstgrade6
		generate cohort = `i'
		save "@LOCATION\Primary Education\cohort_mean_first_v2_`i'.dta", replace
	restore

	append using "@LOCATION\Primary Education\cohort_mean_first_v2_`i'.dta"

	erase "@LOCATION\Primary Education\cohort_mean_first_v2_`i'.dta"
}

drop if schoolid_firstgrade6 == ""
order schoolid_firstgrade6  cohort type_stat
save "@LOCATION\Primary Education\Pseudo-entry cohort mean first 2004-2010.dta", replace


* count
use "@LOCATION\Primary Education\cohort_count_first_2004.dta", clear

	rename wpobrin_crypt_2004 schoolid_firstgrade6
	generate cohort = 2004

forvalues i = 2005(1)2010 {
	preserve
		use "@LOCATION\Primary Education\cohort_count_first_`i'.dta", clear

		rename wpobrin_crypt_`i' schoolid_firstgrade6
		generate cohort = `i'
		save "@LOCATION\Primary Education\cohort_count_first_v2_`i'.dta", replace
	restore

	append using "@LOCATION\Primary Education\cohort_count_first_v2_`i'.dta"

	erase "@LOCATION\Primary Education\cohort_count_first_v2_`i'.dta"
}

drop if schoolid_firstgrade6 == ""
order schoolid_firstgrade6  cohort type_stat
save "@LOCATION\Primary Education\Pseudo-entry cohort count first 2004-2010.dta", replace

* sum
use "@LOCATION\Primary Education\cohort_sum_first_2004.dta", clear

	rename wpobrin_crypt_2004 schoolid_firstgrade6
	generate cohort = 2004

forvalues i = 2005(1)2010 {
	preserve
		use "@LOCATION\Primary Education\cohort_sum_first_`i'.dta", clear
		rename wpobrin_crypt_`i' schoolid_firstgrade6
		generate cohort = `i'
		save "@LOCATION\Primary Education\cohort_sum_first_v2_`i'.dta", replace
	restore

	append using "@LOCATION\Primary Education\cohort_sum_first_v2_`i'.dta"

	erase "@LOCATION\Primary Education\cohort_sum_first_v2_`i'.dta"
}

drop if schoolid_firstgrade6 == ""
order schoolid_firstgrade6  cohort type_stat
save "@LOCATION\Primary Education\Pseudo-entry cohort sum first 2004-2010.dta", replace


*** All stats

use "@LOCATION\Primary Education\Pseudo-entry cohort mean first 2004-2010.dta", clear
append using "@LOCATION\Primary Education\Pseudo-entry cohort count first 2004-2010.dta"
append using "@LOCATION\Primary Education\Pseudo-entry cohort sum first 2004-2010.dta"
save "@LOCATION\Primary Education\Pseudo-entry cohort first 2004-2010.dta", replace

**** School level and cohort level merge
*****************************************
use "@LOCATION\Primary Education\Pseudo-entry school first 2004-2010.dta", clear
append using "@LOCATION\Primary Education\Pseudo-entry cohort first 2004-2010.dta"
save "@LOCATION\Primary Education\Pseudo-entry first 2004-2010.dta", replace
```

```
************************
*** PSEUDO-ENTRY COHORTS
*** Last time in grade 6
************************

***** Merge school indicators
*****************************
* mean
use "@LOCATION\Primary Education\school_mean_last_2004.dta", clear
	generate cohort = 2004

forvalues i = 2005(1)2010 {
	preserve
		use "@LOCATION\Primary Education\school_mean_last_`i'.dta", clear

		generate cohort = `i'
		save "@LOCATION\Primary Education\school_mean_v2_last_`i'.dta", replace
	restore

	append using "@LOCATION\Primary Education\school_mean_v2_last_`i'.dta"

	erase "@LOCATION\Primary Education\school_mean_v2_last_`i'.dta"
}

drop if schoolid_lastgrade6 == ""
order schoolid_lastgrade6  cohort type_stat
save "@LOCATION\Primary Education\Pseudo-entry school mean last 2004-2010.dta", replace


* count
use "@LOCATION\Primary Education\school_count_last_2004.dta", clear

	generate cohort = 2004

forvalues i = 2005(1)2010 {
	preserve
		use "@LOCATION\Primary Education\school_count_last_`i'.dta", clear
		generate cohort = `i'
		save "@LOCATION\Primary Education\school_count_v2_last_`i'.dta", replace
	restore

	append using "@LOCATION\Primary Education\school_count_v2_last_`i'.dta"

	erase "@LOCATION\Primary Education\school_count_v2_last_`i'.dta"
}

drop if schoolid_lastgrade6 == ""
order schoolid_lastgrade6  cohort type_stat
save "@LOCATION\Primary Education\Pseudo-entry school count last 2004-2010.dta", replace

* sum
use "@LOCATION\Primary Education\school_sum_last_2004.dta", clear

	generate cohort = 2004

forvalues i = 2005(1)2010 {
	preserve
		use "@LOCATION\Primary Education\school_sum_last_`i'.dta", clear
		generate cohort = `i'
		save "@LOCATION\Primary Education\school_sum_v2_last_`i'.dta", replace
	restore

	append using "@LOCATION\Primary Education\school_sum_v2_last_`i'.dta"

	erase "@LOCATION\Primary Education\school_sum_v2_last_`i'.dta"
}

drop if schoolid_lastgrade6 == ""
order schoolid_lastgrade6  cohort type_stat
save "@LOCATION\Primary Education\Pseudo-entry school sum last 2004-2010.dta", replace

*** All stats

use "@LOCATION\Primary Education\Pseudo-entry school mean last 2004-2010.dta", clear
append using "@LOCATION\Primary Education\Pseudo-entry school count last 2004-2010.dta"
append using "@LOCATION\Primary Education\Pseudo-entry school sum last 2004-2010.dta"
save "@LOCATION\Primary Education\Pseudo-entry school last 2004-2010.dta", replace
```

```
***** Merge cohort indicators
*****************************
* mean
use "@LOCATION\Primary Education\cohort_mean_last_2004.dta", clear

        rename wpobrin_crypt_2004 schoolid_lastgrade6
        generate cohort = 2004

forvalues i = 2005(1)2010 {
        preserve
                use "@LOCATION\Primary Education\cohort_mean_last_`i'.dta", clear

                rename wpobrin_crypt_`i' schoolid_lastgrade6
                generate cohort = `i'
                save "@LOCATION\Primary Education\cohort_mean_v2_last_`i'.dta", replace
        restore

        append using "@LOCATION\Primary Education\cohort_mean_v2_last_`i'.dta"

        erase "@LOCATION\Primary Education\cohort_mean_v2_last_`i'.dta"
}

drop if schoolid_lastgrade6 == ""
order schoolid_lastgrade6  cohort type_stat
save "@LOCATION\Primary Education\Pseudo-entry cohort mean last 2004-2010.dta", replace


* count
use "@LOCATION\Primary Education\cohort_count_last_2004.dta", clear

        rename wpobrin_crypt_2004 schoolid_lastgrade6
        generate cohort = 2004

forvalues i = 2005(1)2010 {
        preserve
                use "@LOCATION\Primary Education\cohort_count_last_`i'.dta", clear

                rename wpobrin_crypt_`i' schoolid_lastgrade6
                generate cohort = `i'
                save "@LOCATION\Primary Education\cohort_count_v2_last_`i'.dta", replace
        restore

        append using "@LOCATION\Primary Education\cohort_count_v2_last_`i'.dta"

        erase "@LOCATION\Primary Education\cohort_count_v2_last_`i'.dta"
}

drop if schoolid_lastgrade6 == ""
order schoolid_lastgrade6  cohort type_stat
save "@LOCATION\Primary Education\Pseudo-entry cohort count last 2004-2010.dta", replace

* sum
use "@LOCATION\Primary Education\cohort_sum_last_2004.dta", clear

        rename wpobrin_crypt_2004 schoolid_lastgrade6
        generate cohort = 2004

forvalues i = 2005(1)2010 {
        preserve
                use "@LOCATION\Primary Education\cohort_sum_last_`i'.dta", clear
                rename wpobrin_crypt_`i' schoolid_lastgrade6
                generate cohort = `i'
                save "@LOCATION\Primary Education\cohort_sum_v2_last_`i'.dta", replace
        restore

        append using "@LOCATION\Primary Education\cohort_sum_v2_last_`i'.dta"

        erase "@LOCATION\Primary Education\cohort_sum_v2_last_`i'.dta"
}

drop if schoolid_lastgrade6 == ""
order schoolid_lastgrade6  cohort type_stat
save "@LOCATION\Primary Education\Pseudo-entry cohort sum last 2004-2010.dta", replace
```

```
*** All stats

use "@LOCATION\Primary Education\Pseudo-entry cohort mean last 2004-2010.dta", clear
append using "@LOCATION\Primary Education\Pseudo-entry cohort count last 2004-2010.dta"
append using "@LOCATION\Primary Education\Pseudo-entry cohort sum last 2004-2010.dta"
save "@LOCATION\Primary Education\Pseudo-entry cohort last 2004-2010.dta", replace

**** School level and cohort level merge
**************************************
use "@LOCATION\Primary Education\Pseudo-entry school last 2004-2010.dta", clear
append using "@LOCATION\Primary Education\Pseudo-entry cohort last 2004-2010.dta"
save "@LOCATION\Primary Education\Pseudo-entry last 2004-2010.dta", replace
```

Do-file 4: School level data

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* 4. School level data
* Purpose: To create school level tables
****************************************

use "@LOCATION\Primary Education\Pseudo-entry school first 2004-2010.dta", clear

reshape wide p_rcnsdr_rec_f years_1 years_2 years_3 testscore_std_first ladder_teacherrec_first,
i(schoolid_firstgrade6 cohort) j(type_stat) string

drop *sum
drop years_2count years_3count

* rename
rename p_rcnsdr_rec_fcount test_rec_n
rename p_rcnsdr_rec_fmean test_rec_m
rename years_1count accnomret_n
rename years_1mean acc_m
rename years_2mean nom_m
rename years_3mean ret_m
rename testscore_std_firstcount testscore_std_n
rename testscore_std_firstmean testscore_std_m
rename ladder_teacherrec_firstcount rec_ladder_n
rename ladder_teacherrec_firstmean rec_ladder_m

////// Outliers

*** Standardising (z-transformed)
foreach var of varlist test_rec_m acc_m nom_m ret_m testscore_std_m rec_ladder_m {
        generate z_`var' = .
        forvalues i = 2004(1)2010 {
        capture noisily {
        generate `var'_`i' = `var' if cohort == `i'
        egen z_`var'_`i' = std(`var'_`i')
        replace z_`var' = z_`var'_`i' if cohort == `i'

        }
        }
}

*** Trimmed and deleted
foreach var of varlist test_rec_m acc_m nom_m ret_m testscore_std_m rec_ladder_m {
        generate `var'_del = .s

        forvalues i = 2004(1)2010 {
        capture noisily {

        // normal score and trimmed values set missing
        replace `var'_del =  `var'_`i' if cohort == `i' & (z_`var'_`i' >= -4 & z_`var'_`i' <= 4)
        replace `var'_del = .s if cohort == `i' & (z_`var'_`i' > -100 & z_`var'_`i' <= -4)
        replace `var'_del = .s if cohort == `i' & (z_`var'_`i' < 100 & z_`var'_`i' >= 4)

        drop `var'_`i' z_`var'_`i'
        }
        }
}

*** ordening & cleaning variables
drop test_rec_m acc_m nom_m ret_m testscore_std_m rec_ladder_m

foreach var in test_rec acc nom ret testscore_std rec_ladder {
rename `var'_m_del `var'_m
rename z_`var'_m `var'_z
}

order schoolid_firstgrade6 cohort test_rec_* accnomret_* acc_* nom_* ret_* testscore_std_* rec_ladder_*

* variable labels
label variable test_rec_n "N test higher than recommendation"
label variable test_rec_m "% test higher than recommendation"
label variable test_rec_z "Std % test higher than recommendation"
```

```
label variable accnomret_n "N acceleration, nominal duration and retention"
label variable acc_m "% acceleration"
label variable acc_z "Std % acceleration"
label variable nom_m "% nominal duration"
label variable nom_z "Std % nominal duration"
label variable ret_m "% retention"
label variable ret_z "Std % retention"
label variable testscore_std_n "N test score"
label variable testscore_std_m "Average test score"
label variable testscore_std_z "Std average test score"
label variable rec_ladder_n "N grade ladder score teacher recommendation"
label variable rec_ladder_m "Average grade ladder score teacher recommendation"
label variable rec_ladder_z "Std average grade ladder score teacher recommendation"


* select on N

foreach var in test_rec testscore_std rec_ladder {
replace `var'_m = .n if `var'_n >= 0 & `var'_n < 10
replace `var'_z = .n if `var'_n >= 0 & `var'_n < 10
replace `var'_n = .n if `var'_n >= 0 & `var'_n < 10
}

foreach var in acc nom ret {
replace `var'_m = .n if accnomret_n > 0 & accnomret_n < 10
replace `var'_z = .n if accnomret_n > 0 & accnomret_n < 10
}
replace accnomret_n = .n if accnomret_n > 0 & accnomret_n < 10

* formatting numbers
format *_m *_z %9.3f
format *_n %9.0f

save "@LOCATION\Primary Education\Primary Ecuducation Indicators Data (First).dta", replace
```

Do-file 1. Creating cohort structure

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* Purpose: save .sav files as .dta and merge them into cohort files.
****************************************

// Because multiple cohorts of students are analysed, it would be quite laborous to first make those all in SPSS
via the tool. So now it happens in this syntax.

*** Primary school exit cohort
// Up to 2014 a different the revised recommendation was not included. So two seperate syntaxes.

* Up and including 2014
clear
foreach year in DEF2010 DEF2011 DEF2012 DEF2013 DEF2014 {

import spss using "G:\Maatwerk\NCOV4\NCOPO\NCOPO`year'.SAV", clear
renvars _all, lower
renvars wpoadviesvo wpocodeeindtoets wpoleerjaar wpouitslageindtoets, map("@" + "_" + substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)
keep     rinpersoons     rinpersoon     onderwijsnr_crypt     wpoadviesvo_`addyear'     wpocodeeindtoets_`addyear'
wpoleerjaar_`addyear' wpouitslageindtoets_`addyear'

generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons
save "@LOCATION\NCOPO_`addyear'.dta", replace
}

* From 2015 onwards
clear
foreach year in DEF2015 DEF2016 DEF2017 DEF2018 DEF2019 VRL2020  {

import spss using "G:\Maatwerk\NCOV4\NCOPO\NCOPO`year'.SAV", clear
renvars _all, lower
renvars   wpoadviesvo   wpoadviesherz   wpocodeeindtoets   wpoleerjaar   wpouitslageindtoets,   map("@"   +   "_"   +
substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)
keep     rinpersoons     rinpersoon     onderwijsnr_crypt     wpoadviesvo_`addyear'     wpoadviesherz_`addyear'
wpocodeeindtoets_`addyear' wpoleerjaar_`addyear' wpouitslageindtoets_`addyear'

generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons
save "@LOCATION\NCOPO_`addyear'.dta", replace
}

*** Secondary education cohort data
clear
foreach year in DEF2007 DEF2008 DEF2009 DEF2010 DEF2011 DEF2012 DEF2013 DEF2014 DEF2015 DEF2016 DEF2017 DEF2018
DEF2019 VRL2020  {

import spss using "G:\Maatwerk\NCOv4\NCOVO\NCOVO`year'.SAV", clear
renvars _all, lower
renvars brin_crypt vobrinvest onderwijssoortvo voleerjaar iltcode examuitslagvo brinexamvo_crypt brinvestexamvo
onderwijssoortvodipl cegem segem cyflystgem, map("@" + "_" + substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)
keep      rinpersoons      rinpersoon      onderwijsnr_crypt      brin_crypt_`addyear'      vobrinvest_`addyear'
onderwijssoortvo_`addyear'         voleerjaar_`addyear'         iltcode_`addyear'         examuitslagvo_`addyear'
brinexamvo_crypt_`addyear'      brinvestexamvo_`addyear'      onderwijssoortvodipl_`addyear'      cegem_`addyear'
segem_`addyear' cyflystgem_`addyear'

generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"
```

```
sort sleutel rinpersoons
save "@LOCATION\NCOVO_`addyear'.dta", replace
}

*** Secondary education school data

clear
foreach year in DEF2007 DEF2008 DEF2009 DEF2010 DEF2011 DEF2012 DEF2013 DEF2014 DEF2015 DEF2016 DEF2017 DEF2018
DEF2019 VRL2020  {

import spss using "G:\Maatwerk\NCOv4\NCOBRINVO\NCOBRINVO`year'.SAV", clear
renvars _all, lower
renvars brin_crypt vobrinvest voaantalbrinbestuur vogembrinvest vostedgembrinvest vodenominatie voschoolgrootte
percapc ///
afdgroottevmbobk afdgroottevmbogt afdgroottehavo afdgroottevwo afdgrootteoverig brinstructuur brinveststructuur,
map("@" + "_" + substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)
keep  rinpersoons  rinpersoon  onderwijsnr_crypt  brin_crypt_`addyear'  vobrinvest_`addyear'  voaantalbrinbestuur
vogembrinvest vostedgembrinvest vodenominatie voschoolgrootte percapc ///
afdgroottevmbobk afdgroottevmbogt afdgroottehavo afdgroottevwo afdgrootteoverig brinstructuur brinveststructuur

generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons
save "@LOCATION\NCOBRINVO_`addyear'.dta", replace
}

*** VET cohort data

clear
foreach year in DEF2010 DEF2011 DEF2012 DEF2013 DEF2014 DEF2015 DEF2016 DEF2017 DEF2018 DEF2019 VRL2020  {

import spss using "G:\Maatwerk\NCOv4\NCOMBO\NCOMBO`year'.SAV", clear
renvars _all, lower
renvars brinmbo_crypt typeonderwijsmbo niveaumbo niveaumbodipl brindipl_crypt crebocode crebocodedipl, map("@" +
"_" + substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)
keep    rinpersoons    rinpersoon    onderwijsnr_crypt    brinmbo_crypt_`addyear'    typeonderwijsmbo_`addyear'
niveaumbo_`addyear' niveaumbodipl_`addyear' brindipl_crypt_`addyear' crebocode_`addyear' crebocodedipl_`addyear'

generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons
save "@LOCATION\NCOMBO_`addyear'.dta", replace
}


*** HBO cohort data

clear
foreach year in DEF2010 DEF2011 DEF2012 DEF2013 DEF2014 DEF2015 DEF2016 DEF2017 DEF2018 DEF2019 VRL2020  {

import spss using "G:\Maatwerk\NCOv4\NCOHBO\NCOHBO`year'.SAV", clear
renvars _all, lower
renvars brinhbo_crypt typeonderwijshbo soortdiplsoorthohbo crohocodehbo crohocodehbodipl, map("@" + "_" +
substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)
keep    rinpersoons    rinpersoon    onderwijsnr_crypt    brinhbo_crypt_`addyear'    typeonderwijshbo_`addyear'
soortdiplsoorthohbo_`addyear' crohocodehbo_`addyear' crohocodehbodipl_`addyear'

generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons
save "@LOCATION\NCOHBO_`addyear'.dta", replace
}

*** WO

clear
foreach year in DEF2010 DEF2011 DEF2012 DEF2013 DEF2014 DEF2015 DEF2016 DEF2017 DEF2018 DEF2019 VRL2020  {
```

```
import spss using "G:\Maatwerk\NCOv4\NCOWO\NCOWO`year'.SAV", clear
renvars _all, lower
renvars brinwo_crypt typeonderwijswo soortdiplsoorthowo crohocodewo crohocodewodipl, map("@" + "_" +
substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)
keep rinpersoons rinpersoon onderwijsnr_crypt brinwo_crypt_`addyear' typeonderwijswo_`addyear'
soortdiplsoorthowo_`addyear' crohocodewo_`addyear' crohocodewodipl_`addyear'

generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons
save "@LOCATION\NCOWO_`addyear'.dta", replace
}


*** Special education
clear
foreach year in DEF2008 DEF2009 DEF2010 DEF2011 DEF2012 DEF2013 DEF2014 DEF2015 DEF2016 DEF2017 DEF2018 DEF2019
VRL2020  {

import spss using "G:\Maatwerk\NCOV4\NCOSO\NCOSO`year'.SAV", clear
renvars _all, lower
renvars wectypepo, map("@" + "_" + substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)

keep rinpersoons rinpersoon onderwijsnr_crypt wectypepo_`addyear'
generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons
save "@LOCATION\NCOSO_`addyear'.dta", replace
}


*** Adult education
foreach year in DEF2010 DEF2011 DEF2012 DEF2013 DEF2014 DEF2015 DEF2016 DEF2017 DEF2018 DEF2019 VRL2020  {
import spss using "G:\Maatwerk\NCOV4\NCOVAVO\NCOVAVO`year'.SAV", clear

renvars _all, lower
renvars onderwijssoortvavo onderwijssoortvavodipl, map("@" + "_" + substr("`year'", 4, 4))

local addyear = substr("`year'", 4, 4)

keep rinpersoons rinpersoon onderwijsnr_crypt onderwijssoortvavo_`addyear' onderwijssoortvavodipl_`addyear'
generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons
save "@LOCATION\NCOVAVO_`addyear'.dta", replace
}

*** Background information
clear

import spss using  "G:\Maatwerk\NCOv4\NCOACHTERGRONDSTABIEL\NCOACHTERGRONDSTABIELDEF2020.SAV"

renvars _all, lower
generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"

sort sleutel rinpersoons
save "@LOCATION\NCO_BACKGROUND.dta", replace

*** Cohort backbone files
clear

forvalues year = 2010(1)2015 {

import spss using "G:\Maatwerk\NCOV4\NCOVORUG\NCOVORUG`year'.SAV", clear

renvars _all, lower
generate sleutel = rinpersoon
replace sleutel = onderwijsnr_crypt if rinpersoons == "O"
sort sleutel rinpersoons
```

```
forvalues i = 2007(1)2020 {
merge 1:1 sleutel rinpersoons using "@LOCATION\NCOVO_`i'.dta", keep(master match)
drop _merge
}

forvalues i = 2007(1)2020 {
merge 1:1 sleutel rinpersoons using "@LOCATION\NCOBRINVO_`i'.dta", keep(master match)
drop _merge
}

forvalues i = 2010(1)2020 {
merge 1:1 sleutel rinpersoons using "@LOCATION\NCOMBO_`i'.dta", keep(master match)
drop _merge
}

forvalues i = 2010(1)2020 {
merge 1:1 sleutel rinpersoons using "@LOCATION\NCOHBO_`i'.dta", keep(master match)
drop _merge
}

forvalues i = 2010(1)2020 {
merge 1:1 sleutel rinpersoons using "@LOCATION\NCOWO_`i'.dta", keep(master match)
drop _merge
}

forvalues i = 2010(1)2020 {
merge 1:1 sleutel rinpersoons using "@LOCATION\NCOVAVO_`i'.dta", keep(master match)
drop _merge
}

forvalues i = 2010(1)2020 {
merge 1:1 sleutel rinpersoons using "@LOCATION\NCOSO_`i'.dta", keep(master match)
drop _merge
}

forvalues i = 2010(1)2020 {
merge 1:1 sleutel rinpersoons using "@LOCATION\NCOPO_`i'.dta", keep(master match)
drop _merge
}

merge 1:1 sleutel rinpersoons using "@LOCATION\NCO_BACKGROUND.dta", keep(master match)
drop _merge

keep if startjaar == `year'

save "@LOCATION\Secondary Education\NCO_`year'.dta", replace

}
```

Do-file 2: Making indicators

```
****************************************
* FLEXIBILITY INDICATORS DATA SET

* Purpose: Making variables that eventually will be aggregated to the school level in the next set of do-files.
****************************************

forvalues cy = 2011(1)2013 {

use "@LOCATION\Secondary Education\NCO_`cy'.dta", clear

local cj = `cy' - 1

* destring
forvalues i = 2007(1)2009 {
        gen wectypepo_`i' = ""
        gen wpoleerjaar_`i' = .
        gen wpoadviesvo_`i' = .
        gen niveaumbo_`i' = .
        gen onderwijssoortvavo_`i' = .
        gen typeonderwijshbo_`i' = .
        gen typeonderwijswo_`i' = .
        gen niveaumbodipl_`i' = .
        gen onderwijssoortvavodipl_`i' = .
        gen soortdiplsoorthohbo_`i' = .
        gen soortdiplsoorthowo_`i' = .
        gen wpocodeeindtoets_`i' = .
        gen wpouitslageindtoets_`i' = .
}

forvalues i = 2007(1)2020 {
destring onderwijssoortvo_`i' onderwijssoortvodipl_`i' iltcode_`i' voleerjaar_`i' niveaumbo_`i' wpoleerjaar_`i'
wpoadviesvo_`i' onderwijssoortvavo_`i' typeonderwijshbo_`i' typeonderwijswo_`i' niveaumbodipl_`i'
onderwijssoortvavodipl_`i' soortdiplsoorthohbo_`i' soortdiplsoorthowo_`i', replace
}
forvalues i = 2010(1)2020 {
destring  wpocodeeindtoets_`i' wpouitslageindtoets_`i', replace
}

/// GENERAL AUXILLARY VARIABLES

* level of education each year
label define level 1 "PO" 2 "SO" 3 "praktijkonderwijs" 4 "vmbo bb" 5 "vmbo bb/kb" 6 "vmbo kb" 7 "vmbo gl" 8
"vmbo gl/tl" 9 "vmbo gl/tl/havo" 10 "vmbo gl/tl/havo/vwo" 11 "vmbo tl" 12 "vmbo" 13 "vmbo/havo" ///
14 "vmbo/havo/vwo" 15 "havo" 16 "havo/vwo" 17 "vwo" 18 "mbo 1" 19 "mbo 2" 20 "mbo 3" 21 "mbo 4" 22 "hbo
associate degree" 23 "hbo bachelor" 24 "hbo master" 25 "wo bachelor" 26 "wo master"  27 "wo post master"

* Empty variables up to 2006 to get the loop going.
forvalues k = 2002(1)2006 {
        generate educ_level_`k' = .
        }

forvalues i = 2007(1)2020 {

generate educ_level_`i' = .
replace educ_level_`i' = 2 if wectypepo_`i' == "VSO"
replace educ_level_`i' = 3 if onderwijssoortvo_`i' == 12
replace educ_level_`i' = 4 if onderwijssoortvo_`i' == 5
replace educ_level_`i' = 5 if onderwijssoortvo_`i' == 3
replace educ_level_`i' = 6 if onderwijssoortvo_`i' == 6
replace educ_level_`i' = 7 if onderwijssoortvo_`i' == 7
replace educ_level_`i' = 8 if onderwijssoortvo_`i' == 4
replace educ_level_`i' = 9 if iltcode_`i' == 11
replace educ_level_`i' = 10 if iltcode_`i' == 16
replace educ_level_`i' = 11 if onderwijssoortvo_`i' == 8
replace educ_level_`i' = 12 if iltcode_`i' == 23 | iltcode_`i' == 46
replace educ_level_`i' = 13 if iltcode_`i' == 22
replace educ_level_`i' = 14 if iltcode_`i' == 24
replace educ_level_`i' = 15 if onderwijssoortvo_`i' == 9
replace educ_level_`i' = 16 if iltcode_`i' == 15
replace educ_level_`i' = 17 if onderwijssoortvo_`i' == 10
replace educ_level_`i' = 18 if niveaumbo_`i' == 1
replace educ_level_`i' = 19 if niveaumbo_`i' == 2
replace educ_level_`i' = 20 if niveaumbo_`i' == 3
replace educ_level_`i' = 21 if niveaumbo_`i' == 4
```

```
replace educ_level_`i' = 17 if onderwijssoortvavo_`i' == 1
replace educ_level_`i' = 15 if onderwijssoortvavo_`i' == 2
replace educ_level_`i' = 11 if onderwijssoortvavo_`i' == 3

replace educ_level_`i' = 22 if typeonderwijshbo_`i' == 36
replace educ_level_`i' = 23 if typeonderwijshbo_`i' == 30
replace educ_level_`i' = 24 if typeonderwijshbo_`i' == 31

replace educ_level_`i' = 25 if typeonderwijswo_`i' == 30
replace educ_level_`i' = 26 if typeonderwijswo_`i' == 31
replace educ_level_`i' = 27 if typeonderwijswo_`i' == 33

replace educ_level_`i' = 1 if startjaar == `i' & wpoleerjaar_`i' == 3 | wpoleerjaar_`i' == 4 | wpoleerjaar_`i'
== 5 | wpoleerjaar_`i' == 6 | wpoleerjaar_`i' == 7 | wpoleerjaar_`i' == 8

label variable educ_level_`i' "Track in year `i'"
label values educ_level_`i' level

fre educ_level_`i'
}

* Empty variables from 2021 onwards to get the loop going.
generate educ_level_2021 = .
generate educ_level_2022 = .
generate educ_level_2023 = .
generate educ_level_2024 = .
generate educ_level_2025 = .
generate educ_level_2026 = .
generate educ_level_2027 = .
generate educ_level_2028 = .

* level of education according to inspectorate
forvalues i = `cy'(1)2020 {
recode educ_level_`i' (1=1)(2=2)(3=3)(4 5=4)(6=5)(7 8
9=7)(10=8)(11=7)(12=5)(13=6)(14=7)(15=8)(16=8)(17=9)(18=10)(19=11)(20=12)(21=13) ///
(22=14)(23=15)(24=16)(25=17)(26=18)(27=19), generate(educ_level_insp_`i')
label variable educ_level_insp_`i' "Track in year `i' according to Inspectorate rules"
}

label define level_insp 1 "Po" 2 "So" 3 "Praktijkonderwijs" 4 "Vmbo bb" 5 "Vmbo kb" 6 "Vmbo kb/Vmbo gl/tl" 7
"Vmbo gl/tl" 8 "Havo" 9 "Vwo" 10 "Mbo 1" ///
11 "Mbo 2" 12 "Mbo 3" 13 "Mbo 4" 14 "hbo associate degree" 15 "hbo bachelor" 16 "hbo master" 17 "wo bachelor" 18
"wo master" 19 "wo post master"
label values educ_level_insp_* level_insp
fre educ_level_insp_*

* level of certification
label define dipl_level 1 "vmbo bb" 2 "vmbo kb" 3 "vmbo gltl" 4 "havo" 5 "vwo" 6 "mbo 1" 7 "mbo 2" 8 "mbo 3" 9
"mbo 4" 10 "hbo associate degree" 11 "hbo bachelor" 12 "hbo master" 13 "wo bachelor" 14 "wo master" 15 "wo
postmaster"

forvalues i = 2007(1)2020 {

generate cert_level_`i' = .
replace cert_level_`i' = 1 if onderwijssoortvodipl_`i' == 5
replace cert_level_`i' = 2 if onderwijssoortvodipl_`i' == 6
replace cert_level_`i' = 3 if onderwijssoortvodipl_`i' == 7
replace cert_level_`i' = 3 if onderwijssoortvodipl_`i' == 8
replace cert_level_`i' = 3 if onderwijssoortvavodipl_`i' == 3

replace cert_level_`i' = 6 if niveaumbodipl_`i' == 1
replace cert_level_`i' = 7 if niveaumbodipl_`i' == 2
replace cert_level_`i' = 8 if niveaumbodipl_`i' == 3
replace cert_level_`i' = 9 if niveaumbodipl_`i' == 4

replace cert_level_`i' = 4 if onderwijssoortvodipl_`i' == 9
replace cert_level_`i' = 4 if onderwijssoortvavodipl_`i' == 2
replace cert_level_`i' = 5 if onderwijssoortvodipl_`i' == 10
replace cert_level_`i' = 5 if onderwijssoortvavodipl_`i' == 1

replace cert_level_`i' = 10 if soortdiplsoorthohbo_`i' == 13
replace cert_level_`i' = 11 if soortdiplsoorthohbo_`i' == 3
replace cert_level_`i' = 12 if soortdiplsoorthohbo_`i' == 5

replace cert_level_`i' = 13 if soortdiplsoorthowo_`i' == 3
replace cert_level_`i' = 14 if soortdiplsoorthowo_`i' == 5
replace cert_level_`i' = 15 if soortdiplsoorthowo_`i' == 9
```

```
label values cert_level_`i' dipl_level
label variable cert_level_`i' "Certificate obtained in year `i'"
fre cert_level_`i'
}

* Empty variables from 2021 onwards to get the loop going.
generate cert_level_2021 = .
generate cert_level_2022 = .
generate cert_level_2023 = .
generate cert_level_2024 = .
generate cert_level_2025 = .
generate cert_level_2026 = .
generate cert_level_2027 = .
generate cert_level_2028 = .

* Recommendation
// ADVICE ONLY FOR THOSE STARTING IN 2011

forvalues i = 2010(1)2020 {
recode wpoadviesvo_`i'
(0=.)(1=1)(10=1)(20=2)(21=2)(22=3)(23=3)(24=4)(25=4)(26=4)(27=4)(28=14)(29=15)(30=5)(31=5)(32=6)(33=6)(34=6)(35=
6)(36=7)(37=16) ///
(40=8)(41=8)(42=8)(43=8)(44=9)(45=10)(50=8)(51=8)(52=9)(53=10)(60=11)(61=12)(70=13)(80=17),
generate(recommendation_`i')
label variable wpoadviesvo_`i' "Teacher's recommendation in year `i'"
}

label define rec_lab 1 "vso/pro" 2 "vmbo bb" 3 "vmbo bb/kb" 4 "vmbo bb/kb/(g)t" 5 "vmbo kb" 6 "vmbo kb/(g)t" 7
"vmbo kb/(g)t/havo" 8 "vmbo (g)t" 9 "vmbo (g)t/havo" ///
10 "vmbo (g)t/havo/vwo" 11 "havo" 12 "havo/vwo" 13 "vwo" 14 "vmbo bb/kb/gt/havo" 15 "vmbo bb/kb/gt/havo/vwo" 16
"vmbo kb/gt/havo/vwo" 17 "overig", replace
label values recommendation_* rec_lab
fre recommendation_*

egen recommendation = rowlast(recommendation_20*)
label values recommendation recommendation_20* rec_lab
fre recommendation
tabm recommendation_20*

* Adjusted recommendation
// ONLY FOR THOSE STARTING IN 2015

forvalues i = 2015(1)2020 {
destring wpoadviesherz_`i', replace
recode wpoadviesherz_`i'
(0=.)(1=1)(10=1)(20=2)(21=2)(22=3)(23=3)(24=4)(25=4)(26=4)(27=4)(28=14)(29=15)(30=5)(31=5)(32=6)(33=6)(34=6)(35=
6)(36=7)(37=16) ///
(40=8)(41=8)(42=8)(43=8)(44=9)(45=10)(50=8)(51=8)(52=9)(53=10)(60=11)(61=12)(70=13)(80=17),
generate(rec_revised_`i')
label variable wpoadviesherz_`i' "Revised teacher's recommendation in year `i'"
}

label values recommendation_* rec_revised_* rec_lab

fre recommendation_2015 rec_revised_2015
tab recommendation_2015 rec_revised_2015

* Test recommendation

forvalues i = 2010(1)2013 {
generate test_rec_`i' = .
replace test_rec_`i' = 2 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >=500 & wpouitslageindtoets_`i'
<=518
replace test_rec_`i' = 3 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >518 & wpouitslageindtoets_`i'
<=525
replace test_rec_`i' = 4 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >525 & wpouitslageindtoets_`i'
<=528
replace test_rec_`i' = 6 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >528 & wpouitslageindtoets_`i'
<=532
replace test_rec_`i' = 7 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >532 & wpouitslageindtoets_`i'
<=536
replace test_rec_`i' = 10 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >536 & wpouitslageindtoets_`i'
<=539
replace test_rec_`i' = 11 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >539 & wpouitslageindtoets_`i'
<=544
```

```
replace test_rec_`i' = 12 if wpocodeeindtoets_`i' == 1 & wpouitslageindtoets_`i' >544 & wpouitslageindtoets_`i'
<=550

}

***** 2014 (omslag van toetsen, nu is er cito (11), route8 (12) en iep (13).
generate test_rec_2014 = .
replace test_rec_2014 = 2 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 <=518
replace test_rec_2014 = 3 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >518 &
wpouitslageindtoets_2014 <=525
replace test_rec_2014 = 4 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >525 &
wpouitslageindtoets_2014 <=528
replace test_rec_2014 = 6 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >528 &
wpouitslageindtoets_2014 <=532
replace test_rec_2014 = 7 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >532 &
wpouitslageindtoets_2014 <=536
replace test_rec_2014 = 10 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >536 &
wpouitslageindtoets_2014 <=539
replace test_rec_2014 = 11 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >539 &
wpouitslageindtoets_2014 <=544
replace test_rec_2014 = 12 if wpocodeeindtoets_2014 == 11 & wpouitslageindtoets_2014 >544 &
wpouitslageindtoets_2014 <=550
replace test_rec_2014 = 0 if wpocodeeindtoets_2014 == 12 & wpouitslageindtoets_2014 <141
replace test_rec_2014 = 2 if wpocodeeindtoets_2014 == 12 & wpouitslageindtoets_2014 >=141 &
wpouitslageindtoets_2014 <=168
replace test_rec_2014 = 4 if wpocodeeindtoets_2014 == 12 & wpouitslageindtoets_2014 >168 &
wpouitslageindtoets_2014 <=190
replace test_rec_2014 = 8 if wpocodeeindtoets_2014 == 12 & wpouitslageindtoets_2014 >190 &
wpouitslageindtoets_2014 <=210
replace test_rec_2014 = 10 if wpocodeeindtoets_2014 == 12 & wpouitslageindtoets_2014 >210 &
wpouitslageindtoets_2014 <=234
replace test_rec_2014 = 12 if wpocodeeindtoets_2014 == 12 & wpouitslageindtoets_2014 >234
replace test_rec_2014 = 3 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >=50 &
wpouitslageindtoets_2014 <=61
replace test_rec_2014 = 5 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >61 &
wpouitslageindtoets_2014 <=70
replace test_rec_2014 = 8 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >70 &
wpouitslageindtoets_2014 <=76
replace test_rec_2014 = 9 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >76 &
wpouitslageindtoets_2014 <=81
replace test_rec_2014 = 10 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >81 &
wpouitslageindtoets_2014 <=86
replace test_rec_2014 = 11 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >86 &
wpouitslageindtoets_2014 <=92
replace test_rec_2014 = 12 if wpocodeeindtoets_2014 == 13 & wpouitslageindtoets_2014 >92 &
wpouitslageindtoets_2014 <=100

***** 2015.
generate test_rec_2015 = .
replace test_rec_2015 = 2 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 <=518
replace test_rec_2015 = 3 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >518 &
wpouitslageindtoets_2015 <=525
replace test_rec_2015 = 4 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >525 &
wpouitslageindtoets_2015 <=528
replace test_rec_2015 = 6 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >528 &
wpouitslageindtoets_2015 <=532
replace test_rec_2015 = 7 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >532 &
wpouitslageindtoets_2015 <=536
replace test_rec_2015 = 10 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >536 &
wpouitslageindtoets_2015 <=539
replace test_rec_2015 = 11 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >539 &
wpouitslageindtoets_2015 <=544
replace test_rec_2015 = 12 if wpocodeeindtoets_2015 == 11 & wpouitslageindtoets_2015 >544 &
wpouitslageindtoets_2015 <=550
replace test_rec_2015 = 0 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 <141
replace test_rec_2015 = 2 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=141 &
wpouitslageindtoets_2015 <=169
replace test_rec_2015 = 3 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=170 &
wpouitslageindtoets_2015 <=180
replace test_rec_2015 = 4 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=181 &
wpouitslageindtoets_2015 <=186
replace test_rec_2015 = 5 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=187 &
wpouitslageindtoets_2015 <=194
replace test_rec_2015 = 6 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=195 &
wpouitslageindtoets_2015 <=202
replace test_rec_2015 = 7 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=203 &
wpouitslageindtoets_2015 <=211
```

```
replace test_rec_2015 = 10 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=212 &
wpouitslageindtoets_2015 <=218
replace test_rec_2015 = 11 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >=219 &
wpouitslageindtoets_2015 <=228
replace test_rec_2015 = 12 if wpocodeeindtoets_2015 == 12 & wpouitslageindtoets_2015 >228
replace test_rec_2015 = 3 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >=50 &
wpouitslageindtoets_2015 <=61
replace test_rec_2015 = 5 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >61 &
wpouitslageindtoets_2015 <=70
replace test_rec_2015 = 8 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >70 &
wpouitslageindtoets_2015 <=76
replace test_rec_2015 = 9 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >76 &
wpouitslageindtoets_2015 <=81
replace test_rec_2015 = 10 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >81 &
wpouitslageindtoets_2015 <=86
replace test_rec_2015 = 11 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >86 &
wpouitslageindtoets_2015 <=92
replace test_rec_2015 = 12 if wpocodeeindtoets_2015 == 13 & wpouitslageindtoets_2015 >92 &
wpouitslageindtoets_2015 <=100

***** 2016.
generate test_rec_2016 = .
replace test_rec_2016 = 2 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 <=518
replace test_rec_2016 = 3 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >518 &
wpouitslageindtoets_2016 <=525
replace test_rec_2016 = 4 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >525 &
wpouitslageindtoets_2016 <=528
replace test_rec_2016 = 6 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >528 &
wpouitslageindtoets_2016 <=532
replace test_rec_2016 = 7 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >532 &
wpouitslageindtoets_2016 <=536
replace test_rec_2016 = 10 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >536 &
wpouitslageindtoets_2016 <=539
replace test_rec_2016 = 11 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >539 &
wpouitslageindtoets_2016 <=544
replace test_rec_2016 = 12 if wpocodeeindtoets_2016 == 11 & wpouitslageindtoets_2016 >544 &
wpouitslageindtoets_2016 <=550
replace test_rec_2016 = 0 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 <141
replace test_rec_2016 = 2 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=141 &
wpouitslageindtoets_2016 <=169
replace test_rec_2016 = 3 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=170 &
wpouitslageindtoets_2016 <=180
replace test_rec_2016 = 4 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=181 &
wpouitslageindtoets_2016 <=186
replace test_rec_2016 = 5 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=187 &
wpouitslageindtoets_2016 <=194
replace test_rec_2016 = 6 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=195 &
wpouitslageindtoets_2016 <=202
replace test_rec_2016 = 7 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=203 &
wpouitslageindtoets_2016 <=211
replace test_rec_2016 = 10 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=212 &
wpouitslageindtoets_2016 <=218
replace test_rec_2016 = 11 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >=219 &
wpouitslageindtoets_2016 <=228
replace test_rec_2016 = 12 if wpocodeeindtoets_2016 == 12 & wpouitslageindtoets_2016 >228
replace test_rec_2016 = 2 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=50 &
wpouitslageindtoets_2016 <=53
replace test_rec_2016 = 3 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=54 &
wpouitslageindtoets_2016 <=58
replace test_rec_2016 = 4 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=59 &
wpouitslageindtoets_2016 <=64
replace test_rec_2016 = 5 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=65 &
wpouitslageindtoets_2016 <=70
replace test_rec_2016 = 6 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=71 &
wpouitslageindtoets_2016 <=76
replace test_rec_2016 = 7 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=77 &
wpouitslageindtoets_2016 <=81
replace test_rec_2016 = 10 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=82 &
wpouitslageindtoets_2016 <=86
replace test_rec_2016 = 11 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=87 &
wpouitslageindtoets_2016 <=92
replace test_rec_2016 = 12 if wpocodeeindtoets_2016 == 13 & wpouitslageindtoets_2016 >=93 &
wpouitslageindtoets_2016 <=100

***** 2017.
generate test_rec_2017 = .
replace test_rec_2017 = 2 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 <=518
```

```
replace test_rec_2017 = 3 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >518 &
wpouitslageindtoets_2017 <=525
replace test_rec_2017 = 4 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >525 &
wpouitslageindtoets_2017 <=528
replace test_rec_2017 = 6 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >528 &
wpouitslageindtoets_2017 <=532
replace test_rec_2017 = 7 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >532 &
wpouitslageindtoets_2017 <=536
replace test_rec_2017 = 10 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >536 &
wpouitslageindtoets_2017 <=539
replace test_rec_2017 = 11 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >539 &
wpouitslageindtoets_2017 <=544
replace test_rec_2017 = 12 if wpocodeeindtoets_2017 == 11 & wpouitslageindtoets_2017 >544 &
wpouitslageindtoets_2017 <=550
replace test_rec_2017 = 0 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 <141
replace test_rec_2017 = 2 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=141 &
wpouitslageindtoets_2017 <=169
replace test_rec_2017 = 3 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=170 &
wpouitslageindtoets_2017 <=180
replace test_rec_2017 = 4 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=181 &
wpouitslageindtoets_2017 <=186
replace test_rec_2017 = 5 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=187 &
wpouitslageindtoets_2017 <=194
replace test_rec_2017 = 6 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=195 &
wpouitslageindtoets_2017 <=202
replace test_rec_2017 = 7 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=203 &
wpouitslageindtoets_2017 <=211
replace test_rec_2017 = 10 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=212 &
wpouitslageindtoets_2017 <=218
replace test_rec_2017 = 11 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >=219 &
wpouitslageindtoets_2017 <=228
replace test_rec_2017 = 12 if wpocodeeindtoets_2017 == 12 & wpouitslageindtoets_2017 >228
replace test_rec_2017 = 1 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=50 &
wpouitslageindtoets_2017 <=53
replace test_rec_2017 = 2 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=54 &
wpouitslageindtoets_2017 <=65
replace test_rec_2017 = 3 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=66 &
wpouitslageindtoets_2017 <=67
replace test_rec_2017 = 4 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=68 &
wpouitslageindtoets_2017 <=71
replace test_rec_2017 = 5 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=72 &
wpouitslageindtoets_2017 <=73
replace test_rec_2017 = 6 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=74 &
wpouitslageindtoets_2017 <=77
replace test_rec_2017 = 7 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=78 &
wpouitslageindtoets_2017 <=81
replace test_rec_2017 = 10 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=82 &
wpouitslageindtoets_2017 <=87
replace test_rec_2017 = 11 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=88 &
wpouitslageindtoets_2017 <=91
replace test_rec_2017 = 12 if wpocodeeindtoets_2017 == 13 & wpouitslageindtoets_2017 >=92 &
wpouitslageindtoets_2017 <=100
replace test_rec_2017 = 2 if wpocodeeindtoets_2017 == 14 & wpouitslageindtoets_2017 >=333 &
wpouitslageindtoets_2017 <=349
replace test_rec_2017 = 3 if wpocodeeindtoets_2017 == 14 & wpouitslageindtoets_2017 >=350 &
wpouitslageindtoets_2017 <=354
replace test_rec_2017 = 8 if wpocodeeindtoets_2017 == 14 & wpouitslageindtoets_2017 >=355 &
wpouitslageindtoets_2017 <=361
replace test_rec_2017 = 10 if wpocodeeindtoets_2017 == 14 & wpouitslageindtoets_2017 >=362 &
wpouitslageindtoets_2017 <=370
replace test_rec_2017 = 12 if wpocodeeindtoets_2017 == 14 & wpouitslageindtoets_2017 >=371 &
wpouitslageindtoets_2017 <=391
replace test_rec_2017 = 2 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=14 &
wpouitslageindtoets_2017 <=107
replace test_rec_2017 = 3 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=108 &
wpouitslageindtoets_2017 <=181
replace test_rec_2017 = 4 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=182 &
wpouitslageindtoets_2017 <=254
replace test_rec_2017 = 5 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=255 &
wpouitslageindtoets_2017 <=313
replace test_rec_2017 = 8 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=314 &
wpouitslageindtoets_2017 <=413
replace test_rec_2017 = 9 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=414 &
wpouitslageindtoets_2017 <=517
replace test_rec_2017 = 10 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=518 &
wpouitslageindtoets_2017 <=658
```

```
replace test_rec_2017 = 11 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=659 &
wpouitslageindtoets_2017 <=811
replace test_rec_2017 = 12 if wpocodeeindtoets_2017 == 16 & wpouitslageindtoets_2017 >=812 &
wpouitslageindtoets_2017 <=1000

***** 2018.
generate test_rec_2018 = .
replace test_rec_2018 = 2 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 <=518
replace test_rec_2018 = 3 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >518 &
wpouitslageindtoets_2018 <=525
replace test_rec_2018 = 4 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >525 &
wpouitslageindtoets_2018 <=528
replace test_rec_2018 = 6 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >528 &
wpouitslageindtoets_2018 <=532
replace test_rec_2018 = 7 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >532 &
wpouitslageindtoets_2018 <=536
replace test_rec_2018 = 10 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >536 &
wpouitslageindtoets_2018 <=539
replace test_rec_2018 = 11 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >539 &
wpouitslageindtoets_2018 <=544
replace test_rec_2018 = 12 if wpocodeeindtoets_2018 == 11 & wpouitslageindtoets_2018 >544 &
wpouitslageindtoets_2018 <=550
replace test_rec_2018 = 0 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 <141
replace test_rec_2018 = 2 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=141 &
wpouitslageindtoets_2018 <=169
replace test_rec_2018 = 3 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=170 &
wpouitslageindtoets_2018 <=180
replace test_rec_2018 = 4 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=181 &
wpouitslageindtoets_2018 <=186
replace test_rec_2018 = 5 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=187 &
wpouitslageindtoets_2018 <=194
replace test_rec_2018 = 6 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=195 &
wpouitslageindtoets_2018 <=202
replace test_rec_2018 = 7 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=203 &
wpouitslageindtoets_2018 <=211
replace test_rec_2018 = 10 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=212 &
wpouitslageindtoets_2018 <=218
replace test_rec_2018 = 11 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >=219 &
wpouitslageindtoets_2018 <=228
replace test_rec_2018 = 12 if wpocodeeindtoets_2018 == 12 & wpouitslageindtoets_2018 >228
replace test_rec_2018 = 1 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=50 &
wpouitslageindtoets_2018 <=53
replace test_rec_2018 = 2 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=54 &
wpouitslageindtoets_2018 <=65
replace test_rec_2018 = 3 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=66 &
wpouitslageindtoets_2018 <=67
replace test_rec_2018 = 4 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=68 &
wpouitslageindtoets_2018 <=71
replace test_rec_2018 = 5 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=72 &
wpouitslageindtoets_2018 <=73
replace test_rec_2018 = 6 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=74 &
wpouitslageindtoets_2018 <=77
replace test_rec_2018 = 7 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=78 &
wpouitslageindtoets_2018 <=81
replace test_rec_2018 = 10 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=82 &
wpouitslageindtoets_2018 <=87
replace test_rec_2018 = 11 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=88 &
wpouitslageindtoets_2018 <=91
replace test_rec_2018 = 12 if wpocodeeindtoets_2018 == 13 & wpouitslageindtoets_2018 >=92 &
wpouitslageindtoets_2018 <=100
replace test_rec_2018 = 2 if wpocodeeindtoets_2018 == 14 & wpouitslageindtoets_2018 >=333 &
wpouitslageindtoets_2018 <=346
replace test_rec_2018 = 3 if wpocodeeindtoets_2018 == 14 & wpouitslageindtoets_2018 >=347 &
wpouitslageindtoets_2018 <=353
replace test_rec_2018 = 8 if wpocodeeindtoets_2018 == 14 & wpouitslageindtoets_2018 >=354 &
wpouitslageindtoets_2018 <=361
replace test_rec_2018 = 10 if wpocodeeindtoets_2018 == 14 & wpouitslageindtoets_2018 >=362 &
wpouitslageindtoets_2018 <=370
replace test_rec_2018 = 12 if wpocodeeindtoets_2018 == 14 & wpouitslageindtoets_2018 >=371 &
wpouitslageindtoets_2018 <=391
replace test_rec_2018 = 1 if wpocodeeindtoets_2018 == 16 & wpouitslageindtoets_2018 >=300 &
wpouitslageindtoets_2018 <=306
replace test_rec_2018 = 3 if wpocodeeindtoets_2018 == 16 & wpouitslageindtoets_2018 >=307 &
wpouitslageindtoets_2018 <=331
replace test_rec_2018 = 5 if wpocodeeindtoets_2018 == 16 & wpouitslageindtoets_2018 >=332 &
wpouitslageindtoets_2018 <=367
```

```
replace test_rec_2018 = 7 if wpocodeeindtoets_2018 == 16 & wpouitslageindtoets_2018 >=368 &
wpouitslageindtoets_2018 <=412
replace test_rec_2018 = 11 if wpocodeeindtoets_2018 == 16 & wpouitslageindtoets_2018 >=413 &
wpouitslageindtoets_2018 <=460
replace test_rec_2018 = 12 if wpocodeeindtoets_2018 == 16 & wpouitslageindtoets_2018 >=461 &
wpouitslageindtoets_2018 <=500

* 2019. No test because of COVID19
generate test_rec_2019 = .

* 2020.
generate test_rec_2020 = .
replace test_rec_2020 = 1 if wpocodeeindtoets_2020 == 11 & wpouitslageindtoets_2020 <=504
replace test_rec_2020 = 3 if wpocodeeindtoets_2020 == 11 & wpouitslageindtoets_2020 >=505 &
wpouitslageindtoets_2020 <=524
replace test_rec_2020 = 5 if wpocodeeindtoets_2020 == 11 & wpouitslageindtoets_2020 >=525 &
wpouitslageindtoets_2020 <=532
replace test_rec_2020 = 7 if wpocodeeindtoets_2020 == 11 & wpouitslageindtoets_2020 >=533 &
wpouitslageindtoets_2020 <=539
replace test_rec_2020 = 11 if wpocodeeindtoets_2020 == 11 & wpouitslageindtoets_2020 >=540 &
wpouitslageindtoets_2020 <=544
replace test_rec_2020 = 12 if wpocodeeindtoets_2020 == 11 & wpouitslageindtoets_2020 >=545
replace test_rec_2020 = 1 if wpocodeeindtoets_2020 == 12 & wpouitslageindtoets_2020 <=158
replace test_rec_2020 = 3 if wpocodeeindtoets_2020 == 12 & wpouitslageindtoets_2020 >=159 &
wpouitslageindtoets_2020 <=182
replace test_rec_2020 = 5 if wpocodeeindtoets_2020 == 12 & wpouitslageindtoets_2020 >=183 &
wpouitslageindtoets_2020 <=202
replace test_rec_2020 = 7 if wpocodeeindtoets_2020 == 12 & wpouitslageindtoets_2020 >=203 &
wpouitslageindtoets_2020 <=219
replace test_rec_2020 = 11 if wpocodeeindtoets_2020 == 12 & wpouitslageindtoets_2020 >=220 &
wpouitslageindtoets_2020 <=232
replace test_rec_2020 = 12 if wpocodeeindtoets_2020 == 12 & wpouitslageindtoets_2020 >=233
replace test_rec_2020 = 1 if wpocodeeindtoets_2020 == 13 & wpouitslageindtoets_2020 <=51
replace test_rec_2020 = 3 if wpocodeeindtoets_2020 == 13 & wpouitslageindtoets_2020 >=52 &
wpouitslageindtoets_2020 <=68
replace test_rec_2020 = 5 if wpocodeeindtoets_2020 == 13 & wpouitslageindtoets_2020 >=69 &
wpouitslageindtoets_2020 <=76
replace test_rec_2020 = 7 if wpocodeeindtoets_2020 == 13 & wpouitslageindtoets_2020 >=77 &
wpouitslageindtoets_2020 <=84
replace test_rec_2020 = 11 if wpocodeeindtoets_2020 == 13 & wpouitslageindtoets_2020 >=85 &
wpouitslageindtoets_2020 <=91
replace test_rec_2020 = 12 if wpocodeeindtoets_2020 == 13 & wpouitslageindtoets_2020 >=92
replace test_rec_2020 = 1 if wpocodeeindtoets_2020 == 14 & wpouitslageindtoets_2020 <=337
replace test_rec_2020 = 3 if wpocodeeindtoets_2020 == 14 & wpouitslageindtoets_2020 >=338 &
wpouitslageindtoets_2020 <=350
replace test_rec_2020 = 5 if wpocodeeindtoets_2020 == 14 & wpouitslageindtoets_2020 >=351 &
wpouitslageindtoets_2020 <=356
replace test_rec_2020 = 7 if wpocodeeindtoets_2020 == 14 & wpouitslageindtoets_2020 >=357 &
wpouitslageindtoets_2020 <=363
replace test_rec_2020 = 11 if wpocodeeindtoets_2020 == 14 & wpouitslageindtoets_2020 >=364 &
wpouitslageindtoets_2020 <=369
replace test_rec_2020 = 12 if wpocodeeindtoets_2020 == 14 & wpouitslageindtoets_2020 >=370
replace test_rec_2020 = 1 if wpocodeeindtoets_2020 == 16 & wpouitslageindtoets_2020 <=305
replace test_rec_2020 = 3 if wpocodeeindtoets_2020 == 16 & wpouitslageindtoets_2020 >=306 &
wpouitslageindtoets_2020 <=326
replace test_rec_2020 = 5 if wpocodeeindtoets_2020 == 16 & wpouitslageindtoets_2020 >=327 &
wpouitslageindtoets_2020 <=370
replace test_rec_2020 = 7 if wpocodeeindtoets_2020 == 16 & wpouitslageindtoets_2020 >=371 &
wpouitslageindtoets_2020 <=427
replace test_rec_2020 = 11 if wpocodeeindtoets_2020 == 16 & wpouitslageindtoets_2020 >=428 &
wpouitslageindtoets_2020 <=463
replace test_rec_2020 = 12 if wpocodeeindtoets_2020 == 16 & wpouitslageindtoets_2020 >=464

label define test_rec_lab 0 "pro" 1 "pro/vmbo bb" 2 "vmbo bb" 3 "vmbo bb/kb" 4 "vmbo kb" 5 "vmbo kb/tl" 6 "vmbo
gl/tl" 7 "vmbo gltl/havo" 8 "vmbo tl" 9 "vmbo tl/havo" 10 "havo" 11 "havo/vwo" 12 "vwo"
label values test_rec_* test_rec_lab
fre test_rec_*

/////// GENERAL AUXILLAIRY VARIABLES IN FORMAT OF THE GRADE-YEAR LADDER
/// Level
forvalues i = 2007(1)2020 {
        local z1 = `i' - 1
        local z2 = `i' - 2
        local z3 = `i' - 3
        local z4 = `i' - 4

generate ladder_seclevel_`i' = .
```

```
* Primary education

* Special education
replace ladder_seclevel_`i' = 1 if educ_level_`i' == 2 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 2 if educ_level_`i' == 2 & voleerjaar_`i' == 2
replace ladder_seclevel_`i' = 3 if educ_level_`i' == 2 & voleerjaar_`i' == 3
replace ladder_seclevel_`i' = 4 if educ_level_`i' == 2 & voleerjaar_`i' == 4
* Practice education
replace ladder_seclevel_`i' = 2 if educ_level_`i' == 3 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 3 if educ_level_`i' == 3 & voleerjaar_`i' == 2
replace ladder_seclevel_`i' = 4 if educ_level_`i' == 3 & voleerjaar_`i' == 3
replace ladder_seclevel_`i' = 5 if educ_level_`i' == 3 & voleerjaar_`i' == 4
* Pre-VET level 1
replace ladder_seclevel_`i' = 3 if educ_level_`i' == 4 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 4 if educ_level_`i' == 4 & voleerjaar_`i' == 2
replace ladder_seclevel_`i' = 5 if educ_level_`i' == 4 & voleerjaar_`i' == 3
replace ladder_seclevel_`i' = 6 if educ_level_`i' == 4 & voleerjaar_`i' == 4
* Pre-VET combination level 1 and 2
replace ladder_seclevel_`i' = 3.5 if educ_level_`i' == 5 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 4.5 if educ_level_`i' == 5 & voleerjaar_`i' == 2
* Pre-VET level 2
replace ladder_seclevel_`i' = 4 if educ_level_`i' == 6 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 5 if educ_level_`i' == 6 & voleerjaar_`i' == 2
replace ladder_seclevel_`i' = 6 if educ_level_`i' == 6 & voleerjaar_`i' == 3
replace ladder_seclevel_`i' = 7 if educ_level_`i' == 6 & voleerjaar_`i' == 4
* Pre-VET level 3/4
replace ladder_seclevel_`i' = 4 if (educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 5 if (educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
voleerjaar_`i' == 2
replace ladder_seclevel_`i' = 6 if (educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
voleerjaar_`i' == 3
replace ladder_seclevel_`i' = 7 if (educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
voleerjaar_`i' == 4
* Pre-VET level 3/4 and higher general
replace ladder_seclevel_`i' = 5.5 if educ_level_`i' == 9 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 6.5 if educ_level_`i' == 9 & voleerjaar_`i' == 2
* Pre-VET level 3/4 and higher general and pre-university
replace ladder_seclevel_`i' = 6 if educ_level_`i' == 10 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 7 if educ_level_`i' == 10 & voleerjaar_`i' == 2
* Pre-VET level 1 and pre-VET level 2 and pre-VET level 3/4
replace ladder_seclevel_`i' = 4 if educ_level_`i' == 12 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 5 if educ_level_`i' == 12 & voleerjaar_`i' == 2
* Pre-VET level 1 and pre-VET level 2 and pre-VET level 3/4 and higher general
replace ladder_seclevel_`i' = 4.5 if educ_level_`i' == 13 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 5.5 if educ_level_`i' == 13 & voleerjaar_`i' == 2
* Pre-VET level 1 and pre-VET level 2 and pre-VET level 3/4 and higher general and pre-university
replace ladder_seclevel_`i' = 5 if educ_level_`i' == 14 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 6 if educ_level_`i' == 14 & voleerjaar_`i' == 2
* Higher general
replace ladder_seclevel_`i' = 6 if educ_level_`i' == 15 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 7 if educ_level_`i' == 15 & voleerjaar_`i' == 2
replace ladder_seclevel_`i' = 8 if educ_level_`i' == 15 & voleerjaar_`i' == 3
replace ladder_seclevel_`i' = 9 if educ_level_`i' == 15 & voleerjaar_`i' == 4
replace ladder_seclevel_`i' = 9 if educ_level_`i' == 15 & voleerjaar_`i' == 5
* Higher general and pre-university
replace ladder_seclevel_`i' = 6.5 if educ_level_`i' == 16 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 7.5 if educ_level_`i' == 16 & voleerjaar_`i' == 2
replace ladder_seclevel_`i' = 8.5 if educ_level_`i' == 16 & voleerjaar_`i' == 3
* Pre-university
replace ladder_seclevel_`i' = 7 if educ_level_`i' == 17 & voleerjaar_`i' == 1
replace ladder_seclevel_`i' = 8 if educ_level_`i' == 17 & voleerjaar_`i' == 2
replace ladder_seclevel_`i' = 9 if educ_level_`i' == 17 & voleerjaar_`i' == 3
replace ladder_seclevel_`i' = 10 if educ_level_`i' == 17 & voleerjaar_`i' == 4
replace ladder_seclevel_`i' = 11 if educ_level_`i' == 17 & voleerjaar_`i' == 5
replace ladder_seclevel_`i' = 12 if educ_level_`i' == 17 & voleerjaar_`i' == 6
* VET 1
replace ladder_seclevel_`i' = 6 if educ_level_`i' == 18 & (educ_level_`z1' < 18 | educ_level_`z1' == .)
* VET 2
replace ladder_seclevel_`i' = 7 if educ_level_`i' == 19 & (educ_level_`z1' < 19 | educ_level_`z1' == .)
replace ladder_seclevel_`i' = 8 if educ_level_`i' == 19 & educ_level_`z1' == 19
* VET 3
replace ladder_seclevel_`i' = 8 if educ_level_`i' == 20 & (educ_level_`z1' < 20 | educ_level_`z1' == .)
replace ladder_seclevel_`i' = 9 if educ_level_`i' == 20 & educ_level_`z1' == 20
replace ladder_seclevel_`i' = 10 if educ_level_`i' == 20 & (educ_level_`z1' == 20 & educ_level_`z2' == 20)
* VET 4
replace ladder_seclevel_`i' = 9 if educ_level_`i' == 21 & (educ_level_`z1' < 21 | educ_level_`z1' == .)
```

```
replace ladder_seclevel_`i' = 10 if educ_level_`i' == 21 & educ_level_`z1' == 21
replace ladder_seclevel_`i' = 11 if educ_level_`i' == 21 & (educ_level_`z1' == 21 & educ_level_`z2' == 21)
replace ladder_seclevel_`i' = 12 if educ_level_`i' == 21 & (educ_level_`z1' == 21 & educ_level_`z2' == 21 &
educ_level_`z3' == 21 & educ_level_`z4' < 21)
* HBO associate degree
replace ladder_seclevel_`i' = 11 if educ_level_`i' == 22 & (educ_level_`z1' < 22 | educ_level_`z1' == .)
replace ladder_seclevel_`i' = 12 if educ_level_`i' == 22 & educ_level_`z1' == 22
* HBO bachelor
replace ladder_seclevel_`i' = 11 if educ_level_`i' == 23 & (educ_level_`z1' < 23 | educ_level_`z1' == .)
replace ladder_seclevel_`i' = 12 if educ_level_`i' == 23 & educ_level_`z1' == 23
replace ladder_seclevel_`i' = 13 if educ_level_`i' == 23 & (educ_level_`z1' == 23 & educ_level_`z2' == 23)
replace ladder_seclevel_`i' = 14 if educ_level_`i' == 23 & (educ_level_`z1' == 23 & educ_level_`z2' == 23 &
educ_level_`z3' == 23 & educ_level_`z4' < 23)
* HBO master
replace ladder_seclevel_`i' = 15 if educ_level_`i' == 24 & (educ_level_`z1' < 24 | educ_level_`z1' == .)
* WO bachelor
replace ladder_seclevel_`i' = 13 if educ_level_`i' == 25 & (educ_level_`z1' < 25 | educ_level_`z1' == .)
replace ladder_seclevel_`i' = 14 if educ_level_`i' == 25 & educ_level_`z1' == 25
replace ladder_seclevel_`i' = 15 if educ_level_`i' == 25 & (educ_level_`z1' == 25 & educ_level_`z2' == 25)
* WO master
replace ladder_seclevel_`i' = 16 if educ_level_`i' == 26 & (educ_level_`z1' < 26 | educ_level_`z1' == .)
replace ladder_seclevel_`i' = 16 if educ_level_`i' == 26 & educ_level_`z1' == 26
* WO post master
replace ladder_seclevel_`i' = 17 if educ_level_`i' == 27 & (educ_level_`z1' < 27 | educ_level_`z1' == .)
replace ladder_seclevel_`i' = 18 if educ_level_`i' == 27 & educ_level_`z1' == 27

label variable ladder_seclevel_`i' "Grade Ladder Score for position in education system in year `i'"
}

fre ladder_seclevel_*
list  educ_level_20* ladder_seclevel_20* in 1/100 if educ_level_2011 == .
tab educ_level_`cy' ladder_seclevel_`cy', miss
tab educ_level_`cy'

* Certificate
forvalues i = 2007(1)2020 {
recode cert_level_`i'
(1=6)(2=7)(3=8)(4=10)(5=12)(6=6)(7=8)(8=10)(9=12)(10=12)(11=14)(12=15)(13=15)(14=16)(15=18),
generate(ladder_cert_`i')
label variable ladder_cert_`i' "Grade Ladder Score for obtained certificate in year `i'"
}
fre ladder_cert_*

* Teacher recommendation
gen wpoadviesvo_2006 = .
local ct = `cy' - 1
forvalues i = `ct'(1)2020 {
recode wpoadviesvo_`i'
(0=.)(1=0.5)(10=0.5)(20=2)(21=2)(22=2.5)(23=2.5)(24=3)(25=3)(26=3)(27=3)(28=3.5)(29=4)(30=3)(31=3)(32=3.5)(33=3.
5)(34=3.5)(35=3.5)(36=4)(37=4.5) ///
(40=4)(41=4)(42=4)(43=4)(44=4.5)(45=5)(50=4)(51=4)(52=4.5)(53=5)(60=5)(61=5.5)(70=6)(80=.),
generate(ladder_teacherrec_`i')
label variable ladder_teacherrec_`i'  "Grade Ladder Score for teacher's recommendation in year `i'"
}
fre ladder_teacherrec_*

egen ladder_teacherrec = rowlast(ladder_teacherrec_20*)
fre ladder_teacherrec

* Revised teacher recommendation
forvalues i = 2015(1)2020 {
recode wpoadviesherz_`i'
(0=.)(1=0.5)(10=0.5)(20=2)(21=2)(22=2.5)(23=2.5)(24=3)(25=3)(26=3)(27=3)(28=3.5)(29=4)(30=3)(31=3)(32=3.5)(33=3.
5)(34=3.5)(35=3.5)(36=4)(37=4.5) ///
(40=4)(41=4)(42=4)(43=4)(44=4.5)(45=5)(50=4)(51=4)(52=4.5)(53=5)(60=5)(61=5.5)(70=6)(80=.),
generate(ladder_revised_teacherrec_`i')
label variable ladder_revised_teacherrec_`i' "Grade Ladder Score for revised teacher's recommendation in year
`i'"
}
fre ladder_revised_teacherrec_*

* Test recommendation
forvalues i = 2010(1)2018 {
recode test_rec_`i' (0=1)(1=1.5)(2=2)(3=2.5)(4=3)(5=3.5)(6=4)(7=4.5)(8=4)(9=4.5)(10=5)(11=5.5)(12=6),
generate(ladder_testrec_`i')
label variable ladder_testrec_`i' "Grade Ladder Score for test equivalent recommendation in year `i'"
}
```

```
fre ladder_testrec_*

* Track groups (they overlap)
forvalues i = `cy'(1)2020 {
recode educ_level_`i' (1 2 3 = 0)(4 5 = 1)(6 7 8 9 10 11 = 0)(12 13 14 = 1)(15 16 17 18 19 20 21 22 23 24 25 26
27 = 0), generate(group_vmbobb_`i')
recode educ_level_`i' (1 2 3 4 = 0)(5 6 = 1)(7 8 9 10 11 = 0)(12 13 14 = 1)(15 16 17 18 19 20 21 22 23 24 25 26
27 = 0), generate(group_vmbokb_`i')
recode educ_level_`i' (1 2 3 4 5 6 = 0)(7 8 9 10 11 12 13 14 = 1)(15 16 17 18 19 20 21 22 23 24 25 26 27 = 0),
generate(group_vmbogt_`i')
recode educ_level_`i' (1 2 3 4 5 6 7 8 = 0)(9 10 = 1)(11 12 = 0)(13 14 15 16 = 1)(17 18 19 20 21 22 23 24 25 26
27 = 0), generate(group_havo_`i')
recode educ_level_`i' (1 2 3 4 5 6 7 8 9 = 0)(10 = 1)(11 12 13 15 = 0)(14 16 17 = 1)(18 19 20 21 22 23 24 25 26
27 = 0), generate(group_vwo_`i')
}

* auxillary variable: having a certificate in a certain year
forvalues i = `cy'(1)2020 {
generate ifcert_`i' = 1 if cert_level_`i' != .
replace ifcert_`i' = 0 if cert_level_`i' == .
}

* auxillary variable: how many certificates
egen cert_number = rowtotal(ifcert_*)
fre cert_number

* first diploma
generate cert_first_level = .
generate cert_first_year = .
forvalues i = 2020(-1)`cy' { //The (-1) means that the loop goes down with one year after starting in 2020
replace cert_first_level = cert_level_`i' if cert_level_`i' != .
replace cert_first_year = `i' if cert_level_`i' != .
}

label values cert_first_level dipl_level
fre cert_first_level
list cert_first_level cert_level_* in 1/50

///////
/////// First / Second / Third Diploma within braches of the system
///////

// WITHIN SECONDARY EDUCATION

// First Diploma
generate cert_firstinsec = .
generate cert_firstinsec_year = .
forvalues i = 2020(-1)`cy' { //The (-1) means that the loop goes down with one year after starting in 2020
replace cert_firstinsec = cert_level_`i' if cert_level_`i' != . & cert_level_`i' < 6
replace cert_firstinsec_year = `i' if cert_level_`i' != . & cert_level_`i' < 6
}

forvalues i = 2020(-1)`cy' { //The (-1) means that the loop goes down with one year after starting in 2020
gen cert_firstinsec_`i' = cert_level_`i' if cert_level_`i' < 6
replace cert_firstinsec_`i' = . if `i' != cert_firstinsec_year
}

label values cert_firstinsec cert_firstinsec_2* dipl_level
fre cert_firstinsec

// Second Diploma

forvalues u = `cy'(1)2019 {
generate cert_secondinsec_`u' = .
generate cert_thirdinsec_`u' = .
generate cert_fourthinsec_`u' = .
}

local c = 1
generate cert_secondinsec = .
generate cert_secondinsec_year = .
foreach v in bb kb gltl havo vwo {
        local ct = `c' + 1
                forvalues i = `cy'(1)2019 {
                        local t = `i' + 1
                                forvalues u = `t'(1)2019 {
```

```
                                        replace cert_secondinsec = cert_level_`u' if cert_level_`u' == `c' &
cert_firstinsec_year < `u' & cert_level_`u' < 6 & cert_secondinsec == .
                                        replace cert_secondinsec_year = `u' if cert_level_`u' == `c' &
cert_firstinsec_year < `u' & cert_level_`u' < 6 & cert_secondinsec_year == .
                                        replace cert_secondinsec_`u' = cert_level_`u' if cert_level_`u' == `c' &
(cert_firstinsec_year < `u' & cert_firstinsec < 6) & cert_secondinsec_`u' == .
                                        replace cert_secondinsec_`u' = . if `u' != cert_secondinsec_year
                                }
                }
        local c = `c' + 1
}

label values cert_secondinsec cert_secondinsec_2* dipl_level
fre cert_secondinsec
list cert_level_20* cert_firstinsec cert_secondinsec cert_secondinsec_year in 1/250 if cert_secondinsec != .

// Third Diploma

local c = 1
generate cert_thirdinsec = .
generate cert_thirdinsec_year = .
foreach v in bb kb gltl havo vwo {
        local ct = `c' + 1
                forvalues i = `cy'(1)2019 {
                                local t = `i' + 1
                                forvalues u = `t'(1)2019 {
                                        replace cert_thirdinsec = cert_level_`u' if cert_level_`u' == `c' &
cert_secondinsec_year < `u' & cert_level_`u' < 6 & cert_thirdinsec == .
                                        replace cert_thirdinsec_year = `u' if cert_level_`u' == `c' &
cert_secondinsec_year < `u' & cert_level_`u' < 6 & cert_thirdinsec_year == .
                                        replace cert_thirdinsec_`u' = cert_level_`u' if cert_level_`u' == `c' &
(cert_secondinsec_year < `u' & cert_secondinsec < 6) & cert_thirdinsec_`u' == .
                                        replace cert_thirdinsec_`u' = . if `u' != cert_thirdinsec_year
                                        }
                }
        local c = `c' + 1
}

label values cert_thirdinsec dipl_level
fre cert_thirdinsec
list cert_level_20* cert_firstinsec cert_secondinsec cert_thirdinsec cert_thirdinsec_year in 1/100 if
cert_thirdinsec != .

// Fourth Diploma

local c = 1
generate cert_fourthinsec = .
generate cert_fourthinsec_year = .
foreach v in bb kb gltl havo vwo {
        local ct = `c' + 1
                forvalues i = `cy'(1)2019 {
                                local t = `i' + 1
                                forvalues u = `t'(1)2019 {
                                        replace cert_fourthinsec = cert_level_`u' if cert_level_`u' == `c' &
cert_thirdinsec_year < `u' & cert_level_`u' < 6 & cert_fourthinsec == .
                                        replace cert_fourthinsec_year = `u' if cert_level_`u' == `c' &
cert_thirdinsec_year < `u' & cert_level_`u' < 6 & cert_fourthinsec_year == .
                                        replace cert_fourthinsec_`u' = cert_level_`u' if cert_level_`u' == `c' &
(cert_thirdinsec_year < `u' & cert_thirdinsec < 6) & cert_fourthinsec_`u' == .
                                        replace cert_fourthinsec_`u' = . if `u' != cert_fourthinsec_year
                                        }
                }
        local c = `c' + 1
}

label values cert_fourthinsec dipl_level
fre cert_fourthinsec
list cert_level_20* cert_firstinsec cert_secondinsec cert_thirdinsec cert_thirdinsec_year cert_fourthinsec
cert_fourthinsec_year in 1/100 if cert_thirdinsec != .

* Highest in secondary education
egen cert_highestinsec = rowmax(cert_firstinsec cert_secondinsec cert_thirdinsec cert_fourthinsec)

egen cert_highestinsec_year = rowmax(cert_firstinsec_year cert_secondinsec_year cert_thirdinsec_year
cert_fourthinsec_year)
label values cert_highestinsec dipl_level
list cert_level_20* cert_firstinsec cert_secondinsec cert_thirdinsec cert_fourthinsec cert_highestinsec in 1/100
```

```
fre cert_firstinsec cert_secondinsec cert_thirdinsec cert_fourthinsec cert_highestinsec

tab cert_firstinsec cert_secondinsec
tab cert_secondinsec cert_thirdinsec
tab cert_thirdinsec cert_fourthinsec
tab cert_firstinsec cert_highestinsec

list cert_level_20* cert_firstinsec cert_firstinsec_year cert_secondinsec cert_secondinsec_year cert_thirdinsec
cert_thirdinsec_year cert_highestinsec in 1/250 if cert_firstinsec != . & cert_secondinsec != .
list cert_level_20* cert_firstinsec cert_firstinsec_year cert_secondinsec cert_secondinsec_year cert_thirdinsec
cert_thirdinsec_year cert_highestinsec in 1/250 if cert_secondinsec != . & cert_thirdinsec != .


* Grade Ladder Equivalent
foreach loop in first second third fourth {
recode cert_`loop'insec
(1=6)(2=7)(3=8)(4=10)(5=12)(6=6)(7=8)(8=10)(9=12)(10=12)(11=14)(12=15)(13=15)(14=16)(15=18),
generate(cert_`loop'insec_ladder)
}

fre cert_highestinsec
recode cert_highestinsec
(1=6)(2=7)(3=8)(4=10)(5=12)(6=6)(7=8)(8=10)(9=12)(10=12)(11=14)(12=15)(13=15)(14=16)(15=18),
generate(ladder_cert_highestinsec)
fre ladder_cert_highestinsec


*** School swap

destring vobrinvest_*, replace

forvalues i = `cy'(1)2019 {
       generate schoolswap_`i' = .
       local t = `i' + 1
       replace schoolswap_`i' = 0 if (brin_crypt_`i' == brin_crypt_`t' & vobrinvest_`i' == vobrinvest_`t')
       replace schoolswap_`i' = 1 if (brin_crypt_`i' == brin_crypt_`t' & vobrinvest_`i' != vobrinvest_`t')
       replace schoolswap_`i' = 2 if (brin_crypt_`i' != brin_crypt_`t' & vobrinvest_`i' != vobrinvest_`t')
       replace schoolswap_`i' = 3 if ((brin_crypt_`i' != "" & vobrinvest_`i' != .) & (brin_crypt_`t' == "" &
vobrinvest_`t' == .))
       replace schoolswap_`i' = . if ((brin_crypt_`i' == "" & vobrinvest_`i' == .) & (brin_crypt_`t' == "" &
vobrinvest_`t' == .))
}

forvalues i = 2020(1)2030 {
       generate schoolswap_`i' = .
}

// Correction for splitting/merging schools
forvalues i = `cy'(1)2019 {
generate pc_swap_dum_`i' = 0
replace pc_swap_dum_`i' = 1 if (schoolswap_`i' == 1 | schoolswap_`i' == 2)
bys brin_crypt_`i' vobrinvest_`i': egen aux_swap_perc_`i' = pc(pc_swap_dum_`i')

generate schoolswap_adjust_`i' = schoolswap_`i'
replace schoolswap_adjust_`i' = 0 if (aux_swap_perc_`i' >=50 & aux_swap_perc_`i' <= 100)
}

forvalues i = 2020(1)2027 {
generate schoolswap_adjust_`i' = .
}
order schoolswap_adjust_*, last

tab schoolswap_`cy' schoolswap_adjust_`cy'

local stop_bbkb = `cy' + 4
egen schoolswap_bbkb = anymatch(schoolswap_adjust_`cy' - schoolswap_adjust_`stop_bbkb'), values(1 2)
egen schoolswap1_bbkb = anymatch(schoolswap_adjust_`cy' - schoolswap_adjust_`stop_bbkb'), values(2)
local stop_gltl = `cy' + 5
egen schoolswap_gltl = anymatch(schoolswap_adjust_`cy' - schoolswap_adjust_`stop_gltl'), values(1 2)
egen schoolswap1_gltl = anymatch(schoolswap_adjust_`cy' - schoolswap_adjust_`stop_gltl'), values(2)
local stop_havovwo = `cy' + 6
egen schoolswap_havovwo = anymatch(schoolswap_adjust_`cy' - schoolswap_adjust_`stop_havovwo'), values(1 2)
egen schoolswap1_havovwo = anymatch(schoolswap_adjust_`cy' - schoolswap_adjust_`stop_havovwo'), values(2)

generate schoolswap = .
replace schoolswap = schoolswap_bbkb if group_vmbobb_`cy' == 1 | group_vmbokb_`cy' == 1
```

```
replace schoolswap = schoolswap_gltl if group_vmbogt_`cy' == 1
replace schoolswap = schoolswap_havovwo if group_havo_`cy' == 1 | group_vwo_`cy' == 1

generate schoolswap1 = .
replace schoolswap1 = schoolswap1_bbkb if group_vmbobb_`cy' == 1 | group_vmbokb_`cy' == 1
replace schoolswap1 = schoolswap1_gltl if group_vmbogt_`cy' == 1
replace schoolswap1 = schoolswap1_havovwo if group_havo_`cy' == 1 | group_vwo_`cy' == 1

label define schoolwissel_lab 0 "No school swap next year" 1 "School swap within BRIN next year" 2 "School swap
across BRIN next year" 3 "Out of system next year"
label values schoolswap_20* schoolswap_adjust_20* schoolwissel_lab

fre schoolswap schoolswap1

list brin_crypt_2011 vobrinvest_2011 brin_crypt_2012 vobrinvest_2012 brin_crypt_2013 vobrinvest_2013
brin_crypt_2014 vobrinvest_2014 brin_crypt_2015 vobrinvest_2015 brin_crypt_2016 vobrinvest_2016 ///
brin_crypt_2017 vobrinvest_2017 brin_crypt_2018 vobrinvest_2018 brin_crypt_2019 vobrinvest_2019 schoolswap_20*
in 25/75

fre schoolswap

*****************************************************************************************************************
* Prep. Flex. Indic.
*****************************************************************************************************************

**************************** retention
* Looking overall - all levels considered
local j = `cy' + 1
forvalues i = `j'(1)2020 {
        generate retention_`i' = 0 if voleerjaar_`i' != .
        local t = `i' - 1
        replace retention_`i' = 1 if voleerjaar_`i' == voleerjaar_`t' & voleerjaar_`i' != . & voleerjaar_`t' !=
.
}
fre retention_*

list retention_* voleerjaar_* in 1/100

egen retention = anycount(retention_*), values(1)
fre retention

list retention voleerjaar_* in 1/1000 if retention == 2

* Looking at same level
generate lastyear = . // to differentiate between nominal duration of level; if heterogeneous the longer takes
precdenet over the shorter one
replace lastyear = startjaar + 4 if (group_vmbobb_`cy' == 1 | group_vmbokb_`cy' == 1 | group_vmbogt_`cy' == 1)
replace lastyear = startjaar + 5 if group_havo_`cy' == 1
replace lastyear = startjaar + 6 if group_vwo_`cy' == 1
fre lastyear

local j = `cy' + 1
forvalues i = `j'(1)2020 {
        generate retention_samelevel_`i' = 0 if voleerjaar_`i' != .
        local t = `i' - 1
        replace retention_samelevel_`i' = 1 if voleerjaar_`i' == voleerjaar_`t' & ((educ_level_insp_`i' ==
educ_level_insp_`t') | educ_level_insp_`i' == 9) & voleerjaar_`i' != .
        replace retention_samelevel_`i' = . if lastyear < `i' & 2020 >= `i'
        }
fre retention_samelevel_*

egen retention_samelevel = anymatch(retention_samelevel_*), values(1)
fre retention_samelevel
fre retention retention_samelevel
list retention retention_samelevel voleerjaar_* in 1/100
list retention retention_samelevel voleerjaar_* educ_level_insp_* in 1/100, nolabel

tabstat retention_samelevel_2*, by(lastyear)

**************************** acceleration
* Looking overall - all levels considered
local j = `cy' + 1
forvalues i = `j'(1)2020 {
        generate acceleration_`i' = 0 if voleerjaar_`i' != .
        local t = `i' - 1
        generate temp = voleerjaar_`i' - voleerjaar_`t'
        replace acceleration_`i' = 1 if (temp > 1 & temp < 5) & voleerjaar_`i' != . & voleerjaar_`t' != .
```

```
	drop temp
}
fre acceleration_*

egen acceleration = anycount(acceleration_*), values(1)
fre acceleration

list acceleration voleerjaar_* if acceleration == 1

* Looking at same level
local j = `cy' + 1
forvalues i = `j'(1)2020 {
	generate acceleration_samelevel_`i' = 0 if voleerjaar_`i' != .
	local t = `i' - 1
	generate temp = voleerjaar_`i' - voleerjaar_`t'
	replace acceleration_samelevel_`i' = 1 if (temp > 1 & temp < 5) & ((educ_level_insp_`i' ==
educ_level_insp_`t') | educ_level_insp_`i' == 9) & voleerjaar_`i' != .
	drop temp
}
fre acceleration_samelevel_*

egen acceleration_samelevel = anymatch(acceleration_samelevel_*), values(1)
fre acceleration_samelevel

fre acceleration acceleration_samelevel

list acceleration acceleration_samelevel voleerjaar_* if acceleration_samelevel == 1

list acceleration acceleration_samelevel voleerjaar_* educ_level_insp_* if acceleration_samelevel == 1


************************* Heteregeneous classes
* Dichotomous variable

egen hetero_year1 = anymatch(iltcode_`cy') if voleerjaar_`cy' == 1, values(11 15 16 22 23 24 33 45 46 1393 1915)
tab educ_level_`cy' hetero_year1
fre iltcode_`cy' if educ_level_`cy' == 5 & hetero_year1 == 0

local j = `cy' + 1
egen hetero_year2 = anymatch(iltcode_`j') if voleerjaar_`j' == 2, values(11 15 16 22 23 24 33 45 46 1393 1915)
tab educ_level_`j' hetero_year2
fre iltcode_`j' if educ_level_`j' == 5 & hetero_year2 == 0

** To get a full loop, we "need" the 2021 iltcode and voleerjaar
gen iltcode_2021 = .
gen voleerjaar_2021 = .

local k = `j' + 1
egen hetero_year3 = anymatch(iltcode_`k') if voleerjaar_`k' == 3, values(11 15 16 22 23 24 33 45 46 1393 1915)
tab educ_level_`k' hetero_year3
fre iltcode_`k' if educ_level_`k' == 5 & hetero_year3 == 0

fre hetero_year1 hetero_year2 hetero_year3

* Level variables
generate hetero_level_year1 = 0 if voleerjaar_`cy' == 1 & hetero_year1 == 0
replace hetero_level_year1 = 1 if voleerjaar_`cy' == 1 & iltcode_`cy' == 33
replace hetero_level_year1 = 1 if voleerjaar_`cy' == 1 & iltcode_`cy' == 45
replace hetero_level_year1 = 2 if voleerjaar_`cy' == 1 & iltcode_`cy' == 11
replace hetero_level_year1 = 3 if voleerjaar_`cy' == 1 & iltcode_`cy' == 15
replace hetero_level_year1 = 4 if voleerjaar_`cy' == 1 & iltcode_`cy' == 23
replace hetero_level_year1 = 4 if voleerjaar_`cy' == 1 & iltcode_`cy' == 46
replace hetero_level_year1 = 4 if voleerjaar_`cy' == 1 & iltcode_`cy' == 1393
replace hetero_level_year1 = 4 if voleerjaar_`cy' == 1 & iltcode_`cy' == 1915
replace hetero_level_year1 = 5 if voleerjaar_`cy' == 1 & iltcode_`cy' == 16
replace hetero_level_year1 = 6 if voleerjaar_`cy' == 1 & iltcode_`cy' == 22
replace hetero_level_year1 = 7 if voleerjaar_`cy' == 1 & iltcode_`cy' == 24

generate hetero_level_year2 = 0 if voleerjaar_`j' == 2 & hetero_year2 == 0
replace hetero_level_year2 = 1 if voleerjaar_`j' == 2 & iltcode_`j' == 33
replace hetero_level_year2 = 1 if voleerjaar_`j' == 2 & iltcode_`j' == 45
replace hetero_level_year2 = 2 if voleerjaar_`j' == 2 & iltcode_`j' == 11
replace hetero_level_year2 = 3 if voleerjaar_`j' == 2 & iltcode_`j' == 15
replace hetero_level_year2 = 4 if voleerjaar_`j' == 2 & iltcode_`j' == 23
replace hetero_level_year2 = 4 if voleerjaar_`j' == 2 & iltcode_`j' == 46
replace hetero_level_year2 = 4 if voleerjaar_`j' == 2 & iltcode_`j' == 1393
replace hetero_level_year2 = 4 if voleerjaar_`j' == 2 & iltcode_`j' == 1915
```

```
replace hetero_level_year2 = 5 if voleerjaar_`j' == 2 & iltcode_`j' == 16
replace hetero_level_year2 = 6 if voleerjaar_`j' == 2 & iltcode_`j' == 22
replace hetero_level_year2 = 7 if voleerjaar_`j' == 2 & iltcode_`j' == 24

generate hetero_level_year3 = 0 if voleerjaar_`k' == 3 & hetero_year3 == 0
replace hetero_level_year3 = 1 if voleerjaar_`k' == 3 & iltcode_`k' == 33
replace hetero_level_year3 = 1 if voleerjaar_`k' == 3 & iltcode_`k' == 45
replace hetero_level_year3 = 2 if voleerjaar_`k' == 3 & iltcode_`k' == 11
replace hetero_level_year3 = 3 if voleerjaar_`k' == 3 & iltcode_`k' == 15
replace hetero_level_year3 = 4 if voleerjaar_`k' == 3 & iltcode_`k' == 23
replace hetero_level_year3 = 4 if voleerjaar_`k' == 3 & iltcode_`k' == 46
replace hetero_level_year3 = 4 if voleerjaar_`k' == 3 & iltcode_`k' == 1393
replace hetero_level_year3 = 4 if voleerjaar_`k' == 3 & iltcode_`k' == 1915
replace hetero_level_year3 = 5 if voleerjaar_`k' == 3 & iltcode_`k' == 16
replace hetero_level_year3 = 6 if voleerjaar_`k' == 3 & iltcode_`k' == 22
replace hetero_level_year3 = 7 if voleerjaar_`k' == 3 & iltcode_`k' == 24

label define hetero_level_lab 0 "No heteterogeneous class" 1 "vmbo bb/kb" 2 "vmbo gt/havo" 3 "havo/vwo" ///
4 "vmbo bb/kb/gt" 5 "gt/havo/vwo" 6 "vmbo bb/kb/gt/havo"  7 "vmbo bb/kb/gt/havo/vwo"
label values hetero_level_year1 hetero_level_lab
label values hetero_level_year2 hetero_level_lab
label values hetero_level_year3 hetero_level_lab

fre hetero_level_year1 hetero_level_year2 hetero_level_year3
tabm hetero_level_year1 hetero_level_year2 hetero_level_year3, trans

**************************** mobility
********* FREE METHOD (IF IN COMPREHENSIVE CLASS ALL SUB-TRACKS ARE GOLDEN ROUTE)

* 1 "PO" 2 "SO" 3 "praktijkonderwijs" 4 "vmbo bb" 5 "vmbo bb/kb" 6 "vmbo kb" 7 "vmbo gl" 8 "vmbo gl/tl" 9 "vmbo
gl/tl/havo" 10 "vmbo gl/tl/havo/vwo" 11 "vmbo tl" 12 "vmbo" 13 "vmbo/havo" ///
* 14 "vmbo/havo/vwo" 15 "havo" 16 "havo/vwo" 17 "vwo" 18 "mbo 1" 19 "mbo 2" 20 "mbo 3" 21 "mbo 4" 22 "hbo
associate degree" 23 "hbo bachelor" 24 "hbo master" 25 "wo bachelor" 26 "wo master"  27 "wo post master"

****************************  normal next level? year on year
/// Nominal time frame for the mobility. If combination the longest within the combination counts.

forvalues i = `cy'(1)2027 {
               generate next_year_level_`i' = .
}

        local end = `cy' + 3 // 4 years
               forvalues i = `cy'(1)`end' {
                      local t = `i' + 1

                                        replace next_year_level_`i' = 1 if educ_level_`i' == 1 & (educ_level_`t'
>= 1 & educ_level_`t' <= 17)

                                        replace next_year_level_`i' = 0 if educ_level_`i' == 2 & (educ_level_`t'
== 1)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 2 & (educ_level_`t'
== 2)
                                        replace next_year_level_`i' = 2 if educ_level_`i' == 2 & (educ_level_`t'
>= 3 & educ_level_`t' <= 17)

                                        replace next_year_level_`i' = 0 if educ_level_`i' == 3 & (educ_level_`t'
>= 0 & educ_level_`t' <= 2)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 3 & (educ_level_`t'
== 3)
                                        replace next_year_level_`i' = 2 if educ_level_`i' == 3 & (educ_level_`t'
>= 4 & educ_level_`t' <= 17)

                                        replace next_year_level_`i' = 0 if educ_level_`i' == 4 & (educ_level_`t'
>= 0 & educ_level_`t' <= 3)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 4 & (educ_level_`t'
== 4 | educ_level_`t' == 5 | educ_level_`t' == 12 | educ_level_`t' == 13 | educ_level_`t' == 14)
                                        replace next_year_level_`i' = 2 if educ_level_`i' == 4 & ((educ_level_`t'
>= 6 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 & educ_level_`t' <= 17))

                                        replace next_year_level_`i' = 0 if educ_level_`i' == 5 & (educ_level_`t'
>= 0 & educ_level_`t' <= 3)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 5 & (educ_level_`t'
== 4 | educ_level_`t' == 5 | educ_level_`t' == 6 |educ_level_`t' == 12 | educ_level_`t' == 13 | educ_level_`t'
== 14)
                                        replace next_year_level_`i' = 2 if educ_level_`i' == 5 & ((educ_level_`t'
>= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 & educ_level_`t' <= 17))
```

```
                                        replace next_year_level_`i' = 0 if educ_level_`i' == 6 & (educ_level_`t'
>= 0 & educ_level_`t' <= 4)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 6 & (educ_level_`t'
== 5 | educ_level_`t' == 6 |educ_level_`t' == 12 | educ_level_`t' == 13 | educ_level_`t' == 14)
                                        replace next_year_level_`i' = 2 if educ_level_`i' == 6 & ((educ_level_`t'
>= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 & educ_level_`t' <= 17))

                                        replace next_year_level_`i' = 0 if (educ_level_`i' == 7 | educ_level_`i'
== 8 | educ_level_`i' == 11) & (educ_level_`t' >= 0 & educ_level_`t' <= 6)
                                        replace next_year_level_`i' = 1 if (educ_level_`i' == 7 | educ_level_`i'
== 8 | educ_level_`i' == 11) & (educ_level_`t' >= 7 & educ_level_`t' <= 14)
                                        replace next_year_level_`i' = 2 if (educ_level_`i' == 7 | educ_level_`i'
== 8 | educ_level_`i' == 11) & (educ_level_`t' >= 15 & educ_level_`t' <= 17)

                                        replace next_year_level_`i' = 0 if educ_level_`i' == 12 & (educ_level_`t'
>= 0 & educ_level_`t' <= 3)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 12 & (educ_level_`t'
>= 4 & educ_level_`t' <= 14)
                                        replace next_year_level_`i' = 2 if educ_level_`i' == 12 & (educ_level_`t'
>= 15 & educ_level_`t' <= 17)
        }

        local end = `cy' + 4 // 5 years
                forvalues i = `cy'(1)`end' {
                        local t = `i' + 1

                                        replace next_year_level_`i' = 0 if educ_level_`i' == 9 & (educ_level_`t'
>= 0 & educ_level_`t' <= 6)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 9 & (educ_level_`t'
>= 7 & educ_level_`t' <= 16)
                                        replace next_year_level_`i' = 2 if educ_level_`i' == 9 & (educ_level_`t'
== 17)

                                        replace next_year_level_`i' = 0 if educ_level_`i' == 10 & (educ_level_`t'
>= 0 & educ_level_`t' <= 6)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 10 & (educ_level_`t'
>= 7 & educ_level_`t' <= 17)

                                        replace next_year_level_`i' = 0 if educ_level_`i' == 13 & (educ_level_`t'
>= 0 & educ_level_`t' <= 3)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 13 & (educ_level_`t'
>= 4 & educ_level_`t' <= 16)
                                        replace next_year_level_`i' = 2 if educ_level_`i' == 13 & (educ_level_`t'
== 17)

                                        replace next_year_level_`i' = 0 if educ_level_`i' == 14 & (educ_level_`t'
>= 0 & educ_level_`t' <= 3)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 14 & (educ_level_`t'
>= 4 & educ_level_`t' <= 17)

                                        replace next_year_level_`i' = 0 if educ_level_`i' == 15 & ((educ_level_`t'
>= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 15 & (educ_level_`t'
== 9 | educ_level_`t' == 10 | (educ_level_`t' >= 13 & educ_level_`t' <= 16))
                                        replace next_year_level_`i' = 2 if educ_level_`i' == 15 & (educ_level_`t'
== 17)
        }

        local end = `cy' + 5 // 6 years
                forvalues i = `cy'(1)`end' {
                        local t = `i' + 1
                                        replace next_year_level_`i' = 0 if educ_level_`i' == 16 & ((educ_level_`t'
>= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 16 & (educ_level_`t'
== 9 | educ_level_`t' == 10 | (educ_level_`t' >= 13 & educ_level_`t' <= 17))

                                        replace next_year_level_`i' = 0 if educ_level_`i' == 17 & ((educ_level_`t'
>= 0 & educ_level_`t' <= 9) | educ_level_`t' == 11 | educ_level_`t' == 12 | educ_level_`t' == 13 |
educ_level_`t' == 15)
                                        replace next_year_level_`i' = 1 if educ_level_`i' == 17 & (educ_level_`t'
== 10 | educ_level_`t' == 14 | educ_level_`t' == 16 | educ_level_`t' == 17)
                }

label define highlow_level_lab 0 "Downward mobility" 1 "Golden Route" 2 "Upward mobility"
label values next_year_level_* highlow_level_lab

fre next_year_level_*
```

```
list next_year_level_* educ_level_* in 1/50

* Downward - free method
egen downward_free = anymatch(next_year_level_20*), values(0)
fre downward_free
egen downward_nr_free = anycount(next_year_level_20*), values(0)
fre downward_nr_free

* Upward - free method
egen upward_free = anymatch(next_year_level_20*), values(2)
fre upward_free
egen upward_nr_free = anycount(next_year_level_20*), values(2)
fre upward_nr_free

* highest certificate higher or lower than recommendation
// if multiple recommendations are possible or recommendations not from 2010, the last one is taken (hence the i
loop)
// first certificate over the years up to 2019 (u(1)2019) because of the condition & rec_highest_hl_xx == . in
the if statement
// rules are FREE (eg. if in the name --> equal)
// highest certificate in secondary education

forvalues u = `cy'(1)2019 {
generate cert_level_secondary_`u' = cert_level_`u' if cert_level_`u' <=5
}

        local ty = `cy' - 1
        *vso/pro
        generate rec_high_free_hl_vsopro = .
                forvalues i = `ty'(1)2019 {
                replace rec_high_free_hl_vsopro = 3 if recommendation_`i' == 1 & rec_high_free_hl_vsopro == .
                        local t = `i' + 1
                                forvalues u = `t'(1)2019 {
                                        replace rec_high_free_hl_vsopro = 2 if recommendation_`i' == 1 &
(cert_level_secondary_`u' >= 1 & cert_level_secondary_`u' <= 5)
                                }
                        }

        fre rec_high_free_hl_vsopro

        *bb
        generate rec_high_free_hl_bb = .
                forvalues i = `ty'(1)2019 {
                replace rec_high_free_hl_bb = 3 if recommendation_`i' == 2 & rec_high_free_hl_bb == .
                        local t = `i' + 1
                                forvalues u = `t'(1)2019 {
                                        replace rec_high_free_hl_bb = 1 if recommendation_`i' == 2 &
(cert_level_secondary_`u' ==  1)
                                        replace rec_high_free_hl_bb = 2 if recommendation_`i' == 2 &
(cert_level_secondary_`u' >=  2 & cert_level_secondary_`u' <= 5)
                                }
                        }

        fre rec_high_free_hl_bb

        *bb/kb
        generate rec_high_free_hl_bbkb = .
                forvalues i = `ty'(1)2019 {
                replace rec_high_free_hl_bbkb = 3 if recommendation_`i' == 3 & rec_high_free_hl_bbkb == .
                        local t = `i' + 1
                                forvalues u = `t'(1)2019 {
                                        replace rec_high_free_hl_bbkb = 1 if recommendation_`i' == 3 &
(cert_level_secondary_`u' ==  1 | cert_level_secondary_`u' ==  2 )
                                        replace rec_high_free_hl_bbkb = 2 if recommendation_`i' == 3 &
(cert_level_secondary_`u' >=  3 & cert_level_secondary_`u' <= 5)
                                }
                        }
        fre rec_high_free_hl_bbkb

        *bb/kb/gt
        generate rec_high_free_hl_bbkbgt = .
                forvalues i = `ty'(1)2019 {
                replace rec_high_free_hl_bbkbgt = 3 if recommendation_`i' == 4 & rec_high_free_hl_bbkbgt == .
                        local t = `i' + 1
                                forvalues u = `t'(1)2019 {
```

```
                                        replace rec_high_free_hl_bbkbgt = 1 if recommendation_`i' == 4 &
(cert_level_secondary_`u' >= 1 & cert_level_secondary_`u' <= 3)
                                        replace rec_high_free_hl_bbkbgt = 2 if recommendation_`i' == 4 &
(cert_level_secondary_`u' >= 4 & cert_level_secondary_`u' <= 5)
                                }
                        }

        fre rec_high_free_hl_bbkbgt

        *kb
                generate rec_high_free_hl_kb = .
                        forvalues i = `ty'(1)2019 {
                        replace rec_high_free_hl_kb = 3 if recommendation_`i' == 5 & rec_high_free_hl_kb == .
                                local t = `i' + 1
                                        forvalues u = `t'(1)2019 {
                                                replace rec_high_free_hl_kb = 0 if recommendation_`i' == 5 &
(cert_level_secondary_`u' == 1)
                                                replace rec_high_free_hl_kb = 1 if recommendation_`i' == 5 &
(cert_level_secondary_`u' == 2)
                                                replace rec_high_free_hl_kb = 2 if recommendation_`i' == 5 &
(cert_level_secondary_`u' >= 3 & cert_level_secondary_`u' <= 5)
                                        }
                        }
        fre rec_high_free_hl_kb

        *kbgt
                generate rec_high_free_hl_kbgt = .
                        forvalues i = `ty'(1)2019 {
                        replace rec_high_free_hl_kbgt = 3 if recommendation_`i' == 6        &
rec_high_free_hl_kbgt == .
                                local t = `i' + 1
                                        forvalues u = `t'(1)2019 {
                                                replace rec_high_free_hl_kbgt = 0 if recommendation_`i' == 6 &
(cert_level_secondary_`u' == 1)
                                                replace rec_high_free_hl_kbgt = 1 if recommendation_`i' == 6 &
(cert_level_secondary_`u' == 2 |  cert_level_secondary_`u' == 3)
                                                replace rec_high_free_hl_kbgt = 2 if recommendation_`i' == 6 &
(cert_level_secondary_`u' >= 4 & cert_level_secondary_`u' <= 5)
                                        }
                        }
        fre rec_high_free_hl_kbgt

        *kbgthavo
                generate rec_high_free_hl_kbgthavo = .
                        forvalues i = `ty'(1)2019 {
                        replace rec_high_free_hl_kbgthavo = 3 if recommendation_`i' == 7    &
rec_high_free_hl_kbgthavo == .
                                local t = `i' + 1
                                        forvalues u = `t'(1)2019 {
                                                replace rec_high_free_hl_kbgthavo = 0 if recommendation_`i' == 7 &
(cert_level_secondary_`u' == 1)
                                                replace rec_high_free_hl_kbgthavo = 1 if recommendation_`i' == 7 &
(cert_level_secondary_`u' >= 2 & cert_level_secondary_`u' <= 4)
                                                replace rec_high_free_hl_kbgthavo = 2 if recommendation_`i' == 7 &
(cert_level_secondary_`u' == 5)
                                        }
                        }
        fre rec_high_free_hl_kbgthavo

        *gt
                generate rec_high_free_hl_gt = .
                        forvalues i = `ty'(1)2019 {
                        replace rec_high_free_hl_gt = 3 if recommendation_`i' == 8 & rec_high_free_hl_gt == .

                                local t = `i' + 1
                                        forvalues u = `t'(1)2019 {
                                                replace rec_high_free_hl_gt = 0 if recommendation_`i' == 8 &
(cert_level_secondary_`u' == 1 | cert_level_secondary_`u' == 2)
                                                replace rec_high_free_hl_gt = 1 if recommendation_`i' == 8 &
(cert_level_secondary_`u' == 3)
                                                replace rec_high_free_hl_gt = 2 if recommendation_`i' == 8 &
(cert_level_secondary_`u' >= 4 & cert_level_secondary_`u' <= 5)
                                        }
                        }
        fre rec_high_free_hl_gt

        *gthavo
```

```
		generate rec_high_free_hl_gthavo = .
			forvalues i = `ty'(1)2019 {
			replace rec_high_free_hl_gthavo = 3 if recommendation_`i' == 9 & rec_high_free_hl_gthavo
== .
				local t = `i' + 1
					forvalues u = `t'(1)2019 {
						replace rec_high_free_hl_gthavo = 0 if recommendation_`i' == 9 &
(cert_level_secondary_`u' == 1 | cert_level_secondary_`u' == 2)
						replace rec_high_free_hl_gthavo = 1 if recommendation_`i' == 9 &
(cert_level_secondary_`u' == 3 | cert_level_secondary_`u' == 4)
						replace rec_high_free_hl_gthavo = 2 if recommendation_`i' == 9 &
(cert_level_secondary_`u' <= 5)
					}
			}
	fre rec_high_free_hl_gthavo

	*gthavovwo
		generate rec_high_free_hl_gthavovwo = .
			forvalues i = `ty'(1)2019 {
			replace rec_high_free_hl_gthavovwo = 3 if recommendation_`i' == 10 &
rec_high_free_hl_gthavovwo == .
				local t = `i' + 1
					forvalues u = `t'(1)2019 {
						replace rec_high_free_hl_gthavovwo = 0 if recommendation_`i' == 10
& (cert_level_secondary_`u' >= 1 & cert_level_secondary_`u' <= 2)
						replace rec_high_free_hl_gthavovwo = 1 if recommendation_`i' == 10
& (cert_level_secondary_`u' >= 3 & cert_level_secondary_`u' <= 5)
					}
			}
	fre rec_high_free_hl_gthavovwo

	*havo
		generate rec_high_free_hl_havo = .
			forvalues i = `ty'(1)2019 {
			replace rec_high_free_hl_havo = 3 if recommendation_`i' == 11 & rec_high_free_hl_havo ==
.
				local t = `i' + 1
					forvalues u = `t'(1)2019 {
						replace rec_high_free_hl_havo = 0 if recommendation_`i' == 11 &
(cert_level_secondary_`u' >= 1 & cert_level_secondary_`u' <= 3)
						replace rec_high_free_hl_havo = 1 if recommendation_`i' == 11 &
(cert_level_secondary_`u' == 4)
						replace rec_high_free_hl_havo = 2 if recommendation_`i' == 11 &
(cert_level_secondary_`u' == 5)
					}
			}
	fre rec_high_free_hl_havo

	*havovwo
		generate rec_high_free_hl_havovwo = .
			forvalues i = `ty'(1)2019 {
			replace rec_high_free_hl_havovwo = 3 if recommendation_`i' == 12 &
rec_high_free_hl_havovwo == .
				local t = `i' + 1
					forvalues u = `t'(1)2019 {
						replace rec_high_free_hl_havovwo = 0 if recommendation_`i' == 12 &
(cert_level_secondary_`u' >= 1 & cert_level_secondary_`u' <= 3)
						replace rec_high_free_hl_havovwo = 1 if recommendation_`i' == 12 &
(cert_level_secondary_`u' == 4 | cert_level_secondary_`u' == 5)
					}
			}
	fre rec_high_free_hl_havovwo

	*vwo
		generate rec_high_free_hl_vwo = .
			forvalues i = `ty'(1)2019 {
			replace rec_high_free_hl_vwo = 3 if recommendation_`i' == 13 & rec_high_free_hl_vwo == .
				local t = `i' + 1
					forvalues u = `t'(1)2019 {
						replace rec_high_free_hl_vwo = 0 if recommendation_`i' == 13 &
(cert_level_secondary_`u' >= 1 & cert_level_secondary_`u' <= 4)
						replace rec_high_free_hl_vwo = 1 if recommendation_`i' == 13 &
(cert_level_secondary_`u' == 5)
					}
			}
	fre rec_high_free_hl_vwo
```

```
	* overall
	egen rec_cert_free_highest = rowfirst(rec_high_free_hl_vsopro rec_high_free_hl_bb rec_high_free_hl_bbkb
rec_high_free_hl_bbkbgt rec_high_free_hl_kb rec_high_free_hl_kbgt rec_high_free_hl_kbgthavo rec_high_free_hl_gt
///
	rec_high_free_hl_gthavo rec_high_free_hl_gthavovwo rec_high_free_hl_havo rec_high_free_hl_havovwo
rec_high_free_hl_vwo)
	fre rec_cert_free_highest

	label values rec_high_free_hl_vsopro rec_high_free_hl_bb rec_high_free_hl_bbkb rec_high_free_hl_bbkbgt
rec_high_free_hl_kb rec_high_free_hl_kbgt rec_high_free_hl_kbgthavo rec_high_free_hl_gt ///
	rec_high_free_hl_gthavo rec_high_free_hl_gthavovwo rec_high_free_hl_havo rec_high_free_hl_havovwo
rec_high_free_hl_vwo rec_cert_free_highest highlow_rec_highest_lab

* Total STACK
destring brinvestexamvo_*, replace

generate stack_year_first = .
generate str32 brin_crypt_stack_first = ""
generate vobrinvest_stack_first = .

generate stack_year_second = .
generate str32 brin_crypt_stack_second = ""
generate vobrinvest_stack_second = .

generate stack_year_third = .
generate str32 brin_crypt_stack_third = ""
generate vobrinvest_stack_third = .

foreach move in first second third {
	forvalues i = `cy'(1)2019 {
		local t = `i' + 1
		local end = `cy' + 5 //total of 6 years
			forvalues u = `t'(1)`end' {
				replace stack_year_`move' = `u' if (cert_level_`u' >= 2 & cert_level_`u' <= 5) &
(cert_`move'insec_`i' == 1) & stack_year_`move' == .
				replace stack_year_`move' = `u' if (cert_level_`u' >= 3 & cert_level_`u' <= 5) &
(cert_`move'insec_`i' == 2) & stack_year_`move' == .

				replace brin_crypt_stack_`move' = brinexamvo_crypt_`u' if (cert_level_`u' >= 2 &
cert_level_`u' <= 5) & (cert_`move'insec_`i' == 1) & brin_crypt_stack_`move' == ""
				replace brin_crypt_stack_`move' = brinexamvo_crypt_`u' if (cert_level_`u' >= 3 &
cert_level_`u' <= 5) & (cert_`move'insec_`i' == 2) & brin_crypt_stack_`move' == ""

				replace vobrinvest_stack_`move' = brinvestexamvo_`u' if  (cert_level_`u' >= 2 &
cert_level_`u' <= 5) & (cert_`move'insec_`i' == 1) & vobrinvest_stack_`move' == .
				replace vobrinvest_stack_`move' = brinvestexamvo_`u' if (cert_level_`u' >= 3 &
cert_level_`u' <= 5) & (cert_`move'insec_`i' == 2) & vobrinvest_stack_`move' == .
			}
		local end = `cy' + 6 // total of 7 years
			forvalues u = `t'(1)`end' {
				*gltl
				replace stack_year_`move' = `u' if (cert_level_`u' == 4 | cert_level_`u' == 5) &
(cert_`move'insec_`i' == 3) & stack_year_`move' == .
				replace brin_crypt_stack_`move' = brinexamvo_crypt_`u' if (cert_level_`u' == 4 |
cert_level_`u' == 5) & (cert_`move'insec_`i' == 3) & brin_crypt_stack_`move' == ""
				replace vobrinvest_stack_`move' = brinvestexamvo_`u' if (cert_level_`u' == 4 |
cert_level_`u' == 5) & (cert_`move'insec_`i' == 3) & vobrinvest_stack_`move' == .
			}
		local end = `cy' + 7 // total of 8 years
			forvalues u = `t'(1)`end' {
				*havo
				replace stack_year_`move' = `u' if cert_level_`u' == 5 & cert_`move'insec_`i' == 4
& stack_year_`move' == .
				replace brin_crypt_stack_`move' = brinexamvo_crypt_`u' if cert_level_`u' == 5 &
cert_`move'insec_`i' == 4 &  brin_crypt_stack_`move' == ""
				replace vobrinvest_stack_`move' = brinvestexamvo_`u' if cert_level_`u' == 5 &
cert_`move'insec_`i' == 4 &  vobrinvest_stack_`move' == .
			}
		}
}

* Within stack_w
generate stack_w_year_first = .
generate str32 brin_crypt_stack_w_first = ""
generate vobrinvest_stack_w_first = .

generate stack_w_year_second = .
```

```
generate str32 brin_crypt_stack_w_second = ""
generate vobrinvest_stack_w_second = .

generate stack_w_year_third = .
generate str32 brin_crypt_stack_w_third = ""
generate vobrinvest_stack_w_third = .

foreach move in first second third {
	forvalues i = `cy'(1)2019 {
		local t = `i' + 1
		local end = `cy' + 5 //total of 6 years
			forvalues u = `t'(1)`end' {
				replace stack_w_year_`move' = `u' if (cert_level_`u' >= 2 & cert_level_`u' <= 5) &
(cert_`move'insec_`i' == 1) & (brinexamvo_crypt_`i' == brinexamvo_crypt_`u')	& stack_w_year_`move' == .
				replace stack_w_year_`move' = `u' if (cert_level_`u' >= 3 & cert_level_`u' <= 5) &
(cert_`move'insec_`i' == 2) & (brinexamvo_crypt_`i' == brinexamvo_crypt_`u')	& stack_w_year_`move' == .


				replace brin_crypt_stack_w_`move' = brinexamvo_crypt_`u' if (cert_level_`u' >= 2 &
cert_level_`u' <= 5) & (cert_`move'insec_`i' == 1) & (brinexamvo_crypt_`i' == brinexamvo_crypt_`u') &
brin_crypt_stack_w_`move' == ""
				replace brin_crypt_stack_w_`move' = brinexamvo_crypt_`u' if (cert_level_`u' >= 3 &
cert_level_`u' <= 5) & (cert_`move'insec_`i' == 2) & (brinexamvo_crypt_`i' == brinexamvo_crypt_`u') &
brin_crypt_stack_w_`move' == ""

				replace vobrinvest_stack_w_`move' = brinvestexamvo_`u' if  (cert_level_`u' >= 2 &
cert_level_`u' <= 5) & (cert_`move'insec_`i' == 1) & (brinexamvo_crypt_`i' == brinexamvo_crypt_`u') &
vobrinvest_stack_w_`move' == .
				replace vobrinvest_stack_w_`move' = brinvestexamvo_`u' if (cert_level_`u' >= 3 &
cert_level_`u' <= 5) & (cert_`move'insec_`i' == 2) & (brinexamvo_crypt_`i' == brinexamvo_crypt_`u') &
vobrinvest_stack_w_`move' == .
			}
		local end = `cy' + 6 // total of 7 years
			forvalues u = `t'(1)`end' {
				*gltl
				replace stack_w_year_`move' = `u' if (cert_level_`u' == 4 | cert_level_`u' == 5) &
(cert_`move'insec_`i' == 3) & (brinexamvo_crypt_`i' == brinexamvo_crypt_`u')	& stack_w_year_`move' == .
				replace brin_crypt_stack_w_`move' = brinexamvo_crypt_`u' if (cert_level_`u' == 4 |
cert_level_`u' == 5) & (cert_`move'insec_`i' == 3) & (brinexamvo_crypt_`i' == brinexamvo_crypt_`u')	&
brin_crypt_stack_w_`move' == ""
				replace vobrinvest_stack_w_`move' = brinvestexamvo_`u' if (cert_level_`u' == 4 |
cert_level_`u' == 5) & (cert_`move'insec_`i' == 3) & (brinexamvo_crypt_`i' == brinexamvo_crypt_`u')	&
vobrinvest_stack_w_`move' == .
			}
		local end = `cy' + 7 // total of 8 years
			forvalues u = `t'(1)`end' {
				*havo
				replace stack_w_year_`move' = `u' if cert_level_`u' == 5 & cert_`move'insec_`i' ==
4 & (brinexamvo_crypt_`i' == brinexamvo_crypt_`u')	& stack_w_year_`move' == .
				replace brin_crypt_stack_w_`move' = brinexamvo_crypt_`u' if cert_level_`u' == 5 &
cert_`move'insec_`i' == 4 & (brinexamvo_crypt_`i' == brinexamvo_crypt_`u')  &  brin_crypt_stack_w_`move' == ""
				replace vobrinvest_stack_w_`move' = brinvestexamvo_`u' if cert_level_`u' == 5 &
cert_`move'insec_`i' == 4 & (brinexamvo_crypt_`i' == brinexamvo_crypt_`u')  &  vobrinvest_stack_w_`move' == .

			}
		}
}

* Within stack_a
generate stack_a_year_first = .
generate str32 brin_crypt_stack_a_first = ""
generate vobrinvest_stack_a_first = .

generate stack_a_year_second = .
generate str32 brin_crypt_stack_a_second = ""
generate vobrinvest_stack_a_second = .

generate stack_a_year_third = .
generate str32 brin_crypt_stack_a_third = ""
generate vobrinvest_stack_a_third = .

foreach move in first second third {
	forvalues i = `cy'(1)2019 {
		local t = `i' + 1
		local end = `cy' + 5 //total of 6 years
			forvalues u = `t'(1)`end' {
```

```
                                replace stack_a_year_`move' = `u' if (cert_level_`u' >= 2 & cert_level_`u' <= 5) &
(cert_`move'insec_`i' == 1) & (brinexamvo_crypt_`i' != brinexamvo_crypt_`u') & stack_a_year_`move' == .
                                replace stack_a_year_`move' = `u' if (cert_level_`u' >= 3 & cert_level_`u' <= 5) &
(cert_`move'insec_`i' == 2) & (brinexamvo_crypt_`i' != brinexamvo_crypt_`u') & stack_a_year_`move' == .


                                replace brin_crypt_stack_a_`move' = brinexamvo_crypt_`u' if (cert_level_`u' >= 2 &
cert_level_`u' <= 5) & (cert_`move'insec_`i' == 1) & (brinexamvo_crypt_`i' != brinexamvo_crypt_`u') &
brin_crypt_stack_a_`move' == ""
                                replace brin_crypt_stack_a_`move' = brinexamvo_crypt_`u' if (cert_level_`u' >= 3 &
cert_level_`u' <= 5) & (cert_`move'insec_`i' == 2) & (brinexamvo_crypt_`i' != brinexamvo_crypt_`u') &
brin_crypt_stack_a_`move' == ""

                                replace vobrinvest_stack_a_`move' = brinvestexamvo_`u' if  (cert_level_`u' >= 2 &
cert_level_`u' <= 5) & (cert_`move'insec_`i' == 1) & (brinexamvo_crypt_`i' != brinexamvo_crypt_`u') &
vobrinvest_stack_a_`move' == .
                                replace vobrinvest_stack_a_`move' = brinvestexamvo_`u' if (cert_level_`u' >= 3 &
cert_level_`u' <= 5) & (cert_`move'insec_`i' == 2) & (brinexamvo_crypt_`i' != brinexamvo_crypt_`u') &
vobrinvest_stack_a_`move' == .
                        }
                local end = `cy' + 6 // total of 7 years
                        forvalues u = `t'(1)`end' {
                                *gltl
                                replace stack_a_year_`move' = `u' if (cert_level_`u' == 4 | cert_level_`u' == 5) &
(cert_`move'insec_`i' == 3) & (brinexamvo_crypt_`i' != brinexamvo_crypt_`u') & stack_a_year_`move' == .
                                replace brin_crypt_stack_a_`move' = brinexamvo_crypt_`u' if (cert_level_`u' == 4 |
cert_level_`u' == 5) & (cert_`move'insec_`i' == 3) & (brinexamvo_crypt_`i' != brinexamvo_crypt_`u') &
brin_crypt_stack_a_`move' == ""
                                replace vobrinvest_stack_a_`move' = brinvestexamvo_`u' if (cert_level_`u' == 4 |
cert_level_`u' == 5) & (cert_`move'insec_`i' == 3) & (brinexamvo_crypt_`i' != brinexamvo_crypt_`u')&
vobrinvest_stack_a_`move' == .
                        }
                local end = `cy' + 7 // total of 8 years
                        forvalues u = `t'(1)`end' {
                                *havo
                                replace stack_a_year_`move' = `u' if cert_level_`u' == 5 & cert_`move'insec_`i' ==
4 & (brinexamvo_crypt_`i' != brinexamvo_crypt_`u') & stack_a_year_`move' == .
                                replace brin_crypt_stack_a_`move' = brinexamvo_crypt_`u' if cert_level_`u' == 5 &
cert_`move'insec_`i' == 4 & (brinexamvo_crypt_`i' != brinexamvo_crypt_`u') &  brin_crypt_stack_a_`move' == ""
                                replace vobrinvest_stack_a_`move' = brinvestexamvo_`u' if cert_level_`u' == 5 &
cert_`move'insec_`i' == 4 & (brinexamvo_crypt_`i' != brinexamvo_crypt_`u') &  vobrinvest_stack_a_`move' == .

                        }
                }
}

*****************************************************
* Save variables for aggregating
*****************************************************

keep ///
rinpersoons rinpersoon onderwijsnr_crypt sleutel startjaar brin_crypt_* vobrinvest_* brinexamvo_crypt_*
brinvestexamvo_* schoolswap*  ///
group_* voleerjaar_* educ_level_* cert_level_* cert_*insec* cert_highestinsec* rec_cert_free_highest stack_* ///
retention_samelevel_* acceleration_samelevel_* hetero* cegem_* ladder* recommendation* downward_free
downward_nr_free upward_free upward_nr_free


save "@LOCATION\Secondary Education\Data set individual level entry cohort `cy'.dta", replace

}
```

Do-file 3: Collapse – Acceleration

```
**************************************
* DATA SET: FLEXIBILITY INDICATORS

* Purpose: Making the acceleration variable
* Making flexibility indicators available at the school level and at the cohort level
**************************************

/// The do-file is made up as follows
// 1. There is a loop over all the cohort files (from 2011 to 2013)
// 2. This loop is ran for every type of flexibility indicator. Doing it within one file, makes it at the end
slow as more and more variables are created.
// 3. Collapse the file at the cohort level and at the school level but three different statistics are
collapsed: mean, count of all cases, sum of the variable.
// The latter is only useful when it is a 0/1 variable, as it then counts all the 1's.

// Because students switch schools, the file is reshaped wide to include up to three schools.

forvalues cy = 2011(1)2013 {

use "@LOCATION\Secondary Education\Data set individual level entry cohort `cy'.dta", clear
local c = "c`cy'"

capture drop lastyear
generate lastyear = . // to differentiate between nominal duration of level; if heterogeneous the longer takes
precdenet over the shorter one
replace lastyear = startjaar + 4 if (group_vmbobb_`cy' == 1 | group_vmbokb_`cy' == 1 | group_vmbogt_`cy' == 1)
replace lastyear = startjaar + 5 if group_havo_`cy' == 1
replace lastyear = startjaar + 6 if group_vwo_`cy' == 1
fre lastyear

local start = `cy' + 1
local end = lastyear

generate swap_year = .
forvalues i = `start'(1)`end' {
local before = `i' - 1
local excep = `start' - 1
replace swap_year = `i' if (schoolswap_`before' == 1 | schoolswap_`before' == 2)
replace swap_year = `start' if ((brin_crypt_`excep' != brin_crypt_`start') | (vobrinvest_`excep' !=
vobrinvest_`start')) & swap_year == .
}

generate str32 brin_crypt_first = ""
generate vobrinvest_first = .

generate first_end_year = .
generate second_start_year = .

forvalues i = `cy'(1)2019 {
        local t = `i' + 1
        replace brin_crypt_first = brin_crypt_`cy' if voleerjaar_`cy' == 1

        replace vobrinvest_first = vobrinvest_`cy' if voleerjaar_`cy' == 1

        replace first_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & first_end_year == .
        replace first_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & first_end_year == .

        replace second_start_year = first_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & first_end_year !=
. & swap_year != . & brin_crypt_`t' != "" & second_start_year == .
        replace second_start_year = first_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & first_end_year !=
. & swap_year != . & vobrinvest_`t' != . & second_start_year == .
        replace second_start_year = swap_year if brin_crypt_`i' == "" & brin_crypt_`t' != "" // for those cases
who have an in-between BRIN missing
        }

list brin_crypt_first vobrinvest_first brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year
second_start_year in 1/100 if schoolswap == 1
list brin_crypt_first vobrinvest_first brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year
second_start_year in 1/25

generate str32 brin_crypt_second = ""
generate vobrinvest_second = .

forvalues i = `cy'(1)2019 {
```

```
        local t = `i' + 1
        replace brin_crypt_second = brin_crypt_`t' if (brin_crypt_`i' != brin_crypt_`t') & swap_year != . &
second_start_year >= `t' & brin_crypt_second == ""
        replace vobrinvest_second = vobrinvest_`t' if (vobrinvest_`i' != vobrinvest_`t') & swap_year != . &
second_start_year >= `t' & vobrinvest_second == .
}
forvalues i = `cy'(1)2019 {
        local t = `i' + 1
        replace brin_crypt_second = brin_crypt_`t' if brin_crypt_second == "" & (vobrinvest_second != .)
        replace vobrinvest_second = vobrinvest_`t' if vobrinvest_second == . & (brin_crypt_second != "")
        }

generate second_end_year = .
generate third_start_year = .

forvalues i = `cy'(1)2019 {
        local t = `i' + 1
        replace second_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & second_start_year < `i' &
second_end_year == .
        replace second_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & second_start_year < `i' &
second_end_year == .


        replace third_start_year = second_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & second_end_year
!= . & swap_year != . & brin_crypt_`t' != "" & third_start_year == .
        replace third_start_year = second_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & second_end_year
!= . & swap_year != . & vobrinvest_`t' != . & third_start_year == .
        }

generate str32 brin_crypt_third = ""
generate vobrinvest_third = .

forvalues i = `cy'(1)2019 {
        local t = `i' + 1
        replace brin_crypt_third = brin_crypt_`t' if third_start_year == `t' & brin_crypt_third == ""
        replace vobrinvest_third = vobrinvest_`t' if third_start_year == `t' & vobrinvest_third == .
}
forvalues i = `cy'(1)2019 {
        local t = `i' + 1
        replace brin_crypt_third = brin_crypt_`t' if brin_crypt_third == "" & (vobrinvest_third != .)
        replace vobrinvest_third = vobrinvest_`t' if vobrinvest_third == . & (brin_crypt_third != "")
        }

list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap swap_year ///
first_end_year second_start_year second_end_year third_start_year in 1/100 if schoolswap == 1
list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap swap_year ///
first_end_year second_start_year second_end_year third_start_year in 1/25


* ACCELERATE


egen nr_acc_samelevel = anycount(acceleration_samelevel_*), values(1)
fre nr_acc_samelevel

generate acc_year_first = .
generate str32 brin_crypt_acc_first = ""
generate vobrinvest_acc_first = .

generate acc_year_second = .
generate str32 brin_crypt_acc_second = ""
generate vobrinvest_acc_second = .

generate acc_year_third = .
generate str32 brin_crypt_acc_third = ""
generate vobrinvest_acc_third = .

local j = `cy' + 1
forvalues i = `j'(1)2020 {
        local t = `i' - 1
        generate acc_samelevel_first_`t' = 0 if voleerjaar_`i' != .
        generate temp = voleerjaar_`i' - voleerjaar_`t'
        replace acc_samelevel_first_`t' = 1 if (temp > 1 & temp < 5) & ((educ_level_insp_`i' ==
educ_level_insp_`t') | educ_level_insp_`i' == 9) & voleerjaar_`i' != .
        drop temp
```

```
        replace acc_year_first = `t' if acc_samelevel_first_`t' == 1 & acc_year_first == .

        replace brin_crypt_acc_first = brin_crypt_`t' if acc_samelevel_first_`t' == 1
        replace vobrinvest_acc_first = vobrinvest_`t' if acc_samelevel_first_`t' == 1
        }

local j = `cy' + 1
forvalues i = `j'(1)2020 {
        local t = `i' - 1
        generate acc_samelevel_second_`t' = 0 if voleerjaar_`i' != .
        generate temp = voleerjaar_`i' - voleerjaar_`t'
        replace acc_samelevel_second_`t' = 1 if (temp > 1 & temp < 5) & ((educ_level_insp_`i' ==
educ_level_insp_`t') | educ_level_insp_`i' == 9) & voleerjaar_`i' != . & acc_year_first < `t'
        drop temp

        replace acc_year_second = `t' if acc_samelevel_second_`t' == 1 & acc_year_second == .

        replace brin_crypt_acc_second = brin_crypt_`t' if acc_samelevel_second_`t' == 1
        replace vobrinvest_acc_second = vobrinvest_`t' if acc_samelevel_second_`t' == 1

}

local j = `cy' + 1
forvalues i = `j'(1)2020 {
        local t = `i' - 1
        generate acc_samelevel_third_`t' = 0 if voleerjaar_`i' != .
        generate temp = voleerjaar_`i' - voleerjaar_`t'
        replace acc_samelevel_third_`t' = 1 if (temp > 1 & temp < 5) & ((educ_level_insp_`i' ==
educ_level_insp_`t') | educ_level_insp_`i' == 9) & voleerjaar_`i' != . & acc_year_second < `t'
        drop temp

        replace acc_year_third = `t' if acc_samelevel_third_`t' == 1 & acc_year_third == .

        replace brin_crypt_acc_third = brin_crypt_`t' if acc_samelevel_third_`t' == 1
        replace vobrinvest_acc_third = vobrinvest_`t' if acc_samelevel_third_`t' == 1

}

fre acc_samelevel_first* acc_samelevel_second*
sum acc_samelevel_first_2* acc_samelevel_second_2*

egen acc_samelevel_first = anymatch(acc_samelevel_first_2*), values(1)
egen acc_samelevel_second = anymatch(acc_samelevel_second_2*), values(1)
egen acc_samelevel_third = anymatch(acc_samelevel_third_2*), values(1)

fre acc_samelevel_first acc_samelevel_second acc_samelevel_third

list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year second_start_year ///
acc_samelevel_f* acc_year_first acc_samelevel_s* acc_year_second voleerjaar_2* brin_crypt_acc_first
vobrinvest_acc_first brin_crypt_acc_second vobrinvest_acc_second if nr_acc_samelevel == 1 in 1/10000

* Concatenate to one school ID
egen sch_pos1 = concat(brin_crypt_first vobrinvest_first)
egen sch_pos2 = concat(brin_crypt_second vobrinvest_second)
egen sch_pos3 = concat(brin_crypt_third vobrinvest_third)

egen sch_acc1 = concat(brin_crypt_acc_first vobrinvest_acc_first)
egen sch_acc2 = concat(brin_crypt_acc_second vobrinvest_acc_second)
egen sch_acc3 = concat(brin_crypt_acc_third vobrinvest_acc_third)

keep rinpersoons sleutel startjaar sch_pos1 sch_pos2 sch_pos3 acc_samelevel_first acc_samelevel_second
acc_samelevel_third nr_acc_samelevel schoolswap sch_acc1 acc_year_first sch_acc2 acc_year_second sch_acc3
acc_year_third acc_year_third

reshape long sch_pos, i(rinpersoons sleutel) j(iteration) // reshape on the school and second school if swapped

* Empty missing ID's
replace sch_pos = "" if sch_pos == "."
replace sch_acc1 = "" if sch_acc1 == "."
replace sch_acc2 = "" if sch_acc2 == "."
replace sch_acc3 = "" if sch_acc3 == "."

order rinpersoons sleutel iteration nr_acc_samelevel sch_pos sch_acc1 sch_acc2 sch_acc3 acc_samelevel_first
acc_samelevel_second acc_samelevel_third
```

```
* Making of accaining indicators
generate nr_acc = .
replace nr_acc = 0 if sch_acc1 == "" & sch_acc2 == "" & sch_acc3 == ""
replace nr_acc = 0 if (sch_acc1 != sch_pos & sch_acc2 != sch_pos & sch_acc3 != sch_pos) & nr_acc != 0
replace nr_acc = 1 if (sch_acc1 == sch_pos | sch_acc2 == sch_pos | sch_acc3 == sch_pos) & nr_acc != 0
replace nr_acc = 2 if (sch_acc1 == sch_pos & sch_acc2 == sch_pos) & nr_acc != 0
replace nr_acc = 3 if (sch_acc1 == sch_pos & sch_acc2 == sch_pos & sch_acc3 == sch_pos) & nr_acc != 0

generate acc = 0 if nr_acc == 0
replace acc = 1 if nr_acc == 1 | nr_acc == 2 | nr_acc == 3

order rinpersoons sleutel iteration nr_acc_samelevel sch_pos sch_acc1 sch_acc2 sch_acc3 nr_acc acc
acc_samelevel_first acc_samelevel_second acc_samelevel_third


* Aggregate
drop if sch_pos == "" // delete empty school ID's

fre acc nr_acc

generate brin_crypt_`cy' = substr(sch_pos,1,32)
generate vobrinvest_`cy' = substr(sch_pos,33,2)
destring vobrinvest_`cy', replace

* cohorten
preserve
collapse       (mean) acc nr_acc
generate brin_crypt_`cy'= "cohort `cy'"
generate type_stat = "mean"
save "@LOCATION\Secondary Education\Acceleration_cohort_mean_`c'.dta", replace
restore

preserve
collapse       (count) acc nr_acc
generate brin_crypt_`cy'= "cohort `cy'"
generate type_stat = "count"
save "@LOCATION\Secondary Education\Acceleration_cohort_count_`c'.dta", replace
restore

preserve
collapse       (sum) acc nr_acc
generate brin_crypt_`cy'= "cohort `cy'"
generate type_stat = "sum"
save "@LOCATION\Secondary Education\Acceleration_cohort_sum_`c'.dta", replace
restore

* scholen
preserve
collapse       (mean) acc nr_acc ///
                     , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "mean"
save "@LOCATION\Secondary Education\Acceleration_school_mean_`c'.dta", replace
restore

preserve
collapse       (count) acc nr_acc ///
                     , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "count"
save "@LOCATION\Secondary Education\Acceleration_school_count_`c'.dta", replace
restore

preserve
collapse       (sum) acc nr_acc ///
                     , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "sum"
save "@LOCATION\Secondary Education\Acceleration_school_sum_`c'.dta", replace
restore

}
```

Do-file 3: Collapse – Certificate & Exam Result

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* Purpose: Making the acceleration variable
* Making flexibility indicators available at the school level and at the cohort level
****************************************

/// The do-file is made up as follows
// 1. There is a loop over all the cohort files (from 2011 to 2013)
// 2. This loop is ran for every type of flexibility indicator. Doing it within one file, makes it at the end
slow as more and more variables are created.
// 3. Collapse the file at the cohort level and at the school level but three different statistics are
collapsed: mean, count of all cases, sum of the variable.
// The latter is only useful when it is a 0/1 variable, as it then counts all the 1's.

// Because students switch schools, the file is reshaped wide to include up to three schools.

forvalues cy = 2011(1)2013 {

use "@LOCATION\Secondary Education\Data set individual level entry cohort `cy'.dta", clear
local c = "c`cy'"

forvalues i = 2021(1)2027 {
generate vobrinvest_`i' = .
}

forvalues i = 2021(1)2026 {
       generate ladder_seclevel_`i' = .
}

generate str32 brin_crypt_first = ""
generate vobrinvest_first = .
generate str32 brin_crypt_second = ""
generate vobrinvest_second = .
generate str32 brin_crypt_third = ""
generate vobrinvest_third = .
generate str32 brin_crypt_fourth = ""
generate vobrinvest_fourth = .
generate str32 brin_crypt_fifth = ""
generate vobrinvest_fifth = .
generate str32 brin_crypt_sixth = ""
generate vobrinvest_sixth = .
generate str32 brin_crypt_seventh = ""
generate vobrinvest_seventh = .

       local t1 = `cy'
       local t2 = `cy' + 1
       local t3 = `cy'       + 2
       local t4 = `cy' + 3
       local t5 = `cy' + 4
       local t6 = `cy' + 5
       local t7 = `cy'       + 6

       replace brin_crypt_first = brin_crypt_`t1' if brin_crypt_first == ""
       replace brin_crypt_second = brin_crypt_`t2' if brin_crypt_first != "" & brin_crypt_second == ""
       replace brin_crypt_third = brin_crypt_`t3' if brin_crypt_first != "" & brin_crypt_second != "" &
brin_crypt_third == ""
       replace brin_crypt_fourth = brin_crypt_`t4' if brin_crypt_first != "" & brin_crypt_second != "" &
brin_crypt_third != "" & brin_crypt_fourth == ""
       replace brin_crypt_fifth = brin_crypt_`t5' if brin_crypt_first != "" & brin_crypt_second != "" &
brin_crypt_third != "" & brin_crypt_fourth != "" & brin_crypt_fifth == ""
       replace brin_crypt_sixth = brin_crypt_`t6' if brin_crypt_first != "" & brin_crypt_second != "" &
brin_crypt_third != "" & brin_crypt_fourth != "" & brin_crypt_fifth != ""  & brin_crypt_sixth == ""
       replace brin_crypt_seventh = brin_crypt_`t7' if brin_crypt_first != "" & brin_crypt_second != "" &
brin_crypt_third != "" & brin_crypt_fourth != "" & brin_crypt_fifth != ""  & brin_crypt_sixth != "" &
brin_crypt_seventh == ""

       replace vobrinvest_first = vobrinvest_`t1' if vobrinvest_first == .
       replace vobrinvest_second = vobrinvest_`t2' if vobrinvest_first != . & vobrinvest_second == .
       replace vobrinvest_third = vobrinvest_`t3' if vobrinvest_first != . & vobrinvest_second != . &
vobrinvest_third == .
       replace vobrinvest_fourth = vobrinvest_`t4' if vobrinvest_first != . & vobrinvest_second != . &
vobrinvest_third != . & vobrinvest_fourth == .
```

```
	replace vobrinvest_fifth = vobrinvest_`t5' if vobrinvest_first != . & vobrinvest_second != . &
vobrinvest_third != . & vobrinvest_fourth != . & vobrinvest_fifth == .
	replace vobrinvest_sixth = vobrinvest_`t6' if vobrinvest_first != . & vobrinvest_second != . &
vobrinvest_third != . & vobrinvest_fourth != . & vobrinvest_fifth != .  & vobrinvest_sixth == .
	replace vobrinvest_seventh = vobrinvest_`t7' if vobrinvest_first != . & vobrinvest_second != . &
vobrinvest_third != . & vobrinvest_fourth != .       & vobrinvest_fifth != .        & vobrinvest_sixth != . &
vobrinvest_seventh == .

list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_fourth vobrinvest_fourth brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap  in 1/100 if schoolswap
== 1
list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_fourth vobrinvest_fourth brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap  in 1/25

* Variables

generate central_exam_highest = .
forvalues i = `cy'(1)2020 {
replace central_exam_highest = cegem_`i' if cert_highestinsec_year == `i'
}

forvalues i = `cy'(1)2019 {
	bys cert_level_secondary_`i': egen cegem_std_`i' = std(cegem_`i')
}

generate central_exam_highest_std = .
forvalues i = `cy'(1)2019 {
replace central_exam_highest_std = cegem_std_`i' if cert_highestinsec_year == `i'
}

tab cert_highestinsec cert_highestinsec_year, summarize(central_exam_highest_std)

fre ladder_cert_highestinsec cert_highestinsec

rename ladder_cert_highestinsec ladder_cert_highestinsec_`c'
rename central_exam_highest central_exam_highest_`c'
rename central_exam_highest_std central_exam_highest_std_`c'

local cz = `cy' + 6 // Taking first 7 years for aggregate
forvalues i = `cy'(1)`cz' {
	generate cert_`i' = cert_level_`i'
	generate ladder_`i'_`c' = ladder_seclevel_`i'
	}

local leaddigit = 1
foreach type in vsopro bb bbkb bbkbgt kb kbgt kbgthavo gt gthavo gthavovwo havo havovwo vwo bbkbgthavo
bbkbgthavovwo vmbo kbgthavovwo overig {
		generate reccom_`type'_`c' = 0 if recommendation != `leaddigit'
		replace reccom_`type'_`c' = 1 if recommendation == `leaddigit'
local leaddigit = `leaddigit' + 1
}

local leaddigit = 1
foreach type in bb kb gltl havo vwo {
generate cert_first_`type'_`c' = 0 if cert_firstinsec != `leaddigit'
replace cert_first_`type'_`c' = 1 if cert_firstinsec == `leaddigit'

generate cert_second_`type'_`c' = 0 if cert_secondinsec != `leaddigit'
replace cert_second_`type'_`c' = 1 if cert_secondinsec == `leaddigit'

generate cert_third_`type'_`c' = 0 if cert_thirdinsec != `leaddigit'
replace cert_third_`type'_`c' = 1 if cert_thirdinsec == `leaddigit'

local leaddigit = `leaddigit' + 1
}

foreach var in cert_firstinsec_ladder cert_secondinsec_ladder cert_thirdinsec_ladder {
	rename `var' `var'_`c'
}

* Concatenate to one school ID
egen sch_pos1 = concat(brin_crypt_first vobrinvest_first)
egen sch_pos2 = concat(brin_crypt_second vobrinvest_second)
egen sch_pos3 = concat(brin_crypt_third vobrinvest_third)
egen sch_pos4 = concat(brin_crypt_fourth vobrinvest_fourth)
egen sch_pos5 = concat(brin_crypt_fifth vobrinvest_fifth)
egen sch_pos6 = concat(brin_crypt_sixth vobrinvest_sixth)
```

```
egen sch_pos7 = concat(brin_crypt_seventh vobrinvest_seventh)

keep rinpersoons sleutel sch_pos1 sch_pos2 sch_pos3 sch_pos4 sch_pos5 sch_pos6 sch_pos7 ///
cert_firstinsec_ladder_`c' cert_secondinsec_ladder_`c' ladder_cert_highestinsec_`c' central_exam_highest_`c'
central_exam_highest_std_`c' ladder_*_`c' reccom_*_`c'

reshape long sch_pos, i(rinpersoons sleutel) j(iteration) // reshape on the school and second school if swapped

* Empty missing ID's
foreach var in sch_pos {
       replace `var' = "" if `var' == "."
}

order rinpersoons sleutel iteration sch_pos

* Aggregate
drop if sch_pos == "" // delete empty school ID's

generate brin_crypt_`cy' = substr(sch_pos,1,32)
generate vobrinvest_`cy' = substr(sch_pos,33,2)
destring vobrinvest_`cy', replace


* cohort
preserve
collapse       (mean) central_exam_highest_`c' central_exam_highest_std_`c' cert_firstinsec_ladder_`c'
cert_secondinsec_ladder_`c' ladder_*_`c' reccom_*_`c'
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "mean"
save "@LOCATION\Secondary Education\Certexam_cohort_mean_`c'.dta", replace
restore

preserve
collapse       (count) central_exam_highest_`c' central_exam_highest_std_`c' cert_firstinsec_ladder_`c'
cert_secondinsec_ladder_`c' ladder_*_`c' reccom_*_`c'
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "count"
save "@LOCATION\Secondary Education\Certexam_cohort_count_`c'.dta", replace
restore

preserve
collapse       (sum) central_exam_highest_`c' central_exam_highest_std_`c' cert_firstinsec_ladder_`c'
cert_secondinsec_ladder_`c' ladder_*_`c' reccom_*_`c'
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "sum"
save "@LOCATION\Secondary Education\Certexam_cohort_sum_`c'.dta", replace
restore

* school
preserve
collapse       (mean) central_exam_highest_`c' central_exam_highest_std_`c' cert_firstinsec_ladder_`c'
cert_secondinsec_ladder_`c' ladder_*_`c' reccom_*_`c' ///
                     , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "mean"
save "@LOCATION\Secondary Education\Certexam_school_mean_`c'.dta", replace
restore

preserve
collapse       (count) central_exam_highest_`c' central_exam_highest_std_`c' cert_firstinsec_ladder_`c'
cert_secondinsec_ladder_`c' ladder_*_`c' reccom_*_`c' ///
                     , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "count"
save "@LOCATION\Secondary Education\Certexam_school_count_`c'.dta", replace
restore

preserve
collapse       (sum) central_exam_highest_`c' central_exam_highest_std_`c' cert_firstinsec_ladder_`c'
cert_secondinsec_ladder_`c' ladder_*_`c' reccom_*_`c' ///
                     , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "sum"
save "@LOCATION\Secondary Education\Certexam_school_sum_`c'.dta", replace
restore
}
```

Do-file 3: Collapse – Mixed Tracks

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* Purpose: Making the acceleration variable
* Making flexibility indicators available at the school level and at the cohort level
****************************************

/// The do-file is made up as follows
// 1. There is a loop over all the cohort files (from 2011 to 2013)
// 2. This loop is ran for every type of flexibility indicator. Doing it within one file, makes it at the end
slow as more and more variables are created.
// 3. Collapse the file at the cohort level and at the school level but three different statistics are
collapsed: mean, count of all cases, sum of the variable.
// The latter is only useful when it is a 0/1 variable, as it then counts all the 1's.

// Because students switch schools, the file is reshaped wide to include up to three schools.

* Heterogeneous classes
forvalues cy = 2011(1)2013 {

use "@LOCATION\Secondary Education\Data set individual level entry cohort `cy'.dta", clear
local c = "c`cy'"

forvalues i = 2021(1)2027 {
generate vobrinvest_`i' = .
}

capture drop lastyear
generate lastyear = . // to differentiate between nominal duration of level; if heterogeneous the longer takes
precdenet over the shorter one
replace lastyear = startjaar + 4 if (group_vmbobb_`cy' == 1 | group_vmbokb_`cy' == 1 | group_vmbogt_`cy' == 1)
replace lastyear = startjaar + 5 if group_havo_`cy' == 1
replace lastyear = startjaar + 6 if group_vwo_`cy' == 1
fre lastyear

local start = `cy' + 1
local end = lastyear

generate swap_year = .
forvalues i = `start'(1)`end' {
local before = `i' - 1
local excep = `start' - 1
replace swap_year = `i' if (schoolswap_`before' == 1 | schoolswap_`before' == 2)
replace swap_year = `start' if ((brin_crypt_`excep' != brin_crypt_`start') | (vobrinvest_`excep' !=
vobrinvest_`start')) & swap_year == .
}

generate str32 brin_crypt_first = ""
generate vobrinvest_first = .

generate first_end_year = .
generate second_start_year = .

forvalues i = `cy'(1)2019 {
        local t = `i' + 1
        replace brin_crypt_first = brin_crypt_`cy' if voleerjaar_`cy' == 1

        replace vobrinvest_first = vobrinvest_`cy' if voleerjaar_`cy' == 1

        replace first_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & first_end_year == .
        replace first_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & first_end_year == .

        replace second_start_year = first_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & first_end_year !=
. & swap_year != . & brin_crypt_`t' != "" & second_start_year == .
        replace second_start_year = first_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & first_end_year !=
. & swap_year != . & vobrinvest_`t' != . & second_start_year == .
        replace second_start_year = swap_year if brin_crypt_`i' == "" & brin_crypt_`t' != "" // for those cases
who have an in-between BRIN missing
        }

list brin_crypt_first vobrinvest_first brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year
second_start_year in 1/100 if schoolswap == 1
list brin_crypt_first vobrinvest_first brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year
second_start_year in 1/25
```

```
generate str32 brin_crypt_second = ""
generate vobrinvest_second = .

forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_second = brin_crypt_`t' if (brin_crypt_`i' != brin_crypt_`t') & swap_year != . &
second_start_year >= `t' & brin_crypt_second == ""
	replace vobrinvest_second = vobrinvest_`t' if (vobrinvest_`i' != vobrinvest_`t') & swap_year != . &
second_start_year >= `t' & vobrinvest_second == .
}
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_second = brin_crypt_`t' if brin_crypt_second == "" & (vobrinvest_second != .)
	replace vobrinvest_second = vobrinvest_`t' if vobrinvest_second == . & (brin_crypt_second != "")
	}

generate second_end_year = .
generate third_start_year = .

forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace second_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & second_start_year < `i' &
second_end_year == .
	replace second_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & second_start_year < `i' &
second_end_year == .


	replace third_start_year = second_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & second_end_year
!= . & swap_year != . & brin_crypt_`t' != "" & third_start_year == .
	replace third_start_year = second_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & second_end_year
!= . & swap_year != . & vobrinvest_`t' != . & third_start_year == .
	}

generate str32 brin_crypt_third = ""
generate vobrinvest_third = .

forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_third = brin_crypt_`t' if third_start_year == `t' & brin_crypt_third == ""
	replace vobrinvest_third = vobrinvest_`t' if third_start_year == `t' & vobrinvest_third == .
}
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_third = brin_crypt_`t' if brin_crypt_third == "" & (vobrinvest_third != .)
	replace vobrinvest_third = vobrinvest_`t' if vobrinvest_third == . & (brin_crypt_third != "")
	}

list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap swap_year ///
first_end_year second_start_year second_end_year third_start_year in 1/100 if schoolswap == 1
list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap swap_year ///
first_end_year second_start_year second_end_year third_start_year in 1/25



* Heterogeneous classes
local hetero2 = `cy' + 1
local hetero3 = `cy' + 2

generate str32 brin_crypt_hetero_first = ""
replace brin_crypt_hetero_first = brin_crypt_`cy'
generate vobrinvest_hetero_first = .
replace vobrinvest_hetero_first = vobrinvest_`cy'

generate str32 brin_crypt_hetero_second = ""
replace brin_crypt_hetero_second = brin_crypt_`hetero2'
generate vobrinvest_hetero_second = .
replace vobrinvest_hetero_second = vobrinvest_`hetero2'

generate str32 brin_crypt_hetero_third = ""
replace brin_crypt_hetero_third = brin_crypt_`hetero3'
generate vobrinvest_hetero_third = .
replace vobrinvest_hetero_third = vobrinvest_`hetero3'

generate hetero1_`c' = hetero_year1
```

```
generate hetero2_`c' = hetero_year2
generate hetero3_`c' = hetero_year3

tab hetero_level_year1, gen(hetero_level_year1_)
tab hetero_level_year2, gen(hetero_level_year2_)
tab hetero_level_year3, gen(hetero_level_year3_)


* Concatenate to one school ID
egen sch_pos1 = concat(brin_crypt_first vobrinvest_first)
egen sch_pos2 = concat(brin_crypt_second vobrinvest_second)
egen sch_pos3 = concat(brin_crypt_third vobrinvest_third)

egen sch_hetero_1 = concat(brin_crypt_hetero_first vobrinvest_hetero_first)
egen sch_hetero_2 = concat(brin_crypt_hetero_second vobrinvest_hetero_second)
egen sch_hetero_3 = concat(brin_crypt_hetero_third vobrinvest_hetero_third)


keep rinpersoons sleutel startjaar sch_pos1 sch_pos2 sch_pos3 sch_hetero_1 sch_hetero_2 sch_hetero_3
hetero_year1 hetero_year2 hetero_year3 hetero_level_year1_1 hetero_level_year1_2 hetero_level_year1_3
hetero_level_year1_4 hetero_level_year1_5 hetero_level_year1_6 hetero_level_year1_7 hetero_level_year1_8
hetero_level_year2_1 hetero_level_year2_2 hetero_level_year2_3 hetero_level_year2_4 hetero_level_year2_5
hetero_level_year2_6 hetero_level_year2_7 hetero_level_year2_8 hetero_level_year3_1 hetero_level_year3_2

reshape long sch_pos, i(rinpersoons sleutel) j(iteration) // reshape on the school and second school if swapped

* Empty missing ID's
foreach var in sch_pos sch_hetero_1 sch_hetero_2 sch_hetero_3 {
        replace `var' = "" if `var' == "."
}

order rinpersoons sleutel iteration sch_pos sch_hetero_1 sch_hetero_2 sch_hetero_3 hetero_year1 hetero_year2
hetero_year3 ///
hetero_level_year1_1 hetero_level_year1_2 hetero_level_year1_3 hetero_level_year1_4 hetero_level_year1_5
hetero_level_year1_6 hetero_level_year1_7 hetero_level_year1_8 hetero_level_year2_1 hetero_level_year2_2
hetero_level_year2_3 hetero_level_year2_4 hetero_level_year2_5 hetero_level_year2_6 hetero_level_year2_7
hetero_level_year2_8 hetero_level_year3_1 hetero_level_year3_2

* Making of accaining indicators
foreach var in hetero {
generate nr_`var' = .
replace nr_`var' = 0 if sch_`var'_1 == "" & sch_`var'_2 == "" & sch_`var'_3 == ""
replace nr_`var' = 0 if (sch_`var'_1 != sch_pos & sch_`var'_2 != sch_pos & sch_`var'_3 != sch_pos) & nr_`var' !=
0
replace nr_`var' = 1 if (sch_`var'_1 == sch_pos | sch_`var'_2 == sch_pos | sch_`var'_3 == sch_pos) & nr_`var' !=
0
replace nr_`var' = 2 if (sch_`var'_1 == sch_pos & sch_`var'_2 == sch_pos) & nr_`var' != 0
replace nr_`var' = 3 if (sch_`var'_1 == sch_pos & sch_`var'_2 == sch_pos & sch_`var'_3 == sch_pos) & nr_`var' !=
0

generate `var' = 0 if nr_`var' == 0
replace `var' = 1 if nr_`var' == 1 | nr_`var' == 2 | nr_`var' == 3
}

sum nr_hetero hetero

order rinpersoons sleutel iteration sch_pos sch_hetero_1 sch_hetero_2 sch_hetero_3 hetero_year1 hetero_year2
hetero_year3 nr_hetero hetero

* Aggregate
drop if sch_pos == "" // delete empty school ID's

fre nr_hetero hetero

generate brin_crypt_`cy' = substr(sch_pos,1,32)
generate vobrinvest_`cy' = substr(sch_pos,33,2)
destring vobrinvest_`cy', replace

preserve
collapse       (mean) hetero_year1 hetero_year2 hetero_year3 hetero_level_year1_1 hetero_level_year1_2
hetero_level_year1_3 hetero_level_year1_4 hetero_level_year1_5 hetero_level_year1_6 hetero_level_year1_7
hetero_level_year1_8                 hetero_level_year2_1 hetero_level_year2_2 hetero_level_year2_3
hetero_level_year2_4 hetero_level_year2_5 hetero_level_year2_6 hetero_level_year2_7 hetero_level_year2_8
hetero_level_year3_1 hetero_level_year3_2
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "mean"
save "@LOCATION\Secondary Education\Heterogeneous_cohort_mean_`c'.dta", replace
```

```
restore

preserve
collapse       (count) hetero_year1 hetero_year2 hetero_year3 hetero_level_year1_1 hetero_level_year1_2
hetero_level_year1_3 hetero_level_year1_4 hetero_level_year1_5 hetero_level_year1_6 hetero_level_year1_7
hetero_level_year1_8                  hetero_level_year2_1 hetero_level_year2_2 hetero_level_year2_3
hetero_level_year2_4 hetero_level_year2_5 hetero_level_year2_6 hetero_level_year2_7 hetero_level_year2_8
hetero_level_year3_1 hetero_level_year3_2
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "count"
save "@LOCATION\Secondary Education\Heterogeneous_cohort_count_`c'.dta", replace
restore

preserve
collapse       (sum) hetero_year1 hetero_year2 hetero_year3 hetero_level_year1_1 hetero_level_year1_2
hetero_level_year1_3 hetero_level_year1_4 hetero_level_year1_5 hetero_level_year1_6 hetero_level_year1_7
hetero_level_year1_8                  hetero_level_year2_1 hetero_level_year2_2 hetero_level_year2_3
hetero_level_year2_4 hetero_level_year2_5 hetero_level_year2_6 hetero_level_year2_7 hetero_level_year2_8
hetero_level_year3_1 hetero_level_year3_2
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "sum"
save "@LOCATION\Secondary Education\Heterogeneous_cohort_sum_`c'.dta", replace
restore

* scholen
preserve
collapse       (mean) hetero_year1 hetero_year2 hetero_year3 hetero_level_year1_1 hetero_level_year1_2
hetero_level_year1_3 hetero_level_year1_4 hetero_level_year1_5 hetero_level_year1_6 hetero_level_year1_7
hetero_level_year1_8                  hetero_level_year2_1 hetero_level_year2_2 hetero_level_year2_3
hetero_level_year2_4 hetero_level_year2_5 hetero_level_year2_6 hetero_level_year2_7 hetero_level_year2_8
hetero_level_year3_1 hetero_level_year3_2 ///
                      , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "mean"
save "@LOCATION\Secondary Education\Heterogeneous_school_mean_`c'.dta", replace
restore

preserve
collapse       (count) hetero_year1 hetero_year2 hetero_year3 hetero_level_year1_1 hetero_level_year1_2
hetero_level_year1_3 hetero_level_year1_4 hetero_level_year1_5 hetero_level_year1_6 hetero_level_year1_7
hetero_level_year1_8                  hetero_level_year2_1 hetero_level_year2_2 hetero_level_year2_3
hetero_level_year2_4 hetero_level_year2_5 hetero_level_year2_6 hetero_level_year2_7 hetero_level_year2_8
hetero_level_year3_1 hetero_level_year3_2 ///
                      , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "count"
save "@LOCATION\Secondary Education\Heterogeneous_school_count_`c'.dta", replace
restore

preserve
collapse       (sum) hetero_year1 hetero_year2 hetero_year3 hetero_level_year1_1 hetero_level_year1_2
hetero_level_year1_3 hetero_level_year1_4 hetero_level_year1_5 hetero_level_year1_6 hetero_level_year1_7
hetero_level_year1_8                        hetero_level_year2_1 hetero_level_year2_2 hetero_level_year2_3
hetero_level_year2_4 hetero_level_year2_5 hetero_level_year2_6 hetero_level_year2_7 hetero_level_year2_8
hetero_level_year3_1 hetero_level_year3_2 ///
                      , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "sum"
save "@LOCATION\Secondary Education\Heterogeneous_school_sum_`c'.dta", replace
restore
}
```

Do-file 3: Collapse – Mobility

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* Purpose: Making the mobility variables
* Making flexibility indicators available at the school level and at the cohort level
****************************************

/// The do-file is made up as follows
// 1. There is a loop over all the cohort files (from 2011 to 2013)
// 2. This loop is ran for every type of flexibility indicator. Doing it within one file, makes it at the end
slow as more and more variables are created.
// 3. Collapse the file at the cohort level and at the school level but three different statistics are
collapsed: mean, count of all cases, sum of the variable.
// The latter is only useful when it is a 0/1 variable, as it then counts all the 1's.

// The loop can only be executed on up and including the 2018 entry cohort, as one needs an extra year after the
entry year for meaningful indicators.

// Because students switch schools, the file is reshaped wide to include up to three schools.

forvalues cy = 2011(1)2013 {

use "@LOCATION\Secondary Education\Data set individual level entry cohort `cy'.dta", clear
local c = "c`cy'"

forvalues i = 2021(1)2027 {
generate vobrinvest_`i' = .
}

capture drop lastyear
generate lastyear = . // to differentiate between nominal duration of level; if heterogeneous the longer takes
precdenet over the shorter one
replace lastyear = startjaar + 4 if (group_vmbobb_`cy' == 1 | group_vmbokb_`cy' == 1 | group_vmbogt_`cy' == 1)
replace lastyear = startjaar + 5 if group_havo_`cy' == 1
replace lastyear = startjaar + 6 if group_vwo_`cy' == 1
fre lastyear

local start = `cy' + 1
local end = lastyear

generate swap_year = .
forvalues i = `start'(1)`end' {
local before = `i' - 1
local excep = `start' - 1
replace swap_year = `i' if (schoolswap_`before' == 1 | schoolswap_`before' == 2)
replace swap_year = `start' if ((brin_crypt_`excep' != brin_crypt_`start') | (vobrinvest_`excep' !=
vobrinvest_`start')) & swap_year == .
}

generate str32 brin_crypt_first = ""
generate vobrinvest_first = .

generate first_end_year = .
generate second_start_year = .

forvalues i = `cy'(1)2019 {
        local t = `i' + 1
        replace brin_crypt_first = brin_crypt_`cy' if voleerjaar_`cy' == 1

        replace vobrinvest_first = vobrinvest_`cy' if voleerjaar_`cy' == 1

        replace first_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & first_end_year == .
        replace first_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & first_end_year == .

        replace second_start_year = first_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & first_end_year !=
. & swap_year != . & brin_crypt_`t' != "" & second_start_year == .
        replace second_start_year = first_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & first_end_year !=
. & swap_year != . & vobrinvest_`t' != . & second_start_year == .
        replace second_start_year = swap_year if brin_crypt_`i' == "" & brin_crypt_`t' != "" // for those cases
who have an in-between BRIN missing
        }

list brin_crypt_first vobrinvest_first brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year
second_start_year in 1/100 if schoolswap == 1
```

```
list brin_crypt_first vobrinvest_first brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year
second_start_year in 1/25

generate str32 brin_crypt_second = ""
generate vobrinvest_second = .

forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_second = brin_crypt_`t' if (brin_crypt_`i' != brin_crypt_`t') & swap_year != . &
second_start_year >= `t' & brin_crypt_second == ""
	replace vobrinvest_second = vobrinvest_`t' if (vobrinvest_`i' != vobrinvest_`t') & swap_year != . &
second_start_year >= `t' & vobrinvest_second == .
}
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_second = brin_crypt_`t' if brin_crypt_second == "" & (vobrinvest_second != .)
	replace vobrinvest_second = vobrinvest_`t' if vobrinvest_second == . & (brin_crypt_second != "")
	}

generate second_end_year = .
generate third_start_year = .

forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace second_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & second_start_year < `i' &
second_end_year == .
	replace second_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & second_start_year < `i' &
second_end_year == .


	replace third_start_year = second_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & second_end_year
!= . & swap_year != . & brin_crypt_`t' != "" & third_start_year == .
	replace third_start_year = second_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & second_end_year
!= . & swap_year != . & vobrinvest_`t' != . & third_start_year == .
	}

generate str32 brin_crypt_third = ""
generate vobrinvest_third = .

forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_third = brin_crypt_`t' if third_start_year == `t' & brin_crypt_third == ""
	replace vobrinvest_third = vobrinvest_`t' if third_start_year == `t' & vobrinvest_third == .
}
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_third = brin_crypt_`t' if brin_crypt_third == "" & (vobrinvest_third != .)
	replace vobrinvest_third = vobrinvest_`t' if vobrinvest_third == . & (brin_crypt_third != "")
	}

list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap swap_year ///
first_end_year second_start_year second_end_year third_start_year in 1/100 if schoolswap == 1
list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap swap_year ///
first_end_year second_start_year second_end_year third_start_year in 1/25

* First Mobility Move (non-golden route; e.g. normal paths are excluded)
generate mobility_year_first = .
generate str32 brin_crypt_mobil_first = ""
generate vobrinvest_mobil_first = .

	local end = `cy' + 5
		forvalues i = `cy'(1)`end' {
			local t = `i' + 1

			local end_4 = `cy' + 3 // 4 years

					* Year
					replace mobility_year_first = `i' if educ_level_`i' == 2 &
((educ_level_`t' == 1) | (educ_level_`t' >= 3 & educ_level_`t' <= 17)) & mobility_year_first == . & `i' <=
`end_4'
					replace mobility_year_first = `i' if educ_level_`i' == 3 &
((educ_level_`t' >= 0 & educ_level_`t' <= 2) | (educ_level_`t' >= 4 & educ_level_`t' <= 17)) &
mobility_year_first == . & `i' <= `end_4'
```

```
                                        replace mobility_year_first = `i' if educ_level_`i' == 4 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ((educ_level_`t' >= 6 & educ_level_`t' <= 11) | (educ_level_`t'
>= 15 & educ_level_`t' <= 17))) ///
                                        & mobility_year_first == . & `i' <= `end_4'
                                        replace mobility_year_first = `i' if educ_level_`i' == 5 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t'
>= 15 & educ_level_`t' <= 17))) ///
                                        & mobility_year_first == . & `i' <= `end_4'
                                        replace mobility_year_first = `i' if educ_level_`i' == 6 &
((educ_level_`t' >= 0 & educ_level_`t' <= 4) | ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t'
>= 15 & educ_level_`t' <= 17))) ///
                                        & mobility_year_first == . & `i' <= `end_4'
                                        replace mobility_year_first = `i' if (((educ_level_`i' == 7 |
educ_level_`i' == 8 | educ_level_`i' == 11) & (educ_level_`t' >= 0 & educ_level_`t' <= 6)) | ///
                                        ((educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
(educ_level_`t' >= 15 & educ_level_`t' <= 17))) & mobility_year_first == . & `i' <= `end_4'
                                        replace mobility_year_first = `i' if educ_level_`i' == 12 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' >= 15 & educ_level_`t' <= 17)) &
mobility_year_first == . & `i' <= `end_4'

                                        * Brin
                                        replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 2 &
((educ_level_`t' == 1) | (educ_level_`t' >= 3 & educ_level_`t' <= 17)) & brin_crypt_mobil_first == "" & `i' <=
`end_4'
                                        replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 3 &
((educ_level_`t' >= 0 & educ_level_`t' <= 2) | (educ_level_`t' >= 4 & educ_level_`t' <= 17)) &
brin_crypt_mobil_first == "" & `i' <= `end_4'
                                        replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 4 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ///
                                        ((educ_level_`t' >= 6 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & brin_crypt_mobil_first == "" & `i' <= `end_4'
                                        replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 5 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ///
                                        ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & brin_crypt_mobil_first == "" & `i' <= `end_4'
                                        replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 6 &
((educ_level_`t' >= 0 & educ_level_`t' <= 4) | ///
                                        ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & brin_crypt_mobil_first == "" & `i' <= `end_4'
                                        replace brin_crypt_mobil_first = brin_crypt_`i' if (((educ_level_`i' == 7
| educ_level_`i' == 8 | educ_level_`i' == 11) & (educ_level_`t' >= 0 & educ_level_`t' <= 6)) | ///
                                        ((educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
(educ_level_`t' >= 15 & educ_level_`t' <= 17))) & brin_crypt_mobil_first == "" & `i' <= `end_4'
                                        replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 12 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' >= 15 & educ_level_`t' <= 17)) &
brin_crypt_mobil_first == "" & `i' <= `end_4'

                                        * Brinvest
                                        replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 2 &
((educ_level_`t' == 1) | (educ_level_`t' >= 3 & educ_level_`t' <= 17)) & vobrinvest_mobil_first == . & `i' <=
`end_4'
                                        replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 3 &
((educ_level_`t' >= 0 & educ_level_`t' <= 2) | (educ_level_`t' >= 4 & educ_level_`t' <= 17)) &
vobrinvest_mobil_first == . & `i' <= `end_4'
                                        replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 4 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ///
                                        ((educ_level_`t' >= 6 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & vobrinvest_mobil_first == . & `i' <= `end_4'
                                        replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 5 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ///
                                        ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & vobrinvest_mobil_first == . & `i' <= `end_4'
                                        replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 6 &
((educ_level_`t' >= 0 & educ_level_`t' <= 4) | ///
                                        ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & vobrinvest_mobil_first == . & `i' <= `end_4'
                                        replace vobrinvest_mobil_first = vobrinvest_`i' if (((educ_level_`i' == 7
| educ_level_`i' == 8 | educ_level_`i' == 11) & (educ_level_`t' >= 0 & educ_level_`t' <= 6)) | ///
                                        ((educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
(educ_level_`t' >= 15 & educ_level_`t' <= 17))) & vobrinvest_mobil_first == . & `i' <= `end_4'
                                        replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 12 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' >= 15 & educ_level_`t' <= 17)) &
vobrinvest_mobil_first == . & `i' <= `end_4'


                        local end_5 = `cy' + 4 // 5 years
```

```
                                    * Year
                                    replace mobility_year_first = `i' if educ_level_`i' == 9 &
((educ_level_`t' >= 0 & educ_level_`t' <= 6) | (educ_level_`t' == 17)) & mobility_year_first == . & `i' <=
`end_5'
                                    replace mobility_year_first = `i' if educ_level_`i' == 10 &
(educ_level_`t' >= 0 & educ_level_`t' <= 6) & mobility_year_first == . & `i' <= `end_5'
                                    replace mobility_year_first = `i' if educ_level_`i' == 13 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' == 17)) & mobility_year_first == . & `i' <=
`end_5'
                                    replace mobility_year_first = `i' if educ_level_`i' == 14 &
(educ_level_`t' >= 0 & educ_level_`t' <= 3) & mobility_year_first == . & `i' <= `end_5'
                                    replace mobility_year_first = `i' if educ_level_`i' == 15 &
(((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) | (educ_level_`t'
== 17)) & mobility_year_first == . & `i' <= `end_5'

                                    * Brin
                                    replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 9 &
((educ_level_`t' >= 0 & educ_level_`t' <= 6) | (educ_level_`t' == 17)) & brin_crypt_mobil_first == "" & `i' <=
`end_5'
                                    replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 10 &
(educ_level_`t' >= 0 & educ_level_`t' <= 6) & brin_crypt_mobil_first == "" & `i' <= `end_5'
                                    replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 13 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' == 17)) & brin_crypt_mobil_first == "" & `i' <=
`end_5'
                                    replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 14 &
(educ_level_`t' >= 0 & educ_level_`t' <= 3) & brin_crypt_mobil_first == "" & `i' <= `end_5'
                                    replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 15 &
///
                                    (((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 |
educ_level_`t' == 12) | (educ_level_`t' == 17)) & brin_crypt_mobil_first == "" & `i' <= `end_5'

                                    * Brinvest
                                    replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 9 &
((educ_level_`t' >= 0 & educ_level_`t' <= 6) | (educ_level_`t' == 17)) & vobrinvest_mobil_first == . & `i' <=
`end_5'
                                    replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 10 &
(educ_level_`t' >= 0 & educ_level_`t' <= 6) & vobrinvest_mobil_first == . & `i' <= `end_5'
                                    replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 13 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' == 17)) & vobrinvest_mobil_first == . & `i' <=
`end_5'
                                    replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 14 &
(educ_level_`t' >= 0 & educ_level_`t' <= 3) & vobrinvest_mobil_first == . & `i' <= `end_5'
                                    replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 15 &
///
                                    (((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 |
educ_level_`t' == 12) | (educ_level_`t' == 17)) & vobrinvest_mobil_first == . & `i' <= `end_5'

            local end_6 = `cy' + 5 // 6 years

                                    * Year
                                    replace mobility_year_first = `i' if educ_level_`i' == 16 &
((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) &
mobility_year_first == . & `i' <= `end_6'
                                    replace mobility_year_first = `i' if educ_level_`i' == 17 &
((educ_level_`t' >= 0 & educ_level_`t' <= 9) | (educ_level_`t' == 11 | educ_level_`t' == 12 | educ_level_`t' ==
13 | educ_level_`t' == 15)) ///
                                    & mobility_year_first == . & `i' <= `end_6'


                                    * Brin
                                    replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 16 &
((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) &
brin_crypt_mobil_first == "" & `i' <= `end_6'
                                    replace brin_crypt_mobil_first = brin_crypt_`i' if educ_level_`i' == 17 &
((educ_level_`t' >= 0 & educ_level_`t' <= 9) | educ_level_`t' == 11 | educ_level_`t' == 12 | educ_level_`t' ==
13 | educ_level_`t' == 15) ///
                                    & brin_crypt_mobil_first == "" & `i' <= `end_6'

                                    * Brinvest
                                    replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 16 &
((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) &
vobrinvest_mobil_first == . & `i' <= `end_6'
                                    replace vobrinvest_mobil_first = vobrinvest_`i' if educ_level_`i' == 17 &
((educ_level_`t' >= 0 & educ_level_`t' <= 9) | educ_level_`t' == 11 | educ_level_`t' == 12 | educ_level_`t' ==
13 | educ_level_`t' == 15) ///
                                    & vobrinvest_mobil_first == . & `i' <= `end_6'
```

```
}

/// Note that the special education has no BRIN, so that one will be empty.
list rinpersoons sleutel educ_level_2* brin_crypt_2* vobrinvest_2* mobility_year_first brin_crypt_mobil_first
vobrinvest_mobil_first downward_free if downward_free == 1 in 1/100

fre mobility_year_first brin_crypt_mobil_first vobrinvest_mobil_first downward_free upward_free

* Second Mobility Move (non-golden route; e.g. normal paths are excluded)
generate mobility_year_second = .
generate str32 brin_crypt_mobil_second = ""
generate vobrinvest_mobil_second = .


        local end = `cy' + 5
                forvalues i = `cy'(1)`end' {
                        local t = `i' + 1

                        local end_4 = `cy' + 3 // 4 years

                                        * Year
                                        replace mobility_year_second = `i' if educ_level_`i' == 2 &
((educ_level_`t' == 1) | (educ_level_`t' >= 3 & educ_level_`t' <= 17)) & mobility_year_second == . &
mobility_year_first < `t' & `i' <= `end_4'
                                        replace mobility_year_second = `i' if educ_level_`i' == 3 &
((educ_level_`t' >= 0 & educ_level_`t' <= 2) | (educ_level_`t' >= 4 & educ_level_`t' <= 17)) &
mobility_year_second == . & mobility_year_first < `t' & `i' <= `end_4'
                                        replace mobility_year_second = `i' if educ_level_`i' == 4 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ((educ_level_`t' >= 6 & educ_level_`t' <= 11) | (educ_level_`t'
>= 15 & educ_level_`t' <= 17))) ///
                                        & mobility_year_second == . & mobility_year_first < `t' & `i' <= `end_4'
                                        replace mobility_year_second = `i' if educ_level_`i' == 5 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t'
>= 15 & educ_level_`t' <= 17))) ///
                                        & mobility_year_second == . & mobility_year_first < `t' & `i' <= `end_4'
                                        replace mobility_year_second = `i' if educ_level_`i' == 6 &
((educ_level_`t' >= 0 & educ_level_`t' <= 4) | ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t'
>= 15 & educ_level_`t' <= 17))) ///
                                        & mobility_year_second == . & mobility_year_first < `t' & `i' <= `end_4'
                                        replace mobility_year_second = `i' if (((educ_level_`i' == 7 |
educ_level_`i' == 8 | educ_level_`i' == 11) & (educ_level_`t' >= 0 & educ_level_`t' <= 6)) | ///
                                        ((educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
(educ_level_`t' >= 15 & educ_level_`t' <= 17))) & mobility_year_second == . & mobility_year_first < `t' & `i' <=
`end_4'
                                        replace mobility_year_second = `i' if educ_level_`i' == 12 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' >= 15 & educ_level_`t' <= 17)) &
mobility_year_second == . & mobility_year_first < `t' & `i' <= `end_4'

                                        * Brin
                                        replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 2 &
((educ_level_`t' == 1) | (educ_level_`t' >= 3 & educ_level_`t' <= 17)) & brin_crypt_mobil_second == "" &
mobility_year_first < `t' & `i' <= `end_4'
                                        replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 3 &
((educ_level_`t' >= 0 & educ_level_`t' <= 2) | (educ_level_`t' >= 4 & educ_level_`t' <= 17)) ///
                                        & brin_crypt_mobil_second == "" & mobility_year_first < `t' & `i' <=
`end_4'
                                        replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 4 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ///
                                        ((educ_level_`t' >= 6 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & brin_crypt_mobil_second == "" & mobility_year_first < `t'       & `i' <= `end_4'
                                        replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 5 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ///
                                        ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & brin_crypt_mobil_second == "" & mobility_year_first < `t'       & `i' <= `end_4'
                                        replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 6 &
((educ_level_`t' >= 0 & educ_level_`t' <= 4) | ///
                                        ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & brin_crypt_mobil_second == "" & mobility_year_first < `t'       & `i' <= `end_4'
                                        replace brin_crypt_mobil_second = brin_crypt_`i' if (((educ_level_`i' == 7
| educ_level_`i' == 8 | educ_level_`i' == 11) & (educ_level_`t' >= 0 & educ_level_`t' <= 6)) | ///
                                        ((educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
(educ_level_`t' >= 15 & educ_level_`t' <= 17))) & brin_crypt_mobil_second == "" & mobility_year_first < `t' &
`i' <= `end_4'
                                        replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 12 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' >= 15 & educ_level_`t' <= 17)) ///
                                        & brin_crypt_mobil_second == "" & mobility_year_first < `t' & `i' <=
`end_4'
```

```
                                    * Brinvest
                                    replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 2 &
((educ_level_`t' == 1) | (educ_level_`t' >= 3 & educ_level_`t' <= 17)) ///
                                    & vobrinvest_mobil_second == . & mobility_year_first < `t'  & `i' <=
`end_4'
                                    replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 3 &
((educ_level_`t' >= 0 & educ_level_`t' <= 2) | (educ_level_`t' >= 4 & educ_level_`t' <= 17)) ///
                                    & vobrinvest_mobil_second == . & mobility_year_first < `t' & `i' <=
`end_4'
                                    replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 4 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ///
                                    ((educ_level_`t' >= 6 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & vobrinvest_mobil_second == . & mobility_year_first < `t' & `i' <= `end_4'
                                    replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 5 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ///
                                    ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & vobrinvest_mobil_second == . & mobility_year_first < `t' & `i' <= `end_4'
                                    replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 6 &
((educ_level_`t' >= 0 & educ_level_`t' <= 4) | ///
                                    ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & vobrinvest_mobil_second == . & mobility_year_first < `t' & `i' <= `end_4'
                                    replace vobrinvest_mobil_second = vobrinvest_`i' if (((educ_level_`i' == 7
| educ_level_`i' == 8 | educ_level_`i' == 11) & (educ_level_`t' >= 0 & educ_level_`t' <= 6)) | ///
                                    ((educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
(educ_level_`t' >= 15 & educ_level_`t' <= 17))) & vobrinvest_mobil_second == . & mobility_year_first < `t' & `i'
<= `end_4'
                                    replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 12 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' >= 15 & educ_level_`t' <= 17)) ///
                                    & vobrinvest_mobil_second == .        & mobility_year_first < `t'   & `i'
<= `end_4'

                        local end_5 = `cy' + 4 // 5 years


                                    * Year
                                    replace mobility_year_second = `i' if educ_level_`i' == 9 &
((educ_level_`t' >= 0 & educ_level_`t' <= 6) | (educ_level_`t' == 17)) & mobility_year_second == . &
mobility_year_first < `t' & `i' <= `end_5'
                                    replace mobility_year_second = `i' if educ_level_`i' == 10 &
(educ_level_`t' >= 0 & educ_level_`t' <= 6) & mobility_year_second == . & mobility_year_first < `t' & `i' <=
`end_5'
                                    replace mobility_year_second = `i' if educ_level_`i' == 13 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' == 17)) & mobility_year_second == . &
mobility_year_first < `t' & `i' <= `end_5'
                                    replace mobility_year_second = `i' if educ_level_`i' == 14 &
(educ_level_`t' >= 0 & educ_level_`t' <= 3) & mobility_year_second == . & mobility_year_first < `t' & `i' <=
`end_5'
                                    replace mobility_year_second = `i' if educ_level_`i' == 15 &
(((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) | (educ_level_`t'
== 17)) ///
                                    & mobility_year_second == . & mobility_year_first < `t' & `i' <= `end_5'

                                    * Brin
                                    replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 9 &
((educ_level_`t' >= 0 & educ_level_`t' <= 6) | (educ_level_`t' == 17)) & brin_crypt_mobil_second == "" &
mobility_year_first < `t' & `i' <= `end_5'
                                    replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 10 &
(educ_level_`t' >= 0 & educ_level_`t' <= 6) & brin_crypt_mobil_second == "" & mobility_year_first < `t' & `i' <=
`end_5'
                                    replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 13 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' == 17)) & brin_crypt_mobil_second == "" &
mobility_year_first < `t' & `i' <= `end_5'
                                    replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 14 &
(educ_level_`t' >= 0 & educ_level_`t' <= 3) & brin_crypt_mobil_second == "" & mobility_year_first < `t' & `i' <=
`end_5'
                                    replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 15 &
(((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) | (educ_level_`t'
== 17)) ///
                                    & brin_crypt_mobil_second == "" & mobility_year_first < `t' & `i' <=
`end_5'

                                    * Brinvest
                                    replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 9 &
((educ_level_`t' >= 0 & educ_level_`t' <= 6) | (educ_level_`t' == 17)) & vobrinvest_mobil_second == . &
mobility_year_first < `t' & `i' <= `end_5'
```

```
                                        replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 10 &
(educ_level_`t' >= 0 & educ_level_`t' <= 6) & vobrinvest_mobil_second == . & mobility_year_first < `t' & `i' <=
`end_5'
                                        replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 13 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' == 17)) & vobrinvest_mobil_second == . &
mobility_year_first < `t' & `i' <= `end_5'
                                        replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 14 &
(educ_level_`t' >= 0 & educ_level_`t' <= 3) & vobrinvest_mobil_second == . & mobility_year_first < `t' & `i' <=
`end_5'
                                        replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 15 &
(((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) | (educ_level_`t'
== 17)) ///
                                        & vobrinvest_mobil_second == . & mobility_year_first < `t' & `i' <=
`end_5'

                        local end_6 = `cy' + 5 // 6 years

                                        * Year
                                        replace mobility_year_second = `i' if educ_level_`i' == 16 &
((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) &
mobility_year_second == . & mobility_year_first < `t' & `i' <= `end_6'
                                        replace mobility_year_second = `i' if educ_level_`i' == 17 &
((educ_level_`t' >= 0 & educ_level_`t' <= 9) | educ_level_`t' == 11 | educ_level_`t' == 12 | educ_level_`t' ==
13 | educ_level_`t' == 15) ///
                                        & mobility_year_second == .   & mobility_year_first < `t'   & `i' <=
`end_6'

                                        * Brin
                                        replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 16 &
((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) ///
                                        & brin_crypt_mobil_second == "" & mobility_year_first < `t' & `i' <=
`end_6'
                                        replace brin_crypt_mobil_second = brin_crypt_`i' if educ_level_`i' == 17 &
((educ_level_`t' >= 0 & educ_level_`t' <= 9) | educ_level_`t' == 11 | educ_level_`t' == 12 | educ_level_`t' ==
13 | educ_level_`t' == 15) ///
                                        & brin_crypt_mobil_second == "" & mobility_year_first < `t' & `i' <=
`end_6'

                                        * Brinvest
                                        replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 16 &
((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) ///
                                        & vobrinvest_mobil_second == . & mobility_year_first < `t' & `i' <=
`end_6'
                                        replace vobrinvest_mobil_second = vobrinvest_`i' if educ_level_`i' == 17 &
((educ_level_`t' >= 0 & educ_level_`t' <= 9) | educ_level_`t' == 11 | educ_level_`t' == 12 | educ_level_`t' ==
13 | educ_level_`t' == 15) ///
                                        & vobrinvest_mobil_second == .        & mobility_year_first < `t' & `i' <=
`end_6'
        }

list rinpersoons sleutel educ_level_2*       brin_crypt_2* vobrinvest_2* ///
mobility_year_first brin_crypt_mobil_first vobrinvest_mobil_first mobility_year_second brin_crypt_mobil_second
vobrinvest_mobil_second downward_nr_free if downward_nr_free == 2 in 1/2500


* Third Mobility Move (non-golden route; e.g. normal paths are excluded)
generate mobility_year_third = .
generate str32 brin_crypt_mobil_third = ""
generate vobrinvest_mobil_third = .


        local end = `cy' + 5
                forvalues i = `cy'(1)`end' {
                        local t = `i' + 1

                        local end_4 = `cy' + 3 // 4 years

                                        * Year
                                        replace mobility_year_third = `i' if educ_level_`i' == 2 &
((educ_level_`t' == 1) | (educ_level_`t' >= 3 & educ_level_`t' <= 17)) & mobility_year_third == . &
mobility_year_second < `t' & `i' <= `end_4'
                                        replace mobility_year_third = `i' if educ_level_`i' == 3 &
((educ_level_`t' >= 0 & educ_level_`t' <= 2) | (educ_level_`t' >= 4 & educ_level_`t' <= 17)) &
mobility_year_third == . & mobility_year_second < `t' & `i' <= `end_4'
                                        replace mobility_year_third = `i' if educ_level_`i' == 4 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ((educ_level_`t' >= 6 & educ_level_`t' <= 11) | (educ_level_`t'
>= 15 & educ_level_`t' <= 17))) ///
```

```
                                    & mobility_year_third == . & mobility_year_second < `t' & `i' <= `end_4'
                                    replace mobility_year_third = `i' if educ_level_`i' == 5 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t'
>= 15 & educ_level_`t' <= 17))) ///
                                    & mobility_year_third == . & mobility_year_second < `t' & `i' <= `end_4'
                                    replace mobility_year_third = `i' if educ_level_`i' == 6 &
((educ_level_`t' >= 0 & educ_level_`t' <= 4) | ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t'
>= 15 & educ_level_`t' <= 17))) ///
                                    & mobility_year_third == . & mobility_year_second < `t' & `i' <= `end_4'
                                    replace mobility_year_third = `i' if (((educ_level_`i' == 7 |
educ_level_`i' == 8 | educ_level_`i' == 11) & (educ_level_`t' >= 0 & educ_level_`t' <= 6)) | ///
                                    ((educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
(educ_level_`t' >= 15 & educ_level_`t' <= 17))) & mobility_year_third == . & mobility_year_second < `t' & `i' <=
`end_4'
                                    replace mobility_year_third = `i' if educ_level_`i' == 12 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' >= 15 & educ_level_`t' <= 17)) &
mobility_year_third == . & mobility_year_second < `t' & `i' <= `end_4'

                                    * Brin
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 2 &
((educ_level_`t' == 1) | (educ_level_`t' >= 3 & educ_level_`t' <= 17)) & brin_crypt_mobil_third == "" &
mobility_year_second < `t' & `i' <= `end_4'
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 3 &
((educ_level_`t' >= 0 & educ_level_`t' <= 2) | (educ_level_`t' >= 4 & educ_level_`t' <= 17)) ///
                                    & brin_crypt_mobil_third == "" & mobility_year_second < `t' & `i' <=
`end_4'
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 4 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ///
                                    ((educ_level_`t' >= 6 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & brin_crypt_mobil_third == "" & mobility_year_second < `t'       & `i' <= `end_4'
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 5 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ///
                                    ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & brin_crypt_mobil_third == "" & mobility_year_second < `t'       & `i' <= `end_4'
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 6 &
((educ_level_`t' >= 0 & educ_level_`t' <= 4) | ///
                                    ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & brin_crypt_mobil_third == "" & mobility_year_second < `t'       & `i' <= `end_4'
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if (((educ_level_`i' == 7
| educ_level_`i' == 8 | educ_level_`i' == 11) & (educ_level_`t' >= 0 & educ_level_`t' <= 6)) | ///
                                    ((educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
(educ_level_`t' >= 15 & educ_level_`t' <= 17))) & brin_crypt_mobil_third == "" & mobility_year_second < `t' &
`i' <= `end_4'
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 12 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' >= 15 & educ_level_`t' <= 17)) ///
                                    & brin_crypt_mobil_third == "" & mobility_year_second < `t' & `i' <=
`end_4'

                                    * Brinvest
                                    replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 2 &
((educ_level_`t' == 1) | (educ_level_`t' >= 3 & educ_level_`t' <= 17)) ///
                                    & vobrinvest_mobil_third == . & mobility_year_second < `t'  & `i' <=
`end_4'
                                    replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 3 &
((educ_level_`t' >= 0 & educ_level_`t' <= 2) | (educ_level_`t' >= 4 & educ_level_`t' <= 17)) ///
                                    & vobrinvest_mobil_third == . & mobility_year_second < `t' & `i' <=
`end_4'
                                    replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 4 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ///
                                    ((educ_level_`t' >= 6 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & vobrinvest_mobil_third == . & mobility_year_second < `t' & `i' <= `end_4'
                                    replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 5 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | ///
                                    ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & vobrinvest_mobil_third == . & mobility_year_second < `t' & `i' <= `end_4'
                                    replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 6 &
((educ_level_`t' >= 0 & educ_level_`t' <= 4) | ///
                                    ((educ_level_`t' >= 7 & educ_level_`t' <= 11) | (educ_level_`t' >= 15 &
educ_level_`t' <= 17))) & vobrinvest_mobil_third == . & mobility_year_second < `t' & `i' <= `end_4'
                                    replace vobrinvest_mobil_third = vobrinvest_`i' if (((educ_level_`i' == 7
| educ_level_`i' == 8 | educ_level_`i' == 11) & (educ_level_`t' >= 0 & educ_level_`t' <= 6)) | ///
                                    ((educ_level_`i' == 7 | educ_level_`i' == 8 | educ_level_`i' == 11) &
(educ_level_`t' >= 15 & educ_level_`t' <= 17))) & vobrinvest_mobil_third == . & mobility_year_second < `t' & `i'
<= `end_4'
                                    replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 12 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' >= 15 & educ_level_`t' <= 17)) ///
```

```
                                    & vobrinvest_mobil_third == . & mobility_year_second < `t'  & `i' <=
`end_4'

                        local end_5 = `cy' + 4 // 5 years


                                    * Year
                                    replace mobility_year_third = `i' if educ_level_`i' == 9 &
((educ_level_`t' >= 0 & educ_level_`t' <= 6) | (educ_level_`t' == 17)) & mobility_year_third == . &
mobility_year_second < `t' & `i' <= `end_5'
                                    replace mobility_year_third = `i' if educ_level_`i' == 10 &
(educ_level_`t' >= 0 & educ_level_`t' <= 6) & mobility_year_third == . & mobility_year_second < `t' & `i' <=
`end_5'
                                    replace mobility_year_third = `i' if educ_level_`i' == 13 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' == 17)) & mobility_year_third == . &
mobility_year_second < `t' & `i' <= `end_5'
                                    replace mobility_year_third = `i' if educ_level_`i' == 14 &
(educ_level_`t' >= 0 & educ_level_`t' <= 3) & mobility_year_third == . & mobility_year_second < `t' & `i' <=
`end_5'
                                    replace mobility_year_third = `i' if educ_level_`i' == 15 &
(((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) | (educ_level_`t'
== 17)) ///
                                    & mobility_year_third == . & mobility_year_second < `t' & `i' <= `end_5'

                                    * Brin
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 9 &
((educ_level_`t' >= 0 & educ_level_`t' <= 6) | (educ_level_`t' == 17)) & brin_crypt_mobil_third == "" &
mobility_year_second < `t' & `i' <= `end_5'
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 10 &
(educ_level_`t' >= 0 & educ_level_`t' <= 6) & brin_crypt_mobil_third == "" & mobility_year_second < `t' & `i' <=
`end_5'
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 13 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' == 17)) & brin_crypt_mobil_third == "" &
mobility_year_second < `t' & `i' <= `end_5'
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 14 &
(educ_level_`t' >= 0 & educ_level_`t' <= 3) & brin_crypt_mobil_third == "" & mobility_year_second < `t' & `i' <=
`end_5'
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 15 &
(((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) | (educ_level_`t'
== 17)) ///
                                    & brin_crypt_mobil_third == "" & mobility_year_second < `t' & `i' <=
`end_5'

                                    * Brinvest
                                    replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 9 &
((educ_level_`t' >= 0 & educ_level_`t' <= 6) | (educ_level_`t' == 17)) & vobrinvest_mobil_third == . &
mobility_year_second < `t' & `i' <= `end_5'
                                    replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 10 &
(educ_level_`t' >= 0 & educ_level_`t' <= 6) & vobrinvest_mobil_third == . & mobility_year_second < `t' & `i' <=
`end_5'
                                    replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 13 &
((educ_level_`t' >= 0 & educ_level_`t' <= 3) | (educ_level_`t' == 17)) & vobrinvest_mobil_third == . &
mobility_year_second < `t' & `i' <= `end_5'
                                    replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 14 &
(educ_level_`t' >= 0 & educ_level_`t' <= 3) & vobrinvest_mobil_third == . & mobility_year_second < `t' & `i' <=
`end_5'
                                    replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 15 &
(((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) | (educ_level_`t'
== 17)) ///
                                    & vobrinvest_mobil_third == . & mobility_year_second < `t' & `i' <=
`end_5'

                        local end_6 = `cy' + 5 // 6 years

                                    * Year
                                    replace mobility_year_third = `i' if educ_level_`i' == 16 &
((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) &
mobility_year_third == . & mobility_year_second < `t' & `i' <= `end_6'
                                    replace mobility_year_third = `i' if educ_level_`i' == 17 &
((educ_level_`t' >= 0 & educ_level_`t' <= 9) | educ_level_`t' == 11 | educ_level_`t' == 12 | educ_level_`t' ==
13 | educ_level_`t' == 15) ///
                                    & mobility_year_third == .    & mobility_year_second < `t'  & `i' <=
`end_6'

                                    * Brin
                                    replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 16 &
((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) ///
```

```
                                        & brin_crypt_mobil_third == "" & mobility_year_second < `t' & `i' <=
`end_6'
                                        replace brin_crypt_mobil_third = brin_crypt_`i' if educ_level_`i' == 17 &
((educ_level_`t' >= 0 & educ_level_`t' <= 9) | educ_level_`t' == 11 | educ_level_`t' == 12 | educ_level_`t' ==
13 | educ_level_`t' == 15) ///
                                        & brin_crypt_mobil_third == "" & mobility_year_second < `t' & `i' <=
`end_6'

                                        * Brinvest
                                        replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 16 &
((educ_level_`t' >= 0 & educ_level_`t' <= 8) | educ_level_`t' == 11 | educ_level_`t' == 12) ///
                                        & vobrinvest_mobil_third == . & mobility_year_second < `t' & `i' <=
`end_6'
                                        replace vobrinvest_mobil_third = vobrinvest_`i' if educ_level_`i' == 17 &
((educ_level_`t' >= 0 & educ_level_`t' <= 9) | educ_level_`t' == 11 | educ_level_`t' == 12 | educ_level_`t' ==
13 | educ_level_`t' == 15) ///
                                        & vobrinvest_mobil_third == . & mobility_year_second < `t' & `i' <=
`end_6'
        }

list rinpersoons sleutel educ_level_2*       brin_crypt_2* vobrinvest_2* mobility_year_first
brin_crypt_mobil_first vobrinvest_mobil_first ///
mobility_year_second brin_crypt_mobil_second vobrinvest_mobil_second mobility_year_third brin_crypt_mobil_third
vobrinvest_mobil_third downward_nr_free if downward_nr_free == 2 in 1/2500

fre downward_free upward_free

* Concatenate to one school ID
egen sch_pos1 = concat(brin_crypt_first vobrinvest_first)
egen sch_pos2 = concat(brin_crypt_second vobrinvest_second)
egen sch_pos3 = concat(brin_crypt_third vobrinvest_third)

egen sch_downward_1 = concat(brin_crypt_mobil_first vobrinvest_mobil_first) if downward_free == 1
egen sch_downward_2 = concat(brin_crypt_mobil_second vobrinvest_mobil_second) if downward_free == 1
egen sch_downward_3 = concat(brin_crypt_mobil_third vobrinvest_mobil_third) if downward_free == 1

egen sch_upward_1 = concat(brin_crypt_mobil_first vobrinvest_mobil_first) if upward_free == 1
egen sch_upward_2 = concat(brin_crypt_mobil_second vobrinvest_mobil_second) if upward_free == 1
egen sch_upward_3 = concat(brin_crypt_mobil_third vobrinvest_mobil_third) if upward_free == 1

keep rinpersoons sleutel startjaar sch_pos1 sch_pos2 sch_pos3 sch_downward_1 sch_downward_2 sch_downward_3
sch_upward_1 sch_upward_2 sch_upward_3 downward_free upward_free

reshape long sch_pos, i(rinpersoons sleutel) j(iteration) // reshape on the school and second school if swapped

* Empty missing ID's
foreach var in sch_pos sch_downward_1 sch_downward_2 sch_downward_3 sch_upward_1 sch_upward_2 sch_upward_3 {
        replace `var' = "" if `var' == "."
}

order rinpersoons sleutel iteration downward_free upward_free sch_pos sch_downward_1 sch_downward_2
sch_downward_3 sch_upward_1 sch_upward_2 sch_upward_3

* Making of accaining indicators
foreach var in downward upward  {
generate nr_`var' = .
replace nr_`var' = 0 if sch_`var'_1 == "" & sch_`var'_2 == "" & sch_`var'_3 == ""
replace nr_`var' = 0 if (sch_`var'_1 != sch_pos & sch_`var'_2 != sch_pos & sch_`var'_3 != sch_pos) & nr_`var' !=
0
replace nr_`var' = 1 if (sch_`var'_1 == sch_pos | sch_`var'_2 == sch_pos | sch_`var'_3 == sch_pos) & nr_`var' !=
0
replace nr_`var' = 2 if (sch_`var'_1 == sch_pos & sch_`var'_2 == sch_pos) & nr_`var' != 0
replace nr_`var' = 3 if (sch_`var'_1 == sch_pos & sch_`var'_2 == sch_pos & sch_`var'_3 == sch_pos) & nr_`var' !=
0

generate `var' = 0 if nr_`var' == 0
replace `var' = 1 if nr_`var' == 1 | nr_`var' == 2 | nr_`var' == 3
}

sum nr_downward downward nr_upward upward

order rinpersoons sleutel iteration downward_free upward_free sch_pos sch_downward_1 sch_downward_2
sch_downward_3 sch_upward_1 sch_upward_2 sch_upward_3 nr_downward downward nr_upward upward

* Aggregate
drop if sch_pos == "" // delete empty school ID's
```

```
fre nr_downward downward nr_upward upward

generate brin_crypt_`cy' = substr(sch_pos,1,32)
generate vobrinvest_`cy' = substr(sch_pos,33,2)
destring vobrinvest_`cy', replace

* cohort
preserve
collapse       (mean) nr_downward downward nr_upward upward
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "mean"
save "@LOCATION\Secondary Education\Mobility_cohort_mean_`c'.dta", replace
restore

preserve
collapse       (count) nr_downward downward nr_upward upward
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "count"
save "@LOCATION\Secondary Education\Mobility_cohort_count_`c'.dta", replace
restore

preserve
collapse       (sum) nr_downward downward nr_upward upward
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "sum"
save "@LOCATION\Secondary Education\Mobility_cohort_sum_`c'.dta", replace
restore

* scholen
preserve
collapse       (mean) nr_downward downward nr_upward upward ///
                     , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "mean"
save "@LOCATION\Secondary Education\Mobility_school_mean_`c'.dta", replace
restore

preserve
collapse       (count) nr_downward downward nr_upward upward ///
                      , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "count"
save "@LOCATION\Secondary Education\Mobility_school_count_`c'.dta", replace
restore

preserve
collapse       (sum) nr_downward downward nr_upward upward ///
                      , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "sum"
save "@LOCATION\Secondary Education\Mobility_school_sum_`c'.dta", replace
restore
}
```

Do-file 3. Collapse – Recommendations

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* Purpose: Making the acceleration variable
* Making flexibility indicators available at the school level and at the cohort level
****************************************

/// The do-file is made up as follows
// 1. There is a loop over all the cohort files (from 2011 to 2013)
// 2. This loop is ran for every type of flexibility indicator. Doing it within one file, makes it at the end
slow as more and more variables are created.
// 3. Collapse the file at the cohort level and at the school level but three different statistics are
collapsed: mean, count of all cases, sum of the variable.
// The latter is only useful when it is a 0/1 variable, as it then counts all the 1's.

// Because students switch schools, the file is reshaped wide to include up to three schools.

* Stringency of teacher recommendation.
forvalues cy = 2011(1)2013 {

use "@LOCATION\Secondary Education\Data set individual level entry cohort `cy'.dta", clear
local c = "c`cy'"

forvalues i = 2021(1)2027 {
generate vobrinvest_`i' = .
}

capture drop lastyear
generate lastyear = . // to differentiate between nominal duration of level; if heterogeneous the longer takes
precdenet over the shorter one
replace lastyear = startjaar + 4 if (group_vmbobb_`cy' == 1 | group_vmbokb_`cy' == 1 | group_vmbogt_`cy' == 1)
replace lastyear = startjaar + 5 if group_havo_`cy' == 1
replace lastyear = startjaar + 6 if group_vwo_`cy' == 1
fre lastyear

local start = `cy' + 1
local end = lastyear

generate swap_year = .
forvalues i = `start'(1)`end' {
local before = `i' - 1
local excep = `start' - 1
replace swap_year = `i' if (schoolswap_`before' == 1 | schoolswap_`before' == 2)
replace swap_year = `start' if ((brin_crypt_`excep' != brin_crypt_`start') | (vobrinvest_`excep' !=
vobrinvest_`start')) & swap_year == .
}

generate str32 brin_crypt_first = ""
generate vobrinvest_first = .
generate first_end_year = .
generate second_start_year = .

forvalues i = `cy'(1)2019 {
        local t = `i' + 1
        replace brin_crypt_first = brin_crypt_`cy' if voleerjaar_`cy' == 1

        replace vobrinvest_first = vobrinvest_`cy' if voleerjaar_`cy' == 1

        replace first_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & first_end_year == .
        replace first_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & first_end_year == .

        replace second_start_year = first_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & first_end_year !=
. & swap_year != . & brin_crypt_`t' != "" & second_start_year == .
        replace second_start_year = first_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & first_end_year !=
. & swap_year != . & vobrinvest_`t' != . & second_start_year == .
        replace second_start_year = swap_year if brin_crypt_`i' == "" & brin_crypt_`t' != "" // for those cases
who have an in-between BRIN missing
        }

list brin_crypt_first vobrinvest_first brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year
second_start_year in 1/100 if schoolswap == 1
list brin_crypt_first vobrinvest_first brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year
second_start_year in 1/25
```

```
generate str32 brin_crypt_second = ""
generate vobrinvest_second = .
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_second = brin_crypt_`t' if (brin_crypt_`i' != brin_crypt_`t') & swap_year != . &
second_start_year >= `t' & brin_crypt_second == ""
	replace vobrinvest_second = vobrinvest_`t' if (vobrinvest_`i' != vobrinvest_`t') & swap_year != . &
second_start_year >= `t' & vobrinvest_second == .
}
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_second = brin_crypt_`t' if brin_crypt_second == "" & (vobrinvest_second != .)
	replace vobrinvest_second = vobrinvest_`t' if vobrinvest_second == . & (brin_crypt_second != "")
	}

generate second_end_year = .
generate third_start_year = .
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace second_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & second_start_year < `i' &
second_end_year == .
	replace second_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & second_start_year < `i' &
second_end_year == .


	replace third_start_year = second_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & second_end_year
!= . & swap_year != . & brin_crypt_`t' != "" & third_start_year == .
	replace third_start_year = second_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & second_end_year
!= . & swap_year != . & vobrinvest_`t' != . & third_start_year == .
	}

generate str32 brin_crypt_third = ""
generate vobrinvest_third = .
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_third = brin_crypt_`t' if third_start_year == `t' & brin_crypt_third == ""
	replace vobrinvest_third = vobrinvest_`t' if third_start_year == `t' & vobrinvest_third == .
}
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_third = brin_crypt_`t' if brin_crypt_third == "" & (vobrinvest_third != .)
	replace vobrinvest_third = vobrinvest_`t' if vobrinvest_third == . & (brin_crypt_third != "")
	}

generate third_end_year = .
generate fourth_start_year = .
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace third_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & third_start_year < `i' &
third_end_year == .
	replace third_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & third_start_year < `i' &
third_end_year == .


	replace fourth_start_year = third_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & third_end_year !=
. & swap_year != . & brin_crypt_`t' != "" & fourth_start_year == .
	replace fourth_start_year = third_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & third_end_year !=
. & swap_year != . & vobrinvest_`t' != . & fourth_start_year == .
	}

generate str32 brin_crypt_fourth = ""
generate vobrinvest_fourth = .
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_fourth = brin_crypt_`t' if fourth_start_year == `t' & brin_crypt_fourth == ""
	replace vobrinvest_fourth = vobrinvest_`t' if fourth_start_year == `t' & vobrinvest_fourth == .
}
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_fourth = brin_crypt_`t' if brin_crypt_fourth == "" & (vobrinvest_fourth != .)
	replace vobrinvest_fourth = vobrinvest_`t' if vobrinvest_fourth == . & (brin_crypt_fourth != "")
	}

list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_fourth vobrinvest_fourth brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap swap_year ///
first_end_year second_start_year second_end_year third_start_year in 1/100 if schoolswap == 1
```

```
list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_fourth vobrinvest_fourth brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap swap_year ///
first_end_year second_start_year second_end_year third_start_year in 1/25

***** rec comparison
fre cert_firstinsec_year cert_secondinsec_year cert_thirdinsec_year cert_fourthinsec_year
list cert_firstinsec_year cert_secondinsec_year cert_thirdinsec_year cert_fourthinsec_year in 1/100

fre rec_cert_free_highest
generate certlowerrec = 0 if rec_cert_free_highest != .
replace certlowerrec = 1 if rec_cert_free_highest == 0
generate certequalrec = 0 if rec_cert_free_highest != .
replace certequalrec = 1 if rec_cert_free_highest == 1
generate certhigherrec = 0 if rec_cert_free_highest != .
replace certhigherrec = 1 if rec_cert_free_highest == 2

fre rec_cert_free_highest certlowerrec certequalrec certhigherrec

generate str32 brinexam_first = ""
generate str32 brinexam_second = ""
generate str32 brinexam_third = ""
generate str32 brinexam_fourth = ""

generate brinvestexam_first = .
generate brinvestexam_second = .
generate brinvestexam_third = .
generate brinvestexam_fourth = .

forvalues i = 2010(1)2020 {
        replace brinexam_first = brinexamvo_crypt_`i' if cert_firstinsec_year == `i'
        replace brinexam_second = brinexamvo_crypt_`i' if cert_secondinsec_year == `i'
        replace brinexam_third = brinexamvo_crypt_`i' if cert_thirdinsec_year == `i'
        replace brinexam_fourth = brinexamvo_crypt_`i' if cert_fourthinsec_year == `i'

        replace brinvestexam_first = brinvestexamvo_`i' if cert_firstinsec_year == `i'
        replace brinvestexam_second = brinvestexamvo_`i' if cert_secondinsec_year == `i'
        replace brinvestexam_third = brinvestexamvo_`i' if cert_thirdinsec_year == `i'
        replace brinvestexam_fourth = brinvestexamvo_`i' if cert_fourthinsec_year == `i'
        }

list brinexam_first brinexam_second brinexam_third brinexam_fourth brinvestexam_first brinvestexam_second
brinvestexam_third brinvestexam_fourth cert_firstinsec_year cert_secondinsec_year cert_thirdinsec_year
cert_fourthinsec_year ////
cert_level_2* brinexamvo_crypt_2* brinvestexamvo_2* if cert_thirdinsec_year != . in 1/1000

list brinexam_first brinexam_second brinexam_third brinexam_fourth brinvestexam_first brinvestexam_second
brinvestexam_third brinvestexam_fourth cert_firstinsec_year cert_secondinsec_year cert_thirdinsec_year
cert_fourthinsec_year ////
cert_level_2* brinexamvo_crypt_2* brinvestexamvo_2* in 1/25

* Concatenate to one school ID
egen sch_pos1 = concat(brin_crypt_first vobrinvest_first)
egen sch_pos2 = concat(brin_crypt_second vobrinvest_second)
egen sch_pos3 = concat(brin_crypt_third vobrinvest_third)
egen sch_pos4 = concat(brin_crypt_fourth vobrinvest_fourth)

egen sch_cert_1 = concat(brinexam_first brinvestexam_first)
egen sch_cert_2 = concat(brinexam_second brinvestexam_second)
egen sch_cert_3 = concat(brinexam_third brinvestexam_third)
egen sch_cert_4 = concat(brinexam_fourth brinvestexam_fourth)

keep rinpersoons sleutel startjaar sch_pos1 sch_pos2 sch_pos3 sch_pos4 sch_cert_1 sch_cert_2 sch_cert_3
sch_cert_4 certlowerrec certequalrec certhigherrec

reshape long sch_pos, i(rinpersoons sleutel) j(iteration) // reshape on the school and second school if swapped

* Empty missing ID's
foreach var in sch_pos sch_cert_1 sch_cert_2 sch_cert_3 sch_cert_4 {
        replace `var' = "" if `var' == "."
}

order rinpersoons sleutel iteration certlowerrec certequalrec certhigherrec sch_pos sch_cert_1 sch_cert_2
sch_cert_3 sch_cert_4 startjaar

* Making of accaining indicators
foreach var in cert {
generate nr_`var' = .
```

```
replace nr_`var' = 0 if sch_`var'_1 == "" & sch_`var'_2 == "" & sch_`var'_3 == ""
replace nr_`var' = 0 if (sch_`var'_1 != sch_pos & sch_`var'_2 != sch_pos & sch_`var'_3 != sch_pos) & nr_`var' !=
0
replace nr_`var' = 1 if (sch_`var'_1 == sch_pos | sch_`var'_2 == sch_pos | sch_`var'_3 == sch_pos) & nr_`var' !=
0
replace nr_`var' = 2 if (sch_`var'_1 == sch_pos & sch_`var'_2 == sch_pos) & nr_`var' != 0
replace nr_`var' = 3 if (sch_`var'_1 == sch_pos & sch_`var'_2 == sch_pos & sch_`var'_3 == sch_pos) & nr_`var' !=
0

generate `var' = 0 if nr_`var' == 0
replace `var' = 1 if nr_`var' == 1 | nr_`var' == 2 | nr_`var' == 3
}

sum  nr_cert cert

order rinpersoons sleutel iteration startjaar certlowerrec certequalrec certhigherrec nr_cert cert

* Aggregate
drop if sch_pos == "" // delete empty school ID's

generate brin_crypt_`cy' = substr(sch_pos,1,32)
generate vobrinvest_`cy' = substr(sch_pos,33,2)
destring vobrinvest_`cy', replace

preserve
collapse       (mean) certlowerrec certequalrec certhigherrec nr_cert cert
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "mean"
save "@LOCATION\Secondary Education\Recommendation_cohort_mean_`c'.dta", replace
restore

preserve
collapse       (count) certlowerrec certequalrec certhigherrec nr_cert cert
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "count"
save "@LOCATION\Secondary Education\Recommendation_cohort_count_`c'.dta", replace
restore

preserve
collapse       (sum) certlowerrec certequalrec certhigherrec nr_cert cert
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "sum"
save "@LOCATION\Secondary Education\Recommendation_cohort_sum_`c'.dta", replace
restore

preserve
collapse       (mean) certlowerrec certequalrec certhigherrec nr_cert cert ///
                     , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "mean"
save "@LOCATION\Secondary Education\Recommendation_school_mean_`c'.dta", replace
restore

preserve
collapse       (count) certlowerrec certequalrec certhigherrec nr_cert cert ///
                     , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "count"
save "@LOCATION\Secondary Education\Recommendation_school_count_`c'.dta", replace
restore

preserve
collapse       (sum) certlowerrec certequalrec certhigherrec nr_cert cert ///
                     , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "sum"
save "@LOCATION\Secondary Education\Recommendation_school_sum_`c'.dta", replace
restore
}
```

Do-file 3: Collapse – Retention

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* Purpose: Making the retention variable
* Making flexibility indicators available at the school level and at the cohort level
****************************************

/// The do-file is made up as follows
// 1. There is a loop over all the cohort files (from 2011 to 2013)
// 2. This loop is ran for every type of flexibility indicator. Doing it within one file, makes it at the end
slow as more and more variables are created.
// 3. Collapse the file at the cohort level and at the school level but three different statistics are
collapsed: mean, count of all cases, sum of the variable.
// The latter is only useful when it is a 0/1 variable, as it then counts all the 1's.

// The loop can only be executed on up and including the 2018 entry cohort, as one needs an extra year after the
entry year for meaningful indicators.

// Because students switch schools, the file is reshaped wide to include up to three schools.

****************************************
//// RETENTION
****************************************


forvalues cy = 2011(1)2013 {

use "@LOCATION\Secondary Education\Data set individual level entry cohort `cy'.dta", clear
local c = "c`cy'"

capture drop lastyear
generate lastyear = . // to differentiate between nominal duration of level; if heterogeneous the longer takes
precdenet over the shorter one
replace lastyear = startjaar + 4 if (group_vmbobb_`cy' == 1 | group_vmbokb_`cy' == 1 | group_vmbogt_`cy' == 1)
replace lastyear = startjaar + 5 if group_havo_`cy' == 1
replace lastyear = startjaar + 6 if group_vwo_`cy' == 1
fre lastyear

local start = `cy' + 1
local end = lastyear

generate swap_year = .
forvalues i = `start'(1)`end' {
local before = `i' - 1
local excep = `start' - 1
replace swap_year = `i' if (schoolswap_`before' == 1 | schoolswap_`before' == 2)
replace swap_year = `start' if ((brin_crypt_`excep' != brin_crypt_`start') | (vobrinvest_`excep' !=
vobrinvest_`start')) & swap_year == .
}

generate str32 brin_crypt_first = ""
generate vobrinvest_first = .

generate first_end_year = .
generate second_start_year = .

forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_first = brin_crypt_`cy' if voleerjaar_`cy' == 1

	replace vobrinvest_first = vobrinvest_`cy' if voleerjaar_`cy' == 1

	replace first_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & first_end_year == .
	replace first_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & first_end_year == .

	replace second_start_year = first_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & first_end_year !=
. & swap_year != . & brin_crypt_`t' != "" & second_start_year == .
	replace second_start_year = first_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & first_end_year !=
. & swap_year != . & vobrinvest_`t' != . & second_start_year == .
	replace second_start_year = swap_year if brin_crypt_`i' == "" & brin_crypt_`t' != "" // for those cases
who have an in-between BRIN missing
	}
```

```
list brin_crypt_first vobrinvest_first brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year
second_start_year in 1/100 if schoolswap == 1
list brin_crypt_first vobrinvest_first brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year
second_start_year in 1/25

generate str32 brin_crypt_second = ""
generate vobrinvest_second = .

forvalues i = `cy'(1)2019 {
       local t = `i' + 1
       replace brin_crypt_second = brin_crypt_`t' if (brin_crypt_`i' != brin_crypt_`t') & swap_year != . &
second_start_year >= `t' & brin_crypt_second == ""
       replace vobrinvest_second = vobrinvest_`t' if (vobrinvest_`i' != vobrinvest_`t') & swap_year != . &
second_start_year >= `t' & vobrinvest_second == .
}
forvalues i = `cy'(1)2019 {
       local t = `i' + 1
       replace brin_crypt_second = brin_crypt_`t' if brin_crypt_second == "" & (vobrinvest_second != .)
       replace vobrinvest_second = vobrinvest_`t' if vobrinvest_second == . & (brin_crypt_second != "")
       }

generate second_end_year = .
generate third_start_year = .

forvalues i = `cy'(1)2019 {
       local t = `i' + 1
       replace second_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & second_start_year < `i' &
second_end_year == .
       replace second_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & second_start_year < `i' &
second_end_year == .


       replace third_start_year = second_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & second_end_year
!= . & swap_year != . & brin_crypt_`t' != "" & third_start_year == .
       replace third_start_year = second_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & second_end_year
!= . & swap_year != . & vobrinvest_`t' != . & third_start_year == .
       }

generate str32 brin_crypt_third = ""
generate vobrinvest_third = .

forvalues i = `cy'(1)2019 {
       local t = `i' + 1
       replace brin_crypt_third = brin_crypt_`t' if third_start_year == `t' & brin_crypt_third == ""
       replace vobrinvest_third = vobrinvest_`t' if third_start_year == `t' & vobrinvest_third == .
}
forvalues i = `cy'(1)2019 {
       local t = `i' + 1
       replace brin_crypt_third = brin_crypt_`t' if brin_crypt_third == "" & (vobrinvest_third != .)
       replace vobrinvest_third = vobrinvest_`t' if vobrinvest_third == . & (brin_crypt_third != "")
       }

list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap swap_year ///
first_end_year second_start_year second_end_year third_start_year in 1/100 if schoolswap == 1
list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap swap_year ///
first_end_year second_start_year second_end_year third_start_year in 1/25


//// RETAINING
egen nr_ret_samelevel = anycount(retention_samelevel_*), values(1)
fre nr_ret_samelevel

generate ret_year_first = .
generate str32 brin_crypt_ret_first = ""
generate vobrinvest_ret_first = .

generate ret_year_second = .
generate str32 brin_crypt_ret_second = ""
generate vobrinvest_ret_second = .

generate ret_year_third = .
generate str32 brin_crypt_ret_third = ""
generate vobrinvest_ret_third = .

local j = `cy' + 1
```

```
forvalues i = `j'(1)2020 {
	local t = `i' - 1

	generate ret_samelevel_first_`t' = 0 if voleerjaar_`i' != .
	replace ret_samelevel_first_`t' = 1 if voleerjaar_`i' == voleerjaar_`t' & ((educ_level_insp_`i' ==
educ_level_insp_`t') | educ_level_insp_`i' == 9) & voleerjaar_`i' != .
	replace ret_samelevel_first_`t' = . if lastyear < `i' & 2020 >= `i'

	replace ret_year_first = `t' if ret_samelevel_first_`t' == 1 & ret_year_first == .

	replace brin_crypt_ret_first = brin_crypt_`t' if ret_samelevel_first_`t' == 1
	replace vobrinvest_ret_first = vobrinvest_`t' if ret_samelevel_first_`t' == 1
	}


local j = `cy' + 1
forvalues i = `j'(1)2020 {
	local t = `i' - 1
	generate ret_samelevel_second_`t' = 0 if voleerjaar_`i' != .
	replace ret_samelevel_second_`t' = 1 if voleerjaar_`i' == voleerjaar_`t' & ((educ_level_insp_`i' ==
educ_level_insp_`t') | educ_level_insp_`i' == 9) & voleerjaar_`i' != . & ret_year_first < `t'
	replace ret_samelevel_second_`t' = . if lastyear < `i' & 2020 >= `i'

	replace ret_year_second = `t' if ret_samelevel_second_`t' == 1 & ret_year_second == .

	replace brin_crypt_ret_second = brin_crypt_`t' if ret_samelevel_second_`t' == 1
	replace vobrinvest_ret_second = vobrinvest_`t' if ret_samelevel_second_`t' == 1
}

local j = `cy' + 1
forvalues i = `j'(1)2020 {
	local t = `i' - 1
	generate ret_samelevel_third_`t' = 0 if voleerjaar_`i' != .
	replace ret_samelevel_third_`t' = 1 if voleerjaar_`i' == voleerjaar_`t' & ((educ_level_insp_`i' ==
educ_level_insp_`t') | educ_level_insp_`i' == 9) & voleerjaar_`i' != . & ret_year_second < `t'
	replace ret_samelevel_third_`t' = . if lastyear < `i' & 2020 >= `i'

	replace ret_year_third = `t' if ret_samelevel_third_`t' == 1 & ret_year_third == .

	replace brin_crypt_ret_third = brin_crypt_`t' if ret_samelevel_third_`t' == 1
	replace vobrinvest_ret_third = vobrinvest_`t' if ret_samelevel_third_`t' == 1
}

fre ret_samelevel_first* ret_samelevel_second*
sum ret_samelevel_first_2* ret_samelevel_second_2*

egen ret_samelevel_first = anymatch(ret_samelevel_first_2*), values(1)
egen ret_samelevel_second = anymatch(ret_samelevel_second_2*), values(1)
egen ret_samelevel_third = anymatch(ret_samelevel_third_2*), values(1)


list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year second_start_year ///
ret_samelevel_f* ret_year_first ret_samelevel_s* ret_year_second voleerjaar_2* brin_crypt_ret_first
vobrinvest_ret_first brin_crypt_ret_second vobrinvest_ret_second in 1/100 if schoolswap == 1 &
ret_samelevel_first == 1
list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year second_start_year ///
ret_samelevel_f* ret_year_first ret_samelevel_s* ret_year_second voleerjaar_2* brin_crypt_ret_first
vobrinvest_ret_first brin_crypt_ret_second vobrinvest_ret_second in 1/25
list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year second_start_year ///
ret_samelevel_f* ret_year_first ret_samelevel_s* ret_year_second voleerjaar_2* brin_crypt_ret_first
vobrinvest_ret_first brin_crypt_ret_second vobrinvest_ret_second if sleutel ==
"060534b98b6cb2b40b63e467b50bc25a"
list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year second_start_year ///
ret_samelevel_f* ret_year_first ret_samelevel_s* ret_year_second voleerjaar_2* brin_crypt_ret_first
vobrinvest_ret_first brin_crypt_ret_second vobrinvest_ret_second if sleutel ==
"39bbcdca3051a973b4262feb1b02578a"

order brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_ret_first vobrinvest_ret_first ret_year_first ///
brin_crypt_ret_second vobrinvest_ret_second ret_year_second brin_crypt_ret_third vobrinvest_ret_third
ret_year_third ///
ret_samelevel_first ret_samelevel_second ret_samelevel_third nr_ret_samelevel, last
```

```
* Concatenate to one school ID
egen sch_pos1 = concat(brin_crypt_first vobrinvest_first)
egen sch_pos2 = concat(brin_crypt_second vobrinvest_second)
egen sch_pos3 = concat(brin_crypt_third vobrinvest_third)

egen sch_ret1 = concat(brin_crypt_ret_first vobrinvest_ret_first)
egen sch_ret2 = concat(brin_crypt_ret_second vobrinvest_ret_second)
egen sch_ret3 = concat(brin_crypt_ret_third vobrinvest_ret_third)

keep rinpersoons sleutel startjaar sch_pos1 sch_pos2 sch_pos3 ret_samelevel_first ret_samelevel_second
ret_samelevel_third nr_ret_samelevel schoolswap sch_ret1 ret_year_first sch_ret2 ret_year_second sch_ret3
ret_year_third ret_year_third

reshape long sch_pos, i(rinpersoons sleutel) j(iteration) // reshape on the school and second school if swapped

* Empty missing ID's
replace sch_pos = "" if sch_pos == "."
replace sch_ret1 = "" if sch_ret1 == "."
replace sch_ret2 = "" if sch_ret2 == "."
replace sch_ret3 = "" if sch_ret3 == "."

order rinpersoons sleutel iteration nr_ret_samelevel sch_pos sch_ret1 sch_ret2 sch_ret3 ret_samelevel_first
ret_samelevel_second ret_samelevel_third


* Making of retaining indicators
generate nr_ret = .
replace nr_ret = 0 if sch_ret1 == "" & sch_ret2 == "" & sch_ret3 == ""
replace nr_ret = 0 if (sch_ret1 != sch_pos & sch_ret2 != sch_pos & sch_ret3 != sch_pos) & nr_ret != 0
replace nr_ret = 1 if (sch_ret1 == sch_pos | sch_ret2 == sch_pos | sch_ret3 == sch_pos) & nr_ret != 0
replace nr_ret = 2 if (sch_ret1 == sch_pos & sch_ret2 == sch_pos) & nr_ret != 0
replace nr_ret = 3 if (sch_ret1 == sch_pos & sch_ret2 == sch_pos & sch_ret3 == sch_pos) & nr_ret != 0

generate ret = 0 if nr_ret == 0
replace ret = 1 if nr_ret == 1 | nr_ret == 2 | nr_ret == 3

order rinpersoons sleutel iteration nr_ret_samelevel sch_pos sch_ret1 sch_ret2 sch_ret3 nr_ret ret
ret_samelevel_first ret_samelevel_second ret_samelevel_third


* Aggregate
drop if sch_pos == "" // delete empty school ID's

sort sch_pos
order sch_pos  rinpersoons sleutel iteration nr_ret_samelevel sch_ret1 sch_ret2 sch_ret3 nr_ret ret
ret_samelevel_first ret_samelevel_second ret_samelevel_third



fre ret nr_ret

generate brin_crypt_`cy' = substr(sch_pos,1,32)
generate vobrinvest_`cy' = substr(sch_pos,33,2)
destring vobrinvest_`cy', replace

preserve
       collapse       (mean) ret nr_ret
       generate brin_crypt_`cy' = "cohort `cy'"
       generate type_stat = "mean"
       save "@LOCATION\Secondary Education\Retention_cohort_mean_`c'.dta", replace
restore
preserve
       collapse       (count) ret nr_ret
       generate brin_crypt_`cy' = "cohort `cy'"
       generate type_stat = "count"
       save "@LOCATION\Secondary Education\Retention_cohort_count_`c'.dta", replace
restore
preserve
       collapse       (sum) ret nr_ret
       generate brin_crypt_`cy' = "cohort `cy'"
       generate type_stat = "sum"
       save "@LOCATION\Secondary Education\Retention_cohort_sum_`c'.dta", replace
restore


preserve
       collapse       (mean) ret nr_ret  ///
```

```
                        , by(brin_crypt_`cy' vobrinvest_`cy')
        generate type_stat = "mean"
        save "@LOCATION\Secondary Education\Retention_school_mean_`c'.dta", replace
restore
preserve
        collapse        (count) ret nr_ret  ///
                        , by(brin_crypt_`cy' vobrinvest_`cy')
        generate type_stat = "count"
        save "@LOCATION\Secondary Education\Retention_school_count_`c'.dta", replace
restore
preserve
        collapse        (sum) ret nr_ret  ///
                        , by(brin_crypt_`cy' vobrinvest_`cy')
        generate type_stat = "sum"
        save "@LOCATION\Secondary Education\Retention_school_sum_`c'.dta", replace
restore

}
```

Do-file 3. Collapse – Stacking certificates

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* Purpose: Making the stacking certificates
* Making flexibility indicators available at the school level and at the cohort level
****************************************

/// The do-file is made up as follows
// 1. There is a loop over all the cohort files (from 2011 to 2013)
// 2. This loop is ran for every type of flexibility indicator. Doing it within one file, makes it at the end
slow as more and more variables are created.
// 3. Collapse the file at the cohort level and at the school level but three different statistics are
collapsed: mean, count of all cases, sum of the variable.
// The latter is only useful when it is a 0/1 variable, as it then counts all the 1's.

// The loop can only be executed on up and including the 2018 entry cohort, as one needs an extra year after the
entry year for meaningful indicators.

// Because students switch schools, the file is reshaped wide to include up to three schools.




forvalues cy = 2011(1)2013 {

use "@LOCATION\Secondary Education\Data set individual level entry cohort `cy'.dta", clear

local c = "c`cy'"

forvalues i = 2021(1)2027 {
generate brinvestexamvo_`i' = .
}

capture drop lastyear
generate lastyear = . // to differentiate between nominal duration of level; if heterogeneous the longer takes
precdenet over the shorter one
replace lastyear = startjaar + 4 if (group_vmbobb_`cy' == 1 | group_vmbokb_`cy' == 1 | group_vmbogt_`cy' == 1)
replace lastyear = startjaar + 5 if group_havo_`cy' == 1
replace lastyear = startjaar + 6 if group_vwo_`cy' == 1
fre lastyear

local start = `cy' + 1
local end = lastyear

generate swap_year = .
forvalues i = `start'(1)`end' {
local before = `i' - 1
local excep = `start' - 1
replace swap_year = `i' if (schoolswap_`before' == 1 | schoolswap_`before' == 2)
replace swap_year = `start' if ((brin_crypt_`excep' != brin_crypt_`start') | (vobrinvest_`excep' !=
vobrinvest_`start')) & swap_year == .
}

generate str32 brin_crypt_first = ""
generate vobrinvest_first = .

generate first_end_year = .
generate second_start_year = .

forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_first = brin_crypt_`cy' if voleerjaar_`cy' == 1

	replace vobrinvest_first = vobrinvest_`cy' if voleerjaar_`cy' == 1

	replace first_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & first_end_year == .
	replace first_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & first_end_year == .

	replace second_start_year = first_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & first_end_year !=
. & swap_year != . & brin_crypt_`t' != "" & second_start_year == .
```

```
	replace second_start_year = first_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & first_end_year !=
. & swap_year != . & vobrinvest_`t' != . & second_start_year == .
	replace second_start_year = swap_year if brin_crypt_`i' == "" & brin_crypt_`t' != "" // for those cases
who have an in-between BRIN missing
	}

list brin_crypt_first vobrinvest_first brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year
second_start_year in 1/100 if schoolswap == 1
list brin_crypt_first vobrinvest_first brin_crypt_2* vobrinvest_2* schoolswap swap_year first_end_year
second_start_year in 1/25

generate str32 brin_crypt_second = ""
generate vobrinvest_second = .

forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_second = brin_crypt_`t' if (brin_crypt_`i' != brin_crypt_`t') & swap_year != . &
second_start_year >= `t' & brin_crypt_second == ""
	replace vobrinvest_second = vobrinvest_`t' if (vobrinvest_`i' != vobrinvest_`t') & swap_year != . &
second_start_year >= `t' & vobrinvest_second == .
}
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_second = brin_crypt_`t' if brin_crypt_second == "" & (vobrinvest_second != .)
	replace vobrinvest_second = vobrinvest_`t' if vobrinvest_second == . & (brin_crypt_second != "")
	}

generate second_end_year = .
generate third_start_year = .

forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace second_end_year = `i' if (brin_crypt_`i' != brin_crypt_`t') & second_start_year < `i' &
second_end_year == .
	replace second_end_year = `i' if (vobrinvest_`i' != vobrinvest_`t') & second_start_year < `i' &
second_end_year == .


	replace third_start_year = second_end_year + 1 if (brin_crypt_`i' != brin_crypt_`t') & second_end_year
!= . & swap_year != . & brin_crypt_`t' != "" & third_start_year == .
	replace third_start_year = second_end_year + 1 if (vobrinvest_`i' != vobrinvest_`t') & second_end_year
!= . & swap_year != . & vobrinvest_`t' != . & third_start_year == .
	}

generate str32 brin_crypt_third = ""
generate vobrinvest_third = .

forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_third = brin_crypt_`t' if third_start_year == `t' & brin_crypt_third == ""
	replace vobrinvest_third = vobrinvest_`t' if third_start_year == `t' & vobrinvest_third == .
}
forvalues i = `cy'(1)2019 {
	local t = `i' + 1
	replace brin_crypt_third = brin_crypt_`t' if brin_crypt_third == "" & (vobrinvest_third != .)
	replace vobrinvest_third = vobrinvest_`t' if vobrinvest_third == . & (brin_crypt_third != "")
	}

list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap swap_year ///
first_end_year second_start_year second_end_year third_start_year in 1/100 if schoolswap == 1
list brin_crypt_first vobrinvest_first brin_crypt_second vobrinvest_second brin_crypt_third vobrinvest_third
brin_crypt_2* vobrinvest_2* voleerjaar_* schoolswap swap_year ///
first_end_year second_start_year second_end_year third_start_year in 1/25


* Concatenate to one school ID
egen sch_pos1 = concat(brin_crypt_first vobrinvest_first)
egen sch_pos2 = concat(brin_crypt_second vobrinvest_second)
egen sch_pos3 = concat(brin_crypt_third vobrinvest_third)

egen sch_stack_1 = concat(brin_crypt_stack_first vobrinvest_stack_first)
egen sch_stack_2 = concat(brin_crypt_stack_second vobrinvest_stack_second)
egen sch_stack_3 = concat(brin_crypt_stack_third vobrinvest_stack_third)

egen sch_stack_w_1 = concat(brin_crypt_stack_w_first vobrinvest_stack_w_first)
egen sch_stack_w_2 = concat(brin_crypt_stack_w_second vobrinvest_stack_w_second)
```

```
egen sch_stack_w_3 = concat(brin_crypt_stack_w_third vobrinvest_stack_w_third)

egen sch_stack_a_1 = concat(brin_crypt_stack_a_first vobrinvest_stack_a_first)
egen sch_stack_a_2 = concat(brin_crypt_stack_a_second vobrinvest_stack_a_second)
egen sch_stack_a_3 = concat(brin_crypt_stack_a_third vobrinvest_stack_a_third)

keep rinpersoons sleutel startjaar sch_pos1 sch_pos2 sch_pos3 sch_stack_1 sch_stack_2 sch_stack_3 sch_stack_w_1
sch_stack_w_2 sch_stack_w_3 sch_stack_a_1 sch_stack_a_2 sch_stack_a_3 stack_a_year_first stack_a_year_second
stack_a_year_third

reshape long sch_pos, i(rinpersoons sleutel) j(iteration) // reshape on the school and second school if swapped

* Empty missing ID's
foreach var in sch_pos sch_stack_1 sch_stack_2 sch_stack_3 sch_stack_w_1 sch_stack_w_2 sch_stack_w_3
sch_stack_a_1 sch_stack_a_2 sch_stack_a_3 {
        replace `var' = "" if `var' == "."
}

order rinpersoons sleutel iteration sch_pos sch_stack_1 sch_stack_2 sch_stack_3 sch_stack_w_1 sch_stack_w_2
sch_stack_w_3 sch_stack_a_1 sch_stack_a_2 sch_stack_a_3

* Making of accaining indicators
foreach var in sch_stack sch_stack_w sch_stack_a {
generate nr_`var' = .
replace nr_`var' = 0 if `var'_1 == "" & `var'_2 == "" & `var'_3 == ""
replace nr_`var' = 0 if (`var'_1 != sch_pos & `var'_2 != sch_pos & `var'_3 != sch_pos) & nr_`var' != 0
replace nr_`var' = 1 if (`var'_1 == sch_pos | `var'_2 == sch_pos | `var'_3 == sch_pos) & nr_`var' != 0
replace nr_`var' = 2 if (`var'_1 == sch_pos & `var'_2 == sch_pos) & nr_`var' != 0
replace nr_`var' = 3 if (`var'_1 == sch_pos & `var'_2 == sch_pos & `var'_3 == sch_pos) & nr_`var' != 0

generate `var' = 0 if nr_`var' == 0
replace `var' = 1 if nr_`var' == 1 | nr_`var' == 2 | nr_`var' == 3
}

sum nr_sch_stack sch_stack nr_sch_stack_w sch_stack_w nr_sch_stack_a sch_stack_a

order rinpersoons sleutel iteration sch_pos sch_stack_1 sch_stack_2 sch_stack_3 sch_stack_w_1 sch_stack_w_2
sch_stack_w_3 sch_stack_a_1 sch_stack_a_2 sch_stack_a_3 nr_sch_stack sch_stack nr_sch_stack_w sch_stack_w
nr_sch_stack_a sch_stack_a

* Aggregate
drop if sch_pos == "" // delete empty school ID's

fre nr_sch_stack sch_stack nr_sch_stack_w sch_stack_w nr_sch_stack_a sch_stack_a

generate brin_crypt_`cy' = substr(sch_pos,1,32)
generate vobrinvest_`cy' = substr(sch_pos,33,2)
destring vobrinvest_`cy', replace

* cohort
preserve
collapse       (mean) nr_sch_stack sch_stack nr_sch_stack_w sch_stack_w nr_sch_stack_a sch_stack_a
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "mean"
save "@LOCATION\Secondary Education\Stacking_cohort_mean_`c'.dta", replace
restore

preserve
collapse       (count) nr_sch_stack sch_stack nr_sch_stack_w sch_stack_w nr_sch_stack_a sch_stack_a
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "count"
save "@LOCATION\Secondary Education\Stacking_cohort_count_`c'.dta", replace
restore

preserve
collapse       (sum) nr_sch_stack sch_stack nr_sch_stack_w sch_stack_w nr_sch_stack_a sch_stack_a
generate brin_crypt_`cy' = "cohort `cy'"
generate type_stat = "sum"
save "@LOCATION\Secondary Education\Stacking_cohort_sum_`c'.dta", replace
restore

* school
preserve
collapse       (mean) nr_sch_stack sch_stack nr_sch_stack_w sch_stack_w nr_sch_stack_a sch_stack_a ///
                      , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "mean"
save "@LOCATION\Secondary Education\Stacking_school_mean_`c'.dta", replace
```

```
restore

preserve
collapse       (count) nr_sch_stack sch_stack nr_sch_stack_w sch_stack_w nr_sch_stack_a sch_stack_a ///
                     , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "count"
save "@LOCATION\Secondary Education\Stacking_school_count_`c'.dta", replace
restore

preserve
collapse       (sum) nr_sch_stack sch_stack nr_sch_stack_w sch_stack_w nr_sch_stack_a sch_stack_a ///
                     , by(brin_crypt_`cy' vobrinvest_`cy')
generate type_stat = "sum"
save "@LOCATION\Secondary Education\Stacking_school_sum_`c'.dta", replace
restore
}
```

Do-file 3: Collapse – Track composition

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* Purpose: Making the track composition variable
* Making flexibility indicators available at the school level and at the cohort level
****************************************

/// The do-file is made up as follows
// 1. There is a loop over all the cohort files (from 2011 to 2013)
// 2. This loop is ran for every type of flexibility indicator. Doing it within one file, makes it at the end
slow as more and more variables are created.
// 3. Collapse the file at the cohort level and at the school level but three different statistics are
collapsed: mean, count of all cases, sum of the variable.
// The latter is only useful when it is a 0/1 variable, as it then counts all the 1's.

// The loop can only be executed on up and including the 2018 entry cohort, as one needs an extra year after the
entry year for meaningful indicators.
// Because students switch schools, the file is reshaped wide to include up to three schools.

****************************************
//// TRACK COMPOSITION
****************************************

forvalues cy = 2011(1)2013 {

use "@LOCATION\Secondary Education\Data set individual level entry cohort `cy'.dta", clear
local c = "c`cy'"

fre educ_level_`cy'

* are students in track in that year? (0/1)
generate cz = .
replace cz = `cy' + 6
replace cz = 2020 if `cy' > 2014

local cz = cz
local lj = 1
forvalues i = `cy'(1)`cz' {
    egen t_prak_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(3)
    egen t_bb_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(4)
        egen t_bbkb_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(5)
        egen t_kb_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(6)
        egen t_gt_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(7 8 11)
        egen t_gthavo_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(9)
        egen t_gthavovwo_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(10)
        egen t_vmbo_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(12)
        egen t_vmbohavo_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(13)
        egen t_vmbohavovwo_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(14)
        egen t_havo_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(15)
        egen t_havovwo_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(16)
        egen t_vwo_`i' = anymatch(educ_level_`i') if voleerjaar_`i' == `lj', values(17)
local lj = `lj' + 1
        }

* merge school years WITHIN cohort
local cz = cz
forvalues i = `cy'(1)`cz' {

preserve
        collapse (sum) t_prak_`i' t_bb_`i' t_bbkb_`i' t_kb_`i' t_gt_`i' t_gthavo_`i' t_gthavovwo_`i' t_vmbo_`i'
t_vmbohavo_`i' t_vmbohavovwo_`i' t_havo_`i' t_havovwo_`i' t_vwo_`i', by(brin_crypt_`i' vobrinvest_`i')
        save "@LOCATION\Secondary Education\Tracks_`c'_`i'.dta", replace
restore

}

* Merge school years of cohort
use "@LOCATION\Secondary Education\Tracks_c`cy'_`cy'.dta", clear
local m = `cy' + 1
rename brin_crypt_`cy' brin_crypt_`m'
rename vobrinvest_`cy' vobrinvest_`m'

generate cz = .
replace cz = `cy' + 6
```

```
replace cz = 2020 if `cy' > 2014
local cz = cz

forvalues i = `m'(1)`cz' {
merge  1:1 brin_crypt_`i' vobrinvest_`i' using "@LOCATION\Secondary Education\Tracks_c`cy'_`i'.dta", nogen
local t = `i' + 1
rename brin_crypt_`i' brin_crypt_`t'
rename vobrinvest_`i' vobrinvest_`t'
}
rename brin_crypt_`t' brin_crypt
rename vobrinvest_`t' vobrinvest
drop if vobrinvest == .

* set schools with less than 10 students to 0
forvalues i = `cy'(1)`cz' {
    foreach track in prak bb bbkb kb gt gthavo gthavovwo vmbo vmbohavo vmbohavovwo havo havovwo vwo {
       replace t_`track'_`i' = 0 if t_`track'_`i' > 0 & t_`track'_`i' < 10
       }
}

forvalues i = `cy'(1)`cz' {
egen track_number_`i' = anycount(t_*_`i'), values(1/1000)
fre track_number_`i'
}

* 0/1 for existance
forvalues i = `cy'(1)`cz' {
    foreach track in prak bb bbkb kb gt gthavo gthavovwo vmbo vmbohavo vmbohavovwo havo havovwo vwo {
       generate d_`track'_`i' = 1 if t_`track'_`i' > 0 & t_`track'_`i' < 10000
       }
}

egen temp_n = anymatch(d_prak_2013 d_bb_2013 d_bbkb_2013 d_kb_2013 d_gt_2013 d_gthavo_2013 d_gthavovwo_2013
d_vmbo_2013 d_vmbohavo_2013 d_vmbohavovwo_2013 d_havo_2013 d_havovwo_2013 d_vwo_2013), values(1)


* Making combinations
forvalues i = `cy'(1)`cz' {
generate track_configuration_`i' = 0
replace track_configuration_`i' = -99 if track_number_`i' == 0

replace track_configuration_`i' = 1 if d_prak_`i' == 1 & track_number_`i' == 1
replace track_configuration_`i' = 2 if d_bb_`i' == 1 & track_number_`i' == 1
replace track_configuration_`i' = 3 if d_kb_`i' == 1 & track_number_`i' == 1
replace track_configuration_`i' = 4 if d_gt_`i' == 1 & track_number_`i' == 1
replace track_configuration_`i' = 5 if d_havo_`i' == 1 & track_number_`i' == 1
replace track_configuration_`i' = 6 if d_vwo_`i' == 1 & track_number_`i' == 1

replace track_configuration_`i' = 7 if d_prak_`i' == 1 & d_bb_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 8 if d_bb_`i' == 1 & d_kb_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 9 if d_kb_`i' == 1 & d_gt_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 10 if d_gt_`i' == 1 & d_havo_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 11 if d_havo_`i' == 1 & d_vwo_`i' == 1 & track_number_`i' == 2

replace track_configuration_`i' = 12 if d_bb_`i' == 1 & d_bbkb_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 13 if d_bbkb_`i' == 1 & d_kb_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 14 if d_bbkb_`i' == 1 & d_gthavo_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 15 if d_kb_`i' == 1 & d_gthavo_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 16 if d_gthavo_`i' == 1 & d_havo_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 17 if d_gthavo_`i' == 1 & d_havovwo_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 18 if d_gt_`i' == 1 & d_gthavo_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 19 if d_gt_`i' == 1 & d_havovwo_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 20 if d_havo_`i' == 1 & d_havovwo_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 21 if d_havovwo_`i' == 1 & d_vwo_`i' == 1 & track_number_`i' == 2

replace track_configuration_`i' = 22 if d_vmbo_`i' == 1 & d_bb_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 23 if d_vmbo_`i' == 1 & d_kb_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 24 if d_vmbo_`i' == 1 & d_gt_`i' == 1 & track_number_`i' == 2
replace track_configuration_`i' = 25 if d_vmbo_`i' == 1 & d_havo_`i' == 1 & track_number_`i' == 2

replace track_configuration_`i' = 31 if d_prak_`i' == 1 & d_bb_`i' == 1 & d_kb_`i' == 1 & track_number_`i' == 3
replace track_configuration_`i' = 32 if d_prak_`i' == 1 & d_bb_`i' == 1 & d_vmbo_`i' == 1 & track_number_`i' ==
3
replace track_configuration_`i' = 33 if d_bb_`i' == 1 & d_kb_`i' == 1 & d_bbkb_`i' == 1 & track_number_`i' == 3
replace track_configuration_`i' = 34 if d_bb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 & track_number_`i' == 3
replace track_configuration_`i' = 35 if d_bb_`i' == 1 & d_bbkb_`i' == 1 & d_vmbo_`i' == 1 & track_number_`i' ==
3
```

```
replace track_configuration_`i' = 36 if d_bb_`i' == 1 & d_kb_`i' == 1 & d_vmbo_`i' == 1 & track_number_`i' == 3
replace track_configuration_`i' = 37 if d_bbkb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 & track_number_`i' == 3
replace track_configuration_`i' = 38 if d_kb_`i' == 1 & d_gt_`i' == 1 & d_vmbo_`i' == 1 & track_number_`i' == 3
replace track_configuration_`i' = 39 if d_kb_`i' == 1 & d_gt_`i' == 1 & d_gthavo_`i' == 1 & track_number_`i' ==
3
replace track_configuration_`i' = 40 if d_kb_`i' == 1 & d_gt_`i' == 1 & d_havo_`i' == 1 & track_number_`i' == 3

replace track_configuration_`i' = 41 if d_gt_`i' == 1 & d_havo_`i' == 1 & d_gthavo_`i' == 1 & track_number_`i'
== 3
replace track_configuration_`i' = 42 if d_gt_`i' == 1 & d_havo_`i' == 1 & d_vwo_`i' == 1 & track_number_`i' == 3
replace track_configuration_`i' = 43 if d_gt_`i' == 1 & d_havo_`i' == 1 & d_havovwo_`i' == 1 & track_number_`i'
== 3
replace track_configuration_`i' = 44 if d_gt_`i' == 1 & d_havovwo_`i' == 1 & d_vwo_`i' == 1 & track_number_`i'
== 3
replace track_configuration_`i' = 45 if d_havo_`i' == 1 & d_vwo_`i' == 1 & d_havovwo_`i' == 1 & track_number_`i'
== 3

replace track_configuration_`i' = 50 if d_prak_`i' == 1 & d_bb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 51 if d_prak_`i' == 1 & d_bb_`i' == 1 & d_bbkb_`i' == 1 & d_kb_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 52 if d_bb_`i' == 1 & d_bbkb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 53 if d_bb_`i' == 1 & d_bbkb_`i' == 1 & d_kb_`i' == 1 & d_gthavovwo_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 54 if d_bb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 & d_havo_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 55 if d_bb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 & d_gthavo_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 56 if d_bb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 & d_havovwo_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 57 if d_bb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 & d_vmbo_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 58 if d_bbkb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 & d_havo_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 59 if d_kb_`i' == 1 & d_gt_`i' == 1 & d_gthavo_`i' == 1 & d_havo_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 60 if d_kb_`i' == 1 & d_gt_`i' == 1 & d_havo_`i' == 1 & d_havovwo_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 61 if d_kb_`i' == 1 & d_gt_`i' == 1 & d_havo_`i' == 1 & d_vwo_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 62 if d_gt_`i' == 1 & d_gthavo_`i' == 1 & d_havo_`i' == 1 & d_havovwo_`i' == 1
& track_number_`i' == 4
replace track_configuration_`i' = 63 if d_gt_`i' == 1 & d_havo_`i' == 1 & d_havovwo_`i' == 1 & d_vwo_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 64 if d_gt_`i' == 1 & d_gthavo_`i' == 1 & d_havo_`i' == 1 & d_vwo_`i' == 1 &
track_number_`i' == 4
replace track_configuration_`i' = 65 if d_gt_`i' == 1 & d_gthavovwo_`i' == 1 & d_havo_`i' == 1 & d_vwo_`i' == 1
& track_number_`i' == 4
replace track_configuration_`i' = 66 if d_gt_`i' == 1 & d_gthavo_`i' == 1 & d_havovwo_`i' == 1 & d_vwo_`i' == 1
& track_number_`i' == 4

replace track_configuration_`i' = 70 if d_bb_`i' == 1 & d_bbkb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 &
d_havo_`i' == 1 & track_number_`i' == 5
replace track_configuration_`i' = 71 if d_bb_`i' == 1 & d_bbkb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 &
d_vmbo_`i' == 1 & track_number_`i' == 5
replace track_configuration_`i' = 72 if d_bb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 & d_gthavo_`i' == 1 &
d_havo_`i' == 1 & track_number_`i' == 5
replace track_configuration_`i' = 73 if d_bb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 & d_havo_`i' == 1 &
d_havovwo_`i' == 1 & track_number_`i' == 5
replace track_configuration_`i' = 74 if d_bb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 & d_havo_`i' == 1 &
d_vwo_`i' == 1 & track_number_`i' == 5
replace track_configuration_`i' = 75 if d_bb_`i' == 1 & d_kb_`i' == 1 & d_gt_`i' == 1 & d_havovwo_`i' == 1 &
d_vwo_`i' == 1 & track_number_`i' == 5
replace track_configuration_`i' = 76 if d_kb_`i' == 1 & d_gt_`i' == 1 & d_gthavo_`i' == 1 & d_havo_`i' == 1 &
d_vwo_`i' == 1 & track_number_`i' == 5
replace track_configuration_`i' = 77 if d_kb_`i' == 1 & d_gt_`i' == 1 & d_havo_`i' == 1 & d_havovwo_`i' == 1 &
d_vwo_`i' == 1 & track_number_`i' == 5
replace track_configuration_`i' = 78 if d_gt_`i' == 1 & d_gthavo_`i' == 1 & d_havo_`i' == 1 & d_havovwo_`i' == 1
& d_vwo_`i' == 1 & track_number_`i' == 5
replace track_configuration_`i' = 79 if d_gt_`i' == 1 & d_gthavovwo_`i' == 1 & d_havo_`i' == 1 & d_havovwo_`i'
== 1 & d_vwo_`i' == 1 & track_number_`i' == 5

replace track_configuration_`i' = 150 if track_number_`i' == 6 | track_number_`i' == 7 | track_number_`i' == 8 |
track_number_`i' == 9
```

```
label define track_config_lab_`i' 0 "not assigned" 1 "prac" 2 "vmbo bb" 3 "vmbo kb" 4 "vmbo gt" 5 "havo" 6 "vwo"
///
7 "prac & vmbo bb" 8 "vmbo bb & vmbo kb" 9 "vmbo kb & vmbo gt" 10 "vmbo gt & havo" 11 "havo & vwo" ///
12 "vmbo bb & vmbo bbkb" 13 "vmbo bbkb & vmbo kb" 14 "vmbo bbkb & vmbo gthavo" 15 "vmbo kb & vmbo gthavo" ///
16 "vmbo gthavo & havo" 17 "vmbo gthavo & havovwo" 18 "vmbo gt & vmbo gthavo" 19 "vmbo gt & havovwo" ///
20 "havo & havovwo" 21 "havovwo & vwo" 22 "vmbo bbkbgt & vmbo bb" 23 "vmbo bbkbgt & vmbo kb" ///
24 "vmbo bbkbgt & vmbo gt" 25 "vmbo bbkbgt & havo" ///
31 "prac & vmbo bb & vmbo kb" 32 "prac & vmbo bb & vmbo bbkbgt" 33 "vmbo bb & vmbo kb & vmbo bbkb" ///
34 "vmbo bb & vmbo kb & vmbo gt" 35 "vmbo bb & vmbo bbkb & vmbo bbkbgt" 36 "vmbo bb & vmbo kb & vmbo bbkb" ///
37 "vmbo bbkb & vmbo kb & vmbo gt" 38 "vmbo kb & vmbo gt & vmbo bbkbgt" 39 "vmbo kb & vmbo gt & vmbo gthavo" ///
40 "vmbo kb & vmbo gt & havo" 41 "vmbo gt & havo & vmbo gthavo"  42 "vmbo gt & havo & vwo" ///
43 "vmbo gt & havo & havovwo" 44 "vmbo gt & havovwo & vwo" 45 "havo & havovwo & vwo" ///
50 "prac & vmbo bb & vmbo kb & vmbo gt" 51 "prac & vmbo bb & vmbo bbkb & vmbo kb" ///
52 "vmbo bb & vmbo bbkb & vmbo kb & vmbo gt" 53 "vmbo bb & vmbo bbkb & vmbo kb & vmbo gthavovwo" ///
54 "vmbo bb & vmbo kb & vmbo gt & havo" 55 "vmbo bb & vmbo kb & vmbo gt & vmbo gthavo" ///
56 "vmbo bb & vmbo kb & vmbo gt & havovwo" 57 "vmbo bb & vmbo kb & vmbo gt & vmbo bbkbgt" ///
58 "vmbo bbkb & vmbo kb & vmbo gt & havo" 59 "vmbo kb & vmbo gt & vmbo gthavo & havo" ///
60 "vmbo kb & vmbo gt & havo & havovwo" 61 "vmbo kb & vmbo gt & havo & vwo"  ///
62 "vmbo kb & vmbo gthavo & havo & havovwo" 63 "vmbo gt & havo & havovwo & vwo"  ///
64 "vmbo gt & vmbo gthavo & havo & havovwo" 65 "vmbo gt & vmbo gthavovwo & havo & vwo"  ///
66 "vmbo gt & vmbo gthavo & havovwo & vwo"  ///
70 "vmbo bb & vmbo bbkb & vmbo kb & vmbo gt & havo" 71 "vmbo bb & vmbo bbkb & vmbo kb & vmbo gt & vmbo bbkbgt"
///
72 "vmbo bb & vmbo kb & vmbo gt & vmbo gthavo & vwo" 73 "vmbo bb & vmbo kb & vmbo gt & havo & havovwo" ///
74 "vmbo bb & vmbo kb & vmbo gt & havo & vwo" 75 "vmbo bb & vmbo kb & vmbo gt & havovwo & vwo" ///
76 "vmbo bb & vmbo kb & vmbo gthavo & havo & vwo" 77 "vmbo kb & vmbo gt & havo & havovwo & vwo" ///
78 "vmbo gt & vmbo gthavo & havo & havovwo & vwo" 79 "vmbo gt & vmbo gthavovwo & havo & havovwo & vwo" ///
150 "More than 5 tracks" 200 "Miscelleaneous (categories with less than 10 schools)" ///
-99 "no track", replace
label values track_configuration_`i' track_config_lab_`i'

fre track_configuration_`i'

bysort track_configuration_`i': generate count_config_`i' = _N
replace track_configuration_`i' = 200 if count_config_`i' < 10

fre track_configuration_`i'

}

local struc1 = `cy' + 1
local struc2 = `cy' + 2

tabm track_configuration_`cy' track_configuration_`struc1' track_configuration_`struc2', trans
list track_configuration_`cy' track_configuration_`struc1' track_configuration_`struc2' in 100/200

generate track_number = track_number_`struc2'


/// Take the structure in the third year. Then the heterogeneous classes are out and the "real" tracks are
becoming visible.

generate track_config_short = .
replace track_config_short = 1 if track_configuration_`struc2' == 1
replace track_config_short = 2 if track_configuration_`struc2' == 2
replace track_config_short = 3 if track_configuration_`struc2' == 3
replace track_config_short = 4 if track_configuration_`struc2' == 4
replace track_config_short = 5 if track_configuration_`struc2' == 5
replace track_config_short = 6 if track_configuration_`struc2' == 6
replace track_config_short = 7 if track_configuration_`struc2' == 8
replace track_config_short = 8 if track_configuration_`struc2' == 10
replace track_config_short = 9 if track_configuration_`struc2' == 11
replace track_config_short = 10 if track_configuration_`struc2' == 34
replace track_config_short = 11 if track_configuration_`struc2' == 19 | track_configuration_`struc2' == 42
replace track_config_short = 12 if track_configuration_`struc2' == 54 | track_configuration_`struc2' == 74
replace track_config_short = 13 if track_configuration_`struc2' == 200 | track_configuration_`struc2' == 0
replace track_config_short = 14 if track_configuration_`struc2' == -99
replace track_config_short = 13 if track_configuration_`struc2' != . & track_config_short == .

label define track_con_lab_short 1 "prac" 2 "vmbo bb" 3 "vmbo kb" 4 "vmbo gt" 5 "havo" 6 "vwo" 7 "vmbo bb & vmbo
kb" 8 "vmbo gt & havo" ///
9 "havo & vwo" 10 "vmbo bb & vmbo kb & vmbo gt" 11 "vmbo gt & havo & vwo" 12 "vmbo bb & vmbo kb & vmbo gt & havo
& vwo" 13 "other" 14 "no track in that cohort", replace
label values track_config_short track_con_lab_short
fre track_config_short

local d = 1
```

```
foreach t in prac bb kb vmbogt havo vwo bbkb gthavo havovwo bbkbgt gthavovwo bbkbgthavovwo other notrack {
generate tc_`t' = 0 if track_config_short != .
replace tc_`t' = 1 if track_config_short == `d'
local d = `d' + 1
}

generate str32 brin_crypt_`cy'= brin_crypt
generate vobrinvest_`cy' = vobrinvest

preserve
	collapse	(mean) tc_prac tc_bb tc_kb tc_vmbogt tc_havo tc_vwo tc_bbkb tc_gthavo tc_havovwo
tc_bbkbgt tc_gthavovwo tc_bbkbgthavovwo tc_other tc_notrack track_number
	generate brin_crypt_`cy' = "cohort `cy'"
	generate type_stat = "mean"
	save "@LOCATION\Secondary Education\Structure_cohort_mean_`c'.dta", replace
restore
preserve
	collapse	(count) tc_prac tc_bb tc_kb tc_vmbogt tc_havo tc_vwo tc_bbkb tc_gthavo tc_havovwo
tc_bbkbgt tc_gthavovwo tc_bbkbgthavovwo tc_other tc_notrack track_number
	generate brin_crypt_`cy' = "cohort `cy'"
	generate type_stat = "count"
	save "@LOCATION\Secondary Education\Structure_cohort_count_`c'.dta", replace
restore
preserve
	collapse	(sum) tc_prac tc_bb tc_kb tc_vmbogt tc_havo tc_vwo tc_bbkb tc_gthavo tc_havovwo tc_bbkbgt
tc_gthavovwo tc_bbkbgthavovwo tc_other tc_notrack track_number
	generate brin_crypt_`cy' = "cohort `cy'"
	generate type_stat = "sum"
	save "@LOCATION\Secondary Education\Structure_cohort_sum_`c'.dta", replace
restore


preserve
	collapse	(mean) tc_prac tc_bb tc_kb tc_vmbogt tc_havo tc_vwo tc_bbkb tc_gthavo tc_havovwo
tc_bbkbgt tc_gthavovwo tc_bbkbgthavovwo tc_other tc_notrack track_number ///
			, by(brin_crypt_`cy' vobrinvest_`cy')
	generate type_stat = "mean"
	save "@LOCATION\Secondary Education\Structure_school_mean_`c'.dta", replace
restore
preserve
	collapse	(count) tc_prac tc_bb tc_kb tc_vmbogt tc_havo tc_vwo tc_bbkb tc_gthavo tc_havovwo
tc_bbkbgt tc_gthavovwo tc_bbkbgthavovwo tc_other tc_notrack track_number ///
			, by(brin_crypt_`cy' vobrinvest_`cy')
	generate type_stat = "count"
	save "@LOCATION\Secondary Education\Structure_school_count_`c'.dta", replace
restore
preserve
	collapse	(sum) tc_prac tc_bb tc_kb tc_vmbogt tc_havo tc_vwo tc_bbkb tc_gthavo tc_havovwo tc_bbkbgt
tc_gthavovwo tc_bbkbgthavovwo tc_other tc_notrack track_number ///
			, by(brin_crypt_`cy' vobrinvest_`cy')
	generate type_stat = "sum"
	save "@LOCATION\Secondary Education\Structure_school_sum_`c'.dta", replace
restore

}

clear

forvalues cy = 2011(1)2013 {
	local cz = `cy' + 6
	local c = "c`cy'"
	forvalues i = `cy'(1)`cz' {
		erase "@LOCATION\Secondary Education\Tracks_`c'_`i'.dta"
	}
}
```

Do-file 4: Merge collapsed files

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* Purpose: Merging Flexibility Indicators
****************************************

* Tracks offered
forvalues cy = 2011(1)2013 {

local c = "c`cy'"

* School
use "@LOCATION\Secondary Education\Structure_school_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Structure_school_count_`c'.dta"
append using "@LOCATION\Secondary Education\Structure_school_sum_`c'.dta"


rename brin_crypt_`cy' brin_crypt
rename vobrinvest_`cy' vobrinvest
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt vobrinvest cohort stat), punct("_")
save "@LOCATION\Secondary Education\Structure_school_`c'.dta", replace

* Cohort
use "@LOCATION\Secondary Education\Structure_cohort_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Structure_cohort_count_`c'.dta"
append using "@LOCATION\Secondary Education\Structure_cohort_sum_`c'.dta"

rename brin_crypt_`cy' brin_crypt
generate vobrinvest = .
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt cohort stat), punct("_")
save "@LOCATION\Secondary Education\Structure_cohort_`c'.dta", replace
}

use "@LOCATION\Secondary Education\Structure_school_c2011.dta"
forvalues i = 2012(1)2013 {
       append using "@LOCATION\Secondary Education\Structure_school_c`i'.dta"
}
save "@LOCATION\Secondary Education\Structure school 2011-2013.dta", replace

use "@LOCATION\Secondary Education\Structure_cohort_c2011.dta"
forvalues i = 2012(1)2013 {
       append using "@LOCATION\Secondary Education\Structure_cohort_c`i'.dta"
}
save "@LOCATION\Secondary Education\Structure cohort 2011-2013.dta", replace

* Retention
forvalues cy = 2011(1)2013 {

local c = "c`cy'"

* School
use "@LOCATION\Secondary Education\Retention_school_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Retention_school_count_`c'.dta"
append using "@LOCATION\Secondary Education\Retention_school_sum_`c'.dta"

label variable ret "% students at least once retained during secondary education on same level"
label variable nr_ret "Average number of retainments during secondary education on same level"

rename brin_crypt_`cy' brin_crypt
rename vobrinvest_`cy' vobrinvest
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt vobrinvest cohort stat), punct("_")
save "@LOCATION\Secondary Education\Retention_school_`c'.dta", replace
```

```
* Cohort
use "@LOCATION\Secondary Education\Retention_cohort_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Retention_cohort_count_`c'.dta"
append using "@LOCATION\Secondary Education\Retention_cohort_sum_`c'.dta"

label variable ret "% students at least once retained during secondary education on same level"
label variable nr_ret "Average number of retainments during secondary education on same level"

rename brin_crypt_`cy' brin_crypt
generate vobrinvest = .
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt cohort stat), punct("_")
save "@LOCATION\Secondary Education\Retention_cohort_`c'.dta", replace
}

use "@LOCATION\Secondary Education\Retention_school_c2011.dta"
forvalues i = 2012(1)2013 {
        append using "@LOCATION\Secondary Education\Retention_school_c`i'.dta"
}
save "@LOCATION\Secondary Education\Retention school 2011-2013.dta", replace

use "@LOCATION\Secondary Education\Retention_cohort_c2011.dta"
forvalues i = 2012(1)2013 {
        append using "@LOCATION\Secondary Education\Retention_cohort_c`i'.dta"
}
save "@LOCATION\Secondary Education\Retention cohort 2011-2013.dta", replace

* Acceleration
forvalues cy = 2011(1)2013 {

local c = "c`cy'"

* School
use "@LOCATION\Secondary Education\Acceleration_school_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Acceleration_school_count_`c'.dta"
append using "@LOCATION\Secondary Education\Acceleration_school_sum_`c'.dta"

label variable acc "% students at least once accelerated during secondary education on same level"

label variable nr_acc "Average number of accelerated during secondary education on same level"

rename brin_crypt_`cy' brin_crypt
rename vobrinvest_`cy' vobrinvest
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt vobrinvest cohort stat), punct("_")
save "@LOCATION\Secondary Education\Acceleration_school_`c'.dta", replace

* Cohort
use "@LOCATION\Secondary Education\Acceleration_cohort_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Acceleration_cohort_count_`c'.dta"
append using "@LOCATION\Secondary Education\Acceleration_cohort_sum_`c'.dta"

label variable acc "% students at least once accelerated during secondary education on same level"

label variable nr_acc "Average number of accelerated during secondary education on same level"


rename brin_crypt_`cy' brin_crypt
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt cohort stat), punct("_")
save "@LOCATION\Secondary Education\Acceleration_cohort_`c'.dta", replace
}

use "@LOCATION\Secondary Education\Acceleration_school_c2011.dta"
forvalues i = 2012(1)2013 {
        append using "@LOCATION\Secondary Education\Acceleration_school_c`i'.dta"
}
```

```
save "@LOCATION\Secondary Education\Acceleration school 2011-2013.dta", replace

use "@LOCATION\Secondary Education\Acceleration_cohort_c2011.dta"
forvalues i = 2012(1)2013 {
	append using "@LOCATION\Secondary Education\Acceleration_cohort_c`i'.dta"
}
save "@LOCATION\Secondary Education\Acceleration cohort 2011-2013.dta", replace


* Stacking
forvalues cy = 2011(1)2013 {

local c = "c`cy'"

* School
use "@LOCATION\Secondary Education\Stacking_school_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Stacking_school_count_`c'.dta"
append using "@LOCATION\Secondary Education\Stacking_school_sum_`c'.dta"

label variable nr_sch_stack "Average number of stacking in secondary education"
label variable sch_stack "% of students at least once stacked in secondary education"
label variable nr_sch_stack_w "Average number of stacking within school in secondary education"
label variable sch_stack_w "% of students at least once stacked within school in secondary education"
label variable nr_sch_stack_a "Average number of stacking across schools in secondary education"
label variable sch_stack_a "% of students at least once stacked across schools in secondary education"

rename brin_crypt_`cy' brin_crypt
rename vobrinvest_`cy' vobrinvest
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt vobrinvest cohort stat), punct("_")
save "@LOCATION\Secondary Education\Stacking_school_`c'.dta", replace

* Cohort
use "@LOCATION\Secondary Education\Stacking_cohort_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Stacking_cohort_count_`c'.dta"
append using "@LOCATION\Secondary Education\Stacking_cohort_sum_`c'.dta"

label variable nr_sch_stack "Average number of stacking in secondary education"
label variable sch_stack "% of students at least once stacked in secondary education"
label variable nr_sch_stack_w "Average number of stacking within school in secondary education"
label variable sch_stack_w "% of students at least once stacked within school in secondary education"
label variable nr_sch_stack_a "Average number of stacking across schools in secondary education"
label variable sch_stack_a "% of students at least once stacked across schools in secondary education"

rename brin_crypt_`cy' brin_crypt
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt cohort stat), punct("_")
save "@LOCATION\Secondary Education\Stacking_cohort_`c'.dta", replace
}

use "@LOCATION\Secondary Education\Stacking_school_c2011.dta"
forvalues i = 2012(1)2013 {
	append using "@LOCATION\Secondary Education\Stacking_school_c`i'.dta"
}
save "@LOCATION\Secondary Education\Stacking school 2011-2013.dta", replace

use "@LOCATION\Secondary Education\Stacking_cohort_c2011.dta"
forvalues i = 2012(1)2013 {
	append using "@LOCATION\Secondary Education\Stacking_cohort_c`i'.dta"
}
save "@LOCATION\Secondary Education\Stacking cohort 2011-2013.dta", replace

* Mobility
forvalues cy = 2011(1)2013 {

local c = "c`cy'"

* School
use "@LOCATION\Secondary Education\Mobility_school_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Mobility_school_count_`c'.dta"
append using "@LOCATION\Secondary Education\Mobility_school_sum_`c'.dta"
```

```
label variable nr_downward "Average number of downward mobile moves"
label variable downward "% students downward mobile"
label variable nr_upward "Average number of upward mobile moves"
label variable upward "% students upward mobile"

rename brin_crypt_`cy' brin_crypt
rename vobrinvest_`cy' vobrinvest
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt vobrinvest cohort stat), punct("_")
save "@LOCATION\Secondary Education\Mobility_school_`c'.dta", replace

* Cohort
use "@LOCATION\Secondary Education\Mobility_cohort_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Mobility_cohort_count_`c'.dta"
append using "@LOCATION\Secondary Education\Mobility_cohort_sum_`c'.dta"

label variable nr_downward "Average number of downward mobile moves"
label variable downward "% students downward mobile"
label variable nr_upward "Average number of upward mobile moves"
label variable upward "% students upward mobile"

rename brin_crypt_`cy' brin_crypt
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt cohort stat), punct("_")
save "@LOCATION\Secondary Education\Mobility_cohort_`c'.dta", replace
}

use "@LOCATION\Secondary Education\Mobility_school_c2011.dta"
forvalues i = 2012(1)2013 {
        append using "@LOCATION\Secondary Education\Mobility_school_c`i'.dta"
}
save "@LOCATION\Secondary Education\Mobility school 2011-2013.dta", replace

use "@LOCATION\Secondary Education\Mobility_cohort_c2011.dta"
forvalues i = 2012(1)2013 {
        append using "@LOCATION\Secondary Education\Mobility_cohort_c`i'.dta"
}
save "@LOCATION\Secondary Education\Mobility cohort 2011-2013.dta", replace

* Mixed Tracks
forvalues cy = 2011(1)2013 {

local c = "c`cy'"

* School
use "@LOCATION\Secondary Education\Heterogeneous_school_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Heterogeneous_school_count_`c'.dta"
append using "@LOCATION\Secondary Education\Heterogeneous_school_sum_`c'.dta"

label variable hetero_year1 "% students in heterogeneous classes - first year"
label variable hetero_year2 "% students in heterogeneous classes - second year"
label variable hetero_year3 "% students in heterogeneous classes - third year"

label variable hetero_level_year1_1 "% students not in heterogeneous classes - first year"
label variable hetero_level_year1_2 "% students in vmbo bb/kb - first year"
label variable hetero_level_year1_3 "% students in vmbo gt/havo - first year"
label variable hetero_level_year1_4 "% students in havo/vwo - first year"
label variable hetero_level_year1_5 "% students in vmbo bb/kb/gt - first year"
label variable hetero_level_year1_6 "% students in vmbo gt/havo/vwo - first year"
label variable hetero_level_year1_7 "% students in vmbo bb/kb/gt/havo - first year"
label variable hetero_level_year1_8 "% students in vmbo bb/kb/gt/havo/vwo - first year"

label variable hetero_level_year2_1 "% students not in heterogeneous classes - second year"
label variable hetero_level_year2_2 "% students in vmbo bb/kb - second year"
label variable hetero_level_year2_3 "% students in vmbo gt/havo - second year"
label variable hetero_level_year2_4 "% students in havo/vwo - second year"
label variable hetero_level_year2_5 "% students in vmbo bb/kb/gt - second year"
label variable hetero_level_year2_6 "% students in vmbo gt/havo/vwo - second year"
label variable hetero_level_year2_7 "% students in vmbo bb/kb/gt/havo - second year"
label variable hetero_level_year2_8 "% students in vmbo bb/kb/gt/havo/vwo - second year"
```

```
label variable hetero_level_year3_1 "% students not in heterogeneous classes - third year"
label variable hetero_level_year3_2 "% students in havo/vwo - third year"

rename brin_crypt_`cy' brin_crypt
rename vobrinvest_`cy' vobrinvest
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt vobrinvest cohort stat), punct("_")
save "@LOCATION\Secondary Education\Heterogeneous_school_`c'.dta", replace

* Cohort
use "@LOCATION\Secondary Education\Heterogeneous_cohort_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Heterogeneous_cohort_count_`c'.dta"
append using "@LOCATION\Secondary Education\Heterogeneous_cohort_sum_`c'.dta"

label variable hetero_year1 "% students in heterogeneous classes - first year"
label variable hetero_year2 "% students in heterogeneous classes - second year"
label variable hetero_year3 "% students in heterogeneous classes - third year"

label variable hetero_level_year1_1 "% students not in heterogeneous classes - first year"
label variable hetero_level_year1_2 "% students in vmbo bb/kb - first year"
label variable hetero_level_year1_3 "% students in vmbo gt/havo - first year"
label variable hetero_level_year1_4 "% students in havo/vwo - first year"
label variable hetero_level_year1_5 "% students in vmbo bb/kb/gt - first year"
label variable hetero_level_year1_6 "% students in vmbo gt/havo/vwo - first year"
label variable hetero_level_year1_7 "% students in vmbo bb/kb/gt/havo - first year"
label variable hetero_level_year1_8 "% students in vmbo bb/kb/gt/havo/vwo - first year"

label variable hetero_level_year2_1 "% students not in heterogeneous classes - second year"
label variable hetero_level_year2_2 "% students in vmbo bb/kb - second year"
label variable hetero_level_year2_3 "% students in vmbo gt/havo - second year"
label variable hetero_level_year2_4 "% students in havo/vwo - second year"
label variable hetero_level_year2_5 "% students in vmbo bb/kb/gt - second year"
label variable hetero_level_year2_6 "% students in vmbo gt/havo/vwo - second year"
label variable hetero_level_year2_7 "% students in vmbo bb/kb/gt/havo - second year"
label variable hetero_level_year2_8 "% students in vmbo bb/kb/gt/havo/vwo - second year"

label variable hetero_level_year3_1 "% students not in heterogeneous classes - third year"
label variable hetero_level_year3_2 "% students in havo/vwo - third year"

rename brin_crypt_`cy' brin_crypt
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt cohort stat), punct("_")
save "@LOCATION\Secondary Education\Heterogeneous_cohort_`c'.dta", replace
}

use "@LOCATION\Secondary Education\Heterogeneous_school_c2011.dta"
forvalues i = 2012(1)2013 {
       append using "@LOCATION\Secondary Education\Heterogeneous_school_c`i'.dta"
}
save "@LOCATION\Secondary Education\Heterogeneous school 2011-2013.dta", replace

use "@LOCATION\Secondary Education\Heterogeneous_cohort_c2011.dta"
forvalues i = 2012(1)2013 {
       append using "@LOCATION\Secondary Education\Heterogeneous_cohort_c`i'.dta"
}
save "@LOCATION\Secondary Education\Heterogeneous cohort 2011-2013.dta", replace

* Certificate versus recommendation
forvalues cy = 2011(1)2013 {

local c = "c`cy'"

* School
use "@LOCATION\Secondary Education\Recommendation_school_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Recommendation_school_count_`c'.dta"
append using "@LOCATION\Secondary Education\Recommendation_school_sum_`c'.dta"

label variable certlowerrec "% of students first cert lower than recommendation"
label variable certequalrec "% of students first cert equal  to recommendation"
label variable certhigherrec "% of students first cert higher than recommendation"
```

```
label variable nr_cert "Average number of certificates"
label variable cert "% of students with certificate"

rename brin_crypt_`cy' brin_crypt
rename vobrinvest_`cy' vobrinvest
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt vobrinvest cohort stat), punct("_")
save "@LOCATION\Secondary Education\Recommendation_school_`c'.dta", replace

* Cohort
use "@LOCATION\Secondary Education\Recommendation_cohort_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Recommendation_cohort_count_`c'.dta"
append using "@LOCATION\Secondary Education\Recommendation_cohort_sum_`c'.dta"

label variable certlowerrec "% of students first cert lower than recommendation"
label variable certequalrec "% of students first cert equal  to recommendation"
label variable certhigherrec "% of students first cert higher than recommendation"
label variable nr_cert "Average number of certificates"
label variable cert "% of students with certificate"

rename brin_crypt_`cy' brin_crypt
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt cohort stat), punct("_")
save "@LOCATION\Secondary Education\Recommendation_cohort_`c'.dta", replace
}

use "@LOCATION\Secondary Education\Recommendation_school_c2011.dta"
forvalues i = 2012(1)2013 {
        append using "@LOCATION\Secondary Education\Recommendation_school_c`i'.dta"
}
save "@LOCATION\Secondary Education\Recommendation school 2011-2013.dta", replace

use "@LOCATION\Secondary Education\Recommendation_cohort_c2011.dta"
forvalues i = 2012(1)2013 {
        append using "@LOCATION\Secondary Education\Recommendation_cohort_c`i'.dta"
}
save "@LOCATION\Secondary Education\Recommendation cohort 2011-2013.dta", replace

* Exam & Certificate variables
forvalues cy = 2011(1)2013 {

local c = "c`cy'"

* School
use "@LOCATION\Secondary Education\Certexam_school_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Certexam_school_count_`c'.dta"
append using "@LOCATION\Secondary Education\Certexam_school_sum_`c'.dta"

label variable cert_firstinsec_ladder_`c' "Grade Ladder Score of first certificate in secondary education"
label variable cert_secondinsec_ladder_`c' "Grade Ladder Score of second certificate in secondary education"

label variable central_exam_highest_`c' "Central Exam Result of highest certificate in secondary education"
label variable central_exam_highest_std_`c' "Central Exam Result of highest certificate in secondary education
(standardised)"
label variable ladder_cert_highestinsec_`c'  "Grade Ladder Score of highest certificate in secondary education"

rename brin_crypt_`cy' brin_crypt
rename vobrinvest_`cy' vobrinvest
rename *_`c' *
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt vobrinvest cohort stat), punct("_")
save "@LOCATION\Secondary Education\Certexam_school_`c'.dta", replace

* Cohort
use "@LOCATION\Secondary Education\Certexam_cohort_mean_`c'.dta", clear
append using "@LOCATION\Secondary Education\Certexam_cohort_count_`c'.dta"
append using "@LOCATION\Secondary Education\Certexam_cohort_sum_`c'.dta"
```

```
label variable cert_firstinsec_ladder_`c' "Grade Ladder Score of first certificate in secondary education"
label variable cert_secondinsec_ladder_`c' "Grade Ladder Score of second certificate in secondary education"

label variable central_exam_highest_`c' "Central Exam Result of highest certificate in secondary education"
label variable central_exam_highest_std_`c' "Central Exam Result of highest certificate in secondary education
(standardised)"
label variable ladder_cert_highestinsec_`c'  "Grade Ladder Score of highest certificate in secondary education"

rename brin_crypt_`cy' brin_crypt
rename *_`c' *
generate cohort = `cy'

encode type_stat, generate(stat)
order brin_crypt cohort stat
egen merge_var = concat(brin_crypt cohort stat), punct("_")
save "@LOCATION\Secondary Education\Certexam_cohort_`c'.dta", replace
}

use "@LOCATION\Secondary Education\Certexam_school_c2011.dta", clear
forvalues i = 2012(1)2013 {
       append using "@LOCATION\Secondary Education\Certexam_school_c`i'.dta"
order ladder_* reccom*, last
       }
save "@LOCATION\Secondary Education\Certexam school 2011-2013.dta", replace

use "@LOCATION\Secondary Education\Certexam_cohort_c2011.dta", clear
forvalues i = 2012(1)2013 {
       append using "@LOCATION\Secondary Education\Certexam_cohort_c`i'.dta"
order ladder_* reccom*, last
}
save "@LOCATION\Secondary Education\Certexam cohort 2011-2013.dta", replace

***** Merge cohort indicators

use "@LOCATION\Secondary Education\Structure cohort 2011-2013.dta", clear
merge 1:1 merge_var using "@LOCATION\Secondary Education\Retention cohort 2011-2013.dta", nogen
merge 1:1 merge_var using "@LOCATION\Secondary Education\Acceleration cohort 2011-2013.dta", nogen
merge 1:1 merge_var using "@LOCATION\Secondary Education\Stacking cohort 2011-2013.dta", nogen
merge 1:1 merge_var using "@LOCATION\Secondary Education\Mobility cohort 2011-2013.dta", nogen
merge 1:1 merge_var using "@LOCATION\Secondary Education\Heterogeneous cohort 2011-2013.dta", nogen
merge 1:1 merge_var using "@LOCATION\Secondary Education\Recommendation cohort 2011-2013.dta", nogen
merge 1:1 merge_var using "@LOCATION\Secondary Education\Certexam cohort 2011-2013.dta", nogen
drop type_stat merge_var
save "@LOCATION\Secondary Education\Cohorts 2011-2013.dta", replace

***** Merge school indicators

use "@LOCATION\Secondary Education\Structure school 2011-2013.dta", clear
merge 1:1 merge_var using "@LOCATION\Secondary Education\Retention school 2011-2013.dta", nogen
merge 1:1 merge_var using "@LOCATION\Secondary Education\Acceleration school 2011-2013.dta", nogen
merge 1:1 merge_var using "@LOCATION\Secondary Education\Stacking school 2011-2013.dta", nogen
merge 1:1 merge_var using "@LOCATION\Secondary Education\Mobility school 2011-2013.dta", nogen
merge 1:1 merge_var using "@LOCATION\Secondary Education\Heterogeneous school 2011-2013.dta", nogen
merge 1:1 merge_var using "@LOCATION\Secondary Education\Recommendation school 2011-2013.dta", nogen
merge 1:1 merge_var using "@LOCATION\Secondary Education\Certexam school 2011-2013.dta", nogen
drop type_stat merge_var
save "@LOCATION\Secondary Education\Schools 2011-2013.dta", replace
```

Do-file 5: School level data

```
****************************************
* DATA SET: FLEXIBILITY INDICATORS

* Purpose: School level data
****************************************

use "@LOCATION\Secondary Education\Schools 2011-2013.dta", clear

*** rename
rename ladder_cert_highestinsec ladder_cert_hinsec
rename central_exam_highest_std ce_highest_std

keep brin_crypt vobrinvest cohort stat ret acc sch_stack sch_stack_w sch_stack_a downward upward hetero_year1
hetero_year2 hetero_year3 certhigherrec ce_highest_std ladder_cert_hinsec ///
tc_prac tc_bb tc_kb tc_vmbogt tc_havo tc_vwo tc_bbkb tc_gthavo tc_havovwo tc_bbkbgt tc_gthavovwo
tc_bbkbgthavovwo tc_other tc_notrack track_number

reshape wide ret acc sch_stack sch_stack_w sch_stack_a downward upward hetero_year1 hetero_year2 hetero_year3
certhigherrec ce_highest_std ladder_cert_hinsec ///
tc_prac tc_bb tc_kb tc_vmbogt tc_havo tc_vwo tc_bbkb tc_gthavo tc_havovwo tc_bbkbgt tc_gthavovwo
tc_bbkbgthavovwo tc_other tc_notrack track_number, i(brin_crypt vobrinvest cohort) j(stat)

*** rename
rename *1 *_n
rename *2 *_m

* drop non-used (variants of) variables
drop *3
drop tc_bb_m tc_kb_m

*** Standardising (z-transformed)
foreach var of varlist ret_m acc_m sch_stack_m sch_stack_w_m sch_stack_a_m downward_m upward_m hetero_year1_m
hetero_year2_m hetero_year3_m certhigherrec_m ce_highest_std_m ladder_cert_hinsec_m {
        generate z_`var' = .
        forvalues i = 2011(1)2013{
        capture noisily {
        generate `var'_`i' = `var' if cohort == `i'
        egen z_`var'_`i' = std(`var'_`i')
        replace z_`var' = z_`var'_`i' if cohort == `i'

        }
        }
}

*** Trimmed and deleted
foreach var of varlist ret_m acc_m sch_stack_m sch_stack_w_m sch_stack_a_m downward_m upward_m hetero_year1_m
hetero_year2_m hetero_year3_m certhigherrec_m ce_highest_std_m ladder_cert_hinsec_m {
        generate `var'_del = .s

        forvalues i = 2011(1)2013 {
        capture noisily {

        // normal score and trimmed values set missing
        replace `var'_del =  `var'_`i' if cohort == `i' & (z_`var'_`i' >= -4 & z_`var'_`i' <= 4)
        replace `var'_del = .s if cohort == `i' & (z_`var'_`i' > -100 & z_`var'_`i' <= -4)
        replace `var'_del = .s if cohort == `i' & (z_`var'_`i' < 100 & z_`var'_`i' >= 4)

        drop `var'_`i' z_`var'_`i'
        }
        }
}


*** change variable with outliers for those without & shorten z-transformed variable name
drop ret_m acc_m sch_stack_m sch_stack_w_m sch_stack_a_m downward_m upward_m hetero_year1_m hetero_year2_m
hetero_year3_m certhigherrec_m ce_highest_std_m ladder_cert_hinsec_m

foreach var in ret acc sch_stack sch_stack_w sch_stack_a downward upward hetero_year1 hetero_year2 hetero_year3
certhigherrec ce_highest_std ladder_cert_hinsec {
rename `var'_m_del `var'_m
rename z_`var'_m `var'_z
}

* order data
```

```
order brin_crypt vobrinvest cohort acc* ret* sch_stack_w* sch_stack_a* sch_stack* downward* upward*
hetero_year1* hetero_year2* hetero_year3* track_number* certhigherrec* ce_highest_std* ladder_cert_hinsec* tc_*

* variable labels
label variable brin_crypt "Anonymised school identifier"
label variable vobrinvest "Anonymised school location identifier"
label variable cohort "Entry cohort"
label variable acc_m "% acceleration"
label variable acc_z "Std % acceleration"
label variable acc_n "N acceleration"
label variable ret_m "% retention"
label variable ret_z "Std % retention"
label variable ret_n "N retention"
label variable sch_stack_w_m "% stacking certificates within the same school"
label variable sch_stack_w_z "Std % stacking certificates within the same school"
label variable sch_stack_w_n "N stacking certificates within the same school"
label variable sch_stack_a_m "% stacking certificates across different schools"
label variable sch_stack_a_z "Std % stacking certificates across different schools"
label variable sch_stack_a_n "N stacking certificates across different schools"
label variable sch_stack_m "% stacking certificates"
label variable sch_stack_z "Std % stacking certificates"
label variable sch_stack_n "N stacking certificates"
label variable downward_m "% downward mobility"
label variable downward_z "Std % downward mobility"
label variable downward_n "N downward mobility"
label variable upward_m "% upward mobility"
label variable upward_z "Std % upward mobility"
label variable upward_n "N upward mobility"
label variable hetero_year1_m "% Mixed Tracks (first year)"
label variable hetero_year1_z "Std % Mixed Tracks (first year)"
label variable hetero_year1_n "N Mixed Tracks (first year)"
label variable hetero_year2_m "% Mixed Tracks (second year)"
label variable hetero_year2_z "Std %Mixed Tracks (second year)"
label variable hetero_year2_n "N Mixed Tracks (second year)"
label variable hetero_year3_m "% Mixed Tracks (third year)"
label variable hetero_year3_z "Std % Mixed Tracks (third year)"
label variable hetero_year3_n "N Mixed Tracks (third year)"
label variable track_number_m "Number of Tracks"
label variable certhigherrec_m "% certificate higher than recommendation"
label variable certhigherrec_z "Std % certificate higher than recommendation"
label variable certhigherrec_n "N certificate higher than recommendation"
label variable ce_highest_std_m "Average Central Exam Result Highest Certificate"
label variable ce_highest_std_z "Std Average Central Exam Result Highest Certificate"
label variable ce_highest_std_n "N cAverage Central Exam Result Highest Certificate"
label variable ladder_cert_hinsec_m "Average Grade Ladder Score Highest Certificate"
label variable ladder_cert_hinsec_z "Std Average Grade Ladder Score Highest Certificate"
label variable ladder_cert_hinsec_n "N Average Grade Ladder Score Highest Certificate"
label variable tc_prac_m "School offers practical education"
label variable tc_vmbogt_m "School offers pre-VET 3"
label variable tc_havo_m "School offers higher general"
label variable tc_vwo_m "School offers pre-university"
label variable tc_bbkb_m "School offers pre-VET 1 & pre-VET 2"
label variable tc_gthavo_m "School offers pre-VET 3 & higher general"
label variable tc_havovwo_m "School offers higher general & pre-university"
label variable tc_bbkbgt_m "School offers pre-VET 1 & pre-VET 2 & pre-VET 3"
label variable tc_gthavovwo_m "School offers pre-VET 3 & higher general & pre-university"
label variable tc_bbkbgthavovwo_m "School offers pre-VET 1 & pre-VET 2 & pre-VET 3 & higher general & pre-
university"
label variable tc_other_m "School offers other tracks"
label variable tc_notrack_m "School offers no tracks in that year"

* drop n of track offerings
drop tc_*_n

* select on N
foreach var in tc_prac tc_bb tc_kb tc_vmbogt tc_havo tc_vwo tc_bbkb tc_gthavo tc_havovwo tc_bbkbgt tc_gthavovwo
tc_bbkbgthavovwo tc_other tc_notrack track_number ret acc sch_stack sch_stack_w sch_stack_a downward upward
hetero_year1 hetero_year2 hetero_year3 certhigherrec ce_highest_std ladder_cert_hinsec {
capture replace `var'_m = .n if `var'_n >= 0 & `var'_n < 10
capture replace `var'_z = .n if `var'_n >= 0 & `var'_n < 10
capture replace `var'_n = .n if `var'_n >= 0 & `var'_n < 10

capture replace `var'_z = .s if `var'_m == .s & `var'_z == .
capture replace `var'_n = .s if `var'_m == .s & `var'_n == .
}

* formatting numbers
```

```
format *_m *_z %9.3f
format *_n %9.0f
format tc*_m %9.0f

save "@LOCATION\Secondary Education\Secondary Ecuducation Indicators Data.dta", replace
```