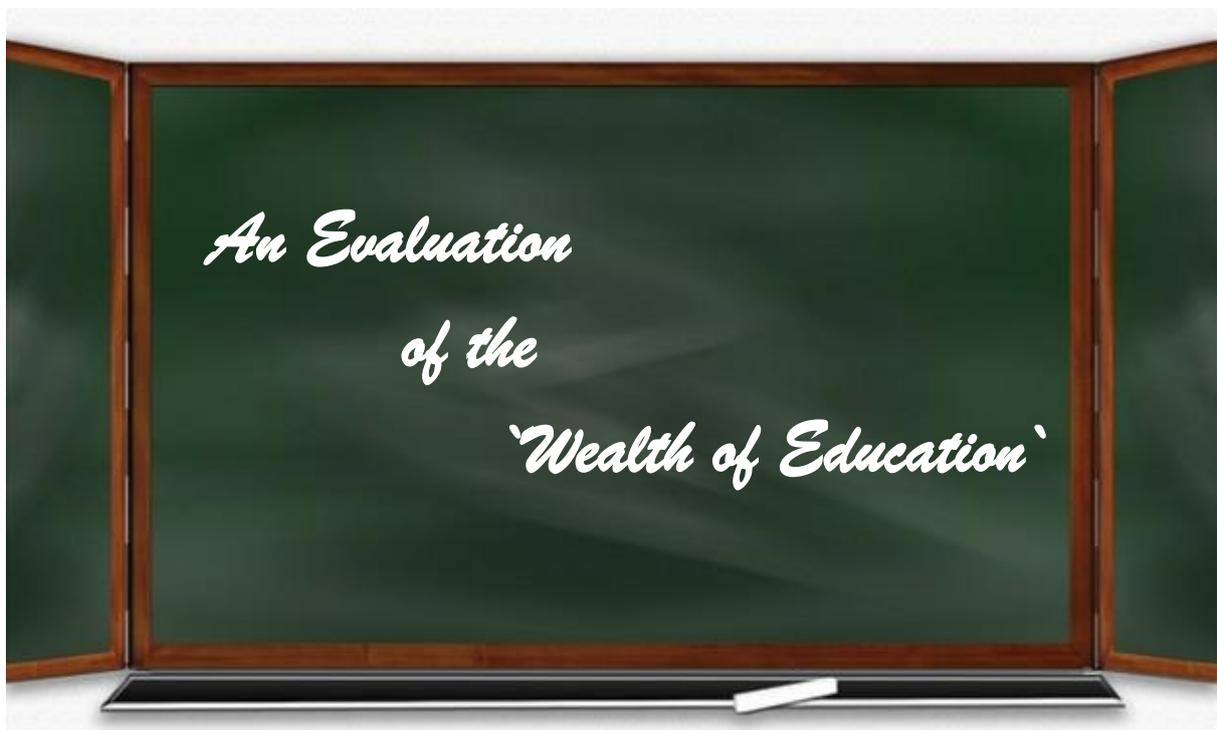Economics in Dutch Secondary Education
An evaluation of the effects of the recent reform in the exam program for HAVO/VWO

An Evaluation

of the

'Wealth of Education`

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Abstract

Throughout this paper, an attempt is made to outline the effects of the recent reform in the economics course in Dutch secondary education. Two complementary analysis methods have been applied in order to identify several outcomes of the reform. The first analysis examined data on all 509 VWO schools and all 500 HAVO schools in the year 2011. It studied the effects of the preliminary pilot program on school-level outcomes such as exam grades and graduation rates through regression. The second analytical method was a questionnaire which was filled in by 11 high-school teachers.

The regression yielded no significant results for VWO schools, but for HAVO schools, the final central exam grades were found to be lower by 0.078 per cent on average for pilot schools in the year 2011 compared to HAVO school departments which were not part of the pilot program. The means comparison over time indicated that the mean average central exam grade of the new program was significantly lower by 0.336 grade points than the years before, but the total graduation rate was significantly higher by 2.460 percentage points. Furthermore, the questionnaire provided indications that teachers do not believe in effectiveness of the reform, and do not execute it perfectly. A possible explanation for these results would be the 'transition phase' hypothesis. Right after implementation of a reform, teachers are not used to it yet, and therefore its results will not be as expected.

1.   Introduction

In the academic year 2008/2009, a reform in the economics course in the secondary education of the Netherlands had been partially implemented which will be completed in the year 2013/2014. This reform will affect approximately 20 per cent of all high school students. In this paper we will investigate what the preliminary effects of this reform have been on affected students. Poor execution of the reform could result in lower grades, lower graduation rates and less economic knowledge and skills which consequently would be disadvantageous to participating pupils. The government should promote equal opportunities and chances. Therefore this paper will evaluate these effects.

This article is centered around the following research question:

 "What were the effects of the recent reform in economics in the secondary education HAVO and VWO?"

The research question has been divided into multiple subquestions, which will be discussed throughout the article.

1.   What does the recent reform in the secondary education HAVO and VWO subject of economics precisely entail?
2.   In what ways does the reform intend to improve upon the old program?
3.   What were the measurable effects of final exam grades and graduation rates of the economics course reform?
4.   Is the program reform achieving its own explicitly stated goals?

A description of the reform is provided in section 2. Then, section 3 is devoted to a discussion of academic literature and the ways in which the reform intends to improve upon the previous program   .

Afterwards , in section 4 the empirical analyses will be introduced and the results will be discussed. In these analyses, two hypotheses, which are based on our research question and subquestions will be tested. The two methods are utilized to provide a more complete image of the reform's effects.

First, an empirical regression will be performed of the year 2011 to study the effects of the preliminary pilot program on four outcome variables which include graduation rates and final exam grades. Second, a questionnaire has been constructed which was completed by 11 high-school economic teachers in order to provide insight in the way the program may have impacted students' results.

In section 5, the findings of this paper are summarized and the paper will end with a conclusion.

2.   The Reform of the Economics Program

In the Netherlands, one school can have different school locations, offering different education tiers at every location. A school here means the controlling organization behind a (set of) school location(s). For example, religious schools usually have different school locations in different cities. At each of those school locations, different types of education are given, by which the educational tiers VMBO, HAVO and VWO (which will be explained in the next paragraph in more detail) are meant.[1] This distinction is useful because we are focusing on only two out of three school types, and therefore need to focus only on those school departments, instead of entire schools or entire school locations.

The term high school is used in this paper to refer to Dutch secondary education. Unlike the American or UK system, the Netherlands does not distinguish between middle school and high schools. All pupils start high school at age 11-12 in the Netherlands, and depending on school type, graduate between ages 16-18. After graduation, pupils can directly continue to tertiary educational institutions.

2.1 Background on the Dutch secondary education system

2.1.1 The general Dutch secondary education system

At the age of 12, Dutch students graduate elementary school and based on their performance, they continue into one of three high-school tiers. Between 50% and 60% of students proceed into the lowest tier, VMBO secondary education, roughly equivalent to vocational education. Approximately 25% to 30% of students will start HAVO education, roughly equivalent to pre-university of applied sciences education. The remainder of students, approximately 15% of all students will proceed into the highest VWO tier, roughly equivalent to pre-university education. In this paper, only HAVO and VWO will be discussed because the reform only applies to these education tiers. HAVO students graduate after completing 5 years of education, with the last two years being called *Tweede Fase*, or Second Phase. VWO students follow 6 years of education, of which 3 years Second Phase. This Second Phase of HAVO and VWO is subject to the same strict exam program, established by the Dutch ministry of education. For each high-school course, a separate exam program exists which details the goals and overarching subjects of the contents of the course. The Examination Board (*College voor Examens*) constructs a course syllabus every year, describing precisely which

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[1] . One school type given at one school location is in this paper referred to as a 'school department'. For example, a Catholic school with one location in Amsterdam and one location in Rotterdam which provides VMBO, HAVO and VWO in Amsterdam, and only HAVO and VWO in Rotterdam will count as one school, two school locations, and finally five 'school departments'.

pieces of knowledge and which skills students should have at the end of the final year. Based on those syllabi and exam programs, the Examination Board constructs the national Central Exams for HAVO and VWO separately to be held in May of the respective academic year.

Age	Class	VMBO	HAVO	VWO
% of students->		*55%*	*30%*	*15%*
12-13	1			
13-14	2			
14-15	3			
15-16	4	Graduation		
16-17	5		Graduation	
17-18	6			Graduation
The darker colored years are called *Tweede Fase* (Second Phase) and are directed at the final exams. For these years, an exam program is designed each year for each course, detailing exactly what knowledge and which skills students should have obtained at graduation.				

Table I. Overview of the Dutch Secondary Education System

2.1.2 The subject of economics in the Dutch secondary education system

In the Second Phase, each student is required to choose one of four so-called profiles:

- Cultuur & Maatschappij (Culture and Society, C&M)
- Economics & Maatschappij (Economics and Society, E&M)
- Natuur & Gezondheid (Nature and Health, N&G)
- Natuur & Techniek (Nature and Science, N&T)

For the profile E&M, economics is an important course, and will count a lot towards graduating. An E&M student obtaining an insufficient mark for this course will have more trouble graduating due to the rules set by the government than when the insufficient mark was obtained for one of his elective courses. For students who have chosen one of the other profiles, economics is just that, an elective course.

Furthermore, it is important to mention that the current reform has not been the only reform to the economics program in recent years. In 2008 for HAVO and 2009 for VWO another reform to the course was completed. Before those years, the course economics was separated in two very similar, but different courses. The elective course was called economics 1 and had a smaller work load, and the profile course was called economics1,2 and had a larger work load. After 2008 and 2009, all schools switched to a unified course called economics for both elective students and E&M students.

This was not a major change, because the new unified course resembled the old course economics1,2 very much, both in content and in work load.

One consequence for our analysis is that HAVO students who failed to graduate in 2008, were still able to take a 'broomstick exam' in the old subjects in 2009. These grades have been included in the calculation of the average grade for a school department in the analysis, because otherwise a large group of lower-performing students would be excluded in the grades of 2009. In this way, the grades could be artificially inflated.

	Academic year						
	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
HAVO							
Old Program	Class 4+5	Class 4+5	Class 4+5	Class 5			
Pilot Program	Class 4	Class 4+5	Class 4+5	Class 5			
New program				Class 4	Class 4+5	Class 4+5	Class 4+5
VWO							
Old Program	Class 4+5+6	Class 4+5+6	Class 4+5+6	Class 4+5+6	Class 5+6	Class 6	
Pilot Program	Class 4	Class 4+5	Class 4+5+6	Class 4+5+6	Class 5+6	Class 6	
New Program					Class 4	Class 4+5	Class 4+5+6

TABLE II: Timeline of the Reform

The reform, which will be discussed in the next subsection in more detail, was implemented in different phases. A timeline is provided in Table I. Before national implementation, a pilot program was executed in which 34 school departments participated. The pilot program consisted of testing the new program and materials, and based on the experiences during the pilot years, the national implementation could be performed more smoothly. After the pilot program ended, the new program was nationally implemented at different times for VWO and HAVO. In the academic year, HAVO has had a full implementation, whereas VWO only has had a partial implementation for class 4 and 5.

2.2 The reform of the economics course in the Dutch secondary education for HAVO and VWO

In order to understand fully the deep changes the economics course has undergone, it is necessary to mention the history of its development. When the motivation behind the new structure is known,

the program itself can be analyzed in more detail. In this section the background of the program will be discussed first, followed by its modified goals. These will then be discussed, together with the altered didactics. Throughout this discussion, it will become apparent why this specific course reform has been very profound and is therefore relevant for research.

2.2.1 History

The new exam program for the HAVO and VWO course economics in Dutch high-schools was created as a reaction to the old program, and was therefore intended to be an improvement thereupon. The Netherlands education ministry appointed two commissions, presided over by notable economist Mr Teulings, which were responsible for this task. The first commission has focused more on what needed to change relative to the old program, and the second commission has aimed to provide a more in-depth blueprint on how the new program should be constructed and which elements it should contain. In 2005 this report titled *The Wealth of Education*, containing the blueprint, came out. In 2007, the Examination Board constructed the first operational syllabus designed for use by economics teachers in Dutch high schools.

2.2.2 Different Goals

The report of the first commission has identified several problems with the old program, and it consequently aimed to solve those in its overarching goals (Commissie Teulings I, 2002). They identified a new overarching goal, which is described in Appendix D. From this meta-goal, a few smaller, more practical goals were identified in the report of which some will be investigated in this paper:

- ➢ Developing an economic point of view through learning economic skills
- ➢ Improving the transition between economics in secondary and tertiary education
- ➢ Increasing motivation for and interest in the course of economics
- ➢ Improving students' economic decision-making skills

All economic concepts, economic connections between phenomena and economic skills should enable students to use economics to their advantage in their future roles in the economy. Therefore the subjects covered in the classes should have relevance in the real society. In addition, the didactics have changed in order to teach students more economic skills instead of just knowledge. (Commissie Teulings II, 2005)This will be discussed in more detail in the following sections.

2.2.3 Different Content

In figure 1, an overview of the new "domains" and "concepts" (the overarching subjects) of the new program has been provided. The main changes include the reintroduction of typically micro-economic elements in the exam program, and the relative reduction of importance of macro-economic subjects.

New Program Domains	HAVO	VWO
A Skills	Less	More
B Concept Scarcity	New	New
C Concept Trade	New	New
D Concept Market	More	More
E Concept Intertemporal Trade	New	New
F Concept Cooperation and Negotiation	New	New
G Concept Risk and Information	New	New
H Concept Welfare and Growth	Unchanged	Unchanged
I Concept Good Times, Bad Times	Unchanged	Unchanged
J Research and Experiment	New	New
K Elective Space	New	New
*** Compared to old program		

FIGURE 1. The new HAVO and VWO Economics Program: Overview of Domains

The first motivation behind the new content choices can be summarized by 'teach more about less'. In the exam syllabus, the Examination Board has put emphasis on the higher thought level students should be able to attain by using Bloom's (Anderson et al 2005) revised taxonomy. Basically, this means that each exam requirement starts with a certain verb which according to Bloom's revised taxonomy is linked to a specific thought level. For example, "memorizing" implies a lower thought level than "applying" would. So even thought the number of exam requirements is lower, the expected thought level at each individual one is higher.

The second reason is strongly connected with the changed goals. In order to enable students to take better economic choices in their future roles in society, the focus of the program has to be shifted to

micro-economics. Hence, the micro-economic subjects of producer and consumer choices have been reintegrated in the economics curriculum.

2.2.4 Different Didactics

The new program is oriented towards teaching students certain economic concepts, which they have to apply in different economically relevant contexts. This phenomenon is called "transfer" of knowledge, and is derived from the natural sciences. Especially in Dutch classrooms, the practical context and the application of scientific principles has been important in the high-school sciences curriculum. A direct reflection of this is the obligatory "klaslokaalexperiment". Every economics teacher is now required to devote a few classes to these experiments, in which the real-life applications of economic concepts are taught to students.

Another way in which this different didactic manifests itself is through the inclusion of "heuristiek" in the exam program. Instead of teaching students what the "correct" answer to an economic problem is, the focus will be on teaching students how to construct a valid economic answer. Students are encouraged to develop their own problem-solving strategies, which may be applicable to more contexts. It matters less whether the final answer is correct, but the economic arguments and economic point of view have grown in importance.

3.   Review of Related Literature and Empirics

3.1 Problem-Based Learning

In this section, problem- or context-based learning is discussed, as it is newly added to the economics exam program. In this section, a definition, or rather a set of minimum requirements of problem-based learning is provided. Consecutively, the effects of this problem-based learning are discussed.

3.1.1 Definition of Problem-Based Learning

A clear, all-encompassing definition of problem-based learning is problematic to construct, due to its many forms across disciplines and education types. Therefore, in this paper the choice has been made to adhere to Walker and Leary's (2009) set of minimum standards rather than a detailed definition of the phenomenon. We will discuss how certain components of the new economics program are related to this set of standards point-by-point, and therefore can be viewed as examples of problem-based learning. These minimum standards have been developed by Walker and Leary:

- "Ill-structured problems
  Ill-structured problems are presented as unresolved so that students will generate not just multiple thoughts about the cause of the problem, but multiple thoughts on how to solve it (Barrows, 2002). Such problems may not have a single correct answer and should engage students in the exploration of multiple solution paths (Hmelo-Silver & Barrows, 2006).

- Student-centered approach
  A student-centered approach in which students determine what they need to learn. It is up to the learners to derive the key issues of the problems they face, define their knowledge gaps, and pursue and acquire the missing knowledge (Barrows, 2002; Hmelo-Silver & Barrows, 2006)

- Teachers act as facilitators
  Teachers act as facilitators or tutors in the learning process. These tutors, typically faculty, initially prompt students with meta-cognitive questions and in subsequent sessions fade that guidance (Barrows, 2002). Tutors forgo lecturing about content in favor of modeling the

kinds of learning processes that lead to success in PBL settings (Hmelo-Silver & Barrows, 2006).

- Authenticity

Authenticity forms the basis of problem selection, embodied by alignment to professional or "real-world" practice (Barrows, 2002). As such, the problems are inherently cross-disciplinary and require students to investigate multiple subjects (Barrows, 1996) in order to generate a workable solution."[2]

3.1.2 Elements of the New Program Relating to Problem-Based Learning

- Ill-structured problems

Two major points since the implementation of the new program and the pilot program relate to ill-structured problems. Firstly, in the required skills section of the new exam program, students are now required to use heuristics and transfer. Heuristics literally is described as applying problem-solving strategies on questions which do not have a prescribed right answer. Transfer means applying knowledge obtained in one context in another context.

Secondly, when analyzing the past Central Exams, ill-structured problems appear on average 3-4 times in each exam. They can be recognized by a higher amount of points awarded for the question, and the presence of hints. By using the hints, students are usually required to reason the effects of phenomenon X on phenomenon Y. In the correction model, which exam correctors use to award points to students, not a single correct answer is given for those questions. The focus here rests on the quality of the reasoning and the incorporation of the concepts which were provided in the form of hints.

- Student-centered approach & Teachers act as facilitators

The new economics program incorporates a new important domain called *Experimenten* (Experiments), which should be carried out. These experiments are not defined in the exam program itself, but are operationalized by a supporting organization called SLO as follows: *"Classroom experiments are short, interactive exercises designed to facilitate*

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[2] Quoted from: Walker, Andrew. Leary, Heather. A Problem Based Learning Meta-Analysis: Differences Across Problem Types, Implementation Types, Disciplines, and Assessment Levels. Interdisciplinary Journal of Problem-Based Learning. 2009. Vol 3. Issue 1. pp. 13 and 14.

understanding of key economic ideas' (Holt, 1996)."[3] The goal of the classroom experiments is best described by Bergstrom and Miller (1997): "To engage students in active learning, to exploit their natural curiosity about economic affairs, and to get them to ponder the questions before we try to give them answers. We found that conducting experiments in class, with discussions before, during, and after the experiments is an effective and enjoyable way of moving from passive learning to active learning."[4] In this passage, it can clearly be read that the questions which are answered during a classroom experiment should come from students, and should be answered as they appear to students. Clearly, this relates perfectly to the student-centered approach standard.

- Authenticity

  Transfer as a required skill, requiring students to be able to apply economic concepts learned in one setting in another economic context appropriately. These new contexts can vary, but two real-world contexts are required to be taught to students. Firstly, the principles of the (Dutch) social security system and secondly the principles of the (Dutch) labor market. Because of the ageing population's effects on social security and the current recession's effects on the labor market, these contexts are highly relevant to the economic society students live in, and will live in.

3.1.3 Effects of Problem-Based Learning

The most notable study in this respect was performed by Walker and Leary (2009). Their meta-analysis of 82 quantitative previous academic studies covers many academic disciplines (e.g. mathematics, social sciences, business, medical sciences) and academic levels (e.g. secondary education, tertiary education). Across all disciplines in all education levels, a significantly positive effect was found of 0.13 standardized differences. Also, their vote count analysis (62 positive outcomes and 21 negative outcomes) proved significantly in favor of positive effects of problem-based learning on student outcomes. In the social sciences and business (the most closely related academic fields to economics) much larger effects of 0.299 and 0.159 were observed. However, the number of studies investigating these disciplines was much lower and therefore these results can be less trustworthy.

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[3] Quoted from: National Expertise Centrum Leerplanontwikkeling. Handreiking schoolexamen economics. March 2012. Page 29. Downloaded from: http://www.slo.nl/downloads/2012/handreiking-schoolexamen-economics.pdf/ (accessed 13 June 2013)
[4] Quoted from: Bergstrom, Theodore C., and John H. Miller. 1997. Experiments with economic principles. New York: McGraw Hill.

Focusing more on the discipline of economics in high schools, Finkelstein and Hanson (2010) investigated the effects of problem-based education on 4,350 students in the states California and Arizona in the United States. Their design included dividing the students into two groups of students with one group being taught by teachers who were in turn trained in problem-based education, and the other group receiving 'regular' economics classes. At the end of the experiment, both groups were made to complete the Test of Economic Literacy (TEL). This test consisted of 40 true/false questions regarding the subject of economics. In addition, a survey was filled in by students and teachers after completion of the experiment.

Finkelstein and Hanson (2010) then found that students who were taught by a PBE-trained teacher outscored their peer group by 2.6 (significant) points at the TEL. They also found that "problem-solving skills and application to real-world dilemmas" significantly favored the intervention group. Another interesting find was that students were significantly more satisfied with the materials which were provided (and constructed) by PBE-trained teachers than their peer group was with their teachers' materials.

A much smaller-scale study, performed by Kneppers et al (2007) subjected 31 Dutch high-school economics students to two treatments. Due to the low number of participants, the results should be interpreted with caution. One group of students was subjected to a "context treatment" whereas the other group was subjected to a "concept treatment". These treatments included two sessions aimed at solidifying contextual skills and conceptual knowledge respectively. After the treatment, both groups took the same two post-treatment tests. The test results indicate that the group subjected to a 'context treatment' scored better on a test which required an economic approach to current economic problems. On the other post-treatment test, which required mostly conceptual knowledge, both groups performed similarly. This could mean that the context treatment aids students in fulfilling one of the goals of the new economics program: applying economic skills to real-world problems. Of course, some caution should be used when interpreting these results due to the small sample size and research design. There is not one objective way to construct a context treatment, and it is difficult to objectively test context skills.

3.2 School Performance

Many factors influence the economic knowledge and skills of high-school economics students. Within the educational research discipline, much discussion has arisen around which elements at the determine student performance. Broadly speaking, one can distinguish different levels of analysis when investigating this research question. One could look at student-level factors, school-level

factors, and national factors. The aim of this particular study is not to compare educational outcomes internationally; therefore the national factors will be disregarded.

At the student level, there exists a broad consensus in academic literature (Hanushek, 1986, 1992; Haveman and Wolfe, 1995; Bradley and Taylor, 2001) that there are many factors contributing to a student's performance and knowledge. To name a few, individual intelligence, individual motivation and interest, parents' intelligence, parents' income, parental involvement play a big role in predicting the outcomes of pupils in the educational process. However, because of the scale of this research and the lack of available data due to privacy reasons, these factors have not been taken into account in the following analysis.

At the school level, there exists much literature (Hanushek 1986, 1992; Haveman and Wolfe, 1995) on what distinguishes a well-performing school from a less-performing school. However, a consensus has not been reached about the questions which factors determine the outcomes of students. This could be due to large international variations in school systems and the unpredictable variation of students between years at the same school. Although it is not adequately confirmed (Bradley and Taylor 2002), below is the list of variables often named:

- Pupil/teacher ratio;

- Quality of teaching;

- Quantity and quality of educational facilities (e.g. library, computers, etc.); and

- Expenditure per pupil.

For these four factors, no data was readily available. Also, Hanushek, Riykin and Taylor (1996a, 1996b) have attempted to estimate the effects of these variables, but were unable to do so. They conclude it could either be due to the quality of the data used to represent concepts such as "teacher quality", or it could be that there exists no systematic relationship. Additional to the fact that no data is readily available; these reasons are why in this paper these factors are not taken into account.

However, the following factors have been used in this paper, based on academic literature which was focused more on The Netherlands' own education system. Much of these factors were derived from the government's Department for Education Inspection's criteria when officially evaluating school performance (Inspectie van het Onderwijs 2013).

Some others were derived from Dutch-focused academic literature (De Lange & Dronkers 2007; Braster 2001; De Moor 2009; Dijkgraaf & Jong 2004). For example, in The Netherlands a substantial number of high schools have a religious denomination, and this can play a role in student performance. However, the division between private and public schools is negligible, a division which is of paramount in school systems such as the United Kingdom or the United States of America. The following list of factors has been included in the following analysis:

- School Denomination

  Schools with a religious denomination often have additional income streams and a different approach to education/learning, and can therefore influence student outcomes in The Netherlands. (Dijkgraaf & Jong 2004)

- School Size

  Schools have been found to experience negative effects of being too large, and of being too small. An influential study performed by Bradley and Taylor (1998) found that British schools had an optimal pupil amount when researching school size's effects on the (excellent) performance of students. For schools for the ages 11-18 (similar to Dutch schools), the optimal size was 1500 students.

- Ethnic Diversity and Ethnic Share

  Levels and Dronkers (2008) have researched international PISA data and concluded that across Europe, schools which had a higher share of ethnic minorities scored less on a standard reading skills test (PISA) in which at least 200,000 15-year-old students in 43 countries participated. This could indicate that a higher share of ethnic minorities could depress school-level outcomes.

- Department of Education Inspection's Rating

  The Dutch Department of Education Inspection, a part of the Dutch ministry of Education, Culture and Science, publishes an overview of their assessments for all schools in the Netherlands. Every year in September, those ratings are updated. The ratings are based on a qualitative evaluation, carried out by inspectors who visit the locations themselves. Next to the qualitative evaluation, a quantitative analysis is a big part of the rating. Based on school and student characteristics, the Education Inspection assesses whether a school enables students to achieve or surpass their expected performance levels. This means that an average-performing school when solely looking at grades could still be rated 'Weak',

because based on the school's students' characteristics, the school should perform better than average. The rating system is three-tiered, ranging from low to high: Zeer Zwak (Very Weak), Zwak (Weak), and Basis (Basic/Normal). Each school location and each school tier is rated separately. So if a school has two physical school locations, and offers both HAVO and VWO at both locations, 4 ratings are published. Out of 2,715 such 'school departments', 25 were rated Very Weak, 256 were rated Weak, and the remaining were rated Basic/Normal.

3.3 Educational Reform

Educational reform comes in many sizes and varieties. Oftentimes, an education reform pertains to changes to the system of education, such as an adjustment to the compulsory education age, or the implementation of a tracking education system. These changes affect almost all students in a country. However, the reform at hand pertains to the economics course for HAVO and VWO students in the Second Phase.

Educational reforms are generally evaluated by comparing the outcomes of the program to its explicitly stated goals. Many educational reforms also impose a set of standards it aims to achieve, and therefore can be deemed effective or ineffective on the basis of those it meeting those criteria. In this paper, the following goals will be tested:

➢ Developing an economic point of view through learning economic skills;
➢ Improving the connection to economics in higher education;
➢ Increasing motivation for and interest in the course of economics; and
➢ Improving students' economic decision-making skills.

In the Research Design section, it will be explained how hypotheses have been derived from these goals, and how they will be examined.

4. Empirical Analysis

4.1 Empirical Research Design

In this section, two hypotheses will be formulated based on our research question and subquestions. These will be empirically tested through analyzing final exam results, graduation statistics and questionnaire responses. The way in which this empirical analysis will be carried out will be explained in more detail in the second part of this section about methodology.

Final exam grades are not often used to evaluate educational reform, especially considering that the final exams in The Netherlands change every year. An increase in the course quality will therefore not necessarily result in an increase in final exam grades. However, a decrease in grades or graduation rates due to an education reform can have undesirable consequences. For example, a poor execution of a program reform can results in lower grades for economics, even though student motivation and work has remained constant.

In this paper, the success of the reform of the economics course will be evaluated in terms of its progress towards its own goals, which have been stated in section 3.3. The second evaluation criterion will be whether the pilot program or the new program have had a negative effect on students' grades. This could have put those students at a disadvantage compared to their peers which follow the old program.

4.1.1 Hypotheses

    I.   The performance at the final school exams or central exams of students and schools which were subjected to the new program or the pilot program has not changed due to the program itself.

    II.   The partial implementation of the new program has been effective in achieving its goals in the short term.

4.1.2 Research Design

Two complementary analyses will be carried out in this paper to identify the effects of the new program and the pilot program, but also to provide some indications in which ways the new program has influenced pupils. A cross-sectional analysis of the year 2011 (discussed in section 4.2.1, results reported in section 4.4.1) and an analysis of questionnaire responses (discussed in section 4.2.3, results reported in section 4.4.3).

4.2 Methodology

4.2.1 Analysis 1: Cross-sectional analysis of 2011

In order to identify the effects of the pilot program on student performance indicators such as final exam grades and graduation rates, these variables will be regressed on a set of explanatory factors[5] which themselves are derived from the literature, as discussed in section 3.2.

Including these other variables serves two purposes: firstly, it separates the effects of those factors from the effects of the program. Since the purpose of this paper is to investigate the effects of the new and the pilot program, this will aid in that objective. Secondly, they are included to examine the robustness of the eventual significant relationships encountered. If the significance, sign or size of the coefficient of one of the variables of interest changes due to the inclusion of more or less other variables, the robustness of its effect decreases. For these two reasons, these other explanatory factors will be included in the analysis.

Considering the statistical analysis part, a choice has been made to employ a cross-sectional analysis for the year 2011, separately for the two educational tiers HAVO and VWO. This is partly due to a government policy.[6] Consequently this has rendered the grades of the pilot Central Exams for HAVO 2009 and for VWO 2010 useless. Only one year remains in which the pilot program for HAVO overlaps with the one for VWO: 2011. In order to ignore year-to-year differences in the effects, a cross-sectional analysis of this year is carried out.

4.2.1.1 Regression model

Four equations will be estimated, for HAVO and VWO separately. Each equation has its own outcome variable, central exam grade, school exam grade, graduation rate for E&M students and total graduation rate respectively. An error term (ε) is also included. The B's indicate linear regression coefficients.

Equation 01

$grad_{s,i,t} = B_0 + B_1* grad_{s,i,t-1} + B_2* Dpilot_{s,I} + B_3* Drating_{s,I} + B_4* ethn\_share_{s,i,t} + B_5* size_{s,i,t} + B_6* Drel_{s,i,t} +$

---

[5] Control variables: total number of students, religious school, inspection rating, ethnicity share
[6] This policy entails that the results of the first pilot program final exams are always adjusted to reflect the previous performance of participating schools. For example, if the pilot schools had an average economics final exam grade of 6.5, the first pilot exams will have approximately the same average exam grade, even though the level of skill and knowledge of the students could be 'objectively' lower. The government's reasoning behind this is that students should not fail a course due to poor execution of a pilot program.

$\varepsilon_{s,i,t}$

Equation 02

$$grad\_EM_{s,i,t} = B_0 + B_1{*}grad\_EM_{s,i,t\text{-}1} + B_2{*} Dpilot_{s,l} + B_3{*} Drating_{s,l} + B_4{*} ethn\_share_{s,i,t} + B_5{*} size_{s,i,t} + B_6{*} Drel_{s,i,t} + \varepsilon_{s,i,t}$$

Equation 03

$$grce_{s,i,t} = B_0 + B_1{*} grce_{s,i,t\text{-}1} + B_2{*}Dpilot_{s,l} + B_3{*} Drating_{s,l} + B_4{*} ethn\_share_{s,i,t} + B_5{*} size_{s,i,t} + B_6{*} Drel_{s,i,t} + \varepsilon_{s,i,t}$$

Equation 04

$$grse_{s,i,t} = B_0 + B_1{*} grse_{s,i,t\text{-}1} + B_2{*}Dpilot_{s,l} + B_3{*} Drating_{s,l} + B_4{*} ethn\_share_{s,i,t} + B_5{*} size_{s,i,t} + B_6{*} Drel_{s,i,t} + \varepsilon_{s,i,t}$$

4.2.2 Analysis 2: Questionnaire

In order to identify more clearly the ways in which the new program and the pilot program have affected students, a more qualitative approach is needed. Therefore a questionnaire had been constructed, based on a similar survey which was sent out to teachers by the organization which officially evaluated the government-led pilot program. This choice has been made to increase comparability between this paper and the earlier pilot evaluation reports, and also to check whether results and conclusions from aforementioned report were still present after all these years. This questionnaire consisted of 40 statements, divided over multiple larger groups of questions which shared a common subject. These statements will be referred to as 'questions' hereafter. 39 of those questions were answered on a rating scale, ranging from 1 (do not agree at all/very bad) to 5 (I agree fully/very good). This means that depending on the question, the rating ranged from 'very bad' to 'very good' or from 'I do not agree at all' to 'I fully agree'. A "not applicable/no opinion"-option was always provided in order to only get results from the teachers who actually had experience with a certain subject.

4.3 Data and Variables

4.3.1 Data Sources

All explanatory variables were obtained from official government websites. Graduation rates and final exam grades are made publicly available each year on the website of the Dienst Uitvoering Onderwijs (DUO, the executive branch of the Dutch ministry of Education, Culture and Science). Annually, all schools are required to report these data to DUO and therefore they represent the most accurate and reliable source.

Concerning the explanatory factors, the school size and the denomination were obtained from the same datasets as the final exam grades and graduation rates. The names of the 34 pilot schools were obtained from the pilot program evaluation reports (SLO 2009; SLO 2011) written by the Stichting Leerplan Ontwikkeling (SLO), the organization which executed the whole economics pilot program. The Department of Education Inspection school department ratings were obtained from the official overview on their website.

The last important variable is ethnicity share. In the Netherlands, the term *allochtoon* is usually utilized instead of foreign. An *allochtoon* is either a foreigner, or a person of foreign descent. In this paper, 'foreign' or 'ethnic minority' will be used to describe the number of *allochtonen* despite the technical differences. As there is no publicly available data of the share of foreign people per educational institution, this paper has made use of a proxy. Since many people choose schools based on location, and are not prepared to travel very far to go to school, we have used the municipal share of non-western *allochtonen* as a proxy for the school's share of non-western *allochtonen*. The school's ethnic diversity is therefore strongly related to the ethnic diversity of its location.

4.3.2 Variables Description

Outcome Variable Name*	Description	Trans-formation
$grad_{s,i,t}$	This refers to the number of graduated students as a percentage of all students participating in the exams	Natural Logarithm
$grad\_EM_{s,i,t}$	This refers to the number of graduated students with the profile Economics and Society as a percentage of all students with the profile Economics and Society who participated in the exams	Natural Logarithm
$grce_{s,i,t}$	This refers to the average grade for the Central Exam in economics for all participating students	Natural Logarithm
$grse_{s,i,t}$	This refers to the average grade for the School Exam in economics for all participating students	Natural Logarithm
*The following subscripts are used in this paper:		

	s = The school type, which can be either HAVO or VWO
i = The school department
t = The year (which is 2011 for all outcome variables)

TABLE III. Description of Variables: Outcome Variables

Explanatory Variable Name*	Description	Trans- formation
$Dpilot_{s,i}$	Takes the value 1 if the school participated in the pilot program for economics for the school type. Takes the value 0 if the school did not participate in the pilot program in the year.	Dummy
$Drating_{s,i}$	Takes the value 1 if the school was assigned the rating "Weak" or "Very weak" by the department of education inspection of the Dutch education ministry. Takes the value 0 if the school had a "Basic" rating.	Dummy
(Outcome Variable)$_{s,i,t-1}$	A lagged value of the outcome variable is included in every regression.	Natural Logarithm
$size_{s,i,t}$	Indicates the total number of students (all school types included) enrolled at a school location at a certain point in time.	Natural Logarithm
$ethn\_share_{s,i,t}$	Percentage of non-western *allochtonen* living in a municipality** in which the school department (*i*) is located	Natural Logarithm
$Drel_{s,i,t}$	A dummy variable which distinguishes between schools of a religious denomination (or a combination involving at least one religious partner), and schools of a non-religious background.	Dummy
*The following subscripts are used in this paper: s = The school type, which can be either HAVO or VWO i = The school department t = The year (which is 2011 for all outcome variables) ** There is no data available on the share of *allochtoon* students, therefore the municipal ethnicity share is used as a proxy.		

TABLE IV. Description of Variables: Explanatory Variables

The descriptive statistics of these variables have been provided in Appendix E. In order to utilize these variables in regression analysis, they have been checked for normality (Appendix H and Appendix I) and multicollinearity (Appendix F and Appendix G). After the regression itself was performed the residuals have been checked for the other Ordinary Least Squares assumptions, and those results will be reported in section 4.4.1.1. We can conclude that there is no indication of multicollinearity.

However, from Appendix H and I we can also already identify strong non-normality in both the outcome and independent variables. However, the non-normal distribution of variables does not influence the regression estimates, and provides a useful alternative next to the usual recommended

models for non-normally distributed outcomes, as Lumley (2002) proved for public health datasets and which was confirmed by Li et al (2012) for other skewed datasets.

4.4 Results

4.4.1 Regression Outcomes

The standard assumptions of the Ordinary Least Squares (OLS) estimation method have been checked, which include normality, absence of autocorrelation, absence of multicollinearity and homoskedasticity. The results for normality of the residuals are reported in Appendix J, heteroskedasticity in Appendix L, autocorrelation in Appendix M. The Gauss-Markov conditions are tested in Appendix K, and Appendix M. For one variable, the graduation rate of E&M students (*gesl_e_mln*), heteroskedasticity will be countered by utilizing the Weighted Least Squares estimator instead of OLS.

Our cross-sectional analysis consists of four equations, which have been explained in section 4.2.1.1. These equations will be estimated for VWO and HAVO separately. Furthermore, both a simple model and a full model will be constructed to examine the robustness of the obtained results. In each model, both a constant and a lagged value of the respective outcome variable have been included. These cannot be interpreted, and they carry no relevance to our research question. Therefore they will not be discussed in the following analysis.

In the tables the estimated coefficients are reported, which represent the outcome variable's elasticity with respect to that particular independent variable. The individual interpretations will be discussed in more detail in the upcoming sections.

4.4.1.1 Equation 01: Central Exam Grades

Coefficients Obtained Through OLS Regression. Outcome: CE_CIJFLN				
INDEPENDENT VARIABLE	CE_CIJFLN			
	HAVO	VWO	HAVO	VWO
CONSTANT	1.035***	1.025***	1.028***	1.051***
LAG_OUTCOME	0.457***	0.445***	0.465***	0.420***
PILOT_DUMMY	-0.070***	-0.029*	-0.078***	-0.024
CONF_DUMMY			-0.002	0.001
INSP_RAT_2013_DUMMY			0.007	-0.019**
ETHN_SHARELN			-0.003	-0.001
TOT_AANT_LLNLN			0.000	0.003
R-squared (Adjusted)	0.273 (0.270)	0.176 (0.173)	0.294 (0.285)	0.181 (0.0170)
N	468	484	444	458

Table VI. Regression Results for Equation 01: OLS Estimates of Coefficients

Concerning the HAVO school departments, our main variable of interest has shown a significant influence on central exam grades in both the simple model and the full model. The effect size indicates that participating in the HAVO pilot program has decreased these school departments' central exam grades on average by 0.07 to 0,078 per cent, ceteris paribus. In contrast, VWO school departments' results at the central exams have not suffered from participation in the pilot program. Their results are however influences by a negative rating from the education inspection, which will decrease the average final central exam grade by 0.019 per cent, everything else remaining constant.

4.4.1.2 Equation 02: School Exam Grades

Coefficients Obtained Through OLS Regression. Outcome: SE_CIJFLN				
INDEPENDENT VARIABLE	**SE_CIJFLN**			
	HAVO	**VWO**	**HAVO**	**VWO**
CONSTANT	0.745***	0.978***	0.666***	1.052***
LAG_OUTCOME	0.592***	0.476***	0.597***	0.451***
PILOT_DUMMY	-0.006	-0.007	-0.005	-0.003
CONF_DUMMY			0.002	-0.001
INSP_RAT_2013_DUMMY			0.006	-0.011**
ETHN_SHARELN			0.000	-0.004
TOT_AANT_LLNLN			0.010**	-0.002
R-squared (Adjusted)	0.342 (0.339)	0.225 (0.222)	0.339 (0.330)	0.220 (0.210)
N	468	484	444	458
*,**,*** indicate significance at the 10%, 5% and 1% level respectively				

Table VII. Regression Results for Equation 02. OLS Estimates of Coefficients

When examining school exam grades, participation in the pilot program has not affected HAVO and VWO school departments' results significantly. In neither the simple or full model the coefficient for pilot schools has turned out significant. However, in the full model for HAVO, the number of students has presented a significant influence on school exam results. If the number of students would increase by 1%, the school exam grades would on average increase by 0.01%, ceteris paribus. This finding confirms the theory of Bailey and Taylor (1998) as discussed in the review of literature. Similarly, VWO schools will see their results decrease by 0.011% if their education inspection rating was below 'Basis'.

4.4.1.3 Equation 03: Graduation Rates E&M Students

Coefficients Obtained Through WLS. Outcome Variable: _GESL_E_MLN				
INDEPENDENT VARIABLE	**_GESL_E_MLN**			
	HAVO	**VWO**	**HAVO**	**VWO**
CONSTANT	3.443***	3.236***	3.667***	3.401***
LAG_OUTCOME	0.227***	0.275***	0.184***	0.244***
PILOT_DUMMY	-0.038	-0.087**	-0.042	-0.025
CONF_DUMMY			0.001	0.011
INSP_RAT_2013_DUMMY			-0.034*	-0.028
ETHN_SHARELN			-0.016	-0.013
TOT_AANT_LLNLN			0.001	0.001
R-squared (Adjusted)	0.060 (0.056)	0.075 (0.070)	0.083 (0.070)	0.074 (0.061)
N	464	462	441	438
*,**,*** indicate significance at the 10%, 5% and 1% level respectively				

Table VIII. Regression Results for Equation 03. WLS Estimates of Coefficients

This analysis has not been carried out through Ordinary Least Squares, but through Weighted Least Squares. This choice has been made because in the scatter plot of the residuals (Appendix L, figure L1), an indication for heteroskedasticity had been found. The variance decreased with the predicted value of the graduation rate. The graduation rate cannot exceed 100 per cent, therefore when the predicted value increases, the upward deviation from this predicted value will on average become smaller which decreases the variance. To correct for this smaller variation, a Weighted Least Squares estimator was employed for this variable for both HAVO models.

The analysis of graduation rates of E&M students has yielded no indication of a robust effect of the pilot program. In the simple model for VWO school departments, a significant negative effect of participation was found, but through the introduction of control variables this effect has disappeared. At the 5 per cent level, no other variables have a significant influence on the outcome variable.

4.4.1.4 Equation 04: Total Graduation Rates

Coefficients Obtained Through OLS Regression. Outcome: _GESL_TOTLN				
INDEPENDENT VARIABLE	**_GESL_TOTLN**			
	HAVO	**VWO**	**HAVO**	**VWO**

CONSTANT	3.214***	2.499***	3.763***	2.800***
LAG_OUTCOME	0.277***	0.443***	0.163***	0.372***
PILOT_DUMMY	-0.002	0.000	-0.043*	-0.012
CONF_DUMMY			0.000	-0.008
INSP_RAT_2013_DUMMY			-0.034*	-0.060***
ETHN_SHARELN			-0.016**	-0.013***
TOT_AANT_LLNLN			0.001	0.008
R-squared (Adjusted)	0.088 (0.084)	0.196 (0.192)	0.080 (0.067)	0.261 (0.251)
N	468	484	444	458
*,**,*** indicate significance at the 10%, 5% and 1% level respectively				

Table IX. Regression Results for Equation 04. OLS Estimates of Coefficients

The coefficients for pilot program participation are not significant at the 5 per cent level in neither the simple models, nor the full models. However, HAVO school departments' total graduation rates are affected negatively by the share of non-western minorities present at school. If the share of *allochtonen* increases by 1 per cent, the total graduation rate will decrease by 0.016 per cent on average, *ceteris paribus*. Concerning VWO school departments, both ethnic minorities and the inspection rating significantly reduces the total graduation rate. For each per cent increase in the share of non-western *allochtonen*, the total graduation rate decreases on average by 0.013 per cent. A decrease of 0.060 per cent of the total graduation rate is caused by a 'Weak' or 'Very weak' rating by the education inspection, everything else remaining constant.

4.4.2 Questionnaire Results

Due to the low number of respondents (N=11), the results in this subsection should be treated as an indication, and not as definitive evidence. Nevertheless, the answers of these 11 Dutch high-school economic teachers can provide a useful indication for further research directions.

An overview of the precise questions, in Dutch, is provided in Appendix C, and the precise answers given by the teachers are provided in Appendix Aand Appendix B. In this section, the most striking results will be discussed. When reporting results, the following conventions will be used. 'In favor' means the number of people reporting a 4 or a 5 (I agree/good and I fully agree/very good respectively), and 'Against' means the number of people reporting a 1 or a 2 (I don't agree at all/very bad and I don't agree/bad). The results will be discussed per subject, but only results where the difference between 'in favor' and 'against' is 2 or more are reported.

First, the results relevant to the first research hypothesis about the effects of the programs on performance will be discussed. Second, the responses and results relevant to the second research hypothesis about the attainment of the programs' goals will be discussed.

Hypothesis I

"The performance at the final school exams or central exams of students and schools which were subjected to the new program or the pilot program has not changed due to the program itself."

Questions 5.1 through 6.4, question 7.4 and 7.5 and question 9.4 and 9.5 were relevant to this hypothesis. Only those responses which had a strong tendency (difference between 'Against' and 'In favor' is at least 2 responses) towards either side will be reported and discussed.

When asked if the new program increased students' grades, both for VWO and HAVO the answers indicated a disposition towards the negative. Similarly, teachers rejected the statement that the new program increased understanding of the subject of economics for both VWO and HAVO. This could indicate that teachers are not convinced of the program's usefulness.

Concerning the implementation of the new program, teachers are generally positive about the support program which was provided by the executing organization. The questions about its quality (questions 5.1 through 5.6) indicated positive or inconclusive answers. Similarly, teachers evaluate the newly constructed school materials (schoolbooks) positively (questions 6.1 through 6.3). However, teachers also indicate there are still start-up problems (*kinderziektes* in Dutch) present in the materials.

It seems the execution from the executing organization's side was successful. The materials and support provided to teachers was deemed sufficient. However, the teachers themselves do not seem to believe in the program, and do not believe students benefit from it. Therefore the change in results at the final exams could be due to the new program implementation. However, the other results also provide another foundation for the 'transition phase' explanation for the deviating results we encountered in the previous sections. The fact that teachers do not believe in the program could be causing the depression in performance, and not the program itself.

Hypothesis II

"The partial implementation of the new program has been effective in achieving its goals in the short term."

The four goals which were identified in the new economics exam program have been discussed in the section about the description of the economics course. Since the reform has not been completely implement yet as of now, the progress until this point towards its goals is examined. Also, some goals may only become apparent in the longer run. However, we feel teachers are qualified to give valuable opinions about the progress due to their extensive experience.

The teachers who responded to the questionnaire demonstrated a negative tendency regarding the program's progress towards its goals. According to respondents, the new program does not relate better to economics in higher education (question 1.1), does not enable students to make better economic decisions (question 1.2), and does not increase motivation and/or interest in the course economics (questions 7.1, 7.3, 9.1 and 9.3).

Concerning one important new component of the new program, the added focus on context-based questions, teachers indicated that they recognized its usefulness (question 2.1), but do not often use these type of assignments. Another component of the new program, classroom experiments, was evaluated as useful and motivating to students, but: it cost too much time; it did not teach students economic-decision making skills; and it should not stay obligatory. Again, the respondents seemed to understand what the classroom experiments meant, but they felt their effects were negative rather than positive.

Again, this could be explained by the 'transition phase' theory. Due to the newness of the program, teachers do not execute it perfectly, which confounds the results and performances of students. This is further supported by the fact that teachers seem to understand the components of the reform, but do not positively evaluate its effects.

4.5 Discussion and limitations

Throughout the analysis, which has been discussed in the previous sections, we have found indications of the effects of the pilot program and the new program.

The first empirical analysis of the year 2011 has provided an indication of the pilot program's negative effect on exam grades for at least the HAVO school departments. This could be due to poor execution of the pilot program with regards to student preparation or the construction of exams. These results reinforce the 'transition phase' theory. However, a cross-sectional analysis cannot examine the effects over time, and therefore a time-series analysis could investigate this theory. Another limitation is that only a small percentage of the total variation in the outcomes was explained by the respective models. Therefore other omitted variables, such as student characteristics and socio-economic status, could still be have a great explanatory power.

The second method, which examined the responses to the questionnaire, has provided even more indications for the existence of the 'transition phase' hypothesis. Teachers have indicated that the new program did not increase students' understanding of the subject of economics. On the other hand, they have indicated that they understand most of the elements of the new program, but do not implement them perfectly. This all seems to support the hypothesis that the actors in this reform do not execute it perfectly, which therefore confounds its outcomes.

Several further limitations apply to the analyses in this paper. First of all, not all school-level explanatory could be included due to the lack of data. Including more variables could reduce the chances of spurious relationships. Especially data about the students would increase the accuracy of the predictions of the models which were constructed in this paper. For example, the students' parents' socio-economic status could be included.

Furthermore, certain assumptions of the statistical methods which have been employed in this paper have not been met. Our data was not normally distributed, which violates the OLS assumption and this could bias the coefficient estimations. In addition, in the means comparison over time, we have found indications that the variables' distributions were not the same over the years, which yields those results less accurate. Also, the number of responses to the questionnaire was much too low to be scientifically valid. Therefore these results should be treated as indications, and not as definitive statements.

5. Conclusion

In this paper the effects of the recent extensive reform of the course of economics in the Dutch secondary education for HAVO and VWO are analyzed. This reform was implemented in multiple stages, and these have been examined through both statistical and qualitative means. Before national implementation, a tentative experimental pilot program was executed which involved 34 school departments in the Netherlands. In 2012, the HAVO school type was fully subjected to the new program, but for VWO the program had only been partially implemented for year 4 and year 5.

To assess the effects these programs have had on different outcomes, multiple analyses and statistical methods were employed. In order to study effects of the pilot program, a cross-sectional analysis for the year 2011 has been carried out for both VWO and HAVO school departments. To identify non-measurable effects, and to obtain some qualitative foundation for the results of the other analyses, a questionnaire has been filled in by 11 high-school economics teachers.

Through the cross-sectional analysis, an indication for a decrease in central exam grades due to the pilot program was found. For HAVO school departments that participated in the pilot program in 2011, the central exam grade was on average 0.078 per cent lower than comparable non-pilot school departments. For the other outcome variables, the effects of the pilot program were found to be insignificant. However, inspection rating had a significantly negative effect in three out of four VWO outcomes, and no HAVO outcomes. Total graduation rates were also influenced, for both VWO and HAVO, by the share of ethnic minorities in the municipality of the school.

Additionally, analysis of the questionnaire responses has yielded surprising and conflicting results. These results should definitely not be treated as scientific due to the low number of respondents (N=11), but rather as a tentative indication for further research. Interviewed teachers have indicated that the new program may not be achieving its primary goals of enabling students to function better in society, and to increase their interest in and motivation for the course of economics. Additionally, the responses have manifested a non-perfect execution of the new program by the teachers. They have for instance indicated to understand multiple new elements of the reform, but they do not incorporate these more often in their lessons. Another striking result is that teachers do not seem to believe that the new program will increase understanding of economics, which indicates a low trust in the reform. This seems to provide support for the 'transition phase' theory which was already mentioned in the previous paragraph.

Summarizing, the ideas outlined in the *Wealth of Education* seem not to have yielded the expected results. Therefore, teachers need to be involved more to implement the reform perfectly, and thus increase the wealth of our nation.

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Images

Chalk Board (Cover Page)
http://nl.freepik.com/vrije-photo/schoolbord-krijt-verlof-bord-leeg_669831.htm

7. Appendix

APPENDIX A. QUESTIONNAIRE RESULTS: REPORTED IN PERCENTAGES OF RESPONDENTS TO EACH QUESTION

Q#	% 1	% 2	% 3	% 4	% 5	Geen mening/NVT	N	# Respondents not selecting NVT
1.1	20	40	30	10	0	9.0909	11	10
1.2	18.18181818	27.273	36.364	18.182	0	0	11	11
1.3	18.18181818	27.273	9.0909	45.455	0	0	11	11
1.4	18.18181818	18.182	27.273	36.364	0	0	11	11
2.1	9.090909091	45.455	27.273	18.182	0	0	11	11
2.2	0	18.182	18.182	36.364	27.273	0	11	11
2.3	0	27.273	27.273	27.273	18.182	0	11	11
2.4	20	30	20	30	0	9.0909	11	10
4.1	10	20	20	40	10	9.0909	11	10
4.2	0	20	30	50	0	9.0909	11	10
4.3	10	30	40	20	0	9.0909	11	10
4.4	0	0	30	50	20	9.0909	11	10
4.5	50	30	10	10	0	9.0909	11	10
4.6	20	0	60	10	10	9.0909	11	10
5.1	0	0	50	25	25	63.636	11	4
5.2	0	0	25	50	25	63.636	11	4
5.3	0	50	0	25	25	63.636	11	4
5.4	0	60	20	20	0	54.545	11	5
5.5	0	28.571	28.571	42.857	0	36.364	11	7
5.6	28.57142857	0	42.857	28.571	0	36.364	11	7
6.1	11.11111111	22.222	11.111	33.333	22.222	18.182	11	9
6.2	0	0	57.143	28.571	14.286	36.364	11	7
6.3	0	22.222	33.333	33.333	11.111	18.182	11	9
6.4	11.11111111	0	11.111	44.444	33.333	18.182	11	9
7.1	11.11111111	33.333	33.333	22.222	0	18.182	11	9
7.2	12.5	12.5	62.5	12.5	0	27.273	11	8
7.3	11.11111111	33.333	33.333	22.222	0	18.182	11	9
7.4	11.11111111	44.444	33.333	11.111	0	18.182	11	9
7.5	14.28571429	57.143	28.571	0	0	36.364	11	7
8.1	12.5	25	12.5	37.5	12.5	27.273	11	8
8.2	12.5	25	25	25	12.5	27.273	11	8
8.3	0	25	12.5	25	37.5	27.273	11	8
8.4	0	12.5	25	37.5	25	27.273	11	8
9.1	28.57142857	28.571	42.857	0	0	36.364	11	7
9.2	28.57142857	0	42.857	28.571	0	36.364	11	7
9.3	28.57142857	28.571	42.857	0	0	36.364	11	7
9.4	28.57142857	14.286	42.857	14.286	0	36.364	11	7
9.5	16.66666667	16.667	66.667	0	0	45.455	11	6
Column1,2,3,4,5&6v are given as % of the total number of respondents who did not report "NVT" Column 7 ("Geen mening/NVT") is given as a % of the total respondents								

Q#	KEY WORD	1	2	3	4	5	0	N	RESPONDENTS
1.1	Aansluiting Hoger Onderwijs	2	4	3	1	0	1	11	10
1.2	Betere Economische Beslissingen	2	3	4	2	0	0	11	11
1.3	Deelname Maatschappelijk Verkeer	2	3	1	5	0	0	11	11
1.4	Praktijkgericht	2	2	3	4	0	0	11	11
2.1	Context Concept Nuttig	1	5	3	2	0	0	11	11
2.2	Context Concept Verschil	0	2	2	4	3	0	11	11
2.3	Context Concept Opdrachten	0	3	3	3	2	0	11	11
2.4	Context Concept Opdrachten	2	3	2	3	0	1	11	10
4.1	Klaslokaalexperimenten Nuttig	1	2	2	4	1	1	11	10
4.2	Klaslokaalexperimenten Motivatie	0	2	3	5	0	1	11	10
4.3	Klaslokaalexperimenten Economische Beslissingen	1	3	4	2	0	1	11	10
4.4	Klaslokaalexperimenten Tijd	0	0	3	5	2	1	11	10
4.5	Klaslokaalexperimenten Verplicht	5	3	1	1	0	1	11	10
4.6	Klaslokaalexperimenten Omschrijving	2	0	6	1	1	1	11	10
5.1	Nascholing Algemene Kwaliteit	0	0	2	1	1	7	11	4
5.2	Nascholing Diepgang	0	0	1	2	1	7	11	4
5.3	Nascholing Hoeveelheid	0	2	0	1	1	7	11	4
5.4	Nascholing Bijeenkomsten Collega's	0	3	1	1	0	6	11	5
5.5	Nascholing Bijeenkomsten Collega's	0	2	2	3	0	4	11	7
5.6	Nascholing Andere Ondersteuning	2	0	3	2	0	4	11	7
6.1	Lesmateriaal Studieboeken	1	2	1	3	2	2	11	9
6.2	Lesmateriaal CE Examen	0	0	4	2	1	4	11	7
6.3	Lesmateriaal Correct	0	2	3	3	1	2	11	9
6.4	Lesmateriaal Kinderziektes	1	0	1	4	3	2	11	9
7.1	HAVO Geinteresseerd	1	3	3	2	0	2	11	9
7.2	HAVO Economische Beslissingen	1	1	5	1	0	3	11	8
7.3	HAVO Motivatie	1	3	3	2	0	2	11	9
7.4	HAVO Begrip Economics	1	4	3	1	0	2	11	9
7.5	HAVO Hogere Cijfers	1	4	2	0	0	4	11	7
8.1	HAVO Examen Examenprogramma Aansluiting	1	2	1	3	1	3	11	8
8.2	HAVO Examen 2012	1	2	2	2	1	3	11	8
8.3	HAVO Examen Vraagstelling	0	2	1	2	3	3	11	8
8.4	HAVO Examen Contextvragen	0	1	2	3	2	3	11	8
9.1	VWO Interesse	2	2	3	0	0	4	11	7
9.2	VWO Economische Beslissingen	2	0	3	2	0	4	11	7
9.3	VWO Motivatie	2	2	3	0	0	4	11	7
9.4	VWO Begrip Economics	2	1	3	1	0	4	11	7

9.5	VWO Beter Cijfers	1	1	4	0	0	5	11	6

		0x	1-5x	6-10x	>10x			
3	Klaslokaalexperimenten	2	7	1	0			11

APPENDIX C. QUESTIONNAIRE QUESTIONS

Zoals u weet, is de afgelopen jaren het examenprogramma havo/vwo van economics grondig gewijzigd naar aanleiding van de adviezen van commmissie Teulings II.

In dit onderzoek gaan wij in op meningen van docenten over dit examenprogramma. Onder andere de doelstellingen van het programma, de kwaliteit van de uitvoering ervan en de inhoud worden behandeld.

Het invullen duurt een kleine 10 minuten. Uw meningen geven ons waardevolle inzichten in de uitvoering van dit programma. Hartelijk dank voor uw medewerking.

Start

1.

Kunt u hier een aantal gegevens opgeven? Deze gegevens worden uiteraard vertrouwelijk behandeld. Het e-mailadres wordt uitsluitend voor correspondentie tussen onderzoeker en u gebruikt.

Schoolnaam:

Locatie/Afdeling:

Plaatsnaam:

e-mailadres:

Ik geef les aan HAVO/VWO/BEIDE
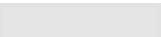
2.

Deze vraag gaat zowel over HAVO-klassen als VWO-klassen. De doelen van het examenprogramma zijn vooral praktisch van aard. Kunt u hieronder aangeven in welke mate u verwacht dat dit programma elk doel behaald heeft/zal behalen?

	Zeer mee oneens				Zeer mee eens	Geen mening/n.v.t.
Betere aansluiting op economics in het hoger onderwijs (hbo/wo)	○	○	○	○	○	☐
Leerlingen zullen beter in staat zijn economische beslissingen te nemen (bv. aanschaf van dure telefoon, kopen vs. huren van een woning, etc.)	○	○	○	○	○	☐
Leerlingen zijn beter voorbereid op hun deelname aan het maatschappelijk verkeer	○	○	○	○	○	☐
Het lesgeven is veel meer praktijkgericht dan in het oude programma	○	○	○	○	○	☐

3.

Deze vraag gaat over zowel HAVO-klassen als VWO-klassen. Kunt u hieronder aangeven wat uw ervaringen zijn met de focus van het nieuwe programma op zogenoemde "wisselwerking tussen context en concept"? Deze wisselwerking komt onder andere terug op het centraal examen in de vorm van contextvragen en conceptvragen.

	Zeer mee oneens				Zeer mee eens	Geen mening/n.v.t.
De focus op context -concept is een nuttige toevoeging aan het examenprogramma	○	○	○	○	○	☐

Het verschil tussen context en concept is mij duidelijk   ○   ○   ○   ○   ○   ☐

Het verschil tussen contextopdrachten en conceptopdrachten is mij duidelijk   ○   ○   ○   ○   ○   ☐

In mijn lessen gebruik ik vaker "context-opdrachten" dan voorheen

〇 〇 〇 〇 〇 ☐

4.

Deze vraag gaat over zowel HAVO-klassen als VWO- klassen. Kunt u hieronder aangeven hoeveel "klaslokaalexperimenten" (zoals beschreven in het examenprogramma) u hebt uitgevoerd per (eindexamen)klas in de bovenbouw? *

〇 0 keer per klas
〇 1-5 keer per klas
〇 6-10 keer per klas
〇 >10 keer per klas

5.

Deze vraag gaat over zowel HAVO-klassen als VWO-klassen. Kunt u hieronder aangeven in hoeverre u het eens bent met de effecten van "klaslokaalexperimenten" op de aspecten hier beneden? Indien u geen gebruik hebt gemaakt hebt van klaslokaalexperimenten, kunt u "Geen mening/n.v.t." aanklikken.

	Zeer mee oneens				Zeer mee eens	Geen mening/n.v.t .
Klaslokaalexperimenten zijn over het algemeen nuttig	〇	〇	〇	〇	〇	☐
Klaslokaalexperimenten zorgen voor meer motivatie bij leerlingen	〇	〇	〇	〇	〇	☐
Klaslokaalexperimenten leren mijn leerlingen praktische, economische beslissingen nemen						

45

| | ◯ | ◯ | ◯ | ◯ | ◯ | ☐ |

Klaslokaalexperimenten kosten te veel tijd	◯	◯	◯	◯	◯	☐
Klaslokaalexperimenten moeten verplicht blijven	◯	◯	◯	◯	◯	☐

Klaslokaalexperimenten moeten duidelijker verwoord worden in het examenprogramma	○	○	○	○	○	☐

HAVO/VWO Lesmateriaal en voorbereiding

6.

Deze vraag gaat zowel over HAVO- klassen als VWO-klassen. Zou u hieronder kunnen aangeven wat uw mening is over de kwaliteit van de nascholing en andere voorbereiding waar u al dan niet van gebruik gemaakt hebt om u voor te bereiden op de inhoud van het nieuwe examenprogramma?

	Zeer onvoldoende				Zeer goed	n.v.t ./geen mening
Algemene kwaliteit nascholing	○	○	○	○	○	☐
Diepgang per onderwerp in de nascholing	○	○	○	○	○	☐
De hoeveelheid stof behandeld tijdens de nascholing	○	○	○	○	○	☐
Bijeenkomsten met collega's van andere scholen	○	○	○	○	○	☐
Bijeenkomsten met collega's van mijn school	○	○	○	○	○	☐
Andere officiële ondersteuning	○	○	○	○	○	☐

7.

Deze vraag gaat over zowel HAVO-klassen als VWO-klassen. Kunt u hieronder aangeven wat u vindt van

de kwaliteit van de fysieke lesmaterialen (studieboeken, lesbrieven, etc.) die u gebruikt hebt tijdens de lessen economics in het nieuwe programma? Met studieboeken wordt hieronder ook ander lesmateriaal bedoeld.

	Zeer mee oneens				Zeer mee eens	Geen mening/n.v.t.
De studieboeken zijn van vergelijkbare kwaliteit als de "oude" studieboeken	○	○	○	○	○	☐
De onderwerpen in de studieboeken sluiten goed aan op het eindexamen (HAVO2012)	○	○	○	○	○	☐
De onderwerpen zijn correct uitgewerkt in de studieboeken	○	○	○	○	○	☐
De studieboeken vertonen nog "kinderziektes"	○	○	○	○	○	☐

Pagina 2 (HAVO-klassen)

8.

Deze vraag gaat specifiek over HAVO-LEERLINGEN. Kunt u voor de volgende 3 aspecten aangeven in welke mate u het eens bent dat het nieuwe examenprogramma zorgt voor een verbetering van deze aspecten bij HAVO-LEERLINGEN? (Indien u alleen VWO-klassen lesgeeft, kunt u Geen mening/n.v.t. aanklikken).

	Zeer mee oneens	Zeer mee eens	Geen mening/n.v.t.
Meer geinteresseerd in het vak economics			

49

| | ○ | ○ | ○ | ○ | ○ | ☐ |

Beter in staat economische beslissingen te nemen ○ ○ ○ ○ ○ ☐

Meer gemotiveerd voor het vak economics ○ ○ ○ ○ ○ ☐

	Zeer mee oneens				Zeer mee eens	Geen mening/n.v.t.
Beter begrip van de economics	○	○	○	○	○	☐
Hogere cijfers (SE en/of CE)	○	○	○	○	○	☐

9.

Deze vraag gaat specifiek over HAVO-klassen. Kunt u hieronder aangeven wat uw mening is over het Centraal Examen (CE) 2012 van HAVO?

	Zeer mee oneens				Zeer mee eens	Geen mening/n.v.t.
Het CE 2012 sloot goed aan op het examenprogramma	○	○	○	○	○	☐
Het CE 2012 was goed te doen	○	○	○	○	○	☐
De vraagstelling was duidelijk anders dan de examens van het oude programma	○	○	○	○	○	☐
Leerlingen hadden moeite met "context-vragen"	○	○	○	○	○	☐

Pagina 3 (VWO-klassen)

10.

Deze vraag gaat specifiek over VWO-LEERLINGEN. Kunt u aangeven voor de volgende 3 aspecten of het nieuwe examenprogramma voor een verbetering heeft gezorgd ten opzichte van het oude programma bij VWO-LEERLINGEN? (Indien u alleen HAVO-klassen lesgeeft, kunt u "Geen mening/n.v.t." aanklikken).

	Zeer mee oneens				Zeer mee eens	Geen mening/n.v.t .
Meer geïnteresseerd in het vak economics	○	○	○	○	○	☐
Beter in staat economische beslissingen te nemen	○	○	○	○	○	☐
Meer gemotiveerd voor het vak economics	○	○	○	○	○	☐
Beter begrip van de economics	○	○	○	○	○	☐
Hogere cijfers (SE en/of CE)	○	○	○	○	○	☐

Bedankt voor het invullen!

11.

Hebt u nog andere opmerking ten aanzien van het nieuwe examenprogramma economics havo/vwo?

Einde Enquete: Versturen

APPENDIX D. REFORM OF THE ECONOMICS PROGRAM HAVO VWO: NEW OVERARCHING GOAL

"Het vak economie bereidt leerlingen voor op een adequate deelname aan het maatschappelijke verkeer. Dit betekent dat leerlingen met behulp van de belangrijkste economische beginselen de economische verschijnselen in de maatschappij begrijpen; verschijnselen waar ze als persoon in de verschillende rollen binnen huishoudens, bedrijven, of overheidsinstellingen mee te maken krijgen en waarbinnen zij beslissingen moeten nemen of waar zij als lid van de (nationale en internationale) samenleving mee te maken krijgen."

Quoted from: Commissie Teulings I. "Economie moet je doen". 2002. Page 47.
http://www.vecon.nl/onderwijs/teulings/economie_moet_je_doen_eindrapport_juli_2002.pdf
(Accessed May 31 2013)

APPENDIX E. VARIABLES DESCRIPTION DESCRIPTIVES

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
_gesl_e_m	499	71.40	28.60	100.00	87.2703	12.21650
_gesl_e_m2010	479	100.00	.00	100.00	86.8747	14.33325
_gesl_tot	508	58.82	41.18	100.00	88.6173	7.27745
_gesl_tot2010	493	58.05	41.95	100.00	88.7929	6.97872
ce_cijf	508	3.30	4.70	8.00	6.3222	.49130
ce_cijflag	493	3.44	4.36	7.80	6.3001	.44946
conf_dummy_vwo	507	1.00	.00	1.00	.4260	.49499
insp_rat_2013_dummy	493	1.00	.00	1.00	.1420	.34939
pilotdummy_vwo	493	1.00	.00	1.00	.0345	.18265
se_cijf	508	2.00	5.50	7.50	6.5049	.31378
tot_aant_lln	508	2860.00	155.00	3015.00	1243.8425	472.20110
se_cijflag	493	2.00	5.40	7.40	6.5384	.31786
Valid N (listwise)	465					

Pearson Correlations HAVO

	Ethn_Shareln	@_gesl_e_mln	@_gesl_totln	tot_aant_llnln	ce_cijfln	se_cijfln
Ethn_Shareln	1	-.199**	-.212**	-.224**	-.165**	-.059
@_gesl_e_mln	-.199**	1	.804**	.130**	.462**	.311**
@_gesl_totln	-.212**	.804**	1	.151**	.455**	.283**
tot_aant_llnln	-.224**	.130**	.151**	1	.119**	.057
ce_cijfln	-.165**	.462**	.455**	.119**	1	.317**
se_cijfln	-.059	.311**	.283**	.057	.317**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Figure F1. Correlation matrix HAVO

Pearson Correlations VWO

	@_gesl_e_mln	@_gesl_totln	ce_cijfln	se_cijfln	Ethn_Shareln	ce_cijflagln	se_cijflagln	@_gesl_totlagln	@_gesl_e_mlagln	tot_aant_llnln
@_gesl_e_mln	1	.317**	.398**	.173**	-.113*	.198**	.078	.573**	.261**	.087
@_gesl_totln	.317**	1	.292**	.155**	-.199**	.448**	.227**	.437**	.635**	.116**
ce_cijfln	.398**	.292**	1	.423**	-.085	.422**	.118**	.425**	.170**	.034
se_cijfln	.173**	.155**	.423**	1	-.072	.231**	.471**	.229**	.105*	-.060
Ethn_Shareln	-.113*	-.199**	-.085	-.072	1	-.154**	-.047	-.198**	-.032	-.254**
ce_cijflagln	.198**	.448**	.422**	.231**	-.154**	1	.392**	.247**	.257**	-.011
se_cijflagln	.078	.227**	.118**	.471**	-.047	.392**	1	.099*	.202**	-.111*
@_gesl_totlagln	.573**	.437**	.425**	.229**	-.198**	.247**	.099*	1	.308**	.048
@_gesl_e_mlagln	.261**	.635**	.170**	.105*	-.032	.257**	.202**	.308**	1	-.013
tot_aant_llnln	.087	.116**	.034	-.060	-.254**	-.011	-.111*	.048	-.013	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Figure F2. Correlation matrix VWO

APPENDIX G. CROSS-SECTION 2011 PILOT PROGRAM: MULTICOLLINEARITY VARIANCE INFLATION FACTOR (VIF) AND TOLERANCE STATISTICS

The following SPSS output is an example of how multicollinearity was checked. This output concerns equation 01 for HAVO. The values in the tolerance column cannot drop below 0.1. The values in the VIF column cannot exceed 10. This has been checked for all other equations as well.

Model	Unstandardized Coefficients B	Collinearity Statistics Tolerance	VIF
1 (Constant)	1.028		
pilotdummy_havo	-.078	.997	1.003
Ethn_Shareln	-.003	.936	1.069
tot_aant_llnln	########	.927	1.078
conf_dummy_havo	-.002	.976	1.025
insp_rat_2013_dummy	.007	.892	1.121
ce_cijflagln	.465	.876	1.142

APPENDIX H. CROSS-SECTION 2011 PILOT PROGRAM: NORMALITY TEST HAVO
VWO SHAPIRO WILK OUTPUT VWO

Tests of Normality

	pilotdummy_vwo	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
tot_aant_llnln	.00	.070	436	.000	.967	436	.000
	1.00	.224	15	.041	.904	15	.109
@_gesl_e_mln	.00	.165	436	.000	.850	436	.000
	1.00	.197	15	.123	.851	15	.018
@_gesl_totln	.00	.095	436	.000	.900	436	.000
	1.00	.195	15	.129	.887	15	.060
ce_cijfln	.00	.066	436	.000	.988	436	.002
	1.00	.149	15	.200[*]	.939	15	.376
se_cijfln	.00	.084	436	.000	.987	436	.000
	1.00	.166	15	.200[*]	.962	15	.727
Ethn_Shareln	.00	.065	436	.000	.972	436	.000
	1.00	.119	15	.200[*]	.979	15	.959

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

APPENDIX I. CROSS-SECTION 2011 PILOT PROGRAM: NORMALITY TEST HAVO VWO SHAPIRO WILK OUTPUT HAVO

Tests of Normality

	pilotdummy_havo	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Ethn_Shareln	.00	.069	434	.000	.972	434	.000
	1.00	.127	15	.200[*]	.954	15	.591
@_gesl_e_mln	.00	.089	434	.000	.828	434	.000
	1.00	.154	15	.200[*]	.882	15	.051
@_gesl_totln	.00	.086	434	.000	.893	434	.000
	1.00	.153	15	.200[*]	.916	15	.170
tot_aant_llnln	.00	.103	434	.000	.933	434	.000
	1.00	.308	15	.000	.839	15	.012
ce_cijfln	.00	.097	434	.000	.979	434	.000
	1.00	.218	15	.054	.935	15	.326
se_cijfln	.00	.087	434	.000	.987	434	.000
	1.00	.340	15	.000	.727	15	.000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

APPENDIX J. CROSS-SECTION 2011 PILOT PROGRAM: NORMALITY OF RESIDUALS
SHAPIRO WILK TEST HAVO VWO

SHAPIRO-WILK NORMALITY TEST OUTPUT FOR RESIDUALS OF THE REGRESSIONS			
		Significance	
Equation No	Outcome Variable	HAVO	VWO
01	Ce_cijf	0.000	0.004
02	Se_cijf	0.358	0.000
03	_gesl_e_m	0.000	0.000
04	_gesl_tot	0.000	0.000

 [INSERT OUTPUT IN THIS OVERVIEW TABLE. SPSS OUTPUT HAS BEEN SAVED]

APPENDIX K. CROSS-SECTION 2011 PILOT PROGRAM: DESCRIPTIVES OF RESIDUALS
OF REGRESSION HAVO VWO

		Mean of the Residuals	
Equation No	Outcome Variable	HAVO	VWO
01	Ce_cijf	0.000	-0.01438
02	Se_cijf	0.000	-0.08565
03	_gesl_e_m	0.000	-0.09326
04	_gesl_tot	0.000	0.032319

APPENDIX L. CROSS-SECTION 2011 PILOT PROGRAM: HETEROSKEDASTICITY OF
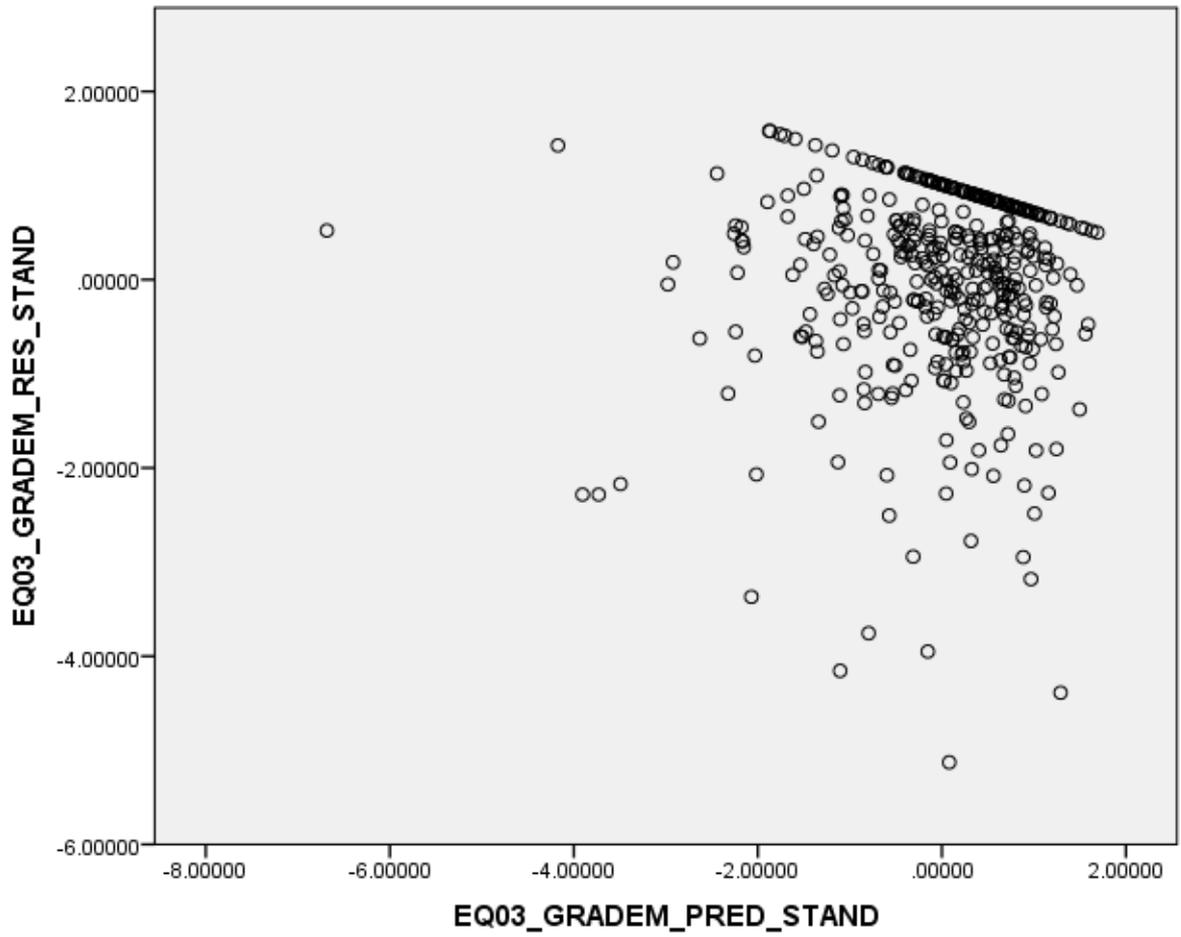REGRESSION RESIDUALS SCATTER PLOTS

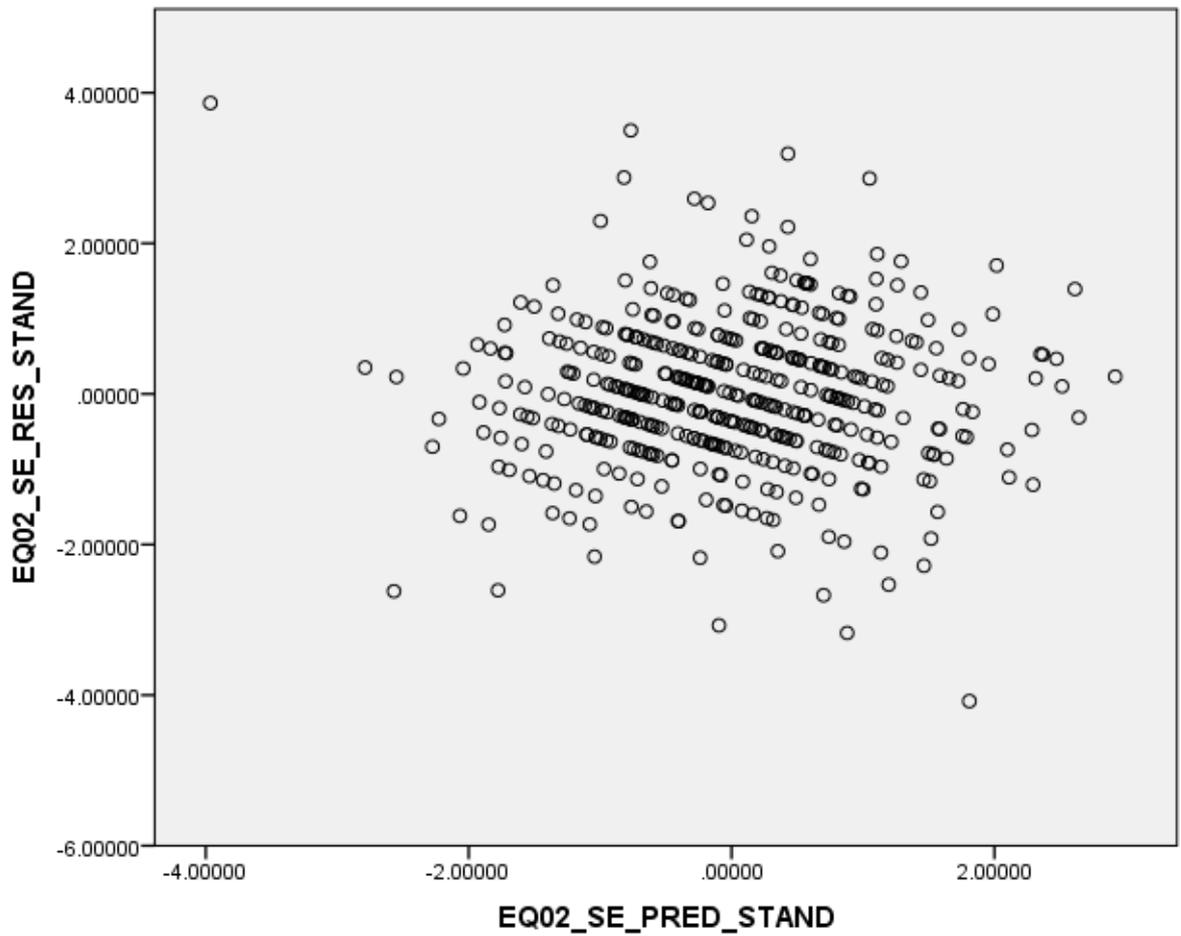Figure L1. Equation 03 Residuals Scatter Plot VWO: Example of Heteroskedasticity

Figure L2. Equation 02 Residuals Scatter Plot VWO: Example of Homoskedasticity

APPENDIX M. CROSS-SECTION 2011 PILOT PROGRAM: AUTOCORRELATION TEST
DURBIN-WATSON CRITICAL VALUES

Equation No	School Type	N	Durbin-Watson statistic	Critical Value of D-W statistic (α=0.05)	Auto-correlation?
01	HAVO	444	1.886	1.831	No
01	VWO	458	2.064	1.831	No
02	HAVO	444	2.042	1.831	No
02	VWO	458	2.071	1.831	No
03	HAVO	442	1.928	1.831	No
03	VWO	438	2.123	1.831	No
04	HAVO	444	2.039	1.831	No
04	VWO	458	2.042	1.831	No