Conclusion

In the last forty years economic research on the investment in people (human capital) and more precisely, the effects of investment in education, have become increasingly common. Since the pioneering work that began in the late 1950's there has been a abundance of research addressing the effects of investment in education on a wide variety of outcomes such as earnings, employment rates, health, teenage pregnancy, drug abuse, crime, and scholastic achievement. The research presented in this book attempts to add to this literature by analyzing issues from two major strands of this literature, educational production and rates of return to schooling.

Governments and individuals expend vast amounts of resources on education for a variety of reasons. To this end, obtaining accurate measurements of the effectiveness of various educational expenditures and reforms is of great importance to those that formulate policy to improve education as well as individuals making personal schooling decisions. Research on schooling production attempts to provide these estimates by relating specific resources and practices used by schools to various student outcomes such as educational attainment (the amount of schooling one completes), scholastic achievement (grades, test scores, literacy levels, etc.) and subsequent labor market position (employment status, wage level, etc.) In this way, those who make educational choices and policies are provided with better information upon which to base their decisions.

Time and time again empirical research has found that education is a major determinant of one's lifetime earnings. In this vain, educational rate-of-return studies focus on a single outcome, the earnings received after leaving school that can be attributed to a given amount of education one has completed. In this strand of the human capital literature education is primarily seen as an investment that fetches a certain return. The main objective therefore is to correctly calculate a percentage rate-of-return to a given amount of schooling, comparable to that found for more conventional forms of investment such as stocks and bonds. In this respect, having a similar "yardstick" with which to measure benefits makes it simple to evaluate whether schooling is a worthy investment compared to other alternatives.

In practice, an accurate evaluation of educational productivity or the rate of return to schooling is not a simple task. To assess the effects of an educational practice or given amount of schooling a researcher would ideally like to compare the outcomes of subjects that are identical in every respect other than the treatment (i.e. the educational practice(s) received, school length taken, etc.) they have experienced. In reality, virtually all individuals differ in many ways making these idyllic comparisons difficult. Another possibility then would be to isolate the effect of a treatment by controlling for all other factors that influence the outcome under scrutiny. This too is an impossibility for the obvious reason that data on all possible factors is generally not at the researcher's disposal. Therefore, the best solution is to evaluate outcomes after randomly assigning individuals to treatment and control groups so that, on average, all other characteristics of treated and untreated subjects are equivalent. Unfortunately, the random assignment of individuals to various educational treatments is rarely a viable option. A second-best solution is to rely on the discovery of natural experiments or phenomenon that naturally mimics the random assignment of treatment across individuals. As the common goal throughout the previous chapters was to properly measure
the true impact of education on various outcomes, the analyses have made extensive use of natural experiments to achieve this objective.

With the current push in many countries to improve educational standards, at the center of recent educational reform debates is the question of whether to reduce class sizes. Class size reduction is currently the most popular educational reform advocated by politicians and policy makers. Indeed the concept is quite simple, making classes smaller means allocating more instruction time per pupil, which should translate into marked increases in academic achievement. Following this line of thought, in 1997 the Dutch Ministry of Education decided to implement a wide-scale initiative to reduce class sizes in primary schools.

In turn, Chapter 1 of this book attempted to shed some light as to whether this was a good policy to pursue. More precisely, the conventional wisdom that reducing class size is an effective means to improve scholastic achievement was tested. The initial findings on the effect of class size on standardized test scores in arithmetic and language provide little support for this idea. After controlling for a large number of individual, class and school characteristics, and using an estimation technique to control for those factors that could not be observed, we find that pupils in larger classes do no worse - and sometimes even better - than identical pupils in smaller classes. As an explanation for the positive relationship found between class size and achievement the hypothesis that having similar classmates with respect to IQ (similar peers) is beneficial in terms of higher achievement scores was tested. Clearly, for each student the expected number of classmates with a similar IQ increases with class size. The results of this exercise showed a strong positive effect on achievement associated with having similar peers in one’s class. Therefore, the evidence leads us to conclude that the policy implemented by the Ministry of Education is unlikely to have a significantly positive impact on achievement in terms of arithmetic and language test scores. Instead, the results suggest that the grouping of students according to ability would be a more practical way to improve achievement in these two areas. It is important to note, however, that the two achievement measures used in this chapter do not cover the entire range of skills and attitudes learned in schools. Schools also play a major role in the social development of students, which includes learning how to interact with other individuals from diverse backgrounds.

While the methodology in the first chapter explored the general effectiveness of class size reduction and similar peers on student achievement, it had little to say about whether they have different impacts across individuals of various achievement levels. For instance, it is not unthinkable that the effect of being placed in a smaller class or with classmates of a similar IQ may be different on the academic performance of low versus high achievers. To this end, in Chapter 2 an approach was adopted which allowed us to measure the effect of these educational treatments at different achievement levels. Again, the initial findings of the effect of smaller classes on arithmetic and language test scores provided evidence in favor of class size reduction, regardless of whether an individual is a high or low achiever. However, incorporating the peer effects in the alternative model yielded intriguing results; the positive effect of similar peers tends to be strongest for those with the lowest achievement and dissipates as one considers individuals with higher achievement levels. Therefore, the results suggest that class size reduction also exerts an indirect effect that can have drastic implications depending on the resulting ability composition following a decrease in class size. While there is no evidence of a direct benefit associated with reducing class size (via increased per-pupil instruction time), the results show low achievers to be most adversely
affected by the loss of similar peers. Therefore, from a policy perspective, class size reductions that result in fewer low-achieving peers in each class can be seen as a regressive policy; stripping away similar peers from which low achievers benefit the most is expected to make those students most in need of improvement worse off.

A common finding in the economics literature on educational production is the phenomenon of better performance by religious, and more precisely Catholic, schools in terms of scholastic achievement, educational attainment and measurable labor market outcomes (i.e. subsequent employment status and wages). The results of these findings have helped fuel a heated debate in the US over school choice and public financing of private education. While the majority of this research in the economic sciences stems from the US, comparatively little research directly addressing the phenomenon has been performed in the Netherlands despite evidence of a significant achievement premium to Dutch Catholic schools. Chapter 3 attempted to bridge this gap by exploring the Catholic school phenomenon in terms of scholastic achievement for primary education in the Netherlands. In addition, as the Dutch education system provides almost perfect freedom of parental school choice and equal treatment of public versus non-public schools in terms of governmental financial support and regulation, it makes for an interesting case to compare to that of the US.

Two possible explanations were put forth as to why we might observe significantly higher achievement in Catholic relative to public schools. First, this would result if practices that prove beneficial to achievement were more effective and/or more often used in the Catholic school setting. Therefore, the first strategy investigated the effects of a diverse number of educational practices and ascertained whether they can account for the achievement premium to Catholic versus public schools. The results of this exercise were inconclusive; although there was some indication that teaching style, testing frequency and classroom composition with respect to student IQ in Catholic schools may explain part of the premium to this type of schooling, the portion attributable to these practices was never statistically significant. As a second explanation, we addressed the possibility that the Catholic school premium may be at least partially driven due to a higher participation rate of more academically inclined students in these schools (non-random selection). To this end, models exploiting natural experiments were run to imitate the random assignment of individuals into Catholic, Protestant and public schools. Should individuals with higher than average achievement more often attend schools in the Catholic sector, implementation of our model would account for this phenomenon producing a corrected premium that was smaller or even zero. Interestingly, the findings suggested just the opposite. Once non-random selection was controlled for, the estimated Catholic school premium became larger; however, the increase was never significant. Therefore, we conclude that bias associated with non-random selection cannot explain the achievement premium to Catholic schooling.

The objective of Chapter 4 is to estimate the rate of return to schooling in the Netherlands. As mentioned above, because we are unable to randomly assign individuals to different lengths of schooling and can not account for all factors other than education length that are conducive to earnings, we must make use of an alternative evaluation method that imitates the randomization process. Using two Dutch data sets we were able to identify several natural experiments related to individual social background and direct constraints which allowed us to replicate several estimation procedures found in the mainstream literature on schooling returns. The common finding in this body of work is that corrected schooling returns become larger than those estimated using a more traditional method. In contrast, the
main findings here suggested that the corrected schooling return estimates are sensitive to the natural experiment used. Moreover, the evidence shows this sensitivity to vary across age cohorts. The procedures making use of natural experiments related to social background produced decreased estimates of the schooling return for older individuals and slightly inflated the estimated return for the younger cohort. Conversely, while the natural experiments related to direct constraints caused the rate of return for the older cohort to rise significantly, they exerted almost no influence on that of the younger generation. In conclusion, our attempt at producing a correct estimate of schooling returns in the Netherlands provided mixed results. The true danger here is that, subject to the choice of natural experiment and data used, the uncorrected rate of return to education could be shown to be understated, consistent, or possibly even overstated.

The last chapter of this book confronted an anomalous finding produced by the Dutch labor market whereby a popular four-year post-secondary educational route, from general secondary schooling (MAVO) to intermediate vocational education (MBO), generates no significant benefit in terms of higher earnings. In the context of the two main economic theories of educational investment (human capital and signaling), a negligible return to successfully completed higher levels of education makes little sense. Why would individuals participate in a lengthy period of education for which there is no benefit? Using four separate datasets the chapter first validated the finding of a zero rate of return. Next, several hypotheses were tested in an attempt to determine why the non-positive return might exist and why large numbers of MAVO graduates continue to enroll in MBO despite the lack of return. The main findings were as follows:

- although there is no difference in incidence or duration of work-related training between graduates from MAVO and MBO, the evidence suggests that the former receive significantly higher benefits from any training received;
- MBO graduates enjoy better employment prospects relative to their MAVO counterparts;
- graduates form MBO are willing to receive a similar wage to those that stopped after MAVO in part because their future salary lies within a smaller range, suggesting less uncertainty.

Although the main findings are only partial explanations as to why we find a zero rate of return to MBO, they shed light on why individuals continue to enroll in this type of education. Furthermore, in the context of Dutch educational policy, the results show that previous efforts to promote enrollment in MBO schooling have not been completely misguided.