Spillover effects in education

5.2 Implications and impact

The contribution of the dissertation is twofold. First, while each chapter applies a specific research method to answer questions in different domains of education, it introduces a conceptual analytical framework that can be applied to questions beyond those studied here. Each separate chapter serves as an example of how spillover effects can be quantified and incorporated in policy assessment and shows that it is important to take into account interactions between different aspects. Second, the dissertation provides policy recommendations based on the results of each study. These recommendations are summarized below.

Implications of Chapter 2 are based on results from a theoretical model that can be applied to any profession where a worker's productivity is not perfectly observable but is potentially measurable, and any skill where professional development programs can be classified by difficulty level. The logic of the model can be used in a more complex situation. The result of the model suggests that when designing a training program, potential spillover effects with respect to its effectiveness and participation rates should be taken into account.

The study has a number of implications relevant for policy interventions. Most importantly, the signalling explanation of training participation decision provides an opportunity for stimulating low skilled individuals to sign up for training. Apart from direct measures, such as increasing the added value of basic training or compensating costs of participants, policy makers can consider introducing a new advanced training program or improving an existing one to exploit the spillover effects. Another way to rectify the negative stigma of the basic training is to make it compulsory for all the employees. Likewise, a higher variety of training programs mutually attenuates each other's signal and decreases sorting inefficiency. This happens because with the decrease in training signals, people who stand to gain most from the training in terms of ability sign up for it. Furthermore, the design of a training program should take into account how the signal sent by the training program affects its participation rates and the type of people that sign up, and therefore available information about the training should be well targeted.

The model developed in Chapter 3 can be used to assess any school educational policy with tracking that satisfies the following requirements:

- Assignment into tracks is based on a measurement of students' ability;

- Tracks are comparable (possible to determine in which track the student is better off);

- Final outcome (at the end of secondary education) is quantifiable and optimizable.

The first requirement means that the initial placement into tracks is not completely voluntarily and is based on a certain rule, even if the rule is (only) advisory. The second and the third ones together imply that for a given student ability, the final outcome in each track is known and quantifiable. In other words, each student is clearly better off in one of the tracks.

If the above mentioned requirements are satisfied, then, for given parameters, the model can be applied to find the optimal tracking policy. The optimal policy can then be compared to the existing one to find ways to improve students' outcomes. The model can be applied to any two adjacent tracks or subtracks, depending on the structure of the education system. For example, in the study we used two higher tracks of the Dutch secondary education system (higher general continued education and preparatory scientific education), but the model can be applied to any two adjacent subtracks of vocational education or the highest subtrack of vocational education and the higher general continued education.

In order to provide policy advice, the model predictions should be robust. Therefore, it is essential to investigate how sensitive the solution is to changes in obtained parameters. The Chapter proposes a way to evaluate the level of uncertainty in each estimated parameter, and to check the sensitivity of the solution with respect to uncertainty. We identify changes in parameters that have the biggest influence on the solution. These are the parameters where precision should be improved in order to increase the solution accuracy.

The model can be used to compare tracking policies in various countries (or regions within one country) that have differences in educational policies but each satisfies the model requirements. In this case, conclusions can be drawn based on the efficiency of each educational policy. Based on these comparisons, recommendations can be made on potential ways to improve less efficient policies. In the study, we fitted the model to the Dutch education system and made certain assumptions in order to estimate the parameters. Clearly, the chosen estimation procedures only apply to the specific case at hand, and completely different strategies may apply for other educational policies.

Results of Chapter 4 suggest that policy makers should take into consideration the fact that schools produce externalities. When determining whether to place a school building in a specific neighborhood, the most important factor that is considered is the demand for education in that area. Clearly, the party that benefits most is families with children, because having a school in close proximity decreases costs of access to education (e.g. transportation costs). Nonetheless, it is not only families who are affected, because a school building also produces externalities that affect the environment. These externalities might be included into the analysis before building a school for a more complete picture of total costs and benefits. Clearly, there are more externalities than the ones considered in Chapter 4. As mentioned in the Introduction, schooling provides a number of social benefits, such as enhanced civic participation and lower crime rates. This implies that total positive spillovers might be higher, but because they are distributed uniformly, they do not affect our analysis and are not included in the study.

As school quality can affect prices of the nearby residential real estate buildings, it is important to focus on improving and maintaining school quality. Particular attention should be paid to schools of low quality, because they impose unintended extra costs on households living in the immediate proximity of the

school building. Those extra costs might have more unequal consequences on less affluent families. Therefore, apart from ensuring that there are enough schools, school quality should be monitored and potentially problematic schools should be identified, funded, and provided assistance. For the Netherlands, we estimated the extra costs on residential real estate market from a low-quality school to be approximately equal to a quarter of monetary costs associated with building a new school. This implies that in total a low-quality school is approximately 25% more expensive than a school of a higher quality.