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# Regulating for-profit schools

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The effects of dividend caps and increased monitoring  
on the Swedish school market

## Abstract

This paper examines the Swedish upper secondary school market, where free school choice and universal school vouchers have been introduced. We present a micro-economic model where students with heterogeneous preferences choose between “good” and “bad” for-profit schools. The model is then used to study how two commonly suggested measures, dividend caps and increased monitoring, would affect the equilibrium on this idealised market. We find that increased monitoring would lead to more students choosing “good” schools. However, if monitoring is not increased enough, some students will still choose “bad” schools and will be worse off in this new equilibrium. As for dividend caps, we conclude that this measure could force all “bad” for-profit schools off the market, given certain prerequisites.

Keywords: school vouchers, for-profit schools, dividend caps, monitoring, independent schools, heterogeneous preferences.

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## 1. Introduction

With several education reforms initiated in the beginning of the 1990s, Sweden went further than most countries in opening the school market for privately operated, but publicly funded schools.

The reforms allowed students to choose the independent school they preferred, rather than the public school located closest to their home. Any natural or legal person, who satisfied the requirements set by the government could establish an independent school and receive public funding in the form of school vouchers. In contrast to most other countries with school choice, e.g. Denmark or the Netherlands, few restrictions on profits and ownership-structures in schools were introduced.

In recent years, the School Inspectorate and media have highlighted several cases of mismanagement in for-profit schools, thus indicating that some students fail to choose a school that gives them an adequate education. This has triggered a political debate about possible measures to deal with this problem, but these measures have until now not been examined scientifically using economic theory.

**In this paper we present a model to examine the effects of two measures to deal with students choosing “bad” schools, dividend caps and increased monitoring, in an idealised school market with “good” and “bad” for-profit schools.**

## 2. Background

### 2.1 Independent schools in Sweden

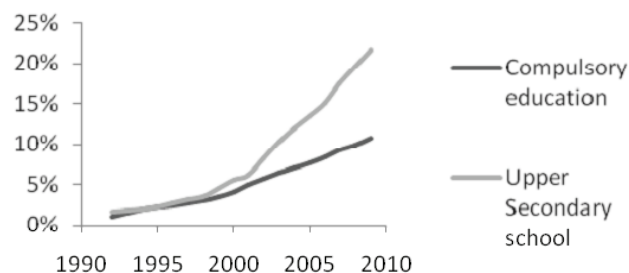
Before the 1990's, there were few independent schools (i.e. schools not under public ownership) in Sweden. However, in July 1992 the centre-right government introduced the Independent School Reform<sup>1</sup> with the aim to improve the education system by promoting competition between different schools, with various specialities and forms of ownership (Government bill, 1991/92:95).

Accordingly, independent schools became eligible for capitation grants in the form of school vouchers, set at 85 percent of the cost per student incurred in public schools (Skolministeriet, 2011). It also became possible for students to apply for independent schools anywhere in Sweden, instead of being locked in geographically to the school closest to their home, as was the rule before the reform (Erixon Arreman and Holm, 2011).

The voucher was further enhanced in 1994 by the Social Democratic government, so that independent schools were given the same capitation grant as the public schools. It was also decided that upper secondary schools were to be included in the voucher system (SOU 2008:8).

These reforms have greatly increased both the number of independent schools and their total share of students. Today, approximately ten percent of the Swedish compulsory school students and 20 percent of the upper secondary school students are enrolled in an independent school (Friskolornas riksförbund, 2009).

**Figure 1: Percentage share of students in independent schools in Sweden 1992-2010**



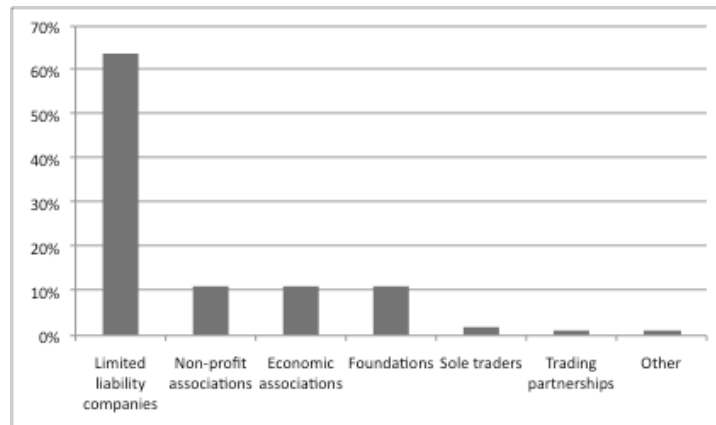
Source: Sahlgren (2010) with data from Skolverket.

About two thirds of the approximately 1250 independent schools in Sweden are registered as limited liability companies, which is thus the dominant type of ownership structure (Friskolornas riksförbund, 2009).

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<sup>1</sup>In Swedish: friskolereformen.

**Figure 2: Ownership structure of independent schools in Sweden 2008**



**Source:** Data from Friskolornas riksförbund (2009).

As of yet, there is no legislation with regards to profits made by independent schools (Lindgren, 2010). However, to qualify for full public funding, the schools are not allowed to charge any tuition (Skolverket, 2006). This sets the Swedish system apart from that proposed by economists such as Friedman (1962), who argued that private alternatives financed by school vouchers should be allowed to charge tuition.

Independent and public schools alike have to meet the general objectives for education as specified in the Education Act<sup>2</sup> and follow the standardised national curriculum (Skolverket, 2006). Independent schools can be established by any natural or legal person, as long as they satisfy the requirements set by the government. Monitoring of all schools is conducted by the School Inspectorate, which also grants licenses to independent schools (Skolinspektionen, 2011).

## **2.2 The debate**

In recent years, independent schools not meeting the quality standards of the School Inspectorate have received increasing attention in the media (Sveriges radio, 2011). During their follow-up visits, the School Inspectorate discovered that one quarter of the independent schools established during 2008/2009 showed severe deficiencies. In one case, the license was suspended and the school was shut down (Ring, 2010).

Several measures have been proposed to deal with these “problem-schools”. For instance, increased monitoring has been suggested by the School Inspectorate. To be able to guarantee the quality of independent schools, it has appealed for more resources and improved tools

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<sup>2</sup> In Swedish: skollagen.

(Begler and Ahnberg, 2011). Their proposal is supported by the administrative director of the Swedish Independent School Union<sup>3</sup> (Stawström, 2011).

Another measure that has been discussed by the political opposition and the Swedish Teachers' Union, is restrictions on profits and dividends in for-profit schools. According to critics of for-profit schools, profits are paid out to investors at the expense of school quality (Jämtin, 2009; Lärarförbundet, 2011). This solution has been controversial among supporters of for-profit schools who emphasize that "bad" schools only represent a minority of all independent schools and worry that the proposition will hurt "good" for-profit schools (Folin, 2009; Randsalu, 2009).

### **2.3 International perspective**

There is a long tradition of private schools receiving public funding in other countries, most notably in Denmark, since 1855, and in the Netherlands, since 1917. However, in both countries only particular kinds of parent-controlled, non-profit schools are entitled to public funds. Several other countries, both developing and industrialized, have introduced school vouchers targeted at particular social groups. Two examples are Bangladesh in 1982 and Colombia in 1992. In the USA, tentative vouchers have been introduced in a limited amount of schools in certain counties, most famously Milwaukee in 1992 and Cleveland in 1995 (Tooley et al., 2003).

A distinguishing feature of the Swedish system is the combination of universal vouchers (i.e. for all students) and for-profit schools. The only country with a similar system is Chile, where school vouchers were introduced in 1981 (Torche, 2005).

However, in several countries, such as the UK and the USA, there is an on-going debate about whether to introduce school vouchers using the Swedish system as a role-model (BBC, 2008; Olsen, 2008). Thus, the issue of the Swedish education system is not a strictly national concern, but is part of an international discourse.

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<sup>3</sup>In Swedish: Friskolornas riksförbund.

### **3. Previous Research**

#### **3.1 School vouchers**

School vouchers are a topic of much debate, not only in politics, but also in economics. Proponents of school vouchers, including Alan Peacock, Jack Wiseman, Milton Friedman and other well-known economists, claim that school vouchers and for-profit schools will stimulate competition. This will in turn lead to better management, matching between supply and demand as well as greater flexibility in adapting to new technology and changing preferences (Cohn, 1975). Competition would thus lead to improvements in both public and private schools and better outcomes for all students – an effect described as “a tide that lifts all boats” (Hoxby, 2002).

The extensive empirical research on the outcomes of school vouchers has so far yielded ambiguous results in confirming their predictions. Sandström and Bergström (2005) find that the results in Swedish public schools have improved due to competition. Using more recent data, Böhlmark and Lindahl (2008) find moderate short-term improvements in Swedish schools, but no significant impact on medium or long-term effects. According to Hsieh and Urquiola (2003), who use data from Chile, there is no evidence that school choice improves average educational outcomes significantly.

#### **3.2 Heterogeneous preferences**

Hastings et al. (2005) offer an alternative perspective on school competition. They propose that the positive effects, predicted by proponents of school vouchers, will depend on the level of heterogeneity in parents' preferences. If all parents value school quality similarly, the “tide that lifts all boats-outcome” will occur, as all schools must provide high quality education or else students will leave. Alternatively, if parents have very heterogeneous preferences for school quality, “vertical separation” may occur. The top students who value quality will abandon underperforming schools. These schools will then be left with students who value other school characteristics and will hence experience little competitive pressure to improve quality.

To test for heterogeneity in school choice, Hastings et al. (2005) use data from parents' actual choice for compulsory schools.<sup>4</sup> They find considerable heterogeneity in preferences for school quality, with preference for quality increasing with income and the student's ability. Gallego and Hernando (2009) use data on Chilean fourth-graders and confirm the prevalence of heterogeneity

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<sup>4</sup>They use data from Mecklenburg County, North Carolina, where a public school choice plan has been implemented.

in households' preferences in school choice. They also show that schools "react" to demand for a particular attribute by increased supply of that attribute.

Looking at segregation effects in Sweden, Söderström and Uusitalo (2010), conclude that free school choice significantly increases segregation by ability, family background and ethnicity among schools in Stockholm. Considering that preference in school choice could be correlated with ability and income, this is consistent with the "vertical separation-outcome" that occurs under heterogeneous preferences. On the other hand, Lindbom (2010) finds that while independent schools may have added somewhat to segregation, increased residential segregation has both stronger and more significant effects on segregation.

### **3.3 Explanations of heterogeneous preferences**

Hastings et al. (2007) have analysed why low-income parents place lower weight on school quality when choosing schools. They put forward two explanations: 1) Low-income families rationally expect lower return on education for their children. 2) Alternatively, they face higher information or decision-making costs, leading to asymmetric information among parents. However, they find empirical support only for the latter one. The presence of imperfect information on the Swedish school market is confirmed by a survey, where six out of ten students claim to feel cheated in their choice of upper secondary school (Gymnasium.se, 2010).

Since the benefits of education occur later than its costs, time-inconsistency could help explain why some students choose a school that does not give them a good education. Because present utility is preferred over future utility, the perceived benefits of education will be decreasing with the individual's discount rate (Reisman, 1998). Furthermore, research shows that discount-rates are heterogeneous, inconsistent and decreasing with age. Thus teenagers are particularly prone to impatience (Bishai, 2004). Moreover, due to their cognitive limitations, they are incapable of foreseeing future changes in their discount rates. This leads them to make short-sighted decisions that they later regret (Laux, 2000). However, the more engaged parents are in the school choice, the likelier it is that the decision will be more forward-looking.

That students are attracted to quick and foreseeable pay-offs in their school choice is confirmed by a survey showing that 46 percent of Swedish upper secondary schools have used giveaways, such as laptops, gym memberships or trips in their marketing efforts (Gymnasium.se, 2010).

### 3.4 For-profit schools

There has not been much research on for-profit schools financed by public funding. A possible explanation could be that this type of school is unusual in an international perspective. There are, however, a few exceptions.

Morley (2006) investigates American charter schools<sup>5</sup> and recognizes the incentive facing profit-maximising schools to reduce quality by cutting costs. As the principals (government, parents and donors) wish to maximise quality, Morley identifies the situation as a principal-agent problem, with increased monitoring costs in for-profit schools as a result. He suggests several measures to regulate for-profit schools; among others, increased monitoring and restrictions on profits. However, he does not examine how these measures would affect the equilibrium behaviour on the school market.

Sahlgren (2010), who has a less critical approach to for-profit schools, emphasises the large share of for-profit independent schools to non-profit independent schools in Sweden. He suggests that without the profit incentive, Sweden would not have seen such an increase of independent schools after the reforms. Since he finds evidence of this increase having positive effects on the entire school market, he argues that profits should be allowed.

### 3.5 Our contribution

Previous research has primarily focused on theoretically explaining or empirically testing the outcomes of vouchers per se. There has been no evaluation of whether the two commonly proposed regulatory measures, dividend caps and increased monitoring, could be welfare-improving compared to the present situation. With this paper, we hope to make a contribution by filling that gap and help policy-makers make informed decisions regarding the education system.

We will focus on one particular problem in the Swedish education system, namely students choosing schools that do not provide them with a “good” education. To analyse this problem we design a model that reflects the basic mechanisms of the Swedish school market. We will then use this model to examine how dividend caps and increased monitoring would affect the equilibrium behaviour on the school market.

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<sup>5</sup>Schools that combine government funding with private management, similar to independent schools.

We limit the focus of the thesis to for-profit schools. They are often overlooked in economic research but make up an important part of the Swedish education system. At the same time there have been several reported cases of mismanagement in these schools.

Furthermore, we will focus only on the upper secondary schools market, where there has been a great increase of for-profit schools in the last 20 years.

#### 4. The model

In our model, we define “bad” and “good” education and schools from the perspective of the government. “Good” education is defined as increasing social welfare and “bad” education as not reaching that objective.<sup>6</sup>

The model will include two important features that reflect the Swedish education market in a realistic way. First, we will allow for heterogeneous preferences in school choice. This is evidenced by the proportion of Swedish students choosing schools deemed inferior by the School Inspectorate. Moreover, this is supported by the empirical research of Hastings et al. (2005) and Gallego and Hernando (2009). We will also use the theories put forward by Hastings et al. (2005) which shows that heterogeneous preferences lead to “vertical segregation”, where some students attend good schools, while others attend bad schools. Second, we take account of bad schools facing a higher risk of being shut down, in line with actual cases of criticised schools losing their license (Ring, 2010).

In our model, for-profit schools will have an incentive to reduce spending in order to increase profit, in accordance with the ideas of Morley (2006). We will also build on the research of Gallego and Hernando (2009), which shows that schools “react” to demand for a particular attribute by increasing the supply of that attribute. Translated to our model, if a type of education is in demand, this type of education will be supplied on the market.

While parents and students often choose school together, for the case of simplicity, we name the agent making the decision *the student*. Her preferences will reflect the preferences of the entire household.

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<sup>6</sup>Needless to say, we define bad schools as providing bad education, good schools as providing good.

The model has the following basic set-up:

| Variable          | Description                                                                                                               |
|-------------------|---------------------------------------------------------------------------------------------------------------------------|
| $n$               | Number of students in a school.                                                                                           |
| $p$               | Probability for a school to survive, i.e. not get shut down.                                                              |
| $M$               | Present value of total resources spent by the school.                                                                     |
| $m = \frac{M}{n}$ | Resources per student.                                                                                                    |
| $s$               | School voucher. Revenue per student for the school. Same for all students and all schools.                                |
| $r$               | Interest rate.                                                                                                            |
| $\beta$           | Slope in Figures 3-5. Describes the perceived difference between a bad and a good school, from the students' perspective. |
| $d$               | The school preference of a student.                                                                                       |

All schools are independent and profit-maximising. There are two types of schools, good and bad. To establish schools, capital from investors is needed. The investors are assumed to be rational, risk-averse and profit-maximising. We assume that investors and schools have perfect information about school quality and probability of not getting shut down.

Only bad schools run the risk of being shut down, thus  $p_{good} = 1$  and  $p_{bad} < 1$ . Furthermore, the monitoring can never be complete, so  $p_{bad} > 0$ .<sup>7</sup>

In all other aspects, there is perfect competition.

The time-line is evenly divided into an infinite number of time-periods. At the beginning of each period, the school enrolls a new cohort of students that remain for one period. We assume that the number of students in a school is decided at period 0 and constant over time. If a school is shut

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<sup>7</sup>This is realistic, since it would be too expensive for the School Inspectorate to increase monitoring until  $p = 0$  and schools can be inspected only after establishment. Thus all schools exist at least for a short period of time.

down, it loses all revenue for that period but keeps the revenues from previous periods. The students attending that school during the period of detection are, however, allowed to graduate.

The utility a student gets from a good school is given by:

$$U_{good} = d \times \beta + m_{good}$$

The utility a student gets from a bad school is given by:

$$U_{bad} = (1 - d) \times \beta + m_{bad}$$

The distribution of preferences is continuous and lies somewhere between 0 and 1 ( $0 \leq d \leq 1$ ). Depending on the level of  $d$ , the student will have an individual level of utility from good and bad schools. They will therefore make different choices compared to students with other levels of  $d$ . Students with  $0 < d < 1$  ideally want to attend a school lying somewhere in between a good school and a bad school, but since there are only two types of schools, every student will choose the school that minimizes her disutility.

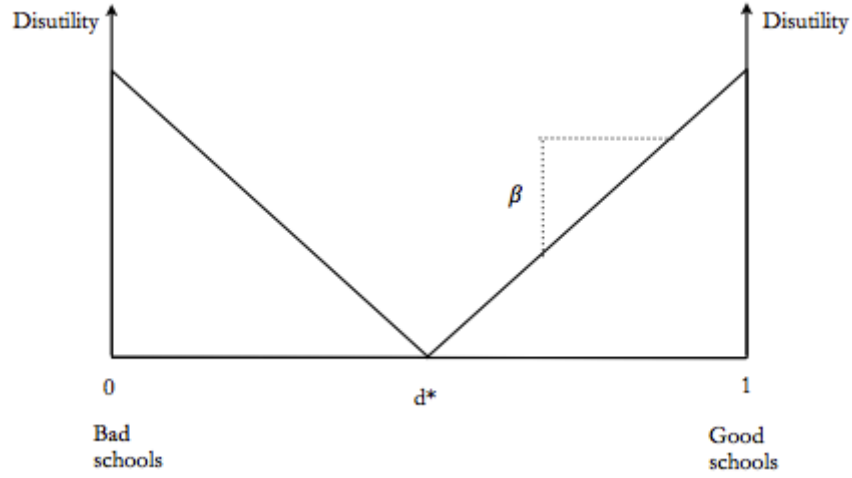
If the students perceive a large difference between a good and a bad school, a high  $\beta$ , they will suffer a greater loss of utility from not being able to go to the preferred school.  $\beta$  is assumed to be fixed, so that all students have the same perception of the difference between the two types of schools.

To find the point of indifference, i.e. the preference ( $d$ ) a student must have to get the same utility from choosing a good school and a bad school, we set  $U_{good} = U_{bad}$  and solve for  $d^*$ :

$$d^* = \frac{1}{2} + \left( \frac{m_{bad} - m_{good}}{2\beta} \right)$$

Figure 3 illustrates the point of indifference using a disutility diagram. If both good and bad schools spend the exact same amount of resources per student, i.e. if  $m_{bad} = m_{good}$ , we find the point of indifference in the middle of the axis of preferences, at  $d^* = 0,5$ , where disutility is minimized.

Figure 3: The point of indifference when  $m_{good} = m_{bad}$



At given levels of  $m_{bad}$ ,  $m_{good}$  and  $\beta$ :

If a student has  $d > d^*$ , her  $U_{good} > U_{bad}$ , and she will choose a good school.

If a student has  $d < d^*$ , her  $U_{bad} > U_{good}$ , and she will choose a bad school.

Schools are profit-maximising and adapt to the demand of the students. Hence, as long as there are students who prefer bad schools, i.e. as long as there are students with  $d < d^*$ , bad schools will establish on the market.

All students are free to choose which school to go to. The total number of students and the distribution of  $d$  among students are both assumed to be identical over time. Due to this, the number of students in good and bad schools respectively will be constant over time in equilibrium.

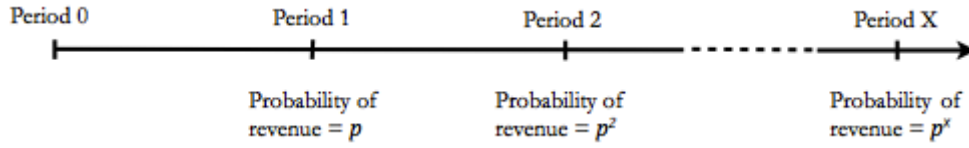
## 5. Results

Following is a discussion based on the model under long-run perfect competition, under which revenue will equal cost. We will analyse three equilibriums: 1) with no intervention, 2) with increased monitoring and 3) with dividend caps.

### 5.1 Equilibrium with no intervention

We first find the equilibrium given by the basic set-up in the model in section 4, where we have  $p_{bad} < 1$  and  $p_{good} = 1$ .

The probability of getting the revenue for each year can be illustrated by the following time-line:



Let  $s = 1$ , thus the expected revenue for the school is given by:

$$n \times \left( \frac{p}{1+r} + \left( \frac{p}{1+r} \right)^2 + \dots \right) = n \times \left( \frac{p}{1+r-p} \right)$$

The spending is given by the present value of the total resources spent by the school =  $M$ .

Since we assume perfect competition, revenue = cost, which gives us:

$$n \times \left( \frac{p}{1+r-p} \right) = M$$

$$\frac{M}{n} = \left( \frac{p}{1+r-p} \right) = m$$

As  $p_{good} = 1$ ,

$$\frac{M_{good}}{n} = \left( \frac{p_{good}}{1+r-p_{good}} \right) = \frac{1}{r} = m_{good}$$

Since  $p_{bad} < 1$ , we find that:

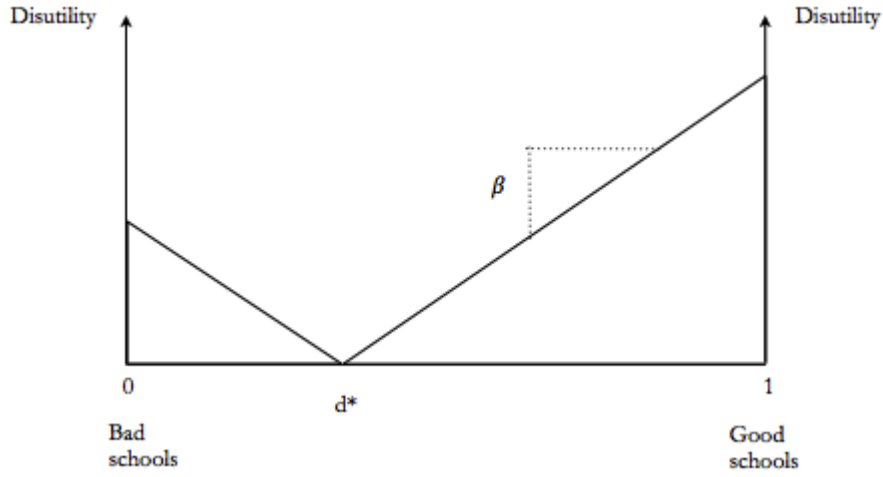
$$m_{bad} < m_{good}$$

In a perfect market, the bad schools will spend fewer resources on each student compared to good schools. This is due to the risk of being shut down by the School Inspectorate. Since  $p_{good} > p_{bad}$ , bad schools have to compensate their investors for taking a higher risk. As the

school voucher is fixed in magnitude, revenue per student is constant and equal for both good and bad schools. In order to increase profit, schools must decrease spending, which means less reinvestment per student in the school operation and higher dividends to the investors.

Since  $d^* = \frac{1}{2} + \left(\frac{m_{bad} - m_{good}}{2\beta}\right)$  and  $m_{bad} < m_{good}$ , the point of indifference will be located closer to the bad schools on the axis of preferences, i.e.  $d^* < 0,5$ , see Figure 4. Because good schools spend more resources per student, a student now needs to have a stronger preference towards bad schools in order to be indifferent.

**Figure 4: The position of the point of indifference when  $m_{good} > m_{bad}$**



The students with preference  $d < d^*$  will choose to attend bad schools, since their  $U_{bad} > U_{good}$ . They have a strong enough preference for bad schools (sufficiently low  $d$ ) to make them choose bad schools even though these schools spend less money per student.

Thus even if the risk of shutdown,  $(1 - p)$ , causes bad schools to spend less per student compared to good schools, both types of schools will exist, conditional on the distribution of preferences.

## 5.2 Equilibrium with increased monitoring

We now increase monitoring, resulting in increased probability of detecting bad schools,  $(1 - p)$ . Thus, fewer bad schools will survive each period. However, since we assume a perfect market with free entry, new bad schools will be established the next period, forming a new equilibrium.

Under this new equilibrium the investors of bad schools face a higher risk, which causes them to demand an even higher compensation. This leads to higher dividends paid out to investors and

fewer resources left in the schools. In other words, a decrease in the survival probability for bad schools leads to decreased resources per student,  $m_{bad}$ , in those schools. This is illustrated by  $m$  in perfect market equilibrium:

$$\frac{M}{n} = \left( \frac{p}{1+r-p} \right) = m$$

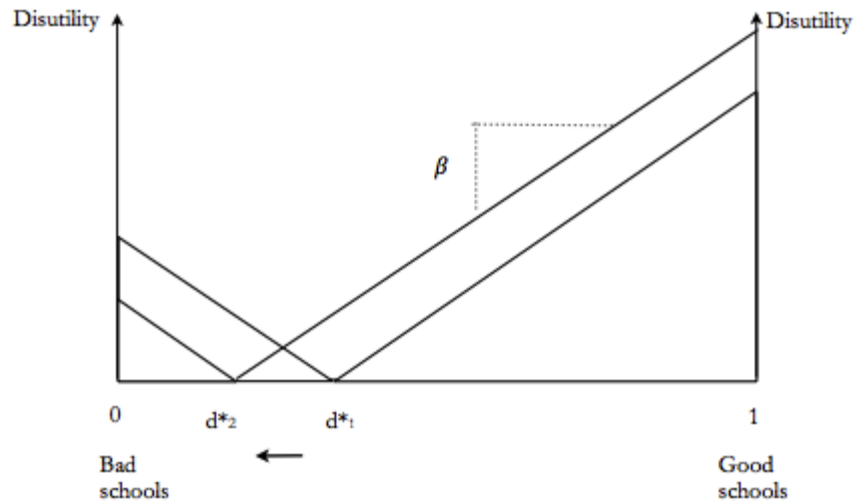
$$m_{bad} = \left( \frac{p}{1+r-p} \right) \rightarrow 0, \text{ if } p \rightarrow 0$$

At the same time

$$\text{When } m_{bad} \downarrow, d^* = \frac{1}{2} + \left( \frac{m_{bad} - m_{good}}{2\beta} \right) \downarrow$$

As illustrated in Figure 5, when the difference in resources per student in good and bad schools increases, the point of indifference,  $d^*$ , will be located even closer to the bad schools on the axis of preferences. An even stronger preference for bad schools (a lower  $d$ ) is needed to compensate for the low spending in these schools, in order for a student to be indifferent between the two types.

**Figure 5: The point of indifference when monitoring is increased**



In Figure 5, students with  $d$  between  $d^*_2$  and  $d^*_1$ , chose bad schools in the no-intervention equilibrium but will now prefer good schools. As a result, the number of students in good schools will increase.

However, as we see in Figure 5, students with  $d < d^*_2$  will continue to attend bad schools if the monitoring fails to increase  $(1-p)$  to a large enough degree. Since bad schools will have

decreased their spending on students,  $m_{bad}$ , these students will suffer a decrease in utility as a result of the increased monitoring. As such, there are both positive and negative effects of increased monitoring. More bad schools will be shut down compared to the no-intervention equilibrium and more students will attend good schools. On the other hand, the students that are left in bad schools will be even worse off than they would otherwise have been, due to the decrease in  $m_{bad}$ .

For all students to choose good schools, the School Inspectorate has to increase risk of shutdown,  $(1 - p)$ , to a sufficiently high level. This occurs when there is no student with a  $d$  lower than  $d^*$ , i.e. when bad schools are required by their investors to invest such a small amount of resources per student, that no student is willing to attend them. What level of monitoring is needed for this to happen depends on the distribution of  $d$  among the students.

### 5.3 Equilibrium with dividend caps

We now assume that the government introduces a dividend cap. A school can choose to either pay out its revenue to the investors or to spend it on the school. Translated to our model, a dividend cap is therefore in effect the same as an enforced level of resources spent per student,  $m$ .

By setting the level of spending per student at the level of the good schools,  $m_{good}$ , the government effectively forces bad schools to increase their spending per student and decrease their level of dividends. This would force all bad schools off the market.

This is evident if we see the model from an investor's perspective. In an ordinary market, companies can compensate for dividend caps by increasing revenue per customer through a price increase. In the Swedish school market, however, since schools lose their public funding if they charge tuition, their revenue per student is fixed at  $s$ .

The expected revenue from a bad school is thus necessarily lower than the expected revenue from a good school.

This can be illustrated by:

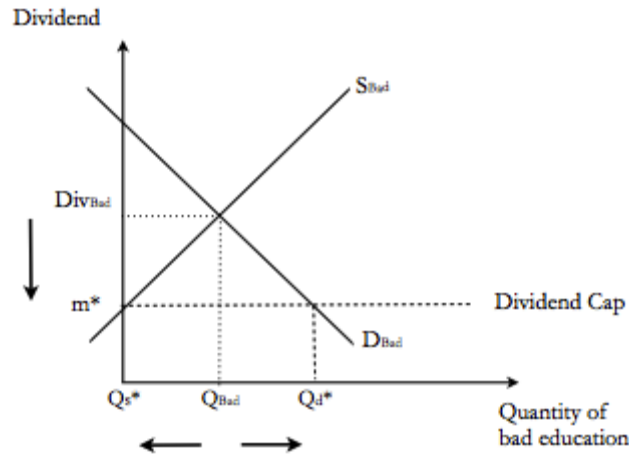
$$\text{Expected revenue} = E(R) = n \left( \frac{p}{1+r-p} \right)$$

$$\text{Since } p_{good} = 1 > p_{bad} \rightarrow E(R_{good}) > E(R_{bad})$$

Without the cap, the bad schools can compensate for this by spending less on the students, i.e. decrease  $m_{bad}$ . When the government stipulate that  $m_{bad} = m_{good}$ , investors have to invest as much money in bad schools, even though the expected revenue for bad schools is lower. No rational investor will therefore choose to invest in a bad school over a good one. Bad schools now have the choice of either becoming good schools, so as to increase their  $E(R)$ , or being shut down and be replaced by good schools. Hence, students are constrained to choose only among good schools.

Figure 6 illustrates this effect using a supply and demand diagram. Since the bad schools are forced to decrease their dividends, the supply of bad education decreases until there are no bad schools left on the market ( $Q_s^*$ ). At the same time, since decreased dividends is equivalent to an increase in  $m_{bad}$ , the demand for bad education increases ( $Q_d^*$ ).

**Figure 6: Supply and demand when a dividend cap is imposed**



There are, however, two important prerequisites for this to happen. Firstly, the School Inspectorate must continue to monitor the school market and have the right to shutdown schools, so that there is a difference in risk between investing in good and bad schools. Otherwise, expected revenue would be the same for both types of schools. Secondly, it is essential that no tuition fees are allowed so that the bad schools cannot demand compensation from the students to cover the increased costs. This means that dividend caps would not work as well under the school voucher system proposed by Friedman (1962), where the independent schools are allowed to charge tuition.

## 6. Discussion of results

### 6.1 Comparison of outcomes

We now compare the outcomes of the different equilibria from the perspective of the government. We will thus consider social welfare, which includes the interests of students and the interests of taxpayers, using the following criteria: Firstly, the government wants tax-money to be spent on good education, not on bad education, since the former increases social welfare and thus the utility of the taxpayers, while the latter is essentially a waste. Secondly, it also wants to keep down the costs of government interventions. Lastly, the government wants both types of students to have access to enough resources in their schools, since this increases the utility of the students.

Given this, the equilibrium with no government intervention (section 5.1) is not optimal from a welfare point of view since some students are choosing to attend bad schools financed by the taxpayers.

When monitoring is increased (section 5.2) fewer students attend bad schools and more tax-money is spent on good education instead of bad. On the other hand, if the monitoring is not increased enough, some of the students will still attend bad schools and will be worse off compared to the no-intervention equilibrium. To evaluate if this is an improvement, one has to weigh the benefits of the many (taxpayers, students in good schools and society) against the costs of the few (students left in the bad schools).

When we introduce a dividend cap (section 5.3), we showed that no bad schools will survive since no investors want to invest in them. As a result, students can only choose between good schools and no tax-money would be spent on bad education. Thus, if the right prerequisites are in place, the dividend cap would be an efficient tool for maximising social welfare.

Given that both dividend caps and increased monitoring can be used to achieve the same outcome, i.e. clearing the system of bad schools, dividend caps might still be superior from a cost perspective. It seems reasonable to assume that the cost of increased monitoring  $(1 - p)$  to the point where all  $d > d^*$ , is higher than the cost of implementing dividend caps and keeping the monitoring at a level of  $(1 - p) > 0$ . Quantifying these costs more precisely is a task which lies beyond the scope of this paper.

In the model, both types of measures leave good schools, as well as their students and investors, unaffected. Since there will still be competition between good schools, society will continue to benefit from the positive effects of competition claimed by Sandström and Bergström(2005).

## **6.2 Welfare effects**

Ultimately, however, the increase in social welfare achieved through clearing the market from bad schools, will depend on why some students have a preference for bad schools in the first place.

As the model is set up, it works equally well under any explanation of heterogeneous preferences. Thus, our conclusions about how the measures affect equilibrium behaviour on the market will not depend on why preferences are heterogeneous. It could, however, influence the welfare effects of introducing the measures. This will be discussed using three explanations of heterogeneous preferences: 1) heterogeneous expected return on education and 2) asymmetric information regarding school quality, which are the two explanations for heterogeneous preferences put forward by Hastings et al. (2007), along with 3) time-inconsistency, since teenagers have been shown to be particularly short-sighted (Bishai, 2004).

In line with the theory of heterogeneous returns on education (Hastings et al., 2007), some students choose schools based on other factors than school quality because they have a low expected return on education. Government interventions would in this case prevent students from making a choice that maximises their utility. The main reason to intervene would, in this case, be to placate taxpayers by ensuring that money is not spent on bad education.

With asymmetric information regarding the school's quality (Hastings et al., 2007) as the explanation for heterogeneous preferences, we would probably see the largest positive effect of our measures. In this scenario, students want a good education, but some of them choose a bad school because they are uninformed of its inferior quality. By constraining students to choose only among good schools, their utility is increased. The effect of government intervention would thus be pareto-improving.

According to the theory of time-inconsistency (Bishai, 2004), there would be a paternalistic argument for government intervention. The government must protect young people because they are short-sighted and do not know what is best for them. The problem is of course that it is not apparent that it is the role of the government to maximise the utility of the future person, at the expense of the present student. However, the external effects of good education on social welfare would still have to be taken into account (Björklund et. al., 2004).

## 7. Discussion of assumptions

We make several simplifying assumptions in the model. We will discuss the sensitivity of the results when relaxing these assumptions.

- 1) We assume perfect competition. In reality, where there is imperfect competition, profits could vary between schools. In this case it becomes more difficult to introduce dividend caps that force all bad schools off the market. But since investors continue to care about risk and schools cannot increase prices, it is still possible for the government to find a level of  $p$  and  $m^*$ , such that fewer investors are willing to invest in bad schools. A remaining problem could be that the government, due to imperfect information, might choose a level of  $p$  and  $m^*$ , such that some good schools are also forced off the market.
- 2) When considering all types of schools, including public and non-profit independent schools, dividend caps may not be superior to monitoring. Dividend caps can only be effective in regulating for-profit schools. Increased monitoring, on the other hand, increases the risk for all schools, regardless of ownership structure. It is up to the policy-makers to decide if the problem is bad for-profit schools specifically or bad schools in general.
- 3) In our model all students perceive the difference between bad and good schools in the same way (constant  $\beta$ ). In real life,  $\beta$  might be highly individual. However, allowing for a stochastic  $\beta$  would not significantly affect our results. Instead of one universal point of indifference as in our model, there would be many individual ones. The measures would nevertheless still move all points in the same direction.
- 4) Quality in schools is best described by a sliding scale; there are not only two types of schools as in our model. However, as long as the risk of being shutdown is negatively correlated with school quality, the absolute worst schools will have the highest risks, thus the measures would still be effective in forcing these off the market.
- 5) However, with ranging school quality and profits varying between schools, a dividend cap may not succeed in forcing the second-rate (semi-bad) schools off the market. Since these will be forced to spend more resources per student, the demand for them will increase. Some students, who without the dividend cap would have preferred better schools, will now apply for a second rate school instead. In this scenario, dividend caps will have decreased the number of students going to the worst schools, but at the same time make second-rate schools more attractive compared to good schools. Thus the welfare effects of the different measures would be ambiguous.

## 8. Conclusion

This paper analyses the problem of students choosing “bad” for-profit schools in Sweden where schools are financed by vouchers and students can choose freely among schools. We designed a model, where students have heterogeneous preferences and choose between “good” and “bad” schools. We also take into account the different levels of risk facing investors of “good” and “bad” schools. The model is then used to study how two commonly suggested measures, increased monitoring and dividend caps, would affect the equilibria on this market.

We find that both increased monitoring and the introduction of dividend caps could clear the market of “bad” for-profit schools, thus constraining students to choose only between “good” schools. Increased monitoring forces the investors of “bad” schools to reinvest less in the school operation, thus making this type of school less attractive to students. However, if monitoring is not increased enough, this measure could have some negative side-effects. If some students continue to choose “bad” schools, these students will be worse off due to less investments in these schools. If instead a dividend cap was introduced, forcing all for-profit schools to reinvest a certain percentage of their profits in the operation of the school, no rational investor would want to invest in “bad” schools. All “bad” for-profit schools would be forced off the market.

We therefore draw the conclusion that, if properly used, dividend caps and increased monitoring would have positive effects on the Swedish school market. At best, more students will receive a good education, which would increase their and the society’s welfare. At the very least, we make sure that tax-money is efficiently spent on education and not on financing “bad” schools.

### 8.1 Further research

An interesting direction for future research would be to see if this model could be adapted to other similar markets. Several features of the Swedish market for independent schools sets it apart from other, more traditional, markets. The revenue comes from tax-funded vouchers but the choice is made by private individuals. Moreover, private alternatives compete with public ones at the same time as the revenue per customer (student) is fixed. In traditional markets, suppliers can raise prices in order to compensate for dividend restrictions or increased monitoring. Because of this, experience from monitoring and dividend caps in other industries (e.g. from the finance

sector<sup>8</sup> or the food industry<sup>9</sup>) seems irrelevant for the Swedish school market. Likewise, the results in this paper cannot be extended to these markets.

Markets that are comparable are those parts of the public sector where for-profit alternatives, free choice and vouchers have been introduced in recent years. One example is the Swedish healthcare sector. Another closely related industry is the rehabilitation sector<sup>10</sup>, where several clinics have been criticized by the National Board of Health and Welfare<sup>11</sup> (Svantesson, 2008). While we have focused on Swedish upper secondary schools, the model could also be extended to the Swedish primary school market and other countries that are considering introducing a school voucher system similar to the Swedish one (e.g. the USA and the UK).

Within the frames of our model, there are also several interesting research areas. First, one could study how changes in monitoring by the School Inspectorate have affected dividend policies in schools in the past, to examine whether the results of our model is consistent with empirics. Second, by using an instrumental variable for school quality (e.g. improved test scores) one could test if quality is negatively correlated with dividends, as predicted by our model. Third, more research is needed on why there are heterogeneous preferences to begin with. This area of research is of great importance because it determines how students are affected when they are constrained to choose only among good schools.

Whereas we limited our focus to dividend caps and increased monitoring for this thesis, we recognize that there are other measures that can clear the school market of bad schools. Two examples of other proposed measures are higher barriers to entry (making it more difficult for new schools to receive licenses) and a ban of profits in schools altogether (Rankka, 2007). It would be interesting with extended studies about other measures to regulate the for-profit school market.

In conclusion, much more research is needed on welfare-improving measures on markets where vouchers and free choice have been introduced. We hope that our model will be an interesting starting point for future research on this subject.

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<sup>8</sup> The financial sector in Sweden is monitored by the Swedish Financial Supervisory. The finance industry is also an example of a sector where dividend restrictions have been introduced. (Finansinspektionen, 2011; Suneson, 2008).

<sup>9</sup> Food products are monitored by the Swedish National Food Administration (Livsmedelsverket, 2011).

<sup>10</sup> In Swedish: HVB, hem och vårdboende.

<sup>11</sup> In Swedish: Socialstyrelsen.

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