Teacher Incentives and Regulation of Education
In the UK

I hereby declare and confirm that this thesis is entirely the result of my own work except where otherwise indicated. I acknowledge the supervision and guidance I have received from Pierre Garello. This thesis is not used as part of any other examination and has not yet been published.
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Introduction:

The aim of this thesis is to examine the incentive effects on teachers of the current regulatory system of education in the UK from a Law and Economics perspective and to provide a theoretical framework that explains the observations that the direct effect on performance of inspections on schools is negative and that the teaching profession is becoming 'deprofessionalised'. I would like to stress that it is not my intention to attempt to provide evidence of the decline in the quality of education, but rather to explore to what extent the findings of such by some current research papers can be explained by current theories in Law and Economics.

In the first section I examine the effects of the regulatory system on schools. I explain the origin and justifications for the regulation of education in the UK and conclude that it functions as an “oversight regime” as defined by Hood et al. (1999). Building on this I draw on the theory of clans as presented by Ouchi (1980) to show how the regulatory reforms since the 1980s have created a more hierarchical structure thus centralising government control over schools and the teaching profession and ultimately contributed to the 'deprofessionalisation' of teachers.

The second and third sections are concerned with the incentive effects of performance related pay on the behaviour of teachers. I draw on the frameworks of incentive contracts, screening and sorting mechanisms presented by Lazear (2000, 2001, 2003) and examine the extent to which the current system of rewards in the teaching profession is likely to produce gaming for performance effects and a lowering of teacher quality.

In the fourth section I explore the combined effects of far-reaching, centralised government control over schools and performance related pay and draw on the theory
of uncertainty and incentives in unstable and stable environments provided by Prendergast (2002) to argue that the combination amounts to rewarding for output while controlling input that is likely to distort the incentives of school management.

In section 6 I conclude that the combination of performance related pay and centralised government control over schools and teaching produced by the current regulatory system provides sufficient explanation for the observed negative effect of OFSTED inspections and the lowering of teaching quality.
1. **Regulation of Education**

Posner (1974) defines economic regulation as referring to “taxes and subsidies of all sorts as well as to explicit legislative and administrative controls over rates, entry and other facets of economic activity.” The regulation of state-funded education is different from most market regulation in that it could be regarded as self-regulation. OFSTED, the Office for Standards in Education, Children’s services and Skills is non-ministerial government department charged with regulating and inspecting education and skills for learners of all ages. Hood et al. (1999) find that, in effect, the regulation of schools in the UK could be compared to an exercise in checking that the government receive ‘value for money’ from their education spending.

Hood et al. (1999) treat OFSTED as a regulatory body within government and note that the system as a whole functions as an oversight regime that, after 1992 attempted to standardise regulatory style through OFSTED. They also explain how OFSTED differs from other internal government regulatory bodies in that it yields real power and credibility as a regulator of schools; presiding over the right to close schools that were very unsatisfactory down and force head teachers to resign. In addition to this it was designed to minimise ‘professional capture’ and increase relational distance. Inspections are contracted out and inspectors are employed on a ‘layman’ basis and not full time civil servants or professionals with close links to the teaching profession.

As the name suggests, Ofsted’s stated aim is to increase standards in education. However, Rosenthal (2001) examined the exam performance data of schools before and after OFSTED inspections and finds a small but significant effect of inspections on student exam performance. Much of the literature on the most recent education reforms notes that the main effect has been to centralise government control over the teaching profession. A result of this is better alignment of schools’ behaviour with government targets. In fact, Marsden and Belfield (2009) find evidence that the reforms produce improved goal setting both within individual schools and between

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1 Quoted from [http://www.ofsted.gov.uk/Ofsted-home/About-us](http://www.ofsted.gov.uk/Ofsted-home/About-us)
2 1992 Education Act Schedule 2, Part 1, sect. 3
3 Hood et al. (1999), Laughlin and Broadbent (1997)
government and schools. They argue that this may be indicative of a more efficient functioning of schools on an organisational level but fail to find any evidence that it affects student achievement or quality of education positively. The reforms made to the secondary and primary education system also indicate an attempt to create a more hierarchical structure with more centralised government control over spending. Laughlin and Broadbent (1997) argue that the Education Reform Act (1988) and subsequent legislation formed an initiative that “… while justified by an appeal to market-based control, has a strong centralising tendency, seeking to restrict the autonomy of professionals”.

The immediately observable costs are the regulatory body itself and conducting inspections and publications but there are also additional and unintended costs associated with this far-reaching form of regulation. Rosenthal (2001) finds evidence that Ofsted inspections actually have a direct, negative effect on student achievement in schools due to a divergence of effort away from teaching and towards providing evidence of good practice in order to fulfil OFSTED inspection criteria. He argues that the cost of this direct negative effect should be taken into account when considering the costs and benefits of schools inspections. A system that is set up with the aim of improving educational standards and transparency and accountability may in fact contribute to lowering them. In later sections I shall examine the effects of the current UK system on the teaching profession and school management in an attempt to explain the negative effects Rosenthal (2001) finds evidence of.

1.1  Justifications for the Regulation of Education

Anthony Ogus (2002) makes a distinction between economic and non-economic justifications for government intervention and regulation. As main economic justifications for intervention due to market failure he cites; asymmetric information, monopolies, externalities and coordination problems. As non-economic arguments he mentions paternalism and distributional justice. In the following section I shall explore to what extent these arguments apply to government regulation of state-funded schools in the UK.
While I shall not discuss what makes a “good school” or what the main purpose of a school should be (i.e. whether it is an “education production function” or a mechanism for the socialisation of different groups into their role and rank in society), I will look at the implications of regulation in the light of both these roles.

1.11 Market Failure due to asymmetric information or high transaction costs:

Market failure can be the result of asymmetry of information. If sellers of a particular good or service possesses superior knowledge about the true value of that good than the buyers, and it is either impossible or extremely costly to the buyers to obtain such information sellers will compete by lowering the quality of their product rather than by seeking more efficient production methods. Eventually this leads to market failure because only the very lowest quality product possible is made available to consumers. An example commonly used to illustrate this is standard form contracts or second hand cars. The two major objections to this argument are that it is one-dimensional and ignores the fact that reputation matters to buyers and sellers in the long-run. Secondly, in many situation where there is asymmetry of information, sellers are able to find a way of signalling the higher quality of their good, for instance in the form of a warranty. Thirdly, where such asymmetry exists there is an incentive for a third party to enter into the market and provide information. Examples of this are review and rating magazines and websites.

The regulation of schools is similar to that of medical care and legal practice; the quality of the service provided is hard for somebody to judge who is not themselves a professional within the field. The actual product of the service is not visible until many years later and even then, the observable outcome is most probably influenced by many other factors. Even in cases where one apparently observes Akerlof’s “Market for Lemons” there is debate over whether market failure justifies regulation. Even if we consider that there is such a thing as a “market for schools” the questions

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5 A good example of this are websites dedicated to customer experiences of hotels abroad, where customers post details of their experience along with photos for future customers to view before making bookings
of whether it is a malfunctioning market and, if so, whether that justifies regulation, still remains to be addressed.

In the case of schools there is an asymmetry of information on the part of parents and students with respect to the teaching and administration staff of the school. Before actually sending a child to a school, it is very difficult for parents to know the quality of education that school can offer their child. Even once they have sent their child to a particular school, they still cannot know how their child would have fared at other schools. This makes it hard to judge, even retrospectively, who good an education the school provided. A child may do poorly at the school they attend but it is possible that the service provided by the school to the child was of comparatively high quality and that, had the same child attended another school in the area, he/she would have fared even worse. In the case of state-funded schools parents are not paying directly for the education of their children and schools do not make profits. Most importantly, it is not easy to define exactly what service it is schools are expected to provide. In this way, the nature of the teaching profession means that effective signalling is difficult. The problem that good quality schools and teachers face is how to signal their higher quality to parents or local authorities. It is difficult to see what signal a good teacher could send to signal his/her quality that could not be mimicked by a bad teacher. The classic example of this is homework. It is quite common in schools for parents to regard the regular setting of homework as a sign of a good and diligent teacher, and the setting of relevant and useful homework (and especially the careful and constructive marking of homework) probably is a sign of a diligent teacher. The difficulty is that it is a signal that is very easy for any teacher to mimic, because it is usually hard for a parent to judge how relevant and useful a piece of homework is to their child’s educational development at that particular stage and will probably not be able to distinguish it from homework that will not contribute to their child’s learning at all.

Although websites such as [www.ratemyteacher.com](http://www.ratemyteacher.com) have emerged as third parties offering information on schools and teachers these are problematic and cannot overcome the lack of expertise in the profession. A teacher may be popular with students because she does not make them do learn anything. Conversely, a teacher who makes students work hard may be very unpopular with students.
Ouchi (1980) argues that when transaction costs become too high, “the inefficiency of bureaucratic organisation will be preferred to the relatively greater costs of market organisation.” This argument does apply to education in the most basic sense in that teachers and students operating as entrepreneurs through a network of contractual relationships is not something that is often observed. History would suggest that it is more efficient for teachers and students when teachers are in an employment arrangement rather than a market arrangement with schools. A possible counterargument would be that modern technological developments could be changing the costs of transaction. Online learning courses are widespread and many learning materials are made available online. However, if one considers the function of the education system to be more than what Lazear (2003) terms an “education production function” this does not apply to my analysis of the UK secondary education sector. If another function of the mandatory education sector is as a socialisation mechanism as well as simply a way of conveying skills and knowledge, then relative benefits of an employment relationship between teachers and schools are large compared to a situation where teachers and students bargain independently for their education. It is worth considering that, if parents do see secondary education, as an institution for integrating their children into society, then they will see the problem of choosing the right school as one of choosing the right peer group for their child. In this way, the quality of teachers and the available facilities may play a minor part in parents’ choice of school because their primary concern would be who the other children at the school are and what their social backgrounds are.

There is also an asymmetry of information on the part of the Government with respect to school management. The Government delegates funding to schools but relies on school management to provide an accurate picture of the funds that are necessary. It also cannot really know whether the funds have been allocated in the way which the government would think ideal. For example, local authorities may choose to allocate fewer resources than necessary to the provision of local schools and within schools head teachers may choose to invest more in teachers’ salaries than in new sports equipment or vice-versa. Because output is so ambiguous and because there is likely to be a misalignment of incentives between all parties involved there is a possible argument for tighter regulation to ensure accountability and transparency in the
allocation of funds and resources. On the other hand, Governments are also subject to failure and their aims may not always be in the direct interest of student, parents or teaching staff. Tightening regulation in order to allow Government bodies better control over fund allocation and educational standards and practices is not necessarily the same as making it more efficient.

1.12 Schools and Local Monopoly

An important part of the reforms made to the secondary and primary education sectors in the 1980s and 1990s was to give parents more choice over what school to enrol their children at. However, there still remains a geographic restriction on most families, regardless of how much choice they are given because, beyond a certain point, it becomes unfeasible to send children to a school that is very far away. In isolated areas, where the population is not large enough to warrant many schools, residents may find that, unless they have the means to send their children into private education, there is little choice over where to enrol their children. In particular cases like this; there is a case for claiming that a school has some monopoly power. However, the catchment areas of local schools play a large part in parents’ choice of where to live in the first place.

Essentially, once it is provided by the state, there is no real market for schools in the sense that the crucial element of a functioning market, namely to transfer information about how individuals value the good, is no longer taking place. If one concludes that there is a case of market failure in the UK education system it still does not automatically follow that regulation is needed. While market failure leads to inefficient and less than optimal outcomes, regulation is also vulnerable to failure. In order to assess whether regulation is an optimal route to take, one must first compare the costs and shortfalls of a regulatory system to the costs of market failure.

Inherent in the fact that there is a perceived need to provide free basic education is the belief that education is not valued highly enough by many individuals. Such paternalistic arguments for regulation do not require market failure or the notion of efficiency to justify intervention. It is essentially a social argument for regulation

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*Hayek (1945) “The Use of Knowledge in Society”*
rather than an economic one. Even if we accept this argument in favour of regulating secondary schools it does not mean that it is not worthwhile examining the possible adverse effects, unintended consequences and costs of the present system. The social argument for the regulation of secondary education is a persuasive one but it is a general one. The exact form that regulation should take and how far it should reach still remain worth assessing.

1.13 The Public Good Argument and the problem of coordination

The public good-justification for regulation when the provision of a public good provides many individuals with a benefit but not enough of a benefit to justify any of those individuals single-handedly providing it, it needs to be provided by the state. The argument is based on the reasoning that when the cost to the individual of providing it exceeds the benefits that individual will reap from it, no individual has an incentive to provide it and, unless government intervenes, it will not be provided at all. However, schools have been set up and run for centuries all over the world without government funding so the argument that it would not exist otherwise does not quite stand up to history. Nevertheless, approaching the provision of state schools from another angle does lend some justification to the Public Goods-argument for state regulation of education. If, instead of viewing the problem as one of providing education we turn it around and consider the problem of providing a society in which everybody is literate and benefits from social inclusion. The benefits of living in a literate and cohesive society are large to the majority of individuals but the cost of ensuring that is extremely high for any one individual to achieve. Even private organisations or interest groups would struggle with such an enormous aim. This is basically a problem of coordination and serves as a reasonable justification of state regulation in the light of the UK education system. However, it only justifies implementation of system that ensures minimum standards are being maintained, what Ogus, A. (2002) describes as “mandatory standards” as the aim is to coordinate efforts to produce a society with a certain minimum level of universal education. It is clear that once a justification for regulation has been found, policy-makers are then faced with choosing what form that regulation should take. As Ogus, A. (2002) notes,

7 Ostrom (1990) Governing the Commons: The Evolution of Institutions for Collective Action
the choice is likely to be influenced by the cost-effectiveness of the regulatory instrument.

1.2 The Costs of Regulation:

While OFSTED was set up to ensure that government funding is allocated efficiently in schools, the question arises as to who is checking that OFSTED is allocating government funds within their organisation efficiently. There is also the issue here of whether what the government sees as priorities for spending is necessarily the most efficient use of the money. OFSTED inspections cost considerable amounts of money to conduct. But, as Rosenthal (2004) points out the costs beyond the immediate costs of an OFSTED inspection should be taken into account.

1.21 Centralised schools’ data:

The difficulty with schools regulation is that it is subject to the same major critique as all other forms of regulation, social as well as economic. The problem with providing the perfect rewards and punishments to all those involved in what Lazear termed the “education production function” is that no single individual or central planner can preside over the entirety of specific knowledge of time and place that is really necessary to influence the outcome in real-life terms. The standards of teaching in a school are observable to those who form a part of them over a long period of time and only those who have specialised knowledge about the local community, the individual students and teachers and changing circumstances are really in a good position to judge whether a school has performed well as a whole and to what extent individuals within the organisation have contributed to that overall outcome. It seems that the regulatory system in place at the moment goes to great lengths to collect data on every measurable input and output in an attempt to overcome this knowledge problem. The huge emphasis on the recording and collection of data on measurable inputs and outputs in the education system is an attempt to centralise all the knowledge of individual circumstances of time and place into one big database and regulate

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8 £ 222 million set aside in 2008/2009 ofsted's draft resource accounts for 2008-09
9 Hayek (1945)
accordingly. The underlying issue in the case of secondary schools in the UK is that the data that is collected, alone, cannot give an accurate picture of the reality in schools. Education is characterised by intangible inputs and outcomes and heavily influenced by random shocks and complex human interaction to an extent that regulating it prescriptively according to the variables that are measurable could be harmful and lead to costly unintended consequences. In addition to this, the process of collecting the data is itself costly. Not just the administrative costs of this data-collecting activity need to be taken into account. The costs incurred due to reallocation of time and resources away from teaching or working towards intangible goals, in order to fulfil the data-recording criteria imposed by such a regulatory system must also be considered. My contribution to this debate is to look at the long-term (unintended) effects on the quality of education the system of OFSTED inspection is likely to have. In particular I shall examine this in terms of its affects on incentives of teachers and school management.
2. **The Principle-Agent problem in UK schools**

2.1. **The basic model**

The traditional theory of the principle-agent problem\(^{10}\) posits that where the agent possesses superior knowledge and observation of the agent’s activities is costly or unfeasible, a moral hazard will exist on the part of the agent. If the agent’s incentives are not perfectly aligned with those of the principle then the agent will be tempted to behave in a way that the principle would consider non-optimal if he/she had the same information. In the case of secondary school education it is clear that the teacher possesses superior information regarding the students’ abilities and progress than does the head teacher or the organisation or person(s) providing the funding of the school. It is also a remarkably difficult environment in which to observe the teacher’s behaviour and performance directly. In a model that assumes agents to be rational utility maximisers it is logical to reason that under the circumstances described above, the agent will seek to exert the least possible effort. However, as with other professions, such as the nursing profession\(^{11}\), it is possible that in the teaching profession is characterised by the fact that those individuals choosing such a profession do so, not because of the expected financial rewards, but out of sense of satisfaction or enjoyment of the work they are doing. If this is the case, tying teachers’ pay to certain performance measures may provoke a hostile reaction from workers who decide that if their job has been reduced to a small set of performance measures, that they feel do not accurately reflect the work they do and the effort it costs them overall, they shall react by concentrating only on producing those performance measures rather than on “doing a good job”. Many graduates in the UK who choose to enter the teaching profession could opt for higher salaries in other sectors but choose teaching instead\(^{12}\) – compared to other professions requiring the same level of investment in education and training the teaching profession is relatively low paid. Of course, it does not necessarily follow that choosing a career in

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\(^{10}\) Gibbons and Waldman (1999)

\(^{11}\) Marsden and Belfield (2009) find that teachers are not greatly motivated by financial incentives

teaching indicates a strong sense for civil duty or satisfaction gained from the nature of the work. Other factors such as job security, generous holidays or more family-friendly working hours may also play a part in the decision. However, if the agent does receive a certain degree of utility from doing their job well and exerting effort then there is no misalignment of incentives and therefore no agency problem. Lazear and Rosen (1981) demonstrate this principle of the agent’s problem using the following model:

The agent’s utility function can be written as\(^{13}\)

\[
U(a) = w - C(e) \tag{1}
\]

Max \(U(a): e = 0\)

Where \(C'(e) > 0\) and \(C''(e) > 0\)

Where \(w\) is the wage the agent receives and \(C(e)\) is the cost function to the agent as a function of effort \(e\). In this model the wage is set exogenously, which is a reasonable in a situation where there is no measurable output on which to base a piece-rate pay system. The only variable the agent can control in this simple model is effort, \(e\) and hence in the maximisation problem of the agent here consists wholly in minimising the positive and increasing cost function \(C(e)\). The solution to the maximisation problem for the agent is to set \(e=0\)

If we add to this model two extra factors, 1) the utility gained by the teacher from a sense of satisfaction in seeing his students improve and perform well, \(P\). and 2) the utility the teacher gains from the sense of satisfaction from knowing that he has “done his duty” and exerted effort (i.e. a sense of virtue and pride in his work): \(V\) Both these factors are dependant on effort exerted by the teacher and therefore can be modelled as functions of \(e\). Now the agent’s utility maximisation problem yields a more ambiguous outcome:

\[
U(a) = w + P(e,x) + V(e) - C(e) \tag{2}
\]

\(^{13}\) I am assuming a risk-neutral agent here as in the standard model
Where

\[ P'(e) > 0, \quad P''(e) < 0 \]
\[ V'(e) > 0, \quad V''(e) < 0 \]
\[ C'(e) > 0, \quad C''(e) > 0 \]

\( x \) is a measure of all other factors affecting the utility gained by the principle from \( P \), such as luck or appeal of the students.

The maximisation problem now becomes:

\[
\frac{dU(e)}{de} = 0
\]

\[
\frac{dU(e)}{de} = \frac{dP(e.x)}{de} + V'(e) - C'(e) = 0
\]

\[
\frac{dP(e.x)}{de} + V'(e) = C'(e)
\]

So the agent will choose a level of \( e \) such that the marginal benefits of effort equal the marginal costs of effort (\( C'(e) \)).

This more sophisticated model serves to demonstrate that the optimal level of effort chosen by the agent, even under zero observation, is not necessarily zero and that it is possible, depending on the form of the individual utility function of the agent that his/her incentives may be aligned to those of the principle. What this model does not prove is that the level of effort chosen by the agent is necessarily the optimal level as seen by the principal. Another factor not accounted for in this model is the allocation of time and resources of the agent. In a profession such as teaching where perceptions of teaching achievements may vary greatly the principal may be more concerned with how the agent chooses to exert effort rather than the level they choose. Marsden and Belfield (2009) discusses this in detail and finds that the goal setting and appraisal aspects of the new system introduced in the UK “seems to be giving rise to a better
alignment of teacher and school objectives and with those of national level policy objectives”. The discussion paper also presents “tentative” evidence that improved goal setting in schools can be linked to higher academic performance of pupils.

2.2 Performance Related Pay

In this section I shall first examine the general framework for pay for performance and then explore to what extent it applies to the situation of teachers in the UK at present. Although teachers are not paid for performance their pay is linked to performance measures. My premise is that while this may improve goal setting within schools, it is unlikely to improve productivity greatly because of the lack of good performance measures to tie pay to. I also consider the likely negative effects within the teaching profession of performance related pay brought caused by a lack of correlation between performance measures and actual productivity, the possibility of gaming for performance measures and the nature of team incentives within the profession.

2.21 The trade-off between risks and incentives

The argument for performance related pay presented in much of the traditional literature\textsuperscript{14} is that when observation of $e$ is not possible tying pay to output brings the agent’s incentives more closely into line with those of the principal. This can be demonstrated using the following model\textsuperscript{15}:

If we assume that the motivating factors modelled in utility function (2) are small or insignificant and retract for a moment to a state of the world where teachers gain no satisfaction from their work other than their wage and are governed by the first utility function (1). We also maintain the same assumptions regarding the positive and increasing relationship between effort and the cost of effort.

The agent’s wage equation is given by:

\textsuperscript{14} Lazear (1986)
\textsuperscript{15} As in Lazear (1986) and (2000)*
Incorporating this into the utility maximisation problem of the agent gives:

\[ U(a) = (s + bY) - C(e) \]

where \( Y(e) > 0, Y(e)'' < 0 \)

\[ \frac{dU(a)}{de} = bY(e)' - C(e)' \]

So the agent will set \( bY(e)' = C(e)' \) to maximise her utility. It follows from this that agents incentives will be perfectly aligned with the principal’s where \( b = 1 \) and the marginal cost of effort to the agent is equal to the marginal benefit \( Y(e)' \) she receives from the principal. However, setting \( b = 1 \) is not always the optimal solution because it means that the agent bears all the risk of the outcome. In the case of teaching, as with many other professions, the outcome \( Y \) is affected by external factors beyond the agent’s control in addition to effort.

\[ Y = e + \varepsilon \]

The random variable \( \varepsilon \) represents the shock or “noise” of other influencing factors or the effect of chance/luck on the final outcome. The variance of \( \varepsilon \) imposes a participation constraint on the agent. The agent will need insurance against the effects of \( \varepsilon \) on her income in the form of \( s \). So, in choosing the efficient level of \( b \) the principal faces a trade-off between providing sufficient insurance and providing the right incentives. A risk averse agent will prefer a contract that is less dependant on In the context of teaching the problem is exacerbated by the problem of choosing a measurable output on which to base such a piece-rate pay system. Baker(1992) looks at situations in which the agent’s incentive contract is not based on the principles actual objective. He derives the performance parameter \( b \) for an optimal incentive contract where effort is unobservable. He demonstrates that, even for a risk-neutral
agent, the optimal performance parameter depends on the correlation between the performance measure $P$ (on which the piece-rate is based) and the true value the principal actually wishes to maximise, $V$. If all other factors remain constant, then the higher the correlation is, the higher the optimal piece-rate. Baker(1992) derives the optimal bonus parameter with unobservable effort to be:

$$b^* = \frac{\text{cov}(V, P) + 1}{\text{var}(P) + 1} = \frac{\rho \sigma_v \sigma_p + 1}{\sigma^2_p + 1}$$

Where $\rho$ is the correlation between $V$ and $P$, $\sigma_v$ is the standard deviation of $V$ and $\sigma_p$ the standard deviation of $P$.

Other factors affecting the optimal performance parameter are the risk aversion of the agent, the variance of the correlation between $V$ and $P$ and the nature of the cost of effort to the agent. The more risk averse a person is, the more they will prefer a fixed rate over a pay-for-performance contract with the same expected payoff. When the variance of the correlation is high, the risk of exerting the wrong amount of effort is high. When the cost of increasing effort is very high, a fixed wage becomes, relatively, more attractive. This model offers a good explanation for why pay for performance is not as common as one might expect given the agency problems in many professions. This is especially the case for teaching where, as Michael Blastland and Andrew Dilnot put it in their book,\(^{16}\) “… for between two thirds and three quarters of all schools, the noise of chance is a roar…”

Conversely, Prendergast (2002) offers a different analysis of employment contracts in the light of the agency problem. We may actually observe a positive relationship between risks and incentives due to subjectivity of supervisors, especially where pay is connected to the outcome of the assessment. The argument is that when risks are high the assessment will poorly reflect the effort exerted by the agent in any case, so the subjectivity of assessment will do less harm than in an environment where there is less risk. In the UK system one would expect a certain degree of subjectivity on the part of head teachers when assessing their colleagues. Although the assessment

\(^{16}\)“The Tiger That Isn’t” 2007 Profile Books Ltd
process for passing the “Threshold” or obtaining a promotion is conducted by outside assessors in conjunction with the head teacher, crucial decisions are often left to the head teacher. The freedom this subjectiveness of the assessment grants to head teachers is interesting because it means that it gives teachers who are demand a tool to bargain with for higher pay. Lazear (2003) touches on the difficulty faced by the secondary education sector caused by the fact that all teachers must be paid according to the same standards regardless of their subject. When there is a much shorter supply of Mathematics teachers than English teachers, schools would be able to solve the problem of teacher shortages in subjects such as Mathematics by offering teachers of those subjects higher wages. In order to retain teachers of those subjects in higher demand, head teachers may have to promote them more often or with less scrutiny. While this effect may help combat the shortage of secondary school teachers in subjects such as mathematics and sciences, it may also have a negative effect in terms of the perceived inequality among teachers working at a school. Perceived inequality and resentment among staff may hamper team efforts within a school that may have a negative impact on overall teaching quality and school performance.

So far, the models I have focused on how to link performance to pay in order to best align the incentives of the principle and the agent. An alternative approach is to consider mechanisms, other than performance related pay, that serve to align the incentives of principle and agent. Ouchi (1980) cites the example of Japanese firms that hire inexperienced workers and invest much effort into socialising them into the firm in an attempt to align the employee’s incentives with those of the firm. Basically, this works by encouraging the employee to see the company as part of their own identity.

2.22 Performance Related Pay for Teachers compensation in the UK

While head teachers in the have received performance related pay for some time the introduction of performance related pay for secondary school teachers in 2000 presented a very drastic change. ‘Teachers’ pay was based on a linear scale with nine levels. Under the performance related pay scheme, teachers who have reached the ninth step of the pay scale are eligible to apply for a Threshold assessment. If they
succeed in passing the Threshold they receive a £2000 annual bonus. They will continue to receive this bonus without having to reapply and regardless of later assessments. In other words, once a teacher has passed the Threshold the pay increase is permanent. In addition to the pay increase, the successful applicant also moves onto a new, higher pay scale. On the new pay scale, teachers are eligible to apply for further performance related bonuses.

In addition to this the Schools’ award was introduced. As Burgess et al. (2001) explains, this is an annual competition, where schools are paid awards depending on their students’ test results. In 2001 performance was judged according to student attainment and not based on value-added attainment. Attainment was, however, controlled for relative deprivation using free school meals as an indicator.\(^{17}\)

In the UK the performance related pay scheme does not always link teachers’ pay directly to student results. However, their role in improving the schools exam results forms part of the assessments that allow them to move up the pay scale by crossing the “threshold” This assessment is based heavily on inputs but also, in part on the “value-added” scores of students. In addition to this, the position of the school on the league tables (that are published online) show the exam results and a ‘value-added’ score that is calculated according to the level of improvement in the students level since the last assessment (this is usually a key stage examination but values calculated by independently contracted assessment agencies using ability tests are also used). Ofsted reports on a school are also heavily influenced by the exam results of students. Due to the competition among schools to attract the best students and the way in which school funding is dependant on the these performance measures, a team incentive exists for teachers to ensure that their school receives good ratings because these will affect the jobs and positions they will be able to apply for in the future. Potential employers will look at these measures when considering a candidate which make them of some value to individual teachers. The PRP system in place for teachers at the moment it cannot be considered pay for performance in the strictest sense. A teacher’s pay is linked to performance but not directly dependent on exam results. The “value-added scores” affect the probability of a teacher receiving a higher wage.

\(^{17}\) In the UK students under a certain income level are entitled to free school meals. Prizes of up to £25,000 were awarded to a total of 6800 schools and were awarded in two categories: those schools that had improved most over time and those that had shown the most dramatic improvements.
in the future. Firstly, they affect an individual teacher’s ratings and assessments, thus affecting the chances of promotion at the “threshold”. Secondly, they affect the standing of the school in relation to other schools which will affect the teacher’s chances of securing a more desirable job in another school.

In the light of this the teacher’s expected lifetime wage could be crudely modelled as

\[ E(w) = s + P_1(w_1) + (1-P_1)(w_2) \]

Where \( P_1 \) is a positive function of measurable output \( Y \) in the form of value-added points from GCSE grades and \( w_1 \) represents the lifetime gain in income over the second period due to the higher wage(s) secured as a result of a promotion(s) to the next level of the “threshold”. \( w_2 \) represents the gain in wages (or rewards) associated with not achieving promotion, in the context this is likely to be close to zero, as the basic wage is already accounted for in the form of \( s \). However, I have included \( w_2 \) because there may be benefits to the agent due to seniority even in the absence of promotions. In essence this amounts to the linear piece-rate wage equation \( w = s + bY \) where \( b \) has a very low value reflecting a correlation <1 between the measurable output, in this case the value-added test scores, and the actual value of the teaching quality we wish to maximise, in this case teaching quality. The very low value of \( b \) is easily explained within the restrictions of the model as agents are likely to be risk averse and there is likely to be a high value of standard deviation in the effect of effort on outcome. In this way the current rewards system for secondary school teachers in UK state-funded schools displays classical trade-off between risks and incentives.

2.3 Possible Adverse Effects of Performance Related Pay

I shall examine two of the main risks associated with piece-rate pay systems and assess to what extent these risks possible adverse effect apply to the case of secondary school teachers’ compensation schemes; agents directing too much of their efforts towards the measurable output and diverting it away from the desired outcome and the possibility of “gaming” the performance measure.
2.31  **Rewarding A while hoping for B**

“Rewarding A while hoping for B” is the title of a much cited article written by Kerr(1975) that goes to the heart of the fears surrounding pay for performance. In the context of teaching it refers to the phenomenon of “teaching to the test”. If the agent is rewarded to too great an extent on a measurable output, there is a risk that she will concentrate her efforts too greatly on producing that measurable output while not, in fact, maximising the value the principal was hoping to maximise. There is a reasonable fear that if too much emphasis is placed on test results teachers will concentrate more on teaching by rote and exam technique and less on students’ actual understanding and skills that will be more useful in the labour market once students leave school. A good example of this is when the UK government originally decided to assess only the results in Maths and English, regarding these as the core competency subjects in secondary schools and thus a good measure of the overall standard of education. The result was an increase in test results for Maths and English combined with a simultaneous drop in scores in all other school subjects. The government’s intention was not to discourage teaching all other subjects in favour of Maths and English, but by regarding these as the only necessary measurable outputs it produced a situation where schools were rewarded only for achievements in those subjects. In fact, Wragg et al. (2001) find evidence suggesting that teachers improved their reporting methods rather than their actual teaching methods.

2.32  **Gaming of Performance Measures**

Given teachers’ and head teachers’ superior knowledge of the situation within a particular school they will know where less effort is more effective in producing higher values of measurable output. For example, in the current system, more points are awarded for managing to make students who are predicted a D, achieve a C at GCSE level than there are points awarded for raising a student who is predicted a grade B to a grade A in the examination. So teachers have an incentive to concentrate there efforts where they are likely to have the biggest possible effect on the final points outcome. The most obvious observable effect of gaming of performance measures in the UK system is the leap in the numbers of low-achieving students sitting GCSE exams.
As schools receive zero points for any student who does not sit the examinations, teachers and management have a strong incentive to make sure as few students as possible do not sit the examinations, even if these students are predicted the lowest possible result and will gain absolutely nothing from sitting the exam. It is arguable that the gaming of performance measures in this way is optimal from a social welfare maximising point of view. If teachers have superior knowledge about where their teaching efforts will translate into the most pronounced increases in exam results (i.e. which students will respond best to their attention) then allocating their time and efforts accordingly will produce the most efficient output. However, this is assuming that the performance measure is strongly correlated to $V$. As an example consider a situation where a teacher has a class of students of mixed abilities. Two students are at approximately the same level of ability and both have considerable potential to improve at relatively little effort of the teacher but one suffers from anxiety problems when faced with examinations and the other does not. It is fair to assume that both students would benefit equally from the teachers additional attention but the one who is more adept in exam circumstances will receive the teachers attention because, although both students will result in the same marginal increase in $V$ per unit of effort on behalf of the teacher, one will have a higher rate of return in terms of measurable output $P$.

Perhaps the most relevant instance of gaming performance measures is teachers’ and managements’ choice of students. Good students are likely to achieve high results regardless of teaching quality and will also require less effort in terms of classroom control and motivation than poor students. The relative attractiveness of teaching good students may cause teachers to waste valuable time and resources wrangling over good student rather than diverting it towards teaching. Even in the absence of performance related pay, teachers have an incentive to fight over good students merely because they cost less effort to teach, but when student performance is linked to career progression and pay the effect will be more pronounced.

2.34 Team incentives:
Hannah Duncombe

Ouchi (1980) draws on Mayo (1954) and Barnard (1968) to address coordination problems in the context of organisations. They argue that the root of coordination problems is that individuals have only partly overlapping goals. Left to their own devices they each follow slightly different objectives leading to uncoordinated efforts. Ouchi (1980) also points out that where joint efforts contribute to a single outcome or where the task requirements change, the processes required to make the transaction appear equitable become very costly. This could also be said for teaching. One of the difficulties in determining incentives for teachers is that the outcome of teaching quality is to a great extent the result of a combination of different teachers’ efforts. A physics teacher’s job may be made considerably easier or harder depending on the skills and efforts of the groups’ maths teacher or even by the efforts of previous teachers in a whole array of subjects. Where the measurable outcome (exam results) is determined by a team effort and the group is sufficiently large to allow shirking to go undetected, the system invites agents to free-ride off the efforts of others.18

Another factor to consider is that the form of assessment differs across subject areas. Although examination papers are marked externally and efforts are made to harmonise marking schemes as much as possible it is almost certainly the case that the marking of English language papers is more subjective than the marking of mathematics exams because the GCSE and A-level English papers are in the form of essays while the mathematics papers generally involve problems that are to be solved in a uniform fashion. The result is that the variation in grading is greater for some subject areas than for others. Where teachers are given performance incentives according to students’ exam results this could mean that the same performance related pay scheme could produce different levels of incentives for teachers across different subject areas.

Ouchi (1980) finds that when the determination of value contributed by individual agents is very ambiguous, the transaction costs of maintaining a market are too high and so market forces fail under such circumstances we are likely to see the formation of what he terms “clans”. He defines a clan as “any occupational group which has organic solidarity”. In such an organisational structure incentive pay is not necessary as members of the clan are ‘socialised’ into adopting the organisations goals as their

18 Holstrom (1982)
own. This line of reasoning could apply to the secondary education system in that teachers at a school could be considered a clan or the profession as a whole could be seen as such. Laughlin and Broadbent (1997) draw on this idea and argue that the current regulatory system, by extending government control and breaking up this clan structure, in a centralised way, undermines the professional autonomy of the teaching profession. The implication is that the teaching profession in the UK used to resemble the “clan” form but now no longer does. Given the difficulties in assessing performance, the less financially motivated mentality of teachers and the team efforts involved in teaching discussed so far, the teaching profession does fit this “clan” model of organisation. In the present system, however, there is no sign of efforts to socialize teachers into the profession or to see the goals of the profession as one with teachers’ individual goals.
3. **Sorting and Screening Effects**

3.1 **Job security: difficulty in sacking teachers**

High levels of job security together with low income do not give the higher quality teachers an incentive to stay and the lower ones to leave. Comparatively, job security of secondary school teachers in the UK is low they are not civil servants and terminating a teacher’s employment is easier than in other European countries. However, once a teacher has been given a job it is still very costly for a head-teacher to force them to leave. If the quality of teachers is unobservable at the outset and only becomes apparent a length of time after the school has chosen who to employ, this difficulty in getting rid of lower quality teachers leads to adverse selection in a group of mixed-quality teachers. It is likely that higher quality teachers will have a higher reservation wage $r(\theta)$ (owing to a better selection of outside options) and therefore have the largest incentives to leave the profession. This is especially a danger in the UK school system where the school as a whole is rewarded on the basis of student performance and OFSTED inspection results. This means that all teachers benefit or suffer equally from the assessment of the joint output. A teacher who knows that they are of higher than average quality within their school will realise that they are paying the price for the lower performance of others and will have a strong incentive to move to a better school.

3.2 **Adverse selection – basic model**

In a pool of teachers of varying quality in the range $[\theta, \bar{\theta}]$, $\theta$ denotes the lowest quality teacher and $\bar{\theta}$ the highest quality teacher. Every teacher in the pool has a reservation wage $r(\theta)$ representing the level of reward below which they will not accept a job. This reservation wage is a positive function of $\theta$ because a higher quality teacher is assumed to have better outside options than a lower quality teacher. In terms of OFSTED reports and the position of a school in the league tables, the school as a whole is judged. The benefit of good results and good OFSTED reports or the cost of bad results and bad inspection results are shared equally among the
teachers at a school in terms of career prospects and the nature of the students the
school will be able to attract. Bearing in mind that better students will want to attend
schools with better ratings and poor students will have less choice about what school
they attend the cost of poor ratings is also born in the form of teachers facing a less
pleasant and more challenging work due to a higher percentage of poor students. The
set of teachers willing to work at the school is given by

$$\Theta^* = \{ \theta : r(\theta) \leq w^*(\theta) \}$$

Where $w^*(\theta)$ is the reward received for a given value of $\theta$.

The total size of the reward is the result of a combined effort and is shared equally
among all teachers at the school. All teachers receive a reward that reflects the
average productivity of all participation teachers.

$$w^* = E(\theta | \theta \in \Theta^*)$$

Any teacher with a reservation wage $r(\theta)$ higher than the reward $w^*$ will leave the
school. But when that teacher leaves the value of $w^*$ also sinks. In this way teachers
will continue to leave and the rewards of staying at the school $w^*$ will continue to
drop until such a point where the highest reservation wage in the set of teacher is
lower than $w^*$. The funding for secondary schools in England and Wales exacerbates
this effect because schools receive more funding if they perform better in the league
tables and OFSTED inspections. A school that looses funding due to bad examination
results will be faced with a smaller budget on which it will be tougher to award
promotions and retain or recruit more experienced (and hence more expensive) staff.
Less experienced, less qualified, teachers require lower wages.

3.3 Reshuffling effects

Lazear, E.P. (2003) highlights the fact that some incentives produce a reshuffling
effect rather than a change in the level of quality in teaching. He cites the example of
the when California introduced a policy requiring that class sizes in the first three
years of school were not to exceed twenty. The result was a sudden increase in
demand for teachers leading to more newly (or less) qualified, less experienced
teachers entering into schools. Given the now increased demand for teachers coupled with lower average teacher quality, more experienced or better quality teachers were able to move from schools in disadvantaged areas to those in more prosperous areas where teaching required less effort and the working environment was more pleasant. So the improved quality of education due to smaller class sizes was countered by a drop in teacher quality in deprived areas.

As the above model of adverse selection demonstrates, the only way for a school in such circumstances to retain valuable teachers is to raise rewards to a level above that of the reservation wage of their best teachers such that $w^* \geq r(\theta)$. Lazear, E.P. (2001) demonstrates how large pay increase produces sorting and improves teaching quality. So, here pay is linked to performance but not in a direct way. It is not linked to test scores/exam results or to an evaluation of inputs. It works by making the teaching profession overall more attractive, relative to other professions for workers of that level of qualification. This results in a better applicant pool and better selection sorting out those at the top to work as teachers and those at the bottom of the pool to move into other professions. The empirical results presented in Lazear (2001) may be open to criticism in that the study looks at a specific case and there is no way of proving whether or not increasing teacher’s pay dramatically would in fact produce the desired effect. However, there is a natural experiment in history that could provide some evidence of improved teaching quality when the relative attractiveness of the profession is higher. Before the emancipation of women, teaching was a relatively attractive profession to most educated women as access to other professions requiring the same level of education and qualification were not accessible to women. The pay, independence, career prospects and prospects for personal development made the profession very attractive indeed compared to the other, very limited, options available to female graduates at the time. Steven Levitt and Stephen Dubner\textsuperscript{19} examined the data and found that from 1940 as much as 55 percent of the female, college-educated workforce in their mid thirties were employed as teachers. Naturally, once other professions such as medicine, finance and law were open to educated women and societal attitudes began to change, that statistic changed too. Levitt and Dubner go on to compare the spread of IQ scores of female teachers in the in 1960 with those in 1980 and find that percentage of female teachers scoring in the top

\textsuperscript{19} “Superfreakonomics” p.43-44
quintile range had dropped by more than half while the percentage scoring in the bottom quintile had more than doubled. Of course, it is very difficult to isolate the effects of women’s emancipation completely (it was gradual and the effects would be lagged and a hell of a lot of other stuff was changing at the same time) but it does lend some credibility to the selection theory. In particular, it demonstrates how pay alone need not be the deciding factor in raising the relative attractiveness of the teaching profession.

3.4 **Screening Contracts: “The Threshold”**

The above sorting model regards experience and qualifications as a proxy for effective or “good” teachers. It must be noted that, although in the case of newly qualified teachers with very little experience this may be a reasonable assumption, it need not necessarily follow that the more experienced teacher is always the more effective teacher. Because real output is so vague and hard to observe, and the true effects of good teachers are often only noticeable many years after the teaching took place it is a challenge to isolate the factors that make a teacher effective. In addition to this teacher effectiveness is not a fixed constant. The environment and student interaction play a role determining the effectiveness of any individual teacher. One teacher may be very effective with the worst students while another produces better results only with dedicated students. Hanushek(2002) failed to find a link between the level of qualification of teachers and their quality of teaching. Experience and additional qualifications remain the only tools teachers can use as signals of their quality. For such a signal to be effective, however it must be more costly for lower quality teachers send than high quality ones. Otherwise low quality teachers will be able to mimic the signals of others and the signal will not be credible and not serve as a means by which employers can discriminate pay.

As it is very hard for employers to encourage a low quality teacher to leave, while at the same time it is difficult for them to prevent high quality teachers from leaving it would be beneficial to employers to be able to use some form of screening to allow them to identify effective teachers and pay and offer them higher rewards. The “Threshold” system seems to offer this form of a screening contract. Teachers are free to apply for
the Threshold. They are assessed according to many different teaching criteria and then external assessors together with the head teacher have the power to place the teacher on to a higher pay scale if they feel the teacher has passed the assessment.

Lazear (1995) examines how probation periods can be used in screening contracts to make a job only attractive to higher quality workers. The model is based on a scenario where two types of workers exist; high quality workers and lower quality workers. Workers are hired for a probationary period on an initial, low wage. At the end of the probationary period the worker faces a test. If they pass this test they can continue the job in the second period with a higher wage. This model appears to bear some similarity with the ‘Threshold’ system of pay for teachers. However, the conditions for such a contract to act as an effective screening device for high quality workers are that the increase in wage from the first to the second period, taking into account the probability of passing the test, must be such that it is only worthwhile for the higher quality workers to apply and bear the burden of the lower quality wage in the first period. This, in turn, will depend on the difference in passing probabilities between high and low quality workers, the size of the difference between the wage in the first period and the wage in the second.

\[
W_1 = \text{wage offered in first period} \\
W_2 = \text{wage offering in second period} \\
W_h = \text{reservation wage of high-quality teacher} \\
W_l = \text{reservation wage of low-quality teacher} \\
P_h = \text{probability that high-quality teacher passes the assessment} \\
P_l = \text{probability that low-quality teacher passes the assessment} \\
P_h > P_l \quad \text{It is harder for the low quality teacher to pass the assessment than the high-quality teacher} \\
X = W_1 - W_2
\]
The participation constraints for the applicants are such that the sum of the wage in the first period and the expected wage in the second period is greater than or equal to the total value of the reservation wage for those two periods.

High quality teacher:

\[ W_1 + P_h W_h + (1-P_h)W_h \geq 2W_h \]

Low-quality teacher:

\[ W_1 + P_l W_h + (1-P_l)W_h \geq 2W_l \]

For given values of \( P_l \) and \( P_h \), we can solve these inequalities to find the wages \( W_2^* \) and \( W_1^* \) at which both low-quality workers and high-quality workers will be indifferent between the probationary contract and their respective reservation wages.

It follows from this that, in order to make sure only high-quality workers apply the employer must lower \( W_1 \) below this level and raise \( W_2 \) respectively.

For the screening contract to be effective \([ P_h, P_l]\) and \([W_h, W_l]\) must be set such that \( W_2^* - W_1^* > X \)

There are two major factors that prevent the Threshold assessment in schools acting as an efficient screening device. The first is that the difference between the probability of a low quality and a high-quality teacher passing it are not sufficiently divergent. A survey conducted on behalf of the Association of Teachers and Lecturers found that 80% of those respondents eligible to apply had applied for the performance threshold (Purslow 2000)\(^{20}\). Wragg et al. (2001) find that in their survey of 1 000 randomly selected schools across more than 150 local education authorities 88% of eligible teachers applied and of that 88%, 97% succeeded in obtaining the £2000 performance bonus. The second is that the assessment is not entirely objective. External assessors are responsible for verifying outcomes but head teachers have considerable discretion over the final decision. While it may not act an effective

screening device it has served to increase a large proportion of teachers’ pay and may therefore have a positive effect on teacher effectiveness and retention.

3.5 The “Bad Apple” Principle

Another aspect of teacher and student allocation that influences the quality of education is that it only takes one very disruptive pupil in a group of, otherwise, perfectly good students to lower the quality of education in the group for everyone. This is partly due to the distraction caused by the individual student and partly due to the extra time and effort the teacher must divert towards that one student. Lazear (2003) illustrates the importance of this effect on overall educational output. Let \( p \) represent the probability that a student behaves in a way that does not hinder anybody’s learning. So \( pn \) is the probability that, in a class of size \( n \), all students are behaving well. If \( p = 0.99 \) so that every student behaves 99% of the time then, in a class of 25, at least one student will be misbehaving at least 22 percent of the time.

As Lazear (2003) goes on to emphasize, the probability that students behave is also affected by qualities of the teacher. It is also worth considering that a teacher’s contribution to the \( p \) is not likely to be fixed. It is a personal quality that depends on the interaction between the students and the teacher as well as the environment in which they find themselves. This, in turn, may depend on other teachers’ behaviours and, also, the rules and regulations surrounding students and teachers. One of the results of the moving decision-making away from teachers and head teachers in schools and towards regulatory bodies, is that teachers and head teachers in the UK now have relatively little power to exclude students permanently from schools. In some schools this sort of regulation leads to excluded pupils being accepted back into the school. Given what a pupil has to do in order to be expelled to start with this has serious implications for other students and the environment as a whole.
4. The Effects of Regulation of Education in UK secondary schools

4.1 Effects on School Administration

Although OFSTED is at the centre of inspections, there is a wealth of regulatory organisations working mostly in conjunction with one another. LA (Local Authorities) that also play a big role as they still remain responsible for “monitoring the progress of institutions”. They also retain some regulatory responsibilities such as internal Audit. Then there is the FAS (Funding Agency for Schools), the DfEs, SCAA, NCVQ (national council for vocational qualifications), the EAB (education assets board). As Hood et al (1999) observe, the array of regulators and their responsibilities is so complicated that it is not surprising that some head teachers themselves lost track.

The motivation behind establishing a regulatory system for schools in England has changed over time but the current system has raising educational standards as its central aim. While OFSTED is at the centre conducting the assessment of teaching standards and publishing performance (now termed “attainment”) data. Hood et al (1999) find that the reforms of education regulation during the 1980s and early 1990s had the raising of educational standards as their aim. Emphasis was laid on increasing competition and oversight and taking some of the control over schools away from teachers and local authority administrators and given to government officials. The interesting thing about OFSTED from an economic point of view is the combination of fostering a competitive “market for schools” combined with the rigorous inspection of teaching practice and other inputs into schools and punishing those that do not meet the required standards. OFSTED is armed with the power to close a school down and replace management if an inspection results are sufficiently damning. They also provide detailed advice in their reports for improvement that can be made to the way

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21 Hood et al. (1999)
the school functions, right down to very precise functions and practices. This amounts to a “Stick and Carrot”-type of regulation. Schools are being rewarded by input and output at the same time.

In one respect the input-based reward and the output based rewards systems cancel out the risks bourne by teachers and schools. Returning to the model of observable output where the variation of the random shock factor ε means that it is hard to tell how much of the final, measurable output can be attributed to effort e:

\[ Y = \epsilon + \varepsilon \]

The aspects of performance related pay that are dependent on exam and test results and the other long term benefits to teachers of good ‘attainment data’ achieved by their students are a function of Y. I consider the inputs based assessments in the form of random lesson observations by an OFSTED inspector and the inspection of lesson preparations and self-evaluation forms for their concordance with OFSTED criteria, these are also the result of a combination of effort on the part of the teacher and a random shock factor. An OFSTED inspection is not exhaustive, inspectors normally only have time and resources to inspect between five and ten lessons. They also speak to students, staff and inspect paperwork. If I denotes measurable inputs it can also be considered a function of e such that \[ I = \epsilon + \delta \] where \( \delta \) represents the random shock affecting the measurable inputs. The particular class the teacher happens to be teaching the day that the inspector walks in or the particular lesson preparations they choose to examine. Even whether or not the inspector empathizes with the teachers they are inspecting can play a role\(^{22} \), despite the efforts to maintain relational distance. It is clear that inspecting inputs in an OFSTED inspection also cannot give a perfect measure of effort or teacher quality. The interesting aspect is the relationship between the variation in \( \delta \) and the variation in \( \epsilon \). If they are not strongly related, then extreme variation in one is likely to be compensated by the variation in the other. If, for example, \( \epsilon \) happens to have an exceptionally negative effect on \( Y \) at the time of observation then, although it is possible for there to be an exceptionally negative effect of \( \delta \) on \( I \) as well, it is unlikely that both will have extreme effects in the same direction. In this way tying rewards to both measures of input and measures of output in this particular case can serve as insurance against exceptionally large effects of \( \epsilon \) or

\(^{22}\) Prendergast (2000) explores the effects subjectivity of assessment can produce a positive relationship between risk and incentives.
δ. While this effect would provide some sort of insurance against wildly misrepresentative measures of effort on behalf of school and teachers, it does not deal with the accuracy of either measure in reflecting performance or value in outcome.

Rosenthal (2001) offers, as part of an explanation for the negative effects of OFSTED inspections on performance, a scenario of downward cycle in which a school becomes trapped after an inspection. As illustrated in the section on teacher sorting and reshuffling effects, once a school receives a disappointing inspection report or exam results, the incentive effects exacerbated by the performance related pay system for teachers, mean that the school will have trouble retaining and recruiting high-quality staff. The negative effect on the school’s reputation will not only affect the number of students entering the school but also the quality of the intake of students. When this scenario is combined with restrictions on methods of teaching and a derosion of teacher autonomy due to prescriptive regulation one must expect a downward spiral of productivity. The interesting thing is that a school need not even fail an inspection to begin this downward cycle. If it is the only school in the region to receive a “satisfactory” rating\textsuperscript{23} when all others receive either “outstanding” or “very good” no parent is going to make that school their first choice. And the difference between a “satisfactory” and a “very good” may come down to nothing more than chance, due to the nature of measurable outputs \textit{and} measurable inputs considered in an inspection.

Predergast (2002) examines the conditions under which it is best to pay agents according to output and those under which paying by output is preferable. The conclusion is that where the environment is familiar and the measurement and causal effect of inputs on desired output are more easily observable and measurable so it is safe to pay the agent by input. In unfamiliar, uncertain environment where inputs and their effects are difficult to measure it is desirable to pay according to output. The example given is that of a US construction company can pay its manager of a project based in US by how much time and energy he spends on completing the project because they have a reasonable idea of what to expect from the manager in that environment and will be able to judge that the agent will produce the desired outcome if they specify exactly how he is to go about it. Where the relationship between in

\textsuperscript{23} There are presently four gradings a school can receive: “Outstanding”, “Very Good”, “Satisfactory” or “failing”
inputs and resulting outputs is unclear and the environment is unfamiliar it is best to pay by output and allow the agent complete freedom over how to allocate resources in order to achieve that goal. Therefore the US company should pay the manager of their first ever project in Armenia according to results rather than specify exactly how they want him to allocate resources. This is because the company does not know how things work in Armenia. They do not know “what works” and so are better off defining what it is they want from the manager and allowing him complete freedom in how he chooses to go about achieving that goal.

In the case of schools, if the environment is familiar and it is output that is harder to measure then, within this framework, rewarding schools according to their inspection results is not as productive as paying according to familiar inputs such as teaching hours and funding for equipment. Perhaps in unusual circumstances, like particularly challenged schools where the conventional framework isn’t working (An example of this could be a school where the majority of students do not use English as their first language, or where a threatening and dangerous atmosphere means that students and teachers are more concerned with their own safety than with the learning process) it is worth rewarding the schools for meeting targets with special bonuses. Under these circumstances, though, one would have to allow the school management and teachers to use whatever unconventional methods they believe will work in this unusual environment. The most striking implication here is that this particular combination of rewarding by output while at the same time prescribing precise inputs is likely to be counter effective. This is because, by specifying exactly, not only what teachers should teach but also exactly how they should teach it24, the variation in outcome can only come from outside influences and teachers will be aware of this.

In UK schools, OFSTED is rewarding schools according to output but instead of allowing school management the freedom to use whatever methods they please to achieve the results it specifies the allocation of resources as well as the methods used.

4.2.1 Teaching Assistants and the ‘Deprofessionalisation’ of Teaching

24 In fact, OFSTED inspections go beyond this and issue recommendations to schools on how to deal with matters such as social inclusion, cultural tensions or antisocial behaviour
A prominent lament within the teaching profession that has received a lot of attention in recent years is that the hierarchical structure and prescriptive nature of the regulatory system is causing a ‘deprofessionalisation’ of the teaching profession by turning the role of teachers into that of a technician. Because OFSTED issues guidelines on how to teach as well as what to teach, some of the professional discretion is taken out of the hands of teachers. Given precise instructions on what to teach and how to teach it, a teacher is left only with the task of implementing it, which resembles the work of a technician rather than a professional. Having examined the sorting effects facing school administrations looking to employ teachers, however, I see a possible cause for the exacerbation of this problem. If a school is faced with increased budget restraints and is aware that there are already guidelines in place for teaching content as well as method, they may be tempted to employ and less qualified member of staff to teach in place of a teacher, where possible. This temptation would be exacerbated if school management believe that the measurable outcome is more largely dependent on the student intake than on teacher quality. If the perceived relative value of a fully trained teacher drops due to prescriptive regulation this certainly adds to the temptation. The primary purpose of teaching assistants is to provide extra support to struggling students in the classroom alongside the teacher. Usually, they are assigned to one individual student, often to help with a particular learning difficulty or health condition. However, in the case of teacher absence, teaching assistants can be employed to teach lessons or supervise students. Teaching assistants can now be employed by schools to teach classes for maternity leave or in emergency situations where the school is struggling to find fully trained teachers to fill vacant posts. A School that receives a damning OFSTED rating may face loosing experienced staff members and difficulties attracting new staff, due to the effect that school status can have on teachers’ careers and pay. In this way, schools that perform poorly in an inspection are also the schools most induced to relying on unqualified teaching staff. This combination of effects may explain the trend for schools receiving a “satisfactory” rating to either remain “satisfactory” or fail subsequent inspections.
5. **Conclusion**

Schools are restricted in how they may operate to achieve this goal while at the same time rewarded for success through awarding bonuses or punished by, indirectly, cutting funding by giving them a damning inspection report could lead to a sharp drop in student numbers as well as affecting individual teacher’s chances of higher present of future salaries negatively. This restriction combined with the emphasis on rewarding according to measurable output is likely to distort teachers’ and school managements’ incentives and increase the instances for gaming of performance measures. Together with the effects of student and teacher sorting, this serves as a satisfactory explanation for why the directly observed effect of OFSTED inspections are likely to be negative for school performance and why a negative OFSTED inspection may be the cause of school failure rather than the result. The emphasis on collecting performance measures and improving ‘attainment data’ comes at a price more far-reaching than the cost of data collection itself; it contributes to the de-professionalization of teaching and gradually, to a lowering of teaching standards. Additionally, the failure to take the effects of random shocks to the data or variation in the quality of the data collected into account combined with the powerful measures available to regulatory bodies to act on the data collected, mean that there is a real danger that well functioning schools are shut down and less productive ones rewarded, which is yet another important cost of the regulatory system. Ogus (2002) sets out that the aim of regulation should be “not be to eliminate loss; rather it should be that of achieving an optimal degree of loss abatement” and with regard to the current regulation of secondary school in England and Wales is scope for further loss abatement.

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25 Roesnthal (2001)
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