

Did High Stakes testing policies result in divergence or convergence in educational performance and financing across counties in Victorian England?

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Abstract: In 1863, the English Parliament set in place a system of elementary school finance in which national level funding for individual schools depended in part on the outcomes of student examinations conducted by school inspectors. It came to be known as payment by results. This system remained in place for roughly thirty years through the early 1890s. At the height of the system in the 1870s and 1880s, on average, roughly half of the national level funding a school received depended on the outcome of student examinations. Did the system result in a leveling up in the funding available to all schools who persisted or did it result in a widening in funding gaps between successful and poorly performing schools? In contrast with previous studies by historians of education which have considered national level impacts of the policy, this paper employs county level data to look at trends between 1870 and 1890. It will consider the extent to which disparities in both funding and educational level outcomes widened or narrowed across the 42 counties of England and Wales in conjunction with the system of payment by results. It thus aims at an evaluation of a Victorian educational policy that has resonance with current school policy debates and discussions in the U.S. and elsewhere.

The proposition that funding for schools should be allocated according to educational performance is a perennial one. Based on this principle, Adam Smith argued that the parish school master of his day should not be paid by the public treasury, “because if he was wholly, or even principally paid by it, he would soon learn to neglect his business,” (Smith, 1776, p.785). And in the U.S. over the last few decades, schemes for funding schools on the basis of performance, so-called high stakes testing, have been both proposed and implemented (Figlio 2005).

One of the most striking and longest running episodes in basing government funding to schools on measures of educational outcomes was the so-called scheme of "Payment by Results" which occurred with the promulgation of the Revised Code of the Department of Education in Britain in 1862. Previous to the Revised Code, annual payments by Parliament to schools for operating expenses had been based on a per student capitation grant, an allowance for teacher and assistant salaries contingent on a generally satisfactory report by government appointed school inspectors. Under the Revised Code, the per student capitation grant was reduced, payments for teacher and assistant salaries were eliminated with these reductions offset by payments for each student passing on-site examinations given by inspectors in reading, writing and arithmetic. Though subject to modifications in among other things the level of payments per examination pass and in the subjects examined, the payments by results scheme for the three R's remained in place until 1890 and for more advanced subjects for several years beyond that.

From the 1860's when it was introduced to recent historiography, contrasting evaluations have been offered of the Victorian episode of payment by results. Critics of payment by results have argued that it led to an obsession by teachers, school managers, and inspectors alike with examination results which in turn resulted in a mechanical approach to learning and teaching of skills that were quickly forgotten after examination day; that it further resulted in a narrowing of the curriculum to the three R's, in a loss of flexibility, control, and status for the teacher, and in a waste of energies devoted to manipulating the system to guarantee good examination results (Sylvester 1974, chap.5; Marcham 1979; Rapple 1992). Defenders of Payment by Results have argued that it was the appropriate approach given the state of Victorian education when it was introduced. In particular they argue that it provided a needed formulation and standardization of secular curriculum goals in the face of an emphasis on religious instruction and that it forced teachers to devote more efforts to the instruction of the full range of students in their schools rather than focus on the brightest and ablest of students. Moreover, they note the general rise in signature ability at marriage which occurred during the payment by results episode (Sylvester 1974; Hurt 1971; Fletcher 1972).

The criticisms made of payment by results are strikingly similar to concerns of a)teaching to the test b) manipulation and cheating and c)lowered teacher morale that have been raised about recent proposals to base school funding on examination results (Clotfelter and Ladd, 1996, pp.43-46; Figlio 2005). At least some of the advocates on each side acknowledge the points of their opponents (Sylvester 1974; Hurt 1971; Rapple 1991, p.3; Marcham 1979). To a large degree such conflicting assessments could be predicted as a matter of ideology before the payments by results scheme was ever actually enacted. This leaves the question of what conclusions can be drawn from the actual experience and record

of the payments by results episode about how a funding for performance educational system will tend to function. This is one of the questions this paper will attempt to address.

However, an incomplete picture of the episode of payment by results will be obtained if one solely focuses on its impact on educational outcomes. Indeed it is striking in contrast to the recent attention paid in the U.S. to improving educational outcomes, that the historiography on the Revised Code and Payment by Results has focused far more on the impact of this policy on parliamentary funding for elementary schooling than its impact on school performance (Marcham, 1979; Morris, 1977). It has been argued by numerous commentators that the payments by results system was introduced and sustained for decades more as a method of controlling the growth of parliamentary spending on education and as method of monitoring and accounting for that spending than as a way of improving educational outcomes (Fletcher, 1972;Hurt, 1971; Morris, 1970, 1977; Sutherland, 1973, Chaps. 7 and 8; Sylvester, 1974; Cross Commission 1888, p.183.) Thus, a proper understanding of the payments by results episode should consider the political factors leading to its introduction and establishment and the factors behind its demise in the 1890s as well as its effects on educational outcomes in Victorian England. Hence, this paper will turn first to this second question.

Even if to a large degree, payment by results was a matter of political compromise, the scheme still influenced the incentives faced by individual teachers and school managers in the conduct of class room activities. And the issue remains of how the scheme influenced both educational outcomes and disparities in funding.

In the mid-Victorian period, England was divided into some 40 counties along with Metropolitan London and Wales. From 1879 through the end of the century, the Committee of Council on Education reported key educational statistics for these 42 county level units annually. Unlike say county level school boards in the United States, English counties did not have any administrative or educational funding authority in England during this period. Nevertheless, there was considerable dispersion across these counties in both educational outcomes and measures of educational inputs. Thus, examining county level trends provides a convenient way of considering the extent to which the Revised Code led to a widening or narrowing of disparities in educational resources and outcomes.

While it might seem most obvious to focus on examination results as a measure of educational performance and to consider dispersion or convergence across counties in examination results as a net measure of impact, the perspective taken here is that examination results influenced the funding of schools. Hence rather than focusing on the extent to which divergence in funding and other measures of

educational inputs resulted in dispersion in examination results, the perspective taken here will more on whether dispersion or convergence in educational outcomes resulted in convergence or divergence in funding and other measures of educational inputs.

#### I. The rise and demise of the Payment by Results Scheme in Victorian Education.

The introduction of the payments by results scheme into Victorian elementary education has frequently been interpreted as primarily due to an ideology suitable for a nation of shopkeepers. Thus Rapple (1992, p.304) states of payment by results, that "this emphasis on the financial aspect of education and the necessity of accountability, common in the world of business, was in keeping with the spirit of the age." Rapple suggests that the main impetus behind the introduction of payment by results was the recommendation to this effect by the Newcastle Commission on popular education appointed by parliament in 1858. He cites the following passage from the Commission's recommendation. The passage is partially repeated here because it explains the basic logic behind why payment by results would be expected to improve educational performance:

"If teachers had a motive of this kind [payment and promotion dependent on examination results] to see that all the children under their charge really learned to read, write, and cypher thoroughly well, there can be little doubt that they would generally find means to secure that result...there can be no sort of doubt that if (a teacher) finds that his income depends on the condition that his scholars do learn to read, whilst (another) is paid equally well whether do so or not, the first will teach more children to read than the second." (Rapple, 1992, p.304, citing Newcastle Commission, 1861, p.157).

Parliamentary grants for a variety of education expenses from their commencement in the 1830's, including most notably school construction were set up to match expenditures from local sources for these purposes. Indeed what would seem to be a late twentieth century concern of whether a pay for performance scheme would impede improvements in the most educationally deprived areas is addressed with the following defense in the Newcastle Commission Report of allocating parliamentary funding according to local effort:

"Another proposal still more objectionable is that the assistance of the government be apportioned to the want...this is to ask that the whole system of the Committee of Council be not merely changed but reversed; that the grant be proportioned not the amount but to the deficiency of local effort; that the carelessness or illiberality of the proprietors be encouraged...We may dismiss these proposals with no further comment." (Newcastle Commission Report, 1861, pp.386-392.)

Rapple (1992) and Sylvester (1974) offer a plausible case that Lowe's introduction of payment by results and the presence of this principle generally reflected the strong influence of political economy in Victorian social policy and a general desire to get value for money.

However, a more specific aim of Lowe's Revised Code noted by many commentators was to stem the growth of parliamentary spending on education (See for example Hurt 1971, pp.186 et ff.; Sylvester 1974, pp.60-61). Lowe on taking charge of education policy in 1859 noted that the parliamentary grant for public education had risen from 109,948 pounds in 1849 to 668,000 pounds in 1858 (Sylvester, 1974 p.60). By 1860, expenditure on Education, Science and Art had become nearly a fifth of all civil expenditures of the British government, and public education was the largest single sub-head of civil expenditure (Hurt 1971, p.186). In this situation and under pressure to meet the expenses of the Crimean War, Gladstone, then Chancellor of the Exchequer, noted the lack of Treasury supervision of public education expenses.

One key point of dispute has been whether Lowe introduced the principle of payment by results into the Revised Code as a way of simplifying, rationalizing, and monitoring the centralized allocation of funds to individual schools or whether payment by results was used as a smoke screen for promulgating a policy of general retrenchment of parliamentary funding of elementary funding.

Morris (1970, pp.14, 19), Hurt (1971), and Fletcher (1972) have all argued that administrative simplification and efficiency were primary motives behind Lowe's incorporation of Payment by Results into the Revised Code. According to this view, the previous arrangement set in place by Kay-Shuttleworth had become increasingly cumbersome and difficult to monitor as a centralized bureaucracy into London attempted to allocate grants to thousands of schools scattered over England (Fletcher 1972; Morris 1970, pp.14, 19). Centrally appointed Inspectors had been visiting and issuing reports on schools receiving parliamentary grants long prior to the Revised Code of 1861. Lowe argued that examination results from individual children rather than inspector's reports on the school as a whole were required because the inspectors were disposed to be too lenient. Lowe noted that Inspectors' assessment of the state of instruction in the three R's was far more sanguine than that of the 1861 Newcastle Commission. In his words:

"We said, we will appeal to the facts, and not go on reasoning apriori. We said we will go to the schools, examine the children, child by child, and have a complete report, and then we shall know whether the Inspectors or the Commissioners are right (Cited in Sylvester, 1974, p.67)."

This point of view has argued that payment by results under the Revised Code would not necessarily lead to a decline in parliamentary grants for elementary schools; that by basing funding allocations to schools on examination results, the Education Department was in fact making an open-ended commitment in terms of the its level of funding to schools, and that the Education Department and Parliament had no way of predicting the level or even direction of funds to be directed to elementary schools (Fletcher 1972; Fletcher 1981; Morris 1977, pp.10-11). Morris (1970, p.19) argues that Lowe probably intended to maintain the level at which parliamentary grants to schools had been running and that the reduction which actually occurred reflected unpredictability of the results of the new funding formula. Lowe, himself, admitted the uncertainty involved in predicting the impact of the new funding formula on levels of parliamentary spending. And he was prepared to support further increases in parliamentary spending for education as long as he could confirm that the money would be spent "efficiently."

In perhaps the most oft quoted statement in Victorian educational history, Lowe stated in his 13 Feb. 1862 speech to Parliament:

“I cannot promise the House that this system will be an economical one, but I can promise that it shall either be one or the other. If it is not cheap, it shall be efficient; if it is not efficient it shall be cheap. The present is neither one or the other. If the schools do not give instruction the public money will not be demanded, but if instruction is given the public money will be demanded...I cannot say to what amount, but the public will get value for its money.” (Cited in Sylvester, 1974, p.61).

In an 1867 speech to Parliament, Lowe said:

I would not grudge the sum of 70,000 pounds per annum, or a much larger sum for the education of the people, if I believed that the money would produce a beneficial effect. I have assisted on more than one occasion in reducing the amount of the grant for public education; but on those occasions I saw the reductions were consistent with—nay, I believed would be the cause of—the greater efficiency of the system. Therefore, I beg the House will understand that, although I am a friend to economy, I only uphold economy when combined with efficiency. I think that no sum that this House would grant would be too large if by its aid the education of the people would be rendered more efficient.” (cited in Sylvester 1974, p.61).

Marcham (1979; 1981) has argued that Lowe's primary objective in incorporating a policy of payment by results and in introducing the Revised Code more generally was to save money. He cites statements which underscore both Lowe's interest in economizing and his alleged unwillingness to contemplate providing close to universal access to elementary schooling. Sylvester (1974b) in showing Lowe's contribution to the 1870 Education Act which made provision for universal schooling would seem to effectively challenge Marcham on the latter point. However, Marcham in evaluating the purposes payment by results provisions of the Revised Code has focussed narrowly on the intentions of Robert Lowe their immediate author. Lowe in fact resigned his education policy role in 1864 while payments by

results provisions related to examination results in the 3 R's persisted in parliamentary funding of elementary education until 1890. The survival of this scheme in some form for the next 30 odd years suggest that it was compatible with a number of the main interests involved in elementary education rather than simply the illiberal views of one stubborn politician or a matter of ideology. For the scheme to persist as long as it did as a functioning educational policy implies that it produced a suitable accord among the various interests involved in shaping this policy.

From the Treasury Department's perspective, payments by results can be seen as offering several advantages. First it offered the prospect, though subject to uncertainty, of slowing the rate of growth of parliamentary expenditure below the dramatic ballooning that had occurred in the 1850's. Indeed, commentators have often noted the drop in education expenditures which occurred from 1861 through the mid-1860's. Much of this drop occurred before payment by results was fully implemented in 1864. And the bulk of the drop can be associated with a decreased commitment to funding the pupil teacher system rather than being any direct outcome of poor examination results as has been demonstrated in Morris (1977). Second it provided greater assurance that the treasury was getting value for the money it was spending than an inspector's visit to a school and subsequent report, as the quote cited above suggests. As Patrick Cumin, one of the Assistant Commissioners to the Newcastle Commission and subsequently head of the Education Department, told the Cross Commission in the 1880's in defending payment by results:

"unless you have got on paper that the inspector has actually examined so many children, you have no security that there has been any inspection or examination at all;...considering the great difficulties of administration and the objections taken to the examinations, I do not think that any department could defend either their inspectors or the examination unless they had something in black and white to show what was done in a particular school on a particular day.(cited in Sutherland, 1973, p.259).

Related to this it provided a form of monitoring and supervision that would be otherwise very difficult for a centralized government agency to undertake on thousands of individual schools dispersed throughout Britain. It should be noted in this regard, that education proposals put before parliament from the 1830's onwards had tried to find ways to shift the burden of funding onto local property rates; but these proposals had foundered on the difficulties of reconciling the conflicting interests, religious and otherwise involved. Lowe in particular perceived that education should continue to be a local responsibility based primarily on local initiative. Payment by results reconciled this with some centralized funding and monitoring of how this money was being used. Finally, payment by results provided a way of allocating the parliamentary grant to the thousands of schools involved while maintaining the accountability just described. As the Cross Commission stated in its final report:

"It must be borne in mind, that after all, what is called "payment by results" is a method devised for distributing the Parliamentary grant, not only in some proportion to the work done in each school, but also in such a manner as to satisfy Parliament that the results for which the money is voted, are actually attained. (Cross Commission, Final Report, p.183)."

A key factor in the feasibility of administering the payments by results system was that Lowe proposed quite specific criteria for examining students in the three R's. Lowe did not intend that elementary education be confined to the specific skills on the exam. He indicted instead that examinations would be confined to them because they were the only ones suitable for standardized examination. All the same it was noted that the examination could be administered differently and different results obtained dependent on how the individual inspector approached matters. Whatever, its shortcomings, the exam criteria were noteworthy for the capacity of reasonably uniform administration. The criteria themselves seem to have been based on an earlier abortive scheme developed by Ralph Lingen when he was in charge of the Education Department in the 1850's (Sylvester, 1974, pp.51-55).

Other interests than the treasury were clearly concerned with Parliamentary funding of elementary education. They would seem to have had some role to play in the rapid of growth of expenditure on elementary education in the 1850's and in preventing larger cuts than actually occurred in expenditure levels in the 1860's. In other words, political support for funding elementary education by parliament must have been coming from somewhere for the level and rate of growth of funding to have been what it was.

One key interest supporting funding for elementary education was that associated with schools affiliated with the Church of England consisting of the National Society along with others in the Church of England establishment that saw it in the interest of the church to maintain schools in which Anglican doctrine was taught. One basic reason why Anglican interests would have at least not opposed the introduction of payment by results is that this enabled Anglican affiliated schools to continue to receive parliamentary funding.

A basic alternative to parliamentary funding of education was funding out of local property taxes, that is out of what were called local rates. Numerous legislative attempts were made in Parliament from the 1840's onwards to shift funding of schools to local rates. One major reason for this was to relieve parliament of the burden of funding education. Moreover, it was generally perceived that education was fundamentally a matter for local provision given the difficulties of centrally administering schools. However, the key sticking point in attempts to fund schools out of local rates was the perception by Parliament generally and the Anglican interests in particular that shifting to local funding would increase local control of personnel and curriculum and hence in many localities weaken the Anglican position

relative to other groups in providing elementary education. Thus Anglican interests found it less threatening and more appealing to be subject to the vagaries of a pay for performance system of funding schools than having schools funded out of local property rates subject to the influence of non-Anglican interests.

The compromise that was reached with the landmark Education Act of 1870 was to "fill in the gaps" in areas deemed deficient in schooling out of local property rates through schools operated by locally elected school boards but with existing voluntary schools, including those affiliated with the Church of England continuing to receive parliamentary funding to enable them to remain competitive with the Board schools. Anglican groups were presumably aware that funding by examination results was required to sustain continued parliamentary funding and that they would do at least as well by this as any other method for allocating parliamentary funds for education. One way of viewing the situation is that local property rates were used to improve the situation in educationally deficient areas while the funding by examination involved with payment by results met the interests of those groups most concerned and supportive of elementary education.

The terms under which grants were provided under the Revised Code were changed a number of times in the 1860's and 1870's. These changes included additional allowances for examinations in more advanced subjects than the three R's and reductions in deductions for endowment income. These changes can be seen as reflecting the political influence of Anglican and other voluntary school groups. Sutherland (1973, p.193) suggests that one motive behind these changes in terms "was a desire to ensure the financial survival of the voluntary schools." She also comments in describing the changes made in the terms of grant in 1878 that "the Code was coming to resemble a system of checks and balances worthy of any eighteenth-century constitution-maker (Sutherland, 1973, p.198)." This indicates a role for political compromise as much as an effort to get value for money in the on-going evolution of Payment by Results. One major group that seems to have generally opposed payment by results consisted, perhaps not surprisingly, of teachers. Lowe's predecessor, James Kay Shuttleworth wanted to boost teacher salaries and provided for salary augmentation grants from Parliament that went directly to individual teachers. Lowe ended this feature and seems to have thought that teacher salaries should be subject to market forces and determined by bargaining with local school managers (see Sylvester, 1974, pp.109-110). Moreover, it seems to have been common though by no means universal for teacher salaries under the Revised Code to be set up on a grant share basis. In these cases, teacher salaries were in whole or in part determined as a share of the grant a given school received from Parliament from its examination results (See Sylvester, 1974, p.110; Sellman, 1967, pp.94-101; Rappale, 1992, p.309). In the event, certified teacher salaries do seem to have declined in the first few years after the Revised Code was set in place.

Figures reported by Sylvester indicate a decline of about 10 percent for men and 12 percent for women in average salaries of certificated teachers between 1861 and 1867 (Sylvester, 1974, pp.110-111). Teachers' representatives also reported in various forums that they resented the monitoring of their efforts by inspectors and that the role of exam results in determining school incomes had the effect of instilling an assembly line atmosphere in the class room. However, there is little indication that teacher opposition played a central role in ending the policy of payment by results. (Sylvester, 1974, pp.110-111).

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The payment by results system was abandoned when Anglican groups no longer thought it assured them an appropriate share of government money and when treasury officials became increasingly uncomfortable with costs and inefficiencies in administering a payment by results system. Ever-increasing numbers of inspectors had to be hired. And the treasury was increasingly suspicious that overpayments due to inappropriate age levels for those taking exams were rising. Restrictions and accompanying expenditures that the government was requiring to qualify for payments by results were by voluntary groups as placing their schools at increasing disadvantage relative to board schools which qualified for funding (Sutherland, 1973, Chaps. 8 and 9).

Thus the rise and demise of payments by results is to be seen as due to the shifting balance of political interests that supported or ceased to support it. During its initial phases it was seen as providing needed accountability and monitoring for school expenditures directed to the locality. However, the growing scale and complexity of school funding arrangements meant that it eventually was not perceived as providing suitable monitoring and support. The entire centralized inspectorate system was seen as too clumsy and costly and the 1902 education act thus shifted basic power to local education authorities to delegate supervision to local levels. During its initial phase, the voluntary groups that were an obstacle to government supported diffusion of schooling in areas otherwise not served viewed payments by results as expanding funding in ways advantageous to their position. But as board schools rose along with schooling levels, voluntary groups no longer saw payments by results as a way of preserving their advantage and demanded more unrestricted funding sources.

II.. The Impact of Payment by Results on Parliamentary Funding for Elementary schools.

Table 1 indicates that initially after the Revised Code was established in 1861 that parliamentary funding for elementary schools fell for a few years and not until the early 1870s reached levels just before the Revised Code. Commentators on the Revised Code have frequently noted this fall in funding and ascribed it to payment by results. In fact, payment by results does not appear to have been fully in place until 1864, after much of the initial fall in funding had occurred. Thus fall would seem to be due to other changes in education funding policy.

Table 1

Year	Parl. Spending on Ed.	Sutherland's Est.EdSpd	Decadal % rise
1841	31,370		
1851	164,346		424%
1861	833,534		407%
1870	894,561	760,561	
1871		828,251	7.3%
1881		2,535,967	206%
1891		3,781,274	49.1%
1895		6,661,640	76.2%

Prior to the revised code it appears that Parliamentary funds were distributed to schools in a way that either was neutral or somewhat favored areas that relatively educationally advantaged as measured by school enrollment rates and signature rates at marriage. However, in 1866, after payment by results, the correlation across counties between percentage of schools receiving parliamentary assistance and initial educational conditions was clearly positive (Mitch, 1992, p.120). One explanation of this result is that many church schools with access to local funding chose to forego parliamentary grants to avoid being subject to examination, inspection and other forms of government scrutiny. Unfortunately, published statistics on parliamentary funding for schools make it difficult to examine the geographical distribution of funds after 1861. But all the same this issues deserves further consideration. The issue of how

voluntary sources of school funding changed to compensate for falling parliamentary grants will not be considered further here.

A more direct indication of a school's parliamentary grant was influenced by the outcome of student examinations is provided by considering the basic terms of the grant. It has been estimated that in the years just prior to the revised code, that the parliamentary grant for maintenance of schools had been running at 10 shillings per student in average attendance (Morris, p.19). The basic terms of the revised code were that grant of 4 shillings per student in average attendance would be given regardless of examination results and with a further grant of 2.67 shillings per student for a successful pass in each of reading, writing, and arithmetic up to a total of 8 shillings per student based on examination results. In other words, under the terms of the Revised Code, the maximum grant per student was 12 shillings. In the last half of the 1860's, after the Revised Code had been set in place, the grant per student averaged 9 shillings. With the amount of this 9 shillings due to examination performance being 5 shillings, the implied average pass rate was  $\frac{5}{9}$  or 62.5 percent. Achieving the pre-Revised Code figure of 10 shillings per student would have required grant income from examination results of 6 shillings or an average pass rate of  $\frac{6}{9}$  or 75 percent. A pass rate of 50 percent on average would have lowered income per student from Parliamentary grant to 4 shillings from examination results or to a total of 8 shillings.

As will be considered in more detail shortly, it appears that most schools were able to achieve a 50 percent pass rate with the onset of the Revised Code. At the upper limit, only the better schools achieved a pass rate in excess of 90 percent. So the plausible variation in average examination income per student was between 4 shillings and 7 shillings implying a range of parliamentary grant per student ranging between 8 shillings and 12 shillings.

Reports by school inspectors published in the Parliamentary Papers provide a fuller picture of the range of examination pass rates achieved by individual schools. E.P.Arnold (1867) reports the examination pass rates (averaged over the school and not broken down by subject) for 170 Church of England Schools examined in Cornwall and Devon that year. The schools examined were below the national average in examination performance. Arnold (1867, p.43) reports examination pass rates in his district of 79.7 percent in reading, 77.1 percent in writing, and 60.5 percent in arithmetic. In comparison, the national average for Church of England schools was 89 percent in reading, 85.2 percent in writing and 73.8 percent in arithmetic. Arnold (1867, p.47) suggested the following bench marks for performance, with his criteria including both the examination pass rate and the percentage of students examined in upper standards, that is standards IV through VI. He set forth a good performance as a 75 percent pass rate combined with 31 percent examined in the upper standards, a fair to very fair performance as a 65

percent pass rate combined with 28 percent examined in the upper standards, a moderate performance as 55 percent pass rate with 20 percent examined in the upper standards and a bad performance as under 55 percent passing with less than 20 percent examined in the upper standards. Further benchmarks are provided by the points noted in the previous paragraph that a 75 percent pass rate would provide a parliamentary grant per student at the level prevailing before the Revised Code was enacted and that level of grant prevailing after the revised code implied an examination pass rate of 62 percent.

What Arnold's (1867, pp.48-51) figures imply is that of the 170 schools for which examination pass rates are reported, 6 or 3.5 percent had pass rates over 90 percent, 70 or 41.2 percent had pass rates over 75 percent, 116 or 68.2 percent had pass rates over 65 percent (Arnold's cutoff for "fair schools"), 124 or 73 percent had pass rates above 62 percent (the average implied by Revised Code funding levels), while 143 schools or 84 percent had pass rates above 55 percent (Arnold's cutoff for being a moderate rather than a bad school). Only 4 schools had pass rates below 40 percent, with the lowest rate being 31.4 percent.

Arnold's figures indicate that in his relatively poorly performing district, 41 percent of the schools performed well enough on examinations to obtain a level of parliamentary funding per student at least equal to that of the pre-revised Code era. The 54 schools or 32 percent of those reported that had examination pass rates between 62 percent and 75 percent were at jeopardy for losing 1 shilling out of the 10 shillings per student obtained by Parliamentary grants before the revised code, thus a 10 percent loss. Only 15 schools or 8.8 percent of the total had pass rates below 50 percent and thus risked losing 2 shillings or more per student or over 20 percent of what had been received before the Revised Code. Thus, Arnold's figures indicate that most schools risked a loss of no more than 10 percent of the grant received per student before the Revised Code was set in place.

Trends in examination pass rates provide one indicator of the extent to which there may have been improvement over time and the extent to which learning and adjustment to the pressures to secure good examination performance occurred. Table 2 reports trends at the national level in examination pass rates. The important caveat should be noted that the pass rates reported make no allowance for the changes which occurred over the period covered in the specific criteria used for examination. The criteria seem to have been raised and in that regard, Table 3 may understate the improvement which occurred over time. Table 2 shows clear indications of improvement in examination performance in the first few years after the Revised Code for students in Standard I, that is for those at the lowest level. No clear trend in Standards II and III.

Table 2 Examination Pass Rates

A. Reading

Year	Standard I	Standard II	Standard III
1863-4	79.8%	89.15%	93.6%
1866	85.25%	87.2%	91.2%
1867	86.6%	88.1%	92.0%
1872	84.4%	90.6%	91.9%
1877	79.2%	89.4%	90.3%
1882	84.1%	90.96%	91.2%
1887	87.8%	94.1%	93.2%

B. Arithmetic

Year	Standard I	Standard II	Standard III
1863-64	73.2%	74.75%	81.05%
1866	80.3%	72.6%	75.1%
1867	82.4%	73.9%	76.4%
1872	74.1%	78.0%	65.4%
1877	69.8%	76.4%	67.6%
1882	79.7%	82.1%	76.7%
1887	87.95%	88.1%	85.3%

Source: Annual Reports of the Committee of Council on Education.

Examination trends as measures of the impact of payment by results on educational performance have subject to extensive criticism on both the narrower grounds that examination performance reflects efforts to teach to the test and to instill rote, mechanical learning and on the broader grounds that specific, narrowly defined skills such as reading or writing certain passages from set texts as was the practice under the Revised Code aim too low in developing the capacities of students, no matter how humble the segment of the working-classes from which they come. This latter point was made forcefully in Hodgson's (1867) criticism of the educational standards set in place by the Revised Code. Aggregate trends in parliamentary funding for elementary schooling trace out a "J" shape at first declining and then rising. Did this pattern reflect positive learning or response effects to payment by results?

B.J.Binn's (1867) report on Church of England Schools in Wales offered a generally sanguine assessment of the impact of the Revised Code. He cites in particular a newspaper report by "the rector of a populous parish":

"The wounds probed two years ago by the Revised Code have been of the utmost service. There is a vast difference between 263 pounds this year and 80 pounds then. The truth was, the Old Code made us all indifferent teachers as well as managers. We knew that we should get our money, and there it was; in a large parish like this many things must be done, and we neglected that which we believed would come just the same whether we attended to it or not. This is human nature. But the Revised Code is a different thing. The school must be looked after as well as the sermon. I never miss a day now in going to one or other the schools." (Cited in Binns, 1867, pp.78-79).

In contrast, Rev. Kennedy's report on Church of England Schools in South Lancashire provide an interesting balancing of beneficial and adverse effects of payment by results:

"The bad schools have been made better --, but the best schools have been made worse. The best schools have lost ground in respect of masters, in respect of number and quality of pupil teachers, and in respect of classification of scholars, which is now affected by the standard system..They have also lost by an over-anxious and excessive attention to reading, dictation, and arithmetic, and by the consequent exclusion of other subjects, or at least comparative neglect of them...On the other had, Revised Code system has had a good effect upon careless masters, and perhaps I may add careless managers. It has compelled them on all accounts to see that the children learn some essential things with at least a fair amount of accuracy." (Kennedy, 1867, pp.170-71).

The contrast between Binn's view that greater teacher and school manager effort and attention could play a critical role in improving educational outcomes and Matthew Arnold's view that low rates of school attendance were the the main impediment to improving performance are of particular interest in

considering the impact of the revised code. These lead to a consideration of the specific ways in which educational outcomes might have been influenced by payment by results.

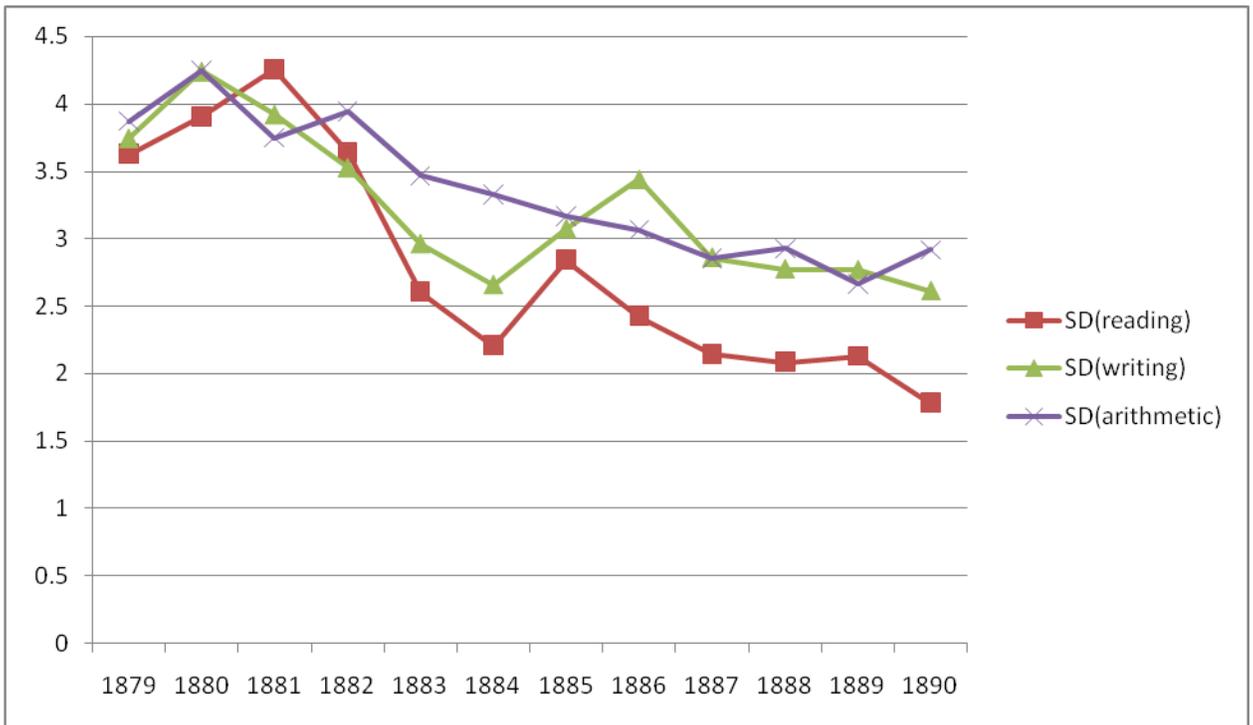
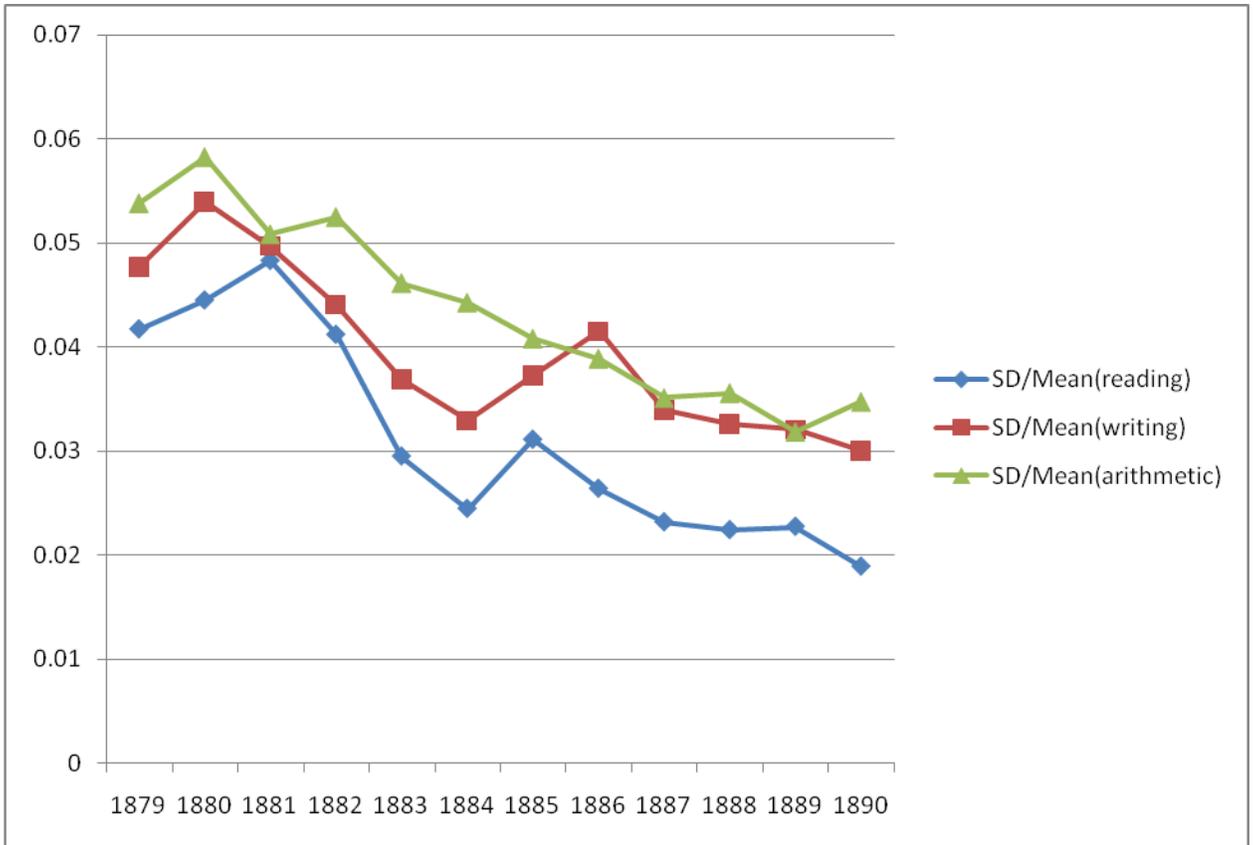
Did payment by results widen the gap between effective and ineffective schools by diverting increase amounts of resources to the former and away from the latter? Or did the policy actually narrow gaps by prodding initially ineffective schools to improve and weeding completely schools that would not respond to incentives? Consideration of county level trends provides one way of addressing this set of questions.

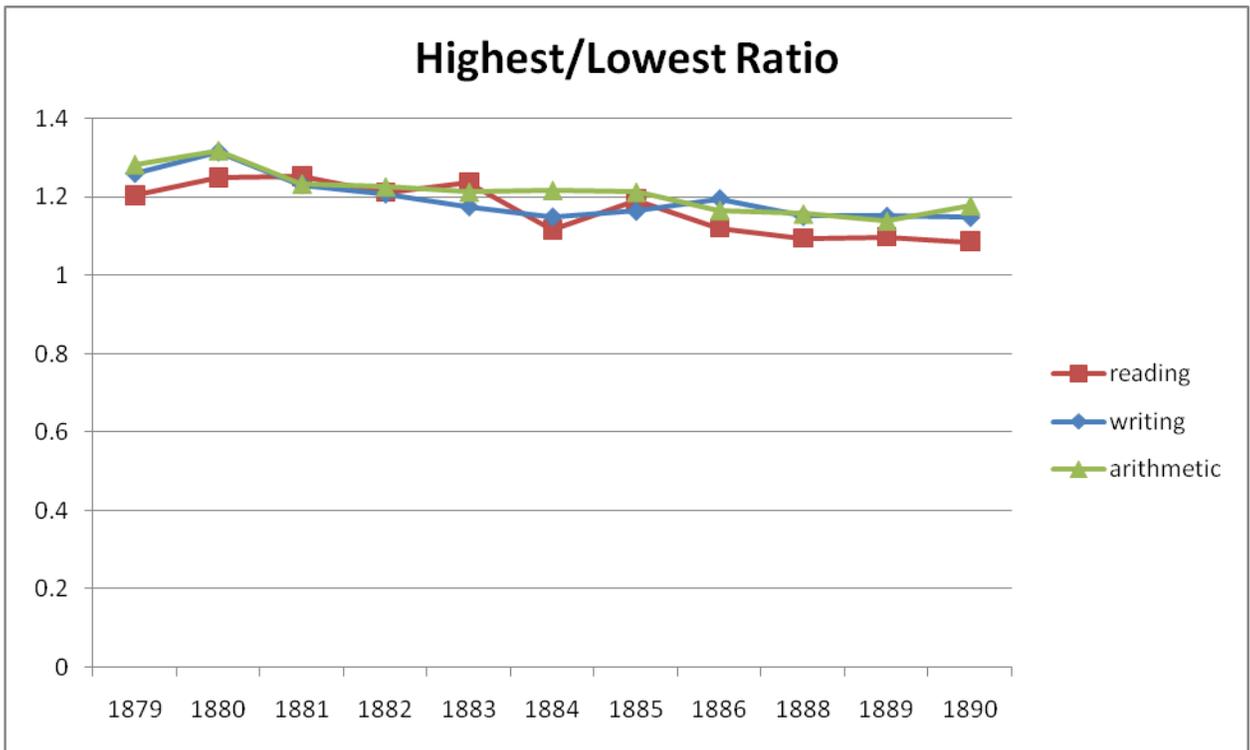
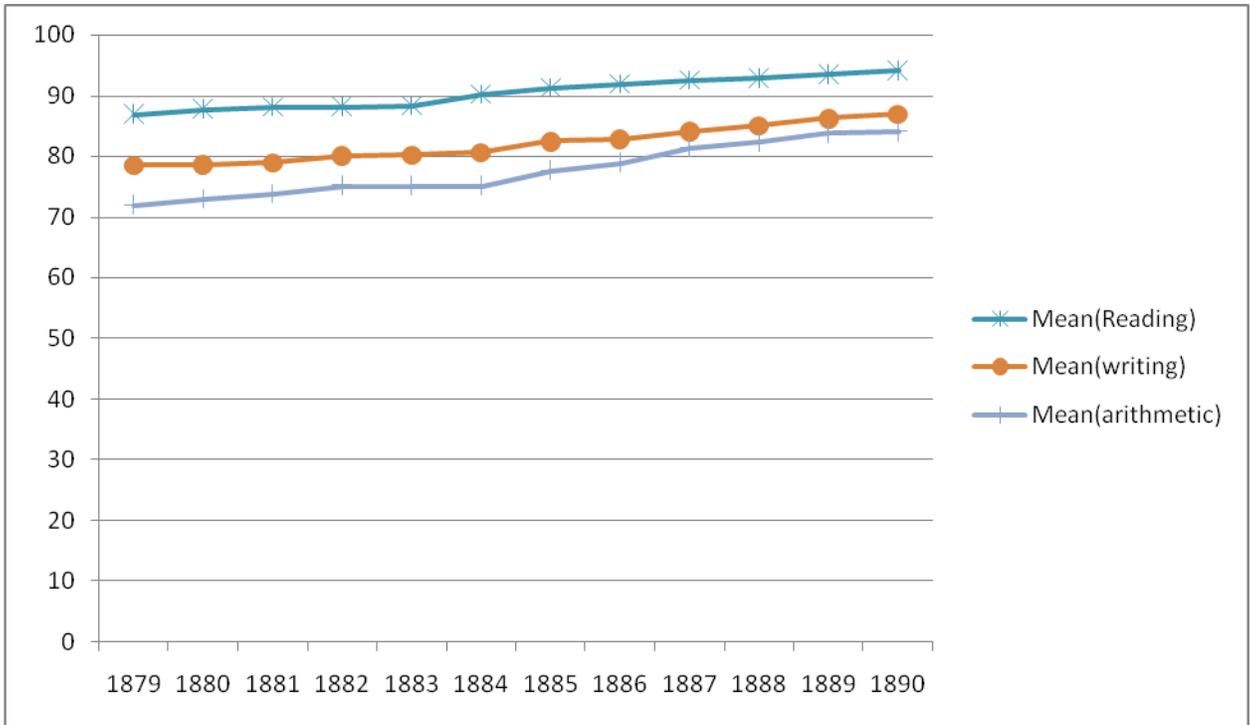
### III. Trends in the dispersion of County level educational inputs and outcomes.

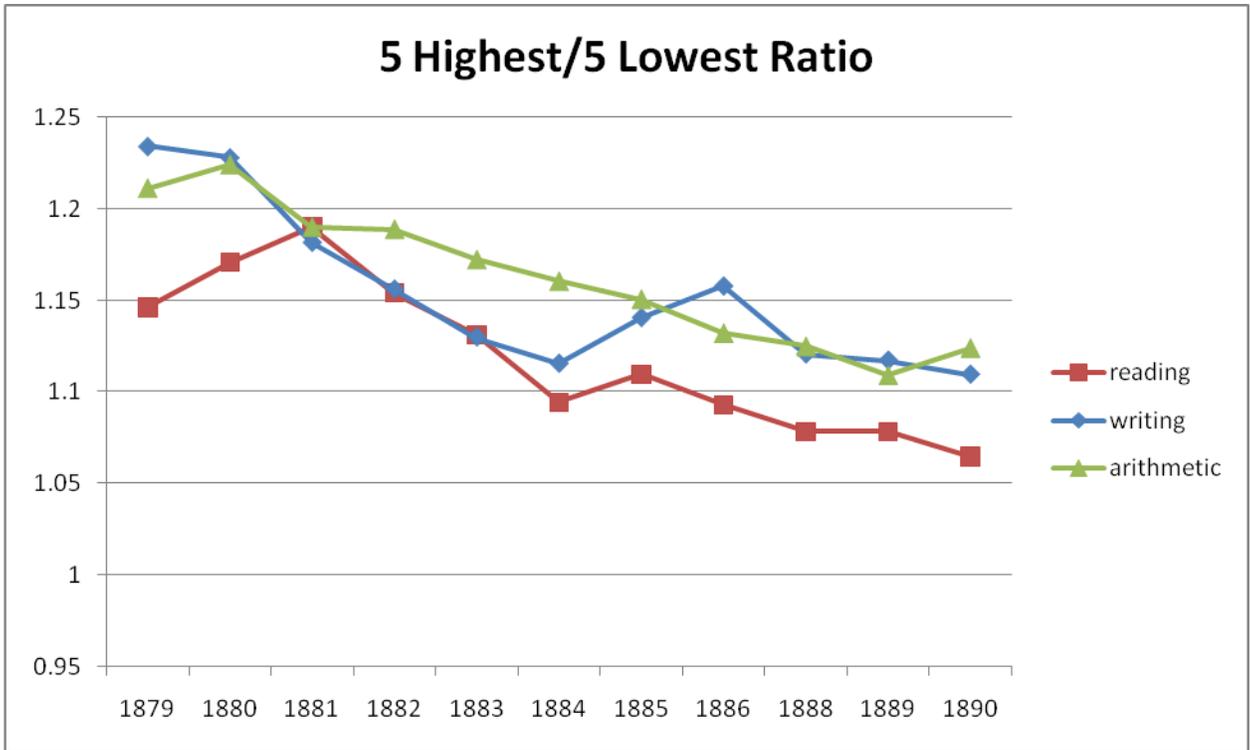
In the mid-Victorian period, England was divided into some 40 counties along with Metropolitan London and Wales. From 1879 through the end of the century, the Committee of Council on Education reported key educational statistics for these 42 county level units annually. Unlike say county level school boards in the United States, English counties did not have any administrative or educational funding authority in England during this period. Nevertheless, there was considerable dispersion across these counties in both educational outcomes and measures of educational inputs. Thus, examining county level trends provides a convenient way of considering the extent to which the Revised Code led to a widening or narrowing of disparities in educational resources and outcomes.

While it might seem most obvious to focus on examination results as a measure of educational performance and to consider dispersion or convergence across counties in examination results as a net measure of impact, the perspective taken here is that examination results influenced the funding of schools. Hence rather than focusing on the extent to which divergence in funding and other measures of educational inputs resulted in dispersion in examination results, the perspective taken here will more on whether dispersion or convergence in educational outcomes resulted in convergence or divergence in funding and other measures of educational inputs.

The dispersion across counties in all three basic examination subjects (reading, writing, arithmetic) generally trended downward between 1879 and 1890 whether measured by trends in the coefficient of variation across counties or ratios of highest to lowest or ratios of five highest to five lowest counties.



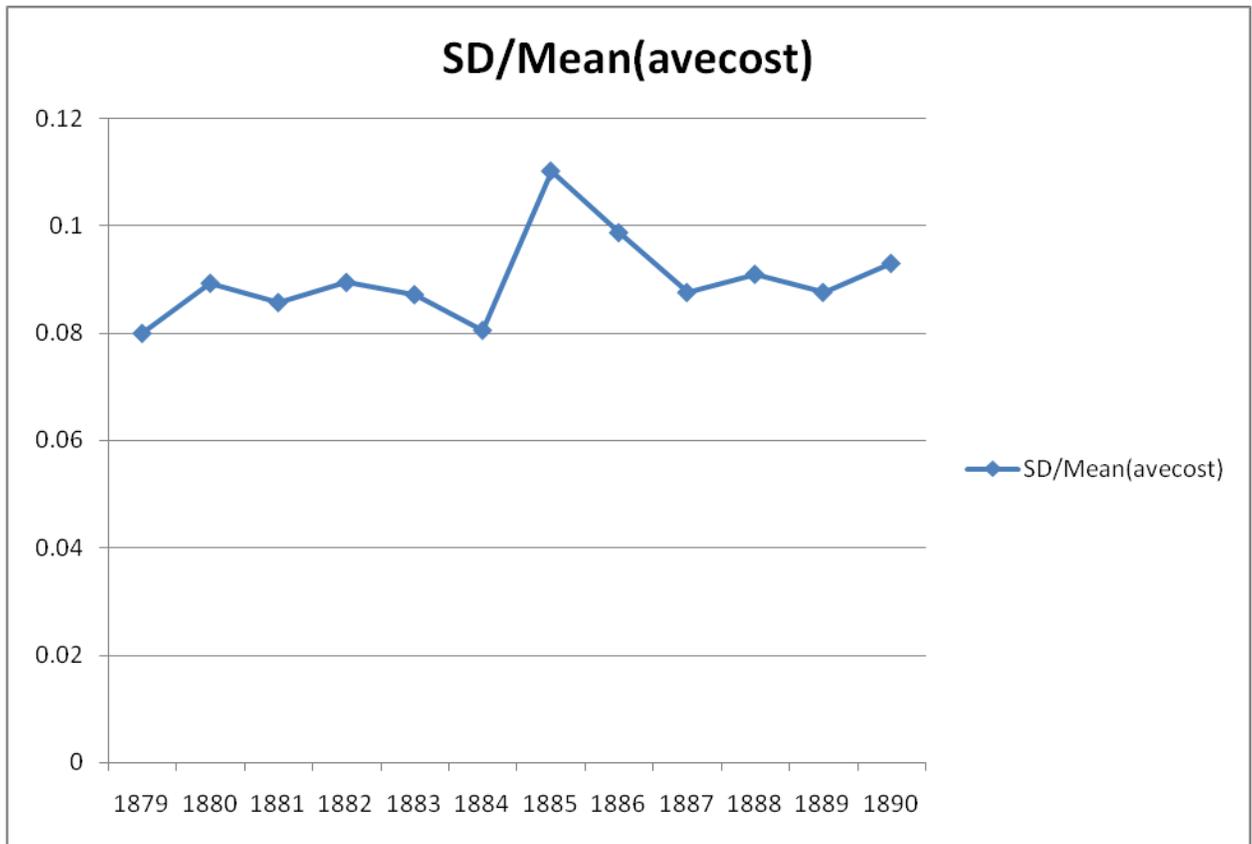


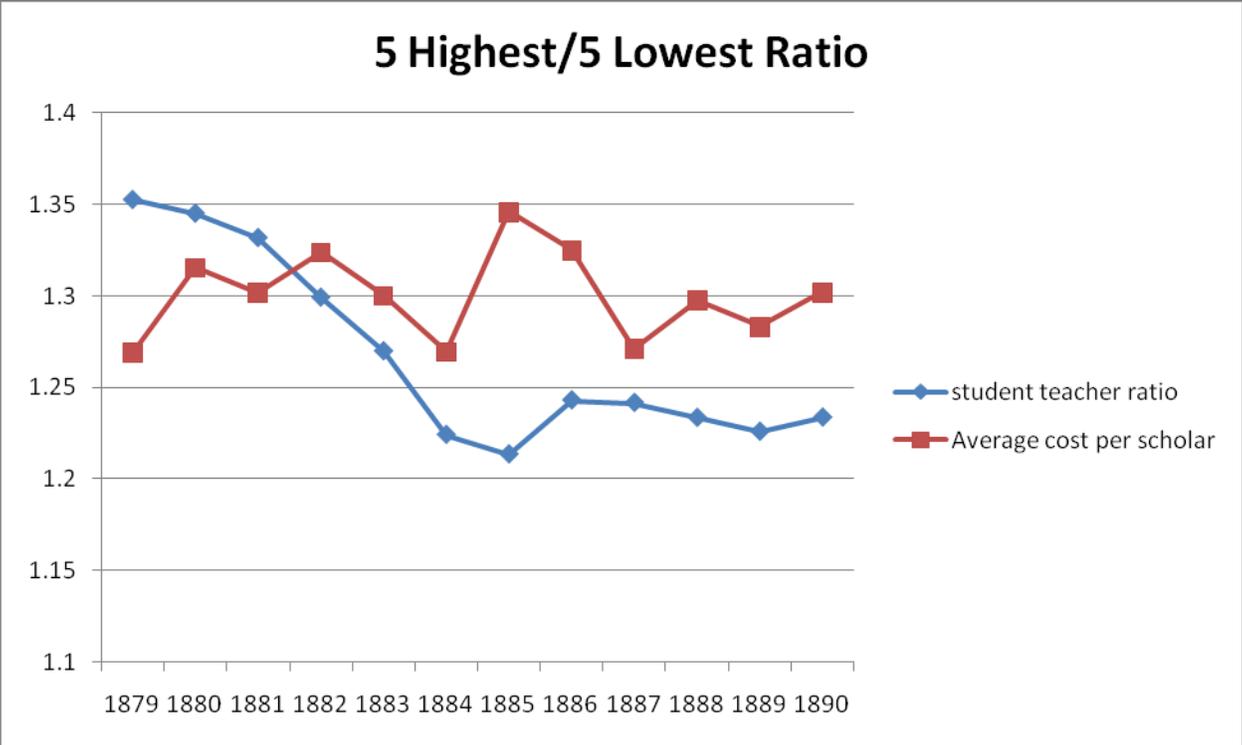
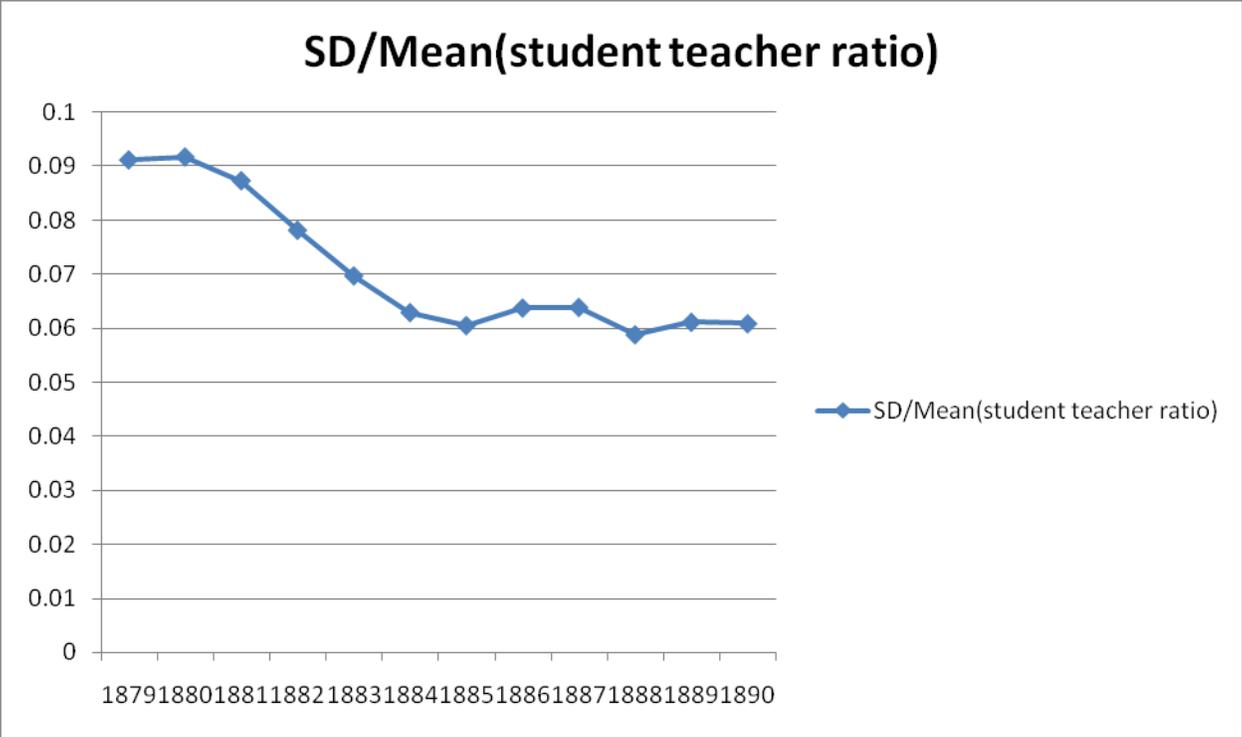


	% Grooms Signing at marriage 1839-45	% Grooms Signing at Marriage 1875	Reading pass rate 1879	Reading Pass Rate 1890	Writing Pass Rate 1879	Writing Pass Rate 1890	Arithmetic Pass Rate 1879	Arithmetic Pass Rate 1890
High	74%	92%	92.7%	97.4%	85.7%	92.8%	79.8%	90.3%
Low	43%	71%	77.1%	89.8%	68%	80.8%	62.2%	76.6%
5 Highest	71%	89.4%	91.8%		84.5%		78.8%	
5 lowest	45%	70.6%	80.1%		71.7%		65.0%	

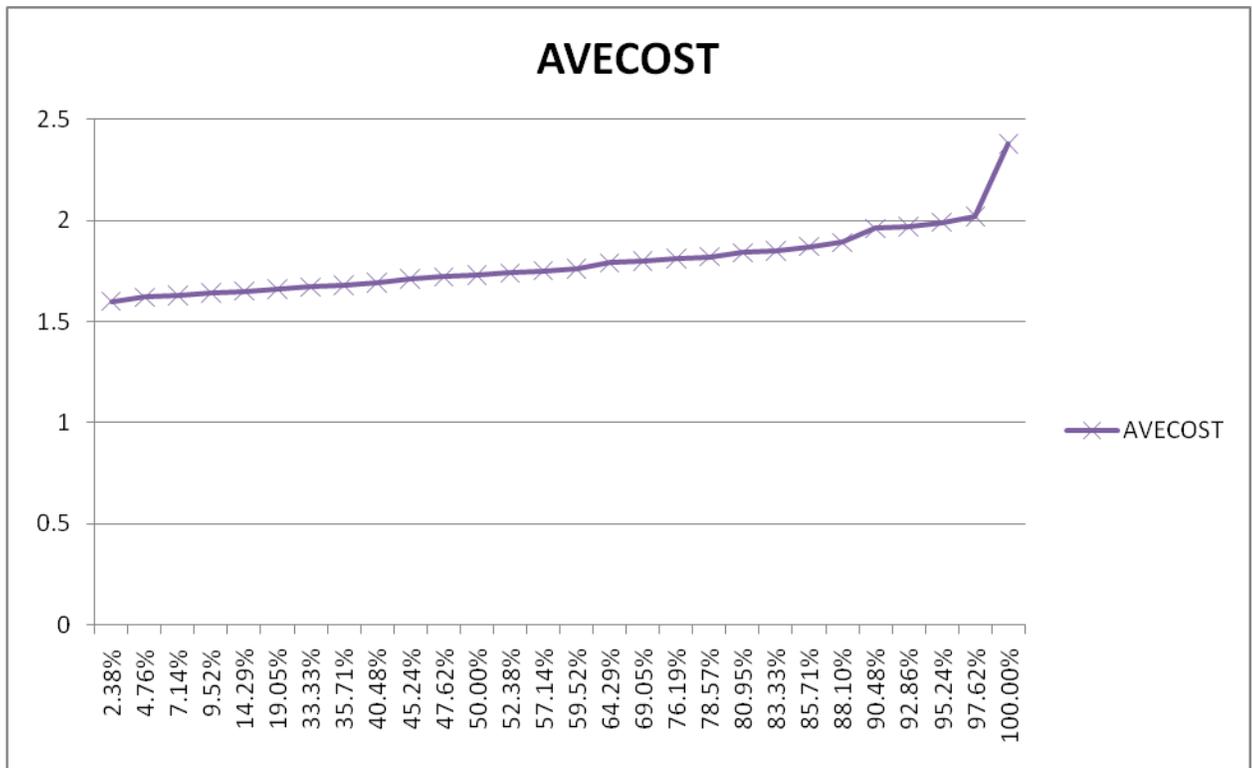
#### IV. Trends in Educational Equity during the Payment by Results Era.

Whether this convergence in educational outcomes was reflected in convergence in educational inputs appears to depend on which measure of educational inputs is employed. One obvious input measure is expenditure per student. Evidence available on this measure indicates if anything divergence over time across counties. However, if the student/teacher ratio is employed, another common input measure, then there do appear to have been both overall declines in this ratio over time and a convergence across counties in this ratio.

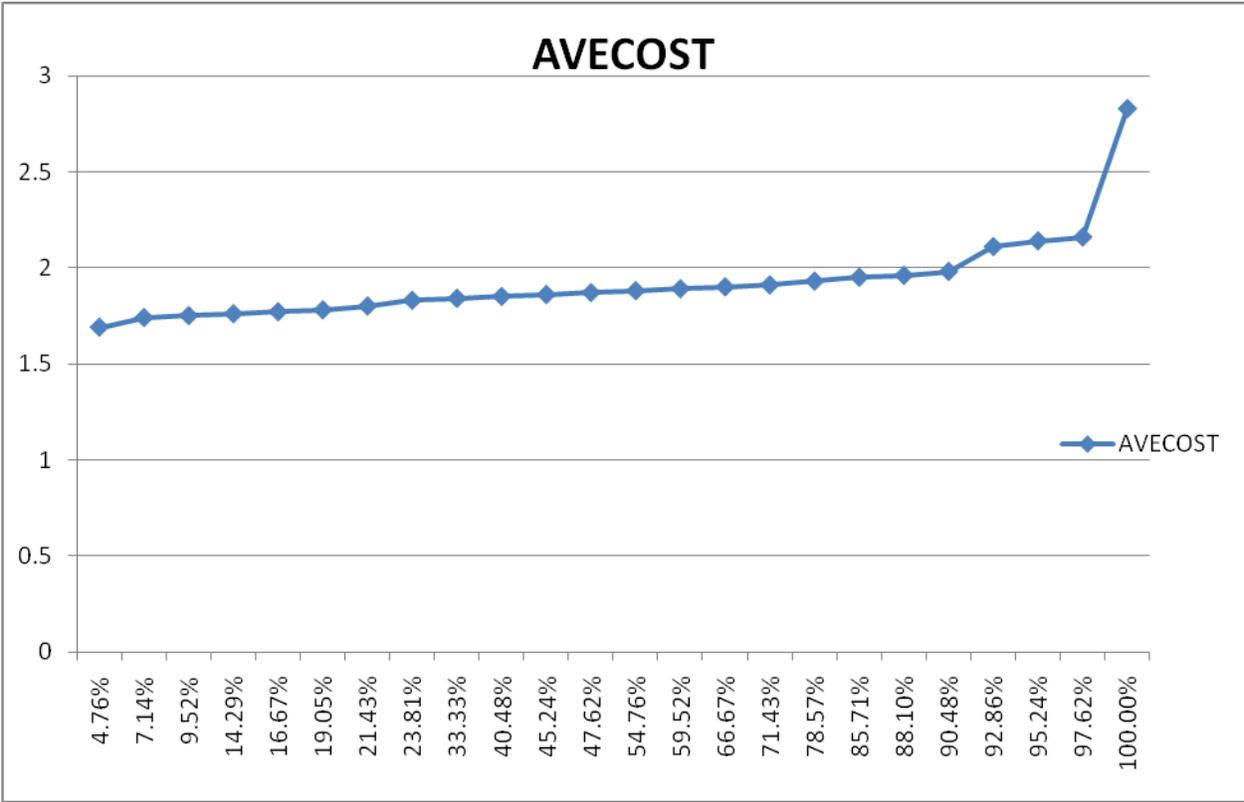




Although regional differences in examination outcomes converged between 1879 and 1890, gaps across counties in expenditure per student did not clearly narrow. The gap was particularly wide between London and other regions of the country and if anything this gap widened over this time period, as the following two figures indicate (the outlier on the right in each figure is for London).

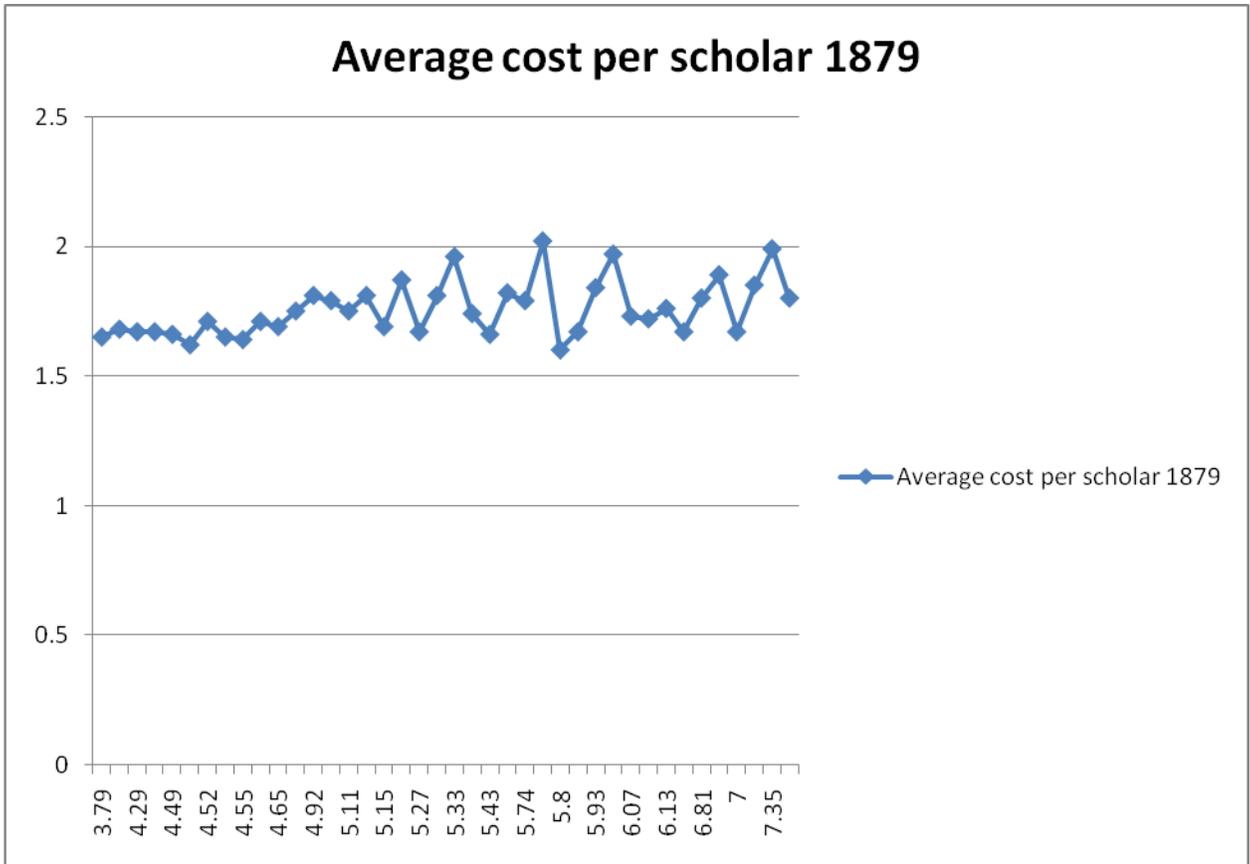


1879: Average Cost per student in 1879 for a given county on vertical axis plotted against cumulative frequency distribution from low to high.

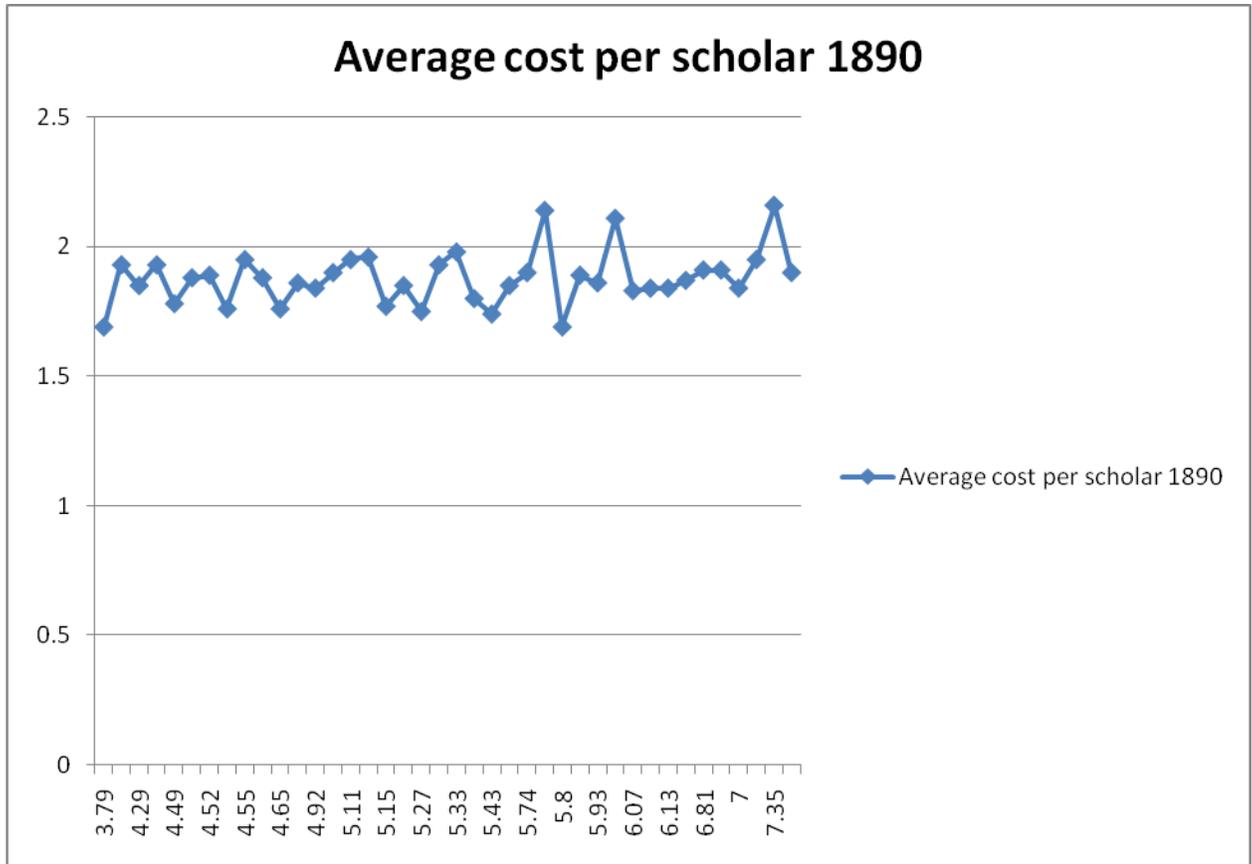


1890: Average Cost per student in 1890 for a given county on vertical axis plotted against cumulative frequency distribution from low to high.

A standard indicator of educational equity across students or more aggregated units is whether some measure of educational advantage bears a systematic positive relationship to measures of social and economic advantage. The more positive such relationships, the more inequitable the situation would be according to one line of analysis (see Berne and Stiefel, 1984). Plots of average cost per scholar in both 1879 and 1890 against assessments of taxable property value per capita in 1859 give suggestions of a tendency for expenditure per scholar to rise as economic advantage measured by assessed property value rises in the county.



Average cost per scholar in 1879 by county plotted against assessed value of property per capita in 1859.



Average cost per scholar in 1890 plotted against assessed value of property per value in 1859.

However, considering both the variation in expenditure per student in general and more particularly any relationship with measures of economic advantage should make some allowance for price level and cost differences across regions. Thus, the far higher level of expenditure per student in London than other counties could reflect higher wage and salary levels in London in general, this in turn reflecting among other factors higher housing costs due to population density. One simple way of both exploring more systematically the relationship between average cost per scholar and economic advantage and also making allowance for regional cost of living differences is to regress cost per scholar on the property value measure and estimates of nominal agricultural wages in a county. The wage variable can be interpreted as controlling for labor cost and cost of living differences. At this point, I have only incorporated property value estimates for 1859; however, in future work I hope also to include property value variables for later years as well.

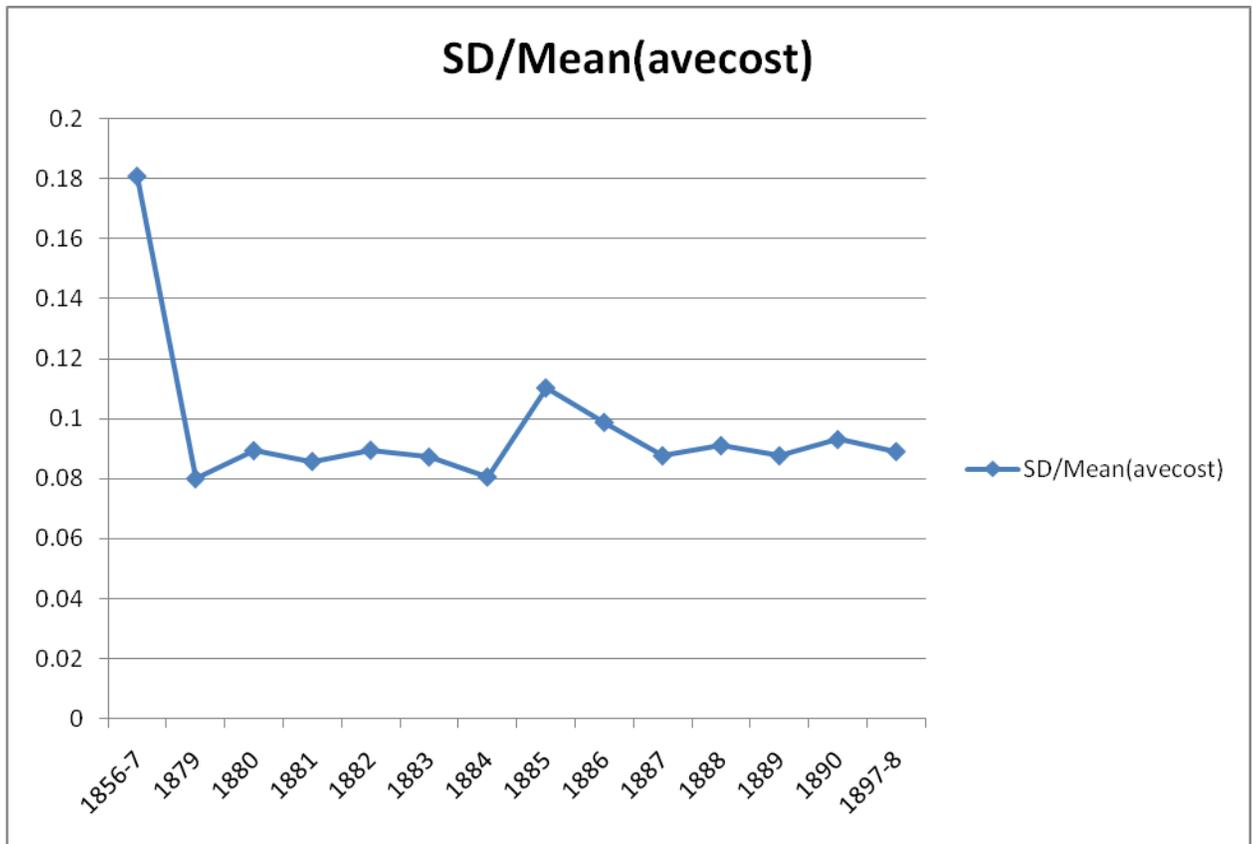
Regressions for cost per scholar in 1879 and 1890 are reported below. Even after controlling for wage levels in the county, the estimated coefficients on property values are positive and statistically significant. However, the magnitude of the impact of variation in property values would appear relatively small; a 10 percent rise in property values above the mean for England and Wales would increase expenditure per scholar in a county by only about 1 percent.

All the same, the fall in the estimated coefficient value on property value per capita between 1879 and 1890 suggests that educational inequity did not widen during the payment by results era and may actually have narrowed somewhat.

Regressions of Average cost per student on property per capita and Ag. wage

	1879	1890
Property per cap 1859	.055 (3.43)	.0432 (3.04)
Wage 1867	.232 (2.75)	
Wage 1898		.385 (4.23)
R2	.341	.4015

A quite tentative estimated at extending measures of dispersion across counties in cost per scholar to dates prior to the start of payment by results in 1861 and after its demise in 1890, also suggest that the policy did not result in marked longer term dispersion in cost per scholar. The earlier 1856-7 measures of dispersion are based on National Society figures for Church of England schools; further work is necessary to ascertain the extent to which splicing these figures with those of the later Committee of Council of Education is appropriate. Taken at face value, the comparison implies a substantial narrowing in dispersion. Between 1890 when payment by results ended, and 1898, the dispersion measure narrows somewhat but not dramatically. The blip up in dispersion around 1885 seems to have been driven by London trends which would suggest further investigation of developments there.



One explanation of why costs per student did not converge across counties despite convergence of examination scores during the payment by results era is that other school funding policies were introduced with offset the impact of payment by results. An examination of trends in the sources of state funding for schools as in the table below indicates the rising importance of local property tax rates which could fund Board Schools as an educational funding source between 1860 and 1890 when payment by results was in effect. One item for further work is to examine the relationship between rate funding through school boards and examination outcomes. Did rate funding tend to rise in areas that were initially educationally disadvantaged?

Trends in the sources of funding for State Inspected Schools in England and Wales, 1860-98

Year	State Grants	Fees	Vol. Subsidies	Rates
1860	39%	26%	36%	
1871	45%	27%	25%	3.50%
1876	37%	24%	20%	20%
1881	39%	22%	13%	26%
1886	40%	21%	10%	29%
1890	39%	20%	10%	30%
1891	40%	19%	9%	32%
1895	57%	3%	8%	32%
1898-99	66%	2%	8%	23%

#### V. Factors influencing convergence or divergence in Examination Results.

One concern about a policy that bases funding to individual schools on recent examination performance is that this could exacerbate initial disparities in the efficiency and level of support for schools. One indication of how much of a problem this was during the period of the Revised Code is to look at the rank order correlation for counties across years for various measures of school inputs and outcomes. Insofar as the Revised Code exacerbated initial disparities in educational support and effectiveness, one might expect that the rank order correlation across years should be high.

There are some indications of a considerable degree of what could be called inertia both across counties at a point in time and over time.

First, it appears that counties that scored relatively high in one basic subject tended also to score relatively well on the two others as well. The rank order correlations between reading and writing and between writing and arithmetic can be rejected as non-random at well below the

1 percent significance level for both 1879 and 1890. The rank order correlation between reading and arithmetic was noticeably lower than the others, but even this can be rejected as non-random at around the 10 percent level. Interestingly, the correlations between one measure of parental educational attainment, signature ability at marriage (or more precisely, its inverse, percent making marks at marriage) and examination results is considerably lower, with randomness not being rejected at conventional significance levels. The strongest correlations are between percent making marks and arithmetic scores. The apparent positive relationship between arithmetic scores and illiteracy of brides at marriage is puzzling and requires further consideration.

Spearman Rank order correlations across counties

	RHO	Prob. > t (on hyp.of randomness)
Reading79 Writing79	0.5802	0.0001
Reading79 Arithmetic79	0.2622	0.0934
Writing79 Arithmetic79	0.4826	0.0012
Reading90 Writing90	0.5339	0.0003
Reading90 Arithmetic 90	0.2555	0.1024
Writing90 Arithmetic90	0.8023	0.0000
Reading79 GroomsMark79	-0.0492	0.7598
Writing79 GroomsMark79	-0.1973	0.2162
Arithmetic79GroomsMark79	-0.2350	0.1391
Reading79BridesMark79	-0.0990	0.5382
Writing79BridesMark79	-0.0378	0.8146
Arithmetic79BridesMark79	+0.2346	0.1398

Note: GroomsMark79 = percentage of Grooms in the County making a mark rather than signing name at marriage in 1879. BridesMark79 is equivalent for Brides

Second, the rank order correlations between scores in 1879 and scores in subsequent years admittedly declines substantially over time. However, one can reject the hypothesis that the

rank order correlations between scores in 1879 and scores in 1890 were non-random at conventional significance levels.

Spearman rank order correlations across counties between percent passing exams in 1879 and subsequent years

	Reading RHO	ReadingProb.>t	Writing RHO	Writing Prob.>t	Arith. RHO	Arith Prob.>t
1880	0.8279		0.9082		0.7927	
1881	0.7621		0.8062		0.7200	
1882	0.7043		0.7498		0.6205	
1883	0.7330		0.5808		0.5923	
1884	0.6507		0.4273		0.2732	
1885	0.5964		0.5568		0.4329	
1886	0.6264		0.5732		0.4757	
1887	0.5354		0.5964		0.5906	
1888	0.3427		0.4813		0.6590	
1889	0.4029		0.5041		0.6114	
1890	0.3623	0.0184	0.4451	0.0031	0.5374	0.0002

Third, the rank order correlation between input measures in 1879 and the same measures in subsequent years is substantial and for most years, one can reject non-randomness at conventional significance levels. This is of some importance for evaluating payment by results as a funding mechanism. The rank order correlation between 1879 and 1890 was much stronger for the average cost per scholar measure than for pupil teacher ratios and the average cost per scholarly measure is arguably of greatest relevance for examining the effects of payment by results on funding disparities. However, even with student teacher ratios, as late as 1888, one can reject non-randomness at conventional levels for the correlation with 1879 student teacher ratios.

Spearman rank order correlations across counties over time between

Average cost per student in 1879 and Student/teacher ratio in 1879 and subsequent years

	Average cost per student	Ave. Cost per student	Student/teacher ratio	Student/teacher ratio
	RHO	Prob.>t	RHO	Prob..t
1880	0.8808		0.9655	
1881	0.8443		0.9318	
1882	0.8101		0.8874	
1883	0.8054		0.8731	
1884	0.7879		0.8088	
1885	0.8019		0.7401	
1886	0.8378		0.7984	
1887	0.7256		0.7687	
1888	0.7388	0.0000	0.8007	
1889	0.6869		0.8475	
1890	0.6120	0.0000	0.6721	

The correlation between the various test score outcomes and average cost per scholar is generally higher and more consistently positive than with student teacher ratios though not uniformly so. Moreover, the correlations between test score outcomes and average cost per scholar in contrast with that with the student teacher ratio strengthens considerably over time. In a basic OLS regression, the coefficient on average cost per scholar remains constant between 1879 and 1890, though the t-statistics in the later period is considerably higher.

Spearman Rank order correlations across counties between percent passing various basic exam subjects and average cost per student and student/teacher ratios

	Reading		Writing		Arithmetic	
	Avecost	Student/Teacher	Avecost	Student/Teacher	Avecost	Student/Teacher
1879	.1248	-.0396	0.0133	-.1195	0.1418	0.1257
1880	-.0559	0.0315	-.1140	-.1289	0.0007	0.0701
1881	0.0431	0.0786	-0.0142	-0.0699	0.0755	0.0293
1882	0.0973	0.0189	-0.0905	0.0485	0.0370	-0.0238
1883	0.0724	-0.1688	-.2396	0.1912	-0.0485	0.2622
1888	0.1383	-.1756	0.1457	-0.3255	0.3067	-0.1845
1889	0.1799	-0.169	0.2341	-0.2038	0.4468	0.1273
1890	0.3369	-0.0154	0.3760	-0.1392	0.3994	0.0585

OLS Regressions with Percent Passing Arithmetic exams in 1879 and 1890 as dependent Variable

	1879	1890
Avecost 79	7.576 (1.80)	7.53 (3.20)
Student/teacher 1879	0.286 (0.83)	0.0113 (0.06)
Constant	15.65 (3.07)	69.22 (8.99)
R-squared	0.0842	0.213
N	42	42

T-statistics in parentheses

Some basic regressions using 1890 test scores as dependent variables indicate that initial test scores in 1880 have statistically significant coefficients.

	Reading	Reading	Writing	Writing	Arithmetic	Arithmetic
Avecost90	3.847 (2.56)	2.745(1.95)	6.98 (3.41)	5.543 (2.75)	7.266 (3.03)	4.46 (1.95)
Stuteacher	-.112(.116)	-.023(-0.21)	-.191 (-1.17)	-.166(-1.10)	.016 (0.09)	.06 (0.36)
Reading80		.2015 (3.13)				
Writing90				.230 (2.78)		
Arithmetic80						0.316 (3.35)
Constant	91.1(18.6)	72.10 (9.59)	80.95 (11.8)	64.64 (7.48)	69.6 (8.92)	50.2 (5.55)
R-Squared	.1494	.3235	.2261	.3565	.1961	.3793

Conclusion:

During an era in which national sources of funding to local schools depended on examination outcomes, examination outcomes did converge between counties. This occurred despite the onset of universal compulsory schooling and the sweeping into the officially inspected school system of elements of the school age population sometimes termed “the residuum.” Nevertheless there were also substantial elements of inertia in examination result dispersion over time. Despite a funding scheme based on examination results and the convergence of these results across counties, it is not evident that school expenditure per student converged across counties. Furthermore, expenditure per student does appear to have varied positively with measures of economic advantage. However, the strength of the measure does appear to have declined at least modestly over the payment by results era. That the dispersion in expenditure per scholar did not narrow more despite convergence in examination results presumably reflects the emergence of property rates as a source of school board funding. One direction for future work is to examine the developing relationship between rate funding and payments stemming from examination outcomes.

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