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Markets in the Provision of Lifetime Learning: Evidence from the United Kingdom

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Abstract[2] – Post-compulsory lifetime learning has been the subject of substantial social, political and cultural investigation, but it has received little attention from economists. This is surprising because this sector operates in more market-like environments than schools; quality of provision is therefore anticipated to depend on the market structure. Using a large-scale survey of providers of lifetime learning, this paper relates the quality of provision to economic notions of competition, ownership and fee pricing. Across a range of proxies for education quality, we find that: (1) market forces are positively correlated to quality; (2) there are significant differences across ownership status, yet no ownership structure appears superior; and (3) direct tuition fee pricing is positively correlated with quality. The first result is anticipated, being consistent with the substantial extant evidence base. The second result is perhaps more surprising, although here the evidence base (and theory) is much less clear-cut. The third result is not only of particular interest, insofar as direct financing (and student voice) may be an important channel for quality improvements, but also novel, in having received little empirical inquiry.

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1.   Introduction

Fundamental to the logic of introducing markets and privatization within the public sector are the notions of competition and ownership (Beesley, 1997; Murphy, 1996). Competition encourages enterprises to cater to the demands of their clients, and ownership ensures that the rewards for a highly demanded service go to those providing it. As well, privatization may, e.g. through the introduction of loans rather than grants, tighten the link between those paying for education and those receiving it. The beneficial effects of this direct charging may include clearer specification of students' needs as customers. Generally, more efficient services should result from privatization, as supply and demand are matched more closely (see evidence in D'Souza and Megginson, 1999; for the effects of education reforms in the UK and New Zealand, see Bradley et al., 2000; Fiske and Ladd, 2000). However, private providers may be much more heterogeneous, some with superior but others with inferior syndromes. Critically, for privatization to be successful public schools would have to adopt only the superior syndromes. The identification of these syndromes is therefore essential.

This paper offers some empirical evidence on competition, ownership and direct charging in the market for post-compulsory 'lifetime learning' education in the UK. This sector has been the subject of much consideration, as a way of *inter alia* empowering citizens and reducing long-term unemployment through re-skilling (DfEE, 1998; Tight, 1998). Yet there are few empirical studies directly on lifetime learning provision: little is known therefore about its scale, the organizational characteristics of providers and the extent of competition (on 'continuing vocational education' in UK universities, see Belfield et al., 2000).   Here, data on 659 provider institutions is analyzed, with direct information available on the ownership status, the extent of competition and a measure of 'voice' within the sector. This analysis considers directly whether these three facets do have beneficial effects on the quality of provision and the efficiency of providers.

The investigation is structured as follows. Section 2 offers a brief summary of the literature on: (a) the effects of competition, ownership, and direct charging on the provision of education; and

(b) the nature of the market for lifetime learning in the United Kingdom. Section 3 describes the dataset and notes the particular advantages of inquiry into the post-compulsory sector (than into schooling). Section 4 reports the estimation method and empirical results. A conclusion links the extant evidence with these new results.

2.   The effects of introducing markets in education
There is considerable evidence on how greater market pressures (competition) prompt higher educational outcomes across providers – for example in terms of amounts of education, achievement, parental satisfaction or subsequent wages from human capital. These effects are summarized in Hoxby (1999) for the US and Belfield (2000) for other countries. However, there may also be substantive adverse effects on equity from competition (Fiske and Ladd, 2000; Noden, 2000, although see Gorard, 2001). There is also some evidence on how competition sharpens internal processes such as principal's autonomy or goal-setting (Chubb and Moe, 1990; Belfield et al., 2001), although the findings here are less robust and subject to alternative explanations (Bryk and Lee, 1992). Moreover, the move toward market exchanges can occur in various ways, for example through the introduction of loans or tax credits to students, the introduction of vouchers, or greater contracting out by providers (see the list in Patrinos, 2000). Education providers may therefore face market pressures across several domains: more of the inputs may be priced competitively; enrollment barriers may be reduced; and or funding formulae may be performance-related. Alternatively, greater competition in one domain may be offset by weaker competition in another.

There is some information on the ownership component of privatization: privately owned schools may indeed be more effective, but typically with greater resources and higher ability students than government schools (McEwan, 2000). Such ownership aspects have been explored to a much lesser extent, however. Looking across enterprises and sectors, Boardman and Vining (1992) present a typology of ownership structures and how these may influence efficiency (see also the evidence in Megginson et al., 1994). Public sector enterprises may be constrained either by more

3

rules (e.g. on staffing) or generalized and so sub-optimal rules, applied across all government providers. These constraints might make them less efficient than the private sector. Within the private sector, however, there are different organizational structures: providers such as partnerships, where ownership and management are the same entity, should generate higher quality provision than limited companies. In terms of capital risk, government-run agencies have risk borne by the taxpayer, private providers by the share-holders, and partnerships by the managers. The first of these is assumed to generate weakest control and partnerships the strongest. On the other hand, private companies may have emerged because they have attracted outside capital investment as a result of their proven quality. Partnerships may therefore be the residual of providers unable to obtain outside capital investment. Given these conflicting influences, the government–private distinction is anticipated to hold, within the hypothesis that the private sector generates superior education, but differences in private ownership may also be pertinent.

Combined together, the above evidence still leaves some ambiguity. Although the advantages of competitive markets in education appear statistically significant for the students enrolled in choice schools, there is no consensus as to how or why this is so in terms of the behaviors of the schools (beyond an appeal to 'natural selection', Chubb and Moe, 1990). Moreover, the (limited) evidence on ownership is not compelling. Thus, it is not clear whether competition and ownership have specific influence on, as examples: the curriculum; student access and enrollment criteria; assessment; governance and management; the deployment of particular resources; or indeed student effort.

A third strand of privatization that has also received little empirical interest has been the pricing structure of education. Economic theory would suggest that where students directly pay for their education, they would place providers under greater pressure for higher quality. Student voice would be stronger, forcing providers to offer more human capital and to divert resources from

4

activities that maximize the providers' preferences. Plus, where students directly pay for education they are in a good position to detect provision which does not meet the contracted standard. Conversely, where the education is subsidized through the government, it is more costly for students to find out what the contracted standard of education is. Under direct pricing, monitoring may be more efficient, therefore, and accountability higher. Further, if students directly pay for education they are bearing a significant human capital investment risk and this is a large proportion of the total risk: not only are they forgoing earnings during study but they are also making positive monetary outlays. Under plausible assumptions of risk-aversion, fee-paying students would demand higher quality provision to offset this extra burden. (They might also supply greater effort in learning).

Two cautions should be noted in regard to the above discussion. One is that the benefits of competition may not be evident for all education markets. Specifically, niche provision (such as lifelong learning, but also special education and professional training) may be less suitable for competition: minimum efficient scale may, for example, mean such provision is a natural monopoly and so should be provided through the government. Conversely, though, national systems of primary or secondary may not allow for much variation in internal processes, as all providers must work to an 'industry standard' (as in the UK National Curriculum). It may be in the niche markets where competition and ownership effects are most evident, as providers respond better to enrollees' variegated preferences. Participants in lifetime learning are typically adults, who may be less location-constrained in their choice of provision. The lifetime learning market is also appropriate for investigating these effects because competition is reasonably free (relative to schooling). There are fewer (legislative) barriers to entry for providers. But there in the UK there are also subsidies available to some students (based on their employment status or age, for example); and some providers may obtain direct government or charitable subventions (partly arising from 'historical' or regional policies). As is shown below, the lifetime learning market does include both direct fee-

paying and subsidized provision across similar subject groups. Finally, the demand for skills (such as computing) may change more frequently than the demand for schooling. Varied preferences may therefore 'drive' the market more.

As a second caution, the empirical evidence on privatization is available primarily for schools, only one type of educational enterprise. In contrast, most research on lifelong learning has used a socio-political method (Coffield, 1999, 2000), although some surveys report on the intergenerational nature of participation (Gorard et al., 1998, 1999). Brennan (1998) offers a typology of providers of continuing vocational education in UK universities, but does not report any evidence on the efficacy of particular types. Turner (1998) reports on a case study of provision on one course at one university. In an in-depth economic review of lifelong learning, little or no mention of supply is made (Oosterbeek, 1998; Levin, 1998; Cohn and Addison, 1998). Moreover, it is not appropriate simply to subsume lifelong learning as one version of training – on which there is a substantial body of evidence. Only around one-third of training involves instruction or formal learning, with the largest proportion being supervised work or observation of others at work (Barron et al., 1997). Plus, much training is in-house rather than in designated classes (DfEE, 1998) and is available only to those already employed.

Hence, basic economic research on provision in the lifelong learning sector is needed. And this paper speaks to each of these issues: ownership and competition are investigated; internal processes of education are considered explicitly, including tuition pricing; and the logic of competition is tested in one of the niche markets of education, that for lifetime learning.

The specific hypotheses are as follows. In terms of ownership, it is anticipated that privately run institutions will generate higher quality provision (howsoever defined), relative to government-run providers. In terms of competition, greater competition is unambiguously anticipated to

improve the quality of provision across all domains. In terms of funding, it is predicted that enhanced provision will be obtained where students directly pay for their instruction.

3. Data
3.1 The Lifetime Learning Survey
The dataset used here is from a survey of 857 lifetime learning institutions in the United Kingdom in 1994, based on telephone interviews with managers of each institution. Here lifetime learning is defined as 'any training, learning or education provided for people of any age who have completed their full-time, continuous education' (excluding those who go to college within two years of leaving school). The Lifetime Learning Survey was undertaken by Social and Community Planning Research for the Department for Education and Employment in 1994. Basic data on the characteristics of the institutions is available, along with details on internal processes. Each of the internal process characteristics can then be compared against measures of competition, holding other factors constant.

3.2 Provider characteristics
The basic descriptive frequencies for the sample are shown in Table 1 (see also Table A1 in the appendix). Only institutions with more than 10 enrollments at the survey date and those reporting that lifetime learning is their main activity are included in the estimation. This yields a sample of 659 institutions. Provider characteristics are reported in the top section of the Table. The (log of) teacher-student ratio is used as a measure of resources — given the high labor costs of education, this may be a passable proxy for per pupil expenditure (Belfield, 2000). Here, the average lifetime learning class has ten students per teacher. The organizational form of the establishment is also reported: 53% of providers are single establishments; 49% only offer part-time provision; and 69% allow enrollment open to all. Also, the average size of each provider is 1370 enrollments (noting that many courses are part-time, of short duration and many of the students may be trainees

7

or employees). Nine subject groupings were identified by the providers, ranging from courses for specific trades to academic programs to social activities.[3]

3.3   Ownership, competition and voice

The middle section of Table 1 reports on the ownership status of the providers, the two measures of competition in the lifetime learning market and the proxy for voice. The lifetime learning market spans the range of directly private providers to fully government-run institutions; quasi-government and quasi-private agencies also provide lifetime learning. Ownership may therefore be a significant influence on provision: private provision is a reasonable proportion of all activity and enrollees of a given ability may have feasible choices between the ownership types. The heterogeneity of the sector also means that there is no clear 'industry standard' that might generate a uniform quality of provision. Here, ownership status is separated into government agencies (36% of the sample); limited companies or PLCs (28%); partnerships and self-proprietorships (14%); and other types of provider, such as quasi-government agencies, trade union agencies and friendly societies (22%). For estimation, the effects of ownership are compared against the government-run providers.

Both the competition questions are based on reports of managers to direct questions about competition. In the first question, managers were asked to estimate the competition in their market as '(very) strong', 'average' or '(very) weak'. This is then the first measure of competition, represented as two binary variables for (very) strong competition (52% of the sample) and average competition (30%). The second question explicitly asks managers about whether market forces affect provision at the establishment or not: 87% reported that they did.[4]

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[3] Principal components analysis was also used to derive a set of subject loadings. The estimations reported below are unaffected by the use of these loadings. No readily characterizable provider type emerged from the components analysis, so the actual subject groupings are retained for estimation. Details available from the authors.

[4] A third question is available, based on responses yes/no to whether 'the types of lifetime learning courses that this establishment will provide in the next 12 months will be affected by market forces?' Responses to this question were very highly correlated with the main questions. Estimation using this variable generated very similar results to those reported here.

A third pressure on performance arises from the fee structure. The dataset includes information on whether or not students directly pay fees for their instruction. In 16% of providers, students did not pay fees directly, i.e. some amount of subsidy was available or other agents, such as employers, paid for the courses.

3.4   Educational Quality Measures

The bottom section of Table 1 reports on the quality of provision characteristics of the institutions. These are the dependent variables that would be affected by, competition, ownership, and direct fee pricing (voice).

Management cost-consciousness may be influenced: 87% of managers reported that costs were very important in making decisions on the types of courses to provide. This pressure may be a proxy for efficiency. Other process variables relate more directly to provision quality. Managers report on whether their courses are 'affected in any way by the demands of students/ trainees/ employees': 80% respond positively. Information on the spread of the curriculum is also available: from the set of nine subject groupings, managers itemized how many were provided (mean, 4.19). For estimation purposes, a binary variable was created to denote wide-range providers from the top quartile of providers. A wider spread to the curricula may represent greater choice (although Friedman (1962) adverts to the potential for government providers to supply too many 'imaginative' courses).

For student support, three measures are available on the extent of guidance on enrollment, advice during the education program, and follow-up after the course. For the first two, managers identified the modes of support provided; the average provider offered 3.26 enrollment guidance modes and 4.81 on-program advice modes. (The modes are detailed at the foot of Table 1). Again for comparable estimation, these two variables are collapsed into binary variables, indicating high-guidance and high-advice institutions as those in the top quartiles of the distributions. For the last variable on guidance, a yes/no response was made as to whether all students were followed up after

9

completion of the course (49% of providers undertook full follow-up). This last variable may either reflect more intensive evaluation of the program or greater support for the students, and so higher quality education.

Finally, two measures of assessment are available: such assessment might be valued in the labor market by the enrollees. Table 1 shows the percentage of non-credit courses that are formally assessed (58%), and a binary variable equal to one where at least 75% of the courses at the institution lead to qualifications (49%).

3.5   Summary statistics
These data offer a broad summary of lifetime learning provision in the UK. In the Appendix, frequencies are reported, subdivided across the ownership types.[5] These frequencies show that there are differences across ownership types, but importantly the subject mix provided by these institutions does not differ greatly across ownership type: this, and the fact that all enrollees are the same 'age group' (adults), suggests that the providers are reasonable substitutes for each other.

Before estimation, it is worth noting the advantages and disadvantages of this dataset. The advantages are that this is a large sample of relatively heterogeneous institutions with substantial variation in internal processes. Such variation may be hindered in a national system with, for example, a standard curriculum or where teacher pay is set through collective bargaining. For these providers, there appears to be reasonable discretion as to how education is delivered. In addition, there is detail within the survey on how provision is managed rather than on outcome scores, which are strongly dependent on student prior ability. Finally, the subjective measure of marketization may

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[5]Partnerships appear to be relatively small-scale, autonomous providers (with average enrollment at 700). With 62% of providers offering part-time courses, partnerships operate with relatively large group sizes and with a more specialized curriculum (typically offering only 2.8 of the 9 course types). Private companies are also relatively small-scale providers (average enrollment at 424). These companies offer less part-time provision and a reasonably specialized curriculum (3.36 subject groups provided). Finally, government providers appear to be the largest (with enrollments at 1801). These providers offer the greatest range of courses (4.9 of the 9 subjects) and are the main providers of academic

be a useful alternative to the more commonly-used Herfindahl index (Zanzig, 1997). This index measures the market shares of the providers, without any information on whether such providers are in fact in direct competition (rather than tacitly colluding).

However, there are two main disadvantages to the dataset. First, the survey is not a precise random sample of institutions and so may not be representative of the general market of lifetime learning providers. (The sampling frame was a one-stage stratified or systematic random sample. No stratum weights are available). Second, responses are based on attitudinal statements by managers. These subjective responses may be subject to 'noise', reflecting the personal characteristics of the respondent. Notwithstanding, there are no strong grounds for assuming this noise will vary systematically with the key independent variables.

## 4.	Estimation and results

As an initial test, the data show that greater marketization, direct fee pricing and private-oriented ownership status are positively correlated within the sample. At the general level, this correlation is weakly supportive of the hypotheses. However, it is also raises the possibility that the key independent variables may be multi-collinear. Sensitivity analysis is offered below after presentation of our main results.

Estimation of the relationship between quality and the level of competition and processes is summarized in Tables 2, 3 and 4. The estimation method is either probit or ordered probit and the Tables shows the marginal effects for the independent variables of ownership (3 variables), the measures of competition (2 and 1) and the tuition pricing measure (1). That is, the coefficients indicate changes in the dependent variable when the independent variable goes from 0 to 1 (i.e. from no tuition fees to fee payment). The full estimations for each equation are reported in the Appendix Tables A2–A6.

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programs. Perhaps because of their size, such providers report relatively high student-teacher ratios and are more likely to allow open enrollment.

The estimation in Table 2 reports on three of the dependent variables: cost-consciousness of the provider; student responsiveness; and wide-range providers. There are no differences in cost-consciousness according to ownership status. However, there is some weak evidence of greater cost-consciousness where competition is higher, using the market forces measure; and where providers do not directly charge tuition fees. This last result contraverts the hypotheses regarding the effects of marketisation. For student responsiveness, private companies appear to be less responsive, relative to government providers (this result is even clearer, when ordered probit estimation is used, see Appendix). However, where individuals do not pay fees directly, and where market forces are reported to be weak, the result is a lower level of student responsiveness. These two results are supportive of the hypotheses. For the range of course provision, again private companies offer a narrower range of courses. There is no effect from tuition fees, but again market forces press providers to offer a wider range of courses. Across these marginal effects, market forces are as substantively important as ownership structure, with the coefficients for fee pricing somewhat lower.

Table 3 reports the marginal effects from estimation regressions of modes of guidance, advice, and follow-up. Here, for guidance on enrollment, there are some ownership differences, but no effects from fee-levying or from competition. For advice to participants, ownership and fee-levying effects are absent, but market forces are negatively correlated with modes of guidance (fee-levying does increase advice and guidance using alternative specifications, see Appendix Tables). There are no effects of competition, however. In the last model of Table 3, post-course follow-up is significantly higher outside of government-run provision. Also, competition raises post-course follow-up assistance, but there is no effect of tuition fees.

In Table 4, marginal effects for the quality of assessment is considered. Using the binary variable indicating providers where at least 75% of courses lead to a qualification, only the tuition

fee variable is significant. Here, when no tuition fees are paid there is less assessment. For courses where non-credit courses are formally assessed, private companies are more likely to offer this type of provision. However, there is (weak) evidence that greater competition reduces this service. There is no influence on non-credit bearing courses from tuition fee payment.

Finally, the control variables also merit comment. First, there appears to be no effect from the teacher-student ratio; this result is not surprising and may reflect the sizable empirical and methodological difficulties of establishing this link (see Hanushek, 1998; Figlio, 1999). Scale effects are evident, however. Enrollment size influences: cost consciousness (weakly negative); responsiveness to student demands, the number of courses and modes of enrollment and on-program advice (all strongly positive); post-course follow-up and issuance of qualifications (negative). Other variables – part-time provision and open enrollment – have plausible signs, particularly for modes of advice. For cost-consciousness, a significant source of variation occurs by subject; this result fits with the evidence on costing formulae where subject differences are strong (Ross and Levacic, 1999).

To check the robustness of the results, sensitivity analysis was also undertaken (although the closeness of the predicted to the observed probabilities of the dependent variables offer some support for the models). Estimations were run including establishments where provision of education was not the main activity and including providers who declared less than 10 enrollments at the survey date. Estimations without each of the control variables were run. Ordered probit estimations were performed for curriculum choice, enrollment guidance and on-course guidance, as was ordinary least squares. An alternative independent variable for competition was also tested for each of these estimations, based on the providers' response about the level of competition in the future. The subjective measure on the strength of competition was also re-tested, with fewer categories of competition. The results reported here are not affected by these sensitivity tests (with

the exception noted above). In particular, none of the results are overturned. Finally, each equation was estimated using only ownership variables, only marketization variables, or only fee-pricing to isolate for multicollinearity. These estimations emphasize more clearly the tendencies reported in Tables 2–4.

5.   Conclusion

Although theories of privatization are powerful, the compelling arguments over their benefits must be based on the evidence. This paper reports on an empirical investigation of ownership, competition and voice in the lifetime learning education market. This market is a useful test-ground because it has heterogeneity in ownership and provision technologies; plus there is information on fee-paying status and this varies across a sample of *prima facie* similar providers.

The results with respect to competition are plausible but not comprehensive: the intensity of market forces are positively correlated with enhanced educational quality in terms of cost-consciousness, responsiveness to students, curriculum choice, student support, and assessment. These results fit well with the extant literature on competition.

However, the results for ownership are much less straightforward. Government-run provision and private provision appear to have exhibit different syndromes, such that judgments about quality remain elusive. Caution is warranted here: the management and organizational factors that determine performance remain unidentified and it cannot be concluded that privately-run providers or partnerships offer enhanced lifelong learning.

Finally, there are plausible and persuasive effects on the quality of provision from the fee structure. Across at least some of the domains of investigation here, quality is enhanced where students pay tuition fees directly. This result – tentative and again not ubiquitous – suggests that student voice and consequent provider accountability may prove an important mechanism for improved educational standards.

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Table 1 Frequencies

	Mean	SD
Provider characteristics:		
Teacher-student ratio	0.10	0.16
Single establishment (%)	0.53	
Only part-time provision (%)	0.49	
Open enrollment (%)	0.69	
Number of enrollees	1369.94	3502.73
Subject: offers professional/trade courses (%)	0.60	
Subject: offers computing courses (%)	0.64	
Subject: offers administration and management courses (%)	0.57	
Subject: offers teaching courses (%)	0.32	
Subject: offers engineering courses (%)	0.22	
Subject: offers academic courses (%)	0.53	
Subject: offers leisure courses (%)	0.45	
Subject: offers motivational courses (%)	0.64	
Subject: offers other courses (%)	0.21	
Ownership status (%):		
Status: government (public sector education providers)	0.36	
Status: limited company or PLC	0.28	
Status: partnership	0.14	
Status: other (quango, trade union, society)	0.22	
Measures of competition (%):		
Would you say the level of competition with other establishments for attracting students/trainees onto your courses is currently:		
(Very) strong	0.52	
Average	0.30	
(Very) weak	0.15	
Types of lifetime learning courses that this establishment currently provides are affected in any way by market forces:	0.87	
Fee pricing (%):		
No tuition fees are paid directly by participants	0.16	
Provision characteristics:		
Management: (very) strong cost-consciousness	0.87	
Provision is responsive to students	0.80	
Curriculum choice: range of courses provided (1-9)	4.19	2.05
Enrollment guidance: number of advice modes[a]	3.26	1.62
On-program guidance: number of advice modes[b]	4.81	2.45
Post-course follow-up on all students	0.49	
Assessment: non-credit courses are formally assessed	0.58	
Assessment: >75% of courses lead to qualifications	0.49	
N	*659*	

[a]Advice modes for enrollment guidance are: on general careers; specific to the course itself; personal development advice; individual/group advice sessions with careers tutor; other.

[b]Advice modes are as for enrollment guidance, but also include individual/group induction courses and work placement opportunities.

TABLE 2
Marginal Effects: Cost-consciousness, Student Responsiveness, and Range of Course Provision

	(1) Cost-consciousness		(2) Student Responsiveness		(3) Range of Course Provision	
	Marginal(S.E.) Effects	Marginal(S.E.) Effects	Marginal(S.E.) Effects	Marginal(S.E.) Effects	Marginal(S.E.) Effects	Marginal(S.E.) Effects
Status: other	0.0759(0.0639)	0.0881(0.0660)	-0.0867(0.0592)	-0.0953(0.0617)*	0.0187(0.0518)	0.0475(0.0563)
Status: private co.	0.0347(0.0697)	0.0490(0.0718)	-0.0958(0.0584)*	-0.0897(0.0594)	-0.1443(0.0399)***	-0.1263(0.0434)**
Status: partnership	-0.0324(0.0928)	-0.0183(0.0954)	-0.0397(0.0730)	-0.0325(0.0738)	0.1047(0.0548)	-0.0612(0.0691)
No tuition fees	0.1113(0.0630)*	0.1309(0.0653)*	-0.0691(0.0506)	-0.0858(0.0547)*	0.0812(0.0650)	0.0864(0.0688)
Strong competition		0.1193(0.0755)		-0.0506(0.0615)		0.0421(0.0691)
Average competition		-0.0921(0.0645)		-0.0192(0.0471)		-0.0120(0.0545)
Market forces	0.1226(0.0667)*		0.1243(0.0567)**		0.1194(0.0426)**	
Observed P	0.5581	0.5560	0.8140	0.8147	0.2558	0.2587
Predicted P (at means)	0.5608	0.5606	0.8504	0.8489	0.1710	0.1717
N	559	545	559	545	559	545

Marginal Effects based on (robust) probit estimation. Other variables in the equations for models (1) and (2) are: single establishment; ln(enrollment); part-time provision; open enrollment; ln(student–teacher ratio); 9 subjects. For model (3), the 9 subject dummies are excluded. See Appendix Tables for full estimation.

***significant at 1% level; **significant at 5% level; *significant at 10% level.

TABLE 3
Marginal Effects: Modes of Guidance for Enrollees, Modes of Advice for Participants, and Post-Course Follow-up

	(4) Modes of Guidance for Enrollees		(5) Modes of Advice for Participants		(6) Post-course Follow-up	
	Marginal Effects (S.E.)	Marginal Effects (S.E.)	Marginal Effects (S.E.)	Marginal Effects (S.E.)	Marginal Effects (S.E.)	Marginal Effects (S.E.)
Status: other	0.1423(0.0655)**	0.1332(0.0673)**	0.0316 (0.0581)	0.0318 (0.0595)	0.2067(0.0627)***	0.2070(0.0646)***
Status: private co.	0.0330(0.0653)	0.0372(0.0669)	0.0060 (0.0617)	0.0064 (0.0628)	0.1698(0.0686)**	0.1989(0.0696)***
Status: partnership	-0.1057(0.0772)	-0.1048(0.0791)	-0.0876(0.0750)	-0.0901 (0.0753)	0.1458 (0.0897)	0.1731(0.0906)*
No tuition fees	0.0249(0.0600)	0.0241(0.0631)	-0.0557(0.0529)	-0.0775(0.0525)	0.0327 (0.0665)	-0.0193 (0.0692)
Strong competition		0.0928(0.0804)		0.0039 (0.0711)		-0.0498 (0.0791)
Average competition		0.0224(0.0630)		0.0431 (0.0573)		-0.0735 (0.0668)
Market forces	-0.0616(0.0674)		-0.1212(0.0667)*		0.1273(0.0656)*	
Observed P	0.3059	0.3064	0.2791	0.2771	0.4937	0.4862
Predicted P (at means)	0.2664	0.2659	0.2413	0.2391	0.4926	0.4843
N	559	545	559	545	559	545

Marginal Effects based on (robust) probit estimation. Other variables in the equations for models (4), (5) and (6) are: single establishment; ln(enrollment); part-time provision; open enrollment; ln(student–teacher ratio); 9 subjects. See Appendix Tables for full estimation.

***significant at 1% level; **significant at 5% level; *significant at 10% level.

TABLE 4
Marginal Effects: Assessment where >75% of courses lead to a Qualification and Formal Assessment for Non-credit Courses

	(7) >75% of courses lead to a qualification		(8) Non-credit courses are formally assessed	
	Marginal(S.E.) Effects	Marginal(S.E.) Effects	Marginal(S.E.) Effects	Marginal(S.E.) Effects
Status: other	0.1106(0.0685)	0.1051(0.0703)	0.0230 (0.0779)	0.0183(0.0808)
Status: private co.	0.0663(0.0736)	0.0648 (0.0756)	0.1851 (0.0843)**	0.1937(0.0853)**
Status: partnership	0.0842(0.0961)	0.0834(0.0986)	0.0099 (0.1226)	0.0158(0.1240)
No tuition fees	-0.1332(0.0670)*	-0.1391(0.0698)*	0.0897 (0.0869)	0.0684(0.0909)
Strong competition		0.1209(0.0811)		-0.1883(0.1007)*
Average competition		0.0805(0.0709)		-0.0303(0.0771)
Market forces	0.0007(0.0714)		-0.0374 (0.0825)	
Observed P	0.5170	0.5211	0.5962	0.5932
Predicted P (at means)	0.5162	0.5217	0.6081	0.6055
N	559	545	364	354

Marginal Effects based on (robust) probit estimation. Other variables in the equations for models (7) and (8) are: single establishment; ln (enrollment); part-time provision; open enrollment; ln(student–teacher ratio); 9 subjects. See Appendix Tables for full estimation. ***significant at 1% level; **significant at 5% level; *significant at 10% level.

Table A1
Frequencies by Ownership Type

	Full sample		Partnerships		Private companies		Government sector	
	Mean	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
LOG STUDENT TEACHER RATIO	2.89	1.18	3.19	1.41	2.68	1.15	2.91	1.11
NO. ENROLLEES	1369.95	3502.73	699.92	3901.07	424.20	1481.01	1801.09	3450.21
NO. COURSES	4.19	2.05	2.79	1.46	3.36	1.71	4.92	1.71
SINGLE ESTABLISHMENT	0.53		0.87		0.61		0.23	
ONLY PART-TIME	0.49		0.62		0.36		0.64	
OPEN ENROLLMENT	0.69		0.60		0.64		0.79	
SUBJECT:								
Professional/trade courses	0.60		0.54		0.64		0.51	
Computing courses	0.65		0.40		0.54		0.81	
Admin. management courses	0.57		0.56		0.63		0.49	
Teaching courses	0.32		0.22		0.19		0.37	
Engineering courses	0.22		0.07		0.16		0.22	
Academic courses	0.53		0.20		0.28		0.82	
Leisure courses	0.45		0.12		0.14		0.76	
Motivational courses	0.64		0.46		0.57		0.70	
Other courses	0.21		0.22		0.19		0.23	

Appendix Table A2
Cost-consciousness of and student responsiveness in lifetime learning courses (Probit)

	Cost-consciousness				Student responsiveness			
	Coeff.	(S.E.)	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
SINGLE EST.	0.1886	(0.1286)	0.1889	(0.1318)	0.2455	(0.1550)	0.2320	(0.1563)
ENROLLMENT (LN)	-0.0081	(0.0501)	0.0231	(0.0524)	0.1316	(0.0628)**	0.1258	(0.0642)*
PART-TIME PROVISION	-0.1824	(0.1301)	-0.1346	(0.1332)	0.2411	(0.1564)	0.2130	(0.1572)
OPEN ENROLLMENT	-0.0882	(0.1311)	-0.0841	(0.1339)	-0.2096	(0.1546)	-0.1887	(0.1557)
STUDENT-TEACHER RATIO (LN)	0.0026	(0.0608)	-0.0048	(0.0638)	-0.1070	(0.0735)	-0.0793	(0.0769)
COURSE: KEYBOARD SKILLS	0.1959	(0.1294)	0.2243	(0.1329)*	0.3083	(0.1488)**	0.3158	(0.1499)**
COURSE: ADMIN.	0.2078	(0.1303)	0.2587	(0.1324)*	0.1503	(0.1583)	0.1965	(0.1568)
COURSE: TEACHING	-0.0872	(0.1293)	-0.1162	(0.1322)	-0.1421	(0.1622)	-0.1015	(0.1628)
COURSE: ENGINEERING	-0.1859	(0.1568)	-0.3024	(0.1632)*	-0.2232	(0.1910)	-0.1360	(0.1954)
COURSE: ACADEMIC	0.0153	(0.1441)	0.0663	(0.1480)	0.2095	(0.1657)	0.1838	(0.1675)
COURSE: LEISURE	0.3162	(0.1479)**	0.3089	(0.1512)**	0.1376	(0.1761)	0.1630	(0.1770)
COURSE: SOCIAL	-0.2163	(0.1276)*	-0.2667	(0.1307)**	0.4065	(0.1474)***	0.3753	(0.1487)**
COURSE: OTHER	0.1565	(0.1395)	0.1318	(0.1434)	0.0151	(0.1761)	-0.0348	(0.1783)
STATUS: OTHER	0.1947	(0.1662)	0.2266	(0.1727)	-0.3391	(0.2141)	-0.3677	(0.2189)*
STATUS: PRIVATE CO.	0.0882	(0.1782)	0.1250	(0.1841)	-0.3778	(0.2144)*	-0.3540	(0.2196)
STATUS: PARTNERSHIP	-0.0819	(0.2337)	-0.0464	(0.2408)	-0.1607	(0.2796)	-0.1320	(0.2867)
NO TUITION FEES	0.2890	(0.1689)*	0.3422	(0.1781)*	-0.2706	(0.1826)	-0.3273	(0.1892)*
STRONG COMPETITION			0.3089	(0.2011)			-0.2041	(0.2353)
AVERAGE COMPETITION			-0.2354	(0.1666)			-0.0830	(0.2056)
MARKET FORCES	0.3087	(0.1685)*			0.4554	(0.1825)**		
_cons	-0.3490	(0.2944)	-0.2099	(0.3069)	-0.2797	(0.3493)	0.1370	(0.3701)
LOG-LIKELIHOOD	-369.0		-353.42		-233.16		-229.94	
LR CHI (K)	29.42		41.84		70.82		62.64	
N	559		545		559		545	

***significant at 1% level; **significant at 5% level; *significant at 10% level.

Appendix Table A3
Number of courses provided at each establishment (Ordered probit)

	Coeff.	S.E.	Coeff.	S.E.
SINGLE EST.	0.1874	0.1003*	0.1130	0.1023
ENROLLMENT (LN)	0.4544	0.0374***	0.4798	0.0385***
PART-TIME PROVISION	-0.4778	0.0974***	-0.4875	0.0991***
OPEN ENROLLMENT	0.1932	0.1018*	0.1723	0.1033*
STUDENT-TEACHER RATIO (LN)	-0.1905	0.0479***	-0.1977	0.0498***
STATUS: OTHER	-0.1001	0.1294	-0.0406	0.1328
STATUS: PRIVATE CO.	-0.6638	0.1294***	-0.6424	0.1329***
STATUS: PARTNERSHIP	-0.7082	0.1758***	-0.6356	0.1793***
NO TUITION FEES	0.2657	0.1295**	0.3091	0.1346**
STRONG COMPETITION			0.2108	0.1557
AVERAGE COMPETITION			0.0890	0.1309
MARKET FORCES	0.3428	0.1341**		
LOG-LIKELIHOOD	-965.18		-939.34	
LR CHI (K)	359.44		356.38	
N	559		545	

***significant at 1% level; **significant at 5% level; *significant at 10% level.

Appendix Table A4
Modes of advice given to enrollees and to participants (Ordered probit)

	Modes of advice to enrollees				Modes of advice to participants			
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
SINGLE EST.	0.0987	0.1041	0.1252	0.1060	0.1049	0.1023	0.0945	0.1041
ENROLLMENT (LN)	0.0599	0.0408	0.0705	0.0422*	0.0859	0.0402**	0.0884	0.0415**
PART-TIME PROVISION	-0.3322	0.1059***	-0.3365	0.1073***	-0.5340	0.1052***	-0.5289	0.1066***
OPEN ENROLLMENT	-0.1040	0.1058	-0.1403	0.1074	-0.3008	0.1044***	-0.3532	0.1061***
STUDENT-TEACHER RATIO (LN)	-0.1487	0.0499***	-0.1590	0.0519***	-0.1371	0.0489***	-0.1218	0.0508**
COURSE: KEYBOARD SKILLS	0.2600	0.1050**	0.2568	0.1069**	0.2737	0.1036***	0.2484	0.1053**
COURSE: ADMIN.	0.1682	0.1054	0.1828	0.1059*	0.3368	0.1048***	0.3235	0.1052***
COURSE: TEACHING	0.2496	0.1055**	0.2576	0.1071**	0.1492	0.1037	0.1581	0.1052
COURSE: ENGINEERING	0.3519	0.1281***	0.3407	0.1316**	0.3356	0.1257***	0.3480	0.1292***
COURSE: ACADEMIC	0.0472	0.1164	-0.0041	0.1184	-0.1766	0.1146	-0.2092	0.1166*
COURSE: LEISURE	-0.1267	0.1198	-0.0969	0.1213	-0.1644	0.1175	-0.1189	0.1190
COURSE: SOCIAL	0.6056	0.1041***	0.6285	0.1057***	0.5369	0.1026***	0.5556	0.1041***
COURSE: OTHER	0.2076	0.1134*	0.2247	0.1160*	0.0866	0.1110	0.0906	0.1136
STATUS: OTHER	0.0848	0.1354	0.0903	0.1392	0.3592	0.1330***	0.3550	0.1367***
STATUS: PRIVATE CO.	-0.0989	0.1438	-0.0789	0.1472	0.0807	0.1415	0.0975	0.1449
STATUS: PARTNERSHIP	-0.3329	0.1905*	-0.3127	0.1946	-0.3777	0.1871**	-0.3757	0.1913*
NO TUITION FEES	-0.1918	0.1351	-0.2812	0.1411**	-0.2338	0.1332*	-0.2973	0.1392**
STRONG COMPETITION			0.1350	0.1588			0.2686	0.1570*
AVERAGE COMPETITION			0.1738	0.1333			0.1330	0.1317
MARKET FORCES	0.0550	0.1359			0.0092	0.1338		
LOG-LIKELIHOOD	-930.35		-902.04		-1105.80		-1073.61	
LR CHI (K)	178.65		183.56		243.65		244.92	
N	559		545		559		545	

***significant at 1% level; **significant at 5% level; *significant at 10% level.

Appendix Table A5

Post-course follow-up of participants (Probit)

	Coeff.	S.E.	Coeff.	S.E.
SINGLE EST.	-0.1026	0.1304	-0.0688	0.1324
ENROLLMENT (LN)	-0.0497	0.0511	-0.0443	0.0529
PART-TIME PROVISION	-0.0944	0.1323	-0.1086	0.1339
OPEN ENROLLMENT	0.1477	0.1316	0.1598	0.1333
STUDENT-TEACHER RATIO (LN)	-0.0400	0.0627	-0.0304	0.0650
COURSE: KEYBOARD SKILLS	0.0111	0.1307	0.0361	0.1331
COURSE: ADMIN.	0.1168	0.1323	0.1774	0.1331
COURSE: TEACHING	-0.0015	0.1309	0.0120	0.1331
COURSE: ENGINEERING	-0.0374	0.1579	-0.0033	0.1618
COURSE: ACADEMIC	-0.3474	0.1442**	-0.3688	0.1463**
COURSE: LEISURE	-0.1015	0.1480	-0.0942	0.1499
COURSE: SOCIAL	-0.1066	0.1284	-0.1014	0.1302
COURSE: OTHER	0.2062	0.1413	0.1620	0.1450
STATUS: OTHER	0.5284	0.1671***	0.5281	0.1712***
STATUS: PRIVATE CO.	0.4303	0.1779**	0.5051	0.1819***
STATUS: PARTNERSHIP	0.3700	0.2341	0.4403	0.2390*
NO TUITION FEES	0.0819	0.1669	-0.0484	0.1739
STRONG COMPETITION			-0.1252	0.1996
AVERAGE COMPETITION			-0.1845	0.1681
MARKET FORCES	0.3235	0.1710*		
_cons	-0.0090	0.2965		
LOG-LIKELIHOOD	-355.97		-346.21	
LR CHI (K)	62.91		62.70	
N	559		545	

***significant at 1% level; **significant at 5% level; *significant at 10% level.

Appendix Table A6
Assessment: At least 75% of courses lead to a qualification and formal assessment for non-credit courses (Probit)

	>75% of courses lead to a qualification				Non-credit courses are formally assessed			
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
SINGLE EST.	0.3953	0.1351***	0.3713	0.1376***	0.1397	0.1707	0.1390	0.1740
ENROLLMENT (LN)	-0.0631	0.0536	-0.0544	0.0551	-0.0620	0.0625	-0.0685	0.0658
PART-TIME PROVISION	-0.5689	0.1351***	-0.5873	0.1373***	-0.0462	0.1736	-0.0702	0.1758
OPEN ENROLLMENT	-0.2332	0.1388*	-0.2996	0.1420**	-0.1260	0.1851	-0.0784	0.1876
STUDENT-TEACHER RATIO (LN)	-0.0880	0.0664	-0.0860	0.0688	-0.0559	0.0734	-0.0494	0.0773
COURSE: KEYBOARD SKILLS	0.2948	0.1376**	0.2492	0.1395*	-0.1687	0.1749	-0.1719	0.1793
COURSE: ADMIN.	0.1046	0.1413	0.0614	0.1415	0.1010	0.1690	0.0934	0.1699
COURSE: TEACHING	0.0701	0.1400	0.0766	0.1419	0.1243	0.1664	0.1213	0.1698
COURSE: ENGINEERING	0.4225	0.1713**	0.3834	0.1765**	-0.0248	0.2072	0.0768	0.2134
COURSE: ACADEMIC	-0.0949	0.1520	-0.1135	0.1544	0.1252	0.1909	0.0739	0.1949
COURSE: LEISURE	-0.4140	0.1540***	-0.3522	0.1564**	-0.2124	0.2031	-0.2430	0.2055
COURSE: SOCIAL	-0.4246	0.1367***	-0.4320	0.1387***	0.4781	0.1718***	0.4806	0.1762***
COURSE: OTHER	0.0779	0.1511	0.0451	0.1543	0.0653	0.1756	0.0462	0.1797
STATUS: OTHER	0.2801	0.1762	0.2665	0.1809	0.0603	0.2050	0.0476	0.2116
STATUS: PRIVATE CO.	0.1669	0.1863	0.1632	0.1916	0.5121	0.2538**	0.5357	0.2575**
STATUS: PARTNERSHIP	0.2130	0.2462	0.2113	0.2531	0.0258	0.3208	0.0412	0.3251
NO TUITION FEES	-0.3366	0.1723*	-0.3514	0.1797*	0.2406	0.2416	0.1815	0.2473
STRONG COMPETITION			0.3073	0.2102			-0.4793	0.2568*
AVERAGE COMPETITION			0.2023	0.1785			-0.0789	0.2019
MARKET FORCES	0.0019	0.1792			-0.0986	0.2197		
_cons	0.9290	0.3185***	0.8059	0.3285**	0.4915	0.3921	0.5674	0.4052
LOG-LIKELIHOOD	-312.61		-304.32		-224.76		-217.74	
LR CHI (K)	149.07		145.90		41.55		42.89	
N	559		545		364		354	

***significant at 1% level; **significant at 5% level; *significant at 10% level.