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PERFORMANCE MANAGEMENT IN THE FRENCH SYSTEM OF SECONDARY-TEACHER TRAINING

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Abstract – The present study focuses on performance analysis and performance management in teacher training in France. After a brief summary of the French system of secondary-teacher training, determinants affecting performance are analyzed. The analysis shows that three determinants – the number of external competitors, the size of a department and the number of posts to be filled by recruitment examinations – are crucial to the performance of a training department. The analysis reveals, however, that although a department's performance may be related to its size, efficiency and inefficiency limits have to be taken into account in growth strategies.

Zusammenfassung – DIE FRAGE DES VERWALTENS VON LEISTUNG IM FRANZÖSISCHEN SYSTEM DER LEHRERAUSBILDUNG FÜR DIE SEKUNDARSTUFE – Die vorliegende Studie nimmt die Analyse von Leistung und das Verwalten von Leistung in der Lehrerausbildung in Frankreich in den Blickpunkt. Nach einer kurzen Zusammenfassung des französischen Systems der Lehrerausbildung für die Sekundarstufe werden Determinanten analysiert, welche die Erfolgsrate beeinflussen. Die Analyse zeigt, dass drei Determinanten – die Anzahl der externen Mitbewerber, die Größe der Abteilung und die Anzahl der Stellen, die durch Einstellungsprüfungen zu besetzen sind – ausschlaggebend für die Erfolgsraten einer Ausbildungsabteilung sind. Die Analyse verdeutlicht gleichwohl, dass Effektivitäts- sowie Ineffektivitätsgrenzen in Wachstumsstrategien berücksichtigt werden müssen, auch wenn die Erfolgsrate einer Abteilung mit ihrer Größe in Verbindung gebracht werden kann.

Résumé – LA PROBLÉMATIQUE DE LA GESTION DES PERFORMANCES DANS LE SYSTEME FRANÇAIS DE LA FORMATION DES ENSEIGNANTS DU SECONDAIRE – L'étude se concentre sur l'analyse de la performance et sur la gestion de la performance dans la formation d'enseignants en France. Après un bref résumé du système Français de formation des enseignants du secondaire, différents déterminants affectant la performance de succès sont analysés. L'analyse montre que trois déterminants – le nombre de compétiteurs externes, la taille de la Préparation et le nombre de postes à pourvoir dans les examens de recrutement – sont cruciaux pour la performance de succès d'une Préparation. L'analyse révèle cependant que, bien que le succès d'une Préparation puisse être mis en relation avec sa taille, les limites d'efficacité et d'inefficacité doivent être prises en compte dans les stratégies de croissance.

Resumen – EL TEMA DE LA GESTIÓN DEL RENDIMIENTO EN EL SISTEMA FRANCÉS DE LA FORMACIÓN DE DOCENTES DE LA EDUCACIÓN SECUNDARIA – Este estudio se centra en el análisis del rendimiento y de la gestión del rendimiento en la formación de docentes en Francia. Después de presentar un breve resumen del sistema francés de formación de docentes de enseñanza secundaria, el autor analiza factores determinantes que afectan el nivel de rendimiento. Este análisis muestra que tres de estos factores: el número de competidores externos, el tama-

ño de un instituto de formación docente y el número de puestos a cubrir por oposiciones, son decisivos para el éxito de un instituto de formación docente. Sin embargo, el mismo análisis revela que pese a que el nivel de éxito de un instituto de formación deba relacionarse con su tamaño, al delinearse las estrategias de crecimiento deberán tomarse en cuenta los límites de eficiencia e ineficiencia.

Резюме – ОБ ЭФФЕКТИВНОСТИ УПРАВЛЕНИЯ ВО ФРАНЦУЗСКОЙ СИСТЕМЕ ПОДГОТОВКИ УЧИТЕЛЕЙ СРЕДНЕЙ ШКОЛЫ – Данное исследование фокусируется на анализе показателей эффективности управления в сфере подготовки учителей во Франции. После краткого обзора французской системы подготовки учителей средней школы, анализируются пять факторов, оказывающих влияние на показатели результативности. Анализ показывает, что решающими для показателей результативности работы департамента по подготовке учителей являются три основных фактора – количество конкурентов извне, количественный состав департамента и количество занимаемых вакансий. Анализ, тем не менее, выявляет, что показатели результативности работы департамента могут быть связаны с его размером, поэтому ограничители эффективности и неэффективности должны приниматься во внимание в стратегиях роста.

In France, secondary teachers are public-sector employees. Becoming a secondary teacher is subject to passing a competitive public-entry examination. Preparation for this examination is provided by Exam Preparation Departments within the framework of University Institutes for Teacher Training (*Instituts Universitaires de Formation des Maîtres* [IUFM]. These departments are assessed on the basis of their students' performance in the exams. This means that according to the number of successful candidates, or according to the pass rate, additional funding might be awarded or not, and a department with a poor performance rate might even be closed down. Therefore, it is important for department heads to know which factors affect success performance on the exam, and which strategies could help improve it.

Very few studies have been published to date on this topic in the international academic literature. The present contribution should be relevant to readers interested in teacher preparation, in performance analysis, performance management and performance assessment in higher education, and especially to readers interested in the French educational system. This study begins by providing a brief introduction to the French system of secondary-teacher recruitment. It then describes the method of analysis. In closing, the results are presented and conclusions for performance management are drawn.

General background of the French system of secondary-teacher recruitment

Teacher-recruitment examinations are organized by the Ministry of Education. About 110 different examinations, corresponding to as many different

teaching specializations, are organized annually. Every year approximately 70,000 examinees take these examinations (Valette 2002, 2003). To sit for an exam, examinees must have a Bachelor's degree; they can choose between preparing themselves and attending preparatory courses within IUFM Departments. Such preparatory programs last one year, and comprise the first part of the IUFM curriculum.

The 110 exams can be divided into four categories. Type 1, called *Certificat d'aptitude au professorat de l'enseignement du second degré* (CAPES), comprises the examinations for teacher candidates in general education. There are about 30 specializations in this category: Philosophy, Literature, History and Geography, Economics, Documentation Techniques, foreign languages (Arabic, Chinese, English, German, Greek, Hebrew, Italian, Portuguese, Russian and Spanish), regional languages (Basque, Breton, Catalan, Corsican, Creole, Occitan, and Tahitian), classical languages (Ancient Greek and Latin), Mathematics, Physics, Chemistry, Earth and Life Sciences, Music and Fine Arts.

Type 2, called *Certificat d'aptitude au professorat de l'enseignement technique* (CAPET), comprises the examinations for teacher candidates in technical education. There are about 40 specializations in this group, including management, accounting, tourism, technology, bio-technology, medical imaging, multimedia technologies, engineering (including various specializations), computer science, environmental science, water-resources management, horticulture, decorative arts, cosmetic and make-up artistry.

The examinations for teacher candidates in vocational training are grouped into the third type, called *Certificat d'aptitude au professorat de lycée professionnel* (CAPLP). There are about 40 specializations in this group, including hairdressing, paramedic studies, graphic arts, industrial art and design, office administration, secretarial training, sales, transportation, and auto mechanics.

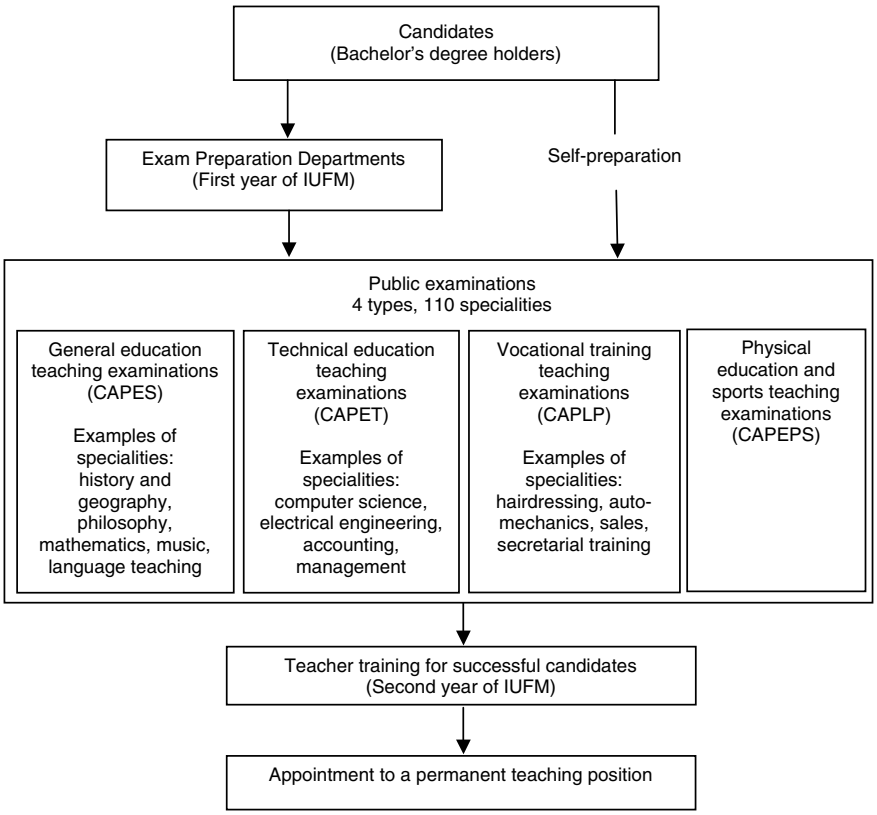
Finally, the fourth type, *Certificat d'aptitude au professorat d'éducation physique et sportive* (CAPEPS), is the examination for those wishing to become physical education and sports teachers.

The passing rates for these examinations are quite low: About 12,000 candidates out of the 70,000 (i.e., less than 20%) pass the exams every year. Successful examinees are offered teacher training for one year, which comprises the second year of the IUFM. With few exceptions, all trainees admitted to this stage become qualified secondary-school teachers, and subsequently receive appointments to permanent teaching positions. Figure 1 provides a general overview of the system.

The French IUFM system was created in 1990. Different authors have described the origins and institutional organization of this system (Asher and Malet 1996; Bonnet 1996; Brisard and Hall 2001; Caldwell and Mailhos 2002; Cornu 2002; Holyoake 1993; Zay 1997). There are 31 Institutes throughout the country and overseas (in Wallis and Futuna, Réunion, New Caledonia, Martinique, French Polynesia, French Guiana, and Guadeloupe).

Each institute contains several Exam Preparation Departments, each department preparing specifically for one examination. Not all specializations

Figure 1. The process of becoming a secondary-school teacher in France.



are covered in every Institute. Coverage depends on local demand and on the funding available. In 2001, 773 Preparation Departments were operational (CNE 2001). Each department is managed by a head nominated by the director of the institute. The department head is in charge of the administrative and pedagogical organization of the department. She or he chooses the educators and lecturers who teach in the department. The head also designs the program contents and schedules, the student recruitment policy, the bibliographical policy, and deals with problems that arise. For reasons of equity, institutes and departments are not permitted to take part either in the organization of the examinations or in the meetings of the examining boards.

Method of analysis

This study is based on a survey of Preparation Departments conducted in 2003. Of the 773 existing departments queried, 309 made their data available

for the analysis. These data cover the period from 1992 to 2002. The sample for this study includes 40% of the existing departments and 60% of the existing specializations.

Sample representativeness

To check the representativeness of the sample, some of its main characteristics were compared with those of the entire population of Preparation Departments. Characteristics of the entire population can be found in the CNE national evaluation document (2001: 75–91). As can be seen in Table 1, the characteristics of the sample are generally very close to those of the global population.

The sample can therefore be seen as representative. However, examinations for smaller specializations, with few posts to fill and few examinees, are under-represented. For example, some examinations for language teaching (e.g., Danish, Japanese, Vietnamese, Tahitian or Swedish) and some highly specialized technical or vocational teaching exams (e.g., industrial engineering specialization in glass and ceramics) generally offer fewer than 10 posts per year and attract fewer than 20 examinees. Small and highly specialized departments preparing for such small and highly specialized examinations are under-represented in the sample. Therefore, the results obtained will not necessarily be valid for such departments.

Factors of performance

The data obtained cover six possible factors of performance. The first factor is the total number of examinees nationally. This factor is expected to have a

Table 1. Comparison between the sample and the population of Preparation Departments

Comparison criteria	Population	Sample
Average size of departments (students registered per department)	44	47
Percentage of departments preparing for general education teaching	49.80%	49.19%
Percentage of departments preparing for technical education teaching	22.25%	23.30%
Percentage of departments preparing for vocational training teaching	24.19%	24.27%
Percentage of departments preparing for physical ed. and sports teaching	3.75%	3.23%
Average national number of candidates per examination	1073	1485
Average number of posts filled per examination	173	252
Average number of successful candidates per department	10.42	10.88
Average pass rate per department	29.9%	30.81%

negative influence on the exam success of all departments: The higher the number of examinees at an exam, the lower the expected average performance of Preparation Departments on this exam.

The second factor is the department size, which is synonymous with the number of candidates registered in the department. This factor is expected to have a positive influence on exam success: The higher the number of candidates registered in a department, the higher the probability that this department has good candidates.

The third factor is the number of posts to be filled. Before each examination, the Ministry of Education determines the exact number of posts to be filled in each specialization. This factor is expected to have a positive influence on exam success: The higher the number of posts to be filled, the higher the chance of success. However, the number of posts finally filled can be different from the number initially set. This discrepancy is due to decisions of the examining boards. Each exam has its own specific examining board. Examining boards are independent: The head of the board is nominated by the Minister of Education, but once nominated, the head chooses other members of the board and is free to implement his or her own policy. Thus, a board can decide that there are not enough good candidates to fill all posts. On the contrary, it can decide that there are many more good candidates than posts to be filled, and negotiate with the Ministry to obtain additional posts.

The fourth influencing factor is the type of examination. In fact, each of the four categories has a specific style of examination tests. General education exams (Type 1) are rather academic and essentially consist of essay writing and lecturing. Technical education exams (Type 2) very often consist of case studies. Vocational training exams (Type 3) are often organized around real work situations. Finally, tests in physical education and sports (Type 4) are very practical. Therefore, the type of examination is expected to have an influence on a department's success.

The fifth influencing factor is the examination specialization. To some extent, type and specialization are linked: A specialization is often associated with only one type of examination. However, this is far from being a systematic rule. For example, in most engineering specializations, teaching exams are structured in both technical and in vocational formats. Therefore, specialization can exert an autonomous influence, which results from the fact that examining boards are independent. Thus, boards decide which selection criteria will be used. A board can decide to use not only academic criteria, but also extra-academic standards such as social or geographical equity criteria.

The final factor is the location of a department. Location is expected to have an influence on exam success because each department has its own staff, organization and pedagogical methods.

Performance indicators

To measure success of a department, quantitative indicators have been used. Five different possible indicators were considered:

- the department's pass rate, which is the ratio

$$y_1 = \frac{\textit{Number of successful candidates from a department}}{\textit{Number of candidates from this department who were effectively present at the exam}}$$

- the number of successful candidates from a department (y_2)
- the department's share in the total number of successful candidates, which is the ratio:

$$y_3 = \frac{\textit{Number of successful candidates from a department}}{\textit{Total number of successful candidates on this exam}}$$

- the department's share in the total number of successful candidates related to its share in the total number of registered candidates (weighted share in the number of successful candidates y_4)
- the department's share in the total number of successful candidates related to its share in the total number of candidates effectively present at the exam (weighted share in the number of successful candidates y_5).

The reason for considering several indicators is that it is important to detect whether the relationships observed between the factors and a department's performance depend on the indicator used. Moreover, if different indicators were to give similar results, it would be important to know whether these indicators are intercorrelated. To check this, the matrix of correlations was computed. Table 2 shows that y_1, y_2 and y_3 can be considered non-intercorrelated (correlation coefficients inferior to 0.3), whereas y_4 and y_5 are strongly intercorrelated (coefficient superior to 0.7). The indicator y_2 is not correlated with other indicators. Finally, y_1 and y_3 can be considered to be weakly correlated with y_4 and y_5 (coefficients contained between 0.3 and 0.7).

Therefore, one may expect that indicators y_1, y_2 and y_3 each lead to specific results, while the group composed of indicators y_4 and y_5 should lead to a fourth set of specific results. Annex A provides further details.

Results and conclusions

Each of the five performance indicators has been regressed on the potential determinants. Tables 3–5 report the coefficients of the regressions. Each coefficient is associated with a Student test statistic (T-stat), noted in parentheses.

Table 2. Intercorrelations among the performance indicators

	y_1	y_2	y_3	y_4	y_5
y_1	1.00				
y_2	0.17	1.00			
y_3	0.28	0.22	1.00		
y_4	0.55	−0.05	0.44	1.00	
y_5	0.63	0.03	0.43	0.96	1.00

T-stats indicate the statistical significance of coefficients. T-stats are interpreted as follows: A coefficient is statistically non-significant (^{NS}) if the absolute value of the associated T-stat is less than 1.64; weakly significant (*) if the absolute value of the T-stat is between 1.64 and 1.96; and highly significant (***) if the absolute value of the T-stat is greater than to 2.57.

The results obtained show that the six potential factors of performance in this analysis are sufficient to explain up to 80% of the success rate of a department as measured by the five performance indicators. Tables 3–5 report the best global fits in terms of prediction quantity (highest R-square statistics) and quality (highest Fisher and Wald chi-square tests) for each performance indicator. One can observe that each potential factor does not influence every performance indicator: Some potential factors have no influence on certain performance indicators. Besides, according to the performance indicator considered, an influent factor may require a rather different specification. Therefore, considering these differences in determinants, a difference is made between three groups of performance indicators.

Group 1: Number of successful candidates and pass rate

As can be seen in Table 3, the number of successful candidates and the pass rate of a department depend essentially on the same set of factors, which are the number of external competitors, the department size, and the final number of posts filled. These factors have a significant influence on the two indicators. The results are similar for both y_1 and y_2, although the two indicators are not intercorrelated. However, the way in which the factors influence the respective performance indicator is different in each case.

Number of successful candidates: Determinants and conclusions

As regards the number of successful candidates, the determinants show the outcome expected: The number of external competitors has a negative influence, whereas the department size and the final number of posts filled have a positive influence. Contrary to expectations, however, one can observe that type, specialization and location do not have any influence on the number of successful candidates.

Table 3. Regressions of the number of successful candidates and pass rate per department

Variables	Regressions of the number of successful candidates (N = 1981)			Regressions of the pass rate (N = 1926)		
	Fixed-effects model	Random-effects model	OLS	Fixed-effects model	Random-effects model	OLS
Number of actual external competitors	−1.44e−03*** (−7.16)	−3.14e−03*** (−16.91)	−0.0045*** (−11.28)	−4.59e−05*** (−6.35)	−6.89e−05*** (−13.18)	−8.85e−05*** (−21.53)
Department size	0.1455*** (15.31)	0.2043*** (23.48)	0.1947*** (10.75)	−1.2e−03*** (−3.55)	−4.85e−04** (−2.06)	2.4e−05^{NS} (0.2)
Marginal effect of department size	−1.67e−04*** (−14.64)	−9.82e−05*** (−8.63)	2.61e−07^{NS} (0.007)	**1.06e**−06*** (2.62)	6.44e−07** (2.04)	1.65e−07^{NS} (1.03)
Final number of positions filled	0.025*** (24.77)	0.025*** (28.62)	0.027*** (17.38)	4.23e−04*** (11.68)	3.84e−04*** (15.42)	4.34e−04*** (22.77)
Examination type	–	−0.34^{NS} (−0.43)	0.1946^{NS} (0.405)	–	0.002 ^{NS} (0.13)	−0.009^{NS} (−1.43)
Examination specialization	–	0.56^{NS} (1.39)	0.04^{NS} (1.62)	–	0.002*** (3.16)	0.003*** (8.48)
Location of department	–	−0.13^{NS} (−1.11)	−0.25*** (−5.91)	–	−9.9e−04^{NS} (−0.37)	−0.001^{NS} (−0.75)
Constant	−1.42** (−2.48)	−0.56^{NS} (−0.45)	1.24** (2.16)	0.28*** (13.62)	0.25*** (9.03)	0.25*** (18.15)
R^2	0.54	0.75	0.793	0.10	0.22	0.23
Hausman	$205 > \chi^2_{5\%}(5) = 11$			$15.9 > \chi^2_{5\%}(5) = 11$		

Note: T-statistics are in parentheses.
^{NS} Non-significant.
*Significant at the 10% level.
**Significant at the 5% level.
***Significant at the 1% level.

Table 4. Regressions of a department's share in the total number of successful candidates (N = 1981)

Variables	Fixed-effects model	Random-effects model	OLS
Number of external actual competitors	8.62e−07^{NS} (0.97)	3.45e−07^{NS} (0.49)	4.23e−07^{NS} (1.12)
Deptartment weight in the national number of actual candidates	1.4711*** (23.10)	1.7239*** (38.71)	1.70*** (15.17)
Marginal effect of department weight ($X2C^2$)	−0.78*** (−12.90)	−0.88*** (−16.97)	−0.633*** (−5.22)
Initial number of posts to be filled	−2.24e−06^{NS} (−0.72)	−5.09e−06* (−1.88)	−6.37e−06*** (−4.41)
Examination type	–	0.003^{NS} (0.86)	0.001* (1.74)
Examination specialization	–	2.26e−04^{NS} (1.20)	2.57e−04*** (4.02)
Location of department	–	−7.8e−04^{NS} (−1.37)	−8.28e−04*** (−3.79)
Constant	0.001^{NS} (0.59)	−0.008^{NS} (−1.42)	−0.0063* (−1.67)
R^2	0.73	0.74	0.75
Hausman	$95 > \chi^2_{5\%}(5) = 11$		

Note: T-statistics are in parentheses.
^{NS} Non-significant.
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

The results of both fixed-effects and random-effects models are similar. However, the result of the Hausman test shows that the random-effects model is not consistent and should be rejected. According to the R-square statistic of the ordinary least squares (OLS) estimates, these three factors explain up to 80% of the variation of the number of successful candidates.

Possible limits on the positive influence of department size on exam performance were also investigated. The intention was to know if a point exists beyond which the growth of a department has a decreasing positive influence, or even a negative influence, on the number of successful candidates. Theoretically, such an 'efficiency limit' is conceivable and would be explained by the fact that growth creates increasing difficulties in material organization and coordination. In order to determine the marginal effect of increasing

Table 5. Regressions of the department's weighted shares in the total number of successful candidates y_4 and y_5 (N = 1498).

Variables	Regressions of y_4			Regressions of y_5		
	Fixed-effects model	Random-effects model	OLS	Fixed-effects model	Random-effects model	OLS
Number of external actual competitors	−3.05e−06^{NS} (−0.05)	−1.76e−05^{NS} (−0.41)	7.17^{NS} (0.31)	2.96e−05^{NS} (0.90)	1.43e−05^{NS} (0.55)	1.49e−05^{NS} (0.92)
Department weight in the national number of registered candidates	−45.79*** (−4.89)	−21.22*** (−3.16)	−6.18 ^{NS} (−1.38)	−26.21*** (−4.44)	−9.23** (−2.29)	−1.18^{NS} (−0.44)
Marginal effect of department weight	277.02*** (3.51)	122.76** (2.41)	20.11^{NS} (0.78)	161.28*** (3.24)	55.17* (1.81)	0.29^{NS} (0.01)
Final number of positions filled	−3.42 ^{NS} (−1.07)	−6.34e−04*** (−2.84)	−8.53*** (−6.68)	−8.24e−05^{NS} (−0.41)	−2.44e−04* (−1.79)	−3.06e−04*** (−3.64)
Examination type	–	0.09^{NS} (0.6)	0.06^{NS} (1.14)	–	0.047^{NS} (0.55)	0.03^{NS} (0.88)
Examination specialization	–	0.015** (2.01)	0.019*** (5.00)	–	0.009** (2.18)	0.011*** (5.09)
Location of department	–	−0.05** (−2.26)	−0.04*** (−2.73)	–	−0.03** (−2.56)	−0.02*** (−3.07)
Constant	2.98*** (12.43)	2.62*** (9.09)	2.32*** (13.06)	1.83*** (12.12)	1.62*** (9.73)	1.46*** (13.42)
R^2	0.03	0.11	0.12	0.0057	0.07	0.07
Hausman	$13 > \chi^2_{5\%}(5) = 11$			$15.3 > \chi^2_{5\%}(5) = 11$		

Note: T-statistics are in parentheses.
^{NS} Non-significant.
*Significant at the 10% level.
**Significant at the 5% level.
***Significant at the 1% level.

size, the squared size was inserted in the regressions. If an efficiency limit exists, the coefficient of the quadratic variable must be negative.

In the analysis, a significant efficiency limit was observed. This means that increasing the size of a department raises the number of successful candidates, but less than proportionately and only up to a certain threshold, beyond which additional growth lowers exam performance. Figure 2 illustrates this phenomenon.

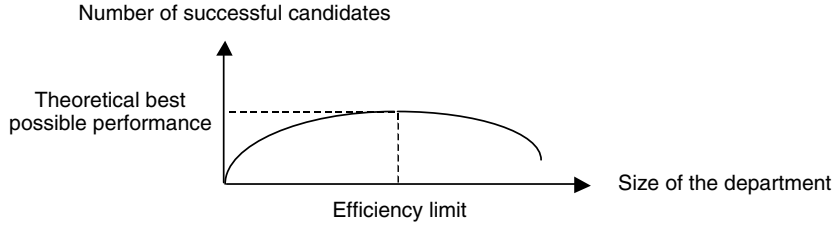
In terms of performance management, these results suggest that department heads who want to improve their results should increase the size of their departments. In fact, the only variable that a department head can control is the number of applicants that he or she authorizes to register at the department. Thus, the head can lower enrolment, or increase it, effectively determining department size.

Raising enrollment increases the size of a department. Up to the efficiency limit, such an increase has a positive influence on the number of successful candidates. Besides, *ceteris paribus*, raising enrolment lowers the number of external competitors, which in turn positively influences performance on the exams. Consequently, the net effect of raising enrolment is quite positive. On the contrary, *ceteris paribus*, lowering enrolment would reduce the size of the department and would raise the number of external competitors. Therefore, lowering enrolment would have a negative net effect on the number of successful candidates.

Pass rate: Determinants and conclusions

With this indicator too, the Hausman test suggests that the random-effects model should be rejected. The calculations confirmed the negative effect of the number of external competitors and the positive effect of the final number of posts filled. Conversely, type and location seemed to have no influence on the pass rate. The major difference between the estimates of the successful-candidates indicator and the estimates of the pass rate is the sign of the size factor: The department size has a negative influence on the pass rate,

Figure 2. The efficiency limit of the size factor



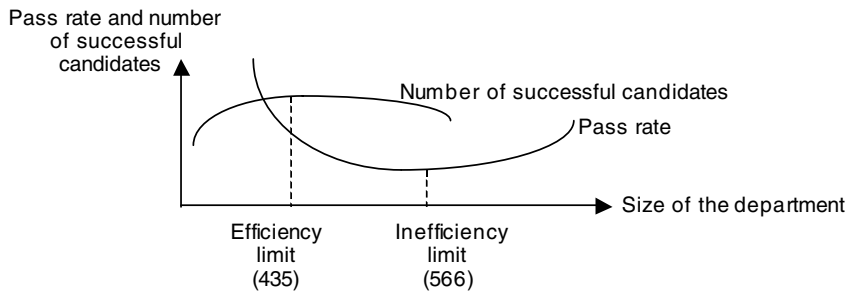
and its marginal effect is positive. This means that the pass rate and the number of successful candidates do not obey the same dynamics. In other words, instead of an efficiency limit, an 'inefficiency limit' can be observed: Beneath a certain threshold, increasing the department size simultaneously decreases the performance, while beyond this threshold increasing the size raises the performance (Figure 3). The efficiency limit in terms of the number of successful candidates and the inefficiency limit in terms of the pass rate do not necessarily correspond. According to the coefficients of the estimates, and given the unexplained part of the variation of performance indicators, it is possible to compute that for the whole sample, the average department sizes corresponding to the greatest possible number of successful candidates and to the lowest possible pass rate are approximately 435 and 566 people, respectively.

These numerical values are mentioned simply to illustrate the phenomenon of an (in)efficiency limit. In fact, the actual size of departments varies according to the specialization. Departments preparing for examinations in which only a few posts are to be filled (e.g., regional language teaching exams) are small, while the biggest departments (e.g., those that prepare candidates for history and geography teaching exams) can enroll more than 700 students. Therefore, the right numerical values have to be calculated for each specialization.

The inefficiency limit suggests that only large departments have sufficient means to overcome the increasing organizational difficulties which result from growth strategy and lower pass rates.

Two conclusions can be drawn from these observations. First, a department head who is targeting the pass rate as a performance indicator should calculate the inefficiency limit, beyond which increasing the size will have a positive influence. Then the head has to set the department size beyond the inefficiency limit. However, the minimum size might be out of reach, for example, for institutional reasons. Limits of the physical premises, a shortage of lecturers in the area or a low student enrollment can make a large department unfeasible. If this is the case, reducing the department size below the

Figure 3. The efficiency and inefficiency limits of the size factor



inefficiency limit can be an alternative solution, since reducing the size improves the pass rate.

The second conclusion is that, as can be seen from the differences in dynamics of the pass rate and number of successful candidates, the choice of a performance indicator is important. It is necessary for heads to understand the relevance of this choice.

In fact, a performance indicator has three main functions. First, performance indicators are the criteria on the basis of which the policy and the efficiency of departments can be assessed. Assessment is important because it determines funding. Therefore, assessment has to be conducted in full public view, on the basis of criteria that should be precise, stable and well known to both partners (departments and assessment institutions). Good performance indicators have to meet these characteristics. If this is the case, assessment will be accepted as reliable and fair.

The second function of a performance indicator is to be the goal towards which the entire performance policy of a department is designed. Once the performance indicator has been chosen, the whole policy of the department should be designed in order to achieve the best possible performance according to this indicator, which thus becomes a kind of 'reference indicator'. The implication is that department heads have a good understanding of the dynamics of the indicator chosen, such as whether an efficiency or inefficiency limit exists or not. Insofar as it is based on the department's reference indicator, the assessment of the department policy and results will be relevant.

The third function of a performance indicator is to shape the communication policy of the department. Those in which no student is registered will be closed down. Therefore, departments which intend to continue their activity need to attract new prospective examinees every year. However, as van Zanten (2001) has shown for secondary education, the main factor that potential applicants take into consideration is a department's exam performance. Therefore, performance indicators play a major role in communication policies implemented towards potential applicants.

Group 2: Share in the total number of successful candidates

This third indicator is the only one in this group. It has been isolated because its determinants are different from those of the other performance indicators.

As can be seen from Table 4, a department's share in the total number of successful candidates in a given year depends essentially on the department's weight in the total number of candidates nationally. The other variables have no significant influence. An efficiency limit (concave or inverted U-shape curve) can be observed: Increasing the department's weight first increases the department's share in the total number of successful candidates before finally having a negative influence beyond the efficiency limit. The results of both models are similar, but the Hausman test shows that only the fixed-effects

model is consistent. According to the R-square statistic of the OLS estimates, the weight factor explains up to 75% of the variation of a department's share in the total number of successful candidates. This means that a department head who intends to improve exam performance in terms of this indicator would have to increase the weight of his or her department in the national number of actual candidates up to the efficiency limit.

Group 3: Share in the total number of successful candidates related to share in the total number of candidates registered for or effectively present at the exam

As stated above, indicators y_4 and y_5 are strongly intercorrelated. As can be seen from Table 5, the best fits for performance indicators y_4 and y_5 show that the available potential factors explain only a small part (no more than 12%) of these indicators. However, these estimates show that the weight of the department in the national number of registered candidates is a significant determinant of indicators y_4 and y_5. An inefficiency limit (convex or U-shape curve) of the weight factor can be observed. This can be seen from both fixed-effects and random-effects models. However, the Hausman test shows that only the fixed-effects model is consistent. This means that improving a department's success on the exams in terms of these indicators is subject to increasing the department's weight in the national number of registered candidates beyond the inefficiency limit.

Conclusion

In a system of teacher recruitment based on a rigorous selection of candidates (as is the case in France), candidate preparation turns into a matter of strategy. The institutions in charge of candidate preparation have to devise strategies to maximize the chances of success on the exams. Two main conclusions can be drawn from the French Preparation Department model of performance management.

The first conclusion is that the choice of an indicator for performance measurement is critical. Each performance indicator depends on specific determinants and obeys a specific dynamic. Therefore, the best strategy depends on the indicator chosen. In addition, relevant department communication with future potential applicants as well as the effective evaluation of a department's performance by assessment institutions should be based on the indicator chosen. As a consequence, it is important that before choosing a performance indicator, department heads have a good knowledge of what different indicators exist and what the determinants, dynamics and policy implications of the various indicators look like.

The second conclusion is that a large amount of information is now available concerning three performance indicators used by the IUFM: The

number of successful candidates, the share of the total number of successful candidates, and the pass rate.

The number of successful candidates from a given department depends on this department's size, on the total pool of candidates outside the department, and on the number of posts filled by the recruitment examination. Raising the department's size thus increases the number of successful candidates. However, this positive effect of growth is limited by an efficiency ceiling: Beyond a certain size, likely due to increasing difficulties in organization, growth decreases the number of successful candidates. This means that for a department head who chooses the number of successful candidates as the reference indicator, the best strategy for increasing success consists of increasing the number of students enrolled until the efficiency limit is reached but not surpassed.

The share of a department in the total number of successful candidates essentially depends on this department's weight in the national number of actual candidates. Raising the weight also increases the departmental share of the total number of successful candidates. Here, too, the positive effect of growth is limited by an efficiency barrier: Beyond a certain weight, additional enrollment by the department reduces the share of the total number of successful candidates.

The third indicator is the pass rate. The pass rate of a department is affected by the same determinants as the number of successful candidates, but the dynamic is different: The positive effect of growth begins only after a minimum size has been reached. Below this minimum size, a growth strategy is inefficient and even decreases the department's pass rate. This implies that the best strategy for increasing success consists of first bringing the department size to the minimum level required by the pass-rate dynamic. However, when the minimum size is out of reach, an alternative option for improving the pass rate consists of reducing the department size.

This analysis has essentially focused on performance management. The question of the rate of failure in teacher-recruitment examinations has not been considered. However, the global rate of failure in French secondary-teacher-recruitment examinations is quite high: at least 80% every year. Nevertheless, unsuccessful candidates have various alternative choices. They can, for example, become teachers in private schools, or take the public teacher exams again and again for years, since there is no time limit. They can also try to pass other civil service entry examinations. But what is certain is that the high rate of failure does not make the public teacher recruitment examinations less attractive. Various reasons could explain this: social prestige, a lack of alternative opportunities in the labor market, a certain freedom at work which makes it possible for teachers to combine professional career with social and family life, and job security (Cros and Obin 2003: 32–33). But, however that may be, given budgetary constraints, the main concerns of the Ministry of Education and of the IUFM are how to select the best candidates and how to manage performance, rather than what to do with unsuccessful candidates. This situation is clearly different from those prevailing in

other countries such as the United Kingdom, Finland, Australia or the United States, where one of the main concerns is how to attract new teachers and retain them in the educational system. But the situation in France is not so different from that of other countries such as Korea, Italy and Spain. In these countries, despite competitive recruitment examinations, secondary teaching still attracts a great number of candidates. In such contexts, it is necessary to establish rigorous processes for the selection of candidates, and this in turn can generate competition and create a need for preparation strategies.

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Annex A: Technical note

Variables

Concerning the first three potential factors, alternative specifications have been taken into account. *For the national number of candidates* sitting for an examination, four specifications have been considered alternatively:

- the national number of candidates registered for this examination (called X1A);
- the national number of *actual* candidates, which are the candidates registered for *and* present at the exam (X1B);
- the national number of external registered competitors, which are the candidates outside the department who are registered for the exam (X1C); and
- the national number of external actual competitors, which are the candidates outside the department who are registered for and present at the exam (X1D).

The size of a department can be represented by

- either the number of departmental candidates, which are the candidates registered in this department (department size, named X2A);
- or the weight of this department in the national number of registered candidates (X2B = X2A/X1A);
- or the weight of this department in the national number of actual candidates (X2C = X2A/X1B).

The number of posts to fill at an examination can be defined as

- the initial number of posts officially announced before the beginning of the examination (X3A);
- or the final number of positions effectively filled at the end of the examination (X3B);
- or the initial number of positions per departmental candidate (X3C = X3A/X2A);
- or the final number of positions per departmental candidate (X3D = X3B/X2A).

Statistical model

The links between factors and performance are investigated by means of linear-regression models. Panel-data-regression models are used (Baltagi 2001). The use of panel-data statistics is justified by the fact that the data used in this study constitute a panel of several individuals (the departments) observed during several periods (11 years from 1992 to 2002). Two primary models of panel-data statistical analysis could be used: the model with fixed-effects (FEM) and the model with random-effects (REM). The results of these two models are presented in this study. Hausman's test is run to compare these results and select the best model. For comparison purposes, the OLS estimates are also presented. In the OLS regression, White's estimator is used because of its robustness to heteroscedasticity of unknown form.

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