Economic Modelling 26 (2009) 300–308

Contents lists available at ScienceDirect

Economic Modelling

journal homepage: www.elsevier.com/locate/econbase

Incentives in academic tenure under asymmetric information ☆

Zhao Chen [a], Sang-Ho Lee [b,*]

[a] China Center for Economic Studies, Fudan University, 220 Handan Road, Shanghai, 200433, PR China
[b] Department of Economics, Chonnam National University, 300 Yongbong-dong, Bukgu, Gwangju, 500-757, Republic of Korea

ARTICLE INFO

Article history:
Accepted 31 July 2008

JEL classification:
H52
J41
L20

Keywords:
Academic tenure
Incentive compatibility
Information rent
Tenure track

ABSTRACT

This paper examines the incentives in academic tenure under asymmetric information where neither types nor actions of the agents are observable. The different contractual forms are compared, including short-term non-tenured contract and tenure contract with or without probationary period. It is shown that tenure track may help reduce information rent for the department in the situation where a smaller portion of high productive researchers are entitled to undertake very costly and time-consuming research project with a high potential value. However, when the probationary period cannot efficiently screen out the low productive researchers, providing both short-term non-tenured contract and tenure contract without probationary period or merely providing short-term non-tenured contract will be more likely taken by department. Therefore, the coexistence of different contractual forms in higher educational system, including the growing use of non-tenure track in some academic sectors can be economically explained.

1. Introduction

One of the important roles of the university is not only to select talented and creative researchers to conduct more valuable researches, but also to motivate these researchers to place more effort into these activities. In this context, for a long time the tenure system has been treated as an efficient instrument to give an incentive for incumbent academics to reveal truthfully their judgments about the abilities of junior staff and to hire the best candidates available. It then remains to be explained why most research-oriented universities provide tenure track contract while others provide non-tenured positions as well.[1]

Since the 1970s, many spirited defenses of the tenure system have been made on the grounds of academic freedom, i.e., protecting the rights of faculty to pursue their research and teaching. Some economic rationales for tenure system have also been proposed. McPherson and Winston (1983) analyzed an economic security and insurance function of tenure when academic production is highly specialized and investment in knowledge may become obsolete.

However, a recent strain in the tenure literature involves the consequences of lifetime employment in an age of uncapped mandatory retirement. For instance, Levin and Stephan (1991) and Hammermesh (1994) found that the research output of economists declines with age, that is, the public perception that tenure protects 'deadwood' is prevalent.[2] McPherson and Winston (1996) offered the assessment that in the university where the tasks are final once tenure is made, monitoring performance has little value, for there is little to do with the information.

Furthermore, under the context of asymmetric information and ex-post incentive in tenure, Carmichael (1988) made the argument that academic tenure is a necessary condition of ensuring members in its department to hire the best possible candidates, while Dnes and Garoupa (2005) investigated post-tenure performance in the shadow of the threat of dismissal followed by payment of contract damages. These studies then imply that merely providing tenure track contract might not be the best choice for universities under all circumstances.

☆ This paper began while the first author was visiting IDEI in France and was completed while the second author was visiting California State University, Sacramento in USA. The authors are grateful to Zhijun Chen, Taegi Kim, Zonglai Kou, Geamyong Lee, Ming Lu, Yongqing Wang, Yan Zhang, two anonymous referees in this journal, and seminar participants at IDEI of Toulouse, SMU of Singapore, and CNU of Gwangju for their helpful comments and suggestions. Financial supports from the Ministry of Education (program for NCET), Shanghai Leading Academic Discipline Project (B101), "985 Project" of Fudan University, and Korean–American Fulbright Visiting Scholar Grants are also greatly appreciated.

* Corresponding author.
E-mail addresses: zhaochen@fudan.edu.cn (Z. Chen), sangho@chonnam.ac.kr (S.-H. Lee).

[1] AAUP(American Association of University Professors) classified that all full-time appointments would be with tenure, on the tenure track, or short-term, if absolutely necessary. The contributors to the work of Chait (2002) provided the policy-oriented and data-driven research on tenure system in the United States, and reported that the percentage of full-time faculty with tenure has stayed remarkably stable between 1975 and 1998 at about 52%. They also reviewed the background and current state of tenure, and offered the actual and potential changes in tenure policy and practice.

[2] According to the survey of Immerwahr (1999), 95% of corporate executives agreed that tenure sometimes protects incompetent faculty, and an opinion seconded by 74% of the tenured professors polled.

0264-9993/$ – see front matter.
doi:10.1016/j.econmod.2008.07.012

In practice, McPherson and Schapiro (1999) provided that while being a full-time faculty member is typically a necessary condition for taking part in the tenure system, it is not sufficient when they review survey data of the tenure system in the United States. They found that, in terms of institutional type and program areas, there are significant differences between private universities and public universities, and between research areas.[3] However, we have few understandings of the coexistence of different contractual forms in academia. For example, if tenured position is superior, why is it not dominating? One possible explanation is provided by McPherson and Schapiro (1999). They argued that the role of tenure plays in influencing the distribution of authority within universities that make different distributions of authority in different types of institutions. Usually, it is known that tenure diminishes the relative authority of executives when tenure constricts institutional flexibility and undercuts performance accountability.

However, this observation that the relative value of tenure in different types of institutions differ should be examined in a more economic way. By so doing, we can understand the implications of the cost and value of different contractual forms in academic world. For instance, recently in some top universities in China and Korea newly recruited overseas PhDs are provided with tenure track contract, while others are still in a non-tenured, short-term contract. These practices have little to do with the distribution of authority in the department.

The motivation of this paper is thus to examine the efficiency of tenure system as a labor market contract and correspondingly discuss about whether alternative forms of academic contracts might accomplish the goal of efficiency. Specifically, we investigate why many universities use the tenure track contract only from the beginning while others also provide non-tenure-track position as well.

This paper focuses on the ex-ante incentive properties of tenure in academics under asymmetric information. We assume that the department does not know the value of alternative researchers who might be fired in a tenure-less academic world. We also assume that it takes time and cost to discover the full extent of talent of researchers. Then, using a principal–agent model with unobservable type and action, we develop a simple self-selection model of tenure in academics and examine the incentives in different institutions. It is investigated under what condition the tenure system with "up-or-out" fashion could be a device for the department to save the information rent. Later, this paper compares different incentive contracts in academia and helps understand the efficiency of different contractual forms under different circumstances, including tenure contract, which is usually with "tenure track" appointment and "up-or-out" rule.

It is shown that tenure track helps reduce the information rent for the department when high productive researchers are smaller portion and they are entitled to undertake very costly and time-consuming research project with very high potential value. In other words, when the cost of effort or the ex-ante payment is very large, merely providing tenure track contract is more likely to be dominating for the department. However, on the other hand, when low productive researchers can engage in less costly project with high success probability, the department can save the information rent by granting tenure immediately and providing non-tenured position as well. This is because the probationary period can not efficiently screen out low productive researchers.

The organization of this paper is as follows: In Section 2, the basic model for analyzing a principle–agent relationship under the asymmetric information situation is introduced. Several incentive contracts without and with tenure track are examined under the truth telling equilibrium in Sections 3 and 4, respectively. Then, incentive contracts are compared to find optimal contract, and important findings are discussed in Section 5. Conclusions with future research are provided in the final section.

Table 1
The two types of research projects

Research projects	Potential value	Research periods	Probability of success with effort		Total cost of effort
			High type	Low type	
A	V_A	1	1	P_A	C
B	V_B	n	P_B	0	nC

2. The basic model

A principal–agent model is set up with unobservable type and action. There are two types of agents and the portion of less productive (low type) researchers is q. Suppose that the level of effort of both agents could only be 1 or 0, representing hardworking or shirking, respectively. Both the type and level of effort of agents are unobservable.[4] The potential value of academic research could be quite different and thus, projects with higher potential value require longer research period.[5] For simplicity, suppose there are two kinds of research projects, shown in Table 1. Project A has lower potential value and lasts for one period, while project B has higher potential value and lasts for n (> 1) periods. The cost or disutility of effort is C for each period.[6] If the agent shirks, output of the project will be 0. For project B, for example, shrinking means not working hard for at least one period. If the project succeeds, the output is just its potential value. The probability of success with effort is also shown in Table 1, where P_A and P_B are between 0 and 1.

The choice of each project is contractable, where the department commits to provide compensation to each agent. For those that choose project A, the cost of effort C will be compensated when the project is completed in each period. However, for those selecting project B, they cannot wait for compensation until the project ends. This makes it necessary for the department to compensate the agent for at least some of this cost. It is assumed that for $n-1$ periods before the project is completed, the agent must obtain ex-ante compensation in each period, which equals to kC $(0<k\leq 1)$.[7] Suppose the first best solution under complete information is that both types always work hard and the low/high type selects project A/B. That is, $P_AV_A-C>0$ and $P_BV_B-nC>n(V_A-C)$ or, equivalently, $V_B>nV_A/P_B$.[8] Both the principal and agents are assumed to be risk-neutral, and the principal is assumed to maximize net value of the projects.[9]

[3] National Center for Education Statistics (1993) reported that only two third of all public community colleges have a tenure system, compared to nearly 100% of public and private research universities. However, rapid expansion of community colleges has swelled the ranks of faculty on campuses without tenure. Later, National Center for Education Statistics (1997) reported that more than a quarter of full-time non-tenure track faculty work at public research universities, but only 5% are at private comprehensive colleges. Likewise, 60% of community college faculty are part-time against only 19% of public research universities.

[4] For those who have longer academic careers, their abilities might be easy to be investigated according to their academic accomplishments, rankings, or grants obtained. However, even well-established scholars have to reveal their abilities during the early stage of research career where asymmetric information prevails. Tenure track can serve as the most important period for this purpose.

[5] Since most of the non-tenure track positions in academia are teaching-oriented, tenure could be to some extent explained by different time horizons of different dimensions, teaching and research. However, we will focus on the case where research positions are also offered with non-tenured positions, which can be observed in recent top universities in China and Korea.

[6] This implies that long-term tenure contract is needed for the high value project. One possible explanation on this assumption is the lack of high-powered incentive contract or the problem of full commitment from the department. We will discuss this issue in the last section by focusing on the cost and benefit of different contractual forms of tenure.

[7] It might also be regarded as the minimum wage policy constraint or some minimum living standard that must be obtained until the project ends.

[8] It can be also interpreted that the potential value of project B is high enough that it is necessary to induce effort from the high type on project B. This is because society does require the most talented people to engage in the most challenging work.

[9] Notice that given the researcher's effort and payoffs of each project, to maximize net returns to the department of the principal is equal to minimize the rent of the agents.