

**Allocation dynamics of resources imperiled:
AACSB, students, and their professors**

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Abstract

To comply with the accreditation standards of the American Association of Collegiate Schools of Business (AACSB), B-schools in the United States have to maintain a low student to faculty ratio. AACSB standards also affect the process of reviewing full-time faculty (FTF) members for promotion and tenure (P&T), so that the P&T review process safeguards the continued development of educational and intellectual activities in US B-schools. AACSB requires the FTF of its members to enhance the reputation of their B-schools through research and publications. This essay extends the work of Georgantzias, Hamilton, & Drobnis (1994) on the implementation of AACSB standards through feedback-loop planning, showing how a system dynamics simulation model complete with computed scenarios has been helping a small but prestigious B-school assess its future in terms of student to faculty ratios.

Introduction

B-schools have transformed themselves profoundly over the last 30 years. Faculty has moved from collecting and transmitting current practice to developing and communicating theoretical understanding of phenomena relevant to management, particularly, the management of complex decision situations (Rumelt, Schendel, & Teece, 1991). In the late '50s, the impetus of the Ford Foundation and Carnegie Foundation as well as the Pierson (1959) report prompted extensive changes in B-schools. One far-reaching recommendation was to infuse B-schools with rigor, method and the content of the basic disciplines: economics, mathematics, psychology and sociology. That recommendation was avidly followed. Alongside the traditional, professionally oriented faculty, the new discipline oriented faculty found scholarship in advancing theory, writing for those similarly placed, sometimes without resort to practice or application of acquired insight.

Traditionally, B-school faculty found scholarship in studying business firms, identifying and transmitting knowledge about the best practice in the classroom, mostly through case studies or the occasional published article. Traditional faculty was frequently cast in consulting to practicing business managers, often with greater financial reward than that found in scholarship alone. In time, set in motion was a process that retired professionally oriented faculty in favor of discipline oriented scholars. While B-schools grew from granting about 10,000 to over 80,000 MBA degrees per year, they aligned their standards for hiring and P&T with the social sciences. Yet, in the early years of growth, well-trained faculty members were scarce in specialty areas, such as accounting, finance, marketing and operational research (OR). To fuel expansion, B-schools were quick to hire discipline oriented faculty, only later to worry about informing practice in business firms. A few faculty members made the transition, but those with allegiance to their discipline continued seeking

publications, not in the field in which they professed, but in the discipline in which they had been trained.

These were some of the war stories told in the early meetings of an ad-hoc committee of administrators, FTF and students at a small but prestigious B-school in New York City. The committee met to discuss the implementation of AACSB accreditation standards pertinent to its student to faculty ratio, and to consider the possible effects of the school's growth on these standards, five years into the future. Broad discussions culminated into a system dynamics model that helped the committee assess the situation. The model captured relationships among variables pertinent to hiring adjunct and full-time faculty.

An important concern expressed by the student participants related to class size. Small classes, i.e., less than fifteen students, are preferable to students who join the MBA 'experience' with a passionate commitment to acquire skills that will help them contribute to the revitalization of core industries. Small classes allow for more participant interaction that facilitates learning. Also, the students understand better what instructors require and the instructor knows each student's special needs and skills. This is consistent with the 1990 AACSB standard FD.4 which set the minimum full-time equivalent (MFTE) faculty equal to "1 (one) FTE per 300 graduate student credit hours" (Evans, 1990, p. 5 of the Appendix to the faculty standard).

The model describes interlinked decision processes, covering student enrollment and graduation, full-time faculty (FTF) hiring, promotion and retirement, and adjunct faculty (AF) hiring, renewal and dissociation. Interviews and discussions with administrators, adjunct faculty, full-time faculty and students, both during and outside the ad-hoc committee meetings, contributed to the model building process.

The model also extends the boundaries of an early version to incorporate both the graduate and the undergraduate student population and faculty of the B-school. Naturally, this not only increases the model's appetite for data but, more importantly perhaps, it also increases its complexity. While the modeling effort continues, the dominance of the model's decision feedback loops might also shift, focusing the project participants' attention on some thorny issues that emerge, namely the allocation and utilization of the full-time and part-time faculty pool that is shared by graduate and undergraduate students.

In its current state, the model shows that, if pressured by a growing student population, the area chairs of the school's discipline-oriented functions might intensify their recruiting effort. Yet, limited resources and a possible line freeze for full-time faculty can further increase the student to full-time faculty ratio. Confirming the inexorable nature of the tenure and promotion evaluation process, the downward adjustment of full-time faculty keeps pressuring associate and full professors to turn tenure applications down, thereby depleting the full-time faculty pool even further. A limited success at quickly replacing full-time faculty could then cause a complete breakdown in the rationality of implementing AACSB (re)accreditation standards pertinent to the students per faculty ratio.

Worth noting is that before joining the ad-hoc committee, initially two and now three of its members have had participated in a system dynamics modeling course. The model focuses attention on the processes of attracting students internationally and from New York's tristate area. Although the description and parameterization of

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Fig. 1
College students (CS), graduate students (GS), and their first-time enrollment trends along with the results of a GS cohort study aimed at assessing graduation rates

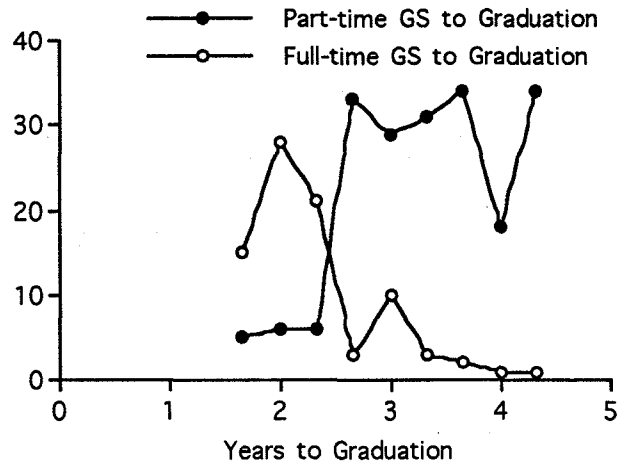
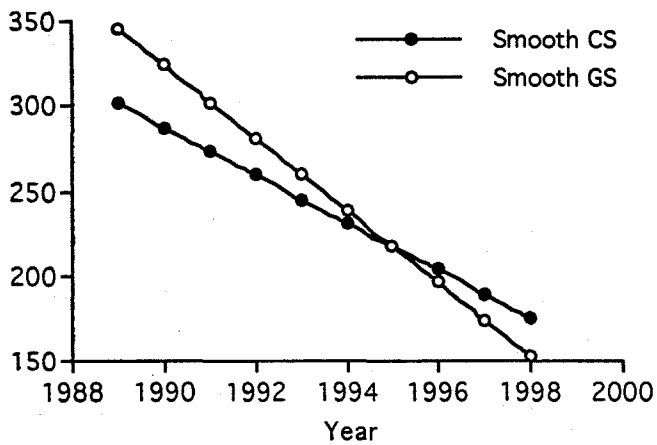
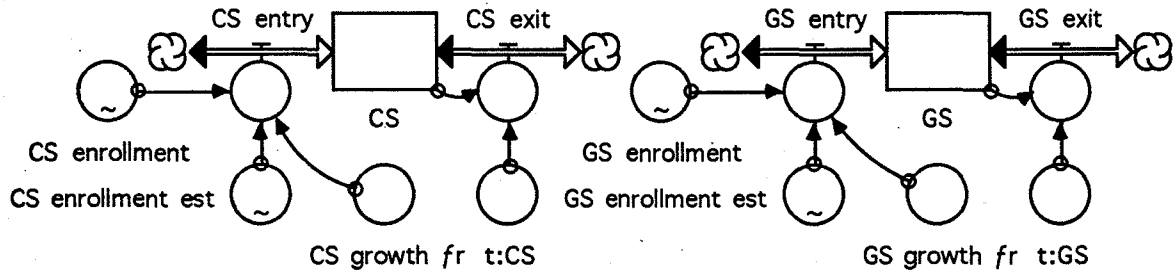
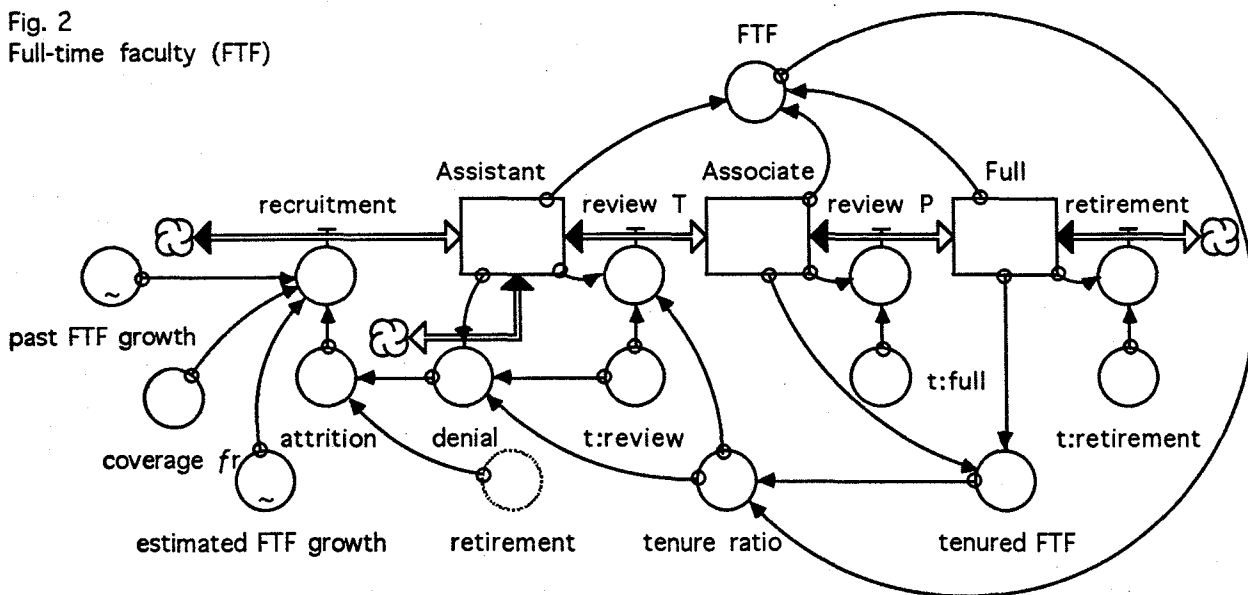


Fig. 2
Full-time faculty (FTF)



these processes are evolving, some remain virtually unchanged from the original model. The rationality of the model preserves that of the original, empirically derived model. Importantly, the simulation results of the model exhibit behavior that resembles reality for reasons that the ad-hoc committee found both plausible and persuasive.

Model Description

Following Morecroft's (1985) ideas, we trace changes in the ratio of students per faculty to the inauspicious interaction of student, FTF and AF growth. Partial model tests combined with behavior-reproduction tests showed how the decision processes of inducing growth in the student population, and hiring full-time and adjunct faculty may work when their rational assumptions are not seriously violated (Georgantzas, et al., 1994). Simulation runs of the entire model to reveal possible dysfunctional behavior in the school's student to faculty ratios.

The Student Population Sector

The average time a graduate student ($t:GS$) spends in the MBA program varies, depending on whether enrolled full time or part time. On the upper left of Fig. 1, actual first-time CS enrollment trends and first-time CS enrollment estimates combine with the CS growth fraction (fr)—which depends on exogenous socioeconomic variables as well as on administrative decisions to recruit new students locally, internationally, or both—to determine the first-time CS entry. Similarly, the graduate student (GS) first-time entry depends on the GS enrollment actual and estimated trend adjusted, through the GS growth fraction (fr) for the administrative decisions to intensify the recruitment of new students locally, internationally, or both. Underneath the college student (CS) and graduate student (GS) population sector, Fig. 1 shows the school's CS and GS actual and estimated first-time enrollment trends as well as the results of a 348-GS cohort study aimed at assessing full-time and part-time graduation rates.

Historical data up to year 1993 were readily available from the school's records, while several administrators shared their student recruitment plans for the future. The CS and GS trend estimations and extrapolations of Fig. 1 were based on purely demographic and socioeconomic conditions, excluding any extra efforts to increase student enrollment.

The Full-time Faculty (FTF) Sector

The full-time faculty sector of Fig. 2 incorporates the process of promotion and tenure (P&T) evaluation. The inexorable nature of this process makes the often desired balanced growth in the ranks of assistant, associate and full processor a physical impossibility. Worth noting in the structure of the FTF sector is the representation of the tenure decision as a power transformation of the tenured to total full-time faculty ratio. The tenure ratio's power transformation parameters were motivated by extensive discussions with the B-school's personnel committee.

Similarly, a dimensionless parameter of 0.75 resulted from extensive discussions but also debate in the deliberations of the ad-hoc committee. Representing success at replacing faculty, this parameter may be set equal one (1) for large schools with a global reputation, but the high cost of living and crime can make it hard for a small B-

Fig. 3
Adjunct faculty (AF)

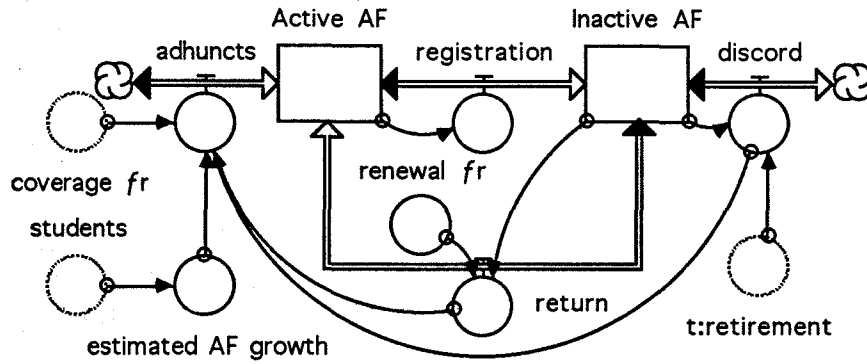
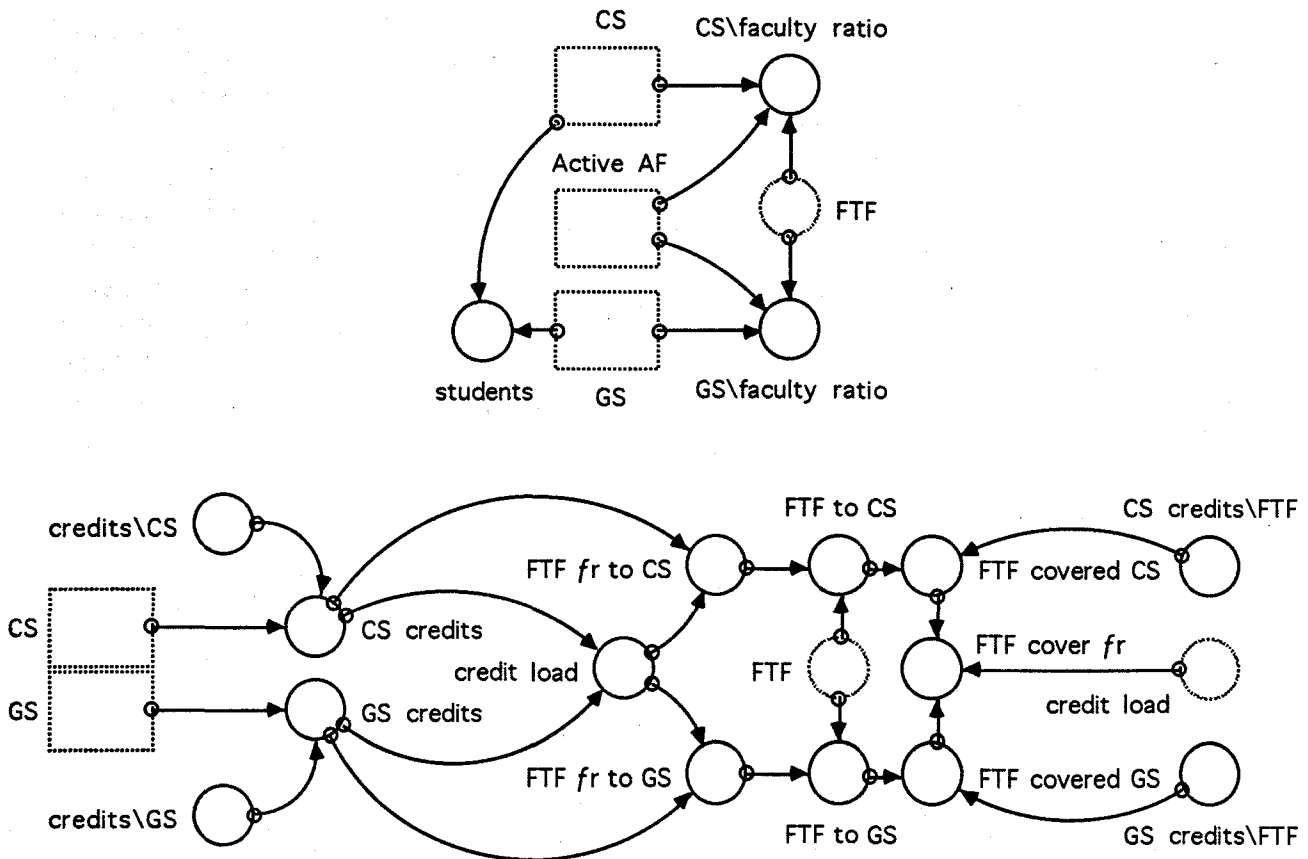


Fig. 4
Student to faculty ratios and FTF allocation to cover the CS and GS credit load



school in New York to hire top-notch junior faculty. Lastly, while a 7-year probation period is fairly standard in the life of FTF, the 12-year parameter used in the time to retirement ($t_{\text{retirement}}$) is consistent with the *mean age* data of (Rees & Smith, 1991, pp. 12-13).

The Adjunct Faculty (AF) Sector

Knowing how inflexible and uncompromising the process of promotion and tenure is, the American Association of Collegiate Schools of Business (AACSB) permits B-schools to use adjunct faculty (AF) to supplement their personnel needs, particularly when unforeseen changes occur in student enrollment. Figure 3 shows how the students 'ghost' haunts the administrative decision of hiring new AF members. Estimated AF growth—one of the terms affecting AF hiring decisions—is itself a logarithmic function of the school's student population (CS + GS).

An adjusted $R^2 = 0.857$ indicated that the logarithmic function could explain more than 85% of the variability historically observed in AF growth data. It is a rather impressive fit that validates using this mathematical function instead of graphical table function. The reason for doing so is that some actual AF data had not yet been compiled at the time of our intervention.

At the end of each academic year AF contracts expire, rendering AF members inactive, in principle at least. Historically again, depending on course registration, roughly $2/3$ of AF contracts are renewed unless, of course, adjunct faculty members in demand choose to dissociate themselves from the B-school, i.e., they retire. That is precisely the information that the dimensionless $2/3$ parameter conveys in the 'return' rate of AF members.

The Student to Faculty Ratio Sector and FTF Allocation and Utilization

Figure 4 shows the students per faculty ratio sector as well as a rough-cut map of the full-time faculty (FTF) allocation to the college student (CS) and graduate student (GS) populations. On the one hand, computing the CS\faculty and GS\faculty entails a straightforward calculation. Given AACSB's guidelines, a $2/3$ parameter is used in this calculation converts AF to their FTF equivalent.

On the other hand, the allocation dynamics of *resources imperiled* (Bowen & Schuster, 1986) entails some messy computations that, according to AACSB standards, convert the CS and GS populations to a credit load. The credit load in turn determines the allocation of full-time faculty to college students and graduate students, depending on the CS credits and GS credits, respectively, that the average FTF member can deliver on a contractual basis. Again, given that AACSB permits B-schools to use adjunct faculty (AF) to supplement their personnel needs, available FTF members are used cover the credit load, while AF members are called to cover its balance. The FTF cover fraction (fr) of the credit load is another performance metric that AACSB looks at for (re)accreditation purposes.

Simulation Results

Following the *computed scenario* approach of Georgantzis & Acar (1995) and Morecroft (1985), in simulation experiments with the entire model, we examine how the intended rationality in hiring AF and FTF might hold up to several contingencies

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Fig. 5
Assistant, associate, and full professors that make up the full-time faculty (FTF) total

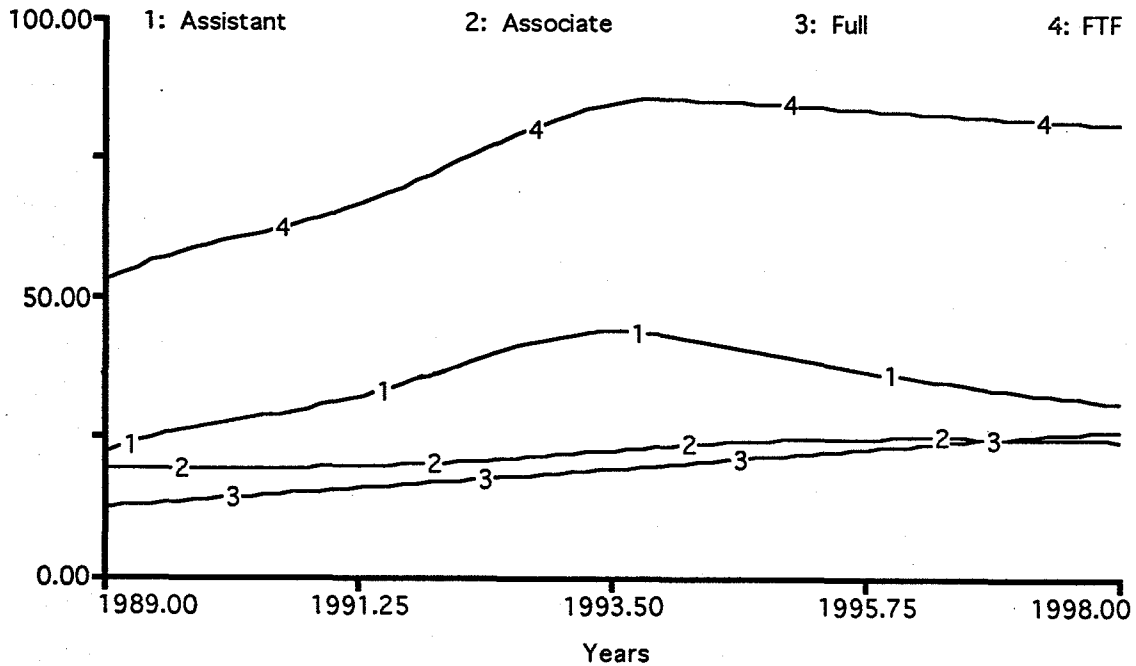
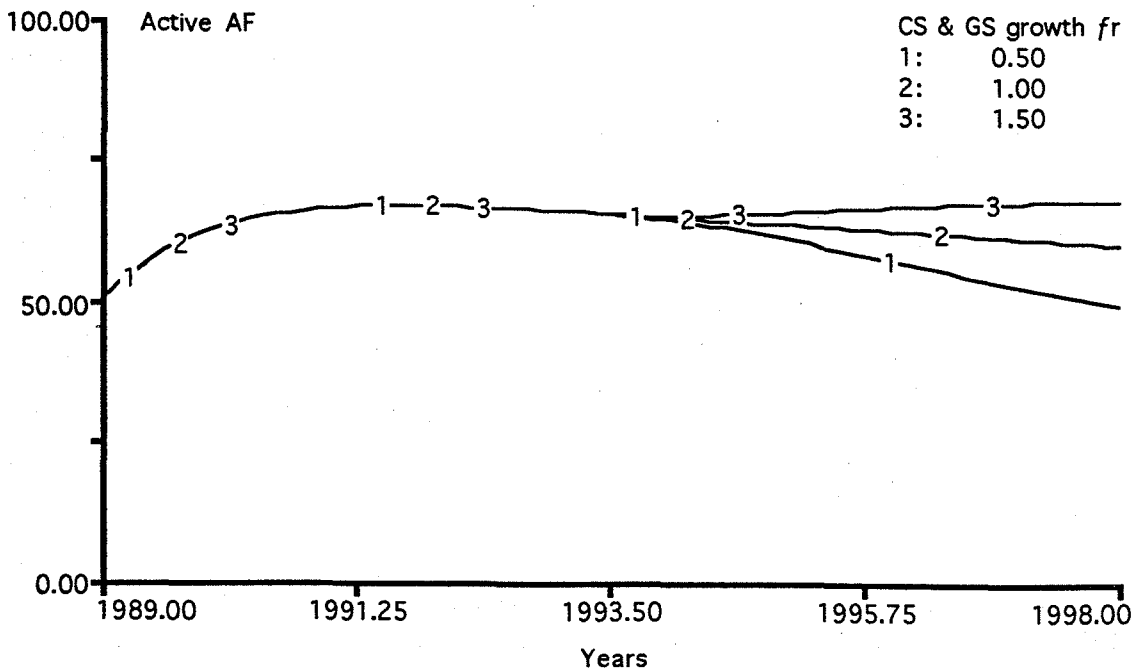


Fig. 6
Active adjunct faculty (AF) under three scenarios of total student growth



and externalities. One such contingency is a recurrent freeze in the estimated FTF growth of the FTF sector (Fig. 2). Another source of uncertainty entails tilting the student growth fraction of Fig. 1. With all our sectors of the model active, three scenarios were computed by letting the value of the student growth fraction (fr) equal to 0.5, 1, and 1.5. These values imply changes in student first-time enrollment from low, to normal, to high, while subtracting the estimated FTF growth from the hiring FTF decision in Fig. 2 freezes all FTF growth plans for the next five years.

Figure 5 shows the entire model's resulting behavior for the assistant, associate, and full professors who make up the full-time faculty (FTF) total. The FTF total will decline in the next five years, if the recurrent freeze in the estimated FTF growth continues, eventually causing an increase in the active adjunct faculty (AF), if the high CS and GS growth scenarios do play. The magnitude of the increase in active AF will depend on how the student growth pattern (yield) evolves in the next five years: the more the student growth, the more active AF members will be recruited to cover the CS and GS credit load.

The magnitude of the decline in the college student (CS) to faculty ratio and in the graduate student (GS) to faculty ratio will also depend on how the student yield curve evolves in the next five years: the less the student population growth, the sharper the decrease in the CS/faculty ratio (Fig. 7) and, similarly, the sharper the decrease in the GS/faculty ratio (Fig. 8). Conversely, if the FTF total were to turn negative, eventually, it would cause the CS and GS to faculty ratios to increase. Again, the magnitude of the ratio departure will depend on how the student growth pattern evolves: the higher the student growth, the sharper the ratio increase by 1998.

Pressured by—and for—a growing yield in student enrollments, the area chairs of discipline oriented functions may intensify their FTF recruiting effort, but the current FTF *line* freeze will also increase the student to faculty ratio. Confirming the inexorable nature of the P&T process, the downward adjustment of FTF lines keeps pressuring associate and full professors to turn tenure applications down, further depleting the FTF pool. The limited success at replacing FTF could cause a complete breakdown in the rationality of implementing AACSB accreditation standards pertinent to students per faculty ratios.

Conclusion

Researchers new to system dynamics understandably look for situations to model that won't cause any significant career or organizational damage if they go awry. Frequently, this translates into a search for unimportant problems. The probability of failure is greater for unimportant projects than for important ones, however, for the system dynamics methodology demands the time and effort of relatively senior management. Busy administrators are highly unlikely to commit their own time or their subordinates' time to unimportant issues.

In the late '60s, the prospect of managing business schools seemed as promising as trying to mix oil and water which, "Left to themselves, [they] will separate again" (Simon, 1967, p. 16). In the '90s, ever since the Hammer & Champy (1993) book on *reengineering*, thousands of organizations, B-schools included, have rushed to jump on the bandwagon, so that even their "walls come tumbling down" (Pandya, 1995).

Assuming that all concerned know and act according to AACSB guidelines may

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Fig. 7
College student (CS) to total faculty ratio under three scenarios of total student growth

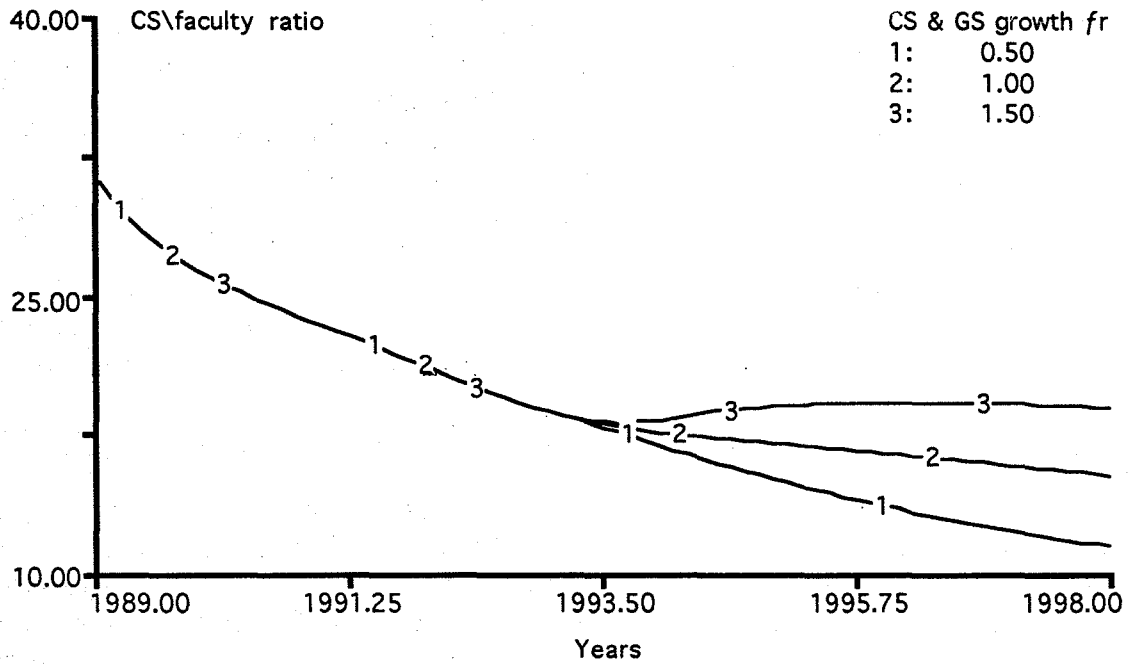
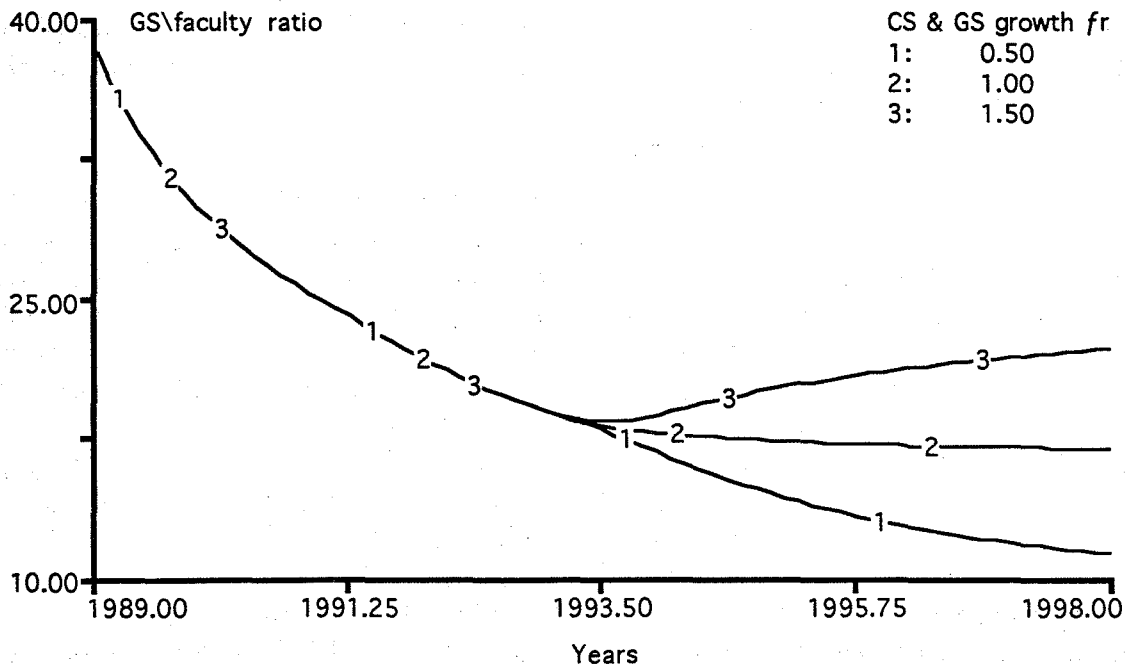


Fig. 8
Graduate student (GS) to total faculty ratio under three scenarios of total student growth



increase the likelihood of being caught in a student growth and tenure denial trap. The computed scenarios show how the CS and GS faculty ratios respond differently to changes in student enrollment and faculty growth. Some committee members found this transparent outcome... "fascinating." One implication is to follow these ratios closely in making hiring and P&T decisions for B-schools to attain their accreditation.

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