



Mandatory Rotation of Company Auditors: A Critical Examination

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Mandatory rotation of corporate auditors has been proposed at EU level in order to improve audit quality. The paper analyses the effect of this requirement on audit cost and quality. The rule is shown to increase audit cost and price through the destruction of specific assets and the distortion of competition. A negative impact on quality is also a highly plausible effect, as a consequence of the lower technical competence of auditors and fewer incentives for independent behaviour—at least for diversified auditors. These conclusions are supported by relevant data on the auditing industry and some empirical evidence on the effect of the rule in the countries where it has been implemented. © 1997 Elsevier Science Inc.

I. Introduction

To improve corporate auditing, several regulatory measures have been discussed in recent times. Among them, mandatory rotation of auditors has received relatively sparse attention in academic circles, in contrast to the professional and public debates. In this area there are remarkable differences of opinion, and there is considerable disparity in the legal provisions in different countries. Thus, a periodic rotation of auditing firms is required for Italian listed companies, and rotation rules were also introduced in Greece and Spain, although most legal systems have allowed a free choice of auditors—the United States, Germany, France; the United Kingdom, etc. This was also the original

Comments received from participants and commentators at the 12th Annual Conference of the European Association of Law and Economics (EALE), the Workshop of Economic Analysis of Law at the Universidad Carlos III in Madrid, and the 1996 International Symposium on Audit Research at the University of Limburg, as well as from an anonymous referee are gratefully acknowledged. The project was supported by the DGICYT, the scientific agency of the Spanish government, through grant PS93-0136.

position with the harmonization efforts at the European level, but things have been changing. Mandatory rotation has found its way into a preliminary revision of proposals for the Fifth European Union (EU) Directive on Company Law.¹ Similar legislative proposals were drawn up in Germany as a result of financial scandals.² Likewise, in Britain, the Cadbury report on corporate governance recommended the rotation of individual auditors, even though it stopped short of this in the case of auditing firms [Cadbury Committee (1992), p. 39].

These legislative proposals indicate that different regulators might impose mandatory rotation in forthcoming years. To look at this possibility in more detail, this paper examines both the relevant literature on the auditing industry and the empirical evidence provided by the actual functioning of mandatory rotation rules.³ The paper is conceived in normative rather than positive terms, and it is structured in accordance with the main effects of the regulation. Thus, after studying the cost structure of auditor rotation, Section II deals with an estimate of the increase in costs that is caused by mandatory rotation. Section III examines how the rule may have negative repercussions on the competitive structure of the auditing industry. Sections IV and V try to demonstrate that mandatory rotation also has a harmful effect on the two variables that define audit quality—technical competence and auditor independence. Finally, Section VI concludes the paper by summarizing its conclusions, which are in essence opposed to mandatory rotation, and by commenting on the points that seem worth studying further.

II. Destruction of Specific Assets

Mandatory rotation of auditors leads to a substantial increase in the total cost of auditing, both in terms of higher costs incurred by audit firms, thus increasing the price of their services, and in terms of the costs directly incurred by the companies audited. This effect on cost and price derives from two sources. First, rotation leads to a direct increase in cost as explicit and implicit start-up costs are incurred more frequently and earlier. This will be dealt with in this section. Second, mandatory rotation makes the market less competitive. This effect on competition will be studied in Section III.

The Costs and Frequency of Auditor Rotation

We will first characterize explicit and implicit costs that might be affected by auditor rotation. Subsequently, we will estimate the cost of rotation as well as the impact of a specific rotation rule on audit cost and price.

¹We are referring to the rule of mandatory rotation every 12 years as a maximum that has been included in the most recent draft for modifying the earlier text of the proposed Fifth Directive as it was presented at the Working Group of the Council of the European Union by the General Secretary of the Council (doc. 9128/89, October 16, 1989). This modification—which is in fact relevant in the context of the EU lawmaking process—means a U-turn from the preparatory work, which expressly declared that auditors could be reappointed indefinitely [Art. 56 of the Amended Proposal for a Fifth Directive of the Council of the European Communities, governing the structure of corporations and the powers and obligations of their governing bodies (OJEC, 240, September 9, 1983)].

²Mandatory rotation had proponents years ago in Germany [see Marten (1994), pp. 46–51], and it was supported by the president of the auditors' association (*Handelsblatt*, September 21, 1994, p. 13). More recently, it was the object of legislative proposals, official committees, and reports, with considerable public debate. See for instance Schmidt (1996). For a critical economic analysis, different from ours, see Herzig and Watrin (1995, pp. 792–797).

³This experience is significant. Both the Greek and Spanish rules have been abolished. (See, for Greece, Art. 18 of Law 2231 of 1994; and, for Spain, the Companies Law of 1995). The Italian law, still in force, has been under criticism from the stock market supervisory authorities [see CONSOB (1990) p. 49]. Italian auditors also oppose the rule—see, e.g., “Italy: Statutory Rotation or Musical Chairs?” (*European Accounting Focus*, no. 38, October 1992, p. 6).

Explicit costs. Most of the costs of rotation lie generically in the fact that it destroys the value of certain types of asset that are of great importance in the production of an audit, namely those that are *specific* to the contractual relationship between auditor and client and that, by definition, are only of value while that relationship persists.⁴ The most tangible manifestation of this destruction, although perhaps not the most important one, is the fact that both the auditor (a) and the client (b) must incur considerable explicit costs each time an auditor performs his first audit of a company:

- (a) The principal start-up costs initially borne by the auditor involve familiarization with the client's accounting procedures and checking the initial balance sheet figures. Because the latter contain *stock*-type variables, once the auditor has supervised the first year, in subsequent years he can concentrate on annual *flow*-type variables. To identify these start-up costs, it suffices to examine the steps that the auditor must perform in a first audit to correctly apply the technical audit rules issued by accounting regulators. For instance, the 1991 Spanish rules include the following procedures, each of them with several features or steps specific to the initial audit: familiarization with the client's accounting, continuity of procedures, review of historical accounts, supervision of inventories, review of the tax situation, and creation of a permanent archive.⁵
- (b) From the client's standpoint, a change of auditor and a new first audit also entail major explicit costs. The client must devote resources to making the first audit possible, in addition to those required by a repeat audit. In chronological order, engaging an auditor involves finding the most appropriate one and contracting the price and other conditions. The choice of auditor generally involves a laborious process, which usually includes a decision by the shareholders' meeting. Subsequently, in the course of the audit, the client must cooperate by providing the auditor with numerous resources. It is sufficient to examine any list of tasks to be performed in a first audit to understand that the cost to the client may well exceed that borne by the auditor. From the familiarization process through to review of the tax situation, the client must provide the auditor with assistance and human and material resources, involving both management and clerical personnel. Additionally, in the year of a first audit, the client is bound to suffer certain financial confusion, particularly if it does not have an efficient internal audit system [Ridyard and de Bolle (1992), p. 92].

Implicit costs. Three types of implicit costs are relevant. The most important type arises because mandatory rotation involves the destruction of specific assets unrelated to start-up activities (a). Second, in contrast to a situation in which *observable* rotations are voluntary, the rotation rule generates an indirect cost in terms of fewer possibilities for

⁴The study of specific assets was initiated by Williamson (1975, 1979) and Klein, Crawford and Alchian (1978).

⁵Audit manuals also describe this start-up work in detail. For example, Arens and Loebbecke (1976; pp. 100–101) highlight three sets of reasons for these start-up costs: (1) the need to verify the details that permanently influence the balance sheet accounts, such as fixed assets, patents, and retained earnings, including transactions that occurred years ago, whereas in recurring audits it is sufficient to check those of the current year; (2) The beginning balances of the balance sheet accounts must be verified to obtain a reliable income statement, even if the financial statements are not being compared with those of prior years. In contrast, in a recurring audit the ending balances will have already been checked by the same auditor. (3) The auditor will not be familiar with the client's operations and internal control system, and will not have ratios and balances with which to compare the current year's results, as well as the previous year's conclusions as a basis for designing his audit plan. As a result of this lack of prior knowledge, more intense work is required in first audits than in recurring audits, including the obtaining of a larger sample of data.

contractual safeguards, because it allows unreliable clients to disguise their voluntary rotation as obligatory (b). Third, insofar as mandatory rotation leads to suboptimal contracting from a private standpoint, it causes a mismatch between the characteristics demanded by the client and those offered by the auditor; this mismatch is an opportunity cost (c).

- (a) In addition to the strictly start-up costs, which are only the initial specific investment, rotation destroys other specific assets, which are more difficult to perceive and which are accumulated over successive audits.⁶ Certain of these assets are contractual in nature, such as the confidential information that is obtained and, in particular, the trust that arises between the two parties, which undoubtedly facilitates the ongoing relationship with the auditor and correctly motivates investment in new specific assets. Other assets are informational, particularly the auditor's knowledge of the accounting systems and the internal control that has been developed by both auditor and client over time.⁷ The continuity of the relationship creates a favorable framework for mutual trust and knowledge to be built up over the years. Trust allows the parties to communicate at low cost and to resolve satisfactorily conflicts that may arise, for example, in connection with fees for services. Even more clearly, the knowledge built up by the auditor with regard to the client company and the industry in which it operates makes it easier for the auditor to audit the financial statements.⁸ These assets are not only destroyed with each rotation; in fact, to a great extent they are never actually produced in the first place in the context of mandatory rotation. Expressed in terms of the simple production-function framework, mandatory rotation increases the cost per unit of product of using specific resources. This increase would rotate the budget-constraint line and motivate adaptive behavior. In the absence of other regulatory changes, the new equilibrium would be characterized by an adjustment in the mix of the two kinds of resources (using less specific resources) as well as audits of a lesser quantity and/or quality.⁹ Such a substitution of resources is, however, severely restricted by the nature of auditing technology. Furthermore, it is not feasible in the case of assets the "production" of which—simply as a free by-product of a continuing relationship—requires a lapse of time as its main input. This is the case of purely contractual assets, such as mutual trust. From this standpoint, mandatory rotation might also generate more disputes between audi-

⁶There is empirical evidence that such accumulation of assets goes beyond the start-up phase. In their study of voluntary rotation, Levinthal and Fichman (1988) found that the probability of voluntary rotation increases in the first three years and declines thereafter, which they interpret as an indication that the accumulation of specific assets over time continues after the first year.

⁷Certain specific investments take on a tangible form, despite not being start-up costs. One example is the preparation of computer programs to perform certain tests at a particular client. For example, in the construction industry certain audit firms prepare a specific program based on *each client's* information systems to extract data on construction in progress and thus calculate the degree of completion of each project.

⁸The importance of such specific assets is highlighted indirectly by the technical audit standards when they refer to the specialized knowledge that the auditor must possess. See, e.g., the Spanish *Normas Técnicas de Auditoría*, nos. 2.3.8 and 2.3.9. (These standards, which are compulsory for all mandatory audits, were laid down in the Order of the regulatory authority, the *Instituto de Contabilidad y Auditoría de Cuentas*, of January 19, 1991).

⁹This new equilibrium would be suboptimal unless the rule improves audit quality to a sufficient extent to make up for the increase in cost. As we will not be using this kind of argument in the rest of the paper, we would just mention that this is unlikely because, otherwise, the parties would have voluntarily provided for a rotation rule. Hence, the rule needs to be justified in terms of externalities. Moreover, there are in fact good reasons why the rule will have a negative impact on audit quality, as we claim in Sections IV and V.

- tors and clients, with a consequent waste of effort in safeguarding positions and taking advantage of the other party.
- (b) Depending on the circumstances, auditor replacement can have a negative, negligible, or even positive effect on a company's stock market price.¹⁰ One might think that this matter would not be material to this paper, inasmuch as it is a cost associated with voluntary rotation. These informational effects of voluntary rotations highlight, however, an intangible cost of mandatory rotations: If the latter can be used to disguise what, in the absence of the rotation rule, would have been a voluntary rotation, then the market will be less efficient because it will have lost a source of information.¹¹ When all auditor rotations are voluntary, they serve as signals for securities' trading and valuation. For example, if the change is due to differences with the auditor and a wish to seek a more lenient one, the market is in a better position to evaluate the event than if it takes place under the guise of a legal obligation. This informational cost falls on securities issuers, because the market will discount the reduction of contractual possibilities caused by the rule. Thus, for example, in a context where an audit is viewed as an important component in the control over the management of "open" companies, shareholders will anticipate fewer possibilities of control. Consequently, the specialization or so-called "separation" of ownership and control functions on which the efficiency of such companies is based will be negatively affected.¹²
- (c) Mandatory rotation also causes a certain mismatch between supply and demand. Accounting and auditing theory propounds two types of demand of these services—one contractual, one regulatory.¹³ With regard to regulatory demand, variations in quality might be damaging. With regard to contractual demand,¹⁴ however, qualitative differences are valuable and there should be audit firms offering differentiated packages of services. Thus, under mandatory rotation, the allocation of auditors and clients might be worth less than under a voluntary system,

¹⁰What is probably the most exhaustive study in this connection concludes that a change of auditor is associated with negative abnormal returns both when the change is announced and beforehand. Such losses are significant if the change of auditor is accompanied by a qualified auditors' report or by disagreement between the auditor and the client over accounting matters that are made public on SEC form 8-K. This pattern only changes when a client switches from a non-Big Eight firm to a Big Eight firm, which is associated with abnormal gains in the 40 days before the announcement, but with no market reaction to the announcement itself [Mangold (1988), pp. 123 *et seq.*]. This matter has been widely studied, in particular by Fried and Schiff (1981), Johnson and Lys (1990), and Teoh (1992).

¹¹The information requirements some countries impose on voluntary auditor switching may be discussed along these lines. In the United Kingdom and France, if the directors propose a change of auditor to the Shareholders' Meeting, the auditor is entitled to be heard by the shareholders (Art. 227.1 of the French law; and Section 391 A [3, 4 and 5] of the U.K. Companies Act). In the United States, the SEC must be informed of the reasons for a change of auditor, and the auditor is entitled to express his viewpoint [Rietberg (1988), pp. 226–228], Smolevitz (1987), pp. 1088–1092]. From an economic standpoint, these transparency rules have been defended by Mangold (1988, particularly p. 153) and criticized by DeAngelo (1981a, pp. 123–126).

¹²In countries with a short history of auditing there might be a considerable degree of repressed desire to change auditors. This was the case in Spain, to judge from the high proportion of qualified auditors' reports (31.6% of listed companies, according to the stockmarket regulator [Comisión Nacional del Mercado de Valores (1996), pp. 264–265].

¹³See, in particular, Watts and Zimmerman (1979; 1983; 1986, pp. 179–199 and 222–243); and also Arruñada (1990, pp. 293–305 and 308–312).

¹⁴This is important even under a regime of mandatory auditing. E.g., in Spain a considerable proportion of the demand is still purely contractual in nature, as evidenced by the fact that 23.01% of all audits performed in 1995 were voluntary ("Situación de la auditoría en España," *Boletín Oficial del Instituto de Contabilidad y Auditoría de Cuentas*, no. 25, 1996, forthcoming). Obviously, many if not most audits of large companies are also part of the contractual demand, as shown by the fact that they had their accounts audited even before it was obligatory to do so.

inasmuch as the latter would presumably optimise the matching of supply to demand.

Rotation cost estimates. Problems arise when estimating the costs incurred as a result of auditor rotation. Firstly, the major part of rotation costs probably lie in the destruction of specific assets, which, despite their importance and because of their nature (based, particularly, on mutual trust and knowledge of the parties), are not included in the financial statements (except when recorded as goodwill, almost invariably as the result of an acquisition). Moreover, it is even more difficult to estimate the informational costs. In this case we only have indications of the importance of the loss caused by mandatory rotation, through preventing the parties involved and the stock market in particular from making use of voluntary rotation decisions to price the securities of audited companies. These aspects are discussed below in greater detail. Last, not even all the costs strictly related to the commencement of a new audit relationship are recorded for accounting purposes and so they cannot be quantified.

Considering these problems, we can only estimate some of the components of the cost of rotation. Thus, the start-up cost incurred by the auditor has been estimated using internal cost studies and budgets. A survey among European audit firms estimated that the start-up cost for the auditor were at least 15% of all the costs incurred during the time needed to be familiar with the client for companies in industries in which the auditor already had experience, and 25% for companies in industries of which the auditor had no experience. In both cases, however, it was considered that more than 1 year was required to gain familiarity with the client: between one and two years, in the first case, and two years in the second case [Ridyard and de Bolle (1991), pp. 89–91]. Based on these figures, the auditor's start-up costs would be between 22.5% ($=1.5 \times 0.15$) of the cost of a recurrent audit for auditing a company in a familiar industry, and 50% ($=2 \times 0.25$) otherwise.¹⁵ Additionally, a study of the first audits performed by a major Spanish firm from 1990 to 1994 revealed that the firm "absorbed" start-up costs for around 25% of its fees. These estimates are incomplete, however, and consequently they understate the true costs. In the first place, they deal only with the start-up costs paid by the auditor, in the stricter sense, and ignore other specific investment as well as the start-up costs paid by the client.¹⁶ Moreover, they tend to be calculated on the basis of variable costs and consequently take no account of the fixed resources assigned in audit firms to budgeting, contracting, and supervising new audits. These costs are germane to the case at hand. The legislative decision to establish a mandatory rotation rule inevitably increases those "fixed" costs, and they should therefore be considered when evaluating the rule. Unfortunately, they cannot be quantified, and we are forced to use variable cost figures as a mere reference, approximating the minimum cost, despite the knowledge that we are thus underestimating both the costs themselves and the increase in them due to the mandatory rotation rule.

¹⁵It is significant that Italian auditors, the only ones obliged by law to undergo large-scale rotation and accordingly those best placed to estimate the related costs, consider that start-up costs amount to 25% of the annual fee for familiar industries and that these costs are spread over 2 to 3 years [Ridyard and de Bolle (1992), p. 92].

¹⁶The information provided in this connection by surveys in countries with the longest experience of auditing [e.g. Ridyard and de Bolle (1992), p. 94] is probably insignificant because in these countries few clients have much experience of start-up costs due to the low rate of rotation. Spanish clients seem to be more aware of these costs however, to judge by the statements published in the financial press, perhaps because they have only recently engaged auditors.

There is also indirect evidence of the cost of rotation. In particular, an inverse relationship can be expected between rotation and the cost it generates [DeAngelo (1981b), p. 188]. Accordingly, the low rotation rate found in empirical studies indicates that the costs of rotation are substantial. A similar indicator of the importance of rotation costs is the fact that allied services tend to be acquired from the same supplier.¹⁷ These indirect clues do not provide an estimate of rotation costs, but they do provide information on the true opportunity cost that includes, as stated above, the loss through destruction of the specific assets of the auditor-client relationship, whether those assets are the result of an actual historical cost or whether they are the free by-product of the continuous performance of audits.

Last, whatever the extent of the rotation costs, it is worth saying that reducing them by making the affected assets less specific would be impractical and would clash with some of the objectives of the rotation rule. The main measures that could be suggested to reduce explicit rotation costs are transfer of the outgoing auditor's working papers to the incoming auditor and policies designed to standardize audit practices and working papers among the various firms. Such measures pose several problems, however. First, standardization of procedures would mean that they would be less adapted to the peculiarities of each client and the strategies chosen by each audit firm,¹⁸ thus increasing cost and reducing quality. Moreover, the obligation to share documents and working papers would be a disincentive to innovation in audit technology, which would have a negative effect on an industry in which such innovations are becoming increasingly important. Additionally, such transfers would hardly be effective: It would not be easy to motivate an auditor who will have to hand over his documentation and, consequently, the latter would lose its reliability.¹⁹ Finally, the transfer of papers might reduce the "fresh viewpoint" advantage supposedly provided by a new auditor and often used as a justification for the rotation rule.

Data on voluntary rotations. Finally, because we will be taking the deregulated situation as our reference for analyzing the cost and price increases that may ensue from mandatory rotation, we also need some data on the rate of voluntary rotation. Empirical estimates of the average voluntary rotation period are much longer than the legally established limits.²⁰ Thus, for European companies, the data from Ridyard and de Bolle (1991, pp. 89–91) puts the average age of the auditor-client relationship at between 15 and 20 years,²¹ which provides an average duration of 30 to 40 years, if we assume such

¹⁷It has been shown that the fact that a firm has acted as a company's auditor or consultant explains its choice by the client as the supplier of consulting and audit services, respectively [Antle and Demski (1991)], which may be due to lower information or contracting costs, in the strictest sense of the term.

¹⁸Regarding the differences between audit firms in this respect, see Kinney (1986, pp. 74–76).

¹⁹Obviously, there is also scope for voluntary transfers, but these have a high contractual cost, first analyzed by Williamson (1976) in the context of franchise bidding. There might therefore need to be a high degree of *de facto* integration between the two transacting auditors. This integration collides with any potential benefit that rotation might provide in terms of independence. Such transfers would, therefore, probably happen only between associated firms that are legally separated for the sole purpose of circumventing the rule.

²⁰The low rotation rate cannot be attributed to auditor dependence on the client because this, if it exists, can only be the minority situation. Otherwise there would be no contractual demand for audits, only the regulatory demand. There are numerous studies on the reasons for changing auditors: DeAngelo (1982), Chow and Rice (1982), Danos and Eichenseher (1982), Nichols and Smith (1983), Eichenseher and Shields (1983), Schwartz and Menon (1985), Smith (1986), Simon and Francis (1988), Mangold (1988), Kluger and Shields (1989), Dye (1991), and Krishnan (1994); studies by jurists include Rietberg (1988) and Smolevitz (1987).

²¹It cannot be calculated exactly because of the open-ended upper interval.

duration follows a uniform distribution. Estimates by audit firms broadly coincide with these figures and indicate that around 4% of companies change auditor each year [Ridyard and de Bolle (1992), p. 89]. Empirical studies agree that this percentage is lower among larger companies. For example, a survey of 3,500 audits performed between 1980 and 1988 in the United Kingdom revealed that the average duration of the auditor-client relationship was 40 years.²² Ridyard and de Bolle (1992, p. 89) provide similar data for the United Kingdom: In a sample of 137 large companies, the rotation rate was less than 1% between 1987 and 1990. The figures for the United States are similar: Rotation is estimated to occur in 1% of large corporations and 6% of small corporations each year.²³

Increase in the Total Auditing Cost

To estimate the impact of the rule on costs, we will take a company of infinite duration that changes auditor every r years.²⁴ Depending on the situation in question, this rotation period will depend either on the free will of the parties or on a legal requirement. We have also defined the following variables: p_t is the price of the audit in year t ; c_f is the annual cost of a recurrent audit; c_a is the additional start-up cost to be incurred by the auditor in his first audit of a company; c_c is the cost to the client of changing auditors, excluding possible increases in the price paid to the new auditor compared with the former one; and i is the appropriate discount rate. It is assumed that the prices and costs of year t are paid at a time $t-1$.

We will use the term "total audit cost" (TAC) to denote the present value of the cost of all the future audits of the company if it changes auditors now and every r years in the future. This total cost is equal to the sum of the present value of the constant annual cost, c_f plus the present value of the successive start-up and switching costs for the auditor and the client ($c_a + c_c$) arising from the change of auditor every r years. The present value of the audit cost will be²⁵:

$$TAC = c_f \frac{1+i}{i} + (c_a + c_c) \frac{(1+i)^r}{(1+i)^r - 1} \quad (1)$$

The derivative of the total audit cost TAC with respect to the rotation period r is negative and varies in direct proportion to the amount of the cost of each rotation to each of the two parties:

$$\frac{dTAC}{dr} = -(c_a + c_c) \log(1+i) \frac{(1+i)^r}{((1+i)^r - 1)^2} \quad (2)$$

Total audit cost will therefore increase as the rotation period decreases. Thus, any rule

²²"Auditors Too Cosy with Clients?," *Accountancy*, January 1995, p. 11.

²³See the studies referred to by DeAngelo (1981b, pp. 188-189) and, more recently, by Beck, Frecka, and Salomon (1988).

²⁴Note that a finite period for the contractual relationship is not equivalent to a finite lifespan for the company, as is assumed by Magee and Tseng (1990).

²⁵We assume in this section that the start-up costs are the same under mandatory and voluntary rotation, disregarding the incentives to invest less in specific assets under mandatory rotation. Even if this underinvestment reduces costs, it should not be taken as a beneficial result, because it deviates from the production possibilities frontier, as we have analyzed in Section II, Implicit Costs.

leading to a rotation period shorter than that would arise in a deregulated situation tends to increase audit costs. For Italy and Spain it is possible to estimate this cost increase more precisely, comparing the total audit costs resulting from the following two situations:

- (a) *Voluntary rotation*, where companies are assumed to change auditor every r years and they are initially half-way through the client-auditor relationship, so that the next rotation will take place in the year $r/2$. The audit cost, denoted in this case by TAC_v , will be:

$$TAC_v = c_f \frac{1+i}{i} + (c_a + c_d) \frac{(1+i)^{r/2}}{(1+i)^r - 1} \tag{3}$$

- (b) *Mandatory rotation*, where the duration of the auditor-client relationship is limited. The present value of the corresponding total audit cost at the time of the first mandatory rotation, denoted by TAC_m , will in this case be a function of the rotation period after the rule has come into force, πr , which will usually be lower than the maximum established by the rule:

$$TAC_m = c_f \frac{1+i}{i} + (c_a + c_d) \frac{(1+i)^{\pi r}}{(1+i)^{\pi r} - 1} \tag{4}$$

Figure 1 presents the results of a stimulation of the cost increase (measured as $[TAC_m - TAC_v]/TAC_v$), which would occur due to the application of a rotation rule like the Italian and Spanish ones. It shows the increase in the total audit cost (vertical axis) corresponding to each possible interval of voluntary rotation before the introduction of the law (horizontal axis), and as a function of the actual rotation period after the law has made it obligatory to rotate every 9 years, at most. (9 years is the maximum in the Italian rule, and it was also the limit in the former Spanish rule). In the absence of a reliable figure for the rotation costs, we have estimated the expected increase in audit costs under two extreme scenarios. They define a broad but conservative interval, particularly because its lower limit is even lower than some estimates of the start-up costs in the strictest sense of this term. Summarizing this simulation, it can be stated that if

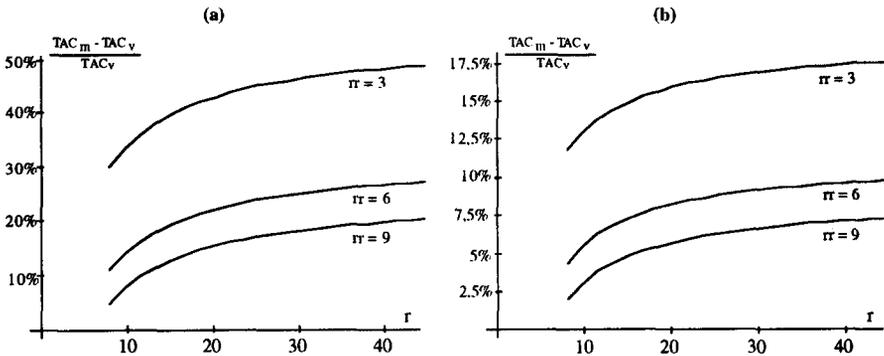


FIG. 1. Rate of increase of the total audit cost $[TAC_m - TAC_v]/TAC_v$ on the introduction of mandatory rotation, depending on the actual rotation period before (\bar{r}) and after (r) the introduction of the rule. In case (a), $c_a = c_c = 0.75 c_f$; $c_a = c_c = 0.25 c_f$ in case (b); and $i = 0.10$ in both cases.

a company went from changing auditor every 40 years to changing auditor every 9 years, the present value of its total audit costs would increase by between 7 and 20%.

Increase in Audit Price

The future evolution of prices will depend on how much of the previously analyzed cost increase is due to the auditor's start-up costs, the only ones that are transferred to the price, and on how the industry handles prices within a contractual context characterized by substantial rotation costs. As indicated in Section V, "The Cost of Independence," which studies the various possibilities in this connection, the pattern in Spain seems to be that the price for the entire audit contract, or at least the method for calculating it, is established at the outset. Assuming that this system is maintained, and using the same limits for the parameters as when estimating the cost increase, the price rise can be calculated at between 4 and 15% just as a result of increased rotation costs,²⁶ not counting the foreseeable negative effects of lower competition and innovation, which are studied in the next section.

This prediction is borne out by price trends in Italy, the only country that has had a mandatory rotation rule for a significant period of time. The rotation rule seems to have produced an average increase in the billings of all firms of 15% in nominal terms, equivalent to 8.8% in constant purchasing power terms. This increase in activity is probably due to the start-up costs associated with mandatory rotation, as indicated by the fact that the number of hours billed has increased considerably (8.2% at the firms for which data is available), with only a slight increase in the hourly rate, which seems to have remained constant in real terms.²⁷

It should be noted, however, that this impact on prices of the increased rotation rate could be, under certain assumptions, compatible with a decline—probably of a selective nature—in the first year in which the rule comes into force.²⁸ This might happen if the new market conditions led to a higher incidence of "low-balling,"²⁹ a phenomenon in which the competition concentrates on the first year, which is offered at a reduced price, on the assumption that the auditor will be able to impose higher prices in subsequent years when competition will be lower due to the start-up expenses that the competitors would have to incur and the replacement costs that would have to be borne by the client. If low-balling, i.e., discounting the first audit, became more widespread, at least certain prices might fall in the first year of mandatory rotation. However, this decline would be illusory and would be offset by price rises in subsequent years.

Additionally, the effect on prices may vary depending on whether each company's auditors lose clients or not.³⁰ The destruction of assets due to mandatory rotation leads

²⁶The estimated increase in prices is lower than that estimated for costs mainly because the increase in the rotation costs paid by the client does not flow through into the audit price. Additionally, the cost increase was calculated on the basis of current values, including not only the fact that rotation will be more frequent in the future but also the fact that the next rotation will be brought forward as a result of the mandatory rotation rule. In contrast, the price increase was estimated by taking the equilibrium price in both situations: with and without mandatory rotation.

²⁷This data on Italy is taken from Smith (1992) and *The 1992 International Accounting Databook* (1992, pp. 93–100).

²⁸It will also be foreseeably attenuated by the devotion by clients of more resources to assist the auditor, particularly in the early years; also, in the longer term, external audit work will be replaced by internal audits [the feasibility of this replacement is widely evidenced: see Simunic (1980) in the field of economic studies, and Wallace (1984) in the field of business administration].

²⁹See, in particular, DeAngelo (1981a).

³⁰These would not necessarily be the leading firms, as evidenced by the Italian case, where the firm that ranked fifth

to a transitory anomalous situation as regards costs, which can produce price distortions in the early years of introduction of and adaptation to the rule. If, in the early years, rotation reduces certain firms' demand, perhaps below their productive capacity, a good proportion of their resources will have a low opportunity cost and such firms may find it optimum to cut prices in line with their low marginal cost. However, the situation of remaining firms will be the opposite, inasmuch as they may find it difficult to increase capacity in the short term, particularly if, due to the risk of the rotation rule being revoked, they have not anticipated the full increase in demand. Consequently, prices may rise for the ex-clients of some firms and decline for the others. (Additionally, both prices will suffer the opposite, possibly dominant, effect due to the greater frequency of rotation and the fact that future rotations are brought forward in time, as well as possible low-balling).

III. Competitive Distortions

The preceding section evaluated the direct impact of more frequent rotation on cost and price. The rotation rule also has an indirect effect on audit efficiency by hindering competition among auditing firms. The rule reduces the incentives for audit firms to compete by equalizing market shares and facilitating collusive agreements (1) without solving the alleged problems of concentration and switching costs (2).

Less Incentives to Compete

In a market economy firms have a powerful incentive to invest: The investment will be profitable if it enables them to obtain more clients. This motivation is radically altered if a rule obliges all of an audit firm's clients to abandon it every certain number of years, foreseeably leading to an equalization of market shares when the rule is introduced in markets with disperse market shares. Figure 2 shows a simulation of this effect as it occurs in such a market using Spanish data.³¹ Consequences would be less dramatic but not less damaging if the rule is introduced in a market where firms held equal shares. In this case, the rule would petrify the starting point, making it difficult for the most efficient firms to increase their shares.

in terms of billings when the rule came into force is the one which suffered most [Hancock (1993), p. 10; Smith (1992), p. 11].

³¹This simulation assumes that all clients are: homogeneous; change auditor simultaneously; and, when leaving a firm, become customers of other firms in proportion to their market shares, these shares being calculated to this respect after excluding in each case the firm that was previously auditing the rotating clients. These assumptions are not unrealistic. First, big audit firms have a sufficiently large number of clients to consider them homogeneous. Second, simultaneous rotation amounts to disregarding voluntary rotation within the mandatory rotation period. This loss of generality diminishes, however, to the extent that these voluntary rotations follow a pattern similar to the one assumed for mandatory rotations. Third, firms' relative weight in respect of other factors influencing the allocation of rotating clients might well be closely related to their market shares, which has been used as a criterion in the simulation. Under these conditions, if $S_{i,t}$ is the market share of firm i in year t , its market share in $t + 1$ will be:

$$S_{i,t+1} = \sum_{j=1}^n S_{j,t} \frac{S_{j,t}}{1 - S_{j,t}} - S_{i,t} \frac{S_{i,t}}{1 - S_{i,t}} = S_{i,t} \left(\sum_{j=1}^n \frac{S_{j,t}}{1 - S_{j,t}} - \frac{S_{i,t}}{1 - S_{i,t}} \right)$$

where $i = 1, \dots, n$, with n being the number of firms in the relevant market. The market of the "Big-Six" auditing firms has been taken as relevant, which excludes those billing less than one thousand million Pta. a year. The starting point is their 1994 market share taken from *Expansión* (October 26, 1994, p. 36).

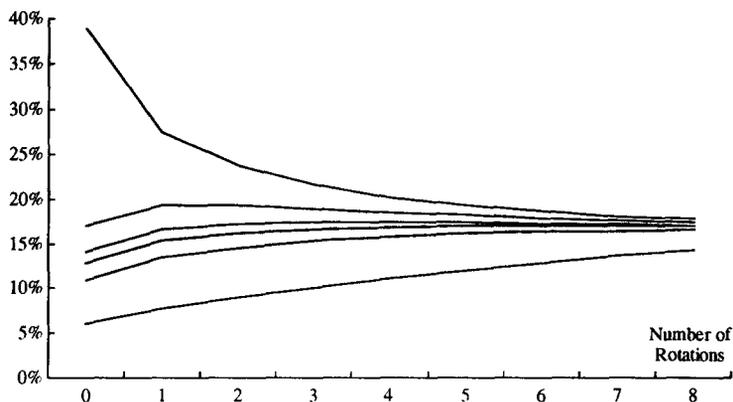


FIG. 2. Predicted evolution of market shares in the Spanish large-firm auditing market if the mandatory rotation rule had become effective. Small firms would increase their market shares and the leading firm would suffer a considerable decline with ambiguous consequences for the second firm. Equilibrium would be reached when all firms had equal market shares.

- (a) This equalizing trend is particularly pernicious because it prevents each firm's investment from being duly rewarded after it has achieved a particular market share. In this context, the most important effect will be on future investment decisions. As a result of mandatory rotation, auditors who achieve greater efficiency fail to obtain their full reward because the rotation rule reduces their potential demand; at the same time, auditors who are less efficient will not suffer as great a punishment because the demand for their services will not fall as much as it should, and it may even increase. Accordingly, under a rotation rule, the incentives to improve efficiency are reduced. We can therefore expect a cutback in investment aimed at improving efficiency, whether investment in *human capital*, discouraged due to the impossibility of internal growth; or investment in *reputation*, which is of great importance in signaling quality in a market in which without such investment there would be serious informational asymmetries; or investment in *technological innovation* in the strictest sense of the term, as applied to audit procedures.³² Furthermore, in the short term, mandatory rotation would also destroy the value of the specific investment already made by auditors. In this case too, the effect would be to reward the less efficient who had not made such investment. By disappointing investors' expectations, the introduction of the rule causes a negative externality in terms of a loss of confidence in the property rights system on which the economy is based. The problem is exacerbated by the fact that wealth is not only *expropriated*, with the mere effect of redistributing it among firms and among clients and firms, but it is also *destroyed*, and thus is of benefit to no one.
- (b) Furthermore, the mandatory rotation rule would not only be a form of sharing out the market on the basis of time, but would also provide a foundation for making it easier for other collusive arrangements to be enforced in the future. The basic reason is that the incentive for each member of a cartel to breach an agreement

³²Despite the semicraft nature of auditing, technological innovation in the form of new procedures is important. Proof of this is that the degree of structuring of the audit process varies widely from firm to firm. See Yardley et al. (1992, pp. 174–175) and Kinney (1986, pp. 73 *et seq.*).

of this type, namely the possibility of increasing its market share and profits, would be reduced by the loss of such clients after the maximum allowed duration; and any such advantage would be minimal once the market shares had approached their foreseeable long-term equilibrium levels. Additionally, the viability of an oligopoly is enhanced by other factors including (1) regulatory oversight of the conditions regarding advertising, pricing, and budgeting; (2) the authorities' propensity to sacrifice a certain degree of competition in favor of a presumably higher quality—a propensity evidenced in most of the regulations; and (3) the practice of referring clients among firms. Last, it should be noted that allegations were made in Italy that firms were colluding with regard to prices and were implementing agreements to swap clients after the entry into force of the mandatory rotation rule³³; apart from another temporary strategy for avoiding the rule which was to switch the leading and second auditor within corporate groups [Glover (1990), p. 13].

Concentration and Switching Costs

Despite the foregoing, mandatory rotation has occasionally been defended as a factor for encouraging competition.³⁴ The main arguments used for this purpose were that audit markets are relatively uncompetitive because the supply is excessively concentrated (a) and because of the high switching costs (b). Accordingly, the mandatory rotation rule was supposed to correct these deficiencies. We think that such arguments are unfounded and that, in any event, the correct treatment of the problem would require it to be approached from the standpoint of anti-trust regulations and not of accounting regulations, in which context the debate would be impoverished (c).

- (a) With respect to concentration, one of the goals of those who defended rotation rules in the past was to favor competition, on the grounds that mandatory rotation would in the long term dilute audit firm concentration.³⁵ This reasoning does not hold water, however, and it is countered by significant theoretical and empirical arguments. The matter was studied in detail in another paper [Arruñada and Paz-Ares (1995b)] the more widely applicable conclusions of which are worth pointing out: (1) The rule is unlikely to modify the share of the various types of firm (individuals, small firms, Big Six) in the relevant market; (2) even if the level of concentration in the market segment where the major firms operate was a motive for concern, the rule is unlikely to have a significant effect on the concentration in that segment; and, in any event, (3) the existence of a certain degree of concentration in the industry is an imperative of efficiency because there are considerable economies of scale linked to specialization, innovation, training, and reputation.³⁶

³³According to Hancock (1993, p. 10) and *The 1992 International Accounting Databook* (1992, p. 98). Danger of collusion was also a main argument against rotation in Germany [Claussen (1979), p. 178].

³⁴For instance, even if this was not an explicit objective of the Spanish law, some professional media have reported it as such ("Spain: Speculation, Rotation & Harmonization," *European Accounting Focus*, December 1994–January 1995, pp. 3–4).

³⁵The alleged lack of competition, attributed to the high level of concentration in the industry, was the motive for the Metcalf report (1976), which, for this purpose, proposed among other solutions the establishment of a mandatory rotation system, which was never implemented [Benston (1979–1980), p. 39–40].

³⁶On economies of scale related to reputation, particularly relevant in this context, see Wilson (1975).

- (b) Additionally, it could be argued that the existence of substantial rotation costs would jeopardize competition in the market by preventing clients from freely choosing their audit supplier. It should be noted, however, that, although rotation costs restrict competition *ex post* by hindering the replacement of a supplier once such costs have been incurred, they do not affect the prospects of competition *ex ante* on commencement of the client-auditor relationship. Most intermediate products are subject to similar or higher rotation costs, but this is not a major cause of concern. Good evidence that no such problem exists is the fact that clients are generally opposed to mandatory rotation. Moreover, in this case the rotation costs are exogenous and not artificial, inasmuch as they arise from the cost structure of the activity and not from the auditors' commercial policy. Consequently, it is easier to foresee the consequences of the contractual structure, and audit firms should not be held responsible for the existence of such costs. Last, if the legislator were concerned about the effect on competition of rotation costs, the appropriate policy would not be to make rotation obligatory, thus forcing companies to incur such costs, but to implement measures to reduce them [Klemperer (1987)], such as, in this case, standardization of criteria and accounting standards and reduction of rotation costs by, for example, obliging the outgoing auditor to transfer his working papers to the incoming auditor. As pointed out in Section II, Rotation Cost Estimates, these measures reduce, however, the incentive to be efficient and are of doubtful efficacy, apart from the fact that they clash with the objective of increasing auditor independence, which is the primary goal pursued by the mandatory rotation rule.
- (c) To conclude this analysis of the competitive conditions in the market, we should point out that even if our evaluation of the conditions defining competition in the audit market were mistaken, and it really were necessary to correct an anticompetitive situation, the law on competition provides more appropriate channels for solving the problem. From a normative viewpoint, a main advantage of using this route is that it allows the competitive conditions in an industry to be examined on an overall basis. An analysis of this type would not overlook, for example, the introduction of restrictions on competition by the accounting regulations themselves, for example the prohibition on advertising.³⁷ From a positive viewpoint, the risk of the regulators being captured by the regulated might also be reduced.

IV. Constraints on Technical Competence

The cost and price increases demonstrated in the preceding section could be justified if they led to increased quality. The conclusion of Sections IV and V is, however, the opposite, because there is no assurance that rotation will increase audit quality and the available evidence rather seems to prove the contrary. The quality of an audit depends on two variables. The first is professional *competence*, defined as the auditor's ability to detect anomalies in the financial statements that he audits. The second is *independence*, i.e., the auditor's willingness to report any irregularity that he has detected. Thus, audit quality can be stated as a function of the combined probability that irregularities will be

³⁷The Spanish Seventh Technical Audit Standard states as follows (in translation): "The auditor may not engage in advertising designed to attract clients," and specifies that "publicity in the form of advertisements in the press or any medium aimed at attracting clients, or which may have that effect, is not permitted."

both detected and reported.³⁸ Strictly speaking, these two probabilities can scarcely be separated: The auditor's search for irregularities will depend *ex ante* on what he is prepared to report *ex post*.³⁹ For the sake of simplicity we will, however, assume them to be independent and analyze separately the impact of mandatory rotation on each one. Section IV deals with the effect on professional *competence*, and Section V deals with the effect on professional *independence*. From the standpoint of professional competence, two factors are most directly affected by the mandatory rotation of auditors: their tenure at the body audited and their degree of specialization in the industry where the audited company operates.

Auditor Tenure

There are two opposing arguments regarding the effect of auditor tenure on the competence or technical dimension of audit quality. On the one hand, the accumulation of specific assets described in Section II, The Costs and Frequency of Auditor Rotation, provides the basis for a positive correlation between tenure and competence. On the other hand, excessive routine is alleged as a reason why auditor tenure might prejudice his competence. After critically assessing these arguments, we will also report how the available empirical evidence supports the existence of a positive correlation.

Both theory and empirical evidence provide support for the fact that with voluntary rotation auditor competence increases as the auditor is more experienced with the client. In other words, as the number of past audits increases, the risk in the present audit decreases, thus reducing the likelihood that irregularities will go undetected. With the passage of time an auditor-client relationship builds up specific assets that are of vital importance for the auditor's competence. The average level of technical competence depends crucially on the stock of these specific assets. Under mandatory rotation, the level of this stock suffers both directly, as the consequence of a greater incidence of initial audits, and indirectly, as the shorter horizon reduces the incentives to invest in such assets. The restricted time horizon weakens the incentive to make investments that are specific to the auditor-client relationship, because it shortens the related recovery period. Consequently, lower auditor competence is to be expected under mandatory rotation for any year, *ceteris paribus*. Furthermore, this result could hardly be affected even if additional incentives—via regulation—were put in place to motivate the parties to increase their start-up costs to improve auditor competence in initial audits. The reason is that there is a technological limit to the re-creation of specific assets—many, if not most, of them cannot be rebuilt immediately (e.g., trust and the auditor's specialized expertise on the client). For these assets a basic input is time, a factor that can only partly be replaced by increased initial investment.

The prolonged continuity of an auditor with a client can, however, lead to audit work becoming excessively routine, which would ultimately affect his competence. A long

³⁸This is a standard definition for accounting theorists [DeAngelo (1981b), pp. 185–186; Watts and Zimmerman (1986), pp. 314–315]. It does not differ substantially from the concept of quality used in the professional literature, although the latter is expressed in different terms [e.g., Palmrose (1988), pp. 56–57, Note 3].

³⁹See DeAngelo (1981a, p. 116, Note 3). In reality, if an auditor does not strive to detect irregularities because he is not prepared to disclose them or because he avoids finding himself in a position where he has to do so, this is a matter of independence, and it can be classified legally as a case of conscious culpability and, possibly, gross negligence. This does not mean, however, that technical competence problems can be reduced to mere questions of negligence. This kind of "implicit collusion" problem has been dealt with by Hietzmann and Sen (1996).

period working with the same client can lead the auditor to put too much trust in the previous years' work and, consequently, may lead him to treat the work as a repetition of the reviews performed in prior years. It is argued that this creates a tendency to anticipate results instead of being alert to subtle and often surreptitious, though important, anomalies. A similar effect is alleged in terms of "self-revision" cases, those in which the auditor must report negatively on his previous work.⁴⁰ In these contexts, by bringing a "fresh view" and forcing an in-depth review, rotation might attenuate these problems.⁴¹ This argument does not justify, however, the mandatory rotation rule. First, the problem of audit work becoming excessively routine should not be exaggerated, particularly because in audit firms the partners have incentives to monitor each other. Second, routine could be combated by lesser measures, such as partner rotation and/or peer review.⁴² It therefore seems that with respect to technical competence, the benefits gained through auditor continuity via specific assets would far exceed the costs linked with the routine that could still exist after such measures. Third, the self-revision problems might be more frequent under mandatory rotation because this increases the quality differential among successive audits.

The existence of a positive correlation between auditor tenure and technical competence is also borne out by the standards of professional practice and several empirical studies. When the opposite result is found, it affects small auditing firms, including one-man operations, which do not enjoy the benefits of partner rotation. Thus, the connection between the number of past audits and audit risk is prominent in audit manuals, which usually instruct auditors to take it into account when planning the audit and estimating the expected errors [e.g., Arens and Loebbecke (1976), p. 96 *et seq.*]. Furthermore, empirical studies have found a significant negative correlation between auditor continuity and the degree of audit failure—as the former increases, the latter decreases. First, in 129 cases of auditor liability St. Pierre and Anderson (1984; p. 256) found that the 30 cases where the auditors had little experience with the client—less than 3 years—accounted for 43% of the "performance errors" and also, coincidentally, 43% of the cases of "client fraud,"⁴³ but accounted, however, for only 23% of the total number of cases. This impression is confirmed by other studies and reports. The Quality Control Inquiry Committee of the Securities and Exchange Commission (SEC) Practice Section, which is part of the American Institute of Certified Public Accountants (AICPA) monitoring program, concluded after investigating 406 alleged cases of audit failure between 1979 and 1991 that such failures are three times more frequent in the first 2 years than in subsequent years [American Institute of Certified Public Accountants (1992), p. 2].⁴⁴ Even if there is some scope for selection bias in this data, as they come from voluntary rotations, available evidence corroborates our hypothesis that risks are greater with new clients and, consequently, that mandatory rotation, by expanding

⁴⁰See e.g., point 3.7. of the document on "Auditing, Independence and Objectivity," approved by the Council of the F.E.E. on June 25, 1995.

⁴¹This idea is widespread among auditing and organization theorists; see, for example, Johnson and Lys (1990, p. 284, no. 4), Tirole (1986, p. 202), Emmerich (1977, p. 227), and the Metcalf report (1976, p. 21).

⁴²This system, introduced by AICPA for firms that audit listed companies include, *inter alia*, periodic by another firm, annual quality controls, and reviews by a second partner. The requirements and results are discussed in Public Oversight Board (1993, pp. 15–19 and 71–79) and Rietberg (1988, pp. 231 *et seq.*). This is also the recommendation of the Cadbury Committee report.

⁴³"Performance errors" are those not due to mistakes in the interpretation of accounting standards or to auditor fraud, and they include deficiencies in obtaining and evaluating evidence. "Client fraud" refers to cases where the client deceives the auditor, by action or omission.

⁴⁴This greater risk in initial audits—and, consequently, the auditor's greater potential liability—might explain why

the number of initial audits, may increase audit failures.⁴⁵ Second, the fact that, except for the initial “honeymoon” period, the likelihood of termination of an auditor’s appointment declines with the length of the appointment [Levinthal and Fichman (1988), pp. 354–356] can be interpreted as evidence that auditor competence improves the longer his tenure at the audited company. Furthermore, numerous studies and experiments have been conducted in connection with the value of experience in auditing. A review is provided by Colbert (1989). His conclusion is that experience is crucial for “complex” or “unstructured” decisions, and is less significant for simple or structured judgments (p. 148). The experience referred to in these studies of cognitive psychology is general experience as an auditor or, occasionally, specialized experience in various industrial sectors, but it can be extrapolated to a certain extent to conclusions as to experience with a particular client.

Industry Specialization

Mandatory rotation hampers the incentives for efficiency-enhancing investments, as analyzed in Section III, *Less Incentives to Compete*. This underinvestment damages technical competence in a variety of ways. A particularly important aspect of this phenomenon is the lessening of investments needed for auditing firms to specialize. “Horizontal” specialization, based on the various industries in which the auditees operate, is seriously jeopardized by a more frequent rotation. There are numerous indications that the peculiarities of the various industries require different audit technologies. First, both professional and official sources insist that auditors should attain a good knowledge of the industry in which the auditee operates.⁴⁶ Second, some cognitive psychology studies show that, in auditing, industry experience is of more value than general experience [Ashton (1991), p. 234]. Third, and most important, economic studies confirm the relevance of industry specialization.⁴⁷ This means that specialization is an important factor in competitiveness, particularly when auditing large companies. In fact, available empirical evidence shows that when engaging an auditor firms take into account the auditor’s degree of industry specialization. This has been shown, for banks, by Shockley and Holt (1983) and, generally, in a survey to 209 companies that had recently changed auditors, in which “industry expertise” was reported as one of the main factors behind the selection of the new auditor.⁴⁸ Consistent with this, specialized firms are able to charge a fee premium of 16% over non-specialized ones [Craswell, Francis, and Taylor (1995)]. Spanish data also indicates that industry expertise is taken into account when

in some contexts they are more expensive, as suggested by Roberts, Gleen, and Jones (1990, p. 221) with regard to the Australian market.

⁴⁵Observers and students of accounting practice have reached similar conclusions, as revealed by the testimony of an ex-director of accounting services at the Securities and Exchange Commission: “In the overwhelming majority of situations . . . the problem in these cases arose from too little involvement by auditors in the activities of their clients rather than too much. A significant proportion of the cases arose in initial audits where the pattern was normally one of the client misleading the auditor rather than conspiring with him” (Burton, 1980, p. 50). In the same line, after considering famous cases of audit failure, Romney and Albrecht (1979, p. 63) concluded that “. . . our research also shows that auditors face a greater risk of litigation and other problems when auditing a new client than when auditing an existing client. The opposite evidence that we know (Deis and Giroux, 1992) might be biased by the nature of the entities involved in the sample.

⁴⁶See, for instance, the Spanish Technical Audit Standards nos. 2.3.3a), 2.3.8 and, most particularly, 2.3.10.

⁴⁷See Eichenseher and Danos (1981) and Craswell, Francis, and Taylor (1995).

⁴⁸Industry expertise obtained a 4.02 grade on a 0–6 scale. Only technical competence (4.42) and prices (4.37) achieved higher grades. See Addams and Davis (1992).

choosing an auditor.⁴⁹ Moreover, indirect evidence on the importance of specialization is provided by the existence of different official accounting schemes applicable to specific industries and the fact that the start-up costs are greater when the client operates in an industry in which the auditor has scant prior experience, as already stated in Section II. Finally, because the possibility of specialization is limited by the extent of the market, the rotation rule might be particularly detrimental in smaller markets such as those of Italy or Spain. Within individual countries, the rule will have a greater effect on those industries whose size is insufficient, rotation apart, to provide a return on the investments required for specialization. As proof of these assertions, it is noteworthy that in Italy the mandatory rotation rule has influenced the policy of mergers between firms, to the detriment of industry specialization.⁵⁰

In view of these circumstances, it seems that the introduction of mandatory rotation can seriously impair auditor specialization. In a static perspective, it does not allow preexisting economies of scale to be exploited.⁵¹ From a dynamic perspective, given that it substantially reduces the incentive to invest in specialized resources, the rule will lessen the future degree of specialization and with it the level of auditor competence.

V. Independence Weakened?

The other mainstay of audit quality is independence, which was defined above as the likelihood that the auditor will report irregularities he has detected. We will assume that the auditor's decision to report rests on the costs involved in alternative courses of action. It is concluded from the analysis that mandatory rotation might be counterproductive in terms of independence because, even if it reduces the cost to the auditor of reporting and thus of independence, it also probably reduces the cost of not reporting and becoming dependent.⁵²

The Auditor's Decision

The auditor who has detected something irregular must decide if he is going to report it or not. This decision is influenced by multiple factors, and its structure can vary substantially with the importance of the anomaly. We will focus on a simple but important case that allows us to assume that some effects are negligible. The analysis can be clarified by a formal representation of the expected financial consequences of the reporting decision for the auditor. To analyze them it is convenient to divide the value of the auditing firm into three parts: the value of the relationship with the client whose

⁴⁹The concentration in the audit market in highly regulated and complex industries such as finance and energy is much higher than average. For example, the combined market shares of the two largest audit firms in each industry in 1993 in Spain were as follows: communications and services 0.2871, manufacturing 0.3450, construction 0.3020, and insurance 0.3424. However, the figures for financial services and energy were 0.5831 and 0.6067, respectively. [These shares were calculated from the number of audited companies, considering only the largest companies in each industry. Figures prepared by the authors from data published in *Fomento 30,000*, [Fomento de la Producción (1994)].

⁵⁰In matching up auditing firms for the mergers that took place in 1990, one of the main criteria was that the merging firms should not have a major presence in the same industries [Glover (1990), p. 12].

⁵¹With regard to the economies of scale relating to industry specialization in auditing, see Eichenseher and Danos (1981, pp. 486–487).

⁵²This negative effect of mandatory rotation on independence is particularly interesting because many defenders of the rule use this argument to support the rotation rule: e.g., the Metcalf report (1976, p. 21), Emmerich (1977, pp. 227–228), Rossi (1985, p. 113), or Galán Corona (1989, p. 283).

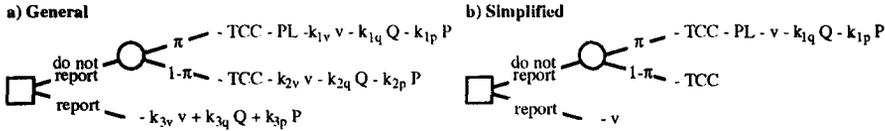


FIG. 3. The auditor's decision to report.

audit report is being considered (v); the net present economic value of all other current contracts (Q); and the value of potential contracts (P)⁵³; thus giving $V = v + Q + P$. Let π be the probability of detection; TCC the amount of the transaction costs of collusion that the auditor may have to incur to get some benefit from not reporting; and k_{ij} ($i = 1, 2, 3; j = v, Q, P$) the impact different decisions and random outcomes have on the value of the three kinds of assets of the firm, an impact that we will assume varies linearly for each outcome according to factors k_{ij} . In general terms (left part of Figure 3), if the auditor reports the irregularity, he loses a function of the quasi-rents associated with that client ($-k_{3v}v$), but he might obtain a benefit in terms of enhanced reputation ($k_{3q}Q + k_{3p}P$). Otherwise, if the auditor does not report the irregularity, he will certainly incur some transaction costs of collusion (TCC) and he opens up two possibilities. Either the failure to report is detected—what may happen with probability π —or it goes undetected with probability $1 - \pi$. In this latter case, he might suffer a relatively small reputational loss ($-k_{2q}Q - k_{2p}P$), as well as, infrequently, some function of the quasi-rents connected with the client ($-k_{2v}v$). On the other hand, if the failure to report is detected the auditor will suffer a more substantial loss, derived from professional liability ($-PL$), the loss of the quasi-rents associated with that client ($-k_{1v}v$) and reputational damage ($-k_{1q}Q - k_{1p}P$).

We will analyze a simplified version of this decision (right part of Figure 3). We will consider that to obtain the benefits of not reporting, some contractual costs of collusion may have to be incurred and that detection of failure to report will cause liability and reputational losses. On the other hand, we will assume that both reporting and detection are discrete, “all-or-nothing” events. Specifically, reporting will certainly mean the loss of the client.⁵⁴ Thus, the decision is simplified to a choice of the minimum cost alternative between reporting or not, but considering as part of the cost of the latter possibility a simplified version of the expected cost, so that this becomes the product of only two factors—the probability and the amount of sanctions. The assumptions roughly correspond to the typical and crucial case where the auditor conceals the closeness of a client to insolvency.⁵⁵

Under the above assumptions, the auditor chooses the minimum cost alternative,

⁵³Both Q and P are not the nominal amounts of these contracts but are their economic values—the net present values of the flows of quasi-rents derived from all contracts of each kind.

⁵⁴In our analysis [part (b) of the figure], we will assume that k_{1v} and k_{3v} are equal to one; and that k_{2v} , k_{2q} , k_{2p} , k_{3q} , and k_{3p} are zero. Let us make explicit the meaning of these assumptions. First, $k_{1v} = 1$ means that the auditor loses the client if the failure to report is detected. Second, $k_{3v} = 1$ means that the auditor loses the client if he reports the irregularity. Indirectly, this assumption avoids the strategic character the situation may present in other cases. Third, $k_{2v} = k_{2q} = k_{2p} = 0$ means that failing to report does not lead to any sanction for the auditor unless explicitly detected, i.e., detection is an “all or nothing” event. Fourth, $k_{3q} = k_{3p} = 0$ means that reporting on a dubious client does not have any patrimonial prize—it does not, e.g., enhance the reputation of the firm in the eyes of third parties.

⁵⁵The massive empirical study by Palmrose supports taking this situation as a reference. It shows that alleged low audit quality—connected to either technical incompetence, dependence, or both—in auditor liability cases is directly related to insolvency of the client [Palmrose (1988, 1991)]. We realize, however, that focusing narrowly on different

between (v) and ($TCC + \pi[PL + v + k_{1,q}Q + k_{1,p}P]$). In the remainder of this section we will study how the mandatory rotation rule affects each of these costs. We will first show that it reduces the cost of independent behavior, as approximated by the present value of the quasi-rents associated with the client (v). Second, we will study the impact of the rule on the cost of dependent behavior, distinguishing the effects on: the transaction costs of collusion (TCC), which we argue are unaffected by the rule; the probability of detection (π), which is likely to decrease; and on the value of sanctions. On these, we abstract the *amount* of professional liability, which we think is unaffected by the rotation regime, and focus on the distinction between current and potential contracts. We argue that the effect of the rule is clearly negative for current contracts ($k_{1,q}Q$), making the net effect—after considering the effect on v —of the rotation rule on independence probably negative when the clientele is diversified. The effect on potential contracts ($k_{1,p}P$) is also discussed, with less conclusive results. Finally, we present some empirical evidence in the form of the perception of specialists on the effect of the rule on independence—in their opinion, nil.

The Cost of Independence

Given the existence of specific assets, auditors and clients generally have an interest in extending their relationship indefinitely. For the auditors, the gains they obtain from an extension of their contracts are greater than those that they would achieve from new contracts with different clients, and the same is true for the clients. Consequently, to retain their clients, it is argued that auditors may be inclined to overlook troublesome areas or under-report detected irregularities. This argument centers on the situation of dependence created for the auditor by the hope of collecting future quasi-rents from those assets that are specific to each client. The start-up costs incurred and the contractual and technical knowledge developed with time are specific assets, inasmuch as their value depends entirely on the continuity of economic relations between auditor and client. Like any specific asset, the difference between its value with and without continuity gives rise to a flow of quasi-rents after such an asset is in place.⁵⁶ To analyze the effect of mandatory rotation on the value of these quasi-rents we will be assuming that: (1) the relationship between auditor and client lasts for r years⁵⁷; (2) all investment in specific assets is concentrated in first year; (3) investment levels are not affected by changes in the rotation period, r ; (4) there is competition in the industry, such that the discounted expected profit for each contract is zero; (5) prices are set to a constant level for the whole duration of the relationship⁵⁸; (6) the parties do not engage in oppor-

(and we think much less relevant) cases, such as those of simple complacency or when the auditor must report on his prior errors, might drive the analysis to different normative conclusions.

⁵⁶For the role of quasi-rents derived from specific investments in the audit field, see DeAngelo (1981a).

⁵⁷This assumption does not clash with the idea that the existence of fixed start-up costs and rotation will encourage the continuity of the same auditor, because there are other more important factors that often make it necessary to change auditor, e.g., a merger or takeover.

⁵⁸This assumption reflects common practice in Spain, where prices are only modified to take into account changes in the work load associated with each audit or general inflation adjustments. [Supporting evidence from auditing contracts and regulation is provided in Arruñada and Paz-Ares (1995a), pp 41–42]. The literature, however, documents opposite arrangements where either the auditor or the client collects all the quasi-rents. On the one hand, Francis (1984) reports that Australian initial audits are charged at a much *higher* rate than subsequent ones. On the other hand, American authors are inclined to give more weight to the appropriation of quasi-rents by the auditor, with the consequence of initial low-balling. For example, the seminal work by DeAngelo (1981a) focuses on the extreme case

tunistic behavior to expropriate each other's specific assets; and (7) these contractual patterns are not altered by the rotation rule.⁵⁹ Under these assumptions, each party collects annual quasi-rents over the duration of the relationship in proportion to his specific investment:

$$q_{t,j} = q_j = c_j \frac{i(1+i)^{r-1}}{(1+i)^r - 1} \text{ for } t = 1, 2, \dots, r; \text{ and } j = a, c \quad (5)$$

where the start-up costs of both auditor and client, c_j ($j = a, c$), are equal to the present value of an annuity payable at the beginning of each year of amount q_j and r terms. If discount rates are positive, both the price and the annual quasi-rents, q_j , increase if the rotation period, r , is shortened, the reason being that the same fixed costs have to be recovered in fewer periods. The auditor's financial incentives depend on the expected value of his quasi-rents. In a year t , the present value of future quasi-rents that the auditor expects to receive from a client, v_t , is equal to:

$$v_t = c_a \frac{(1+i)^{r-1} - (1+i)^{t-1}}{(1+i)^r - 1}. \quad (6)$$

This present value substantially decreases as a consequence of mandatory rotation, as illustrated in Figure 4.⁶⁰ As anticipated, the cost of being independent and losing the client is, therefore, lower than without the rule.

where all the quasi-rents are collected by the auditor. Our assumption does not, however, result in a serious loss of generality for the ensuing analysis, provided the auditor is allocated some of the quasi-rents, i.e., the initial audit is to some extent underpriced. The theory of contract provides conflicting arguments in support of these different patterns. Extreme allocation of the power to fix future prices and appropriate all the quasi-rents could be in consonance with an equally extreme distribution between both parties of the information on the gains they derive from trade, whereas a constant price could be efficient when both parties lack such information but know *ex ante* that gains from trade will exist *ex post* [see, e.g., Tirole (1988), pp. 23–24]. Alternatively, we can see the allocation of quasi-rents as part of a long-term and self-enforcing contractual structure, whose competitive design aims at balancing several conflicting risks of expropriation, these risks consisting not only of price modifications but also other forms of opportunistic behavior such as auditor overcontrol or unanticipated cancellation. In this context, intermediate solutions that make both parties potential victims of expropriation are probably necessary. This latter view, being more comprehensive, can account for the adoption of different patterns as a response to the different characteristics of auditing firms, their clients, or the contractual environment. This line of reasoning also indicates how free market forces would have dealt with the dependence problem caused by the quasi-rents collected by the auditor, if such a problem was really serious or did not serve a counterbalancing function—by suppressing them. That could be achieved by means of charging the full total costs of every annual audit. Such a policy would allocate all future quasi-rents to the client, exposing him to a greater risk of expropriation. If we believe, however, that such a risk is not important when dealing with established auditing firms, the absence of this practice supports the notion that the dependence problem related to auditor quasi-rents is not severe.

⁵⁹The fact that the average hourly fee remained constant in Italy after the first mandatory rotation, as explained in Section II, Increase in Audit Price, above, provides some empirical evidence that this might be the case. In addition, the pattern of charging the full cost in the initial audit seems unrealistic, because it places too much risk on the client, particularly in terms of overcontrol by the auditor. The remaining possible change in the contractual pattern is a larger discount in initial audits, a deeper low-balling. Some industry specialists think it likely for mandatory rotation to provoke such effect. The consequences of this possibility for our conclusions are sketched in Note 71 below.

⁶⁰This assumes the duration of the relationship is equal to either the mandatory rotation period or infinity—given the long durations that have been empirically measured, for all practical purposes it can be expected to last for an infinite time under a freedom of contract regime. The conclusion holds, however, for more general cases. If the auditing relationship is expected to last a certain number of years (e.g., 18 years in Figure 4), the shortening of the rotation period reduces the present value of the individual quasi-rents in the early years (area A) and increases that value in the final years (area B). However, given that v_t is convex with respect to t (its second derivative with respect to t is negative for any $i > 0$). $A > B$; i.e., the average present value of the individual quasi-rents (\bar{v}) also decreases when shortening the rotation period, r .

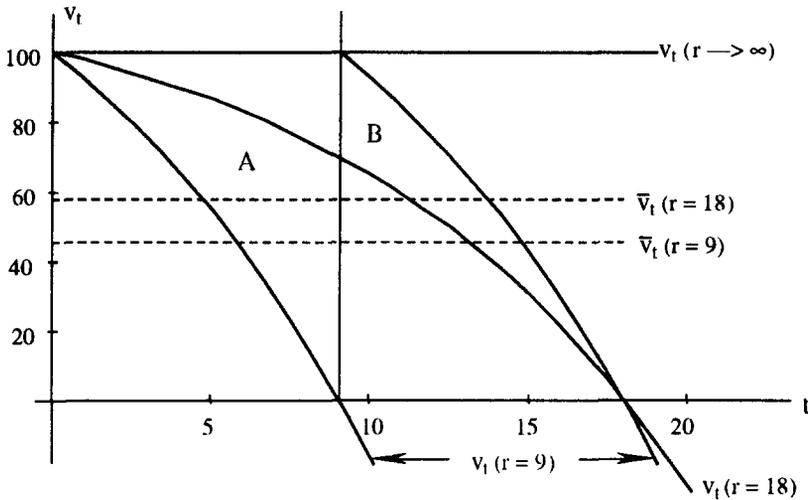


FIG. 4. Functions and averages of the present value of the auditor's individual quasi-rents under different rotation scenarios and assuming the duration of the relationships is deterministic. (Simulation taking $c_f = 146$; $c_a = c_c = 0.75$ c_p ; $i = 0.10$).

The Cost of Dependence

A dependent auditor incurs two types of cost. First, he encounters the transaction costs of collusion, derived from potential difficulties in enforcing the collusive agreement with his client. The dependent auditor would exchange some compensation from the client in return for some kind of indulgent behavior—this consisting of any concealment, distortion, or failure to report information that he is obliged to provide. Second, he faces the risk of losses associated with being detected. The expected value of the legal and reputational sanctions is also a cost for the dependent auditor. We argue that mandatory rotation does not promote auditors' independence because it does not raise the transaction costs of collusion and it probably reduces the sanction related to collusion.

The transaction costs of collusion. It can be argued that an unlimited time horizon encourages cooperation between the auditor and the client, because repetition reduces their transactions costs with regard to collusion. Under this argument,⁶¹ rotation can favor independence in certain circumstances. It is assumed that collusion is feasible only if there is mutual compensation. Thus, the "supervised party" (mainly, in this case, company managers) can only obtain a favor from the "supervisor" (the auditor), consisting of failure to report fully to the "principal" (company shareholders), if he is in a position to make him a believable promise to make a side or covert payment.⁶² The

⁶¹The problem has been studied by Tirole (1986) in the sphere of hierarchical structures, using a tripartite agency model. See also Tirole (1992, pp. 185–92). For a recent application to auditing, see Kofman and Lawarrée (1993), whose results suffer substantially as a consequence of misunderstanding the role of internal auditing, assuming that external auditors are hired by shareholders, and thus always report faithfully, and thinking that managers face a high and changeable level of liability.

⁶²Covert transfers include benefits of all kinds, financial and otherwise. In our case, the financial benefits could

guarantee that such payment will take place is decisive to the success of the collusion. By allowing repeated “games,” a longer lasting relationship increases the possibilities of ensuring covert payments in cases where instant payments are not possible or very difficult to make. Reducing the time horizon of the relationship might thus reduce the incidence of collusion.

This argument can certainly be convincing in situations pertaining to hierarchical structures. It does not, however, justify the mandatory rotation rule in the field of auditing because the tripartite agency model sketched out above is not pertinent. The auditing relationship depends more on the supervised party than on the principal—auditors are hired and paid by managers and/or company directors, instead of shareholders.⁶³ In the terms of Jensen and Meckling (1976, pp. 308–309), auditing is more a “bonding” than a “monitoring” device. Such a situation might indeed be conducive to collusion. This does not mean, however, that rotation might be the solution. Rotation does prevent one form of deferred indirect transfer—i.e., renewal of the auditing contract. It does nothing, however, to prevent more direct and simultaneous side payments—e.g., via consulting contracts—as consideration for collusion or relaxed auditing. In other words, rotation can be meaningful if the collusion between the supervisor and the supervised party requires the additional safeguard or enforcement provided by an unlimited time horizon, under which deferred compensation for favors would be facilitated.⁶⁴ On the contrary, in an audit situation such enforcement is unnecessary because the parties have a mechanism at hand for implementing immediate side payments. For this reason, limiting the time horizon does not significantly reduce the risk of collusion. If the auditor is willing to relax his vigilance, rotation is powerless to prevent him from doing so.⁶⁵

include engagement as a consultant or the renewal of the audit contract. Cash bribes are also possible, but not very useful because they are easily detected [Kraakman (1986), p. 71, in particular Note 56].

⁶³The issue of whether a safeguarding activity is contracted and paid for by the principal or by the agent—whether it is a monitoring or bonding device—is generally irrelevant from a financial perspective because it says nothing about which party really bears such a cost. It is, however, important to the structuring of the contract and the safeguarding industry. The debt-rating industry provides a case in point since the 1970s when it began charging fees to the very companies whose debt it rated. This caused what is seen as a vulnerability (“Rating the Rating Agencies,” *The Economist*, July 15, 1995, pp. 61–62.) In the case of auditing, the fact that company law assigns the right to appoint auditors to the shareholders’ meeting is immaterial, inasmuch as the meeting usually approves the directors’ proposals, as recently recognized, e.g., in the Le Portz report (1993, p. 13).

⁶⁴One might think the cost of collusion argument is more applicable to justify the practice of rotating individual auditors and/or audit partners. In fact, in his examples, Tirole (1986, p. 202, note 35; 1992, p. 186) refers to rotation of *personnel* within audit firms, not to rotation of the firms themselves or of auditors in general. In this industry, such a practice seems, however, to be addressed more at avoiding excessive routine than dependence. Auditing firms avoid individual dependence by their employees and partners mainly by means of a complex structure of incentives and the design of their professional careers, based on remuneration through quasi-rents and self-selection mechanisms. Furthermore, all the partners have strong incentives to mutually control free-rider behavior by other partners who might collude in exchange for individual benefits. This mutual monitoring is reinforced by the partners’ unlimited joint and several liability. [See Fama and Jensen (1983a), pp. 315–317; Fama and Jensen (1983b), pp. 334–337, and Watts and Zimmerman (1986), pp. 316–317]. This is now mandatory in many countries (e.g., Art. 11 of the Spanish Audit Law), but it was historically a widespread pattern. All partners in a audit firm therefore have a strong interest in establishing mechanisms to reduce the likelihood of individual auditors succumbing to pressure from clients.

⁶⁵Consequently, if the problem required a regulatory solution, this should come not from rotation but from reporting, by offering auditors a channel for transmitting to shareholders their point of view regarding the conflict that led them to abandon the company. The measures established for this purpose in certain countries seem to be effective, because they increase the cost to management of a change of auditors. Thus, a threat from the directors not to renew the contract of an uncooperative auditor loses much of its sting [as it has been ratified by Mangold (1988)].

The expected costs of sanctions: (I) The probability of detection. Another cost incurred by dependent auditors derives from the sanctions penalizing detected dependence. This cost is a function of the probability of detection and the value of the sanctions.⁶⁶ Mandatory rotation might lower the probability of detection if a limited time horizon makes it harder to detect a lack of independence *ex post* and therefore to penalize those auditors who collude. As usual, the lack of continuity in the contractual relationship exacerbates moral hazard problems. Even if the contract governing the relationship does not establish explicit penalties for the auditor [as suggested by Antle (1984), p. 16], auditor continuity increases the likelihood of misfeasance being discovered, correctly attributed to the colluding auditor and effectively penalized by the market. On the other hand, under mandatory rotation lenient auditors can hide their behavior by transferring problematic clients to the incoming auditors, who—given the difficulties faced by initial audits—may take time to detect the irregularities.⁶⁷ Thus, by making it harder to identify lenient auditors, rotation hinders the ability of the market to sanction them via reputation.

In this context it is often argued in support of the rotation rule that it encourages the monitoring of outgoing auditors by the incoming ones and, because the former anticipate this control, independence is fostered.⁶⁸ It is likely, however, that this mutual control would not work. The very mechanism of rotation, which can rebound on itself in both time and location, rather tends to produce corporate patterns of mutual protection, and even the artificial division of auditing firms. The French experience is illustrative in this context: The obligation to coaudit was circumvented because such audits were often performed by two members of the same firm or by auditors who belonged to the same group, according to the Le Portz report (1993, p. 61).

The expected costs of sanctions: (II) The amount of sanctions. Following the analysis in Section V, The Auditor's Decision, we will distinguish the impact of the mandatory rotation rule on the value of current contracts, which seems to be negative and dominant, from the effect it might have on potential contracts, which might be positive. As a consequence, the rule seems to lessen the sanction for detected non-reporting, damaging auditor independence. (We also assume that the *amount* of professional liability once the auditor is caught in reporting failure does not change under different rotation regimes. This, however, does not deny an increase in the *expected cost* of professional liability, given the potential change in the probability of detection).

If mandatory rotation shortens the term of the auditing contract, the value of the individual quasi-rents associated to each client would be reduced, as seen in Section V, The Cost of Independence, thus reducing the financial incentive for dependent behavior. This beneficial effect might, however, be more than offset by the parallel reduction that the rotation rule has on the value of all current contracts. These "total quasi-rents" have a fundamental effect that is conducive to independence (except when the auditor's clients are highly concentrated,⁶⁹ a special case that might require a different type

⁶⁶A huge literature has developed on this topic, after the seminal paper by Becker (1968).

⁶⁷Radner (1980) has formally explored this piece of conventional wisdom.

⁶⁸See Emmerich (1977, p. 227) and Schultz and Gustavson (1978, p. 632).

⁶⁹More precisely, when the auditor's *quasi-rents* are concentrated, as pointed out by DeAngelo (1981b, p. 192), both quantities—clients' billings and quasi-rents—are expected to be less closely correlated under mandatory rotation. The reason is the greater variability in the expected duration of the relationship, as, in the long term, different clients would be rotating at different times. This distortion would probably make a diversification rule harder to operate—among clients with the same billings, regulators would have to give more weight to the more recent relationships.

of regulation). Consequently, the reduction of such quasi-rents as a result of the rotation rule would impair auditor independence. Strictly speaking, the impact of mandatory rotation on the effect that detected non-reporting exerts on the value of current contracts, $k_{1q}Q$, has two components, derived from changes in both k_{1q} and Q . It is difficult to predict how mandatory rotation affects the propensity of current clients to abandon their auditor as a consequence of his improper behavior. A case could probably be made that current clients would be tempted to postpone a firing decision until the next round of mandated rotation. The dominant effect seems, however, to be on the total value of current contracts, which can be taken as the total value of individual quasi-rents. Taking into account the extent of the reduction that mandatory rotation has on individual quasi-rents, this effect surely exceeds the potential change in the propensity of current clients to abandon their auditor.

When considering the impact of detected non-reporting on the value of potential contracts ($k_{1p}P$), we can neglect, as in the previous case, the effect on the penalizing factor (k_{1p}), as the rule may be expected to cause only a marginal change in the propensity of potential clients not to choose as their auditor one who has been detected in reporting failure. On the other hand, the effect on the value of potential contracts, P , may be substantial, even though it is probably of a lesser order of magnitude than the effect on current contracts. Certainly the higher rate of rotation under the rule may increase the value of all potential clients for all kinds of firms ($\Delta P > 0$), even for those whose demand decreases. It also seems reasonable to assume that the damage caused by detected non-reporting is greater on the expected value of potential contracts than on current contracts (i.e., $k_{1p} > k_{1q}$). One might therefore be tempted to think that the rule increases the sanction for non-reporting (i.e., $k_{1q}\Delta Q + k_{1p}\Delta P > 0$). This result is unlikely, however, because the value of current contracts should generally be much higher than the value of potential contracts in incremental terms ($\Delta Q > \Delta P$).⁷⁰ The reason is that the value of current contracts includes all quasi-rents associated with past client-specific investment. On the other hand, the cost of future client-specific investment will be subtracted from the value of potential contracts. Therefore, the net economic value of potential contracts—i.e., the discounted value of all quasi-rents related to firm-specific assets that might be realized through such contracts—derives only from a positional advantage whose value must finally rest on competitive restraints and in particular on the existence of barriers to entry. Hence, this positional quasi-rent might only be relevant, if at all, in the first rotation rounds and only to the extent that participants do not get rid of such entry barriers during the legal transitional period.⁷¹ In short, mandatory rotation drastically limits the possibility of economically realizing a substantial

⁷⁰This result would be less likely if the rule were to induce more intensive low-balling of initial audits, which, by increasing annual quasi-rents (q_a), would compensate some of the reduction in the present value of quasi-rents associated with the rule shortening the rotation period. This effect would affect the cost of the auditor of choosing both a dependent or an independent behavior, as it attenuates the reduction the rule causes on individual (v) and total (Q) quasi-rents, thus making the changes experienced by the probability of detection (π) and the value of potential contracts (P) more crucial.

⁷¹Two remarks are in order. First, we are implicitly assuming here that *incentives* to invest in reputational capital are the same with and without mandatory rotation. On the role of reputation in auditing, see generally Wilson (1983, particularly pp. 307–311). The issue has been mentioned in Section III, Less Incentives to Compete, where it is argued that the rule reduces incentives, due to the fact that the auditor has to relinquish his position after reaching some market share level. If this were the case, the rule would in addition reduce the sanctions for detected non-reporting. Second, building on the connection between barriers to entry and quasi-rents, an argument could be made regarding a trade-off between independence and competition. [Incidentally, the existence of such trade-off is clear for market participants, Shockley (1981).]

part of the reputational capital of the audit firm in the form of client-specific assets. These assets are to a large extent indispensable in the production process. They, or more precisely their related quasi-rents, might, therefore, be providing the least costly guarantee for ensuring contractual performance.⁷²

Indirect Evidence

We lack direct empirical evidence that mandatory rotation weakens auditors' independence. The available evidence is indirect and relates to the perceptions of auditors and users of financial statements.⁷³ From empirical studies that examined the impact of various variables—the level of consulting services, degree of diversification of the auditor's client roster, audit firm size, tenure, client solvency, etc.—on the perception of auditor's independence, the only variable found to be irrelevant was the length of the period during which the auditor had been rendering services to the client—precisely the variable that the mandatory rotation rule is designed to affect. In the United States, Shockley (1981; p. 798) found that this variable was not statistically significant, even if half of those who judged the time factor to be important considered that continuity of appointment not only jeopardized independence but reinforced it. Similar conclusions have been reached by studies conducted in the United Kingdom. Firth (1980) found that 78.3% of users and also 91.5% of auditors did not consider independence to be affected by the fact that an auditor had been auditing a company for more than 10 years. More recently, García-Benau, Humphrey, and Turley (1993) confirmed these conclusions, albeit with a slightly lower degree of significance, and revealed a substantive difference in perceptions in Spain as compared to those in the United Kingdom.⁷⁴ A survey of Italian experts also exposed that they consider that auditor rotation does not promote auditor independence.⁷⁵ Last, in a survey based on an extensive questionnaire completed by actuaries of the only six companies that sell auditor third-party liability insurance in the United States, which was followed by personal interviews, only two variables were considered to be irrelevant with respect to auditor independence. One of them was precisely the length of the auditor-client relationship. In the opinion of these insurance professionals, rotation would not be a justification for reducing the premium for third-party liability insurance [Schultz and Gustavson (1978)].

VI. Concluding Remarks

After summarizing our findings, we will point out in these final comments some of the points that seem worth studying further. We have examined the impact that the man-

⁷²As argued in general by Klein and Leffler (1981, p. 628) and for auditing by DeAngelo (1981b, p. 193).

⁷³The perceptions might be more important than they seem at first sight. In some countries, auditors must not only be, but also *be seen to be* independent (Spanish Technical Audit Standard no. 1.3.5).

⁷⁴In Spain, 59% of auditors considered rotation to be negative (80% in the United Kingdom), whereas 49% of finance managers and 45% of investment analysts (33 and 29%, respectively, in the United Kingdom) were in favor of rotation. The difference in the Spanish data, leaving aside its lower statistical significance, should not be attributed to the intrinsic merits of rotation. In fact, because mandatory rotation was the prevailing system in Spain at the time of the survey, this created favorable expectations that probably biased the responses, in the opinion of García-Benau, Humphrey, and Turley (1993, p. 91).

⁷⁵The results are included in a report entitled "Bilancio certificato e revisione contabile. I giudice degli opinion leaders" (Università Bocconi, Milan, 1991), which has not been available to us. We take the reference from Andrei (1991, p. 1093).

datory rotation of company auditors has on audit cost and quality. From both standpoints, we are inclined to judge the rule as counterproductive, coinciding with most professional and regulatory bodies that have reported on the issue.⁷⁶ First, we show that mandatory rotation makes audits more costly because it increases production costs and reduces competition in the marketplace. The increase in costs derives from the fact that a substantial amount of specific assets—connected most visibly, but neither only nor fundamentally, to initial audits—is destroyed and must to a large extent be rebuilt in each rotation. Additionally, the rule also drastically alters the pattern of competition in the auditing industry. It directly creates a system of turns and, in short, an artificial division of the market, which can favor collusion among auditing firms. More importantly, it also reduces the incentive to invest and compete because firms that manage to excel under it find themselves obliged to relinquish their achievements periodically. Second, we argue that the rotation rule is not justified by its effects on audit quality because it probably damages the two main determinants of quality. The auditor's *technical competence*—i.e., his ability to detect irregularities in the financial statements—is hampered by the greater number of initial audits and the lesser degree of specialization. Mandatory rotation might also harm the auditor's *independence*—his willingness to disclose in his report any irregularities he might have detected. Even if the rule reduces the cost to the auditor of reporting and thus of being independent, it also probably reduces the expected cost of not reporting and becoming dependent. This is because the rule does not substantially modify the transaction costs of collusion and probably reduces both the probability of detecting non-reporting auditors and the amount of sanctions associated with such detected non-reporting.

The purpose of this paper was to bring some rigor to the examination of a rule that had only been previously discussed in casual terms in the professional literature. Nevertheless, even in this context the work needs to be developed at least in five main respects. First, the rule could cause serious final-period distortions to the behavior of both auditor and client, and these were dealt with in a far from exhaustive way. Second, the contractual and pricing patterns of each audit relationship have been studied under assumptions that are too restrictive. We would expect to reach similar conclusions under looser conditions, allowing also for the rotation rule inducing a change in such patterns. Third, the study of independence has been based on a narrow definition of it, even if probably the most important from a regulatory perspective. Fourth, the connection between the economic sanctions for detected non-reporting, reputation building, and market structure calls for a formal treatment. Last, relaxing the implicit consideration of audits as private goods and considering its potential external effects may

⁷⁶The rule was advocated by the Metcalf report (1976, pp. 21–22). The proposal was later rejected by numerous bodies and studies: by an independent commission established at the behest of AICPA [Cohen (1978), pp. 107–108]; by the *Statement of Position* issued by the SEC Practice Section of AICPA [American Institute of Certified Public Accounts (1992), sp. p. 6]; by the *Staff Report on Auditor Independence* of the SEC's Office of the Chief Accountant (Office of the Chief Accountant of the Securities and Exchange Commission) (1994, p. 54); and by the Public Oversight Board of the SEC Practice Section of AICPA (1994), p. 7). In the United Kingdom, the Cadbury Committee report (1992, p. 39) opposed mandatory rotation of audit firms even if it advised rotation of partners auditing listed companies. The Green Paper on *The Future Development of Auditing*, issued by the Auditing Practices Board, also opposed auditor rotation [Auditing Practices Board (1992)] whereas its definitive report did not deal with it [Auditing Practices Board (1994)]. In France, the Le Portz (1993) report does not even mention mandatory rotation in its detailed discussion of how to improve auditor independence. In Germany, after the discussions at the Bochum Symposium, mandatory rotation was ultimately disregarded by the legislature. See Emmerich (1977, pp. 227–228), Schulze-Osterloh (1977, pp. 110–111), Clausen (1979, pp. 177–178), and Claussen and Korth (1991, pp. 665–666). The predominant opinion has not changed since. A summary of the state of the question can be found in Marten (1994, pp. 47 *et seq.*).

open the discussion to wholly different considerations, founded on the eventual need to guarantee a minimum or homogeneous level of quality.⁷⁷ A more detailed study of these topics could substantially refine the analysis. It is, however, unlikely that it would reverse the main conclusion. On the contrary, some of them—last-period effects and the incentives to invest in reputation—are expected to reinforce it.

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⁷⁷For the development of this idea in a different industry, see Arruñada (1995, 1996) and Paz-Ares (1995).

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