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AN ANALYSIS OF THE BRAZILIAN LEGISLATION FOR QUALITY IN HIGHER EDUCATION

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RESUMO

Educação de baixa qualidade é um dos principais problemas de política pública. No Brasil, o governo lida com a questão através de uma política de controle de qualidade: instituições de ensino superior devem ser aprovadas antes de entrar em operação, e são avaliadas periodicamente pelo governo. Instituições de baixa qualidade podem sofrer penalidades, incluindo a cassação da licença para operar. O presente artigo analisa a eficácia desse tipo de política através de um modelo de sinalização em que a educação, de qualidade é conhecida, é usada para que o trabalhador informe seus potenciais empregadores a respeito de sua produtividade, que é exógena. Há dois resultados principais. Primeiro, a política de controle de qualidade reduz o tamanho do setor de ensino superior, excluindo estudantes. Segundo, não há aumento de qualidade. Adicionalmente, mostra-se que quando as taxas de juros são altas, as instituições de ensino superior não optam por prover ensino de qualidade, independente do custo de fazê-lo, mesmo se a política de controle de qualidade tiver rigor máximo.

Palavras-chave: Sinalização; ensino superior; política de controle de qualidade

JEL: D86; K23; I23; I28.

ABSTRACT

Low-quality education is a major concern for public policy. In Brazil, the government addresses this issue with a Quality-Assurance Policy: colleges must be accredited before starting operation, and then are audited by the government periodically. Low-quality colleges suffer penalties that may include shutdown. This paper investigates the effectiveness of this policy in a signaling model in which education, whose quality is known, is used as a device for a worker to inform potential employers about his exogenous productivity. I have two main results. First, Quality-Assurance decreases the college sector, leaving students out. Second, it does not increase quality. Additionally, I show that high interest rates make the choice of high-quality sub-optimal for the college whatever the cost to provide quality, even if the Quality-Assurance Policy is most strict.

Keywords: Signaling; higher education; quality assurance policy

JEL Codes: D86; K23; I23; I28.

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1. Introduction

Education is one of the most important services provided in a market economy. However, its provision usually raises concerns that call for state intervention. One of the main issues is the quality of education. In Brazil, there are several institutions of higher education that offer poor quality.

One solution to this problem is direct quality monitoring with punishments for low quality. The Brazilian Ministry of Education (henceforth ME) uses two mechanisms to implement this policy. First, there is an accreditation process for new institutions. Second, it audits periodically all colleges, both public and private, to determine the quality of courses. This is done through a combination of tools that includes an analysis of objective supply conditions and a standardized national exam that senior students must take every three years. This last point is particularly important as it makes any type of tampering with the result extremely difficult: if students do not actually learn what they need to take the exam, there is hardly any possibility that the college will have a good result. The ME publishes the results, and shuts down institutions with recurrent bad results. The basic legal framework for this process is established in the federal bills 9.393/1996 and 10.861/2004.

This system is more rigorous than its counterparts in most developed countries. There is no need for accreditation in the United States, for example, and the auditing process is much less demanding in Europe - specifically, there is no national exam students must take. Such differences suggest the following question: how effective is the Quality-Assurance Policy (henceforth QAP) used by the Brazilian government to achieve high-quality education?

Quality assurance is beneficial only if consumers do not know the quality of the good or service they acquire - i.e., if there is a problem of asymmetric information. Otherwise, the market price will reflect quality, and quality assurance is equivalent to price control: the government effectively decreases the number of transactions that consumers and firms were willing to make. In general, this decreases welfare.

Hence, evaluating the effectiveness of QAP for higher education amounts to answering the following question: is there asymmetric information about the quality provided by different colleges? If so, QAP makes the consumer more informed, decreasing information asymmetries, benefiting good schools.

However, there is typically no asymmetric information between schools and (potential) students. Universities and courses are usually reasonably recognized and, for private schools, this difference reflects in prices; for public ones, in the number of students seeking to enroll.

The problem of asymmetric information that plagues the market for education is to be found elsewhere. There is a long-standing line of research in Economics that studies the impact of asymmetric information between individuals and their potential future employers, and this friction has a significant impact on this market. Spence (1973) was the first to study the problem of signaling². Even if education does not improve productivity at all, at least some workers are willing to acquire it at a personal cost, and firms will reward education with higher wages. The reason is that education may be used to signal a worker's exogenous productivity: high-productivity workers have a lower cost to acquire education than low-productivity ones, and it follows education may be used as a device firms may use to tell

² See also Spence (1974). For a more recent treatment, see Mas-Colell et al. (1995), chapter 13.

high- and low- productive workers apart even if it does not affect productivity directly. The most famous piece of anecdotal evidence for this theory comes from the London City, which hires a high number of Latin and Ancient Greek majors from Oxford and Cambridge to work in the financial market - such knowledge is entirely useless in the jobs they will carry out, but it shows that the candidate for a position was able to enter a top University and complete a difficult course, signaling high productivity.

Signaling generates a demand for education that does not depend on quality, but only on the difficulty to get a degree. (Notice that quality and difficulty may be correlated, but this does not affect the discussion in the rest of the paper: this parallels the fact the Spence's argument is unaffected by whether education actually has some impact on productivity. In either case, the only relevant point is that education, irrespective of its quality, may be used as a device to identify a worker's productivity.) Since quality is costly, colleges will respond to that by offering higher education with the lowest possible quality - i.e., colleges will offer a discrimination device, not quality education³.

In the present paper, I study the impact of QAP in a Spence economy. Specifically, I pose the following question: what is the impact of quality assurance, including penalties for low quality, in a market where consumers demand low quality education willingly as a device to identify themselves as high-productivity workers?

Formally, I add a third sector to the signaling model: the college sector, modeled through a representative agent that has both setup and operational costs. The setup cost depends on the number of students it wants to attend and must be paid at the beginning of operation and after every punishment it receives due to QAP; it may be interpreted as the cost of re-opening, in case of shutdown, or as the reputational and bureaucratic cost in case it needs to undergo a probation phase. The interaction between workers and firms is modeled as in the original model and generates a demand for low-quality education that colleges will meet. QAP is modeled as the period of time until the government audits the college; since there is no relevant asymmetric information in the supply of education, low quality is immediately detected and the punishment takes place.

I have two main results. First, I find that QAP decreases the size of the educational sector: less students will attend smaller colleges. The reasoning is as follows: every time a college is punished for low quality, it must repay the setup cost; in order to decrease it, it offers less openings. This represents a distortion per se, since economies of scale should play a role in the determination of optimal firm size, but the main impact is on quality. The second result is that QAP does not increase quality, which does not affect the demand for education. Additionally, I study the role of the interest rate in the optimal choice of quality by the college and show that, under high rates, high-quality is never the optimal choice, irrespective of the cost of quality.

The rest of the paper is organized as follows. Section 2 makes a brief description of educational scenario in Brazil. Section 3 describes the model. Section 4 presents the main results. Section 5 relates the effectiveness of QAP to the interest rates colleges are faced with. Section 6 concludes and discusses some alternative policies to QAP.

2. Public Policy for College Quality in Brazil

³ For an empirical evaluation of signaling, see Weiss [1995].

The higher education sector in Brazil has both public and private institutions, which are accredited and audited according to the same legal basis. The Quality-Assurance Policy for College Education in Brazil is established in the federal bills 9.394/1996 and 10.861/2004⁴. The first bill describes the general legal framework for educational policy and states explicitly that it should be based on "a guarantee of quality standards" (3o, IX). Article 7o, II, states that a condition for the operation of private institutions is "an authorization of operation and an evaluation of quality by the State". Articles IX and X determine that two levels of government (Union and States) are responsible for "evaluating college education and granting licenses to operate." Article 46 states explicitly that the authorization for college courses, as well as the accreditation of degree-granting institutions, is granted for a limited amount of time and must be "renewed periodically after a regular process of evaluation", and failure to comply may cause several sanctions, including shutdown.

Bill 10.861/2004 develops the specific structure that implements the objectives stated in the previous paragraph. It creates the SINAES (Sistema Nacional de Avaliação de Ensino Superior - National System for the Evaluation of College Education), a federal system responsible for rating every course in every college in the country. It evaluates several aspects of colleges: professors and lecturers; physical structure; and the pedagogical process. One of the main tools is a nation-wide exam that is mandatory for senior students at most every three years: the ENADE (Exame Nacional de Desempenho dos Estudantes - National Exam of Student Performance), which covers subjects that every college is obliged to teach. The final rating is very objective: each college course gets a grade from 1 to 5. 1 and 2 mean the course failed the evaluation and is subject to sanctions. The SINAES is run by INEP (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira - Anísio Teixeira National Institute for Studies and Research in Education), an autarky under the Ministry of Education.

This system is quite strict when compared to international practices. In the United States⁵, there is no need for accreditation. Eventual punishments to low-quality colleges come mostly in the form of economic sanctions, but these are based on rather subjective performance evaluations by the government since there is no formal evaluation process⁶.

In Europe⁷, legislation usually demands an initial accreditation process and, more recently, auditing has developed. Importantly, however, governments do not set up a national exam for students as a tool to evaluate college quality; auditing is mostly a report by a panel of experts that evaluate the institution directly. In Austria, private institutions need official accreditation and are subject to audits; a bad outcome may result in shutdown. Public institutions need no accreditation, and are subject to an auditing process that may at most cause reputational harm, but no closure. This system is recent, dating back to 2012, and still does not provide a unified treatment of private institutions. In Denmark, a new bill passed in 2013 established the need for accreditation for all institutions, both public and private, but does not mention the need for auditing; audit trails are based on self-reporting. In Finland, all colleges are public and there is no formal accreditation process, but every college is audited and may receive a license for at most six years. In Germany, where "higher education" refers to an educational structure more diversified than in most countries, auditing is tailored to the specific institution, as well as its consequences. In Norway, audit is based on the quality assurance

⁴ See Senado Federal (2005) and Presidência da República (2004).

⁵ See Thelin (2011) for details.

⁶ A recent example was the sequence of lawsuits by the federal government against Corinthian Colleges Inc., a major company in the higher education sector that was forced to close or sell all colleges it owned and lost access to federal funding.

⁷ For details, see AQ Austria (2014), European Consortium for Accreditation (2004) and Costes et al. (2008).

procedure of each institution; the panel that evaluates it may eventually ask for some specific information.

It is relevant to stress that the Brazilian system of accreditation and auditing is more rigorous than all the examples above, mostly due to the fact that one of the tools used for auditing is a common exam, applied by the government, that is mandatory for senior students every three years.

3. The Model

I consider an economy composed by three sectors. The first captures the supply-side of the market for education; I model it with a representative agent labelled “college”. The second is formed by potential employers, or firms in the rest of the economy that may hire workers that may or may not have a college degree. The third is made up of individuals that have a double role: they are consumers in the educational market and potential employees in the rest of the economy – for simplicity, I will label them “workers”. The mass of workers is fixed and exogenous; normalize it to one for simplification. All agents behave competitively.

3.1 Workers and Firms

The interaction of workers and firms is modeled as a simplified version of Spence (1973), including the problem of asymmetric information, as follows. Both sectors are made up by a large number of atomistic agents.

There are two types of workers: they may have either high or low productivity t_h and t_l such that $t_h > t_l$. If this information were available to firms, the competitive equilibrium would entail a wage equal to the worker’s productivity – that is, there would be two wage levels in the economy. However, there is asymmetric information concerning productivity: only workers know it. Firms only know the probability distribution: a worker has high productivity with probability p_h and low productivity with probability p_l . In the absence of any other feature to differentiate workers, firms cannot tell them apart and offer the average productivity $p_h t_h + p_l t_l$.

Firms and workers play a signaling game as follows. In the first period, individuals choose a level of education; I simplify this by assuming it is only a binary choice whether to attend college. In the second period, firms choose competitively the wage they will offer to potential employees, conditional on the level of education they observe.

The cost of acquiring education is higher for low productivity workers. Intuitively, t_h workers are more productive both in the job market and in college. One may interpret that t_l workers need more time in college to get the degree, incurring in a higher opportunity cost or even a direct pecuniary cost. Importantly, this holds for the marginal cost of attending college. Assuming there is no cost if a worker does not attend college, assumptions on total and marginal cost boil down to the same condition: $e_h < e_l$, in which e_i is the cost of attending college for types $i=h,l$. Assume for simplicity that $e_h = 0$ and label $e_l = e > 0$.

There are two types of equilibrium. In a pooling equilibrium, all workers choose the same level of education and receive the same wage. In a separating equilibrium, high productivity workers choose to attend college and receive a high wage t_h , while low productivity workers choose not to attend college and receive a low wage t_l . Intuitively, firms are able to differentiate workers based on their educational choices.

In the rest of the paper I will consider only separating equilibria, since the best pooling equilibrium entails no education at all, making it of little use to study the market for education. Wage differentiation in the job market is based on the unwillingness of t_l workers to imitate the educational choice of t_h workers in a separating equilibrium: it is not worth to pay the cost e in order to get a wage t_h , while for t_h workers it pays off. Formally, this means that $e > t_h - t_l$: the cost to acquire a college degree is higher than the wage difference (which is simply the productivity difference) for t_l workers. For simplicity, and with no loss of generality, I will take from now on $t_h - t_l = 1$.

This structure generates the following demand for college. For a price $p > 1$, demand is equal to zero. If $p < 1$, it is equal to p_h : all t_h workers will enroll. For $p = 1$, demand is undetermined in the interval $[0, p_h]$. For the rest of the paper, I will take this as a stationary equilibrium (i.e., it is played in every period); this is the case, for example, if one restricts attention to the junior market, meaning that each worker participates only once.

3.2 The College Sector

Up to this point, the structure is exactly the same as in Spence (1973). To study the impact of QAP on this setting, I model the educational sector as follows.

There is a representative agent that offers college education (results are unchanged if one considers explicitly a competitive market). For simplicity, assume there is only one major; thus I am not modeling multiple choices. This is a private college that aims at maximizing profits, which are obtained in each period based on the number of enrolled students.

The college is described by a cost function that depends on its size s , i.e., on the number of students, which may also be interpreted as the share of workers in college since the total mass is normalized to one. The cost $c(s)$ has two components. First, there is a cost $c_1(s)$ per period. Second, there is a setup cost $c_2(s)$ paid only at the beginning of operation. Both c_1 and c_2 may or may not have a fixed component. In either case, c_i is strictly increasing and strictly convex⁸.

It is worth stressing that the setup cost $c_2(s)$ depends on the number of students s : it is increasing in the number of students the college wants to attend. This cost may be interpreted as follows. It is necessary to build teaching facilities that will accommodate staff and students (this is true, to a lesser scale, even for online classes, since servers and connection quality depend on the size of the audience). Besides, it is necessary to advertise the new college to attract students; initial advertisement is more relevant as the college cannot count on word of mouth, and it will be larger if the college wants to attract more students.

Given the demand function for education and the cost function, a college gets in every period a net revenue $s - c_1(s)$; gross revenue is ps but p is normalized to 1. It pays the setup $c_2(s)$ only in the initial period. There is a discount factor $\delta < 1$.

⁸ Notice that if the college sector were composed by identical firms with cost function $c(s)$, then the aggregate supply function would be flat and the representative agent would produce with a technology displaying constant returns to scale. The cost function would then be linear. This would not affect the results in this paper but would make the argument cumbersome as there would be multiple equilibria. To avoid this and study a unique equilibrium, one may assume that the underlying market has firms $j = 1, \dots, M$, in which M is the total number of firms, with cost functions $c_j(s) = c(s) + a_j s$, in which $c(s)$ is a baseline cost and $(a_j)_{j=1, \dots, M}$ is a strictly increasing sequence of positive numbers. Firms with lower costs enter the market first. This reflects some degree of scarcity in the market of inputs for education and generates an aggregate supply function with a strictly positive slope.

I assume that there is no asymmetric information in the market for education; hence workers know the level of quality provided by a given college. (Advertisement of quality may be interpreted as cheap-talk; in equilibrium, workers disregard this information.) A college is only known for quality it is actually provided.

For simplicity, I will assume that the college only has two choices of quality: either “no quality” or “high quality”. I will assume for $i=1,2$ that $c_i(s / \text{low quality}) = c_i(s)$ and that $c_i(s / \text{high quality}) = c_i(s) + k_i s$, in which $k_i > 0$. Lastly, I will assume that the Inada conditions hold, implying that one needs not worry about corner solutions in what follows⁹.

I follow Spence (1973) and assume that education is only used for signaling purposes: attending a college and getting a degree do not affect productivity (t_l and t_h are exogenous). This amounts to focusing on educational choices that respond to the problem of asymmetric information in the job market; this focus is justified since this is usually where quality is lowest and QAP should play a major role.

It is worth to summarize and highlight two features of the demand for education in this model. First, workers need education only for signaling purposes. Quality does not affect signaling; only the cost to get the degree does so. (It may be argued that a higher quality is associated with a higher cost; as noted in the Introduction, this does not affect the results below). Second, they know the quality of the education they get.

Notice that the supply-side in the market for education may be rewritten equivalently taking shareholders as the agents. This viewpoint will be useful to interpret the results in the next section.

3.3 Quality Assurance Policy (QAP)

In each date, the regulator measures the quality of the college. The evaluation process allows the regulator to learn it with certainty; this reflects the fact that there is no relevant asymmetric information in the market for education. Hence the regulator just turns available information into hard evidence that may be used for official policy. If a college has low quality, it is shut down and needs to repay the setup cost to resume operation; otherwise it keeps operating.

A college is evaluated after T periods; hence T captures how strict QAP is. If $T=1$, evaluation takes place every period and colleges with low quality are always punished. If T is large, then these colleges may operate and capture profits for a long period before being shut down. It is immediate from the college profit function that it will choose N as large as possible even if it offers low quality; it follows that, in equilibrium, $N=T$: colleges operate with low quality until they are audited.

It is worth to emphasize an alternative interpretation to the setup cost at re-entry. It may be the case that the college does not shut down, and endures the reputational cost of the punishment imposed by the regulator, as well as the eventual bureaucratic cost to get a new license to operate.

4. Results

⁹ Notice that in the current setup, this implies that $c'(s) \rightarrow \infty$ when $s \rightarrow p_h$. In words, it is extremely costly to offer college education to everyone who demands it.

The first point to notice is that the demand for education is not affected by QAP. This is, in fact, a corollary of Spence (1973). In other words, the optimal choice of schooling is not affected by QAP: students are indifferent to quality since any college degree is enough to signal productivity.

Proposition 1. *t_h workers get a college degree but are indifferent to the quality of education; t_l workers choose no education.*

Proof. This is a particular case of Spence (1973). t_h workers choose to get a college degree because $t_h - t_l > 0$. Since this inequality is not affected by the quality of the degree-granting institution, they are indifferent to quality. t_l workers are better off without education because $e > t_h - t_l$. CQD.

The only role of education in the current setting, just as in the original model by Spence, is to serve as a signal of unobserved ability; there is no impact on productivity.

Corollary 1. *The demand for education is not affected by quality.*

Proof. Immediate implication of Proposition 1. CQD.

This follows from the fact that workers get the full benefit from education (namely, $t_h - t_l$) with a low quality degree. There is no additional gain from quality. Again, this comes from Spence (1973).

One may turn now to the supply-side of the market for education to build an equilibrium. The next proposition describes the optimal choice of quality and size made by the college.

Proposition 2. *The college offers low quality and the number of students is increasing in T .*

Proof. Consider first the choice about quality. This generates an additional cost k_1 per student in every period and an additional cost k_2 in the initial period. This cost has no benefit since demand is not affected by quality, as established in Corollary 1. Hence the college will choose low quality¹⁰.

Since it offers low quality, the college will operate for T periods until it is audited by the regulator and shut down. Then shareholders will have to pay the setup cost again to become active. The profit function is:

$$\pi = (s - c_1(s) - c_2(s)) + \delta(s - c_1(s)) + \delta^2(s - c_1(s)) + \dots + \delta^{T-1}(s - c_1(s)) + \delta^T(s - c_1(s) - c_2(s)) + \delta^{T+1}(s - c_1(s)) + \dots$$

$$\pi = [(s - c_1(s)) + \delta(s - c_1(s)) + \delta^2(s - c_1(s)) + \dots + \delta^{T-1}(s - c_1(s)) + \delta^T(s - c_1(s)) + \dots] - [(c_2(s)) + \delta^T(c_2(s)) + \dots + \delta^{2T}(c_2(s)) \dots]$$

$$\pi = \frac{1}{1-\delta} (s - c_1(s)) - \frac{1}{1-\delta^T} (c_2(s))$$

The first-order condition is:

¹⁰ In fact, this result depends on an upper bound on c_2 . See the next section for a complete discussion.

$$\frac{1}{1-\delta} (1 - c'_1(s)) = \frac{1}{1-\delta^T} c'_2(s)$$

The first-order condition is the usual equality between marginal revenue and marginal cost:

$$1 = c'_1(s) + \frac{1-\delta}{1-\delta^T} c'_2(s)$$

To see that s is increasing in T , apply the implicit function theorem to this last equation to compute the derivative of s with respect to T :

$$\frac{ds}{dT} = - \frac{(1-\delta)c'_2(s)[(1-\delta^T)^{-2}](-\delta^T \ln \delta)}{c''_1(s) + \frac{1-\delta}{1-\delta^T} c''_2(s)}$$

Which is strictly positive since c_1 and c_2 are convex and $\delta < 1$. CQD.

Optimal size depends on the period of time until the audit takes place, after T periods; size depends on how long the college can operate with low quality before shutdown. A strict QAP is measured by a small value of T ; hence one can see that, for any given cost functions c_1 and c_2 , a more strict QAP decreases the number of students.

Notice that if there is no QAP (i.e., $T = \infty$), then the first-order condition entails:

$$1 = c'_1(s) + (1 - \delta)c'_2(s)$$

This means that the college considers the full marginal cost c_1 but only the per-period value of c_2 , which is paid only once; hence it becomes less relevant as δ approaches one.

When QAP is most strict (i.e., $T=1$), the setup cost c_2 must be paid in every period: the college sets up, operates for one period, and is evaluated and shut down. The first-order condition for this problem is $1 = c'_1(s) + c'_2(s)$ as there is no distinction between setup and operational costs.

Intuition is as follows. Whenever the college is punished for low quality, it must repay the setup cost c_2 per student. In other words, QAP increases the marginal cost of adding a student.

Abusing the equivalence between the representative agent model above and an analogous competitive-market model, one may consider the following structure: instead of building one large college, an investor may split its capital into two small ones. This will make no difference to total demand according to Proposition 1, and will decrease the cost of punishment due to the convexity of $c(\cdot)$.

One may now evaluate the impact of QAP on quality in the current setting.

Corollary 2. *Quality-Assurance Policy does not increase quality.*

Proof. It follows immediately from proposition 2: QAP only affects the size of colleges. The incentives for quality are unchanged. CQD.

The intuition behind this result may be explained as follows. The demand for low-quality education is unaffected by the QAP; it stems from a fundamental problem of asymmetric information in a different market – namely, the job market, where potential employees use low-quality degrees as a signal that they can go through college, and not as a tool to actually learn or increase productivity.

It should be noticed that QAP would have an impact if it could commit to imposing a significant cost on low-quality firms but this cannot happen exactly due to the characterization of the supply-size in Proposition 2: by decreasing the number of students, colleges can lower the cost of re-entry.

QAP may also have another negative impact on welfare. Referring to s as the share of workers in college, the Inada conditions imply that, in equilibrium, $s < p_h$: some workers are left out of college even if they are willing to pay $t_h - t_l$ to get a degree (the specific rationing rule that should apply is not relevant to the previous results). QAP worsens this problem as s decreases.

5. Extension: Quality and Interest Rates

The previous section implicitly assumed that the cost to provide quality was too high compared to the setup cost without quality, as mentioned in the footnote to Proposition 1. In theory, the college could opt for quality as a way to avoid being shutdown: if the cost of quality is sufficiently low, then it is worth to pay it instead of the setup cost the follows failure at auditing. Namely, the condition for the college to choose low quality is the following:

$$\frac{1}{1-\delta} (s - c_1(s)) - \frac{1}{1-\delta^T} (c_2(s)) \geq \frac{1}{1-\delta} (s - c_1(s) - k_1 s) - (c_2(s) + k_2 s)$$

The left-hand side is the profit without quality, which entails the setup cost c_2 after every auditing. The right-hand side is the profit the college would obtain if it offered high quality: the (higher) setup cost would be paid only once, and there would be a per-period additional cost. This condition boils down to:

$$\frac{1}{1-\delta} (k_1 s) + k_2 s \geq \frac{1}{1-\delta^T} (c_2(s)) - c_2(s)$$

If $T = \infty$, i.e., if there is no QAP, this condition becomes:

$$\frac{1}{1-\delta} (k_1 s) + k_2 s \geq 0$$

Which always holds since k_1 and k_2 are both strictly positive. This means simply that in the absence of any punishment for low quality, a college will never invest in quality. The most strict incentive for quality comes when $T=1$. The condition above becomes:

$$\frac{1}{1-\delta} (k_1 s) + k_2 s \geq \frac{1}{1-\delta} (c_2(s)) - c_2(s)$$

This may be rewritten as:

$$k_1 + (1 - \delta)k_2 \geq \delta \frac{c_2(s)}{s}$$

In words, the average cost to provide quality, taking into account the discount due to the fact that the setup cost for quality k_2 is paid only once, must be higher than the average setup cost without quality. One may see that if k_1 and k_2 are sufficiently large, then this condition holds and the analysis in the previous section goes unchanged. More interestingly, however, is the role of the discount factor δ . If it is close to one (i.e., the college is patient), then the previous analysis only holds if k_1 is larger than $\frac{c_2(s)}{s}$. In the limit when δ approaches zero (i.e., the college is impatient), then this holds for any given positive values of k_1 , k_2 and c_2 . As usual, one may reinterpret this in terms of the interest rate r :

$$\delta = \frac{1}{1-r}$$

Hence high interest rates (high r , low δ) render the choice of quality sub-optimal whatever the cost of quality, even if QAP is most strict. This is particularly important for developing economies like Brazil, where low capital stocks and underdeveloped capital markets tend to increase interest rates.

6. Final Remarks

This paper studied the effect of quality assurance policy in a market with low quality but no asymmetric information about it, meaning that consumers acquire low quality services willingly. In the education market, this choice may be justified as a signaling tool an individual may use to inform firms about his ability, which usually cannot be observed directly by potential employers. The main result is that such a policy does not increase quality, and hence is not an effective way to spend public funds.

Alternative measures may be considered and should be subject to further research. There is at least one solution that tackles the problem of low-quality education directly: the decrease in asymmetric information in the relevant market – i.e., the job market, where potential employees and firms meet. This might be accomplished through a matching program that evaluates the fit of a particular candidate to a given position. Such an evaluation would decrease the need for signaling and hence the demand for low-quality education.

As far as the basic problem in the job market is taken as given, one may also consider direct subsidies for quality and fines for poor performance. An extreme instance of this policy would be a strict ban on low quality education - for example, through the direct provision of education by public universities with high standards. However, the welfare impact of such a ban is yet to be determined empirically.

7. References

AQ AUSTRIA. Quality Audit in the European Higher Education Area: a Comparison of Approaches. Facultas Verlags- und Buchhandels AG, 2014.

COSTES, N., Crozier, F., Cullen, P., Grifoll, J., Harris, N., Helle, E., Hopbach, A., Kekäläinen, H., Knezevic, B., Sits, T., Sohm, K. Quality Procedures in the European Higher Education Area and Beyond; Second ENQA Survey. ENQA, 2008.

European Consortium for Accreditation. Accreditation in the European higher education area. In Conference of European Ministers for Education in Bergen (2005), 2004.

MAS-COLELL, A., Whinston, M., Green, J. Microeconomic Theory. Oxford University Press, 1995.

Presidência da República. Lei no 10.861, 2004.

Senado Federal. Lei de diretrizes e bases da educação nacional, 2005.

SPENCE, M. Market signaling: Informational transfer in hiring and related screening processes, volume 143. Harvard University Press, 1974.

Spence, M. Job market signaling. The Quarterly Journal of Economics, pages 355_374, 1973.

THELIN, J. Governing America: Major Policies and Decisions of Federal, State and Local Government, chapter Higher Education and Public Policies in the United States. 2011.

WEISS, A. Human capital vs. signaling explanations of wages. Journal of Economic Perspectives, 9(4):133_154, 1995.