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# Long Live OPTA!

Maarten Pieter Schinkel en Bjørn Volkerink\*

June 24, 2003

## Abstract

Although explicitly installed as a provisional body, the Dutch telecommunication controller OPTA displays some signs typical of government institutions that seek to become indispensable. A conflict in OPTA's two main policy objectives—guarding consumer prices through controlling the network operator and encouraging entry into the telecommunication market in order to establish symmetric competition—hinders OPTA in making itself redundant. In this paper it is shown that a market structure with a dominant owner of the network and a few fringe firms, among which OPTA referees for ever, is a stable Nash equilibrium. Apart from a warning for this undesirable state of affairs, some possible remedies are discussed. Long live OPTA, but leaner and meaner, supervising a symmetrically competing market.

*Keywords:* natural monopoly, network regulation, Niskanen effect.

*JEL-codes:* H11, L51.

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# 1 Introduction

In order to check and balance the gradual process of liberalization in the Dutch telecommunication market, in August 1997 the government of the Netherlands installed the *Onafhankelijke Post en Telecom Autoriteit* (OPTA). As the liberalization was expected to over time invite sufficiently many new competitors into the telecom market to challenge the dominant former state monopolist KPN Telecom, it has always been the intention to do without OPTA again, once a reasonably equal and stable division of the market among several competitors would establish—in fact, only upon a long debate in parliament was it decided to establish OPTA in the first place, as controlling the telecommunication market was thought by many to resort just fine under the regular tasks of the *Nederlandse Mededingingsautoriteit* (NMa). In the 1996 notice to the Dutch parliament, accompanying the proposal to change the Telecommunicatiewet of 1988 to accommodate for installing OPTA, for example, it reads that:

“The postal and telecommunications sectors currently are in a transition phase from monopoly to perfect competition (*volledige mededinging*). In light of the aim to establish perfect competition in both sectors as soon as possible, it has been decided to temporarily, and in addition to the existing general competition regulations, apply specific legal conditions that in certain cases inspect competitive relationships (among other things with an eye to ‘competition engineering’). (...) This specific regime will be terminated the moment one can speak of a functioning of the market that is such that it suffices to further do with the normal competition regime [NMa]. It is difficult to provide an indication as to when this will be possible. For that reason, an evaluation mechanism has been built into the law proposal.” (*Memorie van Toelichting bij de Wet Onafhankelijke Post- en Telecommunicatie Autoriteit*, pp. 9–10, our translation from the Dutch original.)<sup>1</sup>

In the process towards this envisioned competitive telecom market, OPTA’s main tasks would be the execution of those sections of the modified *Telecommunicatiewet* that concern market supervision. These encompass a guarding of the open network provision in order to accommodate a structural entry into the

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<sup>1</sup>The provision was indeed part of the subsequent evaluation of OPTA. Cf. Kabinetsstandpunt evaluatie OPTA–6th July 2001.

services market, as well as a concern for sufficient investment in infrastructure. Apart from these long-term objectives, and originally only for the period in which the market would be in transition, OPTA's chief tasks consist of mitigating in conflicts between individual suppliers and of controlling the tariffs that KPN Telecom charges others for the use of the fixed telecommunications network.

Since KPN Telecom is in a position of natural monopoly, this supervision of its tariffs is desirable. After all, apart from being unfair, it would be inefficient to allow the company to profit from an infrastructure and a dominant position in the market it has essentially inherited from the Dutch government. It was therefore put in law that OPTA regularly checks tariff-proposals against KPN Telecom's cost structure, and is required to accord them before they can be installed. More explicitly, the prices KPN Telecom's charges to other telecommunication firms should be sufficiently close to KPN Telecom's average costs. With this referee provision in place, KPN Telecom is to be kept from the temptation to exploit its exceptional position as owner of the fixed network, either by restricting entry into the telecom services market, or by charging excessive mark-ups on the services it supplies itself.

Interestingly enough, the *Telecommunicatiewet* also specifies that OPTA is to be financed independently from government. To that end, OPTA is entitled to a fee from the telecom firms it supervises. That is, any supplier of telecommunication services that intends to use the KPN Telecom network is required to pay a yearly contribution to OPTA, which consists of a fixed part and a part that varies in the number of connections the supplier services. Since the intention is that OPTA focuses its control on the dominant firm(s), rather than the fringe, it uses two tariff structures. Firms with a modest market share pay both a low fixed and a low variable tariff, whereas companies with so-called "significant market power" (*aanmerkelijke marktmacht*), measured as a market share of more than 25%, pay a considerably higher amount.<sup>2</sup>

OPTA's tariffs are in turn subject to a yearly revision by the *Minister van Verkeer en Waterstaat*, based on the costs OPTA reports to have been necessary for carrying out its task in the previous year.<sup>3</sup> These do not include costs made for bilateral mitigation, as the actual costs thereof are levied directly on the parties involved. The differentiation in OPTA's tariffs between parties with and

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<sup>2</sup>For more details on the finance structure chosen for OPTA see *Besluit vergoedingen Telecommunicatiewet* (1999), and *Regeling vergoedingen OPTA 1999, and subsequent updates*.

<sup>3</sup>As of 2002, the Dutch Ministry of Economic Affairs is responsible for this.

without significant market power are acknowledged by the *Besluit vergoedingen Telecommunicatiewet* and equal 80% and 20% respectively.<sup>4,5</sup>

As said, the objective was and is to substantially trim OPTA's operational powers, once it has accomplished its tasks of guiding the liberalization process to the point that balanced competition in telecommunication services has established. That is, upon a process of entry and exit in the market, OPTA's duties would be reduced to just that of controlling the network fee and mitigating in isolated cases, a much more modest task than its present functions. It has, however, been observed that OPTA's intentions have gradually changed. Instead of allowing to gradually be dissolved, it seems OPTA actively seeks for enlargement of its interventionist's role.<sup>6</sup>

In itself, this kind of behavior is not uncommon for a bureaucratic body—albeit it unbecoming. The seminal analysis of Niskanen (1971) on bureaucratic empire building presses the point that government institutions typically have the objective to spend their allotted budgets to the maximum—beyond employee costs, for example, on commissioned research and office equipment. It is rational to do so, as future budgets typically decrease when planned budgets are not fully allocated.

Total costs of bureaucratic institutions have a tendency to spiral upwards, particularly when the institutions are in a principal-agent relation to their commissioners, resulting from superior information, a position of power, and little external control. These conditions seem to apply to OPTA. Information asymmetries are likely to exist between the agency and the ministry, which provides the budget. Moreover, OPTA is the sole controller of the telecom market, and itself scarcely monitored. Although its quantitative impact should not be overstated, qualitatively the Niskanen effect has survived more recent scrutiny. Today its dangers are widely acknowledged.<sup>7</sup>

OPTA's set and realized budgets, collected from the organization's annual reports, indeed display a steady increase between 1997 and 2002. The same is true for the number of people employed by OPTA over these years. As can be seen from Figure 1 OPTA's costs slope upwards roughly linearly at about a 40% yearly rate. Furthermore, these summary statistics reveal that OPTA's estimated budget increased substantially in years following a year in which the

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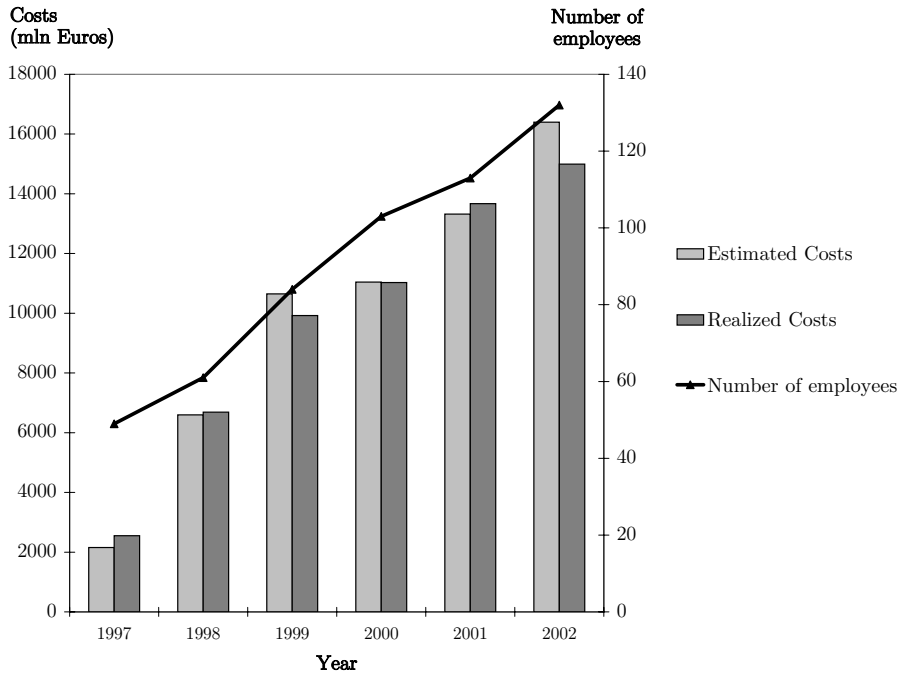
<sup>4</sup> *Op cit.* art. 4, sect. 3.

<sup>5</sup> *Cf. Regeling vergoedingen OPTA 2003*, p. 18.

<sup>6</sup> *Cf. Van Damme (2002)*.

<sup>7</sup> *Cf. Moe (1997), and Mueller (2003)*.

realized budget exceeded the estimate. Even when the first considerable increase in costs between 1997 and 1998 are ignored on the argument that OPTA was an institution in the making, still the costs grew by a good 20% per year. Some concern for the institution falling prey to the Niskanen effect seems warranted, therefore.



Source: OPTA *Jaarverslag OPTA*, various issues.

Figure 1: Total Cost and Employment of OPTA

Without the intent to make the extreme acquisition that OPTA would have no self-control at all, we here forward the argument that a serious conflict in OPTA's objectives, installed in the *Telecommunicatiewet*—albeit not hindered by OPTA's natural drive to survive as an institution—is likely to prevent it from ever becoming redundant. This central conflict is between OPTA's objective to keep the tariffs KPN Telecom charges to the independent suppliers close to the average costs of their use of the network, and its stated goal to invite entry and balance competition. These two ends bite, and as a result cannot be expected to both be met in the long-run. The telecommunication market will remain in unbalanced competition, with KPN Telecom as the dominant firm, a small competitive fringe, and OPTA the unavoidable mitigator.

The remainder of this paper is organized as follows. The next section presents a simple model of the underlying fundamentals of the telecommunication market. It is shown that a stable Nash equilibrium exists, with features quite similar to the situation present in the Dutch fixed network telecommunication market. Moreover, OPTA's role in establishing equilibrium is crucial as it controls both the revenues of KPN Telecom and the costs of the fringe, via the interconnection tariff. Both the long- and the short-run effects of this are exercised through. Section 3 subsequently discusses OPTA's role in mitigating the market. It is argued that OPTA may be susceptible to the Niskanen effect, and will therefore stabilize that Nash equilibrium amongst all the equilibria it can establish, in which its role is maximized. The final section offers some concluding remarks with suggestions for possible ways out of the OPTA deadlock.

## 2 A Model of the Dutch Telecom Market

The following simple model captures an essential part of the Dutch telecom market on the fixed network. One competitor, KPN Telecom, controls all the infrastructure that is needed to provide fixed network telecommunication services as units of a homogeneous product. By law, KPN Telecom is forced to supply those units of services to whoever wants to resell it under its own brand name. For that supply, the dominant firm can charge a fixed and a variable interconnection charge. Both these prices have to be approved of by the regulator, that is, by OPTA. In order to simplify the analysis, we assume that the fixed charge that KPN Telecom demands from its resellers is always exactly in proportion to their amount of sales.

The costs of the regulator are shared among the firms supplying in that market. In accordance with the Dutch regulation, a dominant firm (KPN Telecom) pays 80% of the costs. The other firms taken as a group pay the remainder. More formally, in the stylized model of the Dutch telecom market, the profit functions of KPN Telecom and the fringe firms, therefore, are as follows:

$$\Pi_{\text{KPN}} = pQ + tq - [c(Q + q) + FC_{\text{KPN}} + 0.8FC_{\text{OPTA}} - R_{\text{KPN}}], \quad (1)$$

and

$$\Pi_{\text{fringe}} = pq - (tq + 0.2FC_{\text{OPTA}} + R_{\text{KPN}}), \quad (2)$$

respectively, where, for reasons of exposition, the fringe firms are lumped together in a single representative firm labelled ‘fringe’. Capital  $\Pi_i$  denotes profits of firm  $i$ ,  $p$  is the market price for a unit of telecom services,  $Q$  is KPN Telecom’s sales of units,  $t$  is the interconnection tariff charged by KPN Telecom for variable capacity to the fringe firms,  $q$  is fringe sales,  $c$  reflects constant marginal costs,  $FC_{\text{KPN}}$  are the fixed costs of production of KPN Telecom,  $FC_{\text{OPTA}}$  are the (fixed) costs made by OPTA in policing the market, and  $R_{\text{KPN}}$  is the fixed interconnection charge of KPN Telecom.<sup>8</sup>

Note that all is variable, except the 20/80% split of the costs made by OPTA that is specified in the *Besluit vergoedingen Telecommunicatiewet*. Also note that, effectively, KPN Telecom determines, albeit with OPTA watching, the input prices of the newly established suppliers of telecommunication services. This is interesting, since the fringe consists of KPN Telecom’s (potential) competitors on the services market.

In the following, we first analyze the long-run equilibrium in this simple model of the market. Before turning to that analysis, however, let us provide some insight into the money involved in the Dutch fixed network telecommunication. At the time of writing this paper, a representative (*i.e.*, national) interconnection tariff  $t$  was set, ranging from EURO 0.0047 to 0.013 and the fixed interconnection charge  $R_{\text{KPN}}$  was EURO 85,992.<sup>9</sup> The fixed costs KPN Telecom reported in 2001 ( $FC_{\text{KPN}}$ ) are EURO 3,847,000,000.<sup>10</sup> OPTA’s costs ( $FC_{\text{OPTA}}$ ) were about 0.1% of this, with a 2001 report of approximately EURO 3,350,000.<sup>11</sup> Total sales volumes are hard to come by, but the market share of KPN Telecom in the years 1999, 2000 and 2001 was 78, 66 and 60% respectively, leaving the fringe a slightly growing, but structurally small part of the market.<sup>12</sup> The marginal costs of KPN Telecom,  $c$ , are also hard to obtain—yet,

<sup>8</sup>This representation of profits captures the main elements of the parties’ costs. See, for instance, <http://www.kpn-wholesale.com/> for similar pricing structures for some of the products KPN Telecom supplies to resellers.

<sup>9</sup>For the latter figure, that is the fixed charge plus the charge per access point times the number of access points in the whole country. All figures in the remainder of this paragraph are exclusive of VAT, unless stated otherwise. See <http://www.kpn-wholesale.com/> for more examples.

<sup>10</sup>See the annual report of KPN Telecom for 2001 (KPN Telecom, 2002). These are the fixed costs (excluding depreciation and changes in worth) in 2001.

<sup>11</sup>This figure is reported in *Regeling vergoedingen OPTA 2001* for a firm offering fixed network connection and enjoying significant market power. The actual costs of OPTA are about three times higher, as it supervises other markets, like the mobile network market, as well—see OPTA (2002a). Likewise, KPN Telecom’s fixed costs are somewhat overstated here, as other services are offered via the fixed infrastructure such as the provision of internet access, but are not included here.

<sup>12</sup>Market share is defined here as the number of minutes KPN Telecom has provided, relative



it seems fair to think of them as very close to zero. Finally, the telecom market being known for its use of confusing non-linear pricing strategies, it is difficult to present simple prices, but the price of a call of one minute within a region KPN Telecom charged at the time of writing via the fixed connection is EURO 0.0425 in the peak hours and EURO 0.0201 otherwise, upon a start tariff per call of EURO 0.05, and a monthly fee of EURO 17.18.<sup>13</sup>

## 2.1 Long-Run Equilibrium

The claim forwarded in the introduction is that OPTA's two ends—establishing balanced competition and at the same time strictly regulating prices—are potentially conflicting. To substantiate this claim, we first show in this subsection and the next that OPTA is in the position to establish any given distribution of market shares through average costs pricing as a long-run Nash equilibrium. It is subsequently argued in the next section that OPTA has an incentive to select from this large set of potential long-run equilibria, an equilibrium with asymmetric features, to secure its role as mitigator.

Given the homogeneous nature of the commodity sold, and on the assumption that in the long-run OPTA has sufficient information and occasion to set prices at average costs levels, the long-run equilibrium in this market is characterized by zero economic profits for all firms.<sup>14</sup> This returns the following condition:

$$p(Q + q) - c(Q + q) - FC_{\text{KPN}} - FC_{\text{OPTA}} = 0. \quad (3)$$

Now, let  $\alpha$  be the market share of the fringe firms, so that  $1 - \alpha$  is the market share of KPN Telecom. Note that larger values of  $\alpha$  would accommodate a larger number of fringe firms in the market, and that a symmetric distribution is reflected by  $1 - \alpha = \frac{\alpha}{n}$ , where  $n$  is the total number of fringe firms. We then have

$$\begin{aligned} \Pi_{\text{KPN}} = 0 = & p(1 - \alpha)D(p) + \alpha tD(p) - cD(p) \\ & - (1 - \alpha)(FC_{\text{KPN}} + 0.8FC_{\text{OPTA}}), \end{aligned}$$

to the total market it serves via the infrastructure. *Cf.* KPN Telecom (2002).

<sup>13</sup>These prices hold for the *belbasis* subscription, which is arguably the most popular one, and for nation-wide calls. See <http://www.kpn.com/> for prices and additional tariffs. The numbers reported here are VAT-inclusive.

<sup>14</sup>Average costs pricing is generally not socially optimal in a telecom network setting—*cf.* Laffont and Tirole (2000) and Haan (2002). Rather, OPTA should strive at non-linear Ramsey prices. To avoid complicating matters beyond the scope of this paper—in which we only want to argue that OPTA's two given objectives may be in conflict—these issues are ignored.

which can be rewritten as:

$$((1 - \alpha)p + \alpha t - c)D(p) = (1 - \alpha)(FC_{\text{KPN}} + 0.8FC_{\text{OPTA}}),$$

which in turn solves as

$$t = \left( p - \frac{FC_{\text{KPN}} + 0.8FC_{\text{OPTA}}}{D(p)} \right) \left( 1 - \frac{1}{\alpha} \right) + \frac{c}{\alpha}. \quad (4)$$

This critical value of the interconnection fee  $t$  is the variable tariff OPTA can set to ensure that profits are indeed equal to zero and market shares remain stable.<sup>15</sup> Thus, besides depending on the market share of the fringe firms,  $\alpha$ ,  $t$  is a function of general market conditions  $p$  and  $D(p)$ , and of all cost components,  $FC_{\text{KPN}}$ ,  $FC_{\text{fringe}}$ , and  $c$ .

The expression for the long-run interconnection tariff has at least two characteristics that are worth noting. First, since the second term in brackets is negative for  $\alpha \leq 1$ ,  $t < c$ , which means that KPN Telecom is losing money on every unit it sells to one of its competitors. This is not inconsistent with the rough data presented above. Second,  $\frac{dt}{d\alpha} > 0$ , which indicates that as the market share of the fringe firms (KPN Telecom) increases, the profit margin decreases (increases). As a result, any long-run equilibrium in the market can be sustained by OPTA, by changing  $t$ . This effect is illustrated in Figure 2.

The two market shares for KPN and the fringe, respectively, are determined by the intersection of the two net average costs curves, and the market price, which is determined by the costs of KPN and the fringe together, so that profits are zero. A higher  $t$  shifts the net average cost curve of the fringe firms,  $AC_{\text{fringe}}(t)$ , upwards. As the loss margin of KPN Telecom decreases ( $t < c$ ), the average cost curve of KPN Telecom,  $AC_{\text{KPN}}(t)$ , will shift down in proportion to this, as the market equilibrium price  $p$  is independent of  $t$ . Consequently, by pinning down  $t$ , OPTA chooses the distribution of the market.

To see that any such chosen distribution of the market is in fact a Nash equilibrium, consider the effects of an increase in market share by a party on either side of the market. If KPN Telecom increases its market share at the expense of the new entrants, it increases its profits, as it substitutes away from losing money on selling to competitors (since  $t < c$ ). OPTA, however, effectively responds to this by decreasing  $t$ ,  $\alpha$  has to decrease when  $1 - \alpha$

<sup>15</sup>Note that in this it is assumed that KPN Telecom charges a share  $\alpha$  of all of its fixed costs to the fringe firms. These fixed costs include the ‘fee’ it has to pay OPTA. This assumption does not affect the qualitative findings, however.

increases, and  $\frac{dt}{d\alpha} > 0$ . This increases demand by the other firms, as their profit margins increase. Therefore, any attempt by KPN Telecom to grow will meet strong resistance by the other firms. Something similar occurs if the fringe firms attempt to increase their market shares—it does increase their profits, but since OPTA responds by increasing  $t$ , KPN Telecom would be reluctant to give up market share and increase sales via the fringe, which is a loss making activity. Hence, attempts to increase market share by the fringe are likely to be blocked by KPN Telecom.

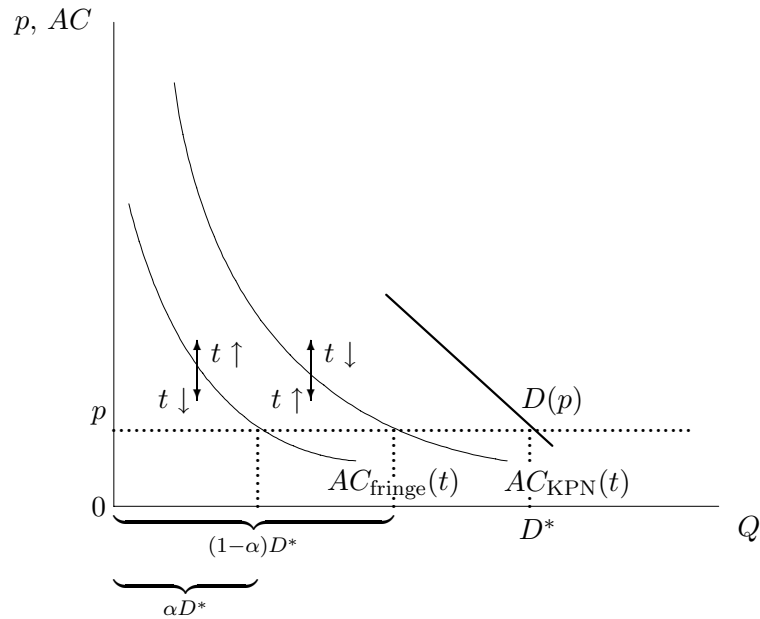


Figure 2: A Prototypical Telecommunication Market

A more formal analysis verifies these effects. Differentiating equations (1–2) with respect to  $\alpha$ , whilst taking into account the (optimal) response by OPTA, equation (4) yields zero's. In other words, in the long-run, and in the presence of OPTA, whose policy is characterized by equation (4), all attempts by any of the suppliers to increase profits by increasing market share are futile.

## 2.2 Short-Run Frictions

From the preceding analysis it follows that, if OPTA responds optimally—that is according to equation (4)—the market is more or less static in the long-run. The informational requirements on OPTA to react in this way, however, are rather strong. It is not unreasonable to foresee that, in the short-run, an

external shock is not accommodated in full, or is not responded to immediately. After all, to do so requires quite some insight into the characteristics and development of the market that even OPTA cannot be expected to obtain instantaneously. If we allow for this, deviations from the long-run equilibrium are possible.

In the short-run, that is for a given, not necessarily optimal,  $\bar{t}$ , the intentions of both KPN Telecom and the fringe can be studied by differentiating their profits at the status quo. This returns the following.<sup>16</sup>

$$\frac{d\Pi_{\text{KPN}}}{d\alpha} = -(p - \bar{t})D(p) + FC_{\text{KPN}} + 0.8FC_{\text{OPTA}} < 0, \text{ and} \quad (5)$$

$$\frac{d\Pi_{\text{fringe}}}{d\alpha} = (p - \bar{t})D(p) - FC_{\text{KPN}} - 0.8FC_{\text{OPTA}} > 0, \quad (6)$$

so that both firms have an incentive to increase their market share, as that increases their profits.

To illustrate the short-run developments in the market on which this result may shed some light, let us go back to the situation at the time OPTA was established in the late 1990s, with KPN Telecom being the sole supplier, and no competitive fringe present. OPTA at the time sought to set  $t$  in such a way that it enabled new firms to enter the market. There is reason to believe OPTA set  $t$  quite low, pro-actively accommodating entry. As a result, the profit margins of the entering firms were relatively high and those firms very much would have wanted to enter and increase their sales rapidly. After all, upon entry they have effectively already payed for part of the fixed OPTA costs involved, and the marginal costs plus the part in the fixed network costs together are lower than the market price.

However, KPN Telecom cannot allow the fringe to expand, as that would impose a loss to the company, since anything it sells to the fringe, it effectively sells below market price—even if KPN Telecom would increase production—since  $t < c < p$ . Therefore, KPN Telecom can credibly claim that it cannot offer more capacity to the fringe. As a result, the natural equilibrium to arise is one with a value of  $\alpha$  that solves equation (4) for that specific interconnection tariff  $t$ . That is, an equilibrium with little entry, a small market share for the fringe, and maintained dominance of KPN Telecom, as  $\frac{d\alpha}{dt} > 0$ .

If, on the other hand, it were the case that OPTA has set  $t$  too high, the profit margin of the fringe would have been low to nil, and entering firms would

<sup>16</sup>The inequalities hold if  $(p - t)D(p) > FC_{\text{KPN}} + 0.8FC_{\text{OPTA}}^*$ , which is the case as  $c > t$ , and profits are nonnegative.

either not have resold anything, or they would have had to sell a very high quantity at once, for being active in the market to be profitable. As KPN Telecom would have been very hesitant to supply services—let alone services of sufficient quality, another dimension along which KPN Telecom displayed resistance to the fringe entry, here ignored—again only KPN Telecom would have served the market. In any event, therefore, OPTA’s objective to invite entry into the telecommunications market would have been difficult for the regulator to meet.

### 3 OPTA’s Deadlock

It has been shown that if OPTA is indeed to steer the fixed network telecom market to one in which KPN Telecom’s historic monopoly is broken and replaced by a symmetric oligopolistic market, OPTA effectively has to force KPN Telecom, via the interconnection tariff, to sell network access to other firms. This, KPN is hesitant to do, certainly in the short-run, but probably even in the long-run, when its profits are being compensated via adjustment of  $t$ .

So in its efforts to comply with its stated objectives, OPTA faces at least one reluctant party. To that should be added that, as explained in the introduction, OPTA is a bureaucracy open to the Niskanen effect. Its future funding depends on two main factors: its present costs, which is the larger and fixed part, and the variable income it receives from the mitigating tasks it fulfils. Not only is it therefore in the interest of OPTA to maintain a market structure in which a dominant party at least does not decrease in market size below the 25% threshold set for “significant market power,” so that it falls under the high tariff structure. It is crucial for OPTA’s proliferation that KPN Telecom maintains a sufficiently asymmetric market share. That is, since it is explicit that OPTA’s role as mitigator of the market would be trimmed substantially once the competitive balance displays a reasonable number of suppliers with more or less equal market shares, it has an interest in preventing this from happening. By maintaining the high market share of KPN Telecom, OPTA can keep its high budget. Moreover, in that way OPTA can substantiate that it may require higher budgets to perform its tasks properly. After all, it has to continue fighting the KPN Telecom monopoly.

The setup of the regulatory arrangements does not help OPTA to resist the perverse pressures it faces, to say the least. Consider the following: when

the interconnection tariff  $t$  is not in equilibrium, and since it is smaller than  $c$ , KPN Telecom refuses to give away market share in the short-run. The fringe firms, however, want to increase their market share, either because  $t$  is below its equilibrium value given in equation (4) above and the fringe can increase profits by obtaining a larger market share, or because  $t$  is above its equilibrium value, and then the fringe needs a higher market share in order to maintain zero profits given the fixed costs it faces. This reluctance of KPN Telecom to supply more capacity to fringe firms, is typically what lately has been observed.<sup>17</sup> Officially, OPTA would need to mitigate in this, and force KPN Telecom to part from its market share. Yet, the institution's silent objective to maintain an asymmetric market structure. Therefore, OPTA would be tempted in the long-run to adjust the interconnection tariff so as to accommodate for KPN Telecom's problems with increasing its loss-generating sales via the fringe. By thus moving  $t$  in the direction of its equilibrium value, the fringe firms lose their interest in a larger share of total sales, and OPTA effectively stabilizes the status quo.

A second detrimental effect of OPTA's deadlock position is that it is not encouraged to keep its costs in check. That is, it can enlarge its bureaucratic costs in  $FC_{\text{OPTA}}$ , as it can restore market equilibrium by changing its instrumental variable, the interconnection tariff.<sup>18</sup> From equation (4) it follows directly that an increase in the costs of OPTA are in equilibrium matched by an increase in  $t$ . In the short-run, with  $t$  fixed, however, the effects of increased OPTA costs are comparable to the pressures on OPTA from disequilibrium interconnection tariffs discussed above. That is, since total differentiation of the zero profit conditions of both KPN Telecom and the fringe gives the following signs for the effect of  $TC_{\text{OPTA}}$  on the desired market share:

$$\begin{aligned} \left. \frac{d\alpha}{dTC_{\text{OPTA}}} \right|_{\Pi_{\text{KPN}}=0} &= - \frac{\partial \Pi_{\text{KPN}} / \partial TC_{\text{OPTA}}}{\partial \Pi_{\text{KPN}} / \partial \alpha} \\ &= \frac{0.8(1 - \alpha)}{(t - p)D(p) + TC_{\text{KPN}} + 0.8TC_{\text{OPTA}}} < 0, \end{aligned} \quad (7)$$

and

$$\begin{aligned} \left. \frac{d\alpha}{dTC_{\text{OPTA}}} \right|_{\Pi_{\text{fringe}}=0} &= - \frac{\partial \Pi_{\text{fringe}} / \partial TC_{\text{OPTA}}}{\partial \Pi_{\text{fringe}} / \partial \alpha} \\ &= \frac{0.8\alpha + 0.2}{(p - t)D(p) - TC_{\text{KPN}} - 0.8TC_{\text{OPTA}}} > 0. \end{aligned} \quad (8)$$

<sup>17</sup> Cf. Het Parool, 2003, for a recent example.

<sup>18</sup> Note, for example, that there has been a 23% costs increase from 2000 to 2001 – *Regeling vergoedingen OPTA 2001*.

These expressions indicate that both KPN Telecom and the fringe firms want to increase their market share, giving rise to a conflict in which KPN Telecom's having to agree to sales via the fringe leads to the blocking problem discussed above. Although this runs counter to the general objective to lower the interconnection tariff in order to accommodate entry into telecommunication market, the way in which OPTA tasks have been handed down to the institution put it in a difficult position to carry them out as intended.

The sketch of the market provided in Figure 2 above illustrates the effect of an increase in the costs of OPTA. From equation (3), it is clear that when  $FC_{\text{OPTA}}$  increases, market demand decreases and the market price increases. That is, the dotted price line in Figure 2 shifts upwards. The effect of this on the respective market shares is ambiguous, as a closer inspection of equation (4) reveals. An increase in  $FC_{\text{OPTA}}$  increases  $t$ , but at the same time  $p$  increases, which in turn decreases  $t$ . Again, OPTA can install any distribution of the market it sees fit.

## 4 Concluding Remarks

We have identified two channels through which OPTA may be tempted to deviate from its set goal to open the fixed telecommunications network up for new entrants into the market. First, OPTA has an objective to maintain an asymmetric market structure, for its role in a symmetric market would be substantially reduced, and second, OPTA has an objective to inflate its bureau costs. This latter argument in turn is the result of a direct Niskanen effect, as well as of the 20/80%-split of OPTA's budget putting strain on the drive to market symmetry. Both effects lead OPTA to accommodate KPN Telecom's reluctance to sell part of demand via the fringe firms while it allows OPTA to give in to a Niskanen effect. If indeed these processes are at work in the Dutch telecommunications market—and there is some anecdotal evidence at least that they might very well be—a question of interest is how to set up natural monopoly control without these detriments.

A first—and to the situation of OPTA quite specific—feature that stands out in the setup chosen to regulate the Dutch telecommunication market on the fixed network is the way in which OPTA is financed. As it draws the larger part of its budget directly from the parties it is to control, in which in turn the telecom firms with the larger (dominant) market share pay a disproportionately

large fee in the two-part tariff structure, there is a direct tie between OPTA's regulatory efforts and its income. We have pointed out in particular how this potentially interferes with OPTA's objective to establish symmetric competition on the network. Should OPTA be financed out of general funds, it would be able to carry out its tasks with a greater degree of independence from the industry.

A more fundamental change to the setup that is likely to enhance the enforcement of average cost pricing by a regulator, which does not fall victim to the perverse incentive effects that OPTA faces, would be a strict separation of ownership of the infrastructure from the use of it. This setup has, for example, been chosen for the railway tracks in the United Kingdom as well as in The Netherlands—where the infrastructure is either a government subsidiary or a regulated private monopoly. The company responsible for the infrastructure then is effectively given control over the natural monopoly, so that it should be controlled strictly. But when the use of the infrastructure is in separate hands, there theoretically no longer is a preferred user—like KPN Telecom is to itself at the moment. The infrastructure firm, in fact, would have a preference for competition for its services, thus inviting entry into the market for use of the infrastructure.

This separation of ownership and use, however, also has an important downside. With ownership and use integrated, there is a clear incentive for the owners of the infrastructure to invest in the maintenance of the network. Additionally, it has superior information on how to do so efficiently. A stand-alone infrastructure owner, on the contrary, lacks the incentive to choose an efficient level of maintenance. Therefore, the government control of the infrastructure firm is essential, yet likely to be off the mark as well—see, for example, Wagner (1991). There are several ways in which these information and incentive problems of a pure mitigator, with no ties to the industry, can be accommodated for. One could, for example, opt to elect and re-elect a regulator on a regular basis—see Besley and Coate (2000). That way, it is forced to regularly give account of its activities, which the public can check against its private information. Another option is to establish yardstick competition of the kind advocated by Shleifer (1985), in which different regulators are compared, for example, internationally. Yet another possibility is to preset goals for the completion of which various institutions subsequently compete. All of these ways of organizing regulation of the market would enhance the dissemination of information and stimulate OPTA to regulate towards efficient use of the fixed telecommunication network.



We have shown how in its present setting OPTA will live long. Since a natural monopoly requires some sort of regulatory control, this in itself is not necessarily a problem. The problem in the present regulatory setup, however, is that with a long lived OPTA, an asymmetrically competing market, in which OPTA is susceptible to the Niskanen effect, remains. A clean break between infrastructure, use of the infrastructure, and control on the price setting by the infrastructure operator would enable an unobstructed view of the processes at play. Moreover, it would accommodate a structural shift to symmetric competition on telecommunication services. Such an organization of the natural monopoly would also call for a role for OPTA. Rather than the current uneasy position, as provisional addition to the *Nederlandse Mededingingsautoriteit*, however, OPTA would then be an integral part of NMa as a chamber, guarding the isolated problem of the pricing of network services at average costs. Developments are steady but slow in this direction, yet any delay should be avoided.<sup>19</sup> than it is today.

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<sup>19</sup> Cf. OPTA (2002b).

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