

Does Press Advertising Foster the “Pensée Unique” ?

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Abstract

The press industry depends in a crucial way on the possibility of financing an important fraction of its activities by advertising receipts. We show that this induces the editors of the newspapers to moderate the political message they display to their readers in order to make their newspaper more attractive as a media support for the advertisers, fostering thereby the ascent of the “Pensée Unique”.

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“As mass advertising grew, the liberal and radical ideas — in editorials, in selection of news, and in investigative initiatives — became a problem. If a paper wished to attract maximum advertising, its explicit politics might create a disadvantage. To obtain more advertising it needed readers of all political persuasions ... The answer in the news was a technique called “objectivity” ... The doctrine of objectivity ... has given American standard news a profoundly establishmentarian cast.”

Bagdikian, *The Media Monopoly*, 1992, 129–30.

1 Introduction

The French expression “*La Pensée Unique*” designates a social context in which discrepancies among citizens’ political opinions are almost wiped out. In this context, people do not pay much attention as to whether politicians belong to the left or to the right: in any case, the platforms of both wings mirror each other. Political newspapers or opinion magazines reflect the context of *Pensée Unique*, as they provide very close analyses of the political process. Extreme positions are softened, or even banished, and their articles depict political events through the same interpretative prisma.

The ascent of the *Pensée Unique* Society has been convincingly explained by the phenomenon underlying the “median voter theorem”. Political parties tend to propose platforms which are close to each other in order to capture voters’ ballots with opinions located at the centre. Discrepancies in citizens’ political preferences are then progressively wiped out, simply because parties’ political programs are not differentiated anymore. In this paper, we intend to show that this tendency is reinforced due to the role played by advertising on the opinions’ image that the press editors are led to display to their readers.

A particular feature of the press industry is that its profitability depends in a crucial way on financing an important fraction of its activities by advertising receipts. As with several other media, the burden of fixed costs is so

heavy in this industry that it would not be able to survive without the advertising manna. Accordingly, most newspapers are sold twice: First to the readers who buy the editorial content of the newspaper – political information, commentaries and entertainment –, and then to the industrial firms and professional advertisers who buy advertising space to promote their products or the products of their customers.¹

The first source of financing calls for some matching between the political “image” presented by the editor of a newspaper, and the political preferences of his readers. Otherwise they could be tempted to buy the newspaper supporting the opposite opinion since the latter becomes a closer substitute to the former. On the other hand, the second source of financing, relying on advertising receipts, requires a sufficiently sizable readership in order to make the newspaper attractive as a media support for the advertisers: The impact of the advertising message increases with the size of the audience. It turns out, however, that confirming the political preferences of the readers in order to stabilize his readership may well have a negative impact on the advertising receipts of the editor. Take, as an example, a newspaper politically targeted to the left. If the editor decides to present his leftist ideas in a too extreme manner, confirming thereby the political preferences of his extreme left readership, he may well lose his customers who are closer to the centre, to the benefit of his rightist competitor! The resulting reduction of his market share makes him less attractive to the advertisers: The advertising messages promoting their products have now a weaker impact. On the contrary, the rightist competitor, now enjoying a larger audience, becomes more appealing to the advertisers! This dependence of advertising receipts on the political image displayed by the editors may lead them to moderate the political message of their newspapers.² This tendency must be expected to be particularly significant when the readers do not give too much weight to the political content of the newspaper, or when advertising receipts are strongly correlated with the size of the readership.

The present paper develops the above ideas in the framework of a sequential game involving two editorial firms, their readers and the advertising

¹Newspapers’ dependence on advertising revenues varies across countries. For instance, in Europe, the percentage of newspapers’ receipts originating in advertising ranges between 40 % and 50 %: 40% in France, 45 % in Spain and 50 % in the “Nordic region”, see Albarran and Chan-Olmsted (1998) and Picard *et al.* (1988)). In United States, this percentage can even reach 80 %.

²Ray (1952) calls the “middle of the road policies” the resulting political images proposed by the editors.

agencies buying advertisements to be inserted in their newspapers. The players of the game are the editors. The set of political opinions — out of which they select their political image in the first-stage game — is represented by the unit-interval. It gives rise to a Downs-Hotelling - like location model, in which the prices of the newspapers are then chosen by the editors in the second-stage game, assuming that the readers incur costs which are quadratic in the difference between their “ideal” political option and the political options selected by the editors.³ The novelty here is that a third-stage game is introduced, through which the editors now decide non cooperatively about the advertising tariffs they will propose to the advertisers. The resulting advertising receipts are then taken into account in the previous price game, influencing accordingly the values of equilibrium prices. This, in turn, feeds back to the opinion selection process performed by the editors in the first-stage of the sequential game. Without the last-stage involving the editors and the advertisers, the above-game is nothing else than the classical Hotelling’s location model with quadratic transportation costs, for which it is known that, at the perfect equilibrium, firms locate at the extremities of the linear market (see d’Aspremont *et al.*, 1979). In our analogy, it would mean that the editors would select the most leftist and rightist opinions corresponding to the extremities of the opinions’ interval. We show that the introduction of advertising receipts via the third-stage advertising game completely upsets the above-prediction of the model in a wide range of situations: *far from selecting a display of the extreme opinions, the editors tend to present a similar centrist image to their readers*. These situations are precisely those in which the readers do not give much weight to their political preferences or when advertising receipts are sufficiently significant.

It is now easy to understand how the development of press advertising can contribute to the ascent of the *Pensée Unique*. Being progressively more exposed to rather bland political opinions, newspapers’ readers are led to adopt weak political preferences, reinforcing thereby the editors’ tendency to display weak political images in view of garnering higher advertising receipts. This self-feeding process spontaneously develops homogeneous political preferences through the population, which is the essence of the *Pensée Unique* context.

We present the model in Section 2. Section 3 is devoted to the equilibrium analysis of the sequential game. A short conclusion develops some implications of the preceding ideas.

³An analysis of competition among newspapers using the Hotelling’s location model has been already proposed by Schultz and Weimann (1989).

2 The model

We consider a model with two editorial firms, producing each a newspaper at a unit cost per copy, c , $c > 0$, and selling advertising insets to announcers in view of promoting their products. The newspapers are sold to the readers who select to patronize one of the two newspapers, to the exclusion of the other. These readers have varying political opinions ranging from the extreme left to the extreme right. To represent this diversity among readers' opinions, we suppose that the set of opinions is the unit interval $[0, 1]$, with 0 corresponding to the most extreme left opinion and 1 to the most extreme right one, intermediate opinions being ranked in the interior of the unit interval along the left-right spectrum. To each opinion there corresponds a specific reader for whom that opinion is the “ideal” one. The farther the newspaper's opinion from this ideal point, the higher the disutility of this specific reader. More precisely, we shall suppose that this disutility is measured by

$$tx_i^2 + p_i, \quad (1)$$

where x_i represents the “distance” between the opinion effectively selected by newspaper i , and the “ideal” opinion of the reader; p_i denotes the price of newspaper i , $i = 1, 2$. The parameter t thus measures the intensity of readers' political preferences, while the disutility of not obtaining their “ideal” opinion varies as the square of the distance between their ideal opinion and the opinion effectively selected by the newspaper. In the following, the parameters a and b will denote the distance between the extreme opinions 0 and 1, and the opinions chosen by editors 1 and 2, respectively: the editor of the left-opinion (resp. right-opinion) newspaper accordingly chooses the opinion represented by point a (resp. $1 - b$), as depicted in Figure 1.



Figure 1:

The ads insets are bought by advertising agencies from the editors of the newspapers at prices s_i , $i = 1, 2$. A particular advertiser is represented by

a parameter θ , $\theta \in [0, 1]$, which expresses the intensity of its preferences for buying an inset in a newspaper. We suppose that the intensity θ for buying an inset in newspaper i , $i = 1, 2$, is multiplied by the *audience* of newspaper i , namely, by the mass of readers buying this newspaper: the larger the audience, the higher the desirability of buying an ad in the corresponding newspaper, since the larger the number of potential consumers who will perceive the advertising message. It follows that the utility for buying an inset in newspaper i for an advertiser of type θ is measured by

$$n_i\theta - s_i, \quad i = 1, 2; \theta \in [0, 1], \quad (2)$$

with n_i representing the number (mass) of readers who buy newspaper i .⁴ In the following, we suppose that each advertising agency may select one among the three following possibilities: (i) to advertise in neither newspaper; (ii) to advertise in a single newspaper; (iii) to advertise in both. In the latter case, we suppose that its utility is measured by

$$n_1\theta - s_1 + n_2\theta - s_2. \quad (3)$$

Finally, we suppose that the density of advertisers' population of type θ is constant and equal to $4k$, $\theta \in [0, 1]$.

In the next section, we analyse the subgame perfect equilibrium of the following three-stage game played by the editors. In stage 1, each editor selects the opinion represented by his newspaper: point a for the editor of the left opinion-newspaper, and point $1 - b$ for the editor of the right one. In the second stage, they select the prices p_1 and p_2 of newspapers 1 and 2, respectively. Finally, in the third-stage, they choose the advertising tariffs s_1 and s_2 to be proposed to the advertising agencies.

⁴This representation of advertisers' population and of their preferences is reminiscent of the wellknown model of *vertical product differentiation*, in which firms sell products which are differentiated by their quality (see Gabszewicz and Thisse (1979)). As in this model, if we assume for instance that $n_2 \geq n_1$, an inset in newspaper 2 gives a higher utility than an inset in newspaper 1 to all advertisers. However, when this model is used in industrial economics, it is generally assumed that consumers make mutually exclusive purchases: they buy one variant of the product, at the exclusion of the other. Here we suppose that advertisers may buy insets in *both* newspapers.

3 Equilibrium analysis

3.1 The advertising game

As just stated at the end of the preceding section, the strategies for the editors in this third-stage game are the tariffs s_1 and s_2 . The opinions a and $1 - b$ have been already selected in stage 1, while prices $p_1(a, b)$ and $p_2(a, b)$ of the newspapers have been chosen in stage 2. To these prices correspond the audiences $n_1 = n_1(p_1(a, b), p_2(a, b))$ and $n_2 = n_2(p_1(a, b), p_2(a, b))$ of newspapers 1 and 2, respectively. Without loss of generality, let $n_2 \geq n_1$. Denote by $u(1, 2)$, $u(1)$, $u(2)$ and $u(0)$ the utility levels corresponding to the alternatives consisting in buying at tariffs s_1 and s_2 an inset in both newspapers, in newspaper 1 only, in newspaper 2 only, or buying in neither newspaper, respectively. Using (2) and (3), it is easily checked that

$$(i) \quad u(1) \geq u(0) \Leftrightarrow \theta \geq \frac{s_1}{n_1}; u(2) \geq u(0) \Leftrightarrow \theta \geq \frac{s_2}{n_2}; \quad (4)$$

$$(ii) \quad u(2) \geq u(1) \Leftrightarrow \theta \geq \frac{s_2 - s_1}{n_2 - n_1}; \quad (5)$$

$$(iii) \quad u(1, 2) \geq u(2) \Leftrightarrow \theta \geq \frac{s_1}{n_1}; \quad (6)$$

$$(iv) \quad u(1, 2) \geq u(1) \Leftrightarrow \theta \geq \frac{s_2}{n_2}. \quad (7)$$

Furthermore, we notice that

$$\frac{s_2 - s_1}{n_2 - n_1} \geq \frac{s_1}{n_1} \Leftrightarrow \frac{s_2}{n_2} \geq \frac{s_1}{n_1}. \quad (8)$$

Finally, assume that⁵

$$\frac{s_1}{n_1} \leq \frac{s_2 - s_1}{n_2 - n_1}. \quad (9)$$

It is easy to see that (9) implies

$$\frac{s_2}{n_2} \leq \frac{s_2 - s_1}{n_2 - n_1} \quad (10)$$

for, if the reverse of (10) is assumed, we would obtain

$$\frac{s_1}{n_1} > \frac{s_2}{n_2},$$

an inequality which contradicts (8).

Combining inequalities (8) and (10), we get

$$\frac{s_1}{n_1} \leq \frac{s_2}{n_2} \leq \frac{s_2 - s_1}{n_2 - n_1}.$$

These inequalities are depicted in Figure 2.

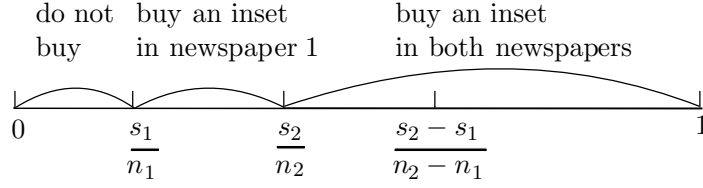


Figure 2:

The advertising agencies' types θ included in the interval $\left[\frac{s_2}{n_2}, 1\right]$ buy an inset in both newspapers since, according to (4) and (6), $u(1, 2) > u(2) > u(0)$ and $u(1, 2) > u(1)$; those in the interval $\left[\frac{s_1}{n_1}, \frac{s_2}{n_2}\right]$ buy an inset in newspaper 1 only since, for these types θ , $u(1) > u(0)$, $u(1, 2) < u(1)$ and $u(1) > u(2)$ (see (4), (7) and (5)). Consequently, demand to editor 1 is made of all the advertising agencies' types θ in the interval $\left[\frac{s_1}{n_1}, 1\right]$ and demand to editor 2 of the advertising agencies' types θ in the interval $\left[\frac{s_2}{n_2}, 1\right]$. Accordingly, the demand function D_i for advertising inset in newspaper i writes as

$$D_i(s_1, s_2) = 4k \cdot \left(1 - \frac{s_i}{n_i}\right); \text{ for } i = 1, 2$$

with corresponding receipts

$$R_i(s_1, s_2) = 4k \cdot \left(1 - \frac{s_i}{n_i}\right) \cdot s_i; \quad i = 1, 2. \quad (11)$$

We notice that the receipts of editor i do not depend on the tariff s_j selected by his rival j , and vice versa, so that the game between the editors on the advertising market is “degenerate”: each editor i behaves as a monopolist and selects independently the equilibrium tariff $s_i^* = \frac{n_i}{2}$, leading to the equilibrium receipts

$$R_i(s_1^*, s_2^*) = kn_i. \quad (12)$$

In the next section we examine the second-stage game through which the prices of the newspapers are determined, when the equilibrium advertising receipts we have just determined are taken into account in the evaluation of *total* receipts of the editors.

⁵This assumption holds if there exist consumers who buy an inset in newspaper 1 only, since then the set $\{\theta \mid u(1) \geq u(2) \text{ and } u(1) > u(0)\}$ is non empty.

3.2 The price game

In the second-stage game, the editors use as strategies the prices $p_1(a, b)$ and $p_2(a, b)$. As above, we suppose that the opinions a and $1 - b$ have been already selected in stage 1 and derive the profits functions of the editors when the advertising receipts determined in the third-stage game are integrated in these profits. Taking (1) into account, the demand functions $n_i(p_1, p_2)$ are easily derived, namely

$$\begin{aligned}
n_1(p_1, p_2) &= 0, \text{ if } a + \frac{p_2 - p_1}{2t(1-a-b)} + \frac{1-a-b}{2} < 0; \\
&= a + \frac{p_2 - p_1}{2t(1-a-b)} + \frac{1-a-b}{2} \text{ if } 0 \leq a + \frac{p_2 - p_1}{2t(1-a-b)} + \frac{1-a-b}{2} \leq 1; \\
&= 1 \text{ if } 1 \leq a + \frac{p_2 - p_1}{2t(1-a-b)} + \frac{1-a-b}{2}; \\
n_2(p_1, p_2) &= 0, \text{ if } b + \frac{p_1 - p_2}{2t(1-a-b)} + \frac{1-a-b}{2} < 0; \text{ and} \\
&= b + \frac{p_1 - p_2}{2t(1-a-b)} + \frac{1-a-b}{2}, \text{ if } 0 \leq b + \frac{p_1 - p_2}{2t(1-a-b)} + \frac{1-a-b}{2} \leq 1; \\
&= 1, \text{ if } 1 \leq b + \frac{p_1 - p_2}{2t(1-a-b)} + \frac{1-a-b}{2}.
\end{aligned}$$

The corresponding profits Π_i , $i = 1, 2$, are given by

$$\Pi_i(p_1, p_2) = (p_i - c)n_i(p_1, p_2) + kn_i(p_1, p_2),$$

or

$$\Pi_i(p_1, p_2) = (p_i + k - c)n_i(p_1, p_2)$$

when the equilibrium advertising receipts $kn_i(p_1, p_2)$ have been integrated. Consequently, the second-stage game we analyse is equivalent to a spatial competition model with quadratic transportation costs, when a constant unit subsidy equal to $k - c$, – the difference between the unit receipt originating from advertising sales and the unit production cost of each copy of the newspaper – is added to the price. The reaction functions corresponding to the price game are given by

$$p_1 = \max\left\{0, \frac{1}{2}(c - k + p_2 + t - 2tb + tb^2 - ta^2)\right\} \quad (13)$$

$$p_2 = \max\left\{0, \frac{1}{2}(c - k + p_1 + t - 2ta + ta^2 - tb^2)\right\}. \quad (14)$$

Several parametric regions have then to be considered. In the following R_i will denote the set of couples $(a, b) \in [0, 1]^2$ satisfying the inequalities which

define region i .

Region 1: $c - k + t(1 - a - b)(1 + \frac{a-b}{3}) \geq 0$ (A) and $c - k + t(1 - a - b)(1 + \frac{b-a}{3}) \geq 0$ (B). Adding up one obtains: $c - k + t(1 - a - b) \geq 0$. Then equilibrium prices are derived from the first-order necessary conditions $\frac{\partial \Pi_i}{\partial p_i} = 0$, $i = 1, 2$, or

$$p_1^* = c - k + t(1 - a - b)(1 + \frac{a-b}{3})$$

$$p_2^* = c - k + t(1 - a - b)(1 - \frac{a-b}{3}),$$

while profits Π_i^* at equilibrium obtain as

$$\Pi_1^*(a, b) = \frac{t}{18}(1 - a - b)(a - b - 3)^2, \quad (15)$$

and

$$\Pi_2^*(a, b) = \frac{t}{18}(1 - a - b)(b - a - 3)^2. \quad (16)$$

Π_1^* (resp. Π_2^*) is a strictly decreasing function of a (resp. b) for all $(a, b) \in R_1$.

Region 2: $c - k + t - 2ta + ta^2 - tb^2 < 0$ (C) and $c - k + t - 2tb + tb^2 - ta^2 < 0$ (D). Adding up one obtains $c - k + t(1 - a - b) < 0$. Regions 1 and 2 are hence mutually exclusive. Then equilibrium prices are given by $p_1^* = p_2^* = 0$ (see (13) and (14)) with profits

$$\Pi_1^*(a, b) = (k - c) \left(\frac{1 + a - b}{2} \right); \quad (17)$$

$$\Pi_2^*(a, b) = (k - c) \left(\frac{1 + b - a}{2} \right). \quad (18)$$

If $k > c$, Π_1^* (resp. Π_2^*) is a strictly increasing function of a (resp. b) for all $(a, b) \in R_2$.

Region 3: $c - k + t(1 - a - b)(1 + \frac{a-b}{3}) < 0$ (E) and $c - k + t - 2ta + ta^2 - tb^2 \geq 0$ (F). These two inequalities together imply $a < b$. Then equilibrium prices are given by

$$\begin{aligned} p_1^* &= 0 \\ p_2^* &= \frac{1}{2}(c - k + t - 2ta + ta^2 - tb^2) \end{aligned}$$

(see (14) with $p_1 = 0$), with corresponding profits

$$\Pi_1^*(a, b) = \frac{1}{4}(k - c) \left(\frac{-3t + 2ta + 4tb + ta^2 - tb^2 - c + k}{t(a + b - 1)} \right); \quad (19)$$

$$\Pi_2^*(a, b) = -\frac{1}{8} \frac{(t - 2ta + ta^2 - tb^2 - c + k)^2}{t(-1 + a + b)}. \quad (20)$$

We notice that, in region 3, we have necessarily $a < b$. It is shown in the Appendix that, in R_3 , $\frac{\partial \Pi_1^*}{\partial a} < 0$. Furthermore, it is also shown in the Appendix that, in region 3, Π_2^* is strictly increasing in b whenever $k < c + \frac{t}{3}$ and $a > \frac{1}{2t^2}(2t^2 - 2\sqrt{3t^3k - 3t^3c})$, or $k \geq c + \frac{t}{3}$. Otherwise there is a local maximum for $b = \frac{1}{6t}(-4ta + 4t - 2\sqrt{t^2a^2 - 2t^2a + t^2 - 3tk + 3tc})$.

Region 4: $c - k + t - 2tb + tb^2 - ta^2 \geq 0$ (G) and $c - k + t - \frac{4}{3}ta + \frac{1}{3}ta^2 - \frac{1}{3}tb^2 - \frac{2}{3}tb < 0$ (H). These inequalities together imply $a > b$. Hence, regions 3 and 4 are mutually exclusive. Then equilibrium prices are given by

$$\begin{aligned} p_1^* &= \frac{1}{2}(c - k + t - 2tb + tb^2 - ta^2) \\ p_2^* &= 0, \end{aligned}$$

(see (13) with $p_2 = 0$) with corresponding profits

$$\Pi_1^*(a, b) = -\frac{1}{8} \frac{(t - 2tb + tb^2 - ta^2 - c + k)^2}{t(-1 + a + b)}; \quad (21)$$

$$\Pi_2^*(a, b) = \frac{1}{4}(k - c) \frac{(-3t + 2tb + 4ta + tb^2 - ta^2 - c + k)}{t(a + b - 1)}. \quad (22)$$

By the same argument as the one used for region 3 (see Appendix), $\frac{\partial \Pi_2^*}{\partial b} < 0, \forall (a, b) \in R_4$. Similarly Π_1^* is a strictly increasing function of a whenever $k < c + \frac{t}{3}$ and $b > \frac{1}{2t^2}(2t^2 - 2\sqrt{3t^3k - 3t^3c})$, or $k \geq c + \frac{t}{3}$. Otherwise there is a local maximum for $a = \frac{1}{6t}(-4tb + 4t - 2\sqrt{t^2b^2 - 2t^2b + t^2 - 3tk + 3tc})$.

Finally, notice that equilibrium prices are continuous functions of a and b over the four regions and so are as well as equilibrium profits Π_1^* and Π_2^* .

Now, using the equilibrium prices we have just derived, we analyse the first-stage game, through which editors select the opinion they will display to their readers.

3.3 The opinion game

In the first-stage game, the editors select the opinion which identifies their newspaper, taking into account the effects of their choice on ensuing competition in price and advertising tariffs. Payoffs in this game, as functions of a and b , are defined by (15) and (16), in region 1, (17) and (18) in region 2, (19) and (20) in region 3, and (21) and (22) in region 4. Now we state the following:

Lemma 1 *The pair of strategies $(a^*, b^*) = (0, 0)$ is a Nash equilibrium of the opinion game if, and only if,*

$$k \leq c + \frac{t}{2}. \quad (23)$$

Proof. See Appendix.

Lemma 2 *The pair of strategies $(a^*, b^*) = (0.5, 0.5)$ is a Nash Equilibrium of the opinion game if and only if*

$$k \geq c + \frac{25t}{72}. \quad (24)$$

Proof. See Appendix.

Lemmas 1 and 2 can be summarized in the following:

Proposition 1 *When $k < c + \frac{25}{72}t$, the opinion game has as unique equilibrium $(a^*, b^*) = (0, 0)$.*

When $c + \frac{25}{72}t \leq k \leq c + \frac{t}{2}$, the opinion game has two equilibria $(0, 0)$ and $(0.5, 0.5)$.

When $c + \frac{t}{2} < k$, the opinion game has as unique equilibrium $(a^, b^*) = (0.5, 0.5)$.*

Proof. See Appendix.

Finally, notice that $\Pi_i^*(0, 0) = \frac{t}{2} \geq \Pi_i^*(\frac{1}{2}, \frac{1}{2}) = \frac{k-c}{2} \Leftrightarrow k \leq c + t$, which implies that $\Pi_i^*(0, 0) > \Pi_i^*(\frac{1}{2}, \frac{1}{2})$ in the domain of k -values where both $(0, 0)$ and $(\frac{1}{2}, \frac{1}{2})$ are Nash equilibria. Accordingly, the N-E $(0, 0)$ Pareto dominates the equilibrium $(\frac{1}{2}, \frac{1}{2})$ in this domain. Figure 3 represents the NE's in the (k, t) -plane.

As expected, the equilibrium $(0, 0)$ leading to a maximal opinion differentiation between the two newspapers, obtains when the unit receipt k from advertising is small, while the intensity of readers' political preferences t is high ($k < c + \frac{25}{72}t$). Conversely, minimal opinion differentiation must be expected in the reverse case (weak political preferences and high unit advertising receipts). It should be noticed that when the equilibrium in the opinion game is

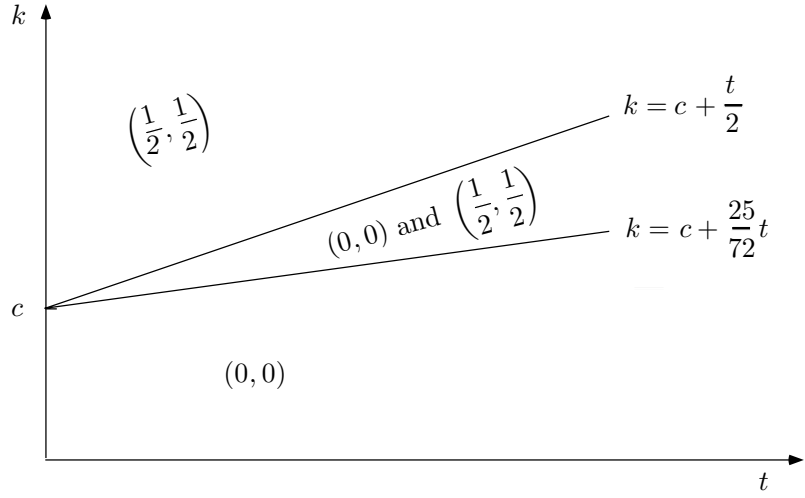


Figure 3:

$(\frac{1}{2}, \frac{1}{2})$, the resulting equilibrium newspapers' prices in the second stage game are zero. Even if zero newspapers' prices are not generally observed, one must recognize that the tendency for alternative medias to supply consumers with free services is nowadays frequent. For instance, consumers can read free of charge newspapers or abbreviated versions of them on Internet. Similarly, some telephone companies provide consumers with free of charge lines provided that they accept advertising interruptions during their connections! Such practices reveal that advertising receipts become so important that they justify to provide these services free of charge, simply in order to utilize them as advertising supports. It is a similar phenomenon which is reflected in the fact that newspapers are provided free of charge at equilibrium. Thus we conclude that the introduction of the last stage advertising game has considerable consequences on the equilibrium of the opinion game. Indeed, without the third-stage game, maximal opinion differentiation would arise for all values of k and t : the quadratic "transportation" costs imply, indeed, that at the perfect equilibrium, candidates would locate at the extremes of the opinions' interval. As shown in the above proposition, this tendency is fully reversed when political preferences are weak or when unit advertising receipts are sufficiently high.

4 Conclusion

Information press is one of the major vectors of media's ideological messages. In particular, daily newspapers and news are meant to reflect the citizens' political opinions. Conversely, these opinions are shaped through the editorial options of their editors. However, the ideological messages which newspapers convey to their readers interfere with the advertising messages promoting commercial products, which are simultaneously addressed to them. Editors are constrained to accept these interferences in order to guarantee a level of total receipts which is high enough to cover their fixed costs. Advertising induces editorial firms to compete for a maximal audience: Advertising receipts are all the more significant that the size of the readership is large. As shown in this paper, the price to be paid by the editors in order to sell a larger audience to the advertisers, may well force them to sell tasteless political messages to their readers. This in turn constitutes the ferment of the *Pensée Unique*, through which citizens' political opinions are uniformly leveled. It should be pointed out that, in our approach, advertisers do not influence directly the editorial content, as it would be the case when an editor is constrained to conform his editorial views with those edicted by some major advertiser "sponsoring" the newspaper. Their influence here is only indirect: It operates through the competition among the editors, who wish to increase the audience each of them is willing to sell to advertisers.

To summarize, the main difference between the selection of policies by candidates competing in an election and the selection of a political image by newspapers' editors lies in the fact that the latter must also choose the price of the newspaper and eventually the tariff to be opposed to the advertisers. In other words, the game which has political candidates as players is a one-shot game with strategies consisting only in choosing a specific political platform. The equilibrium of this game is known to be at the center (the median voter theorem). The game played by newspapers' editors is by essence a *sequential* game. If this game is as in Hotelling (1929), in which firms choose sequentially their location and then their price, the perfect equilibrium of the game depends on the selected transportation cost function. In the case of linear transportation costs, there is a large domain of locations, in which no perfect equilibrium exists. If costs are quadratic, then a perfect equilibrium *always* exists, but firms (or editors) locate at the extremes of the locations' (opinions') set (see d'Aspremont et al. (1979)). When a third-stage game is played between the editors to determine the advertising tariffs, the perfect equilibrium comes back to the center when political preferences are weak or when unit

advertising receipts are high.

The story considered in this paper is reminiscent of candidates' behaviour when they have to settle their political platform before competing in an election. In order to influence voters who are uninformed about their policy, they need the money manna provided by their interest groups, the amount of which increases as the selected political position gets closer to their partisan interests. But, at the same time, informed voters whose vote is based on the selected political position itself, could be thereby diverted, and would prefer to cast their votes on the rival candidate if the latter would behave in a less partisan manner. Finally, the platform which is effectively proposed, is the result of the trade-off between choosing a platform which attracts funds and a policy which attracts the informed voters (see Baron, 1994).

It should also be noticed that the softening of political opinions is not the only device used by editorial firms in view of increasing their readership's market share so as to please to their advertisers. Diversification of their editorial content, introduction of cultural supplements, presentation of TV-programs, etc. are alternative methods attracting readers who are less concerned by the specific political ideas of the newspaper than by its "objective" informational content. This also contributes to enhance a kind of political neutrality among newspapers since the pages devoted to these alternative contents are inevitably substituted to those previously dedicated to political analysis.

Finally, government's subsidies to firms editing newspapers can also be evaluated at the light of the above analysis. The existence of such subsidies is generally motivated by the willingness of maintaining a sufficient diversity among citizens opinions (the contrary of the *Pensée Unique!*). When advertising receipts of a newspaper are too weak – either because its readership is too narrow to be attractive for advertisers, or because the editor simply refuses to be "corrupted" by advertising (like the French newspaper "Canard Enchaîné"), – the financial basis of some titles can be insufficient to cover their fixed costs. Then these titles cannot survive, entailing thereby the disappearance of the opinions they represent. In order to prevent this reduction in opinions' diversity, the government may be inclined to subsidize these titles. If the size of the subsidy would be proportional to the sales of the newspaper, it would play exactly the same role as unit advertising receipts in the above analysis. As a consequence, the subsidy creates an incentive for the editors of these newspapers to modify their political image in order to increase their sales and, thereby, the size of the subsidy ! Accordingly, far from reaching the ob-

jective of maintaining opinions' diversity, subsidies proportional to sales would on the contrary reinforce the leveling of opinions through the population! On the contrary, a lump sum subsidy covering the fixed costs of the newspaper allows its editor to continue his activities, and realizes accordingly the objective of keeping the spectrum of political opinions sufficiently diversified.

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Appendix

Properties of $\Pi_1^*(a, b)$ and $\Pi_2^*(a, b)$ in regions 3 and 4

For any $(a, b) \in R_3$, we obtain

$$\frac{\partial \Pi_1^*}{\partial a} = \frac{1}{4}(k - c) \frac{-2tb + t + ta^2 + 2tab - 2ta + tb^2 + c - k}{t(a + b - 1)^2};$$

$$\frac{\partial^2 \Pi_1^*}{\partial a^2} = \frac{(k - c)^2}{2t(a + b - 1)^3} < 0;$$

$$\frac{\partial \Pi_2^*}{\partial b} = \frac{(k - c + t - 2ta + ta^2 - tb^2)(k - c + t - 2ta + ta^2 + 4tab + 3tb^2 - 4tb)}{8t(a + b - 1)^2}.$$

- (a) Let us show that $\frac{\partial \Pi_1^*}{\partial a} < 0$, $\forall (a, b) \in R_3$. Note first that, from the strict concavity of $\Pi_1^*(a, b)$ with respect to a , $\frac{\partial \Pi_1^*}{\partial a} < 0 \Leftrightarrow a > 1 - b - \frac{\sqrt{k-c}}{\sqrt{t}}$. Now condition (E) and $(1 - a - b) \leq 1 + \frac{a-b}{3} \Rightarrow c - k + t(1 - a - b)^2 \leq c - k + t(1 - a - b)(1 + \frac{a-b}{3}) < 0 \Rightarrow 1 - a - b < \frac{\sqrt{k-c}}{\sqrt{t}}$.⁶ ■
- (b) Let us now analyze the properties of Π_2^* as a function of b in R_3 ; condition (F) $\Rightarrow t - 2ta + ta^2 - tb^2 \geq k - c \Rightarrow (k - c + t - 2ta + ta^2 - tb^2) \geq 2(k - c) > 0 \Rightarrow \text{sign}\left(\frac{\partial \Pi_2^*}{\partial b}\right) = \text{sign}(k - c + t - 2ta + ta^2 + 4tab + 3tb^2 - 4tb)$. Straightforwardly $k - c + t - 2ta + ta^2 + 4tab + 3tb^2 - 4tb$ has at most two roots in b which are given by

$$\begin{aligned} b_1 &= \frac{1}{6t} \left(-4ta + 4t + 2\sqrt{(t^2a^2 - 2t^2a + t^2 - 3tk + 3tc)} \right) \\ b_2 &= \frac{1}{6t} \left(-4ta + 4t - 2\sqrt{(t^2a^2 - 2t^2a + t^2 - 3tk + 3tc)} \right). \end{aligned}$$

The root b_1 corresponds to a local minimum since

$$\begin{aligned} \frac{\partial^2 \Pi_2^*}{\partial b^2} \Big|_{(a, b_1)} &= \\ &= \frac{(k - c + t - 2ta + ta^2 - tb_1^2)2\sqrt{(t^2a^2 - 2t^2a + t^2 - 3tk + 3tc)}}{8t(a + b_1 - 1)^2} > 0. \end{aligned}$$

⁶Note that k must not be lower than c if $R_3 \neq \emptyset$.

The root b_2 corresponds to a local maximum since

$$\frac{\partial^2 \Pi_2^*}{\partial b^2} \Big|_{(a, b_2)} = - \frac{(k - c + t - 2ta + ta^2 - tb_2^2) 2\sqrt{(t^2 a^2 - 2t^2 a + t^2 - 3tk + 3tc)}}{8t(a + b_2 - 1)^2} < 0.$$

On the other hand Π_2^* is strictly increasing in b whenever either $(t^2 a^2 - 2t^2 a + t^2 - 3tk + 3tc) < 0 \Leftrightarrow k < c + \frac{t}{3}$ and $a > \frac{1}{2t^2} \left(2t^2 - 2\sqrt{(3t^3 k - 3t^3 c)} \right)$, or $k \geq c + \frac{t}{3}$. ■

Proof of Lemma 1

First notice that the condition $k \leq c + \frac{t}{2}$ implies that both prices are positive at $(a^*, b^*) = (0, 0)$. Now suppose that one of the editors, say editor 2, wants to deviate unilaterally from $(0, 0)$ to some $(0, b)$ where $b > 0$. Only deviations leading in regions 2 and 3 need to be considered. No deviation to region 4 is possible since in this region $a > b$, what is clearly impossible since $a = 0$. On the other hand any deviation to an opinion b in region 1 leads to lower profits since $\frac{\partial \Pi_2^*}{\partial b} < 0$ in this region. If the editor contemplates a deviation in region 2 (where $\frac{\partial \Pi_2^*}{\partial b} = \frac{k-c}{2} > 0$) his best deviation is $b = 1$, yielding profits equal to $k - c$. Hence $(0, 0)$ is a NE of the opinion game only if $k - c \leq \Pi_2^*(0, 0) = \frac{t}{2}$. It remains to show that this condition is also sufficient.

This amounts to show that a deviation in region 3 never leads to profits larger than $k - c$, i.e. that a deviation to $(0, 1)$ is always the best (unprofitable) deviation. Since $a = 0$, deviating in region 3 implies choosing values of b satisfying conditions (E) and (F), i.e. such that $b \in (2 - \frac{\sqrt{t^2 + 3t(k-c)}}{t}, \frac{\sqrt{c-k+t}}{\sqrt{t}}]$.⁷ When $\Pi_2^*(0, b)$ is monotone and/or convex in b over region 3 the best deviation for editor 2 straightforwardly remains toward $b = 1$. The only case which has now to be considered is when $\Pi_2^*(0, b)$ has a local maximum in region 3. As shown above, this can occur only for $b_2 = \frac{2}{3} - \frac{1}{3t} \sqrt{(t^2 + 3tc - 3tk)}$ where $\Pi_2^*(0, b_2) = \frac{2}{27} \frac{(3k - 3c + t + \sqrt{(t^2 - 3tk + 3tc)})^2}{t + \sqrt{(t^2 - 3tk + 3tc)}}$. One can check that $\Pi_2^*(0, b_2) > k - c \Leftrightarrow k < c + \frac{t}{4}$. But, from condition (E), $(0, b) \in R_3 \Rightarrow k > \frac{8}{25}t + c > c + \frac{t}{4}$:

⁷Since $k < c + t$ such an interval is non void . Note that region 1, where Π_2^* is strictly decreasing in b , obtains for $b \in [0, 2 - \frac{\sqrt{t^2 + 3t(k-c)}}{t}]$ and region 2, where Π_2^* is strictly increasing in b , for $b \in [\frac{\sqrt{c-k+t}}{\sqrt{t}}, 1]$.

the best deviation in region 3 is accordingly always dominated by a deviation toward $b = 1$. Consequently, the condition $k \leq c + \frac{t}{2}$ is not only necessary but also sufficient. ■

Proof of Lemma 2

Let us consider editor 1 whose profits are given by $\Pi_1^*(0.5, 0.5) = \frac{k-c}{2}$. A deviation to a value of a leading in region 4 is to be discarded since in this region $b < a$. A deviation leading in region 2 is not profitable since in this region $a = .5$ is the best reply against $b^* = .5$. The best deviation in regions 1 or 3 leads to $a = 0$ since in these regions $\frac{\partial \Pi_1^*}{\partial a} < 0$. From the conditions defining the different regions, $(0, 0.5) \in R_1$ when $k \leq c + \frac{5t}{12}$, and $(0, 0.5) \in R_3$ iff $k \in (c + \frac{5t}{12}, c + \frac{3t}{4}]$. It follows that $\Pi_1^*(0, 0.5) = \frac{25t}{144}$ iff $k \leq c + \frac{5t}{12}$ and $\Pi_1^*(0, 0.5) = \frac{1}{2t}(k - c)(c - k + 1.25t)$ iff $k \in (c + \frac{5t}{12}, c + \frac{3t}{4}]$. Whenever $(0, 0.5) \in R_3$ there is no profitable deviation from $(0.5, 0.5)$ since $\Pi_1^*(0, 0.5) \leq \Pi_1^*(0.5, 0.5) \Leftrightarrow k \geq c + \frac{t}{4}$, a condition which holds always true in region 3. Whenever $(0, 0.5) \in R_1$, $\Pi_1^*(0, 0.5) \leq \Pi_1^*(0.5, 0.5) \Leftrightarrow k \geq c + \frac{25t}{72}$. ■

Proof of Proposition 1

It only remains to show that $(0, 0)$ and $(0.5, 0.5)$ are the only possible Nash Equilibria of the opinion game. Notice first that $(0, 0)$ and $(0.5, 0.5)$ are the only possible N.E. respectively in regions 1 and 2. Hence any other N.E. (a^*, b^*) should belong to R_3 or R_4 . Let us assume without loss of generality that $(a^*, b^*) \in R_3$. Since, as shown above, $\frac{\partial \Pi_1^*}{\partial a} < 0, \forall (a, b) \in R_3$, we must conclude that $a^* = 0$ and hence $b^* \in (2 - \frac{\sqrt{t^2 + 3t(k-c)}}{t}, \frac{\sqrt{c-k+t}}{\sqrt{t}}]$ where $\frac{\sqrt{c-k+t}}{\sqrt{t}} < 1^8$. Since Π_2^* is strictly decreasing in b for all $b \leq 2 - \frac{\sqrt{t^2 + 3t(k-c)}}{t}$ (i.e. in region 1) and strictly increasing in b for all $b > \frac{\sqrt{c-k+t}}{\sqrt{t}}$ (i.e. in region 2), b^* must correspond to a local maximum of Π_2^* with respect to b over $(2 - \frac{\sqrt{t^2 + 3t(k-c)}}{t}, \frac{\sqrt{c-k+t}}{\sqrt{t}}]$, that is $b^* = \frac{2}{3} - \frac{1}{3t}\sqrt{(t^2 + 3tc - 3tk)}$. However we have already shown (see Proof of Lemma 1) that $\Pi_2^*(0, \frac{2}{3} - \frac{1}{3t}\sqrt{(t^2 + 3tc - 3tk)}) < \Pi_2^*(0, 0)$ and hence that a strategy b such that $(0, b) \in R_3$ is never a best reply to $a = 0$. ■

⁸In the reverse case (i.e. $c \geq k$) the only equilibrium is obviously in region 1.