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You get what you want: A note on the economics of bad news

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ABSTRACT

We develop a simple theoretical model that explains the slant towards negative coverage in news media. In a framework where news is informative and consumers are risk averse, diminishing marginal utility implies that information about a negative income shock is more valuable than information about a positive shock, which leads to disproportionate reporting of bad news.

1. Introduction

A substantial empirical literature documents a slant towards negative coverage in news media.[1] We develop a simple theoretical model to explain this. In a framework where news is informative and consumers are risk averse, diminishing marginal utility will lead consumers to benefit more from bad news than good news. With commercial media companies responding to differences in consumer valuation of information about a negative income shock versus information about a positive shock, this leads to disproportionate reporting of bad news.

Our research contributes to the literature by suggesting a new channel through which demand drives media slant. Most studies focus on the supply side of the information market and its effects.[2] Few studies have considered demand-induced bias. Mullainathan and Shleifer (2005) argue that readers or viewers have a preference for news that is consistent with their initial beliefs, and that media organizations have therefore an incentive to bias their reporting towards confirming their readers' or viewers' initial beliefs.

In this article, we show that consumer preferences induce a media slant towards reporting negative stories, i.e. 'bad news'. In the next section, we develop a theoretical model and derive the key proposition. Afterwards we discuss extensions and robustness of the theory. The last section concludes.

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[1] For example, studies conclude that mass media gives greater coverage to bad news than good news in crime coverage (O'Connell, 1999), risks related to health and new technologies (Koren and Klein, 1991; Kalaitzandonakes et al., 2004), and employment (Heinz and Swinnen, 2013).

[2] These include papers focusing on the media's incentive to deliver news to different groups (Strömberg, 2001), ideological bias (Groseclose and Milvo, 2005), commercial objectives (Baron, 2006) and information distortions by sources or journalists under pressure from competition (Dyck and Zingales, 2002).

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2. The model

2.1. Demand side

Consider that there are two types of articles in a newspaper, positive stories or ‘good news’ and negative stories or ‘bad news’. Consumers may want to read such stories for a variety of reasons. We assume that consumers read good news stories because they provide them with information on how to make choices to increase their welfare. When they read bad news stories, they can use the information to avoid bad choices and the resulting welfare losses.

Consider two events that have exogenous impact z on utility. The two events differ in the direction of their impacts: one positive (z_g) and one negative (z_b). If the media report on these events, we assume that a negative event is reported in a ‘negative story’ (‘bad news’), which provides the reader with information to avoid a possible negative event in the future, and that a ‘positive story’ (‘good news’) describes a positive event, providing the reader with information to benefit from a possible positive event. For the purpose of comparison, we assume that the effect on income is symmetric and that consumers have initial income Y.

After reading the negative story, a consumer can avoid the negative event or at least the impact on his income, which he otherwise would have incurred. Similarly, after reading about the positive event the consumer is able to reap the benefits of the positive event of which he knows the impact on his income. The expected individual utility gain (by preventing a loss in income) of reading about the negative event is thus $u_k(Y) - u_k(Y - z_b)$. Similarly, the expected utility gain reading a positive story (from taking action to gain income) is then $u_k(Y + z_g) - u_k(Y)$. We assume that utility is increasing and strictly concave in income $(u_k'(\cdot) > 0, u_k''(\cdot) < 0)$.

The space (news articles or stories) allocated by newspapers i to the negative and positive events is respectively q_b^i and q_g^i, with $i \in \{A, B\}$. The probability $\rho(q)$ that a consumer will be aware of a certain event increases in the space allocated to this type of event in the newspaper that he chooses to read but at a decreasing rate, $\rho'(\cdot) > 0$ and $\rho''(\cdot) < 0$. When a consumer reads only one newspaper, the probability that a consumer reads about the negative and positive event is respectively, $\rho(q_b^i)$ and $\rho(q_g^i)$. Expected utility, net of price and processing costs, from reading newspaper i for consumer k, $w_k\left(q_g^i, q_b^i\right)$, therefore equals:

$$w_k\left(q_g^i, q_b^i\right) = \rho\left(q_g^i\right)[u_k(Y + z_g) - u_k(Y)] + \rho\left(q_b^i\right)[u_k(Y) - u_k(Y - z_b)]. \tag{1}$$

A consumer’s valuation of a newspaper and its news content also depends on other characteristics of the newspaper (e.g. the editorial stance).[3] Consumer k’s valuation of these aspects is captured by respectively parameters a_k and b_k for newspaper A and B. Hence newspapers A and B give respectively utility $w_k\left(q_g^A, q_b^A\right) + a_k$ and $w_k\left(q_g^B, q_b^B\right) + b_k$ to consumer k. Consumer k buys newspaper A if [4]

$$\Delta w_k = w_k\left(q_g^A, q_b^A\right) - w_k\left(q_g^B, q_b^B\right) \geqslant b_k - a_k; \tag{2}$$

and the consumer buys newspaper B otherwise. The newspapers assign a probability distribution $\Gamma(\cdot)$ with density $\gamma(\cdot)$ to the difference $b_k - a_k$. The probability that consumer k will read newspaper A is therefore $\Gamma(\Delta w_k)$.

2.2. Supply side

Newspaper i’s expected cost function, C^i, is: [5]

$$C^i\left(q_g^i, q_b^i\right) = c_q\left(q_g^i + q_b^i\right) + n^i c_s \tag{3}$$

where c_q is the cost of producing one unit of news space,[6] and c_s the average cost of reproducing and delivering a newspaper to its expected number of consumers, n^i. The expected number of readers of newspapers A and B are respectively $n^A = n\Gamma(\Delta w_k)$ and $n^B = n[1 - \Gamma(\Delta w_k)]$, with n the total number of consumers. Newspaper i maximizes expected profits

$$E(\Pi^i) = n^i(p - c_s) - c_q\left(q_g^i + q_b^i\right) \tag{4}$$

with respect to q_g^i and q_b^i. Similar to Strömberg (2004), p is the marginal revenue gain from selling an additional newspaper to a person, including the price of the newspaper and the price per reader paid by advertisers.

2.3. Equilibrium

The profit maximization by newspaper i results in the following two first order conditions:

$$\frac{\partial E(\Pi^i)}{\partial q_g^i} = n(p - c_s)\gamma(\Delta w_k)\frac{\partial w_k\left(q_g^i, q_b^i\right)}{\partial q_g^i} - c_q = 0, \tag{5}$$

$$\frac{\partial E(\Pi^i)}{\partial q_b^i} = n(p - c_s)\gamma(\Delta w_k)\frac{\partial w_k\left(q_g^i, q_b^i\right)}{\partial q_b^i} - c_q = 0. \tag{6}$$

These two conditions imply that at the optimum for newspaper i it must be that

$$\frac{\partial w_k\left(q_g^i, q_b^i\right)}{\partial q_g^i} = \frac{\partial w_k\left(q_g^i, q_b^i\right)}{\partial q_b^i} \quad \text{at } \left(q_g^{i*}, q_b^{i*}\right). \tag{7}$$

[3] See Strömberg (2004). Note also that our model does not explicitly consider print advertising, which could be positive (i.e. informative) or negative (i.e. annoying) for readers. The literature on the consumer response to print advertising is mixed (Kaiser and Wright, 2006).

[4] We assume that every consumer buys exactly one newspaper. This assumption of “single-homing” does not affect our main result.

[5] This specification follows Strömberg (2004). We assume that both newspapers have the same cost functions. Different cost functions may influence the levels of space devoted to good and bad news, but in the same direction for both types of news so that our main result still holds.

[6] If costs were to differ between gathering positive and negative news, this would affect conditions (5) and (6) differently, so that condition (7) would not necessarily hold with equality. In which direction condition (7) would change depends on all of the model’s parameters. However, we cannot make a compelling argument for assuming such a cost difference.

Using the expression for $w_k\left(q_g^i, q_b^i\right)$ we rewrite this to

$$\frac{\partial \rho}{\partial q_g^i}[u_k(Y+z_g) - u_k(Y)] = \frac{\partial \rho}{\partial q_b^i}[u_k(Y) - u_k(Y-z_b)]. \quad (8)$$

Given our assumptions that $\rho'(\cdot) > 0$ and that $u_k'(\cdot) > 0$, all terms on the left and right hand side of expression (8) are strictly positive.

Proposition 1. Newspapers will report more negative news than positive news $q_b^{i*} > q_g^{i*}$.

Proof. Expression (8) implies that when the utility function $u_k(\cdot)$ is strictly concave in income $\left(u_k''(\cdot) < 0\right)$, it holds that $u_k(Y+z) - u_k(Y) < u_k(Y) - u_k(Y-z)$. Under this condition, for expression (8) to hold it must be that $\frac{\partial \rho}{\partial q_g^i} > \frac{\partial \rho}{\partial q_b^i}$. This implies that $q_b^{i*} > q_g^{i*}$ because we have $\rho''(\cdot) < 0$. □

The intuition behind Proposition 1 is straightforward. With negative news having a larger utility effect than positive news with concave utility functions, consumer demand for negative news is larger than for positive news, ceteris paribus. Profit maximizing media companies respond to this difference in demand by supplying more bad news than good news. The result is driven solely by (potential) differences in income effects.

The result can be reinforced or mitigated when good and bad news have additional effects beyond the direct income effects as we have modeled them, when other factors influence news consumption, when there may be heterogeneity among consumers and in the effects that the news may cause, when there is framing by newspapers, and when the structure and objectives of the industry are different. In the next section we discuss several of these variations in the model and assumptions to see how they affect our main proposition.

3. Extensions and robustness

3.1. Additional media consumption effects

Consider the case that coverage (reading) of the two events (good news and bad news) implies other consumer effects (than income effects).[7] One additional effect could be entertainment or enjoyment the reader gets from reading the article. If the "entertainment effect" is equal across types of news, it does not affect Proposition 1. However if people get more entertainment out of reading good news or bad news it would mitigate or reinforce the conclusion from Proposition 1.

Another element could be a "happiness effect" from reading bad news and good news, respectively. People tend to be happier if they feel relatively better off, i.e. if other people's income falls; and vice versa.[8] If people derive happiness from others' misfortune (and feel worse when reading that others have moved on) this effect would reinforce Proposition 1 since it reinforces the differential utility effect and adds to a stronger demand for bad news.

3.2. Heterogeneity in shocks and consumers

Our results are robust to alternative assumptions on consumer heterogeneity such as, for example, in Besley and Burgess (2002) where only some proportion of consumers β is affected by the events, or that the size of the income shocks is heterogeneous among consumers (i.e. z_k instead of z). In the Appendix we formally show this.

Obviously, the result from Proposition 1 depends to some extent on the relative sizes of positive and negative income shocks. If they are not of equal size, it may affect the outcome. Suppose that $z = m$ for positive shocks, and $z = \ell$ for negative ones. Under these assumptions, the above proposition holds as long as $2u_k(Y) > u_k(Y+m) + u_k(Y-\ell)$. This condition shows that, whether relatively more bad news is published or not, depends on both the degree of concavity of $u_k(\cdot)$ *and* the relative sizes of m and ℓ. In other words, only if m is sufficiently larger than ℓ to overcome the concavity of $u_k(\cdot)$ will Proposition 1 no longer hold.

3.3. Asymmetry in responses to good and bad news

The model assumes asymmetry in actions in response to good and bad news. Unless action is undertaken – negative events impact on income while positive events do not. The assumption is not essential for Proposition 1. It guarantees that good news is of value to consumers. Under symmetry, if we were to assume, for example, that uninformed consumers' income also increases when a positive event occurs, consumers would have no incentive to read good news to be able to benefit from this event. This would remove any added value of positive news, and thus immediately result in 'more bad than good news'.

3.4. Framing

Our model does not analyze the potential strategy of newspapers to frame an event as either positive or negative, irrespective of the actual nature of the event. The newspapers' strategic decision in our model is to decide on the amount of positive and negative stories, not on how to frame an event. How would this affect our result? Consider a situation where only 'neutral' events happen. Such events can be portrayed by news media as either positive or negative (the glass is half full or half empty). As long as consumers expect a potential gain when reading a positive story or a potential loss when reading a negative story, newspapers have an incentive to frame the content of their news reports negatively, i.e. to report more negative news stories. Although this slightly alters the interpretation of the model, the main result that newspapers focus on bad news because of consumers' expectations and loss aversion continues to hold.

[7] Both effects could be easily integrated in the formal model by considering z_g^Y, z_b^Y as vectors representing multiple effects.

[8] This is sometimes referred to as the Easterlin (1974) Paradox. There is substantive evidence for this in the so-called happiness economics literature (e.g. Layard, 2005).

3.5. Industry structure and social objectives

Proposition 1 also holds with a monopolist newspaper when not all consumers buy a newspaper.[9] Proposition 1 remains valid when maximizing social welfare, which is defined as the sum of consumer utility minus the costs of news provision. Independently of the market structure (i.e. duopoly or monopoly), newspapers publish relatively more bad than good news in the social optimum. In the model, newspapers' profits are linear and strictly increasing in their readership. Hence, for any newspaper, it is optimal (whether monopolist or duopolist) to maximize readership which can only take place through maximizing consumer utility. Therefore, both in the monopoly and duopoly case, newspapers maximize consumer utility, which is also the objective of social welfare maximization.

4. Conclusions

This article develops a theoretical model to show that negative news coverage ("bad news") is likely to dominate positive news stories because of demand side effects, i.e. consumer preferences. With concave utility functions, negative news can affect consumer utility stronger than positive news, and this leads to a larger demand for negative news. Commercial companies who maximize profits will respond to this demand by providing relatively more bad news.

The dominance of negative news coverage can have important implications as it may distort public opinion and so indirectly cause personal problems and public distortions.[10] This effect may be reinforced if negative information has a greater impact on individuals' attitudes than positive information or play a greater role in voters' opinion formation and voting behavior.[11] Not surprisingly, incumbent politicians and parties often complain that voters and the public's view on the economy is too pessimistic. Moreover, negative perceptions may result in psychological problems such as depressions. In this perspective, the result of this paper is somewhat paradoxical in that it is media consumer preferences themselves which may be the prime cause of the bias in mass media reporting towards negative coverage.

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[9] If one assumes that every consumer buys a newspaper, the monopolist would have no incentive to attract a larger readership and the model would produce no meaningful results.

[10] See e.g. Smith (1984), McCluskey and Swinnen (2011) and Vigani and Olper (2013).

[11] See e.g. Aragones (1997), Easaw (2010) and Soroka (2006).

Appendix A

Proposition 1 is robust to different assumptions on consumer heterogeneity. First, as Besley and Burgess (2002), consider that there is a fraction $1-\beta$ of consumers who are unaffected by the income shocks. These consumers then only value newspapers because of their exogenous preference parameters a_k and b_k. Their newspaper selection is not influenced by the amounts of good and bad news. Hence this group's newspaper selection is exogenous to the profit maximization of the newspapers. Assuming that the fractions β and $1-\beta$ are orthogonal to the probability distribution $\Gamma(\cdot)$, the first-order conditions of the newspapers' profit maximization problem are:

$$\frac{\partial E(\Pi^i)}{\partial q_g^i} = \beta n(p-c_s)\gamma(\Delta w_k)\frac{\partial w_k\left(q_g^i, q_b^i\right)}{\partial q_g^i} - c_q = 0, \quad \text{(A.9)}$$

$$\frac{\partial E(\Pi^i)}{\partial q_b^i} = \beta n(p-c_s)\gamma(\Delta w_k)\frac{\partial w_k\left(q_g^i, q_b^i\right)}{\partial q_b^i} - c_q = 0. \quad \text{(A.10)}$$

Comparing conditions (A.9) and (A.10) to respectively conditions (5) and (6) shows that the only difference is the factor βn instead of n. This difference has however no impact on conditions (7) and (8). Hence this distinction between affected and unaffected consumers does not impact Proposition 1.

Second, we assume that the size of the shock to consumers' income is heterogeneous across consumers, i.e. z_k instead of z. As before, a consumer buys newspaper A (and otherwise newspaper B) if:

$$\left[\rho(q_+^A) - \rho\left(q_g^B\right)\right][u_k(Y+z_k) - u_k(Y)] + \left[\rho(q_b^A) - \rho(q_b^B)\right][u_k(Y) - u_k(Y-z_k)] \geqslant b_k - a_k. \quad \text{(A.11)}$$

The probability distribution of $b_k - a_k$ is $\Gamma(\cdot)$ with density $\gamma(\cdot)$ and the probability distribution of z_k is $F(\cdot)$ with density $f(\cdot)$, for $z_k \in [0, I]$. The total number of consumers reading newspaper A is then

$$n\int_0^I \Gamma\left(\left[\rho\left(q_g^A\right) - \rho\left(q_g^B\right)\right][u_k(Y+z_k) - u_k(Y)] + \left[\rho(q_b^A) - \rho(q_b^B)\right][u_k(Y) - u_k(Y-z_k)]\right) f(z_k)\mathrm{d}z_k. \quad \text{(A.12)}$$

Using expression (A.12), the first-order conditions of the newspapers' profit maximization problem are:

$$\frac{\partial E(\Pi^i)}{\partial q_g^i} = n(p-c_s)\frac{\partial\rho}{\partial q_g^i}\int_0^I \gamma(\cdot)[u_k(Y+z_k) - u_k(Y)] \times f(z_k)dz_k - c_q = 0, \quad \text{(A.13)}$$

$$\frac{\partial E(\Pi^i)}{\partial q_b^i} = n(p-c_s)\frac{\partial\rho}{\partial q_b^i}\int_0^I \gamma(\cdot)[u_k(Y) - u_k(Y-z_k)] \times f(z_k)dz_k - c_q = 0. \quad \text{(A.14)}$$

Since $[u_k(Y+z_k) - u_k(Y)] < [u_k(Y) - u_k(Y-z_k)]$ (owing to the concavity of u_k), conditions (A.13) and (A.14) together imply that $\frac{\partial\rho}{\partial q_g^i} > \frac{\partial\rho}{\partial q_b^i}$. In addition, since $\rho(\cdot)$ is a concave function, it follows that $q_b^{i*} > q_g^{i*}$.

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