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Rational Ignorance and Negative News in the Information Market

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Abstract

While the availability of information has increased rapidly, the public is still considered poorly informed. This paper contributes to the emerging field of media economics by studying how the demand side of the media market affects news production and consumption. We show that consumers are likely to remain imperfectly informed on most issues and that negative news coverage is likely to dominate positive news stories because of demand side effects.

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Introduction

Although households are flooded with information through hundreds of television channels, internet blogs and other websites, newspapers, and both local and satellite radio, many experts argue that the public is poorly informed on many important issues. For example, when anti-globalist activists demonstrate against the WTO and free trade or when European consumers oppose the introduction of genetically modified organisms (GMOs) in their food – despite scientists and official institutions claiming free trade is good and products are safe – these reactions are blamed on the lack of consumer knowledge.

While there is an extensive literature on imperfect information, it does not focus on the provision of information. This is of key importance because most information is provided by organizations that have an incentive to supply certain types of information. Private sources have profit-maximizing objectives and public sources may have bureaucratic or political incentives. The implications are far reaching and affect all aspects of life. For example, in politics, the most important target of political control is no longer the police or the military; but the media, as witnessed by recent events in Italy and Russia.

A rapidly growing literature has studied the impact of media structures and ownership on information distribution and economic welfare (e.g. Besley and Burgess, 2001; Besley and Pratt, 2002; Djankov et al., 2001). Most of these studies focus on the supply side of the information market and its effects, such as the media's incentive to deliver news to different groups (Strömberg, 2001) or ideological bias (Grosseclose and Milvo, 2005). Several studies focus on the impact of competition on media bias. Baron (2006) explains how bias may be larger in competitive media markets, while Sutter (2001) and Corneo (2006) argue that collusion or a concentration in media ownership makes bias more likely, which is consistent with the findings

of Gentzkow and Shapiro (2006). Mullainathan and Shleifer (2005) separate the impact of competition on bias along two axes and find that competition will neutralize ideological bias, but intensify spin.

The current article analyzes how ideological and attribute preferences affect the information market. This differs from previous work in that information is not neutral for either media consumers or media providers. In the current model, consumer preferences have an impact on information distribution and bias. The findings include that consumers are likely to be imperfectly informed on most issues and may be interested in media reports with a high likelihood of biased information.

A Positive Theory of Media and Information

In producing news stories, media organizations make a multitude of decisions, including which issues to report on, in which format (such as pictures or text), and which aspects to emphasize (such as positive versus negative and business versus environment). A “story” is defined as a unit of media coverage and is characterized by its attributes. The number of stories is defined as $m(\theta)$, with the vector θ representing the set of attributes. These attributes include a variety of characteristics, such as ideology, attitude (e.g. negative versus positive), format, vocabulary, and regional coverage. For each of these attributes, one can assume a single-dimensional space between two extremes.

Supply side of the market

Since our focus is on the demand side, we use a simple model of the supply side. Many media organisations, either because of the preferences of their owners or because of the

preferences of journalists who have sufficient autonomy to influence decision-making of the media organisation, do have their own attribute preferences, for example on the ideological perspective of the stories. We therefore assume that the media organization is driven by the need for profits and its own attribute preferences.¹ Each media company j has the following objective function for producing a story located at θ in attribute space:

$$(1) \quad U_j^m(\theta, \theta_j^m) = -\alpha(\theta - \theta_j^m)^2 + \beta\pi(\theta).$$

Where $\pi(\theta)$ is the profit function for the media company. Further, θ^m is the media company's preferred location in attribute space, and the parameters α and β reflect the relative importance of the profit objective for the company. For example, in case of the ideology attribute, this reflects the company's trade off between ideology and profits.² Profits are $\pi(\theta) = pm(\theta) - F$, where p is the exogenous price of stories and F is the fixed cost of production.³ In the case of a monopolist, the firm chooses its optimal attribute location θ^* to maximize its objective function:

$$(2) \quad \max_{\theta} \quad -\alpha(\theta - \theta^m)^2 + \beta pm(\theta) - F.$$

The first-order condition is

$$(3) \quad -2\alpha(\theta^* - \theta^m) + \beta pm'(\theta^*) = 0,$$

which exhibits the firm's trade-off between ideology and profits. The supply is determined by the ideological choice, θ , which solves (3). The ideological choice and exogenous price determine the supply of stories:

¹ While in the United States media has always been largely commercial, the private media as the dominant source is relatively new in Europe where until relatively recently media were often aligned with political parties.

² For example, McGuire (2001) argues that, despite media tycoon Robert Murdoch's strong political preferences, ultimately his main objective is profit maximizing: "Opportunism, not ideology, drives Murdoch. Whether backing Tory or Labour, cold warriors like Margaret Thatcher or communists in Beijing, one aim remains: the desire for a friendly market for his expanding media empire," (p. 21).

³ For simplicity, production costs are modeled as fixed costs without loss of generality.

$$(4) \quad m^* = m^*(\alpha, \beta, p, \theta^*, \theta^m).$$

The equilibrium can be found by setting supply equal to demand.

Demand side of the market

A consumer obtains utility from leisure and a composite good and obtains disutility from consuming media stories that *diverge* from his or her attribute preferences.⁴ Specifically,

$$(6) \quad U_{it}^c(\theta, \theta_i^c, L_{it}^l, x_{it}) = g(L_{it}^l, x_{it}) - m_{it}\gamma(\theta - \theta_i^c)^2,$$

where L_{it}^l denotes time spent on leisure for the i^{th} person at time t , x_{it} denotes the composite good, θ_i^c denotes consumer i 's K-dimensional ideal point, θ denotes the K-dimensional location of newspaper j issued at time t , m_{it} is the number of stories purchased, γ weighs their ideology preference, and $g(\cdot)$ is an increasing, concave function in both leisure and the composite good. The squared difference between story attributes and the consumer's ideal point negatively affects utility. We assume that there are n consumers whose media preferences are uniformly distributed in attribute space.

The consumer maximizes utility subject to a budget constraint,

$$(7) \quad \frac{x_{it} + pm_{it}}{1+r} = f\left(\frac{L_{it}^w}{1+r}; \frac{\sigma^2}{m_{it-1}}\right),$$

and a time constraint,

$$(8) \quad 1 = L_{it}^l + L_{it}^w + cm_{it},$$

where p is the exogenous price of news stories and r is a discount rate. The price of the composite good x is normalized to equal one. The function $f(\cdot)$ is a concave production function

⁴ Note that entertainment utility could also be modeled.

in time spent working, L^w , and is a negative function of the second argument σ^2/m_{it-1} , which is the variance of events divided by the number of media stories consumed. The idea that motivates equation (7) is that the consumer uses the information from media stories to decrease the impact of surprises or shocks (characterized by the variance of events σ^2). This information could represent many things such as the financial health of a firm (which affects the decision about when to sell one's stocks), how interest rates are expected to behave (which affects the decision about when to refinance one's house). Finally, the time constraint represents how one day is divided up where c is the average time of "consuming" a story.

We assume here that consumption of media products will positively affect income through an increase in the reader's knowledge on certain issues. Combining (6) – (8), the consumer's problem is then:

$$(9) \quad \max_{m_{it}, x_{it}, L_{it}^l, L_{it}^w} \sum_{t=1}^{\infty} g(L_{it}^l, x_{it}) + m_{it} \gamma (\theta - \theta_i^c)^2 + \lambda \left(f \left(L_{it}^w; \frac{\sigma^2 (1+r)}{m_{it-1}} \right) - pm_{it} + x_{it} \right) + \mu (1 - L_{it}^l - L_{it}^w - cm_{it})$$

By rearranging the first-order conditions, we obtain the usual result that the net marginal benefit of time must be equal across the uses of processing media stories, work, and leisure:

$$(10) \quad \frac{1}{c} \left[\gamma (\theta - \theta_i^c)^2 - (1+r) g_x f_m \left(\frac{\sigma^2}{m_{it-1}} \right) - g_x p \right] = g_x f_{L^w} = g_{L^l}.$$

This model yields a demand equation for consumer i for news stories:

$$(11) \quad m_{it} = m_{it}(\theta, \theta_i^c, p, x) = \sqrt{\frac{-f_{m_i} g_{x_i} \sigma^2 (1+r)}{cg_{L^l} + g_x p - \gamma (\theta - \theta_i^c)^2}}.$$

The aggregate demand for media stories is the sum of all individual demand equations, as

$$(12) \quad m_t = \sum_{i=1}^n m_{it}(p, x_{it}, \theta, \theta_i^c).$$

Substituting the expression for demand [11] into [3], we obtain an equation which includes the optimal ideological choice, θ^* for the company as a function of consumer preferences:

$$(13) \quad \beta p \gamma (\theta^* - \theta^c) \sqrt{-f_m g_x \sigma^2 (1+r)} = 2\alpha (\theta^* - \theta^m) \left[c g_L + g_x p - \gamma (\theta^* - \theta^c)^2 \right]^{\frac{3}{2}}.$$

Let us now discuss some of the implications of this model.

The Rational Ignorance Hypothesis: It is rational for individuals to be imperfectly informed.

It follows from equation (10) that it is rational for most individuals not to inform themselves fully on an issue.⁵ Consumers will prefer to inform themselves only up to a point where the marginal increase in income from more information is equal to the marginal cost. First, if the price of news stories is high compared to the marginal benefits of information, it will limit consumers' purchasing of stories. Second, even when stories are free, consumers will stop acquiring more information when the opportunity costs of processing the information becomes larger than the marginal benefits. A third reason has to do with the attributes of the stories. Consuming a story may have a negative impact on consumer welfare because of the story's ideological bias. The marginal disutility from consuming media with a divergent ideology must be equal to the marginal net benefit from the increase in income due to knowledge. This tradeoff can be represented as:

$$(14) \quad \gamma (\theta - \theta_i^c)^2 = g_x \left(c f_{L^v} + p + (1+r) f_m \left(\frac{\sigma^2}{m} \right) \right).$$

⁵ In a sense, the model formalizes and extends an idea first presented by Downs (1957) in his discussion of the rationally ignorant voter in political theory.

Certain characteristics of stories will increase the demand for stories. In the next sections, we discuss the impact of negative versus positive news. A frequent complaint about the media is that the news coverage is too negative.

The Bad News Hypothesis: The generally recognized tendency of the popular media to publish mostly negative aspects of news items is driven by the demand of their audience, rather than by inherent preferences of the media itself.

To understand this, consider that there are two types of stories: positive stories or “good news” and negative stories or “bad news.” Think of good news as stories about *happy endings*, in which people made the right choices. Examples are “Golden Wedding Anniversaries” and lottery winners. Bad news stories are about *unhappy endings*, in which people made the wrong choices. Examples are of bad news are crime stories and shark attacks. When consumers read good news stories, they can make similar choices to increase their incomes. When they read bad news stories, they can choose to avoid bad outcomes and the resulting income losses.

To examine this effect, we partition media stories based on positive versus negative news content: m^G represents good news stories and m^B represents bad news stories. Assuming that the costs involved in purchasing and processing good news and bad news stories are identical, we incorporate good and bad news into the budget constraint:

$$(15) \quad \frac{x_{it} + pm_{it}}{1+r} = f\left(\frac{L_{it}^w}{1+r}; +\sigma^2(m^G), -\sigma^2(m^B)\right).$$

In [15], the variance of events is now split up into arguments, positive shocks $+\sigma^2(m^G)$ and negative shocks $-\sigma^2(m^B)$. The idea behind this partition is that the consumer uses the

information from positive media stories to take advantage of opportunities from positive shocks and uses the information from negative stories to avoid negative shocks. From the first-order conditions, the marginal utility from avoiding negative shocks to income must be equal to the marginal utility from the increase in income due to knowledge. This tradeoff can be represented as:

$$(16) \quad g_x \left(cf_{L^w} + p + (1+r) f_{m^G} \left(+\sigma_{m^G}^2, \cdot \right) \right) = g_x \left(cf_{L^w} + p + (1+r) f_{m^B} \left(-\sigma_{m^G}^2, \cdot \right) \right).$$

The expected value of additional information is higher when it concerns an issue with negative welfare effects than with positive welfare effects. Since $f(\cdot)$ is concave, the marginal loss in utility from not consuming the first bad news story is greater than the marginal gain in utility from consuming the first good news story. Consumers will choose story types until the marginal utility across story types is equal. By concavity, consumers will choose to consume more bad news stories than good news stories $m^B * > m^G *$ (see Figure 1). In words, since the potential gain in income from reading good news stories has a smaller effect on utility than the potential income loss from not reading bad news stories, consumers will choose to read more bad news.

Conclusions

The availability of information has increased rapidly in recent years, yet consumers remain largely uninformed on many important topics and often focus on negative stories. This paper contributes to the emerging field of media economics by studying how producer incentives and consumers preferences and constraints affect the information market. We show that consumers are likely to remain imperfectly informed on most issues and that negative news coverage is likely to dominate positive news stories because of demand side effects.

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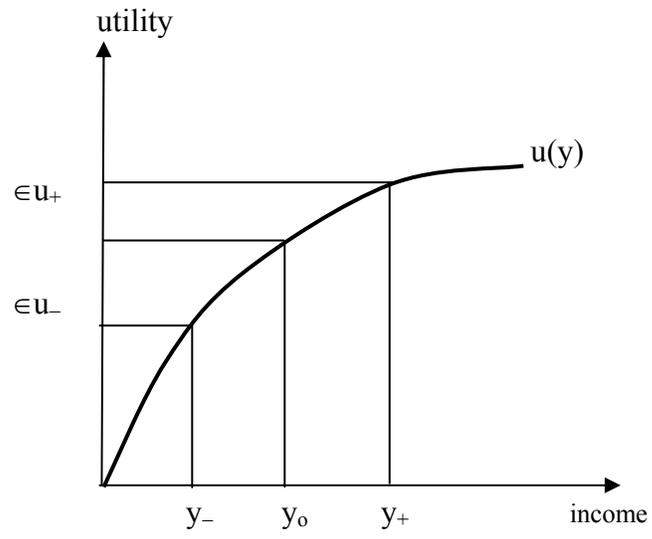


Figure 1