

The Economics of Online Advertising

How Viewable and Validated Impressions Create Digital Scarcity and Affect Publisher Economics



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AUTHOR:

MAGID ABRAHAM PH.D, CO-FOUNDER AND CEO, COMSCORE INC.

CONTRIBUTING EDITORS:

Linda Boland Abraham Co-Founder, CMO & EVP of Global Development, comScore Inc.

Andrea Vollman Senior Director, comScore Inc.

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Introduction

Historically, the primary metric used to buy and sell online advertising was the number of delivered, or served, impressions. However, as ad platforms, formats and delivery technologies have evolved, it has become obvious that not all online ads delivered actually have an opportunity to be seen. The challenge has been that, until recently, it was impossible to know which ads were viewed and which weren't because the appropriate measurement technology did not exist. Today, though, we have insight into whether or not a delivered ad actually appeared within a consumer's viewport, and research has shown that there is often a substantial difference in the value to marketers between delivered impressions and viewable impressions. This has led to an industry-wide interest in *viewable impressions*, and a discussion around what the correct currency metric should be. Naturally, advertisers are not interested in paying for ads that were never seen. The focus on a viewable impression currency has raised many questions and created anxiety about how the move would affect online publishers.

This paper takes the position that a viewable impression currency will benefit publishers. First, it argues that the current state of play, with virtually an unlimited supply of online ad placements, is untenable. It also illustrates how, despite many innovations aimed at increasing demand from traditional brand advertisers, the current marketplace offers little hope of having non-contextual CPMs rebound broadly from their currently depressed level. Second, it points out that the online market is, in reality, subject to scarcity just like other media markets, but only when

measured with the right metrics. Right now, the digital landscape only appears to have an infinite supply because of the existing served impression currency. Shifting the currency to viewable impressions from served impressions re-establishes true scarcity in the market. This, in turn, delivers more value, reduces risk to advertisers, and allows pricing to float to levels that reflect the actual value publishers offer advertisers, thus fundamentally changing the economic dynamics of the market and the revenue potential for publishers.

comScore would like to thank the Interactive Advertising Bureau's **Randall Rothenberg**, president and CEO, and **Sherrill Mane**, SVP, Research, Analytics & Measurement, for their valuable input on this paper.

FOR FURTHER INFORMATION,
PLEASE CONTACT:

Andrea Vollman
comScore, Inc.
+1 212 497 1731
press@comscore.com

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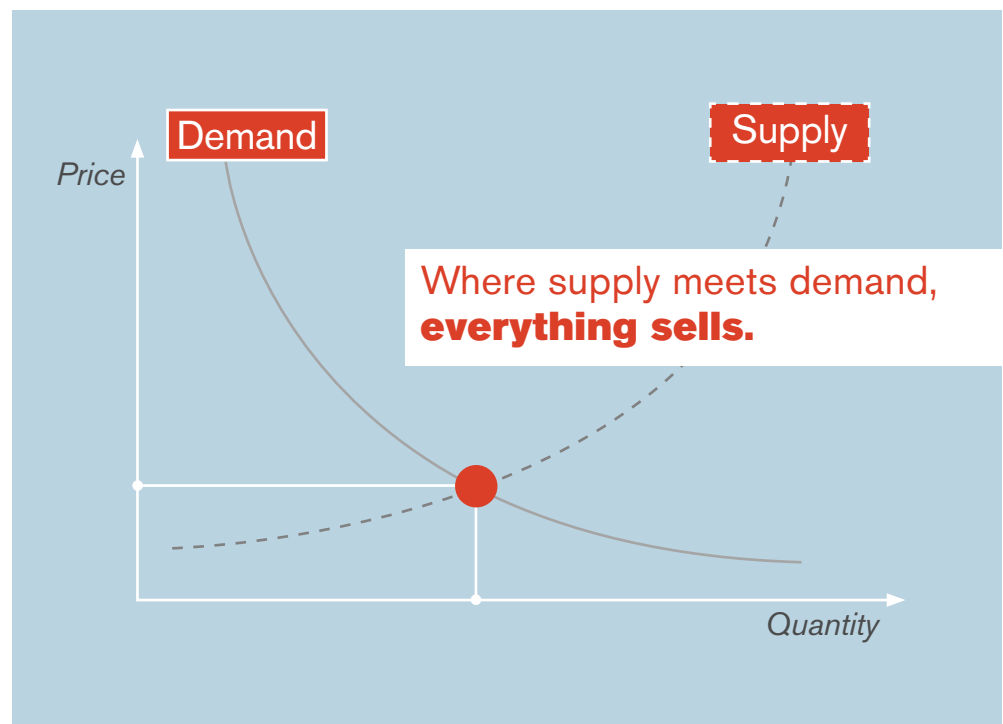


Price is regulated by the proportion between the quantity brought to market and the demand of those who are willing to pay.

THE ECONOMICS OF SUPPLY AND DEMAND IN ONLINE ADVERTISING

More than 200 years ago, Adam Smith wrote: “*Price is regulated by the proportion between the quantity brought to market and the demand of those who are willing to pay.*” For all the fanciful new metrics proffered by digital media and advertising companies since the industry’s origin in the mid-1990s, Smith’s principle remains intact. In Figure 1, the intersection of the downward sloping demand curve and the upward sloping supply curve represents the equilibrium price at which, in a free market, all available supply would sell. In the online ad market, this market-clearing price is the average CPM, or cost per thousand impressions.

Figure 1 Basic Law of Supply & Demand



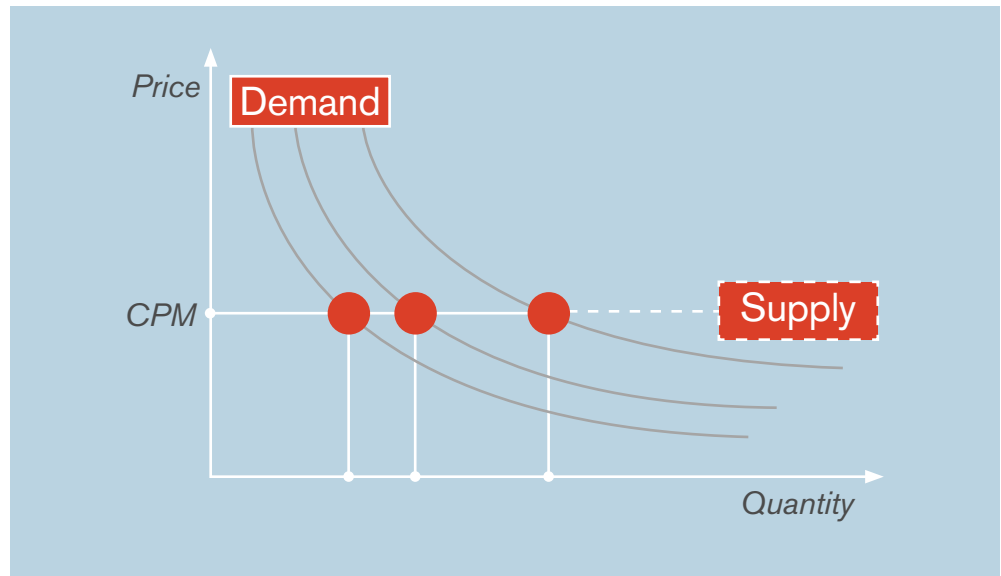
Given this classic economic paradigm – along with demand clearly growing as more ad dollars shift online and the industry’s constant endeavors to increase the value of its ad inventory through improved targeting, more creative executions, new ad formats and effectiveness measurements – CPMs *should* be increasing. But this is not happening. Why not?

This is largely because the economic law depicted in Figure 1 implicitly assumes that supply at a given price is limited, and that the cost of an additional unit of output becomes higher as the total supply expands. A good example of this phenomenon is the petroleum market. To deliver more quantity, additional drilling is required. The new wells are more expensive to exploit because oil companies have presumably exhausted all the wells that could be operated at a lower cost. Thus, they may have to do more expensive off-shore drilling because they have already consumed the less expensive land-based alternatives.

In new media markets, however, the economics of industrial production do not adhere, at least not cleanly. In digital media, the marginal cost of adding new programming or advertising inventory is very low, and has been trending lower for years, as the costs of computer processing and storage have plummeted. Whereas adding new pages to a magazine incurs substantial material, production, and distribution costs, generating new pageviews and attendant

ad inventory online costs almost nothing. In such a case, supply could be infinite as long as the price exceeds the marginal cost per unit. An increase in demand, as implied by a shift of the demand curve to the right, does not increase price. In fact, price remains constant at any level of demand, and efforts to increase demand do not create a supply imbalance and associated price increase (See Figure 2).

Figure 2 If demand increases, but supply is unconstrained, price *does not* increase.



There are a number of empirical examples within the media markets that help to illustrate how constrained supply influences buyer behavior and pricing depending on the nature of the market.

The following three scenarios, relating specifically to TV network advertising, contextual online advertising and online inventory sold via display ad exchanges, provide greater insight into how these supply-and-demand economics play out in the real world.

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**SCENARIO 1:
TV NETWORK ADVERTISING**

In the case of TV advertising, there is a relatively stable inventory of allotted advertising that amounts to an average of approximately 160 spots per viewer each day. This is a direct result of an average of 5 hours of daily TV viewing per user and a limit of 32 ad spots per hour. On occasion TV networks expand inventory, but only in small amounts, so the level of inventory is relatively constant. Because there is a constraint on supply, scarcity exists in this market and consequently, ad pricing has consistently climbed over the years. Indeed, pricing has continued to climb even as the number of viewers for prime time programs has shrunk – a further indication of the effect constrained supply (in this case, the supply of audience for commercials) has on pricing.

**SCENARIO 2:
ONLINE CONTEXTUAL ADVERTISING**

With online contextual advertising – particularly in high-demand content categories, such as automotive, finance and health – soft constraints on supply also exist because there is a finite audience for this specialized content. In addition, media planners and buyers who are intent on buying ads contextually – that is, adjacent to certain forms of content on specific sites known to be attractive to audiences – will limit their activities to a relatively small set of sites in the seemingly vast online marketplace. For example, they will limit their consideration to the top 10 automotive sites or the top 20 sites for women aged 18-34. Because both forms of scarcity exist in this segment of the online advertising market, we tend to see CPMs that are often multiples higher than the average online CPM. These advertising rates have been steady or increasing in periods of high demand.

**SCENARIO 3:
ONLINE ADVERTISING SOLD THROUGH NETWORKS OR AD EXCHANGES**

When we examine the largest segment of the online advertising market – inventory sold through display ad exchanges – we observe a different story. These ads are sold by online aggregators – called ad networks – with an auction mechanism that effectively turns ad units into commodities, placing the ads before audiences wherever they may be found. In many cases, these ad impressions are delivered in lower visibility placements, next to lower quality content or in highly cluttered environments. With nearly 600 million websites on the Internet¹, tens of thousands of them undoubtedly ad-supported, there is virtually no constraint on the amount of inventory available in this commodity segment. Further, the marginal cost of adding an incremental unit of supply is very low, and the costs to serve these ads are negligible – typically between \$0.02 and \$0.05 – meaning that any advertising price higher than that amount is profitable at the margin; an attractive source of additional, albeit small, revenue. It is not uncommon to see CPMs of a few pennies for these ads. The ultimate result is that ad pricing continues to decline in a race to the bottom, particularly as this market has become more competitive and the endless supply dynamic is reinforced. Moreover, the plummeting pricing in this commodity segment has acted as a drag on the pricing power of contextual-focused sites, with advertisers and their agencies reasoning that they can access the same audiences found on contextual sites for mere pennies on the dollar.

¹From the Netcraft Web server survey:
<http://news.netcraft.com/archives/2012/01/03/january-2012-web-server-survey.html>

Bottom line, despite all the ingenuity of market participants, the current market situation is untenable.

CONVENTIONAL WISDOM: UNLIMITED ONLINE AD SUPPLY

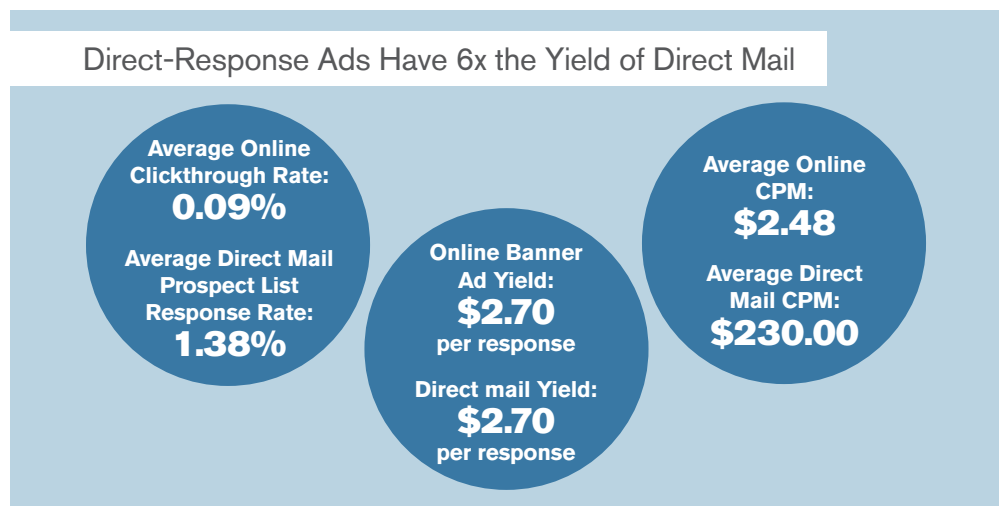
Alongside the explosion of Internet usage over the last decade, the online advertising industry has also seen tremendous growth. As people spend more time engaging with online content, it is only natural that ad dollars would eventually follow.

To capture those ad dollars and boost their revenues, especially after the dot.com bubble burst in 2001-2002, many publishers redesigned their pages to crowd in as much advertising inventory as possible. This made sense at the time. As the recession bit into ad spending, the struggling new medium premised its value to marketers on two things: low prices relative to print and television and, accountability, in the form of click-based compensation (i.e. payment rendered only if the advertisement was clicked on by a user). This led online publishers to crowd their sites with as many advertising availabilities as possible. It also prompted the nascent digital advertising industry to promote served impressions as a currency. If an ad would only be paid for if it was clicked on, reasoned publishers and their clients, it didn't matter if the ad was never seen, especially since little real cost

was incurred in reproducing or delivering the impression. Eventually, the entire industry, even CPM-based advertisers, coalesced around served impressions as currency, in effect adopting both its metrics and its currency from the offline direct-response advertising industry.

For direct-response marketers – those looking for a rapid sale from specific consumers responding explicitly to an immediate offer – Internet advertising has been a boon. The central metric used by direct marketers is the yield curve; in other words, the cost of the advertising campaign divided by the sales or other economic activity generated by the campaign. While many inexperienced observers look at the apparently poor clickthrough rates (CTRs) for online ads and use these to criticize the medium, because online display ad prices have been so low, especially relative to the U.S. postal service (the primary direct response medium), online environments have attracted significant investment from direct response advertisers (See Figure 3).

Figure 3 Online Direct-Response Ads



Sources: Direct Marketing Association 2010 Response Rate Trend Report, Doubleclick Display Advertising Benchmarks, August 16, 2011, and comScore, May 13, 2010.

Even though the low prices are tempting and are drawing in more dollars, most of the money comes from direct response and promotional marketers, who are buying because of the medium's low prices, not because of the value it can provide to brand marketers.

But while the Internet may have been a boon for direct response advertisers, it has been a mixed blessing for brand advertisers who have different ways of measuring success. Most brand advertisers are concerned about maintaining the premium price differential for their goods and services versus generic or store brands. To do so, they want to secure and maintain consumers' emotional affinity for their brands. Against these objectives, many of the techniques and after-effects of direct response ad campaigns, especially online, are inimical. Just as American mailboxes have grown crowded with direct mail letters and catalogues, a glut of digital advertising inventory has become a chronic reality, leading consumers to ignore or even abhor online ads, especially ugly and interruptive "pop-ups." Naturally, many websites are filled with clutter, with ads on every corner of the page. This seemingly unlimited supply on publisher sites not only affects the user experience, but it is also unattractive to advertisers.

Another pernicious effect of the served impression currency is that it increases the risk of buying online ads for brand advertising buyers because of a perceived lack of accountability – a paradox for a medium that has premised its value on accountability. This is starkly illustrated by the utter lack of information on whether or not served impressions are actually seen by a real consumer. If an ad is delivered but never seen, then it has zero potential to improve branding metrics or sales at premium prices. Ad buyers dislike not knowing whether 20% or 60% of their purchased impressions could actually be seen by a real consumer. Faced with the non-quantified risk, buyers must naturally discount the value of what they are buying to compensate for the risk they are taking. The result again: lower pricing.

To illustrate this point, consider a buyer interested in purchasing a used car from an auction lot. Some cars on the lot are in

pristine condition, others are not, and some might not even run at all. In this example, the buyer is given limited information about the cars, such as make, year, color and mileage, but must bid on a car sight unseen. Most would agree that this is a very risky proposition for the buyer who lacks transparency into the specific car he is interested in purchasing. Naturally, the buyer is likely to bid low in hopes of mitigating risk and, on average, getting a good deal.

Generally, high risk means lower prices because buyers demand a risk discount. A similar dynamic is currently at play in the online ad market. Absent information that helps advertisers understand which ads have a chance to connect with consumers and which do not, there is a risk discount baked into the purchase decision, and this inherently depresses price.

So it is that, despite the ingenuity of market participants, most online publishers are faced with an untenable situation: increasing supply in a landscape of relatively stable demand depresses prices. Advertisers perceive a high degree of complexity and risk, and thus bid prices down. Consequently, online remains a challenge for branded advertisers, who are still unsure about how to correctly use the medium. This poses a dilemma for them; more and more of their consumers are spending more and more of their discretionary time with media in digital environments, where brand marketers are uncomfortable pursuing them. Soon – perhaps two years, perhaps five years, as the share of television viewers consuming TV on IP-based devices grows – brand marketers may be faced with a crisis; unable to locate their audiences who have disappeared inside the black hole of digital media.

Digital supply appears unconstrained when served impressions are used as the unit of counting. However, digital supply is effectively constrained when the unit of counting is *viewable impressions*. It is that simple!

REALITY CHECK: DIGITAL AD SUPPLY IS NOT UNLIMITED IF WE ONLY COUNT ADS USERS CAN SEE

Imagine if the TV industry was allowed to serve and bill for unseen ad spots. For example, suppose a TV network could bill for a commercial that was a silent and invisible overlay to what the user was watching. It is not unreasonable to think that many sellers would be lured by the temptation of adding as many overlays as possible since they generate more revenue on the margin. In such a case, the TV ad market would lose its scarcity, just as the digital market has, and this would inevitably affect the economics of the industry.

Now imagine the opposite: assume we apply the same rules of TV ad accounting to the digital space. In other words, ads must deliver an opportunity to be seen by a real person in order to count as a true ad impression. In this environment non-visible banners wouldn't count. Ads that have not finished rendering wouldn't count. Impressions generated by non-human traffic wouldn't count. Ads that are in languages other than those native to the viewer's market wouldn't count.

In sum, all of the conditions that cause scarcity on TV would apply online. This inherently makes sense given that, just like TV, the World Wide Web, for all its seeming vastness, is in fact a bounded environment: there are a limited number of people with limited time to spend online and a limited amount of screen space they actually view during their usage. Granted, some publishers may be tempted to squeeze visible content out and replace it with ads, but they must take care not to "lose" their valuable audience who visited the site to consume content, not to see ad clutter. The opportunity for publishers to game the system and increase supply is fairly small because of the opportunity cost of their audiences. This is precisely why online ad inventory can be constrained – *if we use the TV accounting rules*.

This leads to a striking insight: *the unit of impression accounting can determine whether scarcity exists*. The culprit has been right in front of our eyes all along, and it has seduced us with its counting precision, appealing to our worst instincts to chase more incremental dollars by constantly adding low visibility inventory. Yet it's this same seducer that has generated long-lasting market damage to both the buy-and sell-sides of the market. It is not just a flawed currency, it is a harmful currency. The time has come to change it for the good of the entire ecosystem.

comScore has built a system based on a number of validity criteria that an impression must meet in order to be counted.

AN ALTERNATIVE CURRENCY

While we have focused on **viewability** as a mechanism to introduce scarcity, we believe there are at least three additional important factors that affect the value delivered to advertisers. These are:

1. GEOGRAPHIC COMPLIANCE

In addition to measuring viewability, ensuring that ads are delivered to the appropriate geography will also help introduce scarcity into the marketplace as it will limit the supply of ad inventory within target geography.

2. BRAND SAFETY

Given the complex daisy chain of ad delivery, the ability to eliminate the real-time delivery of ad impressions shown next to undesirable content is important. Avoiding content that is not going to deliver a positive impact, or that may potentially deliver a negative one, reduces the perceived risk by advertisers. It also lowers the valid supply, although, typically, by a negligible amount. Moreover, it brings online advertising into conformity with legacy media which have traditionally had standards and practices to assure brand safety.

3. NON-HUMAN TRAFFIC, INCLUDING FRAUD

In some cases, current impression numbers include counters of various sorts. While counters themselves are not inherently problematic, they can be used to artificially inflate impression counts. In other cases, the activity taking place is more nefarious, including cases where ad impressions are generated robotically or programmatically for the sole purpose of artificially driving up traffic. This artificial increase is achieved by delivering ads to non-human entities such as a fraud server or through using invisible 1x1 pixels on a computer screen. Advertisers do not want to pay for impressions that aren't delivered to actual consumers; nor should they. Publishers suffer because this non-human traffic generates false inventory and harms the reputation of the medium. All types of non-human traffic need to be filtered out of validated impression counts.

It should be noted that while there are now multiple approaches for measuring viewability in the marketplace, the analysis in this paper is based on comScore's visibility methodology. (The criteria used to determine visibility are those that were established by the 3MS initiative, which requires an ad to be at least 50% visible for 1 second or more to be considered viewable.) That said, the economic principles that govern how better measurement around ad visibility will ultimately drive economic benefit for the industry apply in theory to any approach that makes this distinction, as long as it is comprehensive and is applied consistently across publishers.

The system that comScore created to measure this delivery of ad impressions is called validated Campaign Essentials™ (vCE). The validation suite in vCE, which includes its viewability measurement, along with its approach to measuring brand safety, in-country geographic delivery, ad/hover engagement, and the removal of non-human traffic, has been accredited by the Media Rating Council (MRC). vCE was used in a comScore Charter Study; a global pilot embraced by dozens of the world's leading marketers to assess the incidence of sub-optimal ad delivery based on the four criteria; viewability, geographic compliance, brand safety and non-human traffic. A full analysis of the U.S. results are available here, but highlights include:

- **31% of the vCE Charter Study ad impressions were not in-view**, meaning they did not meet the 3MS visibility standard. They, therefore, never had an opportunity to be seen. There was also great variation across sites where the campaigns ran, with in-view rates ranging from 7% to 100% on a given site. This variance illustrates that there is much room for improvement, even for major advertisers making premium buys.
- **72% of campaigns had at least some impressions that were delivered adjacent to inappropriate content.** While this affected only a tiny fraction of the 2 billion impressions analyzed in the study (<1%), it is important to note that 92,000 people were exposed to these impressions. This demonstrates that even with the most premium of executions, brand safety should be of utmost concern for advertisers.
- **On average, 4% of impressions were delivered outside the intended geography.** While one campaign delivered all of its impressions in target, the out-of-geography levels ranged as high as 15%.
- **Non-human traffic, including fraud, ranged from 4 to 11%.** vCE uses a sophisticated methodology to detect and filter out non-human traffic, and the details of the methodology are closely guarded to reduce the chance of certain industry players gaming the system. This methodology goes well beyond industry blacklists of known robots or bad actors. By its very nature, this type of non-human activity is highly adaptable to the countermeasures applied against it, and it is no surprise that published industry blacklists capture a marginal amount of this activity.

Collectively, the results from this vCE Charter Study demonstrate an enormous gap between served impressions and validated impressions, helping to illuminate how the validation lens adds both transparency and scarcity in the online ad equation. It is important to note that all the campaigns in the study were for major branded advertisers who generally executed premium buys. Given this, it is fair to conclude that the results from the study represent best-case scenarios, and that the average ad campaign would probably perform less well in these dimensions.

We know that gross online GRPs contain a substantial amount of noise, and are likely to introduce a large downward bias in marketing mix models, to the detriment of both the publisher and the advertiser.

HOW VALIDATED GRPS IMPROVE THE WAY AD EFFECTIVENESS IS MEASURED

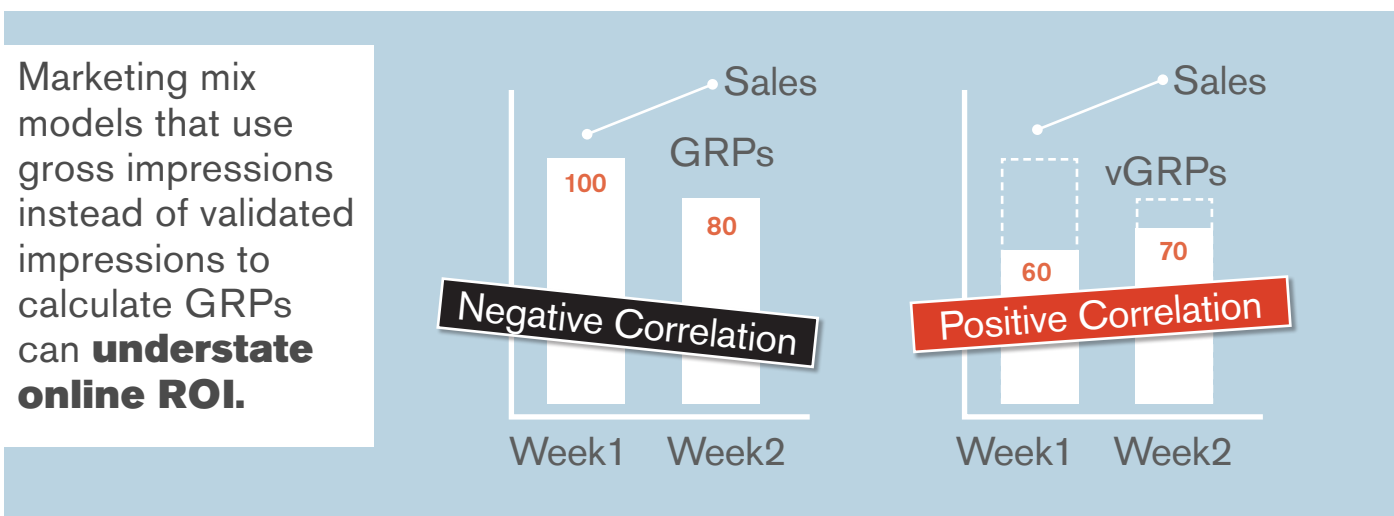
Validated impressions offer a more accurate assessment of digital advertising effectiveness. By eliminating the noise associated with non-valid impressions, the likelihood of measuring a higher return on marketing investments is markedly improved.

vGRPs Alter Evaluation of Behavioral Impact

Consider, for example, the current use of traditional online GRPs in marketing mix models (MMM). Allowing non-validated impressions into the model presents not only opportunity for error but also a biased evaluation of the medium's ability to drive sales. Because the traditional online GRP does not account for whether or not an ad was seen, a significant number of zero-value impressions are inherently included in the GRP calculation. This leads to zero or low ROI estimates and, fundamentally, renders comparisons between online GRPs and offline GRPs (in which all ad impressions are viewable) illegitimate.

As an example, take a scenario in which there is a negative correlation between gross online GRPs and sales, as illustrated on the left hand side of Figure 4 below. From week to week, sales go up but GRPs decrease from 100 in week 1 to 80 in week 2. On the surface, there appears to be a negative correlation. Through the vGRP lens, however, the relationship between advertising and sales looks quite different. In week 1, 60 of the 100 GRPs are validated as compared to 70 in week 2. In other words, when only vGRPs are put into the equation, advertising and sales move in the same direction, showing a positive correlation. Said differently, more accurate measurement of causal variables (reducing the signal-to-noise ratio) enables more accurate measurement of the impact of those variables. While the example is obviously over-simplified, one can see how marketers would draw very different conclusions from MMMs that are based on gross GRPs as opposed to vGRPs when assessing the impact of digital advertising.

Figure 4 Use of gross versus validated impressions in marketing mix models



Even when correlation reversals don't occur, statistical theory has documented a negative estimation bias. This is referred to in the literature as an 'Attenuation Bias' or 'Regression Dilution,' which becomes larger as the error in the causal variable is larger. (Attenuation is a term used to describe bias toward zero, or no effect, in a regression analysis that can manifest as a result of systematic measurement error). We know that gross GRPs are polluted by a substantial amount of noise and are likely to introduce a large downward bias in marketing mix models, to the detriment of both the publisher and the advertiser because the result is an under-estimation of the effects of digital advertising (See Figure 5a).

Figure 5a Use of **gross** impressions in brand lift studies

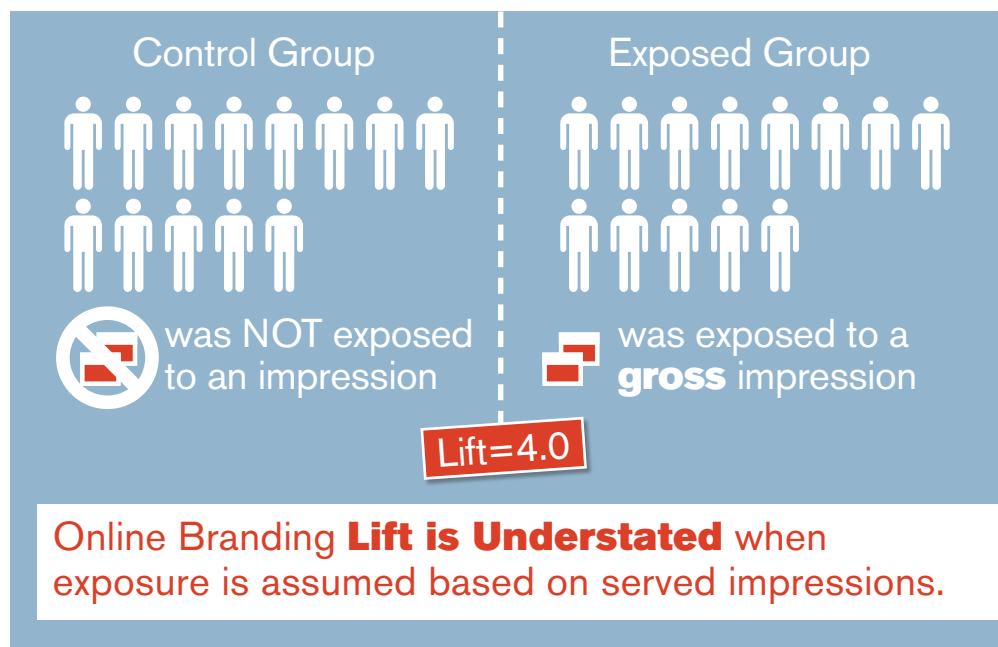
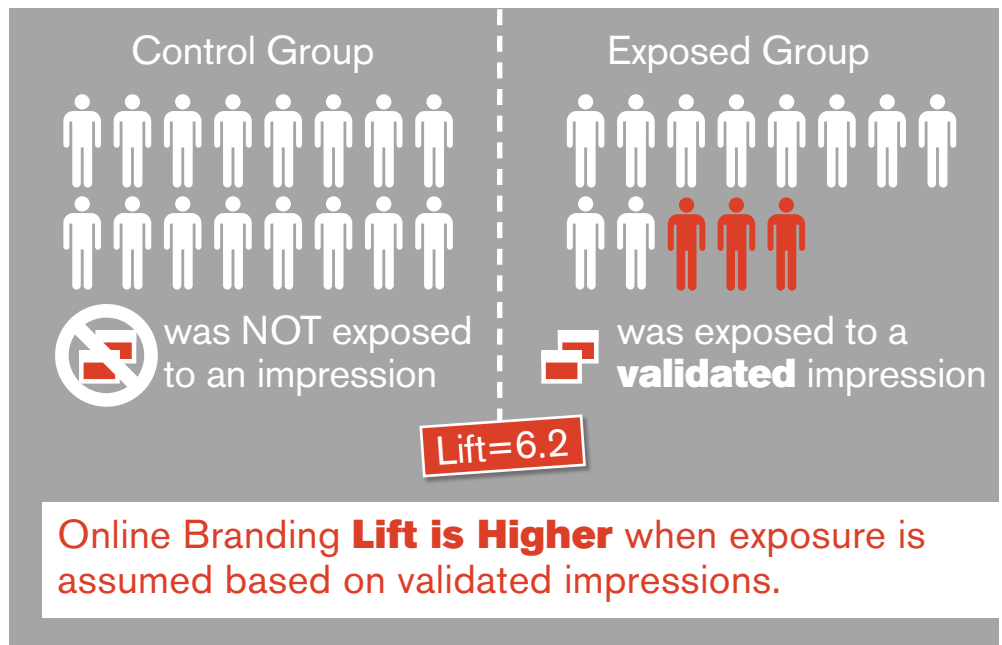


Figure 5b, however, illustrates how validated data uncovers a scenario in which 3 of the people who were served the ad never actually had an opportunity to see it (i.e. the delivery was not validated). Because the ad was never seen and, therefore, didn't have a chance to make an impact, the responses of these individuals are likely to be similar to others who never saw the ad. Including them in the lift calculation for the exposed group (as opposed to the control group) will likely suppress the brand lift calculation. In reality, these consumers should be included in the control group.

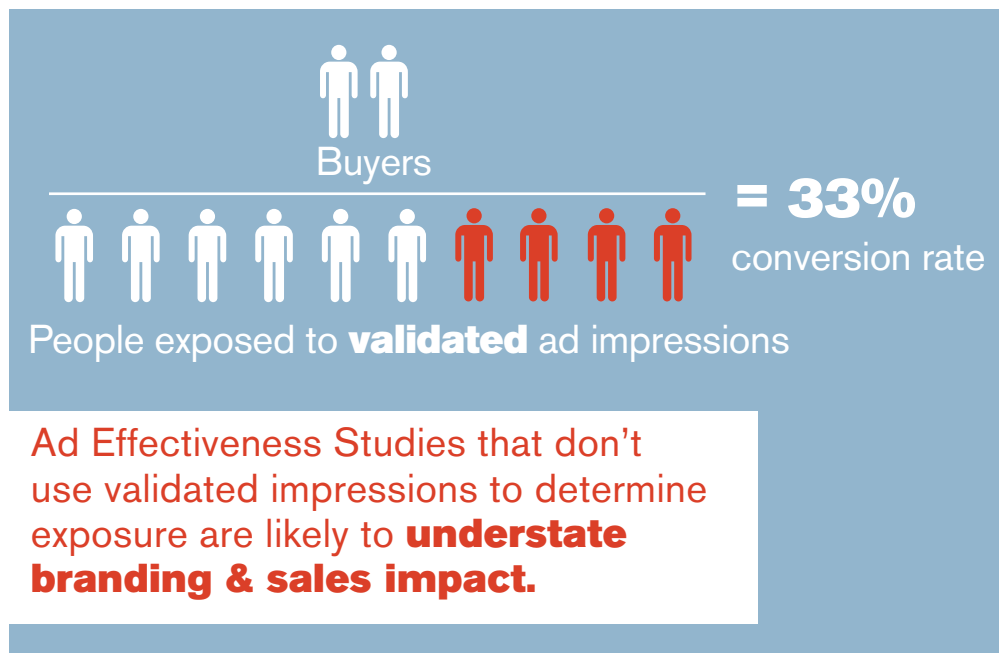
When we remove these consumers from the exposed group, thus measuring the brand lift based on validated impressions (See Figure 5b), the branding impact is 6.2 points (a full 2.2 points higher than the 4-point lift observed in Figure 5a). When using validated impressions rather than served impressions to understand who was actually exposed, publishers and advertisers enjoy a more accurate view of the campaign's effectiveness. In most cases, this more precise view will mean higher lifts for campaigns.

Figure 5b Use of **validated** impressions in brand lift studies



Online branding lifts are quite likely higher when true validated exposures are used in the model rather than gross impressions. For agencies, this also means stronger performance (See Figure 6).

Figure 6 Impact of validated impressions on perceived publisher performance



THE USE OF VALIDATED IMPRESSIONS CREATES A WIN-WIN-WIN SCENARIO

The use of validated impressions as the input into campaign measurement creates value for each of the key stakeholders in the advertising value chain.

- **Publishers** win because advertising on their site is more effective and more fairly valued.
- **Agencies** win because they are able to demonstrate better results to the client, offer better advice on media plans and spending allocations, and benefit from a clearer indication of which strategies and executions are actually contributing to brand lift.
- **Advertisers** win because they have a more accurate picture of online campaign performance and can therefore make better business decisions and allocate spending accordingly.

IMPACT ON PUBLISHER ECONOMICS: REDEFINING PREMIUM INVENTORY BY FINDING GOLD BELOW THE FOLD

Currently, pricing of online ad inventory is strongly driven by whether or not the ad position on the page is above-the-fold or below-the-fold. It is assumed that ads below-the-fold have lower visibility and are therefore less valuable, and that ads above-the-fold have higher visibility and are therefore more valuable. The abundance of remnant supply in the market results in a pricing mechanism that severely undervalues some below-the-fold ads. The following scenario clearly illustrates this.

Imagine a long web page where the portion above-the-fold contains navigational tools, a large picture, and an ad spot (See Figure 7). This ad is considered to be premium and is therefore priced accordingly. But, given the limited amount of content on the screen, consumers spend a minimal amount of time engaging with this content (i.e. 3.4 seconds, on average).

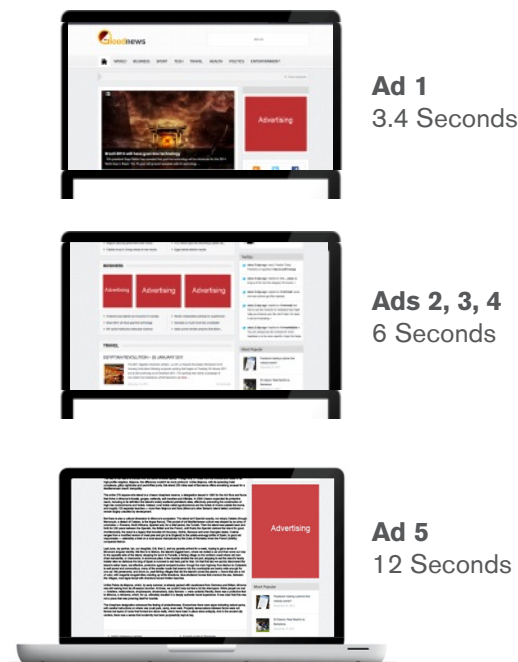
Scrolling down the web page, the next full screen contains more content and 3 prominent ads. Although not everyone scrolls down to see that screen, when they do, they spend an average of 6 seconds. This increased time equates to a higher likelihood that the consumers will notice the ad and/or engage with it.

The final screen contains a lengthy paragraph that takes a significant amount of time to read. Again, a fewer percentage of people will scroll this far down the page, but those who do will view this ad for an average of 12 seconds. With the same copy, a similar audience, and guaranteed viewability, this ad is probably the most valuable to advertisers. Hence, while ad position generally correlates, although imperfectly, with percent viewability, it does not guarantee longer duration. When the advertiser pays for only a validated impression, he may find that a validated impression for an ad well below the fold is the most valuable impression on the page (See Ad 5 in Figure 7), and therefore merits the highest price.

Figure 7 Ad position versus duration on a web page

Position vs. Duration

- When Ad 5 is viewable, it lasts longer than Ads 1-4
- With equal copy and audience, Ad 5 is the most valuable ad on the page when viewability is guaranteed
- Current pricing norms are highly affected by position on the page, as an imperfect surrogate for viewability
- Ad 5 can be priced as premium inventory if sold on the basis of CPM of viewable impressions



The pricing implications are profound. Once the uncertainty of impression validity is removed the value of placements will change, particularly for those ads located below-the-fold. In an efficient market, with a reasonably limited supply, the equilibrium price equals the marginal value to the buyer.

Figure 8 illustrates how pricing might change. The price of Ad 1 (the ad served above-the-fold) may stay the same if 100% viewability is guaranteed. But, if average viewability is 91%, an advertiser who is willing to pay \$6 for a 100% viewable impression (i.e. an advertiser who expects above-the-fold ads to deliver 100% viewability), would pay only \$5.46 per gross impression.

Figure 8 Implications of pricing based on viewable versus gross impressions

	CPM Per Gross Impression	Current Revenue per 1000 PVs			Percent Viewability	Potential CPM per Viewable Impression	Expected Revenue per 1000 PVs	
Ad 1	6	6	➔	Ad 1	91%	6	5.46	↓
Ad 2	1.5	1.5		Ad 2	59%	6	3.54	↑
Ad 5	0.6	0.6		Ad 5	37%	6	2.22	↑
TOTAL		8.1		TOTAL			11.22	+38%

Conversely, an advertiser might pay more for a validated impression of Ads 2, 3, 4, and 5. To be conservative, let us assume he would pay the same \$6 per validated Ad 1 impression. When the revenue per 1000 PVs under viewable-impression pricing is compared to the current gross-impression pricing, the total monetization yield increases by 38%.

It is worth noting that none of these calculations assume a premium because of the reduction in supply of validated impressions in the marketplace. Logic would dictate that a premium should emerge, but such assumption is not needed to demonstrate higher publisher monetization yield.

HOW DOES PRICING MOVE TO A NEW EQUILIBRIUM?

Some publishers have expressed concern that even with viewable impression guarantees, buyers will insist on paying the same prices, despite a significantly reduced advertising supply. That scenario would indeed be disastrous to publishers. However, it runs against the fundamental laws of economics. The example outlined in Figure 8 illustrates how prices will adjust.

In an environment of shrinking supply, the price of Ad 1 should increase. The assumption, for argument's sake, is that advertisers insist on paying the same \$6 CPM, but they pay only for validated impressions. An advertiser might look at Ad 5 and find it incredibly cheap at 60 cents, with more than 3 times the duration of Ad 1 (assuming that validity is guaranteed) and, in fact, he might bid \$3 CPM for validated impressions and still consider the price a bargain relative to Ad 1. A different advertiser, however, might outbid the first one, offering \$5 and still feel he is getting a good value. The process would repeat itself until there is no more arbitrage opportunity between price and value, and the price would settle at \$6 or higher. The equilibrium price settles at the level where it equals the highest value that at least one advertiser is willing to pay.

BUSINESS ECONOMICS FOR PUBLISHERS

For the purposes of understanding these economic principles in action, consider a hypothetical publisher that has 100 million impressions available for sale in a given time period. Further, for purposes of simplicity, we will focus only on the in-view aspect of validation, and leave aside brand safety, geographic accuracy and non-human traffic. Consider the following scenario:

- 35 million of the impressions are considered premium and are therefore priced at \$5 CPM
- 65 million are considered non-premium and are sold at \$0.50 CPM

Notably, the ratio between the price of premium to the price of non-premium inventory is 10:1. Assuming that the publisher is able to sell the entire supply of

available inventory, the resulting revenue would be **\$207,500** (See Figure 9).

Now, let's assume that the in-view rate for premium content is 75%, which means only 26.3 million of those impressions are viewable and, likewise, the in-view rate for the remaining inventory is 35%, which means that 22.8 million impressions in this bucket are viewable. When we use these validated impression numbers to calculate the effective CPM for the ad inventory, we see that the premium price jumps from \$5 per CPM to \$6.67, and the non-premium CPM jumps from \$0.5 to \$1.43 (See Figure 9). Interestingly, the gap in pricing between the premium and non-premium shrinks from 10:1 to approximately 4:1. For a publisher, this decreasing gap is appealing because it is significantly easier to sell premium inventory in a market that is not satiated with very low priced non-premium content.

Figure 9 Publisher economics example

	Premium	Non-premium	
Gross Impressions (000)	35,000	+ 65,000	= 100,000
Current Average CPM	\$5	\$0.5	
Current Revenue	\$175,000	+ \$32,500	= \$207,500
In-View Rate	76%	35%	
Viewable Impressions (000)	26,250	+ 22,750	= 49,000
Effective CPM	\$6.67	\$1.43	

Using this example, the following illustrates multiple scenarios in which the publisher sells inventory on the basis of viewable impressions and the resulting impact it has to the overall revenue potential for that publisher. The scenarios use the following key assumptions:

1. Selling on the basis of viewable impressions means that the publisher can actually sell more current non-premium inventory at premium prices
2. Selling viewable impressions will allow the publisher to increase its CPM by 15% relative to the current pricing system

SCENARIO 1: CPMS STAY THE SAME

In this scenario, the CPM stays the same. The cost for premium and non-premium stays the same, and the resulting change in revenue will be a nominal decrease of 1%. The market supply is reduced by about 51%.

It is important to note that basic laws of economics dictate that when supply decreases and demand is unchanged, the price will increase. As such, a scenario in which CPMs stay the same is not a likely occurrence – particularly in automated systems where bid and ask prices are matched and cleared blindly and continuously.

Figure 9a Publisher economics example

	CPM Premium	CPM Non-Premium	Change in Revenue
Current Nominal CPM	\$5	\$0.50	↓ 0.9%

SCENARIO 2: CPMS INCREASE

Let's examine what happens when an advertiser pays the current **effective CPM** per validated impression instead of the **current CPM** for gross impressions, based on the notion that an advertiser should pay only for ads that deliver an opportunity to be seen. In this scenario, the premium CPM increases from \$5.00 to \$6.66 and the non-premium CPM would increase from \$0.50 to \$1.43. The resulting revenue would increase by 35% because the publisher will be able to package more of the inventory as premium and charge a higher rate.

Taking a more conservative approach, let us now assume that the publisher is not able to charge the effective CPM and, instead, the market clears at the mid-point between gross and effective CPM. In this scenario, the premium CPM would be \$5.83 and the non-premium CPM would be \$0.96. Still, revenue would increase by a substantial 17%.

Finally, let us now assume the publisher is actually able to charge a 10% premium over the effective CPM because of the significant reduction in impression supply. While this 10% premium price might appear steep, it is actually rather conservative, given the 50% drop in supply. In this scenario, revenue increases by nearly 50%.

Figure 9b Publisher economics example

	CPM Premium	CPM Non-Premium	Change in Revenue
Current Effective CPM	\$6.67	\$1.43	↓ 35.3%
Midpoint Nominal-Effective	\$5.83	\$0.96	↑ 17.2%
10% Premium over Effective	\$7.33	\$1.57	↑ 48.9%

Given these scenarios, it is clear that using validated impressions is a very promising option for publishers. The worst-case scenario, albeit unlikely, is that CPMs remain the same and revenue is effectively unchanged. The more probable scenarios, however, show that even in the most conservative cases, revenue will likely increase, and in the most optimistic scenario, this increase in revenue could be dramatic.

Digital scarcity will help bring the online advertising supply-and-demand equation into balance, allowing ad inventory to be valued appropriately, and helping the publishers who own the inventory to achieve greater rewards.

Conclusion

The introduction of digital scarcity is, in many regards, addition by subtraction. By removing surplus inventory from the equation and firmly establishing the true constrained supply of digital advertising, all stakeholders in the digital advertising value chain can effectively benefit by paving the way for the flow of more dollars to this medium. Currency matters. The current served impression or gross impression-based currency is flawed and harmful. A validated impression currency corrects a distorted market system.

It is highly likely that, on the whole, average CPMs of validated impressions will increase substantially, enabling publishers to extract fair value from their inventory based on the value it delivers to advertisers. Remnant inventory for premium publishers will become, mostly, reserved premium and will be priced accordingly. Above-the-fold versus below-the-fold pricing models will become almost irrelevant.

This re-balanced digital economy will also benefit advertisers and agencies with a fundamentally improved accounting of digital ad impressions that enables a more accurate assessment of campaign effectiveness. Agencies can better deliver on their promise of using digital as both an efficient and effective advertising medium, while advertisers can better measure the marketing spend and improve their calculations of ROI. The latter is very important. Advertisers are searching for how to best allocate 100% of their media dollars. They intuitively know that digital is an important part of the mix but are stymied in measuring its effectiveness. Ultimately, they want to optimize the entire 100% of their media spend, rather than their current spend on digital averaging only 8%. Think of it, a 10% improvement of the entire budget is far better than a 10% improvement in the 8% digital budget, which amounts to a mere 0.8% improvement of their total budget.

The Internet has promised to be the most measurable medium largely on the basis of measuring served impressions and clicks. We now understand that both of these metrics are deeply flawed, and have effectively shackled the industry in its quest to capture a bigger share of the branding advertising pie.

The opportunity to truly deliver on the promise is now within reach.

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FOR FURTHER INFORMATION,
PLEASE CONTACT:

Andrea Vollman
comScore, Inc.
+1 212 497 1731
press@comscore.com

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