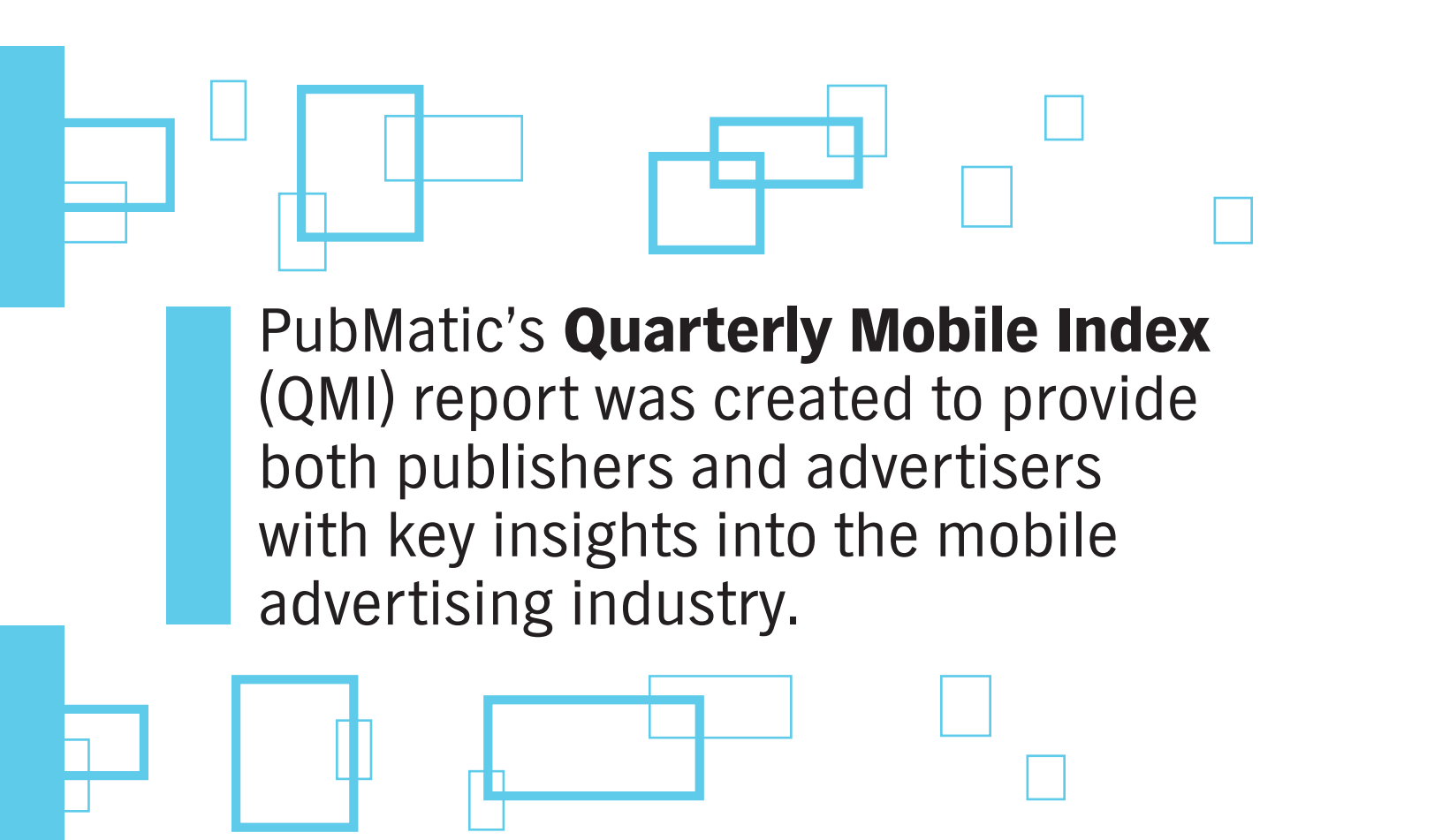




**QUARTERLY
MOBILE INDEX**

Q3 2016



PubMatic's **Quarterly Mobile Index** (QMI) report was created to provide both publishers and advertisers with key insights into the mobile advertising industry.

About PubMatic's Quarterly Mobile Index (QMI)

By analyzing the billions of digital impressions that flow through our platform, we at PubMatic are able to observe real-time developments in the mobile space that allude to broader digital industry trends. We can then compare this information to other published data to further understand changes in the mobile landscape. We are committed to providing best-in-class mobile tools and services, and we believe that information sharing is crucial in

aligning the digital industry towards best practices and, ultimately, growth in mobile advertising.

In our QMI report for calendar Q3 2016, we have updated and added several benchmarks for mobile advertising performance around pricing, volume and growth.

Note that directional data might not be comparable with prior quarter reports.



IN Q3 2016, THE FOLLOWING FOUR KEY TRENDS HAVE EMERGED

Trend #1: Mobile PMP Inventory Value Exceeded the Mobile Average by Nearly 200%, Reflecting Continued Shift of Brand Dollars to Programmatic

Trend #2: As Header Bidding Proliferates in Programmatic, Mobile Saw Tremendous Growth in Adoption

Trend #3: Retail Publishers Saw 230%+ Increase in Mobile Web eCPM Value During the Back-To-School Season

Trend #4: Although Mobile App Inventory Share Increased Worldwide, Mobile Web Monetization Continued to Provide Largest Opportunity for Premium Publishers

What does this mean for publishers and advertisers?

1. Mobile private marketplaces (PMPs) are growing in popularity among premium publishers and advertisers as brand dollars shift towards programmatic channels. The transparency and inventory quality provided by PMPs offer a safer way for brand marketers to access targeted inventory packages at scale. Lifestyle publishers who made their mobile inventory available via PMPs are seeing the greatest uptick in mobile PMP value at the impression level, so publishers in that category should ensure that their premium mobile inventory is available to buyers via PMPs as we enter the busy Q4 advertising season.

2. Publishers worldwide are benefiting from header bidding strategies across screens. The traditional waterfall is being eclipsed

by header bidding for programmatic monetization, and publishers globally are now flocking to the tactic as a way to maximize yield from mobile impressions as well as desktop. When publishers make their mobile impressions accessible via header bidding, advertisers have greater visibility into the bid landscape and have more opportunities to win an auction for a highly-coveted mobile consumer.

3. As consumer buying shifts to mobile-first behavior, **advertiser demand for mobile retail inventory during busy shopping periods is increasing.** Many buyers used their smartphones this Back-To-School season rather than going to brick and mortar locations, and advertisers and publishers alike were able to capitalize on this trend. As we look forward to

the holiday season, retail publishers should ensure that they are making their higher-quality mobile inventory accessible to the advertisers that are increasing their mobile budgets to target the mobile-first consumer.

4. Mobile Advertisers and publishers need to **balance strategies to leverage the growing popularity of mobile apps** while remembering that **mobile web is still the leading monetization opportunity.** Recent news and data around the growth of mobile apps have primarily focused on the top five applications. Big budget brand advertisers value the quality and premium environments offered by mobile web, and publishers should in turn make their mobile web inventory more attractive to buyers.

TREND #1:

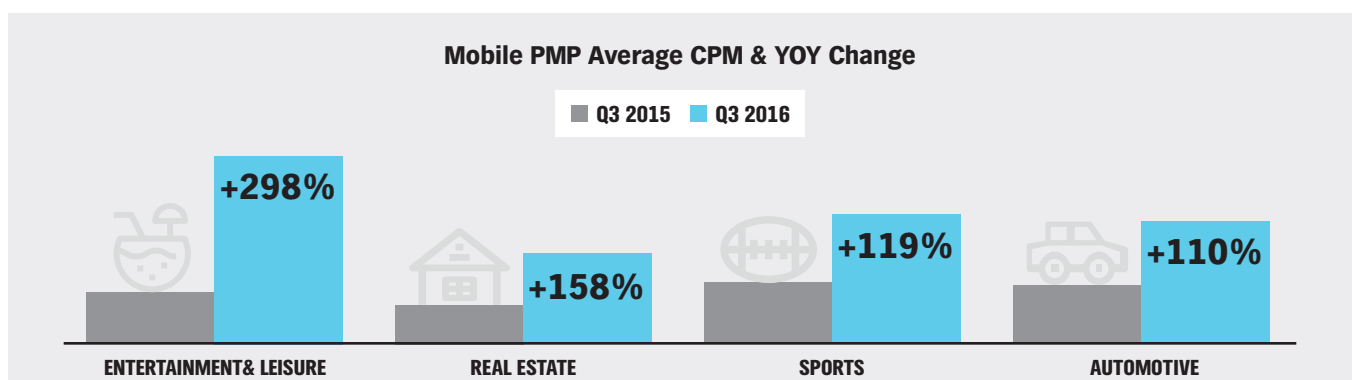
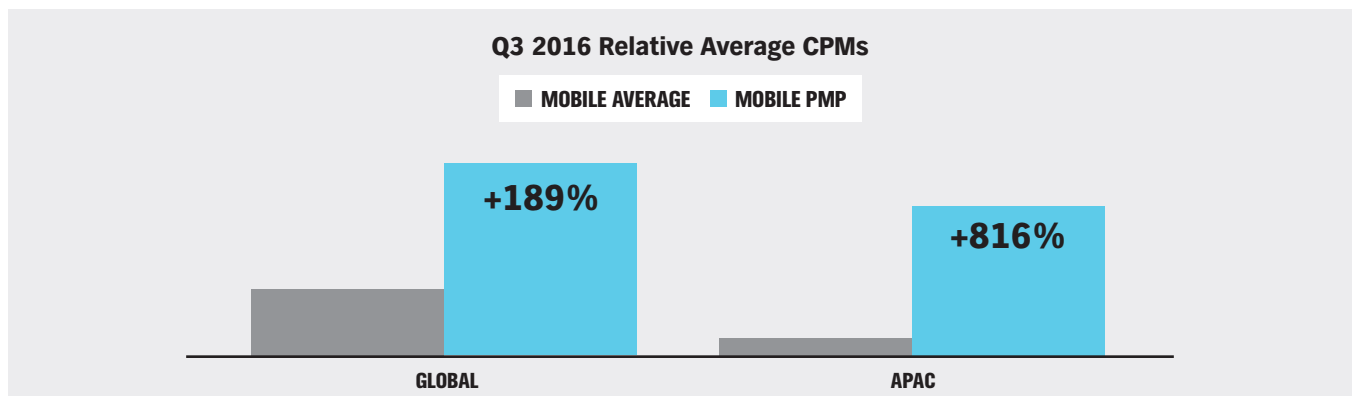
Mobile Web PMP Inventory Value Exceeded the Mobile Average by Nearly 200%, Reflecting Continued Shift of Brand Dollars to Programmatic

Private Marketplaces (PMPs) continue to provide significant mobile monetization opportunities for premium publishers. In Q3 2016, eCPMs for mobile impressions sold through PMPs were nearly 200% higher than the overall average mobile eCPM. This differential existed across all regions globally, however APAC saw the greatest variance with mobile web PMP eCPMs exceeding the average for mobile web by over 800%.

Not only are PMP eCPMs higher than the average across the board, they're also on the rise. In Q3 2016, mobile PMP prices rose more than 30% year over year. Based on the IAB publisher categories that saw the greatest growth in mobile web eCPM, it's evident that the steady growth in PMP eCPMs is due at least in part to brand advertisers becoming more comfortable with programmatic

transacting. Entertainment & Leisure publishers saw the greatest lift, with a nearly 300% increase versus Q3 2015, while other lifestyle categories - including Real Estate, Sports and Automotive publishers - all saw triple digit increases in mobile web eCPMs.

A recent survey of US ad agency professionals found that the biggest fears about using programmatic advertising are quality of inventory and transparency into sources of inventory.¹ Increasingly, both sides of the programmatic market are demanding transparency, viewability and quality across all advertising transactions. Mobile PMPs provide the opportunity for ads to be served in environments that limit fraud and promote accountability. As a result, we expect the shift towards PMPs to continue to grow in the near future.



TREND #2:

As Header Bidding Proliferates in Programmatic, Mobile Saw Tremendous Growth in Adoption

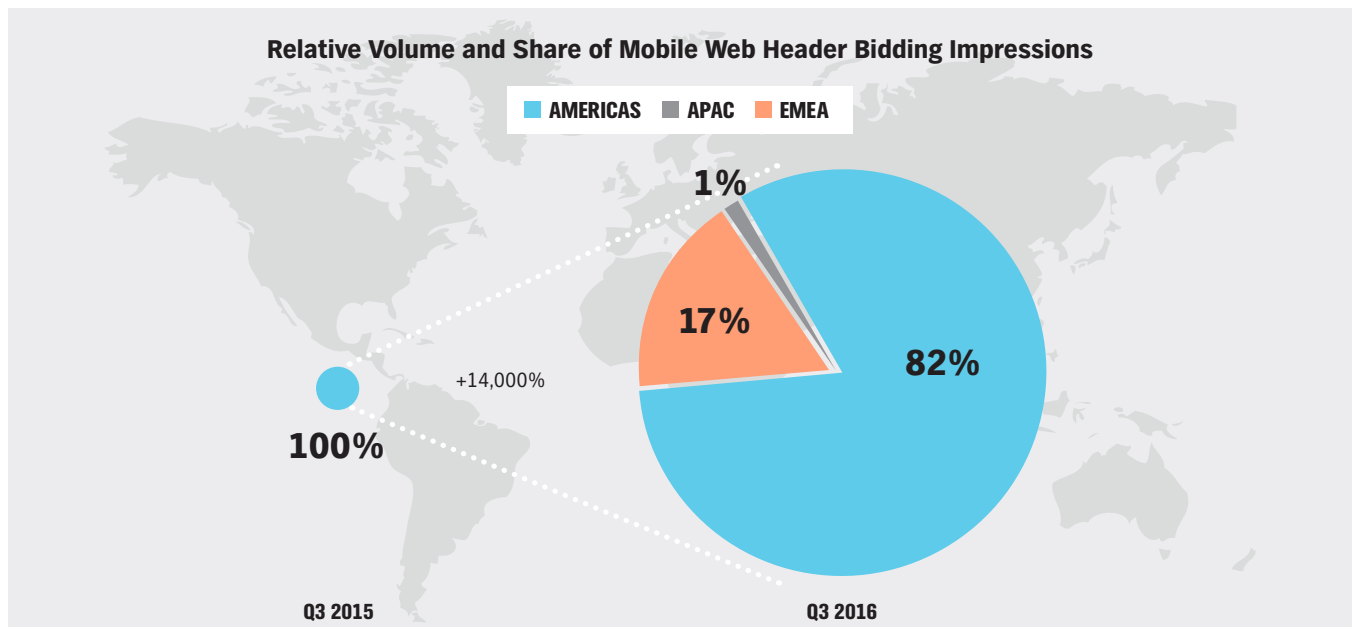
Header bidding is one of the most heavily debated and discussed topics in the digital media market today, likely due to the fact that its prevalence in the market is growing at a rapid rate. In Q3 2015, header bidding was still a relatively new term in the programmatic lexicon. Earlier this year, *Business Insider* found that approximately 70% of US publishers had adopted header bidding strategies,² and we continue to see adoption increase worldwide.

Much of the growth we saw in header bidding was driven by mobile web. PubMatic found that while mobile web header bidding impressions were just emerging one year ago, mobile web accounted for nearly one-in-five impressions transacted via header bidding in Q3 2016, representing a 14,000% increase year-over-year.

In Q3 2015, the US accounted for 100% of the mobile header bidding impressions we saw flow through our platform. This quarter, other markets emerged globally. While the Americas still represent a majority of the constantly-growing mobile header bidding impressions with 82% share, EMEA has grown to represent 17% share and APAC is just seeing header bidding break through with a 1% share.

It is no surprise that markets globally have been swift to adopt header bidding strategies. Publishers are seeing significant lift from the efficiencies created when all sales channels are able to compete at the impression level. We found that mobile web impressions sold through header bidding received a nearly 50% higher eCPM than the average for mobile web. Buyers, too, are seeing benefits from adopting header bidding strategies. The new buying tactic provides increased opportunities for DSPs to bid on the high-value audiences they are targeting which can ultimately result in improved advertiser campaign performance.

As the programmatic industry continues to evolve toward a future where header bidding strategies are the norm, and while consumers continue to shift towards mobile-first behaviors, mobile header bidding will see continued growth. Header bidding is now table stakes for desktop and mobile web. The next frontier will include bringing “header bidding” beyond the header and into mobile apps, ultimately providing increased opportunities for growth.



TREND #3:

Retail Publishers Saw 230%+ Increase in Mobile Web Inventory Value During the Back-To-School Season

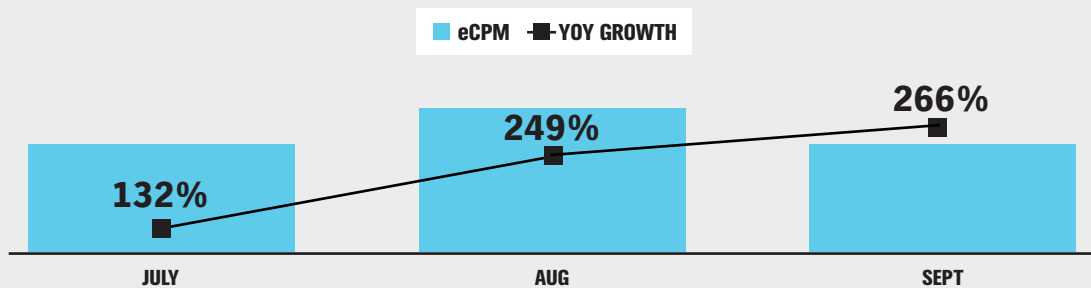
During the Q3 2016 Back-To-School season, retail publishers – those categorized by the IAB as being within the shopping category – enjoyed triple-digit growth in mobile web eCPM. Prices were up over 230% year over year, eclipsing the desktop growth rate of 15% over the same period. Additionally, we saw a rise in the share of impression volume being transacted on mobile devices. The share of total retail inventory that was accessed via mobile web increased by 203% from Q3 2015 to Q3 2016.

The trend of rising inventory volume and higher prices garnered by mobile retail sites this quarter may be due to three complementary factors:

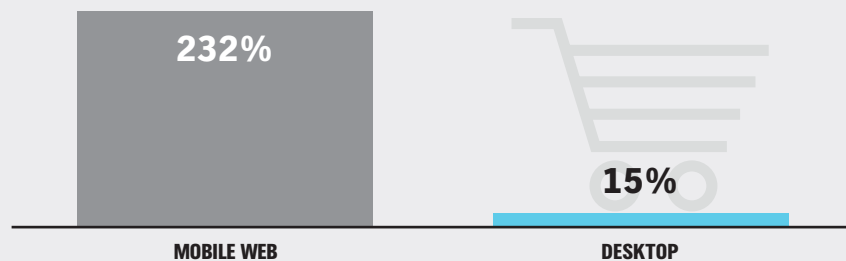
1. Consumers were expected to spend 11% more on back-to-school retail in 2016 than during the prior year.³
2. 30% of ecommerce sales now occur on a mobile device, and that rate is expected to rise to 43% of all ecommerce sales by 2019.⁴
3. Despite the fact that most retail occurred in physical stores, more than half of parents surveyed by Deloitte this Back-to-School season planned to use smartphones to do research ahead of time.⁵

As consumers continue to leverage mobile for either purchasing or browsing, the opportunities will continue to grow for retail publishers to monetize and for advertisers to reach this highly-engaged audience. This is especially relevant as we enter the retail-obsessed Holiday Season, during which eMarketer estimates that 46% of smartphone owners will make purchases on their phone or tablet.⁶ As the tide turns toward mobile transactions, retail publishers and the buyers looking to reach these valuable consumers can expect mobile retail opportunities to continue to rise.

Q3 2016 Retail Publisher Mobile Web eCPMs and YOY Change



Retail Publisher Average CPM YOY Change (Q3 2015 vs. Q3 2016)



TREND #4:

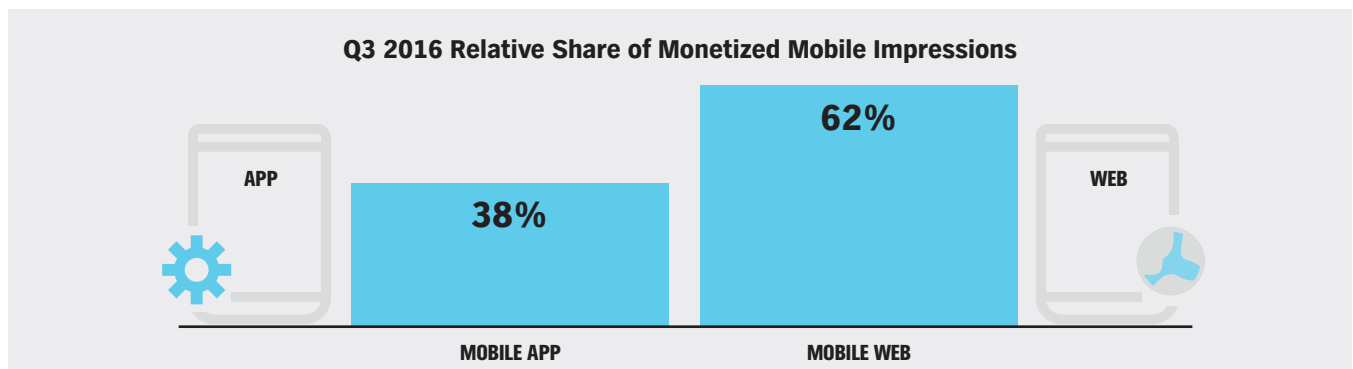
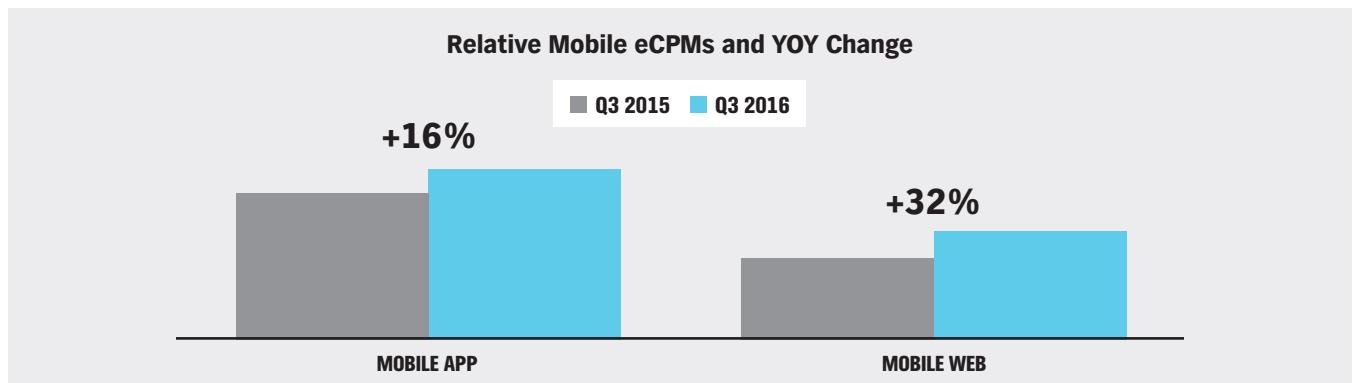
Although Mobile App Inventory Share Increased Worldwide, Mobile Web Monetization Continued to Provide Largest Opportunity for Premium Publishers

Consumer behavior is shifting towards app usage, with a recent comScore study finding that half of smartphone time in the United States is spent on apps.⁷ Despite the fact that the study also found that the vast majority of this time is spent on only five apps, other mobile app publishers have taken advantage of this shift in activity. Mobile app eCPMs have risen 16% year-over-year, and remain 60% higher than mobile web eCPMs. PubMatic also found that the share of mobile ad impressions from apps was up 10 percentage points between Q3 2015 and Q3 2016, closing the inventory gap between app and mobile web. App inventory availability is rising as advertisers demand the ability for precise targeting provided by mobile apps, such as location, device and frequency.

While consumer engagement with apps rises worldwide, mobile web monetization remains the leading

monetization opportunity for premium publishers. Mobile web still represents the largest portion of both mobile traffic and spend, and our data shows that mobile web eCPMs grew twice as fast as mobile app eCPMs between Q3 2015 and Q3 2016, with a growth rate of 32% versus 16% for mobile apps. Brand advertisers often seek premium content environments for their campaigns, and that content is more widely available on the mobile web than in mobile app,⁸ which adds to the growth we are seeing in mobile web eCPMs.

As programmatic gains popularity among brand advertisers, and as consumer behavior continues to shift in favor of mobile internet usage, premium publishers will see increased value from their mobile properties, and should consider partnering with programmatic experts to take advantage of this growing opportunity.



QMI Methodology

PubMatic's yield and data analytics team analyzes billions of impressions on a daily basis, utilizing the company's best-in-class analytics capabilities. The Q3 2016 QMI incorporates impression, revenue and eCPM data from these daily reports to provide a high-level glimpse of key trends within the mobile advertising industry. Data is from calendar year Q3 2016, i.e. July 1, 2016 through September 30, 2016. "Monetized impressions" are defined as impressions that were sold through the PubMatic platform, and "eCPM" is defined as the cost per one thousand monetized impressions.

About PubMatic

PubMatic is the automation solutions company for an open digital media industry. Featuring the leading omni-channel revenue automation platform for publishers and enterprise-grade programmatic tools for media buyers, PubMatic's publisher-first approach enables advertisers to access premium inventory at scale. Processing nearly one trillion ad impressions per month, PubMatic has created a global infrastructure to activate meaningful connections between consumers, content and brands. Since 2006, PubMatic's focus on data and technology innovation has fueled the growth of the programmatic industry as a whole. Headquartered in Redwood City, California, PubMatic operates 11 offices and six data centers worldwide.

PubMatic Contacts

MATTHEW STEWART

Director, Research & Analytics
matthew.stewart@pubmatic.com

JOHANNA BAUMAN

Sr. Director, Marketing Communications
johanna.bauman@pubmatic.com

Sales Contacts

MICHAEL ADAIR

Vice President, Publisher Development,
Americas
michael.adair@pubmatic.com

CRAIG CHINN

Vice President, Customer Success,
Americas
craig.chinn@pubmatic.com

KYLE DOZEMAN

Vice President, Advertiser Solutions,
Americas
kyle.dozeman@pubmatic.com

BILL SWANSON

Vice President, EMEA
bill.swanson@pubmatic.com

JASON BARNES

Vice President, Asia Pacific
jason.barnes@pubmatic.com

Press Contact

PAIGE F. MACGREGOR

Director of Corporate Communications
paige.macgregor@pubmatic.com

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¹ eMarketer, "Strata: Quality, Transparency of Inventory Top Programmatic Buying Fears." November 1, 2016

² Business Insider, "Header bidding gains momentum, drives up publisher ad revenue." May 3, 2016.

³ Advertising Age, "Brands Actually Waited for School to Finish Before Marketing Back-to-School." August 15, 2016

⁴ VentureBeat, "Mobile commerce wars: Apps versus mobile web." September 6, 2016

⁵ Deloitte, "Back-to-school survey 2016." July 20, 2016

⁶ eMarketer, "SessionM: 2016 Holiday Shopping + Mobile Marketing Trends: A Consumer Study." October 2016

⁷ comScore, "The 2016 U.S. Mobile App Report." September 13, 2016

⁸ MediaPost, "In-App Mobile Programmatic Ad Spending Poised To Grow." April 14, 2016.