From:	Nitish Korula [nitish@google.com]
Sent:	11/14/2016 6:41:34 PM
To:	Nirmal Jayaram [nirmaljayaram@google.com]; Max Loubser [maxl@google.com]; David Goodman [davidgoodman@google.com]
CC:	Eisar Lipkovitz [eisar@google.com]; Jim Giles [jimgiles@google.com]; Danielle Romain [dromain@google.com]; Chris Harris [ckharris@google.com]; Max Lin [whlin@google.com]; Bahman Rabii [bahman@google.com]; Sridhar Ramaswamy [ramaswamy@google.com]; Aparna Pappu [apappu@google.com]; Ali Nasiri Amini [amini@google.com]; Lauren Taralli [laurentaralli@google.com]; Jonathan Bellack [jbellack@google.com]
Subject:	Re: Revenue and margin.

[+maxl@, davidgoodman@]

Nitish

On Mon, Nov 14, 2016 at 1:13 PM, Nirmal Jayaram <nirmaljayaram@google.com> wrote:
The gross and net revenue contributions I listed in the email have changed since the time I did the analysis (the DBM portion is higher now). I used the latest percentages in the previous email, so that explains some differences from what we presented earlier. The ballpark of about 30% still seems reasonable though.

On Mon, Nov 14, 2016 at 10:08 AM, Nirmal Jayaram <nirmaljayaram@google.com> wrote:
Regarding why DBM markup made a small change, part of the reason is that we don't make up margins on DBM, so we lost about 60% of the DBM net revenue (i.e, the sell-side component).

Just to give you a quick intuition around the 0,32% row (i.e., sell-side margin is 0, the buy-side adw margin is increased to 32%, the DBM margin is unchanged):

For gross revenue on AdX pubs, Adw, DBM, and other RTB buyers on AdX pubs make up 46%, 32%, and 22% of the total respectively
For net revenue, adw (including buy-side margin), dbm (including markup) and other rtb buyers make up around 50%, 35% and 15% respectively

In the 0, 32% row:
Net revenue goes down by about 0% on adw
Net revenue goes down by about 60% on dbm
Net revenue goes down by about 100% on other buyers

The weighted average of this is about a 30% change in Net revenue.

Of course, if we were able to make up margins on DBM as well, the impact on net revenue would have been around 15%.

On Mon, Nov 14, 2016 at 7:14 AM, Eisar Lipkovitz <eisar@google.com> wrote:
So to summarize, as Chris pointed out, majority of the profit (net revenue) loss comes from reduction in margin, primarily due to loss of margin to non GDN buyers. There appear to be a smaller impact on revenue due to the relationship bet margin and price when pub reserves are at play. The latter appear to be about 1/3 of the margin drop, which is quite substential.

I don't actually understand why adding DBM made such a small change, I thought AdX buyers share of revenue was smaller.

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On Mon, Nov 14, 2016 at 5:26 AM, Jim Giles <jimgiles@google.com> wrote:
Hi Danielle, that is the correct deck. We are working on #1 and should be ready to share soon.

On Mon, Nov 14, 2016 at 12:27 AM Danielle Romain <dromain@google.com> wrote:
On the deck, if I'm not mistaken, it's this one review (go/jedi++2) in Sell-Side Review last week.

Danielle Romain

On Sun, Nov 13, 2016 at 9:21 PM, Danielle Romain <dromain@google.com> wrote:
+ Bellack and Lauren

Hi team,

Would someone mind sharing the deck that we looked at during Thursdays' meeting? I don't think that I have it.

Also sharing a few AIs that I captured from Thursday's Buy- and Sell-side Margin meeting. Let me know if there's anything I've missed. Thanks.

1.   Team to follow-up with the first principles overview of auction dynamics' (bids, floors, first vs. second price) impact on margins.
2.   Based on #1, team may revisit both the model reviewed during the meeting, and other options/knobs for improving competitiveness at sustainable margins.
3.   Team to share take-aways from Jedi++ discussion (also on Nov. 10)
4.   Provide display rev-share overview across buy- and sell-side slices [owner: **Danielle**]

On Fri, Nov 11, 2016 at 8:09 AM, Nitish Korula <nitish@google.com> wrote:
[+whlin also]

On Fri, Nov 11, 2016 at 9:20 AM, Nitish Korula <nitish@google.com> wrote:
Chris, you're spot on about the net revenue changes. That effect is essentially driving the significant net revenue drops.
(Just to point out in case someone asks: One can quibble with a few of the numbers; for example, AdX + DBM is less than 50%, our existing net revenue is less than 32% of gross revenue because of the queries RTB buyers win, etc., but these largely cancel out.)

That said, we're definitely going to see *some* drop in gross revenue (from the cases with publisher-set floors), and publishers will see *some* positive payout increase, so they move in opposite directions. The latter is just because we're transferring some of our margin to them. (But since they get the majority of the existing revenue, any margin transferred has a proportionately smaller impact on them and larger impact on us.)

---More details; can be skipped---
Why do we see a gross revenue drop? It's because at least some prices depend on floors, and then we have the effect of case 2 from Eisar's email. RPO can learn and adjust for the other cases, and we can improve it so it applies to more queries (we hope to get a couple hundred million dollars in incremental revenue from 1H 2016 launches), but it's not perfect. And DRS means we *already* have the benefit of any volume increase from a margin drop.

Especially with features that help with remarketing access / competition with reservations like First Look, and something new we're calling "Optimized Programmatic Competition" to help us get EDA-type access to cases where publishers might be booking HB line items as DFP reservations, the floors that come from these are pretty high, and we already subsidize them quite heavily through DRS. These types of high floors are not often raised further by RPO (typically there are buyside features like a hot cookie list that RPO doesn't know in real time). Lowering the margin here will not result in reserve prices reacting by going up.

(Technical detail for completeness; please feel free to ignore): For these high-publisher floor cases, with lower margins, on the queries not subsidized by DRS, we will lose gross revenue. On the queries subsidized by DRS, our gross revenue will be the same on those individual queries, but we will have used a smaller subsidy, and so we will recover less subsidy on other queries, so our gross revenue will go down indirectly due to these queries as well.)

On Fri, Nov 11, 2016 at 2:15 AM, Chris Harris <ckharris@google.com> wrote:
I'd like to try to simplify reality a bit to describe what's going on in spirit... I'm a cartoonist, basically... :)

Let's look at the (0% sell side margin, 32% buy side margin) row. This is where the margin on GDN won auctions would be unaffected, only auctions won by Adx buyers (including DBM).

Let's further assume no change in who wins each auction due to the margin changes (this is not a great assumption, but it's not horrible either).

In this setup, we're supposed to lose our 20% sell side margin on any query where an Adx buyer or DBM wins. That happens about 50% of the time (revenue weighted). So we expect to lose 20%*50% = 10% of gross revenue. That means a reduction in Google net revenue of $(32\% - 10\%)/32\% = 22\%/32\% = -31\%$.

This is very close to the net revenue chart entry of -29%.

So I think this level of intuition is sufficient to explain the bulk of the net revenue changes column... which is arguably the more important number.

To address gross revenue, it appears we still need to go through and assume that reserve prices react to the margin changes (they should go up if margins go down). If we do that, then Google's Gross Revenue should move more in line with Publisher Payouts, and thus more intuitive.

We'll have to make assumptions on that element, so perhaps showing delta_gross_rev/delta_floor_price is worth doing to see what the sensitivity is to the floor price reaction...?

On Nov 10, 2016 9:49 PM, "Nitish Korula" <nitish@google.com> wrote:

On Fri, Nov 11, 2016 at 12:35 AM, Nirmal Jayaram <nirmaljayaram@google.com> wrote:
Please see the table below on the impact once DBM's markup is added. There is some improvement in the metrics, but not a whole lot (for instance, the -57% in the last row became -52% once DBM's markup is added).

As Nitish clarified, your example 2 is basically what happens in my simulations.

Nitish is referring to the phenomenon where some automated floors (such as from RPO or EDA, if they exist) will learn the drop in margins and increase. So, in your example, an automated floor will change from $3 to $3.19, and the gross revenue will then stay at $3.75. But the net revenue, which is $0.75 in the 20% margin scenario, still reduces to $0.56. So, the impact of these floors adapting is an improvement in gross revenue and a very slight improvement in net revenue.

Thank you, Nirmal. The difference from including DBM was smaller than I expected!
You are of course correct that both RPO and EDA are capable of learning the drop in margins, and increasing the reserve prices they set.

Just to clarify: the 'improvements' Nirmal is referring to are 'improvements compared to the simulated loss' and not 'improvements compared to our current state with existing margins'.

Margin (AdX, GDN)	Gross Revenue	Net Revenue	Publisher Payout
Current	0.00%	0.00%	0.00%
15%, 20%	-1.70%	-7.69%	0.66%
10%, 25%	-3.27%	-15.04%	1.35%
5%, 28%	-4.71%	-22.05%	2.11%
0%, 32%	-6.05%	-28.96%	2.96%
10%, 20%	-3.47%	-22.92%	4.18%
5%, 20%	-5.15%	-37.83%	7.71%
0%, 20%	-6.74%	-52.43%	11.23%

On Thu, Nov 10, 2016 at 9:27 PM, Eisar Lipkovitz <eisar@google.com> wrote:

On Thu, Nov 10, 2016 at 9:02 PM, Nitish Korula <nitish@google.com> wrote:

On Thu, Nov 10, 2016 at 11:40 PM, Nitish Korula <nitish@google.com> wrote:
[+Aparna, Jim, Bahman]

Hi Eisar,

I'm responding inline, which I hope will help:

On Thu, Nov 10, 2016 at 11:15 PM, Eisar Lipkovitz <eisar@google.com> wrote:

It was a fascinating discussion today but I have a bunch of follow up questions I hope we resolve over email.

Let's assume we have a simple proposal where we just reduce margin on the sell side and do not attempt to move margin to GDN to compensate. We go for 20% to 15%.

In that case GDN and all other buyers wouldn't change their bid.

Let's say the floor is $3

1) There was a second price of $5.

Publisher gets paid $4.25 , Google revenue $5.

[Current scheme: $4 & $5]

This is exactly right.

2) Second price lower than $3.

Publisher gets paid $3, Google revenue $3.53

[Current: $3, $3.75]

Can you confirm?

That would be correct if we indeed lowered our buyer reserve price to $3/0.85. But Nirmal's simulation (and he can correct me if I'm wrong) assumes that for a query like this where the highest bid is quite a bit higher than our current reserve of $3.75, there's no real reason to lower the reserve... after all, RPO should detect that the bid will be high and keep the reserve where it currently is. So we would have:
Publisher gets paid 0.85 * 3.75 = $3.19, Google revenue stays at $3.75.

Actually, this was inaccurate, my apologies. Just discussed with Nirmal, and I had slightly misunderstood before. The *simulation* assumes that the publisher-side floor does not change, but the floor faced by the buyer might change due to the drop in margin ,so your example is correct. However, in reality, some of our optimizations will actually keep the buyer-faced floor from some sources unchanged. Nirmal will reply with more details.

Assuming I'm right the results are pretty severe because a drop in margin is equal to a slightly larger drop in revenue first for all cases where the prices set in the auction happened due to Floors, either publisher selected or RPO.

Now a question to Danielle, my "Google revenue numbers" assuming just sell side margin but in practice we charge our buyers on GDN the extra 15%, hence my second example the actual revenue is more like $4.15, right?

The same happens when DBM is the buyer but with a different buyside margin. We need to make sure the numbers we capture account for that.

We will include in our analysis all margin (DBM revshare and AdX revshare) on impressions DBM wins on AdX. Would you like us to also include DBM spend on other exchanges, to get a sense of *total* revenue and margins? (This would not be a part of the simulation output, but we can get some estimate. It won't be perfectly accurate because if DBM spends more or less on AdX as a result of the simulated change in margins, that would affect the budget they have to spend on other exchanges.)

Are you talking about cases where DBM might lose an auction to an AdX buyer due to changes but the $$ will flow to another exchange?

I thought the impact to AdX Buyers and DBM is identical so win rate shouldn't be different.

Obviously if the changes being proposed don't change the winner in the auction you can convince me that this doesn't change the outcome of the analysis.

However when you change buy side margins on GDN, that means our bids get further lowered, which can cause different buyers to win, in all cases they are ones with lower side margins.

Now enter DRS and Bernanke. At this point my memory fails me, but I remember some basics. I think both are schemes where we give up margins in some cases to win volume and recoup that loss in a different query.

Yes, that's correct for both DRS and Bernanke.

I think DRS is for sell side and Bernanke for buyside.

Let's start with DRS, I suspect it gets invoked when floors are used to avoid cases where the auction can't clear. Sounds like you start with a floor which is a "guarantee" (post margin) to be paid to the pub, but instead of sending to the auction Floor/(1-margin), we send a lower or higher number in some cases using a model that predicts what's necessary to clear.

Am I right?

You are almost right here, and if you wait a little while, you will be. :) This is how a 'per-query truthful' version of DRS would work, and Ali has asked us to modify our current implementation of DRS to follow exactly this logic, because it's cleaner for buyers to model / interact with. We are working on it now; the current version adjusts the prices *after the fact* rather than using a model to predict what is necessary. But basically, your understanding follows the right intuition.

If that's the case does DRS really matter if the whole point of today's discussion can be summarized with my 2nd example?

DRS does matter, because that's why lowering the margin doesn't result in more impressions (i.e. matched queries). If there were no DRS, then lowering the margin could result in us clearing more queries, and making up in volume what we lose in revenue or margin per query. But with DRS, we're clearing all queries we possibly can, so we don't clear any more, and lowering margin means we just give up net revenue.

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Eisar

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Eisar

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