Groupon Exercise

1 Gross Billings Estimates

My Gross Billings Estimates for the Local, Goods and Travel segments for 2013 Q4 are as follows:

2013 Q4	North America - Gross Billings Estimates
Local	$372,961,675
Goods	$282,245,671
Travel	$70,552,062
Total Billings	$725,759,408

Calculations and code can be found in the technical appendix.

2 Estimation Approach and Adjustments

This section outlines my estimation approach and adjustments for each segment. Total gross billings was calculated by summing up the gross billings from each segment (product line).

Local

On a very high level, I calculated local billings by grouping the provided data by business line and launch dates and summing over all billings from the local segment. However, I had to work through some adjustments in order to deal with missing data and properly weigh the deals that launched before 2013 Q4, the period in question.

Treating Missing Data

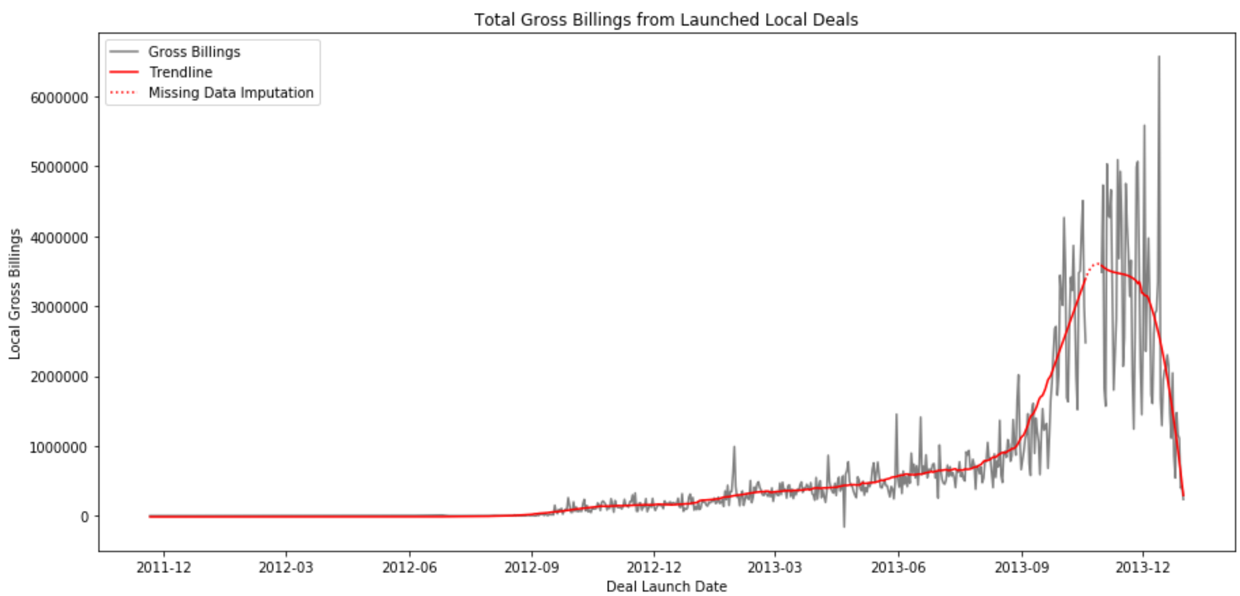
The provided dataset did not include data on local deals which started between October 20th, 2013 and October 30th, 2013 inclusive. To approximate the total billings associated with these deals, I first plotted total billings from the local segment over deal launch dates (provided below). To be clear, this chart *does not* show total billings that occurred on each day. It merely plots the total dollar worth of deals by their start dates. As noted in the assignment instructions, deals can have billings on many days, not just the date the deal started.

Still, this chart is helpful in showing when deals of different size and volume started in the past and may be used as a predictive tool to get a sense of how much billings was lost by YipitData's tracking system. As you see below, there is a general increase in the size of launched deals as 2013 Q4 approaches. The provided data only included deals that were active in at least some part of 2013 Q4, so it makes sense that launched deals would add up faster closer to and during 2013 Q4. Since the end of this quarter marks the end of the holiday season, fewer and fewer big deals launched closer to the quarter end, causing the trendline to drop rapidly.

As you see below, the data contains a good amount of noise in the form of fluctuations in gross billings. This is to be expected as the deals that launch vary in size and number day by day. What is noticeable is that the noise grows significantly during the quarter in question. This must be due to an increase in launched short term deals as well as the increasing proximity of the launched deals to the current date. In order to estimate the billings from the missed deals, I first had to smooth out the noise by fitting a trendline to the data. I used the Savitzky-Golay filter which uses least-squares to fit subsequent windows of data with a low order polynomial. I fitted the sections before and after the missing data separately. Afterwards, I used a quadratic interpolation to connect the trendlines through the missing section. I picked quadratic because I wanted to capture the non-linear increase in gross billings while making sure not to overfit the data and lose sight of the general movements in billings.

I summed up the interpolated (dashed) line over the missing days to come up with an estimate for the total local billings that was missed by the system. I added this amount to my total local billings estimate.

Chart 1: Total Gross Billings from Launched Local Deals



Weighing the deals that launched before 2013 Q4

The task is to find total gross billings that occurred in 2013 Q4. However, for deals that launched before this quarter, billings may have occurred in previous days. Therefore, billings from these deals must be scaled down so as to avoid overestimating gross billings during 2013 Q4. We would ideally need to know the end date of each deal (if any) to find how long it stayed active in 2013 Q4 and properly scale it, but this information is not provided. So, I have made the assumption that all deals that started before 2013 Q4 stayed active through the entire quarter. These are mostly long-term deals and the end of Q4 corresponds to the holiday season, so it would make sense for these deals to stay active through the entire quarter.

The next task in this adjustment is to determine the proportion of billings from these deals that fall within Q4. The provided data only includes total billings for each deal, not billings accrued each day. So I assumed every day after launch date accrued an equal amount of billings with the exception of the holiday season (mid -November till end of December) which I weighed by a factor of 1.35. After observing

Groupon's historic data for previous years, I noticed that billings tended to be about 35% more in December compared to the rest of the year. Hence, I weighed each day of the holiday season by a factor of 1.35 and any other day by a factor of 1.

After estimating the billings accrued each day through the appropriate weight, I added up those billings that fall within 2013 Q4 and combined this number with everything else (total billings from missing deals and deals starting in 2013 Q4)

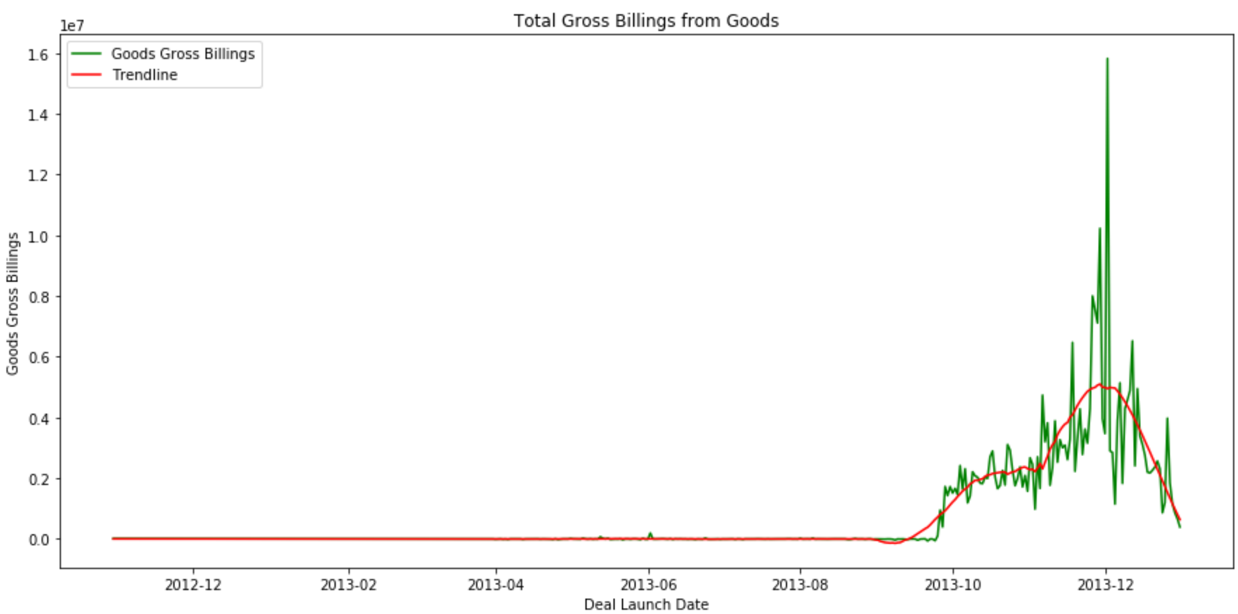
Technically, deals staying active after 2013 Q4 would require a similar adjustment. However, we are pretending it's January 2014, so such deals could not have been active for too long past 2013 Q4. Therefore, any error from this would be negligible.

Goods

The goods data did not need require any adjustments. There were no missing deals. In addition, as seen from the chart below, almost no goods launched before the start of the quarter. Therefore, there was no need to go through the daily scaling that was necessary for local deals.

The gross billings calculation for goods was quite straightforward. I grouped the dataset by business line and summed up all billings from the goods section.

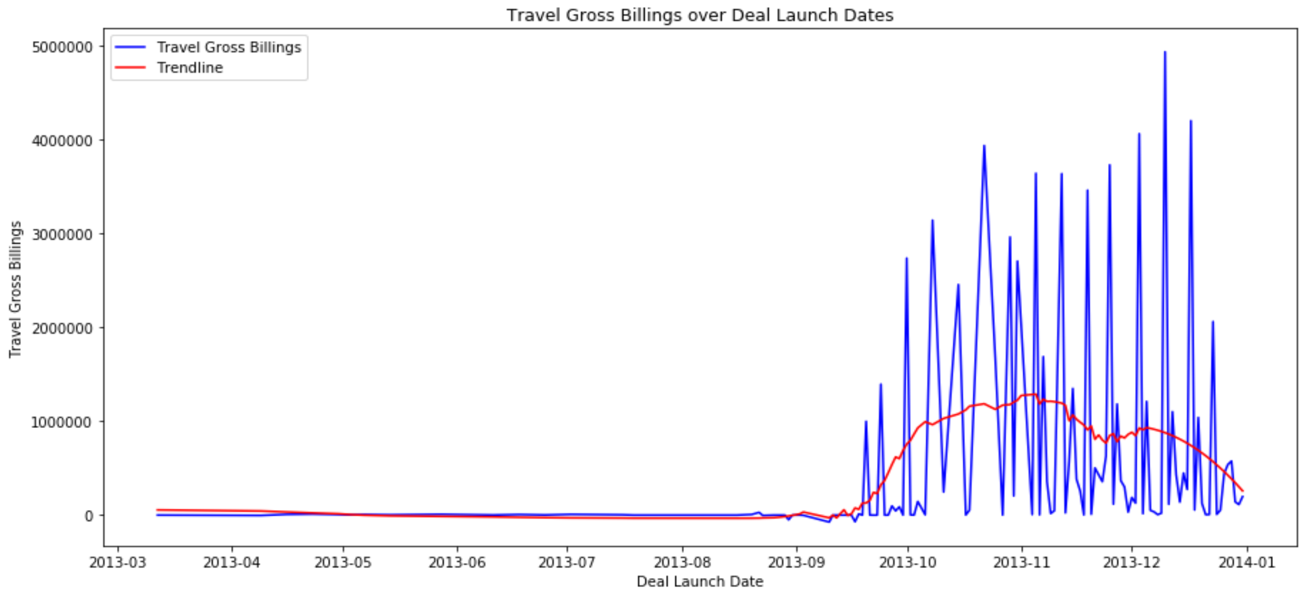
Chart 3: Total Gross Billings from Goods by Launch Date



Travel

Like goods, travel also did not require any adjustments since almost all deals started after the beginning of the quarter (with the exception of a few small spikes) and there was no missing data. Grouping the dataset by segment and summing up all travel billings was sufficient for a gross billing estimate.

Chart 4: Total Gross Billings from Travel Deals by Launch Date



3 Stock Recommendation

I have focused my stock recommendation primarily on North America data in order to simplify my analysis and keep it relevant to my gross billings estimates.

I recommend a moderate buy strategy whereby the investor buys and hedges the Groupon stock through financial derivatives such as put options. While Groupon's business and operations are promising, it faces some challenges that it will need to address in the near future.

One of the key factors I considered is Groupon's growth prospects. From Chart 5 below (end of document), Groupon is visibly on a growth trajectory – albeit there are notable seasonal fluctuations. A striking observation is that my total gross billings estimate was far below the Wall Street average[1]. While my goods and travel estimates very closely align with the Wall Street estimates, it looks like I may have significantly underestimated billings from local deals. While it's difficult to tell why this was the case, it may be because the weight I used to scale and approximate the local billings during the holiday season was not high enough, leading me to allocate insufficient local billings for Q4. I could have used a weight of 4 or 5 which would have brought my estimates closer to the Wall Street ones, however, I could not find any research to justify these numbers and they intuitively felt too big.

Both goods and local segments are estimated to have grown above average in Q4 (by Wall Street estimates) and seem to follow a general growth trend with some seasonal fluctuations (as seen in Chart 6 on last page). On the other hand, growth in travel deals appears to have been stagnant for a long time – yet, this segment only makes up a small portion of total billings relative to the other two, so it does not

[1] Average of JP Morgan and Morgan Stanley estimates. Deustch Bank did not break out billings by segment, so I opted not to use their estimates.

hinder the overall growth trajectory of the company. The Wall Street consensus is that North American ecommerce market will continue to grow and Groupon will be able to claim an increasing share of this market through its growing deal bank and increasing focus on mobile. Furthermore, high barriers to scale make it difficult for others to compete with Groupon in the local ecommerce space. In order to draw more merchants and customers to its platform, Groupon has launched new verticals, merchant analytics, mobile features and is currently working on a new email product for personalized deal distribution. According to a Morgan Stanley survey, a growing proportion of merchants are happy with the Groupon platform and will be returning to the platform to launch new deals – a testament to the success of these Groupon initiatives.

Many challenges affecting Groupon seem to be temporary rather than long term. The increasing transition from email to mobile/website is creating some headwinds as user buying activity in the latter is typically delayed until the user is close to redeeming the deal. Other challenges include disruption from changes in Gmail which Groupon will be increasingly immune to as its customers increasingly transition from email to mobile/website. Groupon also plans to launch more customer analytics on its marketing and distribution channels, which will increase its ability to understand and respond to seasonal fluctuations

A potentially big question mark is that local ecommerce is an up and coming industry and its growth trajectory is fairly uncertain. If Groupon does not go through with its planned initiatives to vary and personalize deal content, it may experience deal fatigue from its customer base, which may hinder long term growth. It also needs to maintain its deal quality which may be difficult to do while growing the platform and bringing in new merchants. Without strong and stable deal quality, it would risk losing market share to competitors like Amazon and eBay.

In summary, I have advised a buy recommendation because Groupon has a growing addressable market and has been increasing its foothold within that market. Furthermore, many of the challenges it faces seem to be addressable through sound business strategy and if carefully managed will not pose a threat to long term growth. If anything, investors could hedge these risks through financial instruments and still benefit from potential rises in the Groupon stock price.

Chart 5: North America – Total Gross Billings

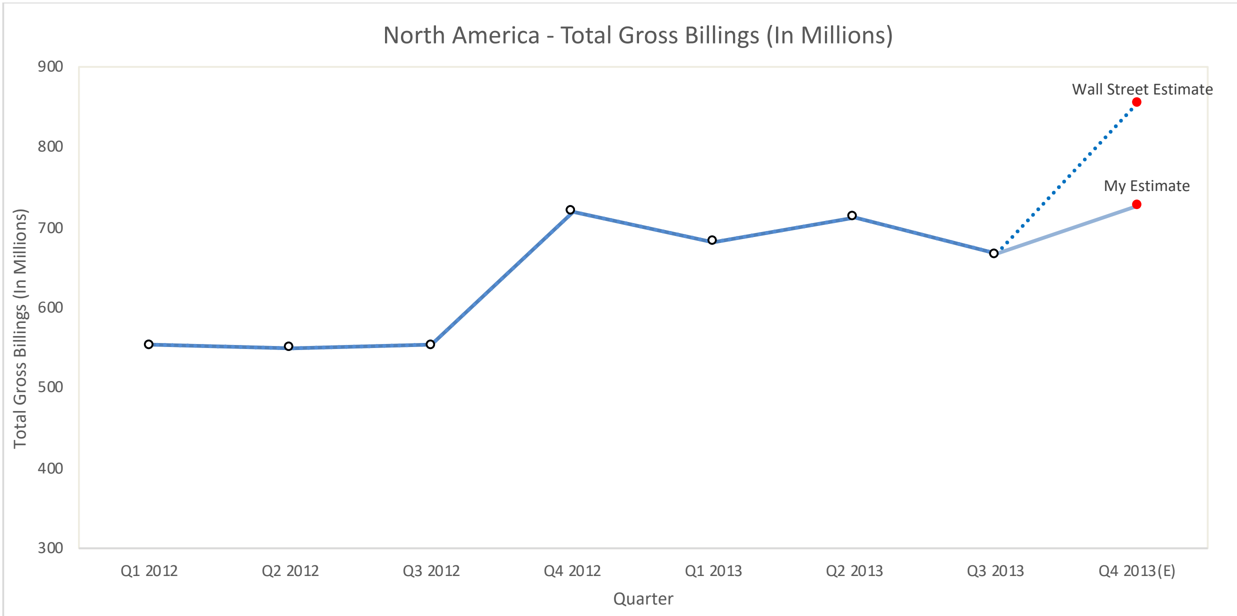


Chart 6: North America – Total Gross Billings by Segment