

%

SMM635 — Data Visualisation

Final course project submission template

Preface

In the following FCP submission document, I assume the role of an audit professional who aims to use data visualization techniques to discover patterns indicating accounting anomalies.

For the same purpose, I have used Wirecard AG (a German payment processing company) as an example for my audit since the company was very recently engaged in an accounting scandal wherein the company's auditors couldn't confirm the existence of EUR 1.9 Bn in cash.

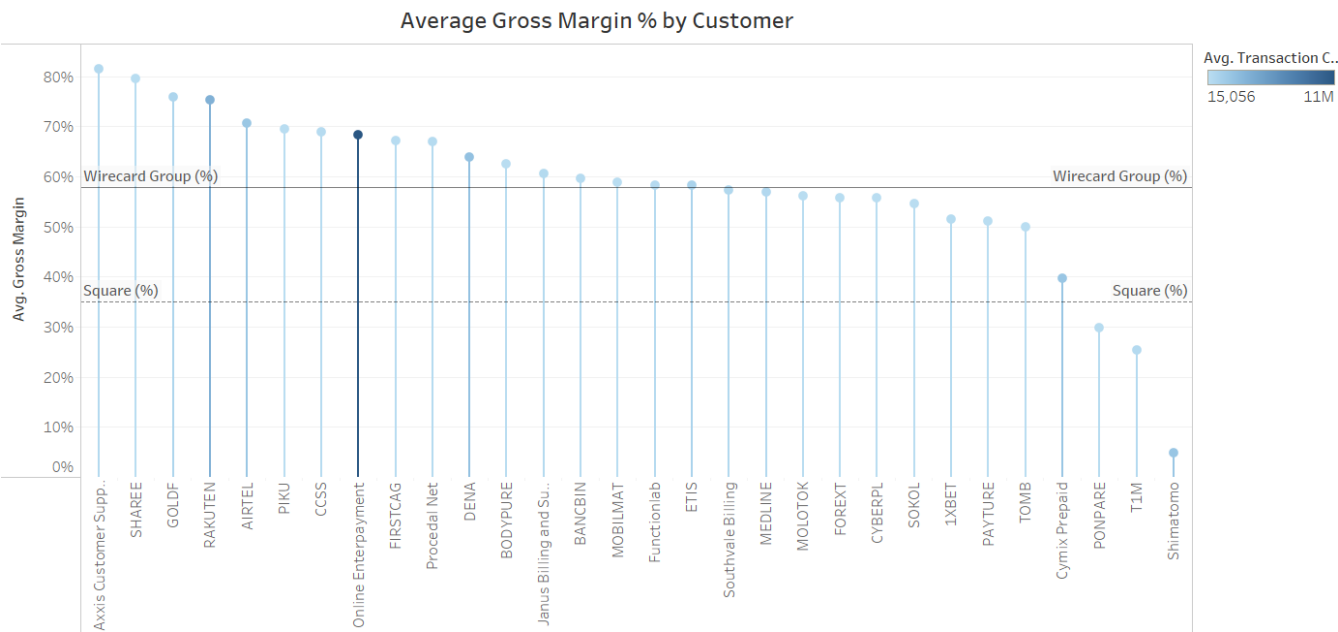
The financial data (for the years 2016 and 2017) analysed has been sourced from internal Wirecard AG spreadsheets published by Financial Times in Oct 2019 (*Dan McCrum, "The Wirecard documents, explained", Oct 15, 2019, <https://www.ft.com/content/6099ad99-0e3b-4337-b20e-647a166aee6e>*), which may have been presumably assessed by the company's auditors as well for the purpose of detecting any accounting misspecifications.

Further, I have also used competitor (Square Inc.) data which has been sourced from SEC exchange filings made in the year 2017. Regarding Wirecard's data, some limitations are as follows:

- The given data is only related to a few financial statement items (though crucial from an audit perspective)
- The data is only related to two of Wirecard's subsidiaries:
 - i. CardPaySystems Middle East (CPSME) – Financial data available from Jan – Dec 2017
 - ii. Wirecard UK & Ireland (WCUKI) – Financial data available from Jul – Sep 2016 and Jan – Mar 2017

Visualization #1

Q1 – How are gross margins of Wirecard’s customers in comparison to its competitors? Do the gross margins have any correlation with transaction volumes?



Visualization #1 - The following lollipop chart shows the avg. gross margins of Wirecard’s customers.

Visualization Description:

The lollipop chart shown above indicates the average gross margin (%) for customers as reported by both the Wirecard’s subsidiaries. Reference lines have also been added showing overall avg. gross margins for both the subsidiaries (both combined referred herein as Wirecard group) and competitor (*Square Inc.*).

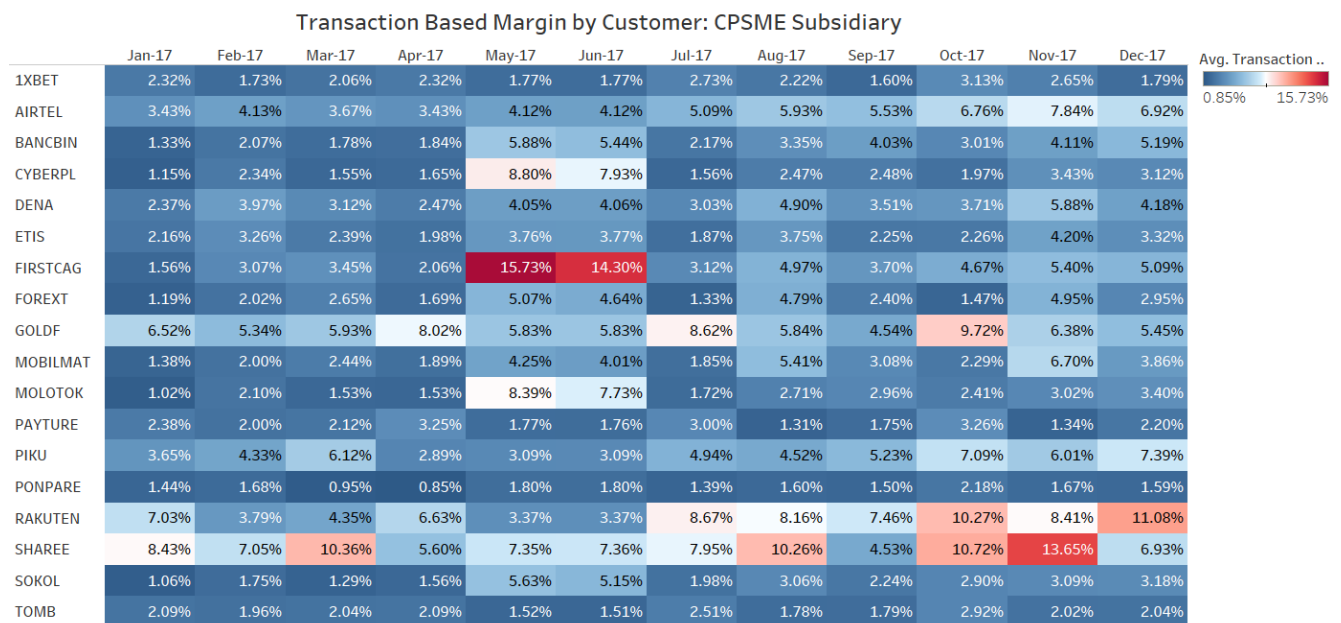
Further, to see whether there is any correlation between the gross margins and transaction volumes for each customer, the lollipop bars have been coloured by average transaction count (darker shades for higher transaction volumes and lighter shades for lower transaction volumes).

Insights:

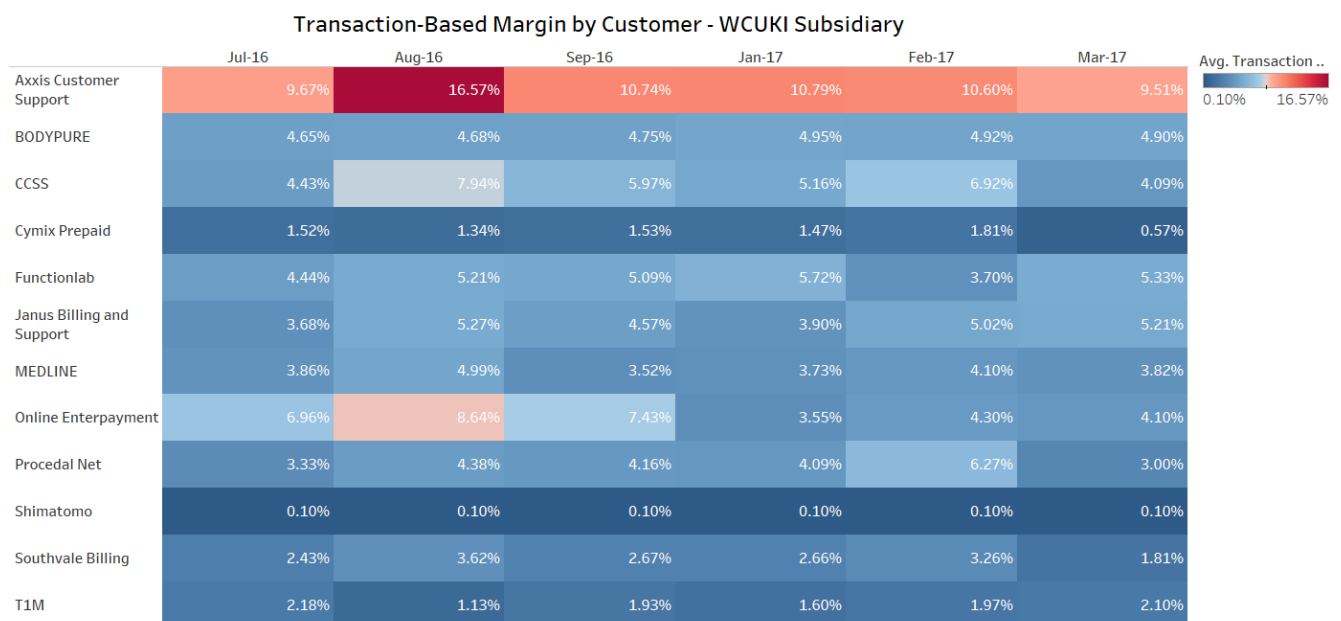
As observed from the data, the gross margins of majority of Wirecard’s customers as well as the overall avg. gross margin of the group is much higher than the competitor listed. Further, there is no relationship observed between the gross margins and transaction volumes of customers. Since these two insights raise questions, we as audit professionals should take them up for further discussions with the client to understand what has been driving such a large variance in gross margins (i.e., as high as 80% to as low as 5%).

Visualization #2 and #3

Q2 – How do transaction margins change for Wirecard subsidiaries’ (CPSME and WCUKI) customers over the financial year? Is it similar across both the subsidiaries?



Visualization #2 - The following chart shows the avg. transaction margins of CPSME subsidiary customers throughout the financial year



Visualization #3 - The following chart shows the avg. transaction margins of WCUKI subsidiary customers for the periods available

For CPSME Subsidiary:

Visualization Description:

The chart shows the average transaction margins (%) of CPSME subsidiary customers over the financial year. The cells of the table have been colour coded by the avg. transaction margins for each customer to assess the trend of margins throughout the financial year (exceptions or large fluctuations have been captured in colours other than shades of blue).

Insights:

As observed from the chart, the most noteworthy margin fluctuations can be seen for *FIRSTCAG*, wherein the margins jumped from 2.06% to 15.73% from Apr-17 to May-17, and reduced from 14.3% to 3.12% from Jun-17 to Jul-17. This, along with other exceptional fluctuations can be taken up with the client for further exploration and discussion.

For WCUKI Subsidiary:

Visualization Description:

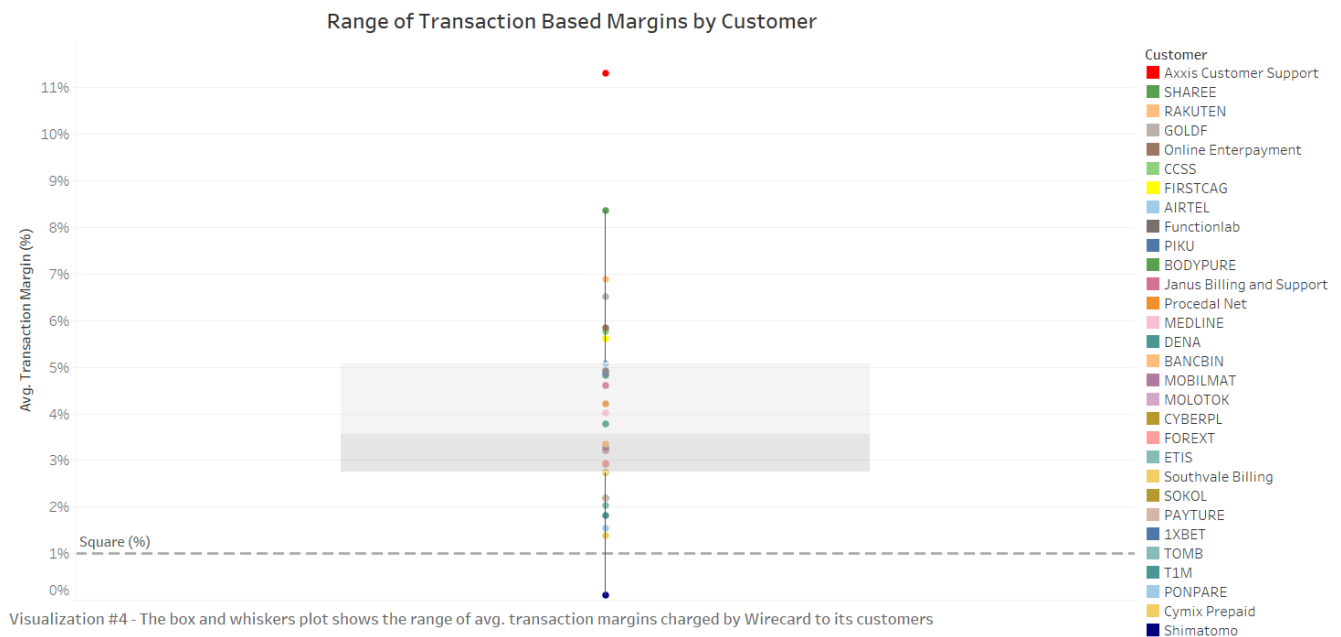
The chart shows similar data to the one written above for CPSME, along with similar colour coding for avg. transaction margin trends. Though, the period for which the margins have been shown is different than CPSME due to limitation in data availability for WCUKI subsidiary.

Insights:

As observed from WCUKI's chart, *Axxis Customer Support* has the highest transaction margins. On the other hand, *Shimatomo* has the lowest margins and is also the only customer with a consistent transaction margin across the period mentioned. Due to such differing margins, it would be useful to discuss the various customer specific policies adopted by Wirecard regarding margins charged to each customer.

Visualization #4

Q3 – What is the range of avg. transaction margins (%) charged by Wirecard to its customers? Are competitor transaction margins comparable?



Visualization Description:

The box and whiskers plot shows the range of average transaction margins charged by Wirecard to its customers. The customer reference for the transaction margin plots have been colour coded and can be found on the legends (the legend for colours has been arranged from top to bottom similar to the way the plots of transaction margins can be observed from the top to bottom).

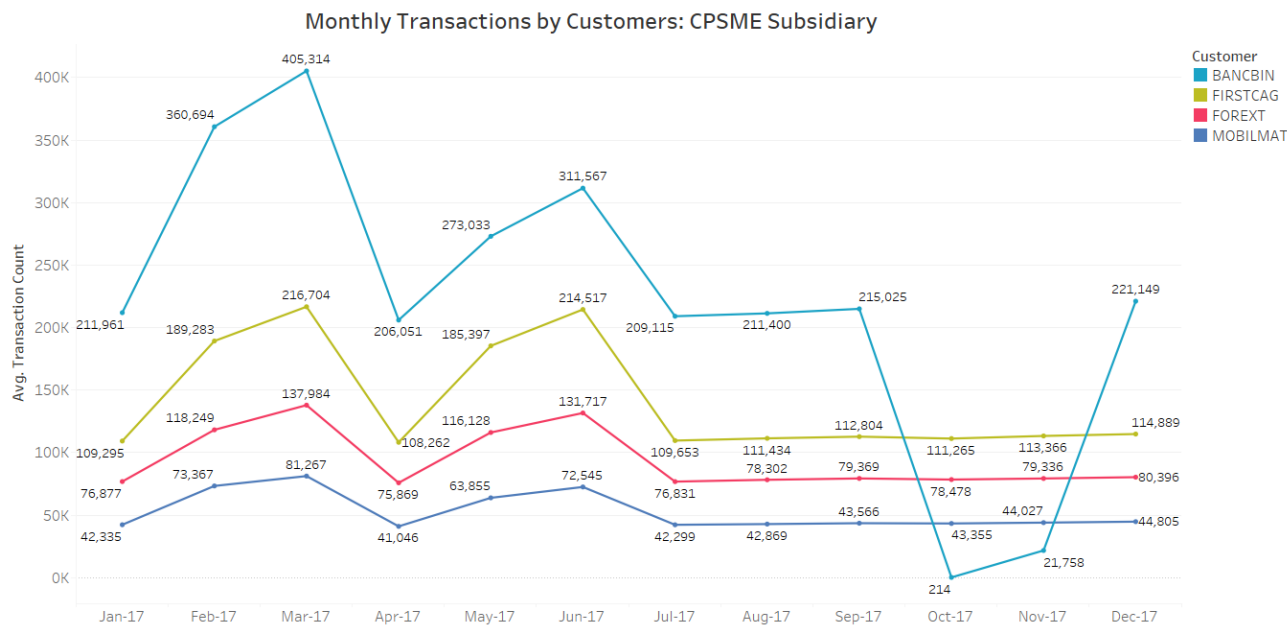
The following box plot allows us to see whether avg. transaction margins charged to customers have any outliers. Also, for comparison purposes, a reference line has been added for competitor's (*Square Inc.*) transaction margins.

Insights:

As observed from the chart above, *Axiis Customer Support* has the highest transaction margin than that of other customers. Additionally, in comparison to the competitor, there is only one customer (*Shimatomo*) which has a lower transaction margin. Therefore, we can conclude that Wirecard's margins appear high for the industry and reasons for the same can be further discussed with the client.

Visualization #5

Q4 – Are there any significant fluctuations in transaction volumes for Wirecard’s customers?



Visualization #5 - The line chart shows the trend of transaction volumes for four customers with similar pattern of transaction volumes over the financial year

Visualization Description:

The line chart above shows the trend of transaction volumes for four of CPSME’s customers. Firstly, customers of only CPSME subsidiary have been considered due to better availability of data. Secondly, only these four customers have been considered for further analysis since they demonstrate large fluctuations in transaction volumes and follow a similar pattern over the year. Another thing to note about these customers is that they have a lower average transaction count in comparison to other CPSME’s customers.

Further, the lines have been colour coded to indicate reference to the customer and transaction volume mark labels have been added to assess the change in volumes month wise.

Insights:

As observed from the chart, all the four customers show a consistent trend of changes in transaction volumes from Jan-17 to Sep-17. From Oct-17 to Dec-17, three of the four customers show a similar pattern of insignificant fluctuations except *BANCBIN*, which experiences a drastic fluctuation in the final quarter of the year (including a reduction of approx. 100% from Sep-17 to Oct-17).

Due to a lower average transaction count, these customers might usually miss scrutiny by an auditor but data visualization techniques have enabled to capture these trends, and can be taken up for further discussion with the client.