Revenue Analytics Challenge

Problem

- Deel is experiencing a decline in the acceptance rate of credit and debit card payments processed by Globepay in the recent period. The “acceptance rate” is defined as the number of accepted transactions divided by the total attempted transactions

Glossary

- The results of tasks 1 to 3 are presented here
- Technical details can be found in the GitHub Repository
  - Task 1 was performed in a jupyter notebook with the help of a profiling eda
  - Task 2 and 3 were solved jointly, by implementing an ETL pipeline with dbt and a local DWH

Task 1

a) Present the volume of declined payments in USD
b) Analyse the root causes for the decline in the acceptance rate
c) Provide well-justified solutions, recommendations, and next steps that you would take if given more time, additional data, and deeper business knowledge.

Task 1: Present the volume of declined payments in USD

Result

- There are 132,672,780.85 USD declined out of 430.271.511,24 USD, resulting in an overall ~69% acceptance rate.

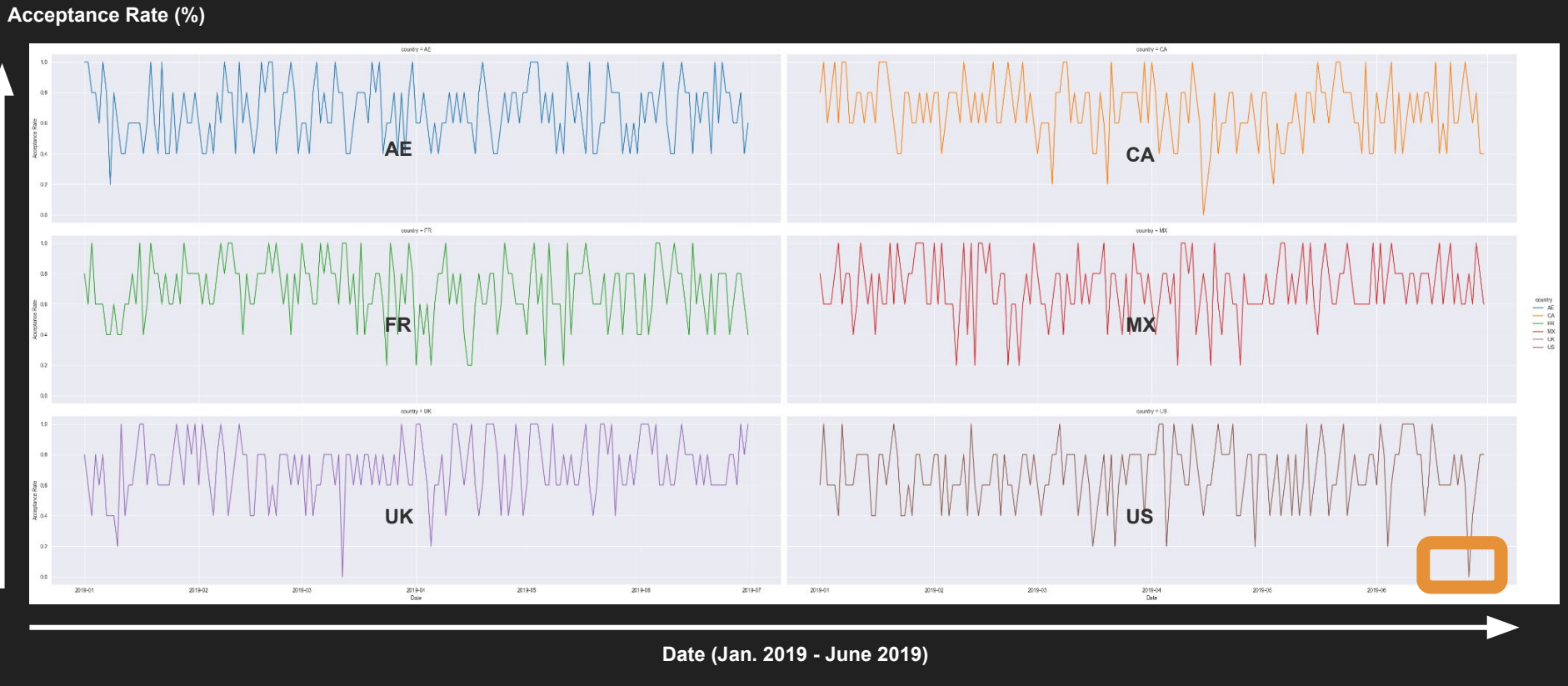
- Note that chargeback (more later) only occurs for accepted payments and therefore wasn't taken into account

- This number seems quite low in general.

Next Steps

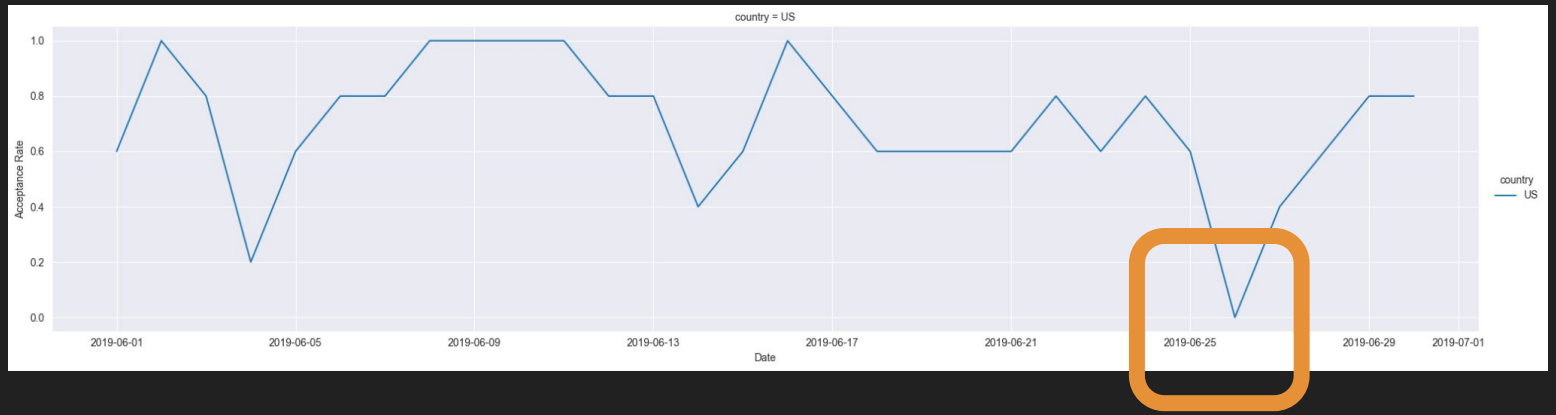
- Let's segment the data according to different time criteria to learn more about the root cause for a recent dip in acceptance rate

We notice a recent dip to acceptance rate = 0% in the US



0 / 5 transactions in the US were accepted on June 26th

Acceptance Rate (%) by day of June in the US



Next Steps:

- Isolate potential root causes with the given data
  - Evaluate impact of provided CVVs
  - Evaluate impact of chargeback
- Recommendation

Task 1: CVV and Chargeback

CVV:

- The CVV is provided < 1% of the time according to our EDA (eda_reports/report_acceptance.html), although it is know to be an important verification mechanism.
- Enforcing CVV more regularily could increase the acceptance rate.

Chargeback:

- Only 4.1% of transactions are being charged back (c.f. eda_reports/report_chargeback.html)
- Chargebacks occur only on accepted transactions
- We also notice that chargeback amounts are very small.
- My knowledge on chargebacks is limited, but at worst it might have to do with fraud. Therefore this is something I must discuss with the responsible stakeholder in order to get a better understanding.

Task 1: Recommendation

Summary of findings:

- 133 million USD were charged back, resulting in an overall ~69% acceptance rate.
- The cause for the recent dip in acceptance rate is due to recent rejections in the US.
- The CVV is almost never provided (<1% of cases)
- Chargebacks occur only in 4.1% of cases, and only for accepted transactions. Need to discuss with stakeholders
- According to the Globepay API, more verification mechanisms are available than presented in the dataset
    - Payment method (e.g. Visa)
    - Expiry month and expiry year can guarantee the card is still valid
    - The accuracy of the Card Holder Name is not very significant in Germany to the best of my knowledge, but could be a relevant verification factor in other countries.

Recommendations and next steps:

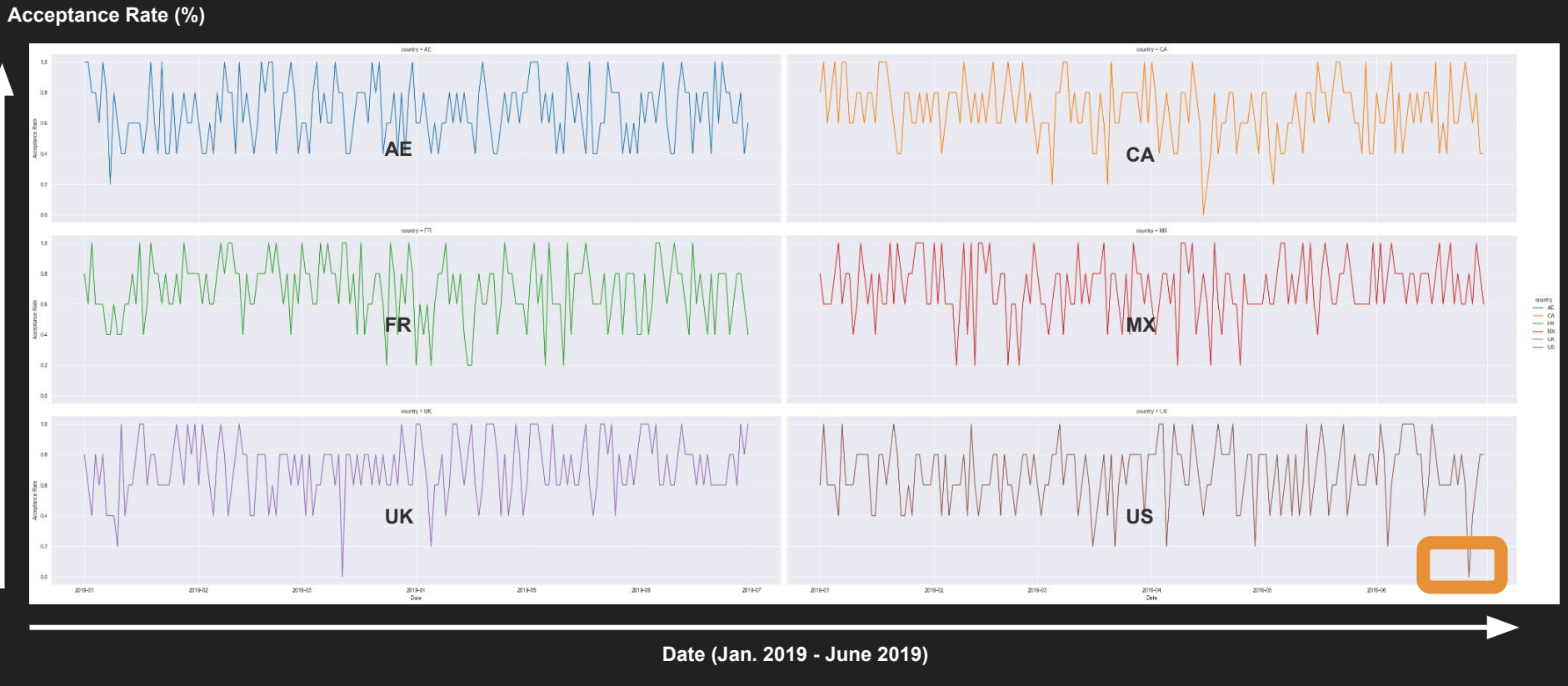
- Enforce the above mentioned verification mechanisms to improve data granularity and eventually the acceptance rate.
- Provide user IDs in order to analyse relationship between acceptance rate and user profile.
- Monitor the Globepay API availability status to ensure failed transactions can be repeated.

Task 2

a) Calculate and present the acceptance rate over time.
b) List the countries where the amount (in dollars) of declined transactions went over $25M
c) Identify transactions from the Acceptance report that are missing chargeback data

The SQL code can be found in the GitHub repository under dbt_warehouse/targets. The resulting data can be found under output_task_2/

Task 2: Acceptance rate over time (from notebook)



Task 2: List the countries where the amount (in dollars) of declined transactions went over $25M

Country	Amount (in USD)
France	33,737,897
UK	27,489,496
Arab Emirates	26,335,152
United States	25,125,669

Task 2: Identify transactions from the Acceptance report that are missing chargeback data

Shortlisted samples (external refs):

_0fqf75KiPa0iiviKCSsU
_0wBrMzAzIhO3fQRWUcBH
_25jZuGDrmwUEdAwKp1xV
_2TnPB1sTeVMRGgPeJgPq
_37l67fDT_R1JwRLapxub
_3bP0LK5iGNfoDqsSVH6d
_41mGNzXrD15Tlma3Wss5

Task 3: Data Lineage and Data Pipeline

- Ingestion/source table(s)
  - Ingested raw data with Vanilla Script into a postgres DWH because of time constraints.
  - Could have used fivetran otherwise
  - Did not use dbt seeds because the purpose of dbt seeds is different, although this would have been the simplest.
- Transformation table(s) - you can have multiple layers/tables as required
  - Staging models available under dbt_warehouse/models/staging/globepay
  - Mart models available under dbt_warehouse/models/marts/payments
- Analytics tables were not used, used marts instead

Note: The output of the models can be found under output_task_2/