BitMEX Violations and Crypto Market Effects

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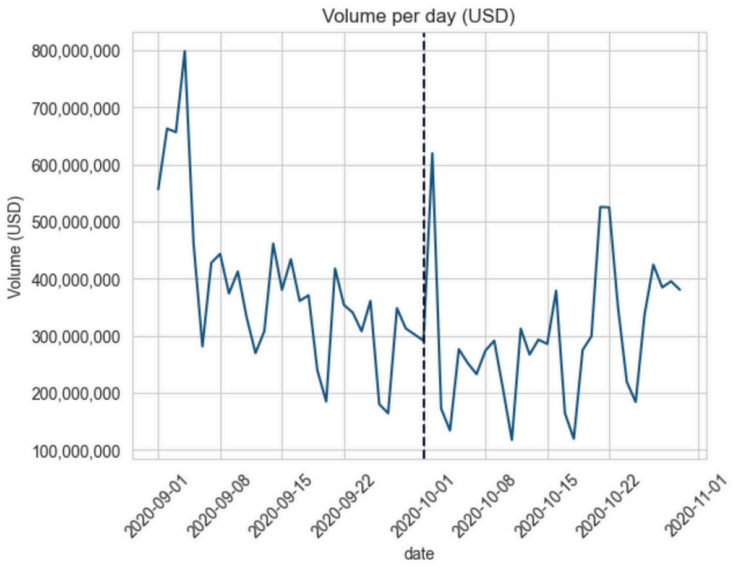
Event Overview

BitMex, a cryptocurrency derivatives exchange platform, was found in violation by the Commodity Futures Trading Commission (CFTC) of numerous US financial laws over almost 6 years. Such violations included: not filing with the CFTC as a Futures Commission Merchant (FCM), failing to implement sufficient anti money laundering and know-your-customer policies, and (illegally) knowingly allowing US customers to use the platform. The extent of identity verification went as far as simply requiring an email address in order to trade, allowing a high level of anonymity of users. And, US traders could simply use a VPN to access the market and get around location restrictions.

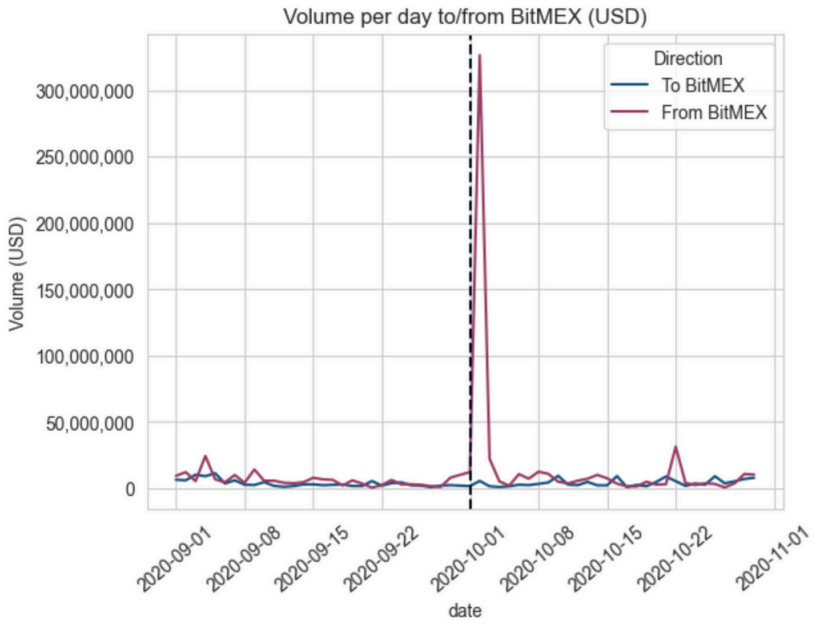
Due to this lack of regulation, the CFTC filed a suit against BitMEX on 1st October, 2020, and our analysis examines the crypto market surrounding this date. Very recently, BitMEX was sentenced to pay $100 million for their past violations, indicating how seriously the CFTC takes anti money laundering and other cryptocurrency trading regulations.

Data Analysis

We began our analysis looking at the entire volume traded in the cryptocurrency market in the weeks surrounding our event to identify any trend influenced by it. As can be seen in the graph “Volume per day (USD)”, that immediately following the action being filed against BitMEX on 1st October, there is a spike in the amount traded in the cryptocurrency market. This spike is followed by a period of a slight decrease in the volume traded overall, with the next week and a half of transactions not exceeding the pre-spike level of around $300,000. BitMEX was a huge derivatives trading platform at the time, so serious action being taken against them influenced the entire market. This could explain why there was a decrease in the entire market’s transactions for the days following the event, though the decrease was quite small and therefore could be due to coincidence.

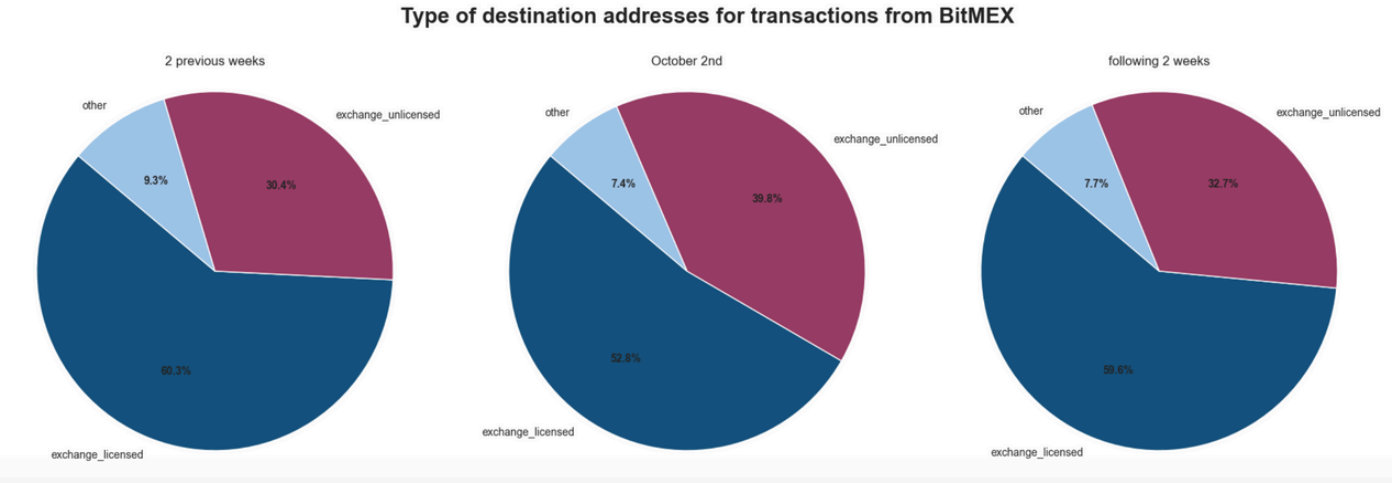


By examining just the transactions in the BitMEX market in the graph “Volume per day to/from BitMEX (USD)”, we can narrow down the driving of this spike to transactions leaving the market, as the “to” transactions remain relatively unchanged, while the “from” transactions dramatically increase. In fact, the change in the entire market volume of transactions the day of the event is around $300,000 ($300,000 to $600,000 according to the “Volume per day (USD)” graph), which means that this change in transactions was comprised essentially entirely of participants closing positions on the BitMEX platform, since it also was about $300,000.



This leads us to speculate that following the CFTC action being announced, BitMEX market participants panicked from impending legal regulation and lost trust in the platform, pulling their investments.

Upon further breakdown of what type of people were liquidating their assets, we created the following series of charts to see the “from” destination address types 2 weeks before the event, the day of the event, and 2 weeks after to observe any changes.



In the 2 weeks before the event, licensed exchanges destinations comprised about 60% of “from” transactions, unlicensed exchanges were about 30%, and all other destinations made up the rest (individually small enough to be irrelevant to our analysis, so all were combined into one

group). Immediately after the event, the proportion of unlicensed addresses rose to almost 40%, while licensed addresses dropped to 53%. The proportions returned to close to pre-CFTC action levels in the 2 weeks following, with 60% being licensed addresses and 33% unlicensed. This phenomenon indicates that potentially suspicious entities sold their positions with an investigation and regulation crackdown looming.

Conclusion

We investigated the price of Bitcoin at the time of the event but despite the notable activity in other measures we explained here, there was very little change in the price itself so it was not something we delved into with our analysis. Although it is suspicious that despite a leading trading platform being significantly impacted, overall the market remained relatively stable. This could be due to the overall crypto bubble forming due to the COVID-19 pandemic mitigating setbacks such as the BitMEX case, as investors simply turned to competitors like Binance instead of pulling out of the market completely.

Clearly there was an effect on the cryptocurrency market following the public announcement of BitMEX's regulatory irresponsibility, as we explained in this report. That effect seems to be concentrated on the BitMEX platform itself as traders moved away from it, especially unlicensed ones, instead of heavily impacting the entire cryptocurrency market for a significant length of time. This could be due to the more impactful rising popularity of cryptocurrency in general at the time, which would reinforce the notion that cryptocurrency is more reactive to public sentiment than to anything tangible.

AML Assignment 1

Lorenzo Dufour, Matthew Hardy February 11, 2025

We will focus on the action filled by the CFTC on October 1st, 2020 against BitMEX for violations of the Bank Secrecy Act (BSA) by failing to meet AML and KYC standards, which resulted in a US$100 Million fine on January 15th, 2025. The firm as been recognized guilty to have "Willfully Flouted U.S. Anti-Money Laundering Laws to Boost Revenue" (DOJ)

The following analysis has been performed on a dataset provided by Dott. Francesco Ambrosini.

Libraries

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from matplotlib.ticker import FuncFormatter
```

Data import

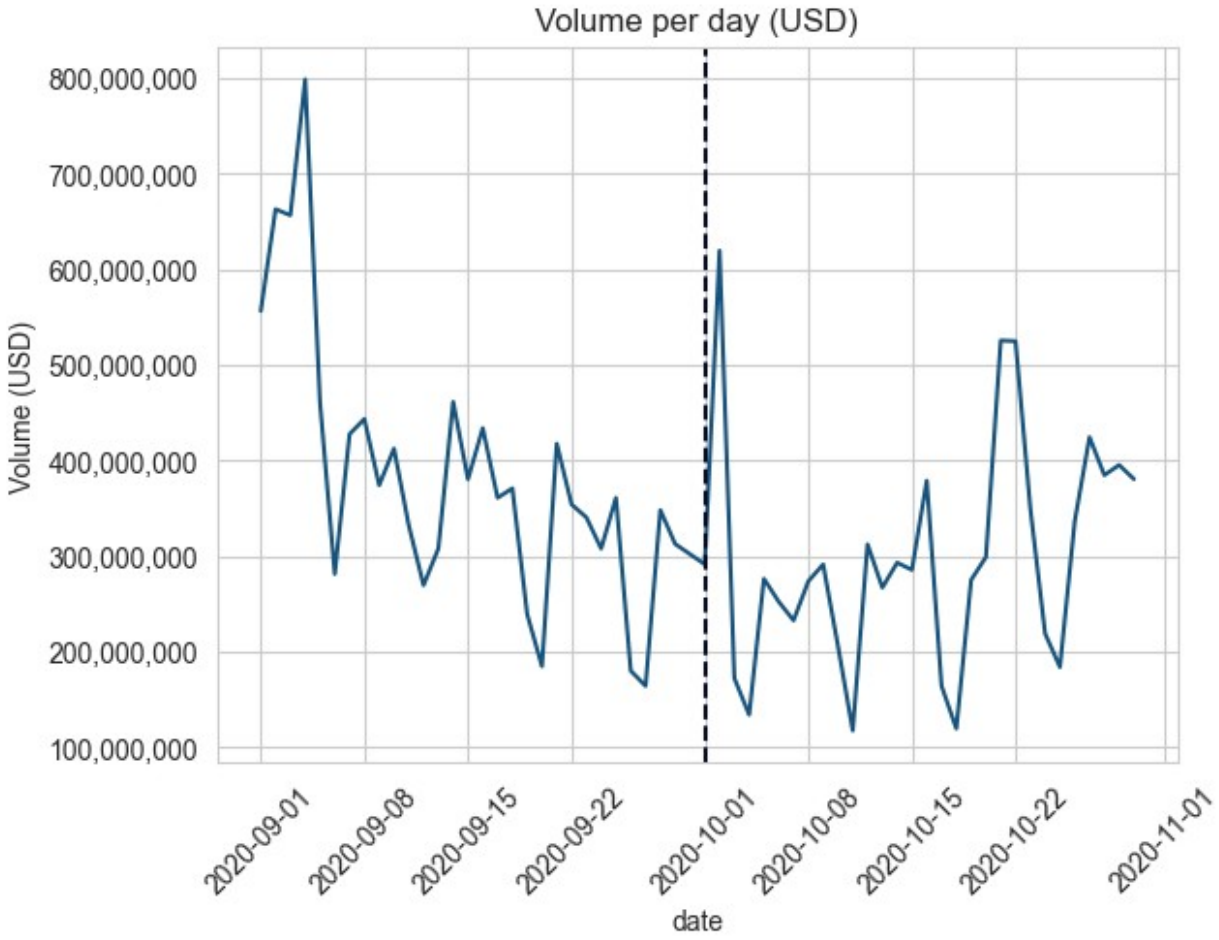
```
data = pd.read_csv("./crypto_synth.csv")

data['date']=pd.to_datetime(data['date'])

# Filter data for period and columns of interest
data = data[(data['date']>='2020-09-01') & (data['date']<='2020-10-
31')]
data = data.drop(['direction', 'volume', 'mean_tx', 'DM_to',
'DM_from'], axis=1).reset_index(drop=True)
```

Volume Analysis

Whole Market

```
# total volume_USD per day
vol_day = data.groupby('date')['volume_USD'].sum().reset_index()

sns.set_style("whitegrid")
g = sns.lineplot(x='date', y='volume_USD', data=vol_day,
color='#16537e', legend=False)
g.set_title('Volume per day (USD)')
g.yaxis.set_major_formatter(FuncFormatter(lambda x, pos:
'{:,.0f}'.format(x)))
plt.xticks(rotation=45)
plt.axvline(x=pd.to_datetime('2020-10-01'), color='#0b0f25',
linestyle='--')
```

```
plt.ylabel('Volume (USD)')
plt.show()
```

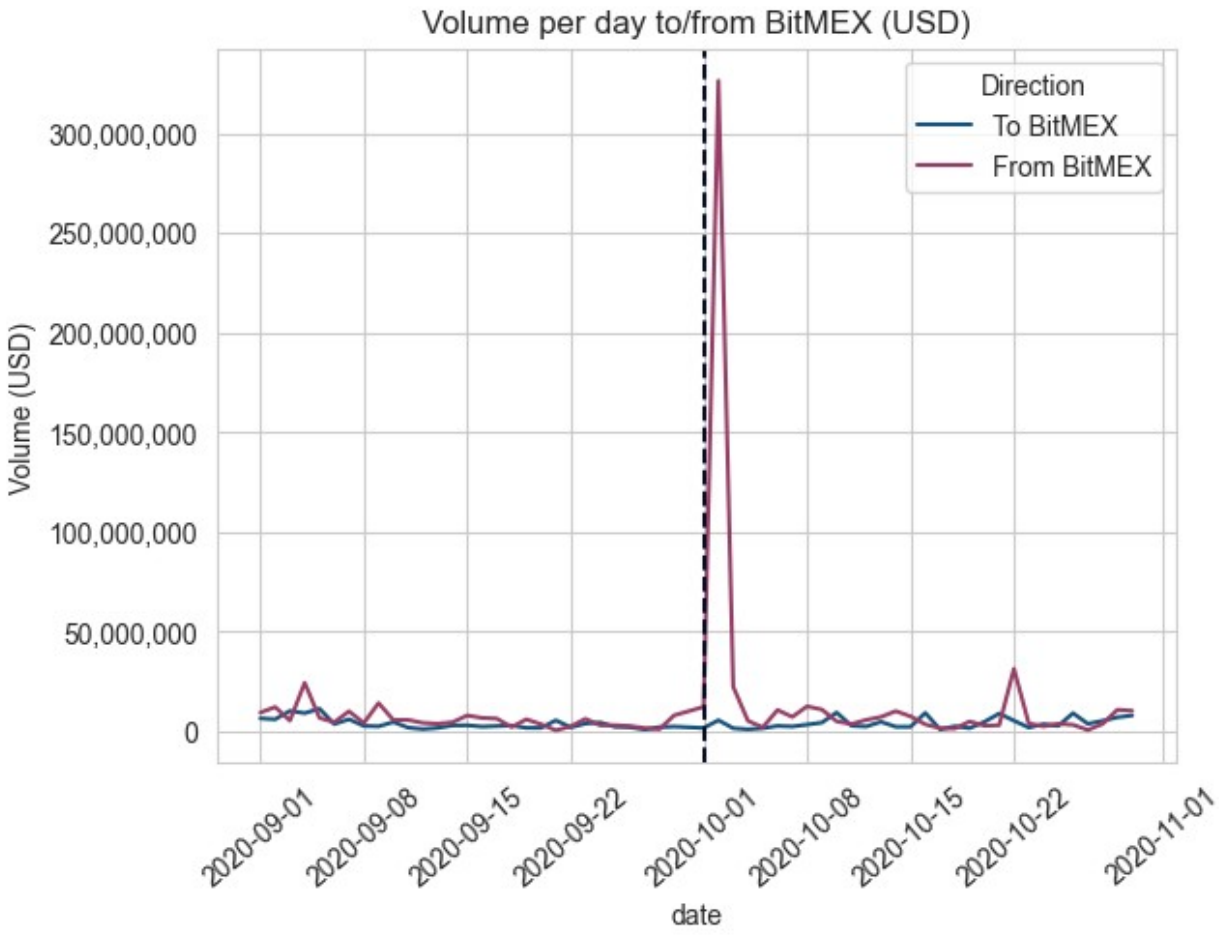


A spike of `volume_USD` can be identified on Oct. 2nd, 2020, the day after the CFTC publicly announce its action.

BitMEX

```
# Subset data for tx from and to BitMEX
vol_day_toBM = data[data['name_to'] == 'BitMEX'].groupby('date')
[['n_tx', 'volume_USD']].sum().reset_index()
vol_day_fromBM = data[data['name_from'] == 'BitMEX'].groupby('date')
[['n_tx', 'volume_USD']].sum().reset_index()

# Merge data and melt+rename for plotting
vol_day_BM = vol_day_toBM.merge(vol_day_fromBM, on='date',
how='outer', suffixes=['_to', '_from'])
vol_day_BM = pd.melt(vol_day_BM, id_vars='date',
value_vars=['volume_USD_to', 'volume_USD_from'], var_name='to_from',
value_name='volume_USD')
vol_day_BM['to_from'] =
```

```
vol_day_BM['to_from'].replace({'volume_USD_to': 'To BitMEX',
'volume_USD_from': 'From BitMEX'})

sns.set_style("whitegrid")
g = sns.lineplot(data = vol_day_BM, x = 'date', y='volume_USD',
hue='to_from', palette=['#16537e', '#993d66'])
g.set_title('Volume per day to/from BitMEX (USD)')
g.legend(title='Direction')
g.yaxis.set_major_formatter(FuncFormatter(lambda x, pos:
'{:,.0f}'.format(x)))
plt.xticks(rotation=40)
plt.axvline(x=pd.to_datetime('2020-10-01'), color='#0b0f25',
linestyle='--')
plt.ylabel('Volume (USD)')
plt.show()
```



Focusing on `volume_USD` to or from BitMEX, the spike is even clearer. Considereing the discrimination between from and to transactions, it can be said that this unusual high volume is due to a spike of transactions from BM, i.e. out of BM.

Coin Analysis

Coin Comparison

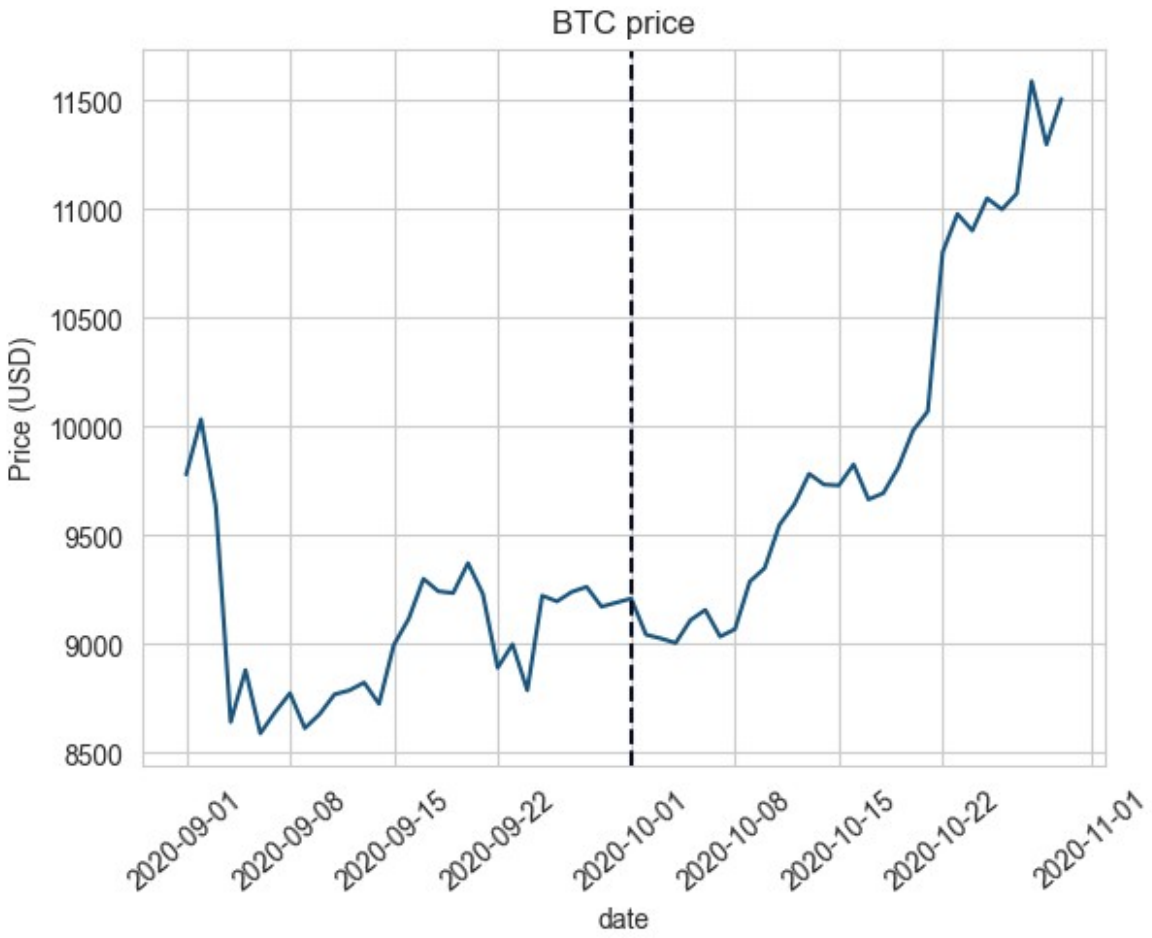
```
BM_tx = data[data['name_from'] == 'BitMEX']\
    .groupby(['date', 'blockchain'])[['n_tx', 'volume_USD',
'mean_tx_USD']]\
        .agg({'n_tx':'sum', 'volume_USD':'sum',
'mean_tx_USD':'mean'}).reset_index()

BM_tx['blockchain'].unique()
```

```
array(['BTC'], dtype=object)
```

Only Bitcoin transactions were made on that period on BitMEX, no coin comparison analysis to be done.

Coin Price

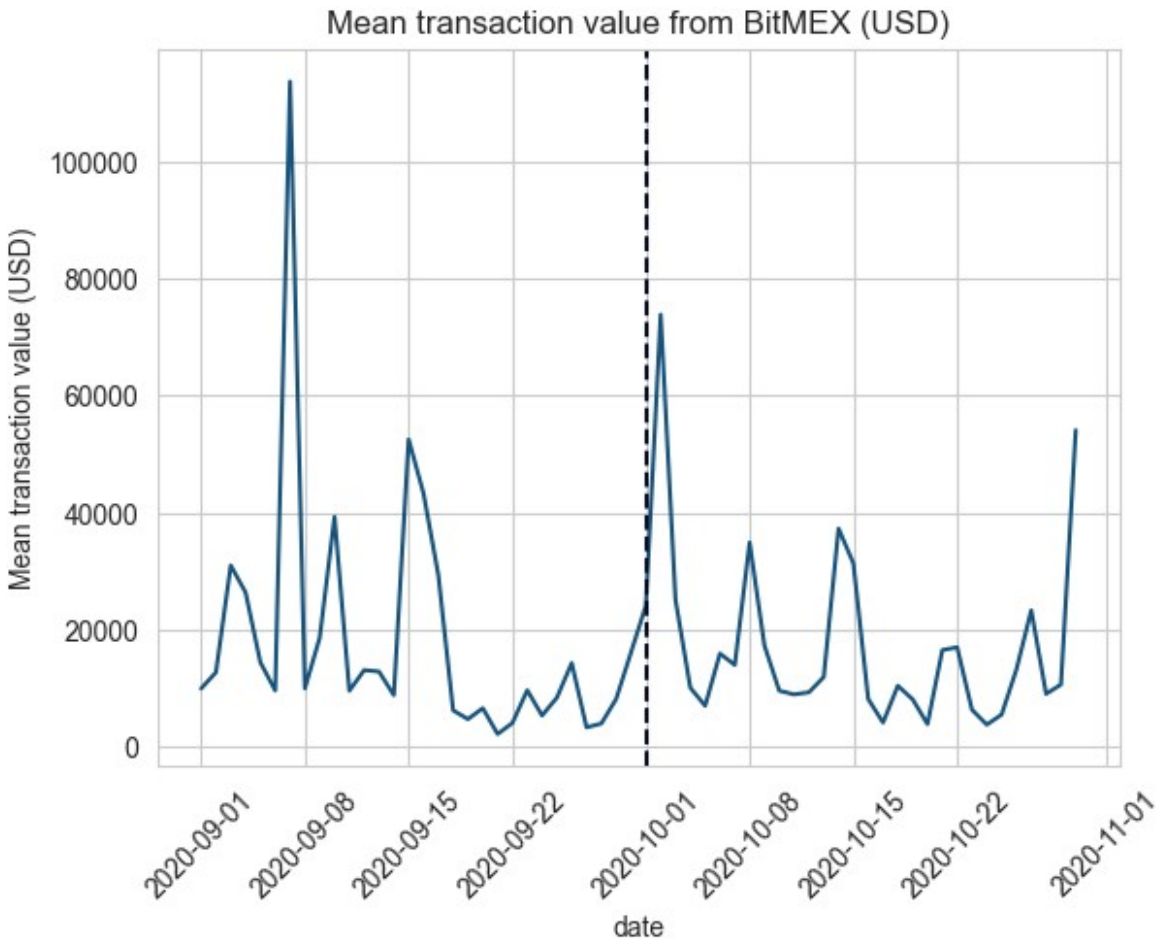
```
# Import BTC price data downloaded from CoinMarketCap
btc_price = pd.read_csv('BTC_price.csv', sep=';')

btc_price['timeOpen'] = pd.to_datetime(btc_price['timeOpen'])
btc_price = btc_price[['timeOpen', 'open', 'marketCap']]
btc_price.columns = ['date', 'btc_price', 'btc_marketCap']

# Set UTC time for BM_tx to avoid merging issues
BM_tx['date'] = pd.to_datetime(BM_tx['date'], utc=True)
BM_tx = BM_tx.merge(btc_price, on='date', how='left')

sns.lineplot(data=BM_tx, x='date', y='btc_price', color='#16537e')
plt.title('BTC price')
plt.ylabel('Price (USD)')
plt.xticks(rotation=40)
plt.axvline(x=pd.to_datetime('2020-10-01'), color='#0b0f25',
linestyle='--')
plt.show()
```



No clear change in BTC price explaining the spike of transfers to be found.

Transaction Value Analysis

```
sns.set_style("whitegrid")
sns.lineplot(data = BM_tx, x = 'date', y='mean_tx_USD',
hue='blockchain', palette=['#16537e'], legend=False)
plt.title('Mean transaction value from BitMEX (USD)')
plt.xticks(rotation=45)
plt.axvline(x=pd.to_datetime('2020-10-01'), color='#0b0f25',
linestyle='--')
plt.ylabel('Mean transaction value (USD)')
plt.show()
```

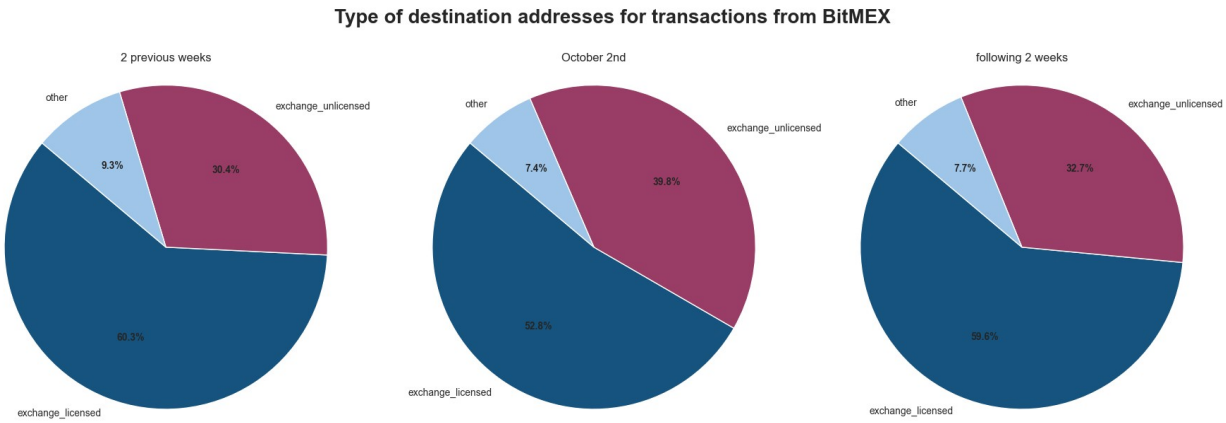


There is a spike in `mean_tx_USD`, but not outstanding considering the spike of Sep 7, 2020.

Transaction Destination Type Analysis

```
# Subsets for before, on, and after specific dates
from_BM_up_to_oct1 = data[(data['date'] >= '2020-09-18') &
(data['date'] <= '2020-10-01') & (data['name_from'] == 'BitMEX')]
from_BM_oct2 = data[(data['date'] == '2020-10-02') &
(data['name_from'] == 'BitMEX')]
from_BM_as_of_oct3 = data[(data['date'] >= '2020-10-03') &
(data['date'] <= '2020-10-16') & (data['name_from'] == 'BitMEX')]

# Function to group values and plot a pie chart
def plot_pie(ax, data, column, title):
    data.loc[:, column] = data[column].apply(lambda x: x if x in
['exchange_licensed', 'exchange_unlicensed'] else 'other')
    counts = data[column].value_counts()
    wedges, texts, autotexts = ax.pie(counts, labels=counts.index,
autopct='%1.1f%%', colors=sns.color_palette(["#16537e", "#993d66",
"#9fc5e8"]), startangle=140)
    ax.set_title(title)
```

```
    for text in texts + autotexts:
        text.set_fontsize(10)
    plt.setp(autotexts, size=10, weight="bold")
    ax.axis('equal')  # Ensure that the pie chart is drawn as a
circle.

# Create a figure with a grid of subplots
fig, axes = plt.subplots(1, 3, figsize=(18, 6))

# Plot the pie charts
plot_pie(axes[0], from_BM_up_to_oct1, 'type_to', '2 previous weeks')
plot_pie(axes[1], from_BM_oct2, 'type_to', 'October 2nd')
plot_pie(axes[2], from_BM_as_of_oct3, 'type_to', 'following 2 weeks')

# Add a suptitle with a larger font size and bold font weight
fig.suptitle('Type of destination addresses for transactions from
BitMEX', fontsize=20, fontweight='bold', y=1.01)

plt.tight_layout()
plt.show()
```



There is a clear change in `type_to` repartition on the vicinity compared to the spike day (Oct 2, 2020).