Uber’s Take Rate

1) Introduction:

Ridesharing companies have recently come under increased scrutiny with regard to fair wages and the employment status of drivers. California has completely disrupted the gig economy by passing Assembly Bill 5, which forces companies to hire workers as employees, rather than independent contractors. Uber and Lyft were not exempt from the bill. These regulations could raise business costs by around 30% per driver for ride-sharing companies. New York City’s Taxi and Limousine Commission voted to enact a $17.22 minimum wage after expenses for rideshare drivers after the commission found that nearly 20% of drivers receive food stamps and 40% receive Medicaid. While state and local authorities attempt to provide financial security to gig workers, the gig economy still fails to provide a safety net for its participants. This research aims to draw attention to issues related to driver pay and the employment status of drivers by closely examining driver trip data. A large goal is to empower driver decisions by giving them easily consumable data about how much they make and their experience driving for ridesharing companies.

Currently, Uber doesn’t provide a simple way for drivers to understand their data. The Uber Driver website remains inaccessible to a driver — it is slow and hard to navigate. To this end, I have built and published a Chrome Extension where Uber drivers can give permission to the extension to access their driver data. With this data, I implemented a straightforward and
user-friendly interface for drivers to visualize their trips, wages, and geographic reach. This all helps to provide drivers with a higher-level understanding of their experience working for ridesharing companies.

The motivation for the research follows from a study conducted by Jalopnik. The study used a data set of 8,962 Uber driver trips where trip receipts were manually submitted. Uber’s take rate is defined as the percentage of the rider fare they are taking. Jalopnik found that Uber’s take rate was 35%, substantially higher than the reported take rate for 2018 of 21.7% and 19% for the second quarter of 2019. Some problems with this study, however, include driver bias in choosing to submit receipts where Uber had a high take rate (such as shorter, surge charge trips). Taking all the trips a driver has done eliminates this problem, which is what the chrome extension I have built does. Many drivers have completed over 500 - 2,000 trips, so collecting data from a few drivers will lead to a larger and potentially better dataset than many existing studies. The research I conducted is from one driver who has completed over 1,000 trips in the last two years.

2) Implementation and Data Collected:

There were a lot of challenges with getting the data. The implementation needs to be user-friendly enough that drivers can figure out how to use it to send their data. However, it also needs to still be trustworthy — it can’t just be Javascript code that’s injected into the browser. A chrome Extension was a good choice because it is vetted and approved by Google and it only has certain permissions like which pages it can access and what data it can access.

The chrome extension has been accepted by Google is available on the Chrome store:

https://tinyurl.com/uberAnalyzer
It has two steps for authentication. First, the driver must sign into their https://partners.uber.com account and then sign into their Google account to authenticate with Firebase and ensure they are the only ones to write to their data tables and read from their data tables.

Instruction Page:

The driver will have to read and agree to a consent form before using the chrome extension. This page appears before when they first download the extension.

Sign in method (top right-hand side of the browser):
Firebase was chosen as the database solution because it provides security rules paired with Firebase Authentication to easily ensure authenticated users can only read and write to their own data.

The data is organized by drivers in a “drivers” collection then a document holding the individual Google User ID (a UID) of each driver. Each UID holds two collections (statements and trips).

Each of which corresponds to individual statements and trips.

Statements -> Individual Statement Data

Drivers -> User Ids

Trips -> Individual Trip Data

An example of statement data:

```json
{
  "statementId": "ffffffff-ffff-fffff-fffff-fffff-ffff",
  "tripData": [
    {
      "Trip_ID": "000000-0000-0000-0000-0000000000",
      "Date_Time": "Friday, December 3, 2019 9:00 AM",
      "Base_Fare": "$1.40",
      "Distance_Earnings": "$2.00",
      "Time_Earnings": "$2.25",
      "Tip": null,
      "Instant_Pay_Fees": null,
      "Total": "$5.65",
      "Type": "UberX",
      "Wait_Time": null
    },
    {
      "Trip_ID": "111111-1111-1111-1111-1111111111",
      "Date_Time": "Friday, December 3, 2019 9:20 AM",
      "Base_Fare": "$1.40",
      "Distance_Earnings": "$1.70",
      "Time_Earnings": "$1.90",
      "Tip": "$1.00",
      "Instant_Pay_Fees": "-$0.50",
      "Total": "$5.50",
      "Type": "UberX",
      "Wait_Time": null
    }
  ],
  "tripIds": [
    "000000-0000-0000-0000-0000000000",
    "111111-1111-1111-1111-1111111111"
  ]
}
```
A statement holds trips a driver conducted in a similar timeframe. There is often one to two statements per day with individual trip times close to the start and end of the previous one. For each trip in a statement, the statement holds some basic trip data such as how much the driver made on the base fare, earnings on the distance of the ride, earnings on how long the trip took, tip when the trip started, and more. Overall, the benefit of a statement is that driver trip data grouped by statements can be used to estimate hourly wages as it shows how long the driver was active on the app and conducting trips.

An example of the trip data:

```json
{
    "Trip_ID": "000000-0000-0000-0000-0000000000",
    "Driver_Breakdown": {
        "Base_Fare": "$1.40",
        "Distance_Earnings": "$2.00",
        "Time_Earnings": "$2.25",
        "Tip": null,
        "Surge": null,
        "Total": "$5.65"
    },
    "Rider_Breakdown": {
        "Rider_Price": "$10.05",
        "Tip": null,
        "Total": "$10.05"
    },
    "Uber_Breakdown": {
        "Service_Fee": "$1.7",
        "Booking_Fee": "$2.4",
        "Total": "$4.1"
    },
    "Other_Breakdown": {
        "Total": "$0.3"
    },
    "Distance": 2.16100000,
    "Duration": 600,
    "Pickup_Address": "X St, Norwalk, CT 06905, US",
    "Pickup_City": "Norwalk",
    "Pickup_State": "CT",
    "Dropoff_City": "Stamford",
    "Dropoff_State": "CT",
    "Dropoff_Address": "X St, Stamford, CT 06902, US",
    "Dropoff_Time": 1500000000,
    "Formatted_Distance": "2.16 mi",
    "Formatted_Duration": "10min 0sec",
    "Pickup_Distance": 0.5,
    "Pickup_Duration_In_Seconds": 100,
    "Requested_At": 14999999900
}
```
From each trip, there is a breakdown of how much the rider paid, how much Uber received, how much the government received, and how much the driver was left with as a fare. Connecticut consistently charges a $0.30 ridesharing fee which shows up in the other breakdown category. Each trip also has the distance of the trip in miles, duration in seconds, pick up address and drop off address, which I parsed by city and state and added to the data. It also has a pickup distance, pick up duration, and the time of the request — these values are valuable in computing a real hourly wage as they should be factored into both the expense of gas and time for the driver. The rider’s tip can be negative which means that a rider was given a promotion by Uber to take a trip. This happens in around 10% of trips -- it means that the driver is burdened with the Uber rider promotion.

The chrome extension runs in a background page which means it can run whenever chrome is open. It works by requesting permission from the user for access to any Uber subdomain and for cookie access. With these permissions, the extension can extract two driver cookies (a CSID and a SID). The extension makes post requests by page for all the statement IDs (can get ninety-nine at once). Then with all the statement IDs, the extension asynchronously downloads a CSV of each statement in batches of nine statements. Each CSV is converted to an object and is sent to Firebase under the driver’s user id. In each statement, CSV is a trip ID, which is used to make another request to get all the trip data. The trip data is then parsed from the HTML and sent to Firebase. Then the background page waits ten seconds and does this process again. The extension cannot asynchronously request all the statements at once because this would cause requests to fail and eventually Uber would rate limit the requests. It takes about
five minutes per thousand trips to process and send to Firebase. After this process is complete, a permanent local storage value is set so that the extension doesn’t request data again.

As previously mentioned, the partners.uber.com (the driver portal) is very poorly implemented. It takes a minimum of three plus seconds to view any individual statement than another few seconds to get any individual trip. It may take a while to load because of large fonts, an intentional delay in the server and/or poor design with lots of unnecessary data stored in the HTML that is not displayed.

On the website interface for viewing data, the same Google login is required to ensure the security of the data. This is the first point of entry for the user to see their data.

Landing page for https://uber-analyzer-view.herokuapp.com/

This login with Google is also authenticated with Firebase so a user can only request data for their specific user id. When they login, all their data is requested, analyzed, and displayed in graphs and tables on the frontend. I’ll discuss this further in the results section.

Some limitations with this approach include the fact that it requires a Google account, Google Chrome, and an understanding of how Chrome works.
3) Results:

All these results appear on the driver portal website.

Some interesting findings for this driver going through the 1026 trips:

The total take rate Uber took (total money Uber made / total money riders paid): 28.82%

In 2018 this was 30.28% (807 trips)

In 2019 this went down by 5% to 24.93% (212 trips)

This is substantially higher than the reported take rate Uber has on their earning reports for 2018 of 21.7% and 19% for the second quarter of 2019. However, it is reducing at a rapid rate.

A heavily requested table from drivers is the average profit made on trips of varying length. The profit is the driver’s fare subtracted by the cost of gas for a trip.

<table>
<thead>
<tr>
<th>Trip Length</th>
<th>Average Profit ($)</th>
<th>Average Profit / Mile ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.106</td>
<td>4.482</td>
</tr>
<tr>
<td>2</td>
<td>3.768</td>
<td>2.559</td>
</tr>
<tr>
<td>3</td>
<td>4.740</td>
<td>1.966</td>
</tr>
<tr>
<td>4</td>
<td>6.160</td>
<td>1.743</td>
</tr>
<tr>
<td>5</td>
<td>6.83</td>
<td>1.530</td>
</tr>
<tr>
<td>6</td>
<td>8.969</td>
<td>1.615</td>
</tr>
<tr>
<td>7</td>
<td>9.124</td>
<td>1.422</td>
</tr>
<tr>
<td>8</td>
<td>9.935</td>
<td>1.331</td>
</tr>
<tr>
<td>9</td>
<td>10.49</td>
<td>1.241</td>
</tr>
<tr>
<td>10</td>
<td>12.716</td>
<td>1.357</td>
</tr>
<tr>
<td>11</td>
<td>12.846</td>
<td>1.226</td>
</tr>
<tr>
<td>15</td>
<td>15.125</td>
<td>1.198</td>
</tr>
</tbody>
</table>

Figure 0: Average Profit per trip length
Figure 0 can be a helpful indicator for a driver to know how much they are actually making on certain trips. This shows the actual amount of money made on each trip subtracting out the variable costs. Car insurance and the amortized cost of the car are the costs that a driver frequently knows and they can think of those as fixed costs as they are not relative to how much they drive. As one can see, the average profit per mile goes down. This is because the starting cost of a $1.4 base fare that the driver receives and the $2.4 booking fee Uber receives is spread out across more miles on a trip.

![Uber Take Rate By Trip Length In Miles](image)

**Figure 1: shows trip lengths effect on the take rate**

Figure 1 shows Uber’s take rate for trips that are <1 mile long are 45.9% and this decreases to 16.2% for trips that are 65+ miles long. The high take rate for short trips is explained by less driver time spent driving and the upfront fee Uber charges to use the service. For longer trips, drivers spend more of their time driving, so they should be better compensated for that time by earning a higher percentage of the fare.
Morning is defined as 6 am to 2 pm, afternoon is from 2 pm to 10 pm, and night is from 10 pm to 6 am. As seen in Figure 2, driving in the afternoon is the least profitable for nearly every trip length. The effects even out for longer trips with less clear benefits being seen.

Figure 3 shows driving at night is more profitable for short trips compared to driving in the morning and afternoon. Trips less than 1 mile at night net profit on average of $3.53 and trips less than a mile in the morning net profit $2.29.
Figure 4 shows how much a driver is earning on an average trip from cities. It heavily favors long trips as they will have a much higher average earning per trip. This would be an interesting graph to compile globally for a large set of drivers to see areas where people are leaving and taking long trips.

Figure 5 shows how much a driver is making on an average trip by the number of hours they work per week. For a low number of hours worked per week, the driver’s low average profit per trip is influenced by having many shorter trips. With more analysis using the statement data on the wait time to get to a destination, this graph can be extended to gain an estimation of hourly wage by hours worked per week. It is likely this is an upside-down U shaped distribution as
working more hours on the platform results in more promotions being earned and eventually working more hours leads to less profitable work hours and locations.

Some statistics drivers see on this interface so they can see how much they’ve really earned driving for Uber:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>This Year's Earnings</td>
<td>$4,000</td>
</tr>
<tr>
<td>Total Amount Riders Paid Excluding Tips</td>
<td>$19,200</td>
</tr>
<tr>
<td>Total Amount You've Made Excluding Tips</td>
<td>$14,000</td>
</tr>
<tr>
<td>Total Amount Uber Received</td>
<td>$5,500</td>
</tr>
<tr>
<td>Total Amount Others Received</td>
<td>$260</td>
</tr>
<tr>
<td>Your Total Share of all Rider's Payments</td>
<td>69.8%</td>
</tr>
<tr>
<td>Your Average Share of a Trip</td>
<td>55.3%</td>
</tr>
<tr>
<td>Uber's Total Share of all Rider's Payments</td>
<td>28.8%</td>
</tr>
<tr>
<td>Uber's Average Share of a Trip</td>
<td>42.3%</td>
</tr>
<tr>
<td>Others’ Total Share of all Rider's Payments</td>
<td>1.4%</td>
</tr>
<tr>
<td>Others’ Average Share of a Trip</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Figure 6: table showing a breakdown of how much a driver has earned working for Uber and how much Uber has earned working with this driver.

Figure 6 shows this driver is keeping about 70% of total fares and 55% of average trip fares.

Additionally, Uber is keeping about 29% of total fares and 42% of an average trip’s fares (as a large number of the 1026 trips are short trips).

Overall, more data from drivers is required to make any substantial claims and to do more segmented analysis on hours worked per week, trip length, time of day worked, and arrival and destination city.
4) Risks and Challenges:

There are many privacy concerns with this project. This had to go through IRB approval because of the sensitive nature of the data and the contracts Uber drivers sign. Each driver signs a Partner Agreement and these are the relevant sections to my study:

5.2: You shall not, and shall not allow any other party to: (b) modify or make derivative works based upon the Uber Services or Driver App; (c) improperly use the Uber Services or Driver App, ... or “scraping” or otherwise improperly obtaining data from the Uber Services or Driver App;

6.1: Confidential Information includes Company Data, Driver IDs, User Information, and the transaction volume, marketing and business plans, business, financial, technical, operational and such other non-public information of each party that such party designates as being proprietary or confidential or of which the other party should reasonably know that it should be treated as confidential.

Section 6.1 poses the question about how much ownership does the driver have over their own data. The driver should have some ownership over their own data as they are involved in creating the data. In reference to 5.2, the Chrome Extension is scraping the driver’s data from the partners.uber.com website and is thus likely not in agreement with this clause. However, Uber appears to be concerned with real time data related to their on-demand service, which a competitor may use to harm its current business. They refer to a Driver App which is the mobile application provided by the company used for the “purpose of seeking, receiving and fulfilling on-demand requests for transportation services.” The data I’m collecting is not related to the Driver App.

The IRB suggested that it does not showcase a great legal concern as the data will be anonymous, only accessible by the driver and viewable by the driver. The only data that is global
between drivers is a take rate measurement. The committee explained it still possess an ethical question that they are still continuing to decide on.

Overall, legal challenges have been a roadblock in publishing the chrome extension on Uber forums to obtain more data and benefit more drivers with more consumable data on their work for Uber.

5) Future Work:

A frequently cited May 2018 report published by the Economic Policy Institute found the median wage for Uber drivers after expenses and fees is $9.21 an hour. This study came to this conclusion by estimating the wages off weekly driver hours (not of real wage data). This study was based on Uber’s old formula for calculating how much a driver would make off base fare plus a per-mile and per-minute rate. This doesn’t take into account surge, tips, or actual trip data. The data set that the chrome extension would gain can be used to calculate real wages by examining Uber statements (collections of grouped trips) where the driver was readily on the app, waiting for trips. The real driver trip receipt data grouped by statements can be used to estimate hourly wages.

In the future, I will create a cloud function that goes through all the driver data and updates the global take rate per driver. Going forward I want to release this extension and accompanying website onto relevant Uber forums to get drivers to participate. I will do this pending IRB approval.
6) References:


7) Useful Links:

Chrome Extension:

https://chrome.google.com/webstore/detail/uber-analyzer/lldighfpegpcmcknhcoemldpeembjl

Website:

https://uber-analyzer-view.herokuapp.com/

Consent Form:

https://www.dropbox.com/s/fifdyqbuod7a2mv/Consent%20Form.pdf?dl=0

Github:

https://github.com/asoni98/uberAnalyzer