

MKT/DSO 566 Marketing Analytics  
Project Report  
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## Visa Market Research

Leveraging Advanced Analytics to Improve Visa's Competitive  
Positioning and Drive Product Development



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## **Table of Contents**

<b>Table of Contents</b>	<b>2</b>
<b>Executive Summary</b>	<b>3</b>
<b>Marketing Analytics Research Scope (Section 1)</b>	<b>4</b>
<b>Existing Data Research (Section 2)</b>	<b>5</b>
<b>Survey Design and Data Analysis (Section 3)</b>	<b>7</b>
<b>Visa Recommendation Strategy (Section 4)</b>	<b>13</b>
<b>Analytics Research and Future Plans (Section 5)</b>	<b>16</b>
<b>Appendix</b>	<b>18</b>

## Executive Summary

This project focuses on using advanced analytical techniques to evaluate and deliver effective marketing recommendations for Visa. Visa is a financial services company that facilitates electronic fund transfers across the world through credit, debit, and prepaid cards. Through VisaNet, Visa processes up to 65,000 transactions per second and has quickly grown to the market leader in the digital payment space. However, the competitive landscape is crowded between other large processes (American Express and Mastercard), traditional payment methods (cash), innovative payment ideas (cryptocurrency), and growing fintech companies (Stripe). Our goal was to understand Visa's current positioning from customer perspectives and deliver marketing strategies backed by data-driven insights to deliver recommendations that continue to establish Visa as the global leader.

Our analysis focused on two different sources of data: existing source data through Google trends/Twitter feeds and a 15-minute survey completed by 76 respondents. Through Google Trends analysis, we identified Visa as a leader over its competitors and generally favorable over cash. Our text analytics identified a mainly positive sentiment towards Visa, with credit card customers feeling a high level of trust to effectively complete their transactions.

Our survey consisted of frequency and satisfaction, perceptual mapping/positioning, and demographic questions. Using these fields, we leveraged four advanced analytics techniques -- segmentation, multidimensional scaling, factor analysis and perceptual mapping, and target marketing models -- to drive new insights for potential customers. Our segmentation, using attitudinal responses, created three unique customer segments (the Best Deal Hunters, the Traditionalists, and the Early Crypto Adopters) and personas that could be used as a basis for creating personalized marketing content. Factor analysis powered a perceptual map of Visa and competitors to see where Visa was strong and weak in the market relative to other players. Multidimensional scaling revealed the strengths and weaknesses of different payment methods in the minds of consumers. Lastly, we constructed a target marketing model to predict an individual's likelihood to be receptive to a credit card offer and identified a 4.8x increase in profits over a random marketing model.

Following insights derived from our analyses, we recommend that Visa release a CryptoCard product as an innovative way to build their brand positioning versus competitors and capitalize on exciting new financial technology opportunities. Visa's existing reputation as a reliable company with esteemed customer service will allow them to ease consumer distrust around crypto, especially when new offerings are marketed in personalized ways for each customer segment. By integrating cryptocurrency capabilities into a card, Visa can transform perceptions of crypto from a volatile and inaccessible investment prospect to a legitimate and attractive substitute for traditional currency, and lead the financial services industry into a new era.

Our Google Trends and Twitter analytics were useful in identifying broad consumer sentiment, though lacked depth. Our survey data was richer in depth but lacked breadth with only 76 respondents. Our research would benefit from additional data such as internal transaction data and results from past marketing campaigns. We also believe that this research would benefit from greater scope to gather more survey data and leverage cyclical use of data sources.

## **Marketing Analytics Research Scope (Section 1)**

### **Visa is in the Center of the Financial Technology Industry**

The Financial Technology environment is growing exponentially, and the electronic payment industry has proven to be a key driver for this growth. As the world's leader in digital payments technology, Visa fuels the dream of a cashless future that enables individuals, businesses, and economies to thrive. Visa utilizes a global "payments ecosystem" known as VisaNet to connect merchants, banks and consumers together. Through VisaNet, Visa serves as the "middleman," processing more than 65,000 transaction messages per second.

### **Visa's Leader Position in the Financial Ecosystem Presents Threats and Opportunities**

While Visa is the market leader in purchase transactions, the company faces many competitors ranging from traditional incumbents to rising FinTech startups with new solutions in faster payments, automated clearing houses for lower fees, and cash alternatives. Mastercard and Amex directly compete with Visa over issuing contracts, while other companies, like PayPal and Stripe, pose new threats in transforming the transactions market. However, Visa must find ways to keep up with its competition's customer-oriented and carefully designed products and services. Therefore, pressure from external threats can also be considered an opportunity to prioritize and generate customer-driven innovation at Visa. In order to maintain their competitive advantage, Visa has begun focusing on innovating their product line, which creates new challenges in effectively researching and marketing to new customers, merchants, and banks.

Visa could direct efforts toward appealing to banks and merchants, but we believe that increasing influence among consumers will be the most effective growth strategy for Visa. Support for this claim originates in the fact that Visa's main competitor is cash. When customers pay in cash, they don't use electronic payment, and therefore cut Visa out of the transaction. Visa makes much of its revenue off of transaction fees, so increasing the number of consumers paying using Visa products will also directly increase earnings. Therefore, Visa must develop new financial offerings that pique the interest of consumers to draw those consumers into Visa's ecosystem. Visa must also effectively market the availability and benefits of these new products to a target group of consumers that are most likely to sign on and generate large transactional revenues.

### **Our Research Questions Will Drive Effective Marketing Insights for Visa**

To generate strategic marketing recommendations for Visa, we will use data analytics and market research to investigate the following questions:

*What group of consumers offers the largest monetary opportunity for Visa, and is this a group of customers currently within Visa's ecosystem that Visa can upsell?*

*What new product(s) and/or offering(s) should Visa design to appeal to this group of consumers?*

*How can Visa most effectively market said product(s) and/or offering(s) to the chosen group of consumers?*

## Existing Data Research (Section 2)

We began our trends and text-based exploration of marketing opportunities with an analysis of Visa's position in relation to its competitors. Our first analytical methodology was to use Google Trends on key search terms such as Visa, their competitors, cryptocurrency, cash, and electronic payments. The output included location-based heat maps to determine regional interest and comparison tools to compare search words with one another. Another mode of research was through sentiment analysis with Enginus. This tool leverages Twitter feeds to scrape the 1000 most recent tweets and creates a report delivering insights into consumer sentiment. Our key words for this text-based exploration focused on Visa, Amex, Mastercard, and cryptocurrency.

### Visa is Well Positioned to Compete with Cash and Other Electronic Payment Companies

Google Trends show that searches for credit are up relative to searches for cash (Appendix Section 2.10), particularly since the beginning of the pandemic when money changing hands became a problematic vector for the spread of the Coronavirus. However, in the American Southeast, search trends (Appendix Section 2.9) indicate that cash still holds popularity over credit payments in the region. Visa, therefore, should see the South as a geographical target for potential market share growth. However, when rolling out new products to customers already on Visa platforms, it would be unwise to target consumers in the South since they don't already use Visa to make payments.

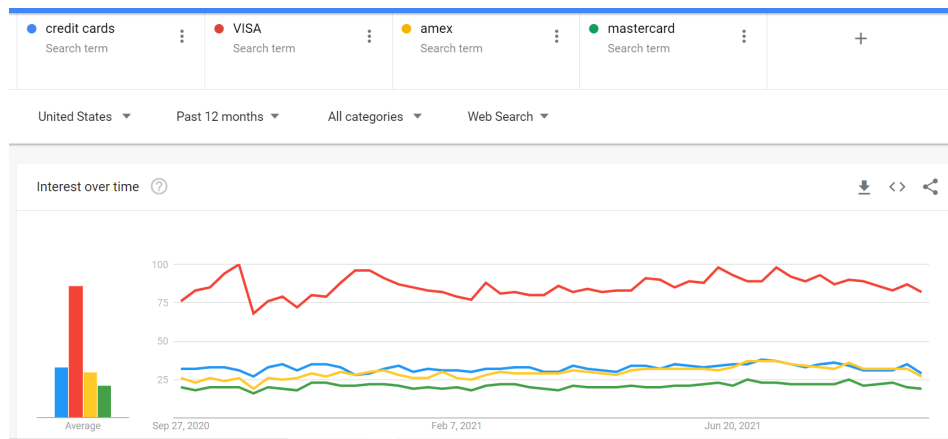


Figure 2.1: Visa Searches against Competitors

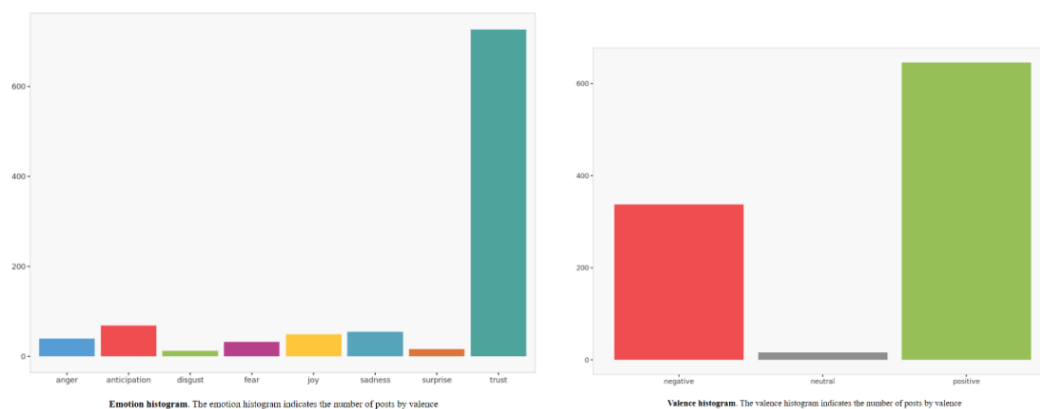
We also utilized trend analysis for Visa to determine its standing amongst its peers within the credit card ecosystem. We compared broad searches for Visa to competitors such as Mastercard and American Express (Amex), as well as to searches for credit cards more broadly. This allowed us to understand Visa's popularity and familiarity to consumers when looking at the electronic payments space. Visa dominated these searches, even compared to searches for the broader term "credit cards". This demonstrates Visa's dominance in this space in the minds of consumers and its position as a market leader.

However, to shed more revealing light on Visa's competition's reputation in the minds of consumers, we also performed sentiment analysis on twitter tweets that contained mentions of

American Express or Mastercard (Appendix Section 2.12). While our analysis classified the majority of tweets sampled about Mastercard and Amex as positive, our sample of tweets that included mentions of Visa had a higher percentage of positive sentiment. Additionally, while all three companies scored high on trust sentiment, Amex and Mastercard had more occurrences of fear and sadness sentiments, while Visa had far more instances of joy and anticipation sentiments than its competitors (Appendix Section 2.8). Our sentiment analysis suggests that Visa is well positioned to introduce an exciting electronic payments product that further amplifies the sentiments of joy and anticipation that its users already seem to feel when using Visa to conduct financial business.

## Positive Trends and Sentiment Around Cryptocurrency Reveal an Exciting Opportunity

One of the market opportunities that we identified for Visa is cryptocurrency payment offerings. Our google trend analysis identified a large growth in search interest for cryptocurrency over the last 2 years, with the largest surge coming in April and May of 2021 (Appendix Section 2.1). However, when compared with credit card search trends, the ratio of interest was 3:1. Credit cards are clearly a preferred method of payment options for customers, but our analysis of tweets noticed important sentiment characteristics for customers interested in cryptocurrency. Tweets mentioning cryptocurrency were either neutral or positive 90% of the time, with opinions centered primarily around trust and anticipation (Appendix Section 2.2). When we scraped Tweets mentioning crypto and Visa together, over 68% were viewed as positive. With Visa now offering crypto-linked products, the positive sentiment and anticipation makes cryptocurrency appear as a growing new payment market. We investigated other payment methods, like electronic payments, but these payment options don't seem to have a growing interest trend.



**Figure 2.2 Credit Card Sentiment**

Our analysis also revealed that credit cards as a search term demonstrate broad popularity and positive sentiment when conducting a sentiment analysis. As the leading brand for credit cards in the eyes of consumers, Visa appears well-positioned to leverage this goodwill associated with credit cards into new ventures to grow its overall business line and brand.

A subtopic for cryptocurrency is a cryptocurrency card. When searching for “Visa” in Google Trends, “crypto visa card” was searched over +2,900% times (Appendix Section 2.5 and 2.6). The largest spike of the crypto currency card happened in May of 2021 and is expected to have

another spike in September 2021. The top three geographic locations tied to these searches are California, Florida and New York. The overall idea of crypto with this subtopic of a crypto card has demonstrated defined data with promising spikes.

### **Potential to Tap Into New Market with Visa Installments - Buy Now Pay Later Initiative**

Another market opportunity that we looked into are the “Buy Now Pay Later” programs, which has grown in appeal to young consumers and is changing online sales. Buy Now Pay Later is an alternative to traditional credit and instead gives shoppers more flexibility as you can pay for items over time. Buy Now Pay Later services from companies like AfterPay, Klarna, and Affirm are leading the way for this initiative, and it is estimated that consumers will make nearly \$100 billion in retail purchases using these programs in 2021. We conducted a Google trends analysis (Appendix Section 2.13) and discovered that Visa was fifth out of the top related topics connected with Buy Now Pay Later. Visa has recently launched “Visa Installments”, essentially giving customers the ability to pay for qualifying purchases in smaller payments over a period of time. When using Google trends to analyze the number of searches for Visa Installments over other Buy Now Pay Later companies, the interest over time was much lower for those Visa searches.

Along with the Google trends analysis, we also used sentiment analysis of tweets regarding Buy Now Pay Later to get a better understanding of consumers’ response to this growing topic (Appendix Section 2.13). Out of the latest 1000 tweets, about 56% were positive while 44% were negative. These programs have only recently seen tremendous growth, and there are still questions surrounding how the service works and whether it is beneficial for consumers. Trust was the main emotion gathered from the tweets, with anticipation being a close second. This is useful information for Visa as their marketing team should try to capitalize on the transparency of Visa Installments as this is an opportunity to grow Visa’s market share and both retain current cardholders and gain new ones. Sentiment analysis will be very helpful for tracking customer response as the Visa Installments program continues to build out its services to compete with other Buy Now Pay Later companies currently at the forefront of the space.

## **Survey Design and Data Analysis (Section 3)**

### **Survey Design and Data Collection**

The survey was conducted on Google Forms where answers were recorded. Members of our team shared the survey with friends, family and colleagues through platforms such as Whatsapp, LinkedIn, Email and Facebook. Since Google Forms allows for a link to access the survey, there was a simple way for consumers to access and answer the questions.

Our survey design consisted of frequency and satisfaction questions, perceptual mapping questions, and demographic questions. This flow allowed for the users to have frictionless experiences while answering the various questions provided. Over the course of three weeks, we closed the survey and collected 76 responses which were exported into an excel file for data cleaning and analysis. Since our questions limited free response fields, there was minor data cleaning to be done as we moved into our analysis. With our style of questions, we decided to

approach 4 unique analytical techniques: customer segmentation, multidimensional scaling, perceptual mapping, and logistic regression target marketing model.

## **Survey Segmentation**

Our survey was designed to ask questions around attitudinal and demographic information that could be used as a basis for forming customer segment groups. We performed K-Means clustering on our 76 survey respondents using the fifteen attitudinal questions to form three unique customer segments (Appendix Table 3.1). Segment 1, the “Best Deal Hunters”, are respondents that want to add to their credit card portfolio, are active in the stock market, and embrace innovative new products. However, this group expresses some hesitancy towards cryptocurrency as a means of reliable payments as they lack familiarity. Segment 2 was made up of our “Traditionalists” as these respondents feel completely uneasy about cryptocurrency, the stock market, and innovative new products. This group prefers their current portfolio of credit cards and online banking services. Our last segment 3, the “Early Crypto Adopters”, are growing experts in the field of cryptocurrency, feeling that crypto products are safe, reliable, and represent the future of transactions.

Since our survey included some demographic information, we created some customer personas to better understand our target market to inform our recommendations. A full detail on the descriptor averages for each of our segments can be found in the Visa Segmentation File.

**Ben (Best Deal Hunters):** Ben is a recent 24-year old college grad, employed full-time making over \$100K a year. Ben heavily favors using credit cards over cash, but keeps his monthly spend low at under \$1000 a month charged to his credit. Ben can often be seen checking his Robinhood account, tracking his stock portfolio and researching the hottest new companies to invest in. Ben has heard a lot about cryptocurrency in the news and thinks it has a bright future, but doesn’t see it as a reliable way of completing transactions and has concerns for its safety. However, Ben wants to learn more about the future of crypto and imagines that it will become widely adopted.

**Rachel (Traditionalist):** Rachel is a 28-year old marketing professional, currently earning around \$50K a year. She earned her masters in Marketing from the Marshall School of Business. Rachel is a huge credit card user, hardly ever using cash to complete any payments and charging around \$1000 a month to her credit cards. Since Rachel uses her credit cards so often, she loves her current portfolio of cards and has no interest in any of the new credit card deals that she gets in the mail. She’s heard about this new digital trend called Bitcoin, but has no interest in using it for her everyday life. Rachel likes everything just the way it is and would prefer if her bank stops sending her new emails for these innovative new products.

**Matthew (Early Crypto Adopters):** Matt is a current 24-year old USC Marshall graduate student that was an early investor into Bitcoin. His early portfolio success has allowed him to charge high amounts to his credit cards, as he uses them daily, spending upwards of \$2000 a month. Much of his Marshall coursework has surrounded digital innovations as he’s grown a big interest in blockchain and how it relates to decentralized finance. Since he was an early adopter of cryptocurrency, he finds transactions to be safe and has been waiting to sign up for cryptocurrency rewards cards with Visa. He imagines that crypto will become a key payment



method in the next few years with many new opportunities, as he has been encouraging his friends to research cryptocurrency by sending them new articles.

	Predicted 1	Predicted 2	Predicted 3	Total
<b>Segment 1</b>	72%	19%	9%	100%
<b>Segment 2</b>	30%	61%	9%	100%
<b>Segment 3</b>	29%	5%	67%	100%

**Table 3.2 Classification for Segments**

From these new customer segments and personas, Visa can get great insights into their current customer base on their attitudes towards rising trends in the financial services industry. Through a predictive model (Table 3.3), Visa can assign each new customer to one of our three categories with 67% accuracy and build new product offerings or marketing strategies that are personalized to each group. In the recommendations, we discuss further how these segments can be leveraged to deploy effective and powerful new marketing campaigns.

### **Factor Analysis and Perceptual Mapping of Consumers' Perception of Competitive Brands**

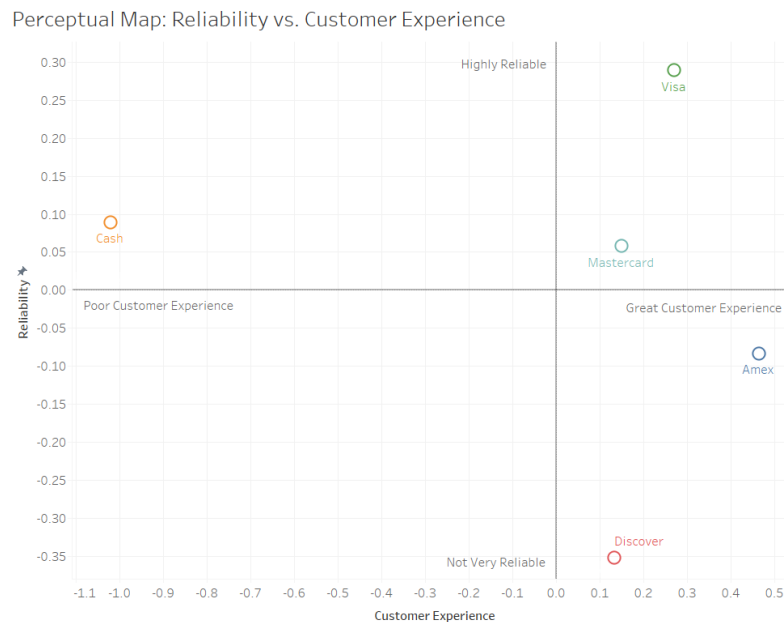
In our survey, we collected data from respondents regarding their perception of how well Visa and other key competitors fulfilled five important attributes: trust, rewards, innovation, customer support, and acceptance (how regularly institutions accept payments from the vendor in question). We chose these five qualities because we felt that together, they encompass almost all of what makes a financial services company attractive or unattractive to a consumer deciding between customership at one or the other. Our goal was to create a visual chart, called a perceptual map, of where Visa and its competitors sit in the financial services competitive landscape relative to each other. Doing so can help us determine where Visa is strong or weak relative to competitors, insights which in turn can drive effective product innovation and deployment strategies.

To create a visual map of the competitive landscape, we first needed to reduce the number of features on which we would compare competitors. Though we collected data on five attributes, there is no visually feasible way to plot competitors in 5-dimensional space. In fact, without 3-D plotting technology, a two-dimensional perceptual map is the only interpretable option. With this in mind, we sought to reduce the number of attributes from 5 to two, or if absolutely necessary, 3 features (which would then allow us to create three 2-D perceptual maps: Feature 1 vs. Feature 2, 1 vs. 3, and 2 vs. 3). The conventional method for feature reduction in marketing analytics is called Factor Analysis, which attempts to explain as much of the actual variation in the attribute data in as few unique computational features as possible. Though the computed features are sometimes difficult to understand since they represent a heterogeneous combination of the original attributes, they can still be interpreted with the input data and business context in mind.

After preparing the attribute rating data from our survey, we ran a factor analysis and interpreted the results. First, we chose the number of factors we would use based on the commonly-used Eigenvalue threshold of 1.0. Each additional factor used explains additional variation, but

typically factors that have Eigenvalues less than 1 don't contain enough additional information to make the complexity of another feature worthwhile. The first two factors developed in the analysis had Eigenvalues greater than 1, so we kept just two calculated dimensions, which accounted for 72.6% of the total original variation. Next, we interpreted the factors using the rotated factor loading matrix. The loading matrix shows the factors with which certain original attributes are more closely associated. In the case of our analysis, the first factor loaded on Innovation, Rewards, and Customer Support, and the second factor loaded on Trust and Acceptance. We interpret Factor 1, the intersection of Innovation, Rewards, and Customer Support, as Customer Experience, since all three attributes comprising this factor are standard CX components. We interpret Factor 2, the combination of trust and acceptance, as Reliability. In other words, Factor 2 describes the average consumer's perception of how reliably they can make payments through each competitor wherever and whenever they want without worry.

Finally, we were able to plot Visa and its four primary competitors (American Express, Discover, MasterCard, and Cash, which isn't a brand but is what Visa considers to be its fiercest competition) using their mean value on each of the two factors as coordinates.



It's clear in the perceptual map that cash is perceived as very different from the other competitors, which makes sense because cash isn't a brand that designs and maintains its customer experience. In fact, cash doesn't technically have customers at all. On the positive side of customer experience, Amex leads the pack in consumers' minds, with Visa close behind. On the other hand, Visa is considered by far the most reliable by consumers of all the competitors studied. Visa's unique strength in the competitive landscape is its perception as both a reliable brand and a brand that provides an excellent customer experience.

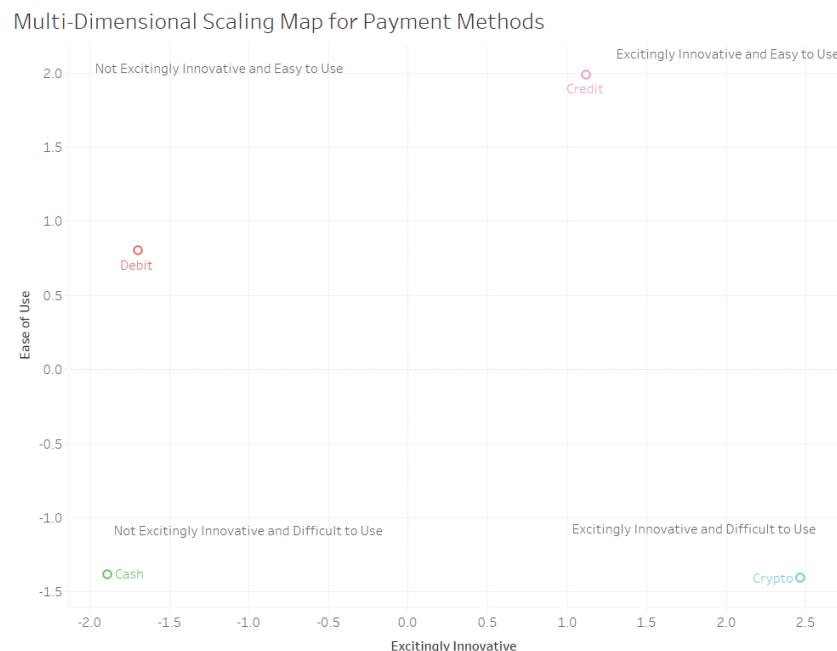
We also used the attribute perception survey data to create a snake plot, which shows each competitor's average rating among all respondents for each of the five attributes examined. Like perceptual maps, snake plots (Appendix Section 3.2) are useful for comparing similarities and differences between competitors, but for more than 2 dimensions at a time.

As in our perceptual map, the snake plot shows that cash is a clear outlier in the competitive set. While Amex leads the rest on the three CX attributes that contribute most to Factor 1, Visa is close behind, and Visa leads on both Reliability attributes. Additionally, it's clear that Visa has the most room to improve on Innovation, relative to Visa's other attribute ratings and its competitors' ratings on the same attribute.

## Multidimensional Scaling for Visualizing Perceived Differences Across Payment Methods

In addition to collecting consumer perception data on the five aforementioned attributes, we also asked consumers for opinions on different payment methods. The methods we investigated were Cash, Debit, Credit, and Cryptocurrency, the latter being the focus of our proposed product. Contrary to the previous analysis, we didn't ask consumers to rate their perception of how well payment methods fulfilled various attributes, but rather asked how different (on a scale of 1 to 5, 5 being extremely different and 1 being not different at all) each payment method was from all other payment methods. To analyze and visualize consumers' perceived differences between payment methods, we used a technique called Multidimensional Scaling (MDS), which, like factor analysis (with two factors), reduces a multidimensional space to just two dimensions while retaining as much information as possible. Unlike factor analysis, MDS plots agents specifically based on how different they are from each other, and like factor analysis, the dimensions on the x and y axes must be interpreted using business context and intuition about the agents' positions.

To prepare the raw survey data for MDS, we created a row and a column for each payment method. Each cell contained the mean of the consumer difference ratings between the method in the row and the method in the column for that cell. Differences between a method and itself were 0, and the half of the matrix above the zero-diagonal was omitted due to redundancy. We then fed the matrix into the MDS analysis, and interpreted the results. The MDS plot is shown below:



First we inspected the statistical validity of the analysis, and found the R-squared to be relatively high (0.855) and the stress statistic to be relatively low (0.099), meaning that the two dimensions selected by MDS explained over 85% of the total variance in differences between the payment methods -- an acceptable result. We then set about interpreting the business meaning of the x and y axes based on intuition and context. On the x-axis, debit and cash are proximal, as are credit and crypto. Debit cards and cash are simple, and often considered antiquated and boring. On the other hand, credit, and especially crypto, which is farthest along the x axis, are considered more innovative, novel, and exciting. Therefore, we decided to label the x-axis “Excitingly Innovative,” such that payment methods farther right on the map are more exciting and innovative, and those on the left are not exciting or innovative.

On the y-axis, Cash and Crypto are close to each other, debit is next, and credit takes the “highest” score. We felt that “Ease of Use” best described the vertical score distribution based on the order and characteristics of the payment methods. Cash and Crypto (at least currently) are not always accepted as payment methods (for example, cash can’t be used to pay for things online), and it’s often logistically difficult to obtain currency in Cash and Crypto form. Debit and credit cards make those methods much easier to use, and they are accepted as payment methods in almost any checkout process. However, consumers may consider credit easier to use than debit since credit users don’t need to pay for their purchase right away.

The product development focused takeaway from our MDS analysis is that crypto excites consumers and can help Visa improve its perception as an innovative brand, but that crypto is also difficult for consumers to use and isn’t currently seen by most as a commonly viable payment method.

### **Logistic Regression Model for Target Marketing Campaign**

As part of our survey design, we asked our respondents on a scale from 1-5 how likely they were to apply for a new credit card within the next 6 months. This response was converted to a binary indicator with values of 4-5 changed to a 1 for likely to be receptive and values 1-3 changed to 0 to be non-responsive. Using this as a new outcome variable, we designed a target marketing model that could identify people that would be receptive to a new credit card ad and calculate profit based on a conversion rate for customers that signed up for an offer.

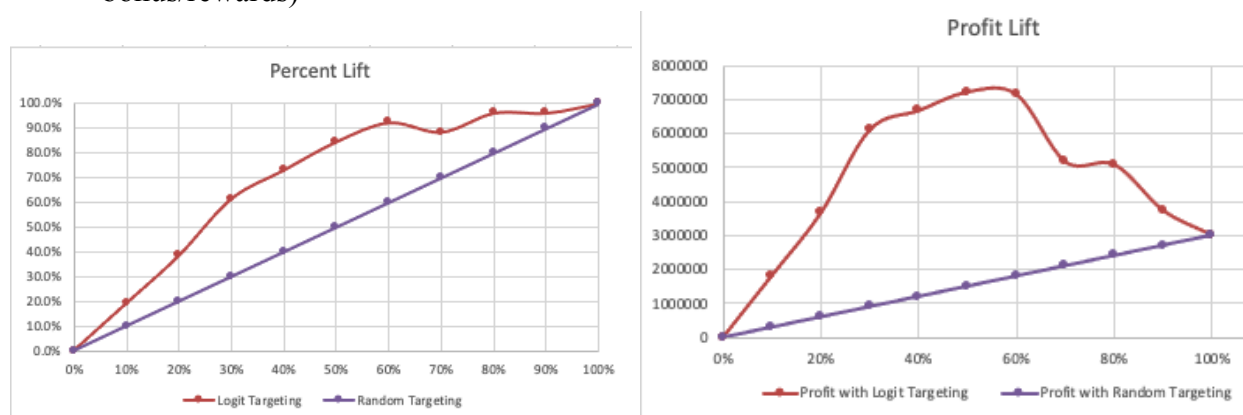
Our model used an advanced analytics technique known as Logistic Regression, a linear classifier algorithm that outputs a probability of an individual being receptive to applying for a new credit card. Our model was built leveraging libraries from Python (sklearn) with the feature selection coming from a custom-written script (Appendix Section 4) using forward stepwise selection. This forward selection method builds a single classification model using each variable individually first, and chooses the most significant one (based on the highest ROC-AUC: a metric used to test the validity of a classification model) to place in the base model. This process will continue until the ROC-AUC can no longer be improved.

The observations that we used to build this model came from our 76 survey respondents with the predictor variables coming from demographic information. Our predictor variables were as follows (a full list can be found in the appendix): annual income, monthly credit charge,

education level, employment status, and credit per week usage. Since these demographic fields contain categorical levels, we use dummy variables to one-hot encode each category into its own binary field. While our model was only able to achieve an R-squared of 0.22, it was able to predict reception with 77.3% accuracy and had an ROC-AUC of 0.82. In order to fully evaluate the performance of our model, we combined the model scores to business objectives to examine the lift and profit implications of our model in a credit card offer campaign scenario.

Our profit and lift model had the following assumptions:

- We assume if we sent out a campaign for 30 million people, 150,000 will sign-up for a credit card (a conversion rate of 0.5%), the campaign cost is \$0.45 per promotion
- Annual profit from a credit card sign up is \$450 (\$2500 in average monthly spend \* 12 months \* 1.5% transaction fee)
- Annual cost from a credit card sign up is \$340 (\$100 in various fees and \$240 in bonus/rewards)



**Figure 3.1 Percent and Profit Lift Charts**

Compared to a random marketing strategy, our target marketing model was able to achieve a significant lift at all deciles, with a maximum lift of 34.6% on only contacting 50% of the total market. In terms of profitability, this model had a 4.8 times increase in profits over the random marketing model for a campaign that contacts only half of the eligible population. This massive profit increase potential demonstrates an important proof of concept in utilizing target marketing models with common demographic fields as an efficient way to optimize profitability. While this model was built off of only 76 respondents, Visa can leverage their large data stores with many more users and demographic fields to construct an even more predictive model to achieve a better lift. Our recommendation would be for Visa to utilize their existing user profiles to build a new target marketing model that will offer access to new predictive fields to improve market penetration and sign-up conversion rates.

### **Visa Recommendation Strategy (Section 4)**

After conducting our analyses, we developed a set of recommendations that Visa should consider implementing in their business and marketing strategy. These recommendations fall into four categories:

- Innovation Improvements

- Marketing Strategy
- User Friendly for Consumers
- Customer Service and Rewards

Below, we envisage how these recommendations might manifest for Visa under ideal conditions, and provide a description of the advanced analytics insights that inform our four areas of implementation.

### **Innovation Improvements**

*Recommendation:* Visa can improve consumers' perceptions of the brand's innovation by adopting cryptocurrency capabilities into its portfolio of financial products and services. The crypto integration initiative's flagship product will be a new Visa CryptoCard that allows consumers to spend and load cryptocurrency just as they would traditional currency on a credit or debit card. To accompany and amplify the success of the CryptoCard, Visa can offer rewards programs that incentivise CryptoCard account users with cryptocurrency benefits. By introducing crypto-enabled and infused products and services, Visa can leapfrog its competitors and bolster its reputation as an innovative pioneer and leader in the financial services industry.

*Data Drivers:* The snake plot in Section 3 shows that Visa lags behind key competitor Amex in consumers' perceptions of innovation. Furthermore, the MDS plot shows that Cryptocurrency is considered the most innovative of all payment methods. Visa can absorb positive perceptions of innovation surrounding Cryptocurrency by adopting Crypto-powered payment capabilities and other related technology into its portfolio of services.

### **Marketing Strategy**

*Recommendation:* Using our customer segment groups from our survey analysis, Visa should customize their marketing campaigns and tactics based on the unique preferences and behaviors of each persona. For example, Best Value Hunter customers like Ben could receive monthly newsletters detailing new innovations at Visa and special product offerings - like integration for brokerage accounts - to increase product conversion sign-ups. For Traditionalists like Rachel, a dedicated customer support channel and upgraded rewards on current card portfolios can maintain her high satisfaction with Visa credit cards. Early Crypto Adopters like Matt can become the first to sign-up for new crypto-enabled cards and participate in pilot programs to test Visa-supported cryptocurrency products.

*Data Drivers:* Our segmentation analysis revealed distinct and meaningful differences in the way different groups of consumers view, interact with, and perceive cryptocurrency-related technology. With this in mind, Visa can distribute and market its product more efficiently and effectively by targeting a group of consumers that is already predisposed to using and enjoying Crypto-enabled financial products. Visa can also customize marketing messaging to match the crypto-adjacent preferences and interests of other segments if they choose to expand their marketing beyond the Early Crypto Adopters segment.

### **User Friendly for Consumers**

*Recommendation:* We recommend that Visa develop and introduce a cryptocurrency-enabled card whose ease of use is similar to a traditional credit or debit card. By allowing banks and

merchants on Visa's payments network to accept cryptocurrency transactions through our new card, Visa can offer a user-friendly product that will appeal to crypto-interested consumers. Since the vast majority of consumers are familiar with the use process for debit and credit cards, allowing shoppers to spend cryptocurrency through the same step-by-step process will ensure seamless adoption, and will at last provide users with an easy way to use cryptocurrency on a regular basis.

*Data Drivers:* After running multidimensional scaling analyses on our survey data, we see from the perceptual map that cryptocurrency is behind other payment methods in terms of ease of use. However, crypto appears to be an exciting area that consumers are willing to explore from this MDS analysis, and by developing a user-friendly product, Visa can gain new market share with an innovative solution.

### **Customer Service and Rewards:**

*Recommendation:* In addition to introducing CryptoCards through Visa backed cryptocurrency-centric accounts, Visa should roll out loyalty programs that pay out attractive benefits and rewards in crypto. Visa must also ensure that fresh crypto programs are supported by strong and capable customer service teams specifically trained to guide consumers through the new offerings.

*Data Drivers:* Our perceptual map shows Visa's strength in the market as a highly reliable brand that also provides excellent customer service. However, Amex leads Visa in overall customer service perceptions, and so aside from improving perceptions of innovation, Visa must ensure that their new Crypto-related product and service rollouts maintain, or better yet exceed, the level of standard for customer service tangential to Visa's existing products and services. Accompanying innovative new offerings with the excellent customer service and rewards programs that customers have come to associate with Visa will ensure a smooth crypto adoption process that delights and satisfies consumers around the globe.

### **Visa is Well-Positioned to Successfully Introduce Crypto Capabilities**

Because Visa is such a reliable brand with an excellent customer experience compared to similar financial services companies, we believe that Visa will be able to release a crypto product that customers can trust, which will give Visa an advantage. Easing customer uncertainty around cryptocurrency and clearly highlighting its benefits will be key in slowly building up a strong customer base regarding this product. By positioning the crypto product as an innovative improvement to their already impressive customer experience, Visa can market the product as an additive to available payment and currency options. Rather than deterring customers by introducing something new that they may have little knowledge about, it will be important for Visa to take the mystery out of cryptocurrency, making it customer-friendly.

As stated above, Visa would only need to contact 50% of the total market for a maximum lift of 34.7%. The persona in this market that should be targeted by Visa would mainly be the Matt personas from the segment analysis. As Matt is an early crypto adopter, with interests in blockchain and cryptocurrency rewards, he would be highly likely to convert to a Visa crypto-enabled credit card. Similar to Matt, Visa can assign each new customer to one of our

three categories from above with 67% accuracy and build new product offerings or marketing strategies that are personalized to this group.



**Figure 4.1 Cryptocurrency-enabled card mock-up**

Appendix Section 4.2 contains an infographic mock-up detailing our data-driven cryptocurrency adoption plan for Visa. This plan outlines a structured approach for Visa to implement and integrate the cryptocurrency capabilities proposed in this report. Also see Appendix Section 4.3 for a more detailed look at the CryptoCard mock-up.

Perhaps the most exciting aspect of our proposal is the opportunity we afford Visa to transform the public opinion of cryptocurrency from a risky and volatile investment prospect into a legitimate and attractive alternative to traditional currency. If Visa can catalyze such a transformation and associate the “new” public perception of cryptocurrency with the Visa brand name, they can expect to rule the financial services industry for years to come.

## **Analytics Research and Future Plans (Section 5)**

We conducted two types of analytics on available/existing data: Google Trends analysis and Twitter analytics. We utilized both in order to better understand how Visa competes in the payments processing market and where it stands relative to competitors.

Google Trends analytics was useful for discerning overall consumer sentiment about the brand and its product offerings. While Visa’s first economic customers are banks and other financial institutions, much of its marketing and sales is dependent on its ability to reach end-consumers. Thus, we utilized the Google Trends analytics to understand what products consumers most associate Visa with, how it performs relative to searches of competitors, and how consumers see it tie-in to cryptocurrency.

This research was especially valuable in understanding our chosen topics and identifying opportunities to further research. For the Google search data, its sheer scale and the ability to mine this data allows us to truly understand broad consumer trends when it comes to perception of Visa and association of Visa with specific products and competition. Moreover, because of the sheer volume of Google searches and data that Google provides for free, we were able to gather



rich insights from a dataset that we wouldn't otherwise have been able to replicate on our own. Nonetheless, it is important to note the limitations of the Google Trend analysis. Since Google only provides basic search data for free, we were not able to pick up on many subtleties/nuances within the dataset. While this data was very valuable in gaining a broad understanding of how consumers view Visa, it was not very useful in drilling into these insights.

Our Twitter analytics were used in a very similar manner to our Google Trends analysis. We mined recent Tweets using Enginius' built-in Twitter scraper to understand consumer sentiment and identify areas for further exploration and research. As with the Google Trends analytics, this was especially valuable because it allowed us to analyze a large-scale dataset that we wouldn't otherwise be able to replicate. Another key strength of this method was that Enginius allowed us to pull the 1000 most recent Tweets, hence giving us a more real-time snapshot of consumer sentiment as compared to the Google Trends. Combining this real-time snapshot with the longer view of Google Trends allowed us to leverage two very powerful analytics techniques and datasets.

As with Google Trends however, this data was limited in its drill-down and deep dive capabilities. Due to its fairly large scale and low granularity, we were unable to obtain more than high-level insights from this dataset. For one, it was hard to identify the context around some tweets, as well as whether or not how relevant these tweets were for each account. For example, it is almost impossible to distinguish if a negative tweet about Visa was coming from someone who is active in the fintech/payments space or just tangentially tweeting about the topic.

If we were to conduct this analytics and research again, we would continue to utilize both Twitter mining and Google Trends analytics. However, we would likely use these methods in closer conjunction with the deeper insights gleaned from our survey. For example, while we would use them to identify areas of interest as we did currently, we would also choose to go back and re-analyze these datasets to build on the insights from the survey to drive further avenues for research. Thus, we would be able to identify more unorthodox associations and better understand consumer sentiment around Visa.

Our survey analytics provided us with a very valuable dataset to mine and better understand who we were targeting for our marketing campaigns and how we would best reach these consumers. While Visa's first economic customers are primarily financial institutions such as banks, targeting consumers is important in being able to market to these first economic customers. While our survey design provided us with many important axes along which to analyze, we were limited by our sample size of "only" 76 respondents. Moreover, due to how we pitched the survey (to those closest to our social circles), we were left with a very skewed population. Thus, it is very likely that our survey results and resulting analytics can be misleading.

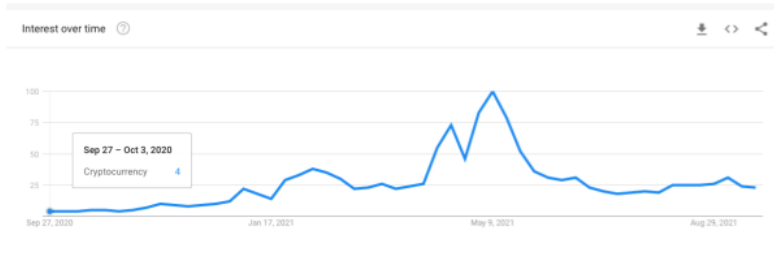
The true strength of our survey was the ability for us to dive deep into the areas identified by our Google Trends and Twitter analytics; by asking 76 respondents to fill out a 15+ min survey, we were able to get a good sense of how and why consumers thought and felt the way they did. This being said however, we believe that given additional time and resources we could have benefited from a larger survey sample size to capture more demographic and socioeconomic cross-sections, as well as additional questions to better ascertain consumer sentiment.

We would also find value in analyzing Visa's transaction data and past marketing campaign data in order to understand what type of offers and products consumers respond to and interact most often with. By combining these internal datasets with our external data, we would be able to paint a more accurate picture of the consumer segment we were aiming to target and develop an even more personalized go-to market plan for the proposed cryptocurrency-enabled Visa card. For example, it would be interesting to conduct clustering based on spending categories and compare these clusters to the results of our perceptual maps and survey clusters. This analysis would allow us to validate these self-reported answers consumers provide and understand how they view themselves. We would also be able to evaluate the effectiveness of potential marketing campaigns by running machine learning models on past datasets with similar characteristics.

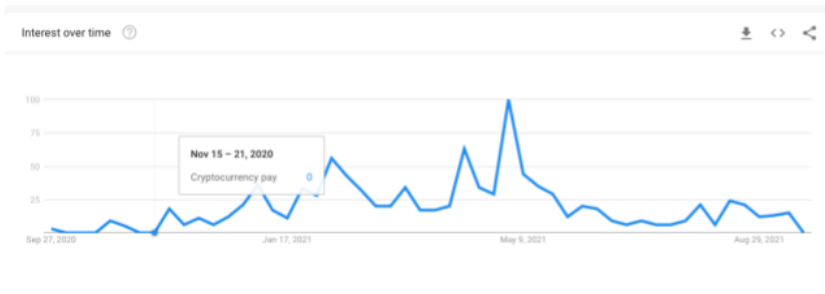
# Appendix

## Section 2.1

### Cryptocurrency



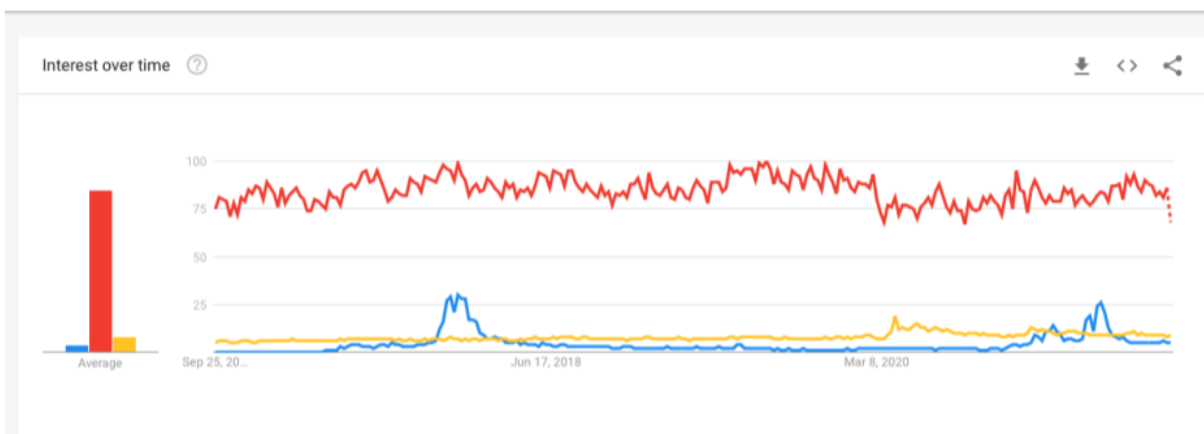
Related topics	Rising	Breakout
1 Capital gain - Topic		Breakout
2 Capital - Topic		Breakout
3 Wallet - Topic		Breakout
4 Robinhood - Company		Breakout
5 Capital gains tax - Topic		Breakout
< Showing 1-5 of 18 topics >		



### Cryptocurrency Pay



United States ▼ Past 5 years ▼ All categories ▼ Web Search ▼

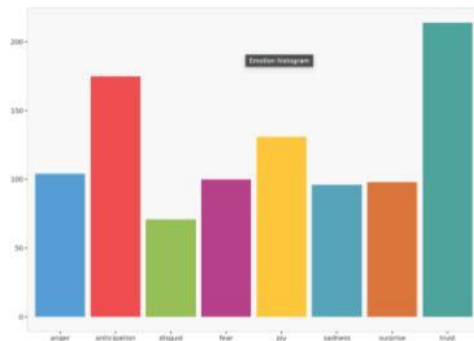


## Section 2.2

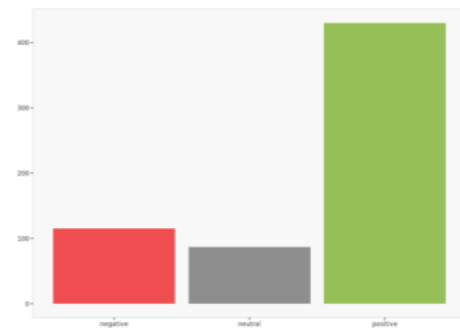
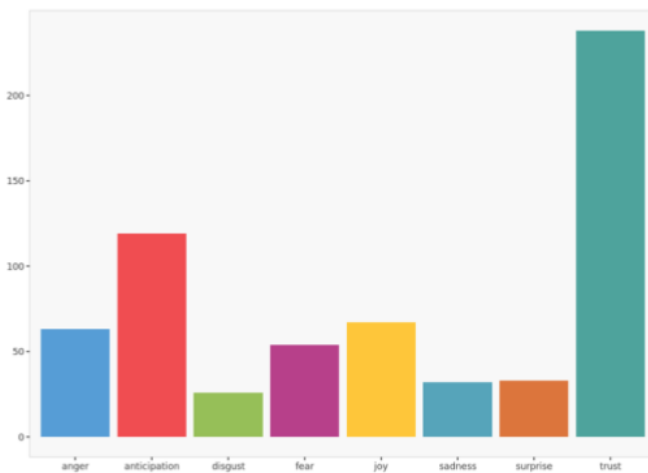
## Crypto Tweets

	Posts count	Relative posts count
<b>Total</b>	989	100%
<b>negative</b>	105	11%
<b>neutral</b>	481	49%
<b>positive</b>	403	41%

**Valence repartition.** The number of posts that fall into different valence categories summarized by their absolute and relative values



## Visa Crypto Tweets

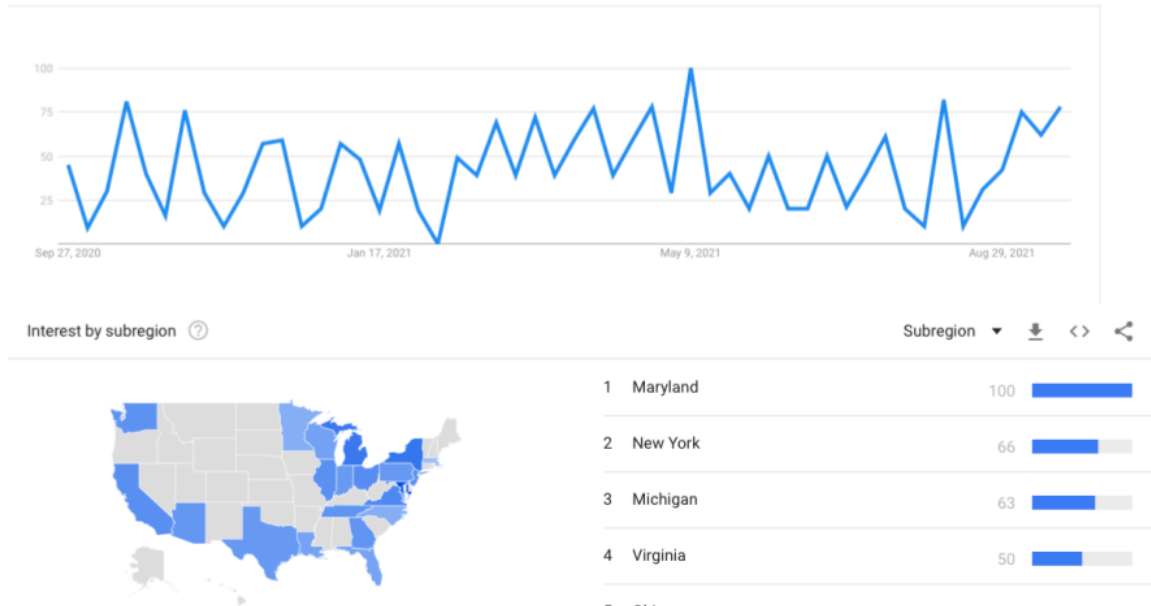


	Posts count	Relative posts count
<b>Total</b>	632	100%
<b>negative</b>	115	18%
<b>neutral</b>	87	14%
<b>positive</b>	430	68%

**Valence repartition.** The number of posts that fall into different valence categories summarized by their absolute and relative values

## Section 2.3

## Electronic Payments

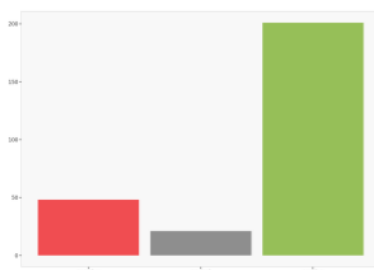


## Section 2.4

### Electronic Payments Tweets

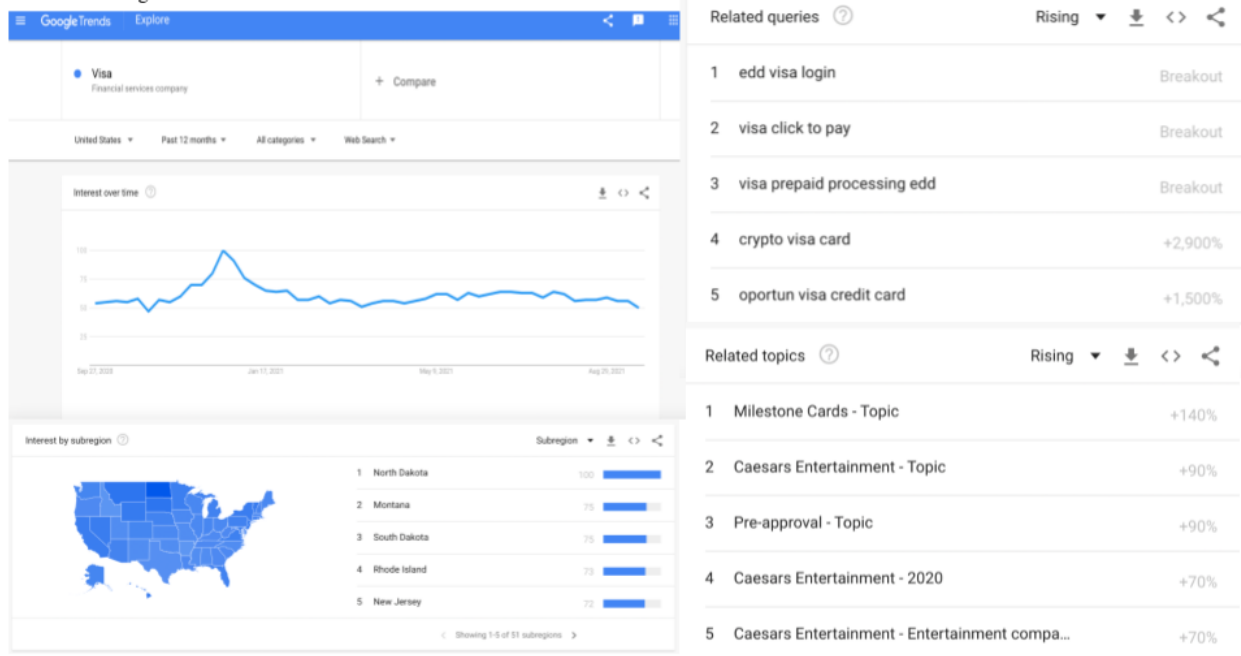
	Posts count	Relative posts count
<b>Total</b>	270	100%
<b>negative</b>	48	18%
<b>neutral</b>	21	8%
<b>positive</b>	201	74%

**Valence repartition.** The number of posts that fall into different valence categories summarized by their absolute and relative values



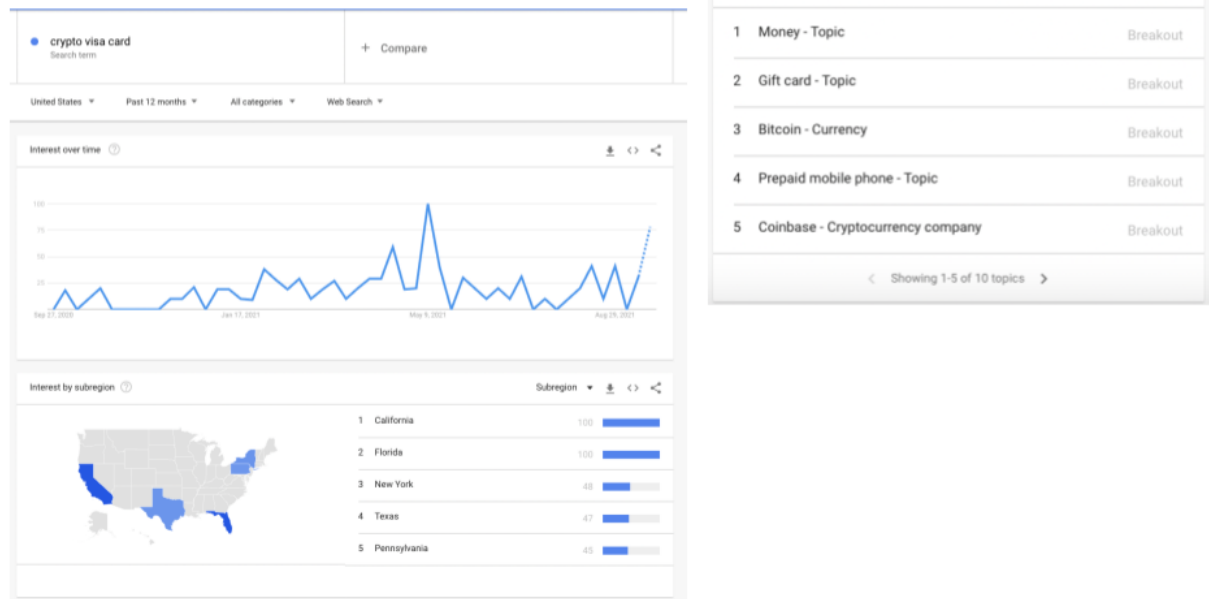
## Section 2.5

### “Visa” in Google Trends



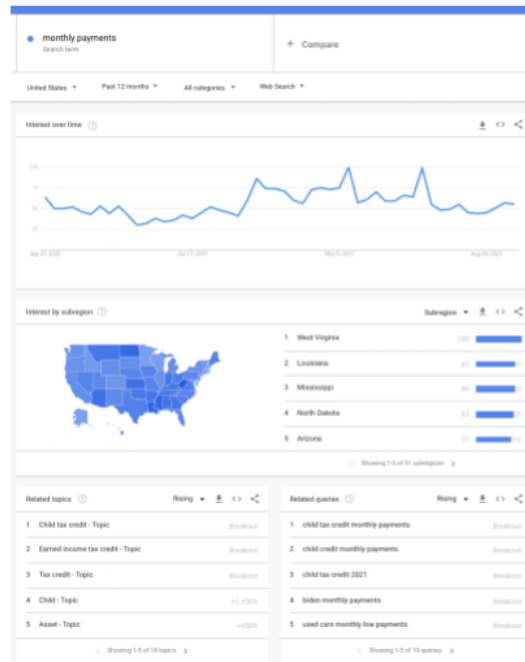
## Section 2.6

### Related queries “crypto Visa Card”



## Section 2.7

“Monthly payments”



## Section 2.8

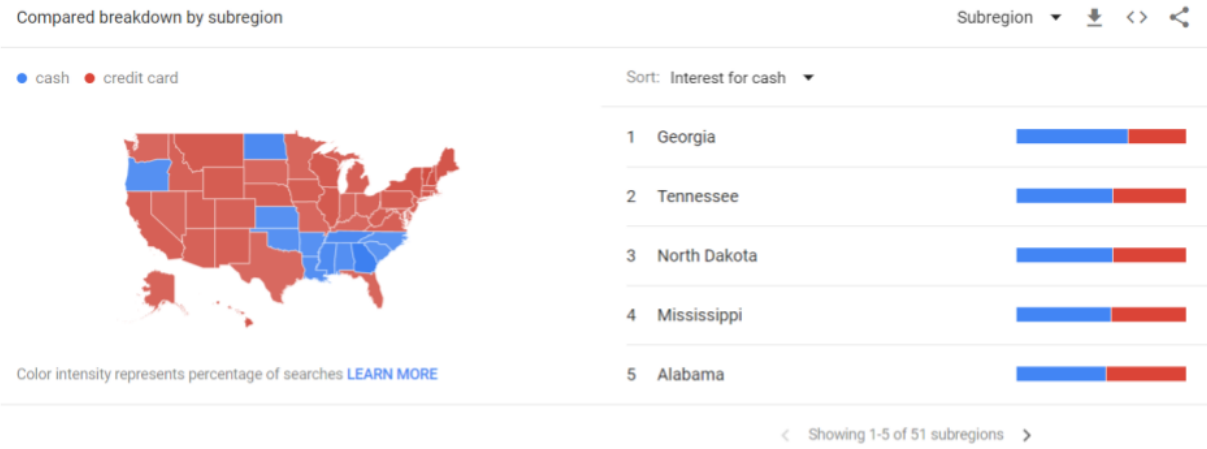
Visa tweets

Word cloud of most frequent words(without stemming)



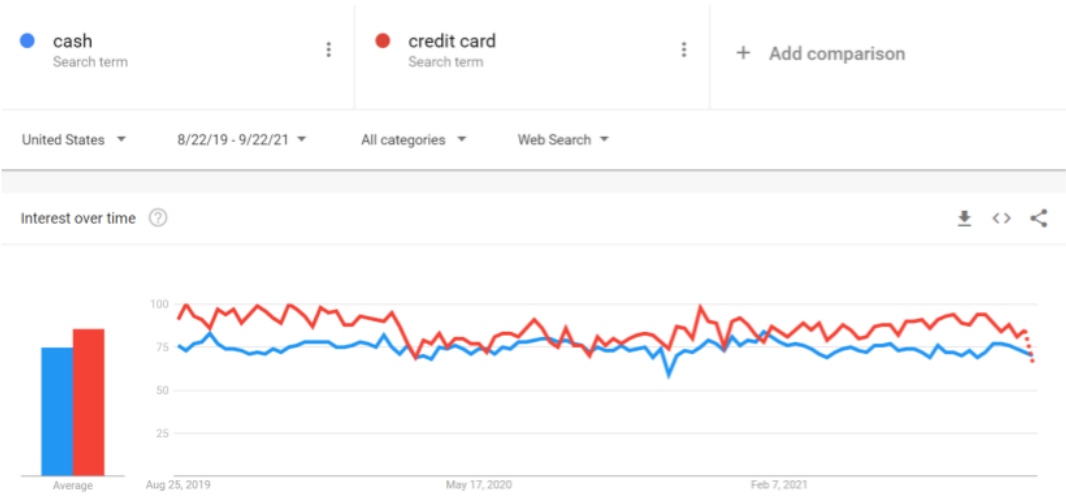
Section 2.9

Cash vs. Credit -- American south loves their cash



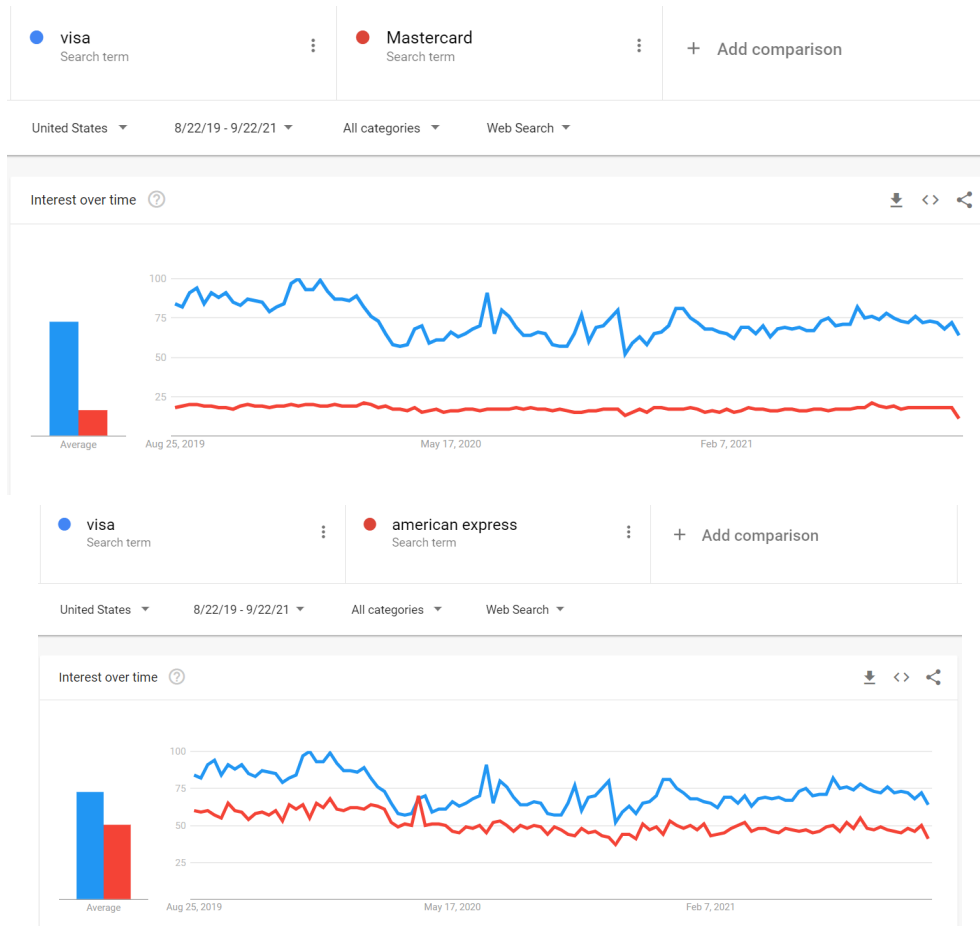
Section 2.10

Cash vs. Credit -- recent interest for credit seems to have grown relative to interest in cash, particularly since the pandemic started.



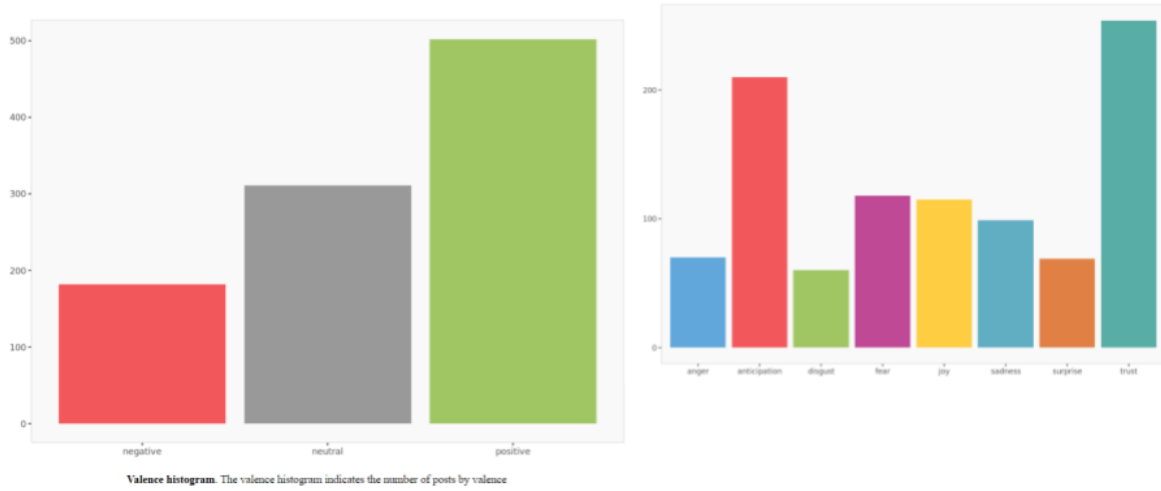


## Section 2.11

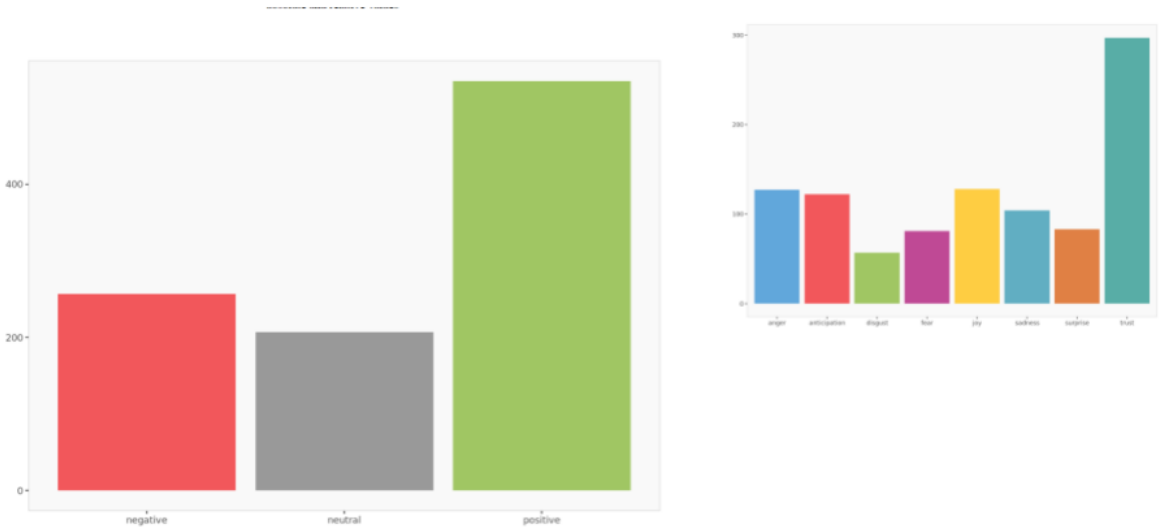


## Section 2.12

### Mastercard Valence Report

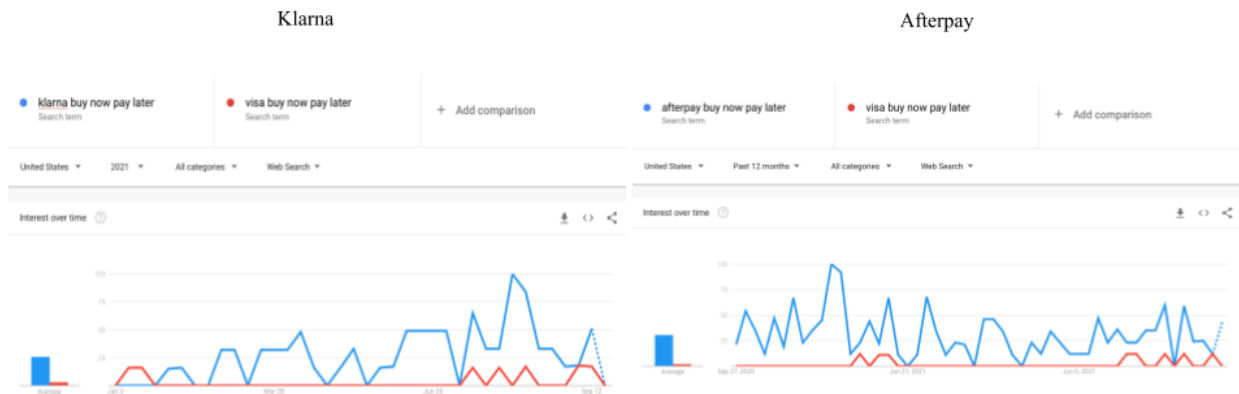


### AMEX valence report



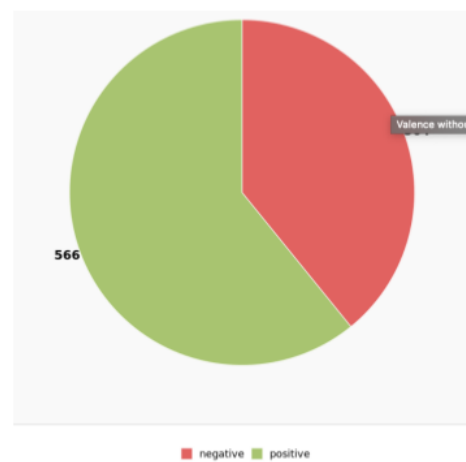
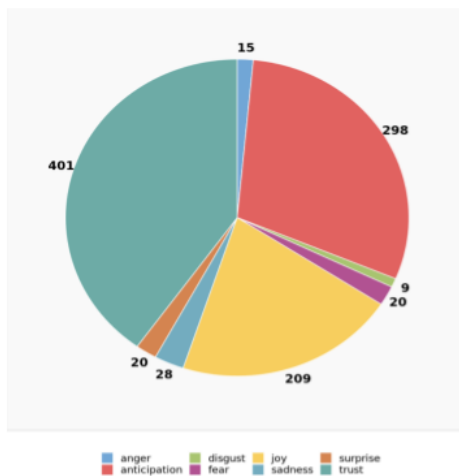
## Section 2.13

### Visa's Buy Now Pay Later Competitors



### Buy Now Pay Later Sentiment Analysis

- Trust and anticipation are the emotions most related with “buy now pay later”
- More positive sentiment, but still numerous negative Tweets

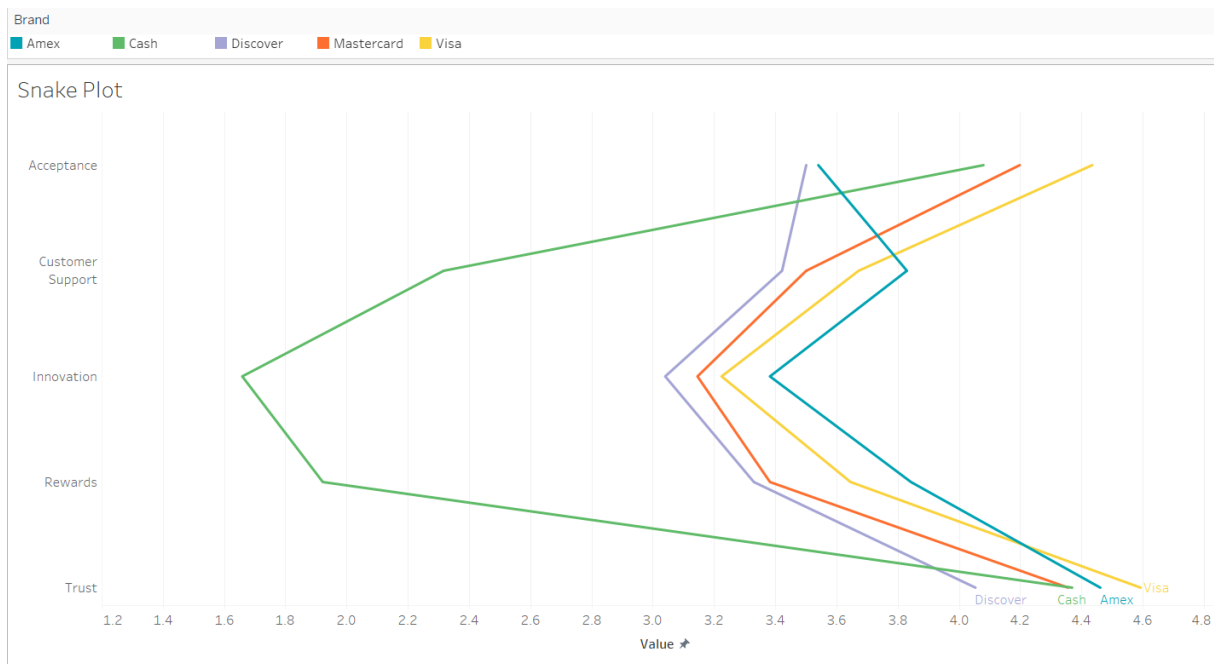


**Table 3.1**

Field	Population	Best Deal Hunters	Traditionalists	Early Crypto Adopters
Size	76	32 (42%)	23 (30%)	21 (28%)
Sign-Up for New Credit Card	2.84	3.31	2.22	2.81
Shop Credit Often	1.78	2.19	1.26	1.71
Trade Stocks	2.67	3.03	1.87	3.00
Crypto Familairy	2.72	2.94	1.61	3.62
Interested in Researching Crypto	4.00	4.31	2.87	4.76
More Crypto Opportunities	3.04	3.25	1.61	4.29
Innovative Banking	3.70	3.75	2.78	4.62

**Table 3.1: Segment Descriptions with 1 representing lowest scores and 5 representing the highest. Full Table can be found in the Appendix**

## Section 3.2



## Section 4.1

```
def ForwardSelection(train_features, test_features, train_labels, test_labels, number):  
    """  
    Completes a forward selection iterative model, starting with no features and adding a new feature  
    based on the best ROC AUC score. This program, for each iteration, will print the best feature that was  
    added to the model and it's associated ROC AUC score.  
  
    Takes 4 arguments:  
  
    train_features: training dataset with no labels  
    train_labels: training dataset with only target labels  
    test_features: test dataset with no labels  
    test_labels: test dataset with only target variables  
    number: how many features you want selected (if improvement in ROC_AUC continues)  
    """  
  
    from sklearn.linear_model import LogisticRegression  
    from sklearn.metrics import roc_auc_score  
    import numpy as np  
  
    best_roc = -100  
    best_roc_list = [0]  
    checks_before_break = 0  
    features = list(train_features.columns)  
    best_features = ['First']  
  
    while (len(best_features) < number):  
        for feature in features:  
            if best_features[0] == 'First':  
                model = LogisticRegression(solver='liblinear', random_state=0)  
                model.fit(np.array(train_features[feature]).reshape(-1,1), train_labels)  
                p_pred = model.predict_proba(np.array(test_features[feature]).reshape(-1,1))  
                p_pred = p_pred[:,1]  
                roc_value = roc_auc_score(test_labels, p_pred)  
            else:  
                features_to_test = best_features + [feature]  
                model = LogisticRegression(solver='liblinear', random_state=0)  
                model.fit(train_features[features_to_test], train_labels)  
                p_pred = model.predict_proba(test_features[features_to_test])  
                p_pred = p_pred[:,1]  
                roc_value = roc_auc_score(test_labels, p_pred)  
            if roc_value >= best_roc:  
                best_roc = roc_value  
                current_best = feature  
        if current_best == best_features[-1]:  
            break  
        elif best_features[-1] == 'First':  
            best_features = []  
        best_features.append(current_best)  
        best_roc_list.append(best_roc)  
        features.remove(current_best)  
        print(f'Added Feature: \'{current_best}\', ROC_AUC: {abs(best_roc)}')  
    return best_features, best_roc_list
```

```
Added Feature: 'annual_income_100,000-125,000', ROC_AUC: 0.5723076923076923  
Added Feature: 'annual_income_50,000-75,000', ROC_AUC: 0.6484615384615384  
Added Feature: 'monthly_credit_charge_$0-$500', ROC_AUC: 0.6907692307692308  
Added Feature: 'education_level_PhD or Higher', ROC_AUC: 0.7196153846153845  
Added Feature: 'monthly_credit_charge_$500-$1,000', ROC_AUC: 0.7465384615384616  
Added Feature: 'monthly_credit_charge_$2,000-$2,500', ROC_AUC: 0.7723076923076923  
Added Feature: 'education_level_Graduate Masters', ROC_AUC: 0.7823076923076923  
Added Feature: 'monthly_credit_charge_$3,500-$4,000', ROC_AUC: 0.7926923076923077  
Added Feature: 'monthly_credit_charge_More than $4,000', ROC_AUC: 0.8023076923076923  
Added Feature: 'employment_status_Employed Part-Time', ROC_AUC: 0.8107692307692308  
Added Feature: 'annual_income_More than 200,000', ROC_AUC: 0.8138461538461539  
Added Feature: 'gender_Female', ROC_AUC: 0.8153846153846155  
Added Feature: 'education_level_High School', ROC_AUC: 0.816923076923077  
Added Feature: 'credit_per_week_Once a Week', ROC_AUC: 0.8184615384615385
```

## Section 4.2: Infographic for 4-Step Implementation Plan

# Cryptocurrency Adoption Plan

A Data Driven Action Plan for VISA to Deploy and Integrate Crypto Capabilities

## 4-Step Plan for Success

- /Engage Partners
- /Empower Cardholders
- /Integrate Loyalty Programs
- /Marketing and Messaging

### Engage Partners



VISA should work with merchants and banks to build crypto-enabled transactional infrastructure such that banks and merchants working with VISA can accept crypto payments from their customers.

### Empower Cardholders

Current VISA credit and debit cardholders can earn cryptocurrency rewards, and even spend cryptocurrency loaded onto VISA-backed accounts using special new CryptoCards.



### Promote Crypto-Loyalty



By implementing loyalty programs that pay out rewards in cryptocurrency, VISA can attract a profitable and loyal consumer base of crypto-enthusiasts before they disperse to other financial services providers that offer similar programs.

### Marketing and Messaging

By sending the right message to the right people about new cryptocurrency enabled products, services, and perks, VISA can greatly increase the chances of a successful crypto rollout. See our report and presentation for more information.



By following our 4-step implementation plan, Visa can prepare for and execute a successful rollout of cryptocurrency capabilities designed for consumers who crave innovation with ease.

### Section 4.3: Mockup of CryptoCard with Capability Details

