

# Problem Set 1

Paul Freed

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## 1 My research interests

I will define my areas of research interest into two broad categories: fintech lending and PPP/traditional banking.

### 1.1 Fintech Lending

Fintech lending is a relatively new field within finance, mostly originating in the last ten to fifteen years. Fintech lending itself fits into a broader category of fintech, which includes everything from robo-advising and cryptocurrency to "insurtech", or technology driven alternative insurance platforms. The two largest fintech lenders are LendingClub and Prosper.com within the US, but fintech lenders now exist in almost every country in the world. I have been researching factors that fuel fintech demand or development in certain areas, driven by such possibilities as the local banking structure or broader categories, like social trust. A recent paper that looks at the relationship between banking structure and fintech development is [\[Balyuk et al., 2020a\]](#). Fintech lenders are also generally very transparent with data, which allows for interesting methodologies like machine learning to predict default or loan acceptance. A paper like this is [\[Netzer et al., 2019\]](#), which uses textual analysis to examine if certain grammatical cues or phrasing can be signals of default. I know Python is great for these kinds of analyses regarding machine learning, and I am particularly looking at applications of boosted regression tree and random forest designs, but recently I have taken a particular interest in textual analysis and how it can be leveraged in the world of fintech lending research for interesting results.

Fintech lenders also maintain different standards than traditional banks, so it is also interesting to look at their role within the context of the COVID-19 pandemic and the Paycheck Protection Program. I will discuss PPP more in detail in the next section, but fintech lenders accounted for a sizable amount of loans, which has had major consequences. For instance, [\[Griffin et al., 2021\]](#) find that fintech lenders

may have facilitated higher levels of lending fraud. Overall, I am very interested in the fintech lending literature, and I hope to do more work on these topics.

## 1.2 The Paycheck Protection Program and Traditional Banking

The PPP is the largest bailout of its type in the history of the US, so there is a lot of interesting research going on about it. Generally, the research finds PPP was generally successful. However, beyond this, research also finds that there has been a great deal of waste and fraud, and there future questions to be asked about this in regard to PPP loan forgiveness.

In regard to some of the main pieces of literature, [Balyuk et al., 2020b] find that some large firms curiously return their PPP loans without using them, and then experience higher valuations when they do so, suggesting some possible unobservable costs of receiving a loan. There are still a lot of questions left unanswered regarding the PPP, and I find that exciting, and I hope to continue to be a part of it.

I also enjoy more broadly working within the field of traditional banking, particularly looking at community banking. Community banks are becoming less and less common, particularly in large cities, which is all to say some changes are taking place. It is also relatively easy to look at the factors related to community banking, given due to regulation, a lot of the internal data from each bank branch must be made public in call reports. Data from transparent sources like this can be combined with interesting geographic factors, or even some fintech-related factors to make for a number of interesting research topics. While at this point I am mostly unfamiliar with this, there are also a lot of interesting applications of machine learning to the world of banking research.

## 2 Figures and Equations

### 2.1 A Map I Made in R

I made this map for a recent project. I am labelling it as See the code for Figure 1. It presents regional differences in unemployment rates across counties in April 2020, with darker colors representing higher values. I really enjoy making maps, as I utilize regional variation a lot in my own research, and this is a skill I hope to better learn in Python, provided it is a function.

### 2.2 A Basic Equation

I am going to add a basic equation from some of the research I have done. Generally, since I do not do theoretical work, regression equations are what I find myself writing most of the time, so I am glad

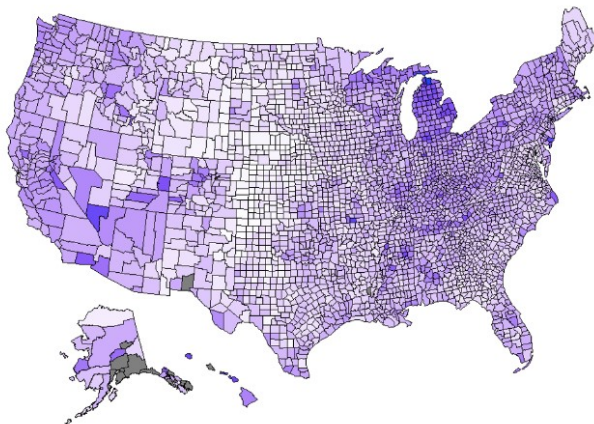


Figure 1: This is a figure I generated recently showing the heterogeneous effect of the COVID-19 pandemic

that it looks good using LaTeX.

$$\text{Constraints}_{t,i} = \alpha_i + A_1 \text{PPP}_{t,i} + A_2 \text{Controls}_{t,i} + \varepsilon_i$$

## References

- [Balyuk et al., 2020a] Balyuk, T., Berger, A. N., and Hackney, J. (2020a). What is fueling fintech lending? the role of banking market structure. *The Role of Banking Market Structure (June 23, 2020)*.
- [Balyuk et al., 2020b] Balyuk, T., Prabhala, N. R., and Puri, M. (2020b). Indirect costs of government aid and intermediary supply effects: Lessons from the paycheck protection program. Technical report, National Bureau of Economic Research.
- [Griffin et al., 2021] Griffin, J. M., Kruger, S., and Mahajan, P. (2021). Did fintech lenders facilitate ppp fraud? *Available at SSRN*.
- [Netzer et al., 2019] Netzer, O., Lemaire, A., and Herzenstein, M. (2019). When words sweat: Identifying signals for loan default in the text of loan applications. *Journal of Marketing Research*, 56(6):960–980.