

Innovation Landscapes: An Analysis of National Science Foundation Research Grants from 1999-2016

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Introduction

The National Science Foundation is

Methodology

The dataset used in this study is comprised of queries obtained from <https://www.usaspending.gov>. Using multiple queries on the followig page <https://www.usaspending.gov/Pages/TextView.aspx?data=HomeAwardTypeFunding>, the range of fiscal years 1999-2016 was obtained. The variables that were selected for the working data frame are:

recipient_name - Recipient name recipient_city_name - Name of recipient's location city recipient_type - Type of recipient ranging from non-profits and corporations to higher educational institutions action_type - New grant , Continuing grant or revised fed_funding_amount - Dollar amount granted obligation_action_date - Grant decision made starting_date - Start of research ending_date - End of research principal_place_state - Recipient location state cfda_program_title - Field of research fiscal_year - Budget year principal_place_state_code - Recipient location state code

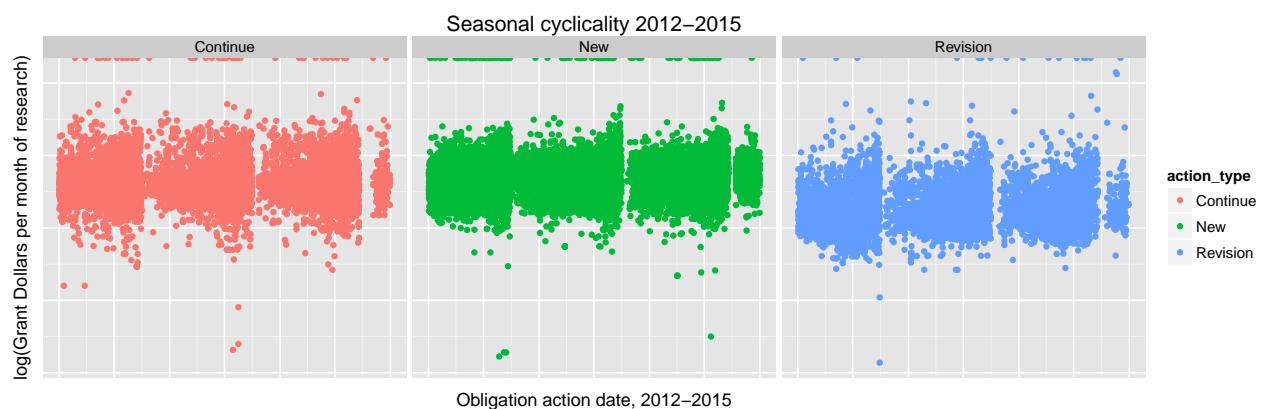
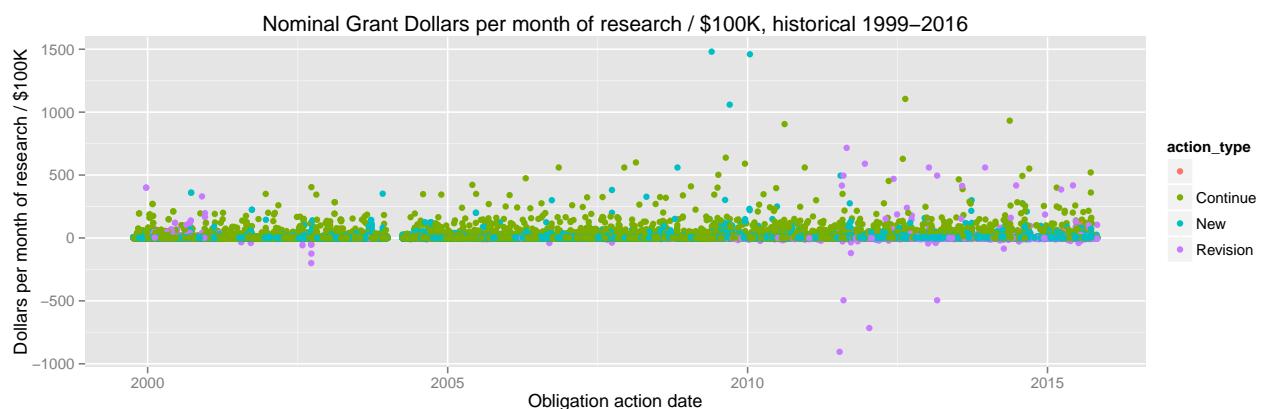
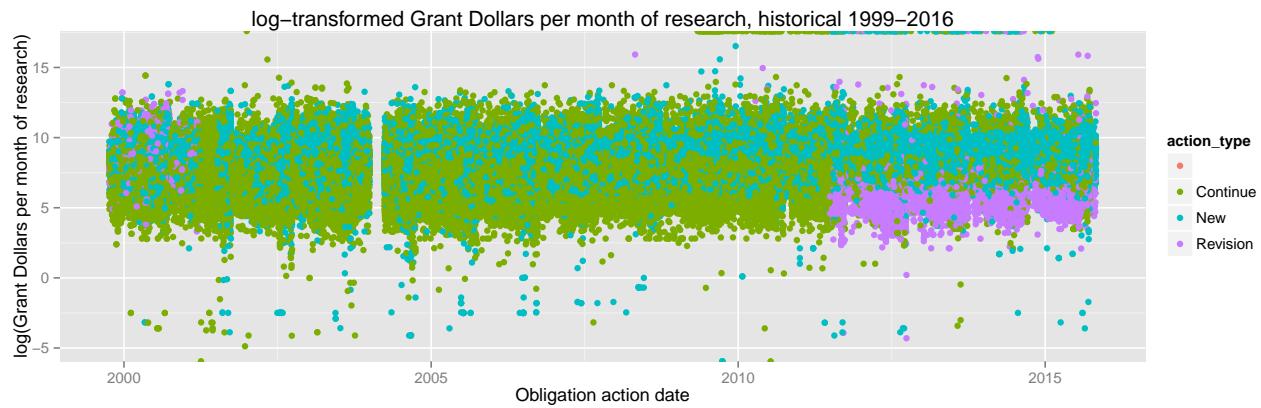
The following modifications were conducted to the existing variables:\begin{enumerate} 1. conversion of non-numeric variable into categorical variables 2. dates were transformed to be treated as dates by R 3. duplicates of variable values were merged to be treated as identical values 4. cfda_programm_title values werereplaced by more concise Continue, New and Revision \end{enumerate}

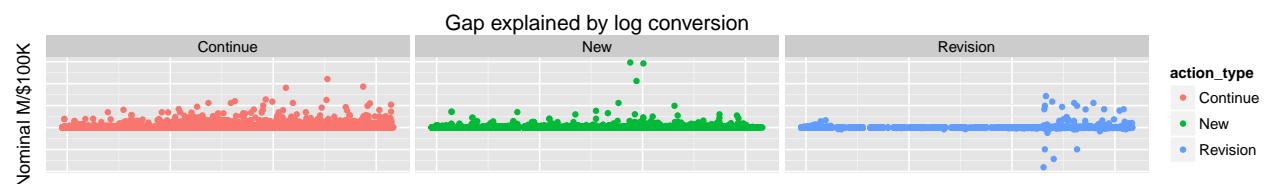
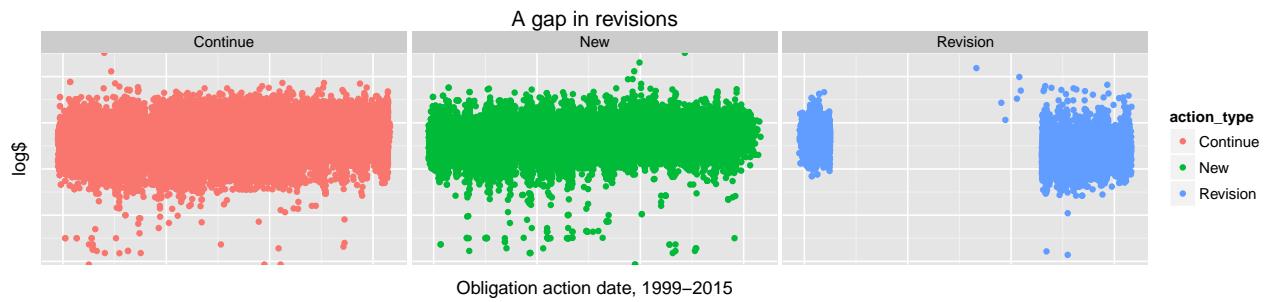
Following variables were added as new columns\begin{enumerate} 1. res_duration - duration of research obtained by calculating the difference between the ending and starting dates of research. Such values were divided by 30 to obtain duration in months 2. costmon - fed_funding_amount was divided by res_duration to establish the common base for comparing amounts alocated to different recipients 3. monstar, mondec - month of research start and obligation action date respectively 4. logcost - log-transformed costmon calculated for plotting\end{enumerate}

The resyting dataset consists of 410292 observations of 17 variables. Various subsets were created to calculate cumulative amounts granted to states, programs and by months. Subsets of top recipient states was also created for similar purposes.

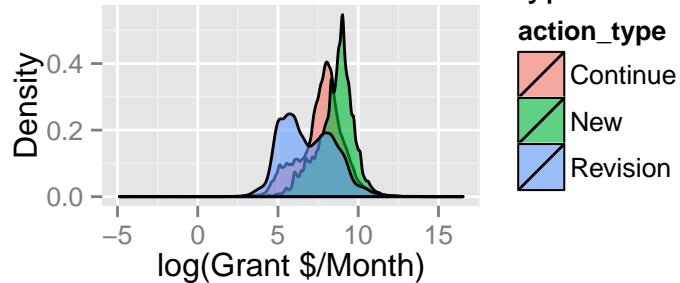
General observations

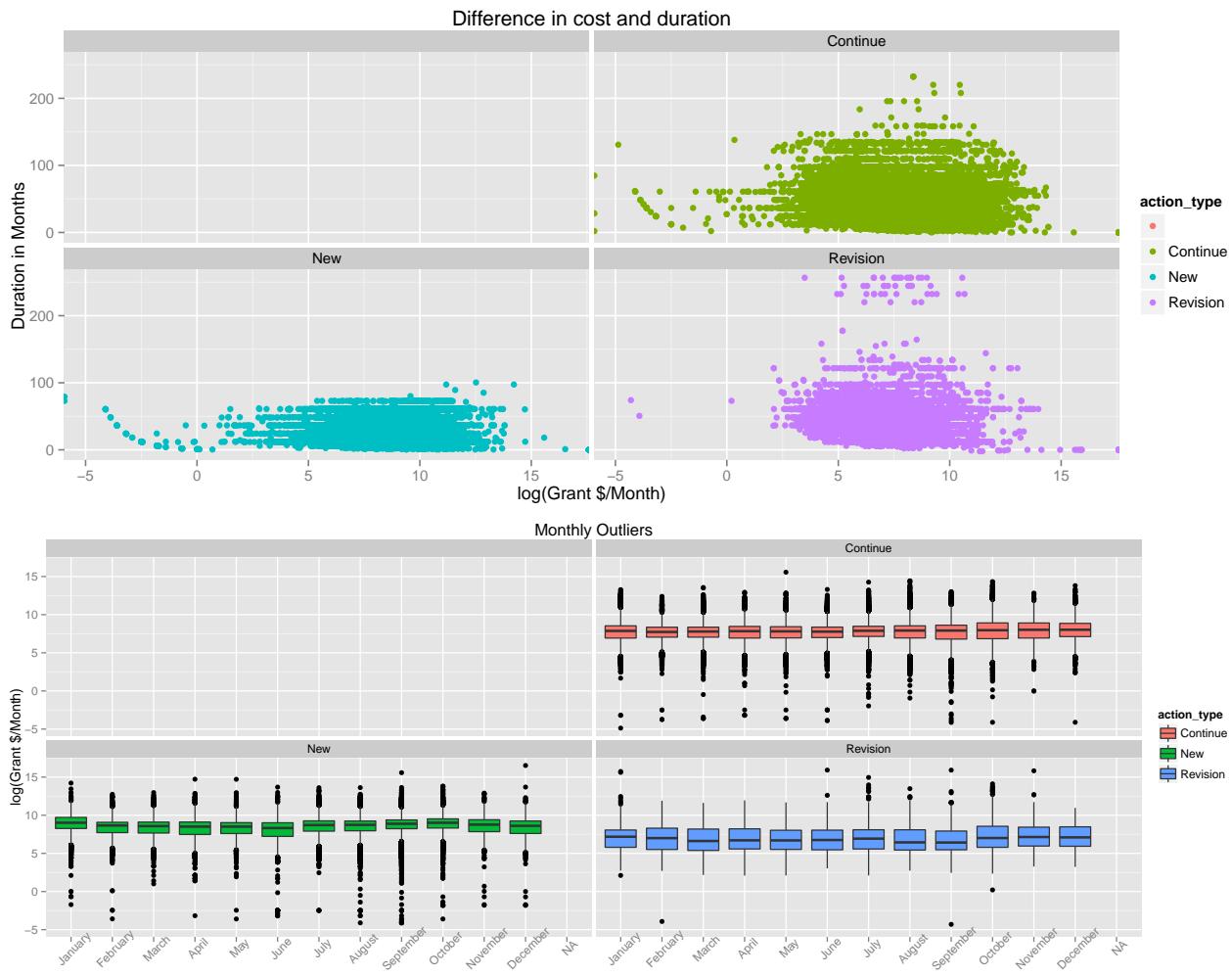
As seen on the plot



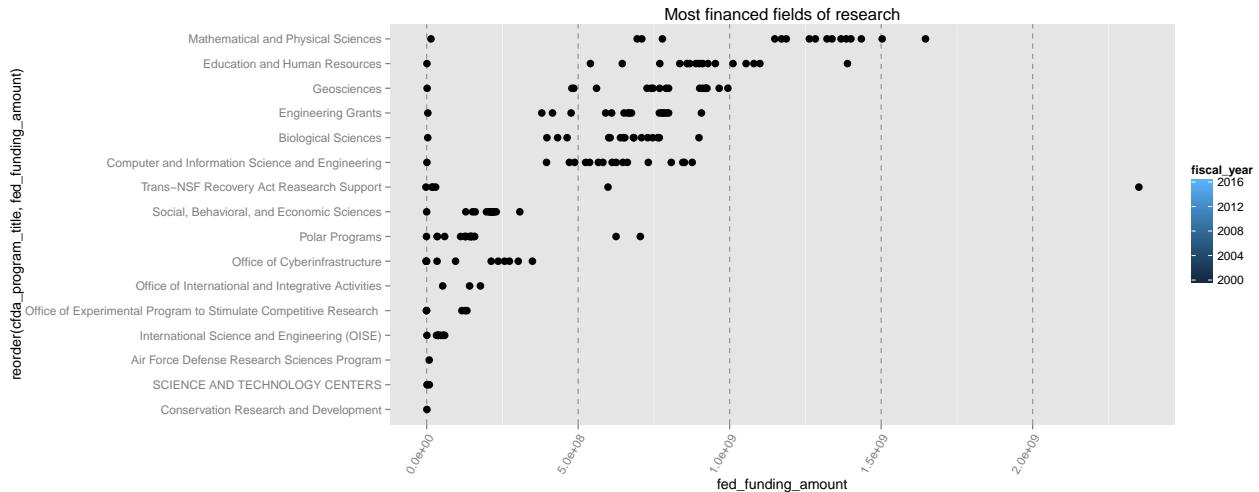


Cost differences between action types

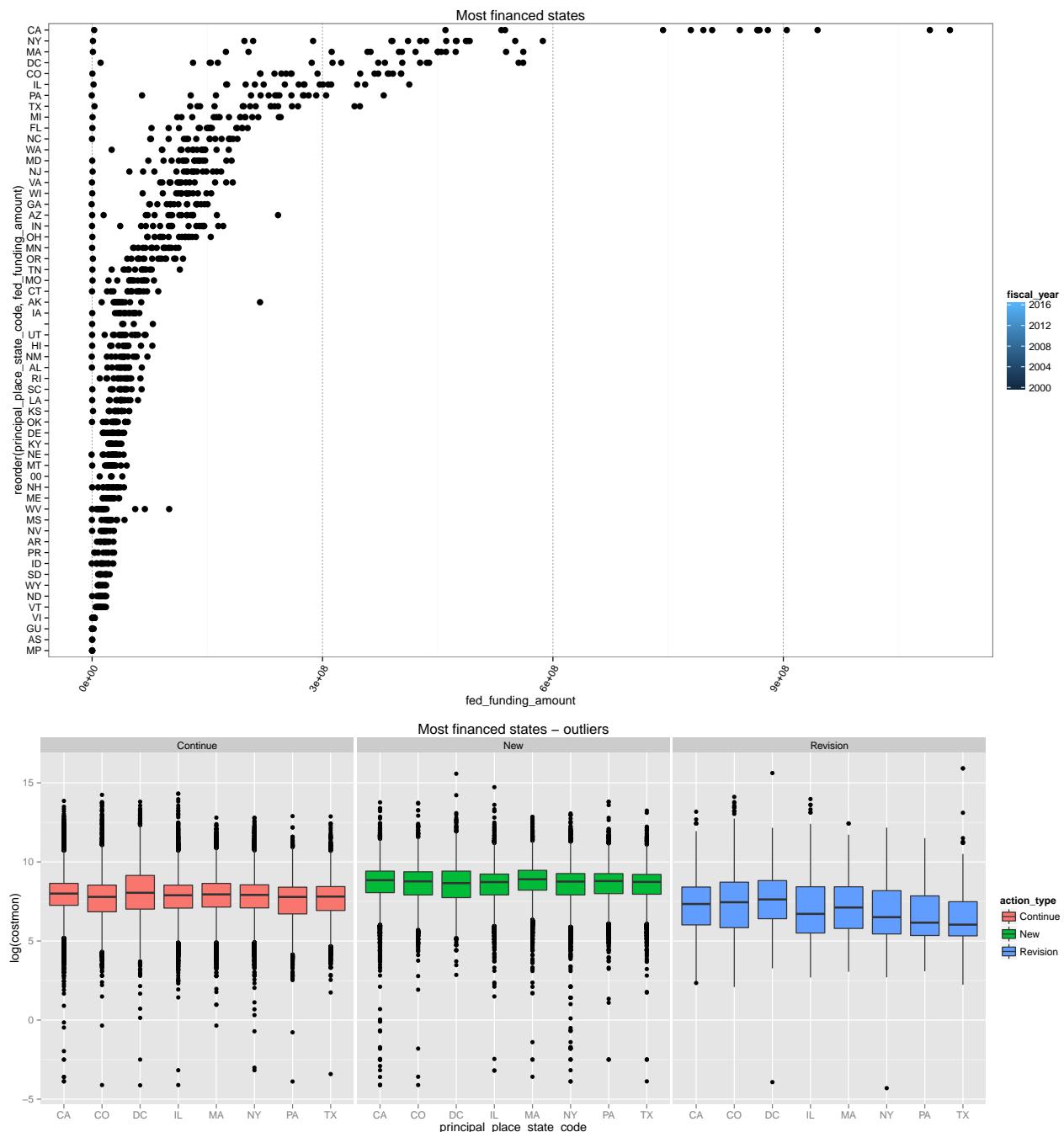




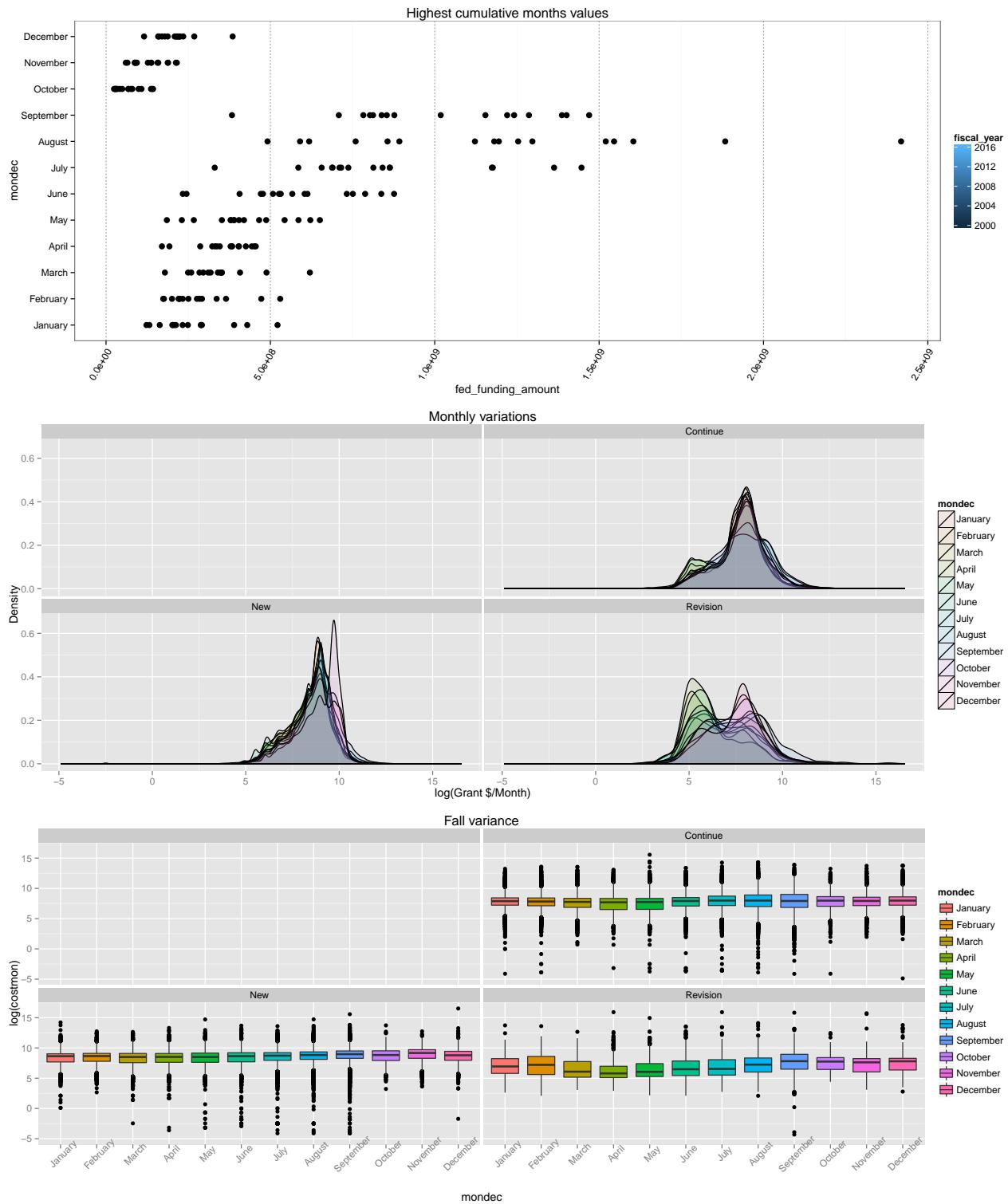
Fields of research



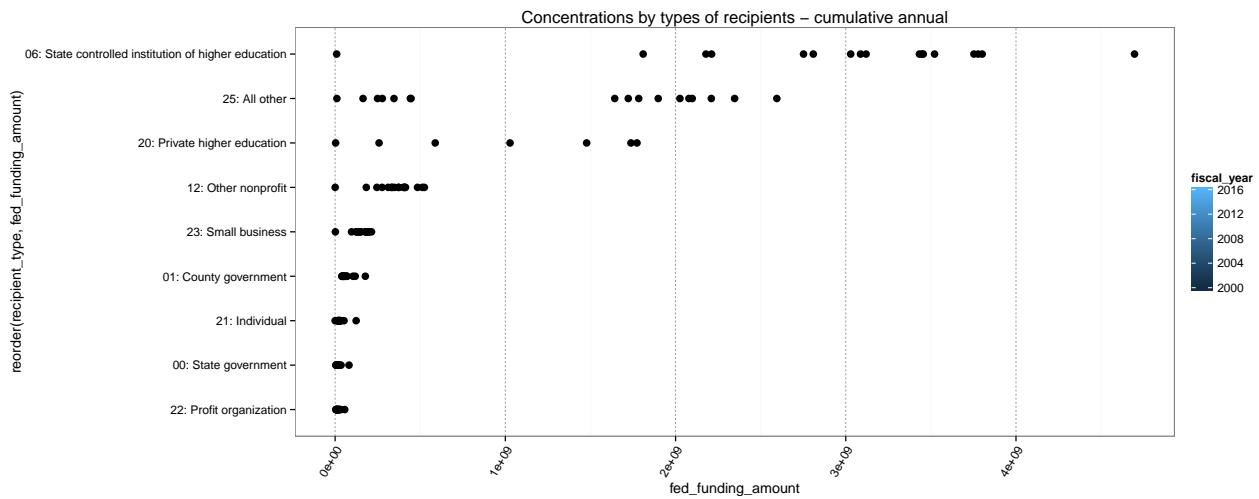
States



Months



Recipient



Discussion

Bibliography