

How to Not Get Rich: An Empirical Study of Donations in Open Source

Cassandra Overney* @CassandraOvern1

Jens Meinicke

Christian Kästner @p0nk

Bogdan Vasilescu @b_vasilescu

*Franklin W. Olin College of Engineering



Sustaining Open Source is critically important

Heartbleed



MSR 2020 FOSS Award
<https://arxiv.org/abs/2005.14242>

Leftpad

NPM ERR!

How one programmer broke the internet by deleting a tiny piece of code

By Keith Collins • March 27, 2016

```
1 module.exports = leftpad;
2 function leftpad(str, len, ch) {
3   str = String(str);
4   var i = -1;
5   if (!ch && ch !== 0) ch = ' ';
6   len = len - str.length;
7   while (++i < len) {
8     str = ch + str;
9   }
10  return str;
11}
```

<https://qz.com/646467/how-one-programmer-boke-the-internet-by-deleting-a-tiny-piece-of-code/>

Equifax

Equifax confirms Apache Struts security flaw it failed to patch is to blame for hack

The company said the March vulnerability was exploited by hackers.



<https://www.zdnet.com/article/equifax-confirms-apache-struts-flaw-it-failed-to-patch-was-to-blame-for-data-breach/>

Sustaining Open Source is critically important

But a significant challenge

Heartbleed



MSR 2020 FOSS Award
<https://arxiv.org/abs/2005.14242>

Leftpad

NPM ERRI

How one programmer broke the internet by deleting a tiny piece of code

By Keith Collins • March 27, 2016

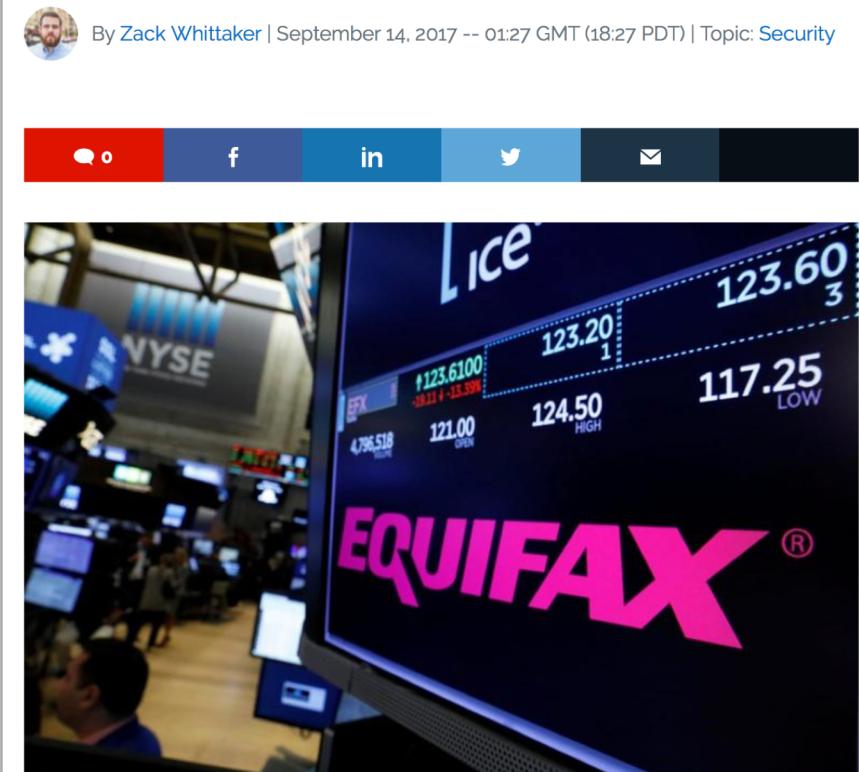
```
leftpad.js  package.json
1 module.exports = leftpad;
2 function leftpad(str, len, ch) {
3   str = String(str);
4   var i = -1;
5   if (!ch && ch !== 0) ch = ' ';
6   len = len - str.length;
7   while (++i < len) {
8     str = ch + str;
9   }
10  return str;
11 }
```

<https://qz.com/646467/how-one-programmer-boke-the-internet-by-deleting-a-tiny-piece-of-code/>

Equifax

Equifax confirms Apache Struts security flaw it failed to patch is to blame for hack

The company said the March vulnerability was exploited by hackers.



<https://www.zdnet.com/article/equifax-confirms-apache-struts-flaw-it-failed-to-patch-was-to-blame-for-data-breach/>

Roads and Bridges:

The Unseen Labor Behind Our Digital Infrastructure

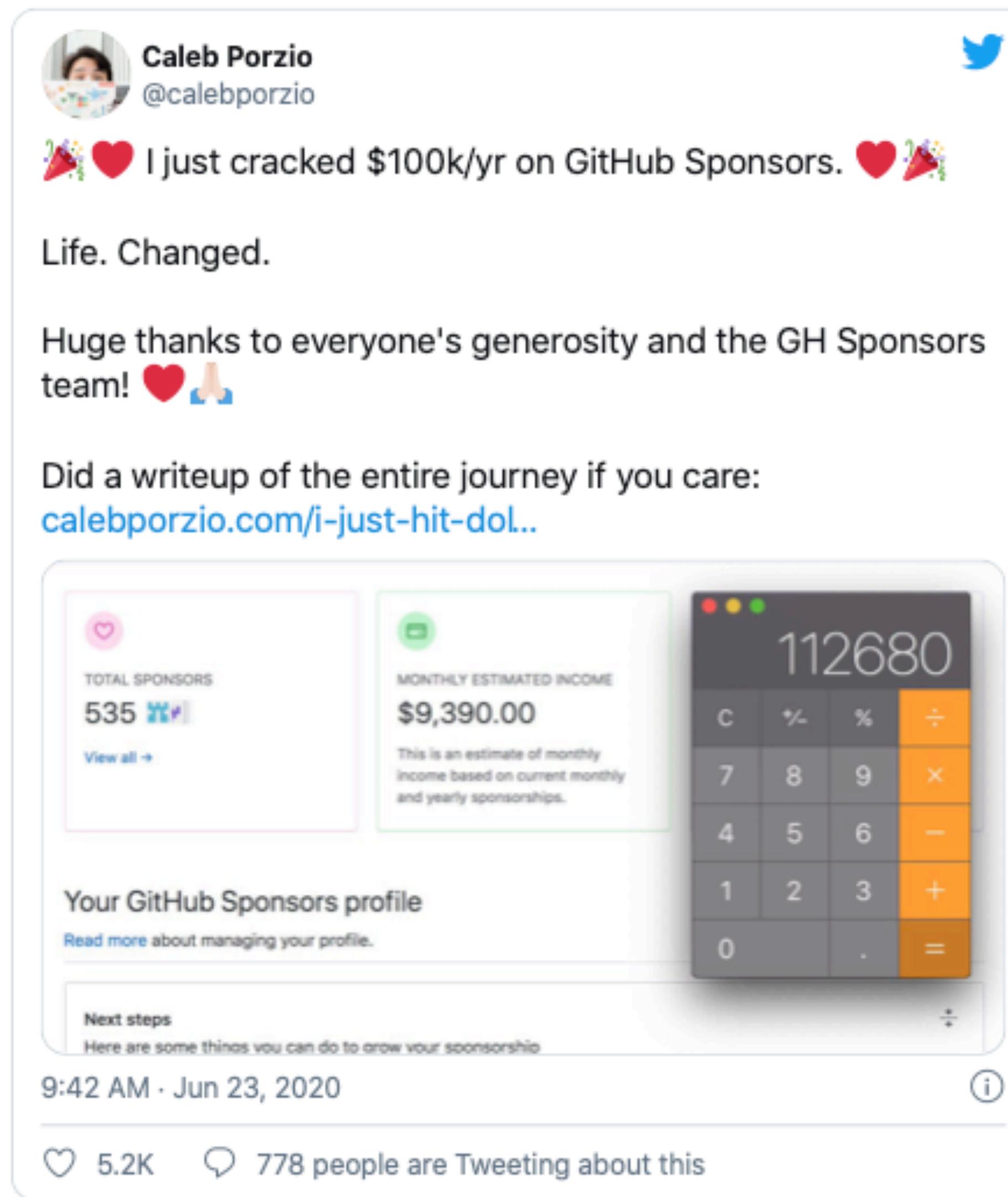
“Most of us take [Open Source] for granted, the way we take turning on the lights for granted. We don’t think about the human capital necessary to make that happen.”

WRITTEN BY
Nadia Eghbal



Donations are gaining in popularity as a potential solution

Only anecdotes about their prevalence and impact



Caleb Porzio
@calebporzio

I just cracked \$100k/yr on GitHub Sponsors. Life. Changed.

Huge thanks to everyone's generosity and the GH Sponsors team! 🙏

Did a writeup of the entire journey if you care: calebporzio.com/i-just-hit-dol...

TOTAL SPONSORS: 535

MONTHLY ESTIMATED INCOME: \$9,390.00

This is an estimate of monthly income based on current monthly and yearly sponsorships.

Your GitHub Sponsors profile

Read more about managing your profile.

Next steps

Here are some things you can do to grow your sponsorship.

9:42 AM · Jun 23, 2020

5.2K 778 people are Tweeting about this



Chris Aniszczyk
@cra

paying maintainers via charity or donations is the wrong approach for long term sustainability, also shorts maintainers into a gig-style economy without benefits, it's corporations that need to give back through hiring and setting time for open source contribution

sMyle ✅ @MylesBorins

Open source doesn't work without large scale enterprise or corporate investment

Simply paying maintainers has the wrong incentive model and is not scalable. twitter.com/AmarachiAmaech...

8:07 PM · Mar 10, 2019 from San Carlos, CA

57 See Chris Aniszczyk's other Tweets

Census

Characteristics

Expectations

Effects

Usage

Key insight: README files contain signals of donation requests

The compiler for writing next generation JavaScript.

Gitpod ready-to-code

v7 downloads 74M/month v6 downloads 23M/month

travis passing circle passing coverage 91% slack 13112 Follow 47k

Supporting Babel

backers 640 sponsors 270 business model floratown

Babel (pronounced "babble") is a community-driven project used by many companies and projects, and is maintained by a group of volunteers. If you'd like to help support the future of the project, please consider:

- Giving developer time on the project. (Message us on [Twitter](#) or [Slack](#) for guidance!)
- Giving funds by becoming a sponsor on [Open Collective](#) or [Patreon](#)!



<https://github.com/babel/babel>

This study:

GitHub-scale
census of donation
requests

Stated
expectations
for donations

Actual
usage
of donations

Characteristics
of projects asking /
getting money

Measurable
effects
of donations

Today: Only a few highlights

See paper for the rest

How to Not Get Rich: An Empirical Study of Donations in Open Source

Cassandra Overney,[†] Jens Meinicke,[‡] Christian Kästner,[‡] Bogdan Vasilescu[‡]

[†]Olin College, USA [‡]Carnegie Mellon University, USA

ABSTRACT

Open source is ubiquitous and many projects act as critical infrastructure, yet funding and sustaining the whole ecosystem is challenging. While there are many different funding models for open source and concerted efforts through foundations, donation platforms like *PayPal*, *Patreon*, and *OpenCollective* are popular and low-bar platforms to raise funds for open-source development. With a mixed-method study, we investigate the emerging and largely unexplored phenomenon of donations in open source. Specifically, we quantify how commonly open-source projects ask for donations, statistically model characteristics of projects that ask for and receive donations, analyze for what the requested funds are needed and used, and assess whether the received donations achieve the intended outcomes. We find 25,885 projects asking for donations on GitHub, often to support engineering activities; however, we also find no clear evidence that donations influence the activity level of a project. In fact, we find that donations are used in a multitude of ways, raising new research questions about effective funding.

ACM Reference format:

Cassandra Overney, Jens Meinicke, Christian Kästner, Bogdan Vasilescu. 2020. How to Not Get Rich: An Empirical Study of Donations in Open Source. In *Proceedings of 42nd International Conference on Software Engineering, Seoul, Republic of Korea, May 23–29, 2020 (ICSE '20)*, 13 pages.

DOI: 10.1145/3377811.3380410

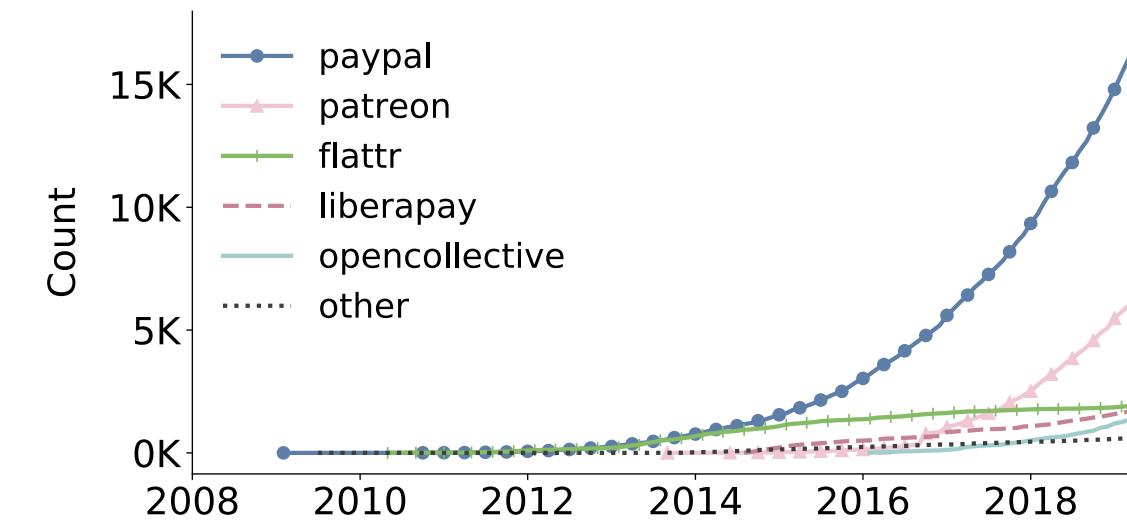
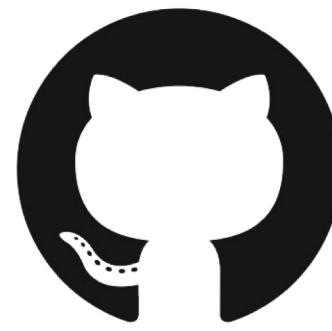


Figure 1: Adoption of donation platforms over time on GitHub (number of new non-fork repositories per month).

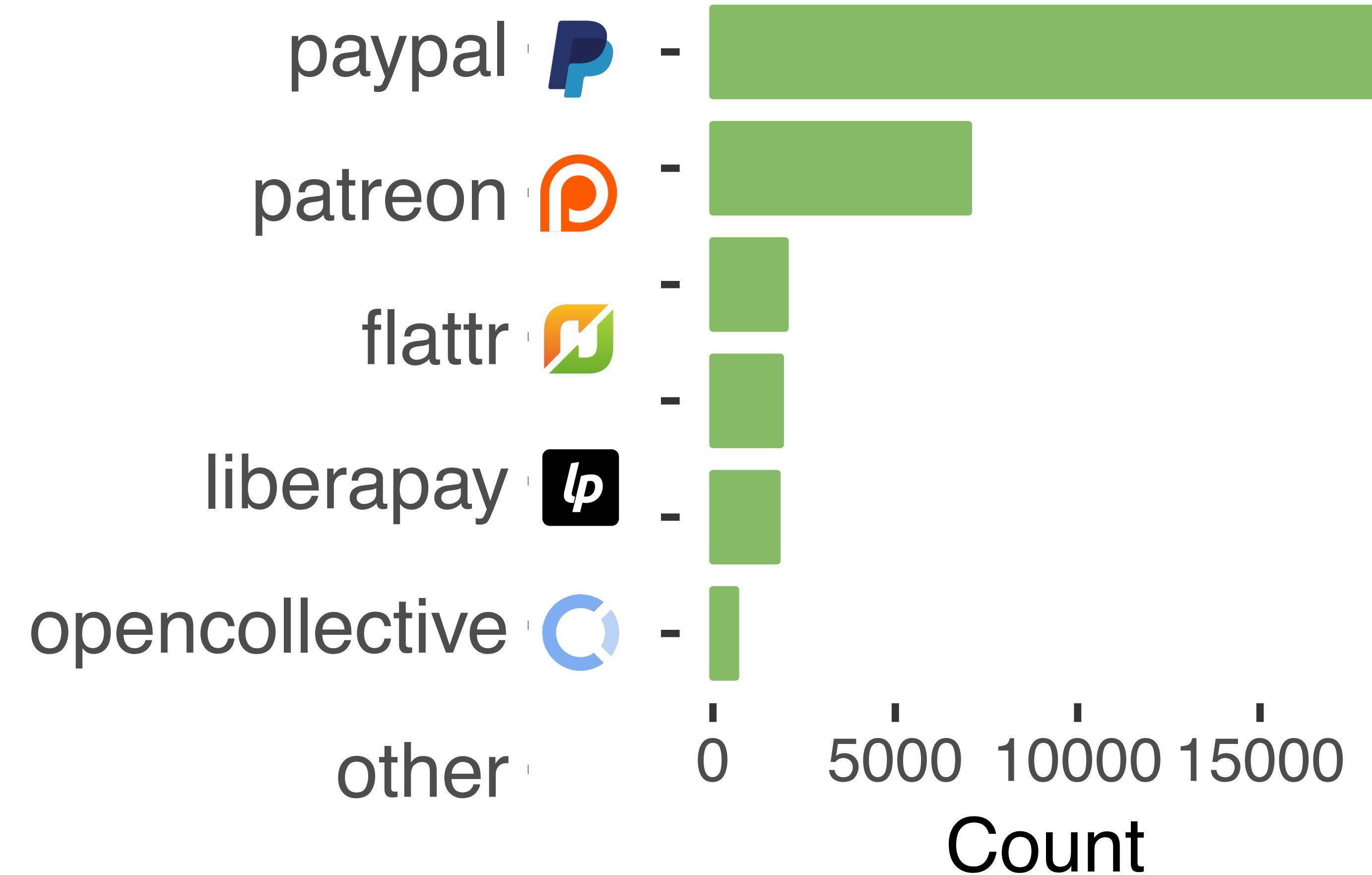
relevant. With increasing popularity, demands for maintenance and support work typically rise, including large numbers of support requests, feature requests, and reported issues. When open-source infrastructure is insufficiently maintained or even abandoned by their developers, this can raise significant costs and risks for users of such infrastructure, who might need to work around known bugs or make significant changes to find alternatives. How to supply all this needed maintenance and development work is an open and sometimes controversial question.

Traditionally much work in free software and open source has

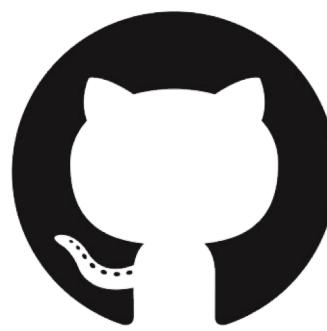


GitHub: 0.04% of repos ask for donations

- Census
- Characteristics
- Expectations
- Effects
- Usage



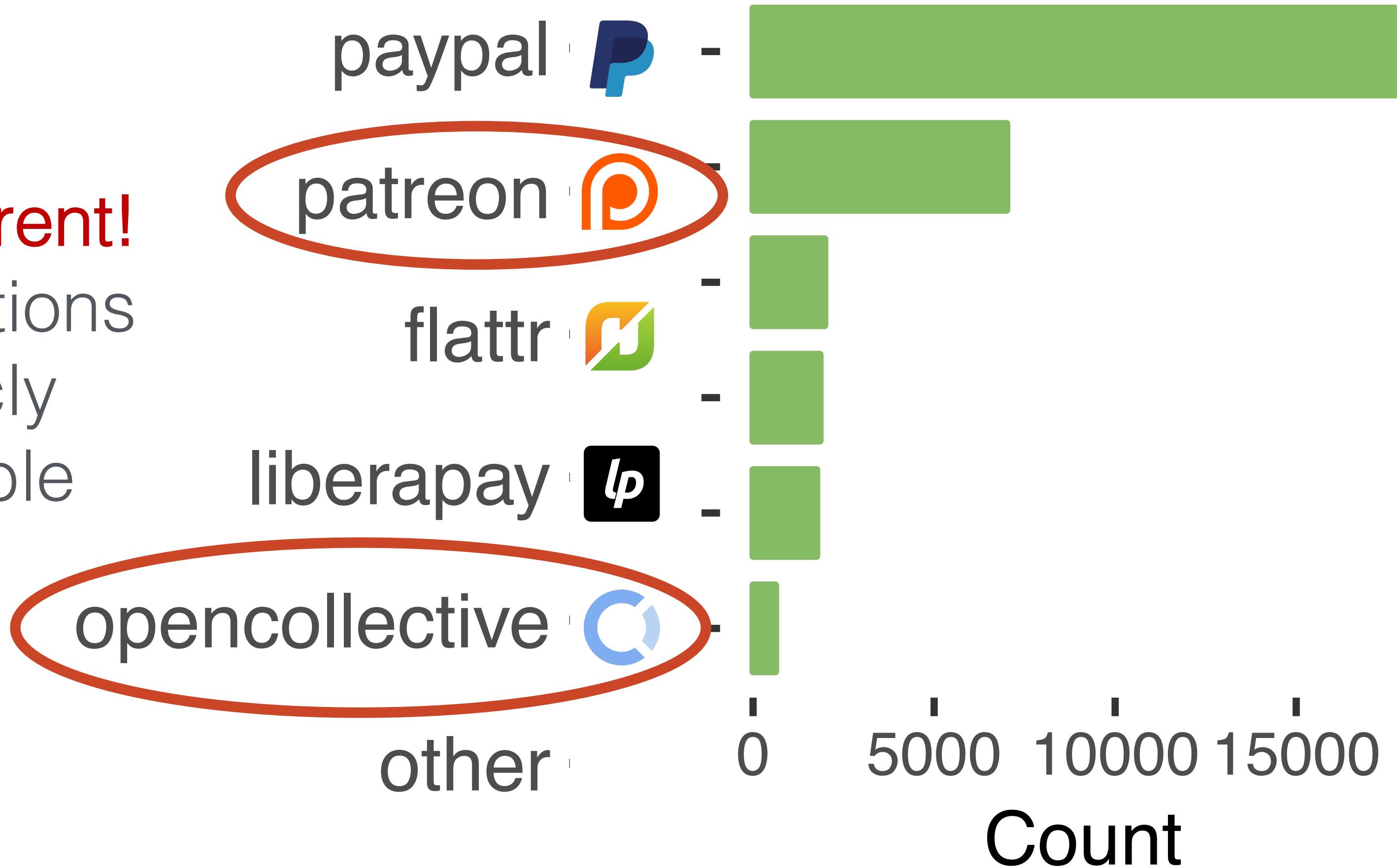
as of May 23, 2019



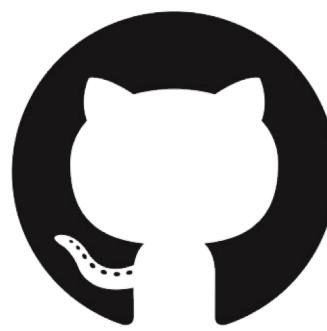
GitHub: 0.04% of repos ask for donations

Census
Characteristics
Expectations
Effects
Usage

Transparent!
Transactions
publicly
available



as of May 23, 2019



GitHub: 0.04% of repos ask for donations

Transparent!
Transactions
publicly
available

The screenshot shows the Babel budget page. At the top, there are tabs for Contribute, Budget (which is selected), Contributors, and About. There are also Contact and Submit Expense buttons. The main section is titled "Budget" and contains the following information:

- Financial contribution to Babel** by Kenichiro Fukushima on 06/25/2020: + \$10.00 USD
- Monthly financial contribution to Babel (Backers)** by Neal Lindsay on 06/21/2020: + \$5.00 USD
- Financial contribution to Babel** by Darasimi Ajewole on 06/12/2020: + \$20.00 USD

On the right side, there is a summary box:

- TODAY'S BALANCE**: \$107,819.40 USD
- ESTIMATED ANNUAL BUDGET**: ~ \$291,748.40 USD

At the bottom, there are two buttons: "View all transactions" and "View all expenses".

Census

Characteristics

Expectations

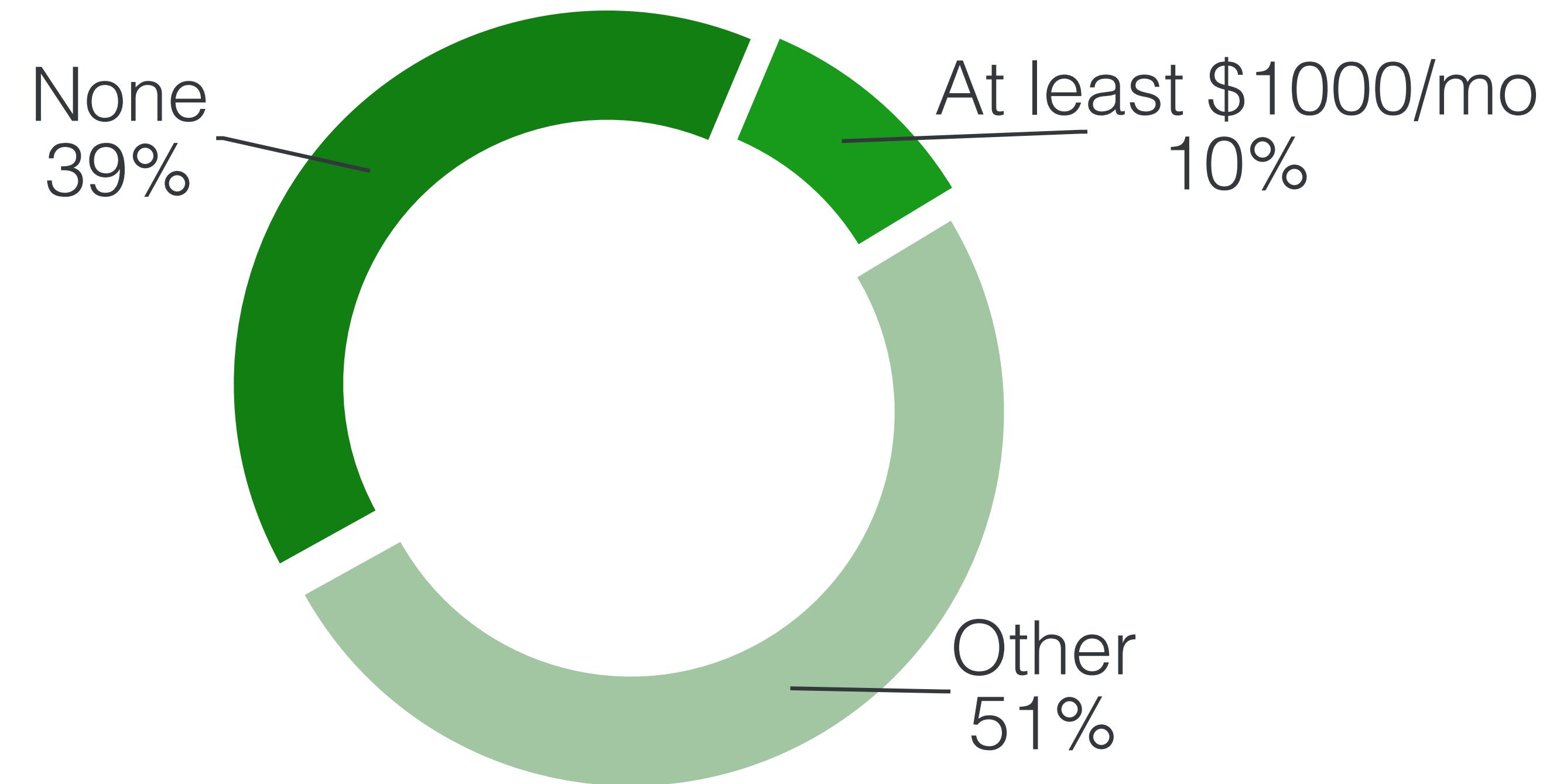
Effects

Usage

Most projects receive little funding

Sample: 6,516 repos using  patreon /  open collective

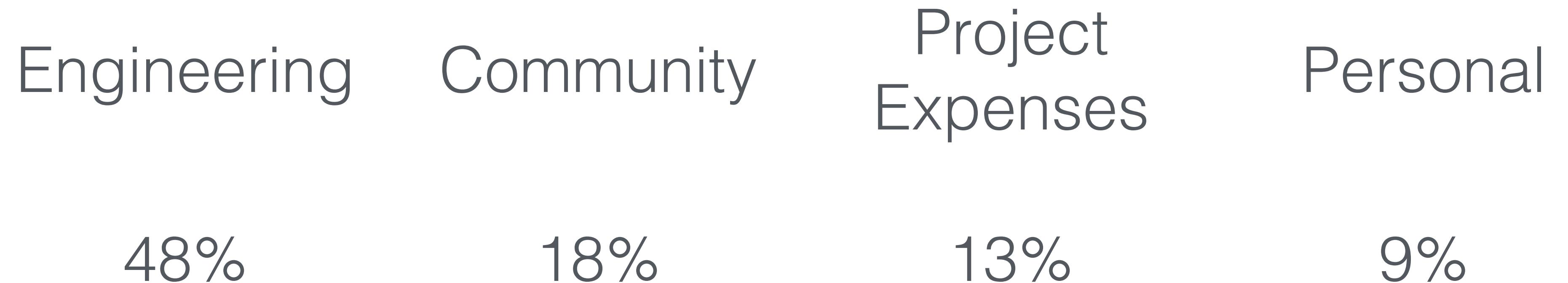
Census
Characteristics
Expectations
Effects
Usage



last 9 months before May 23, 2019

Developers plan to spend donations on ...

Census
Characteristics
Expectations
Effects
Usage



Qualitative analysis of donation profile pages for 109 **npm** projects on **patreon** **open collective** **KICKSTARTER**

Developers plan to spend donations on ...

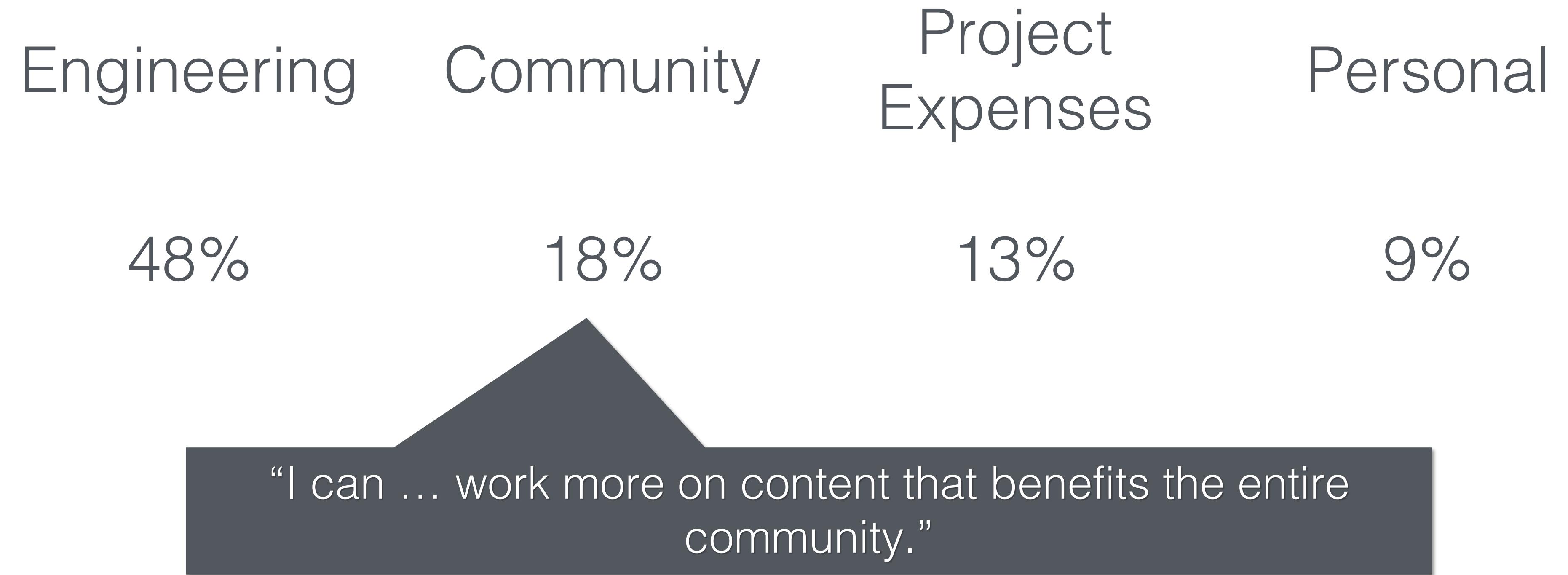
Census
Characteristics
Expectations
Effects
Usage



Qualitative analysis of donation profile pages for 109 **npm** projects on **patreon** **open collective** **KICKSTARTER**

Developers plan to spend donations on ...

Census
Characteristics
Expectations
Effects
Usage



Qualitative analysis of donation profile pages for 109 **npm** projects on **patreon** **open collective** **KICKSTARTER**

Census

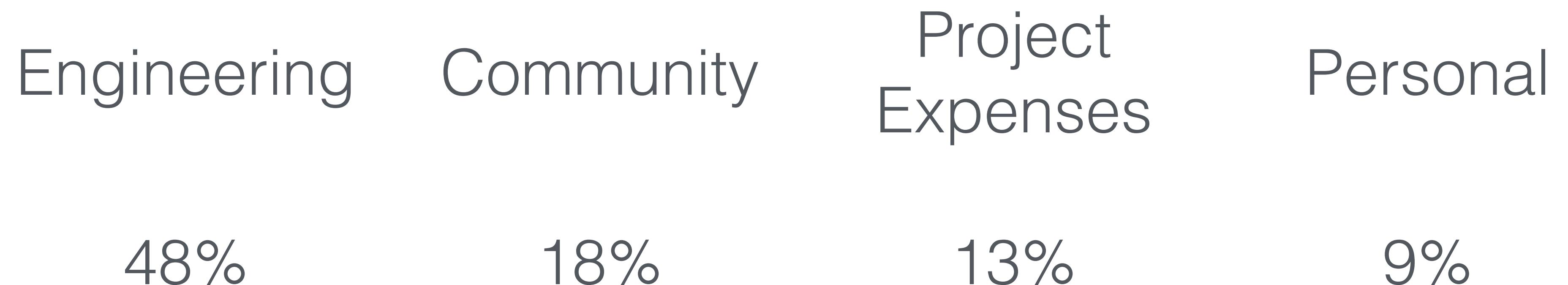
Characteristics

Expectations

Effects

Usage

Developers plan to spend donations on ...



“The money from this Patreon keeps the servers for my projects running.”

Qualitative analysis of donation profile pages for 109 **npm** projects on **Patreon** **Open Collective** **KICKSTARTER**

Census

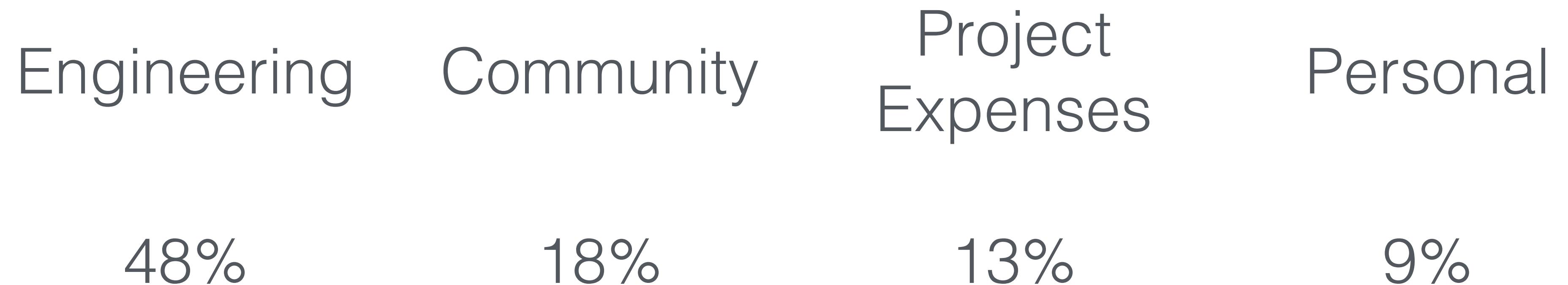
Characteristics

Expectations

Effects

Usage

Developers plan to spend donations on ...



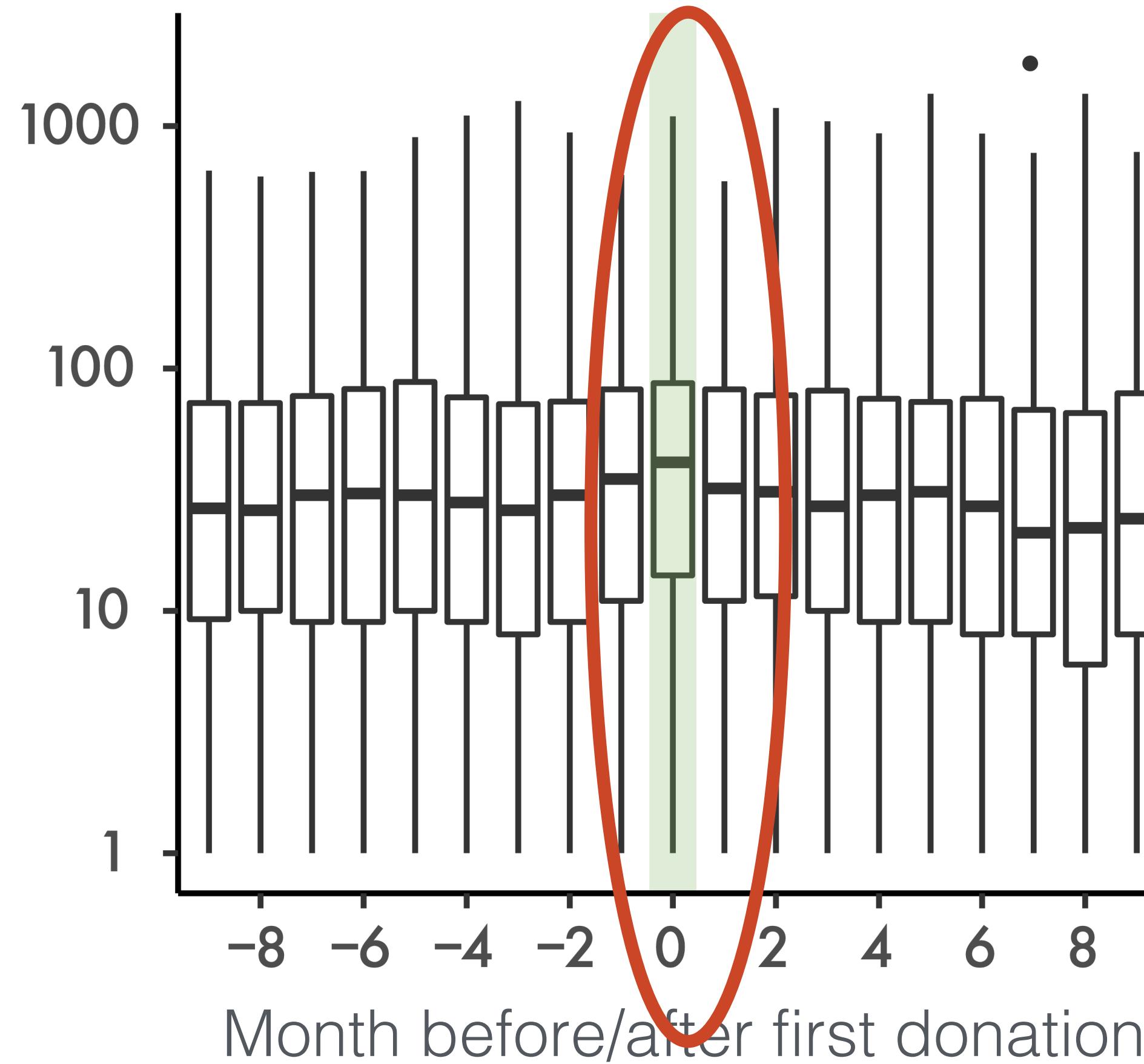
“The \$3,000 per month will be put toward my living expenses and student loan bills.”

Qualitative analysis of donation profile pages for 109 **npm** projects on **patreon** **open collective** **KICKSTARTER**

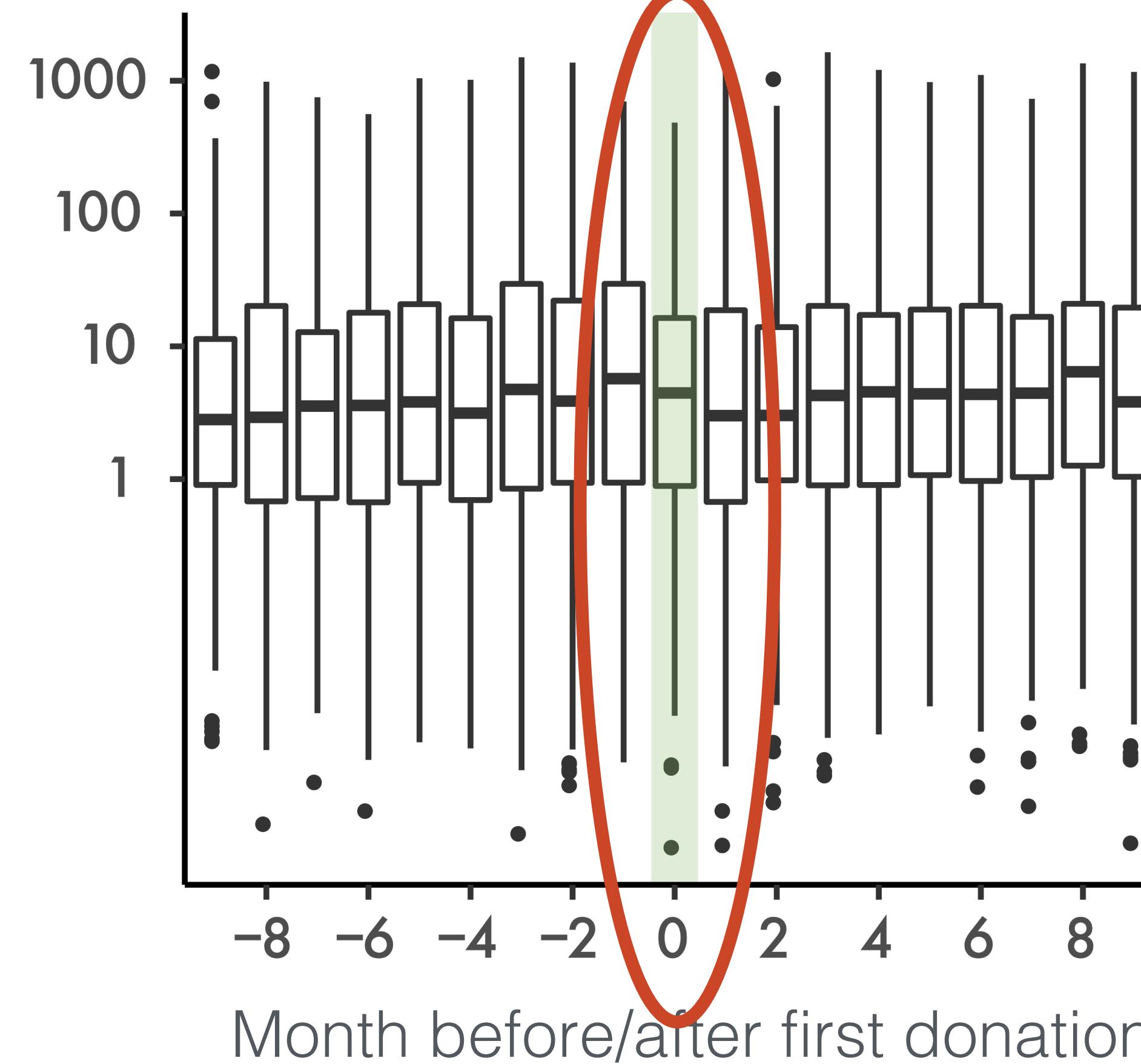
The impact of donations is small on average, and short-lived

Census
Characteristics
Expectations
Effects
Usage

Commits per month



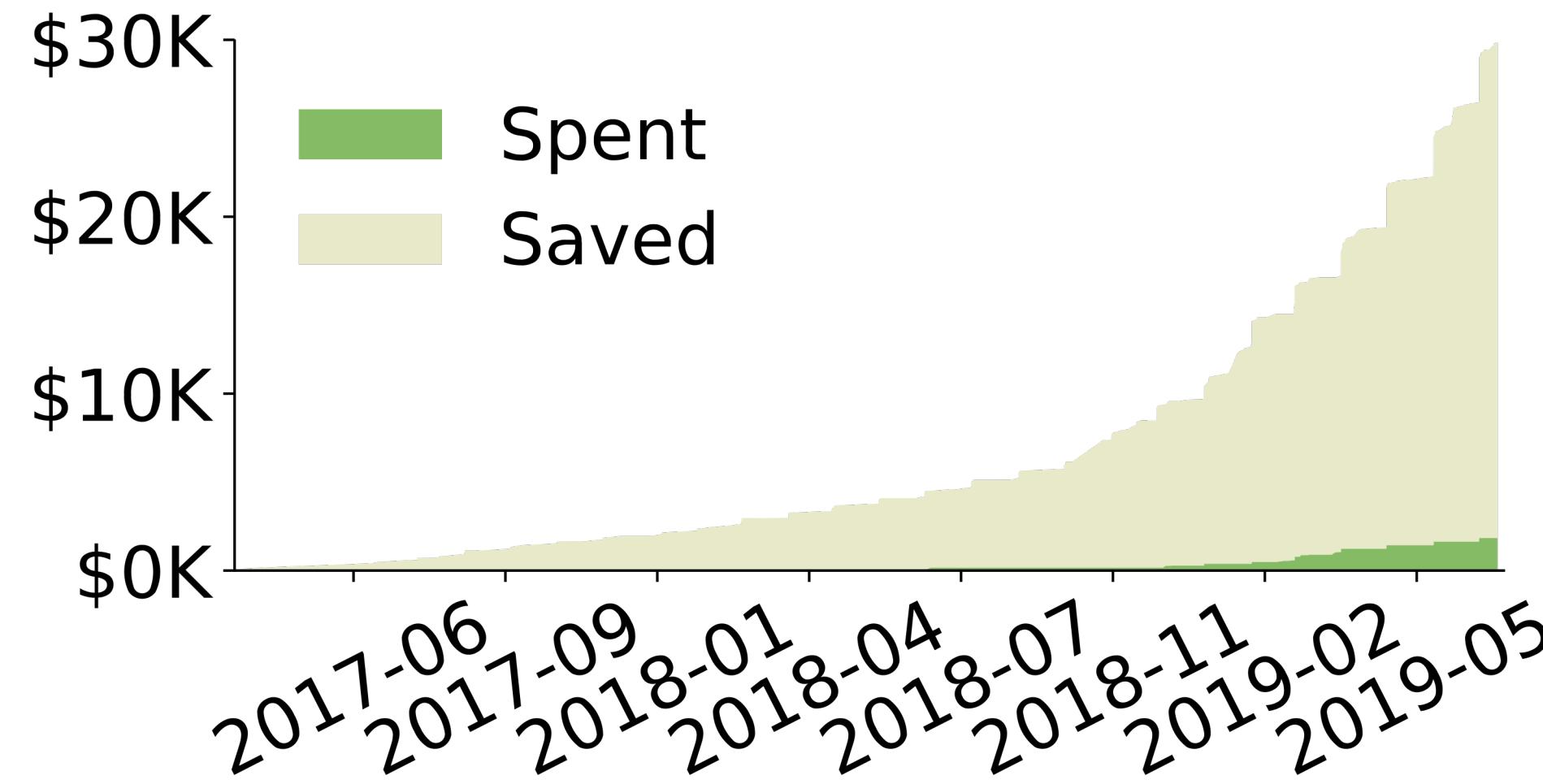
Average issue resolution time



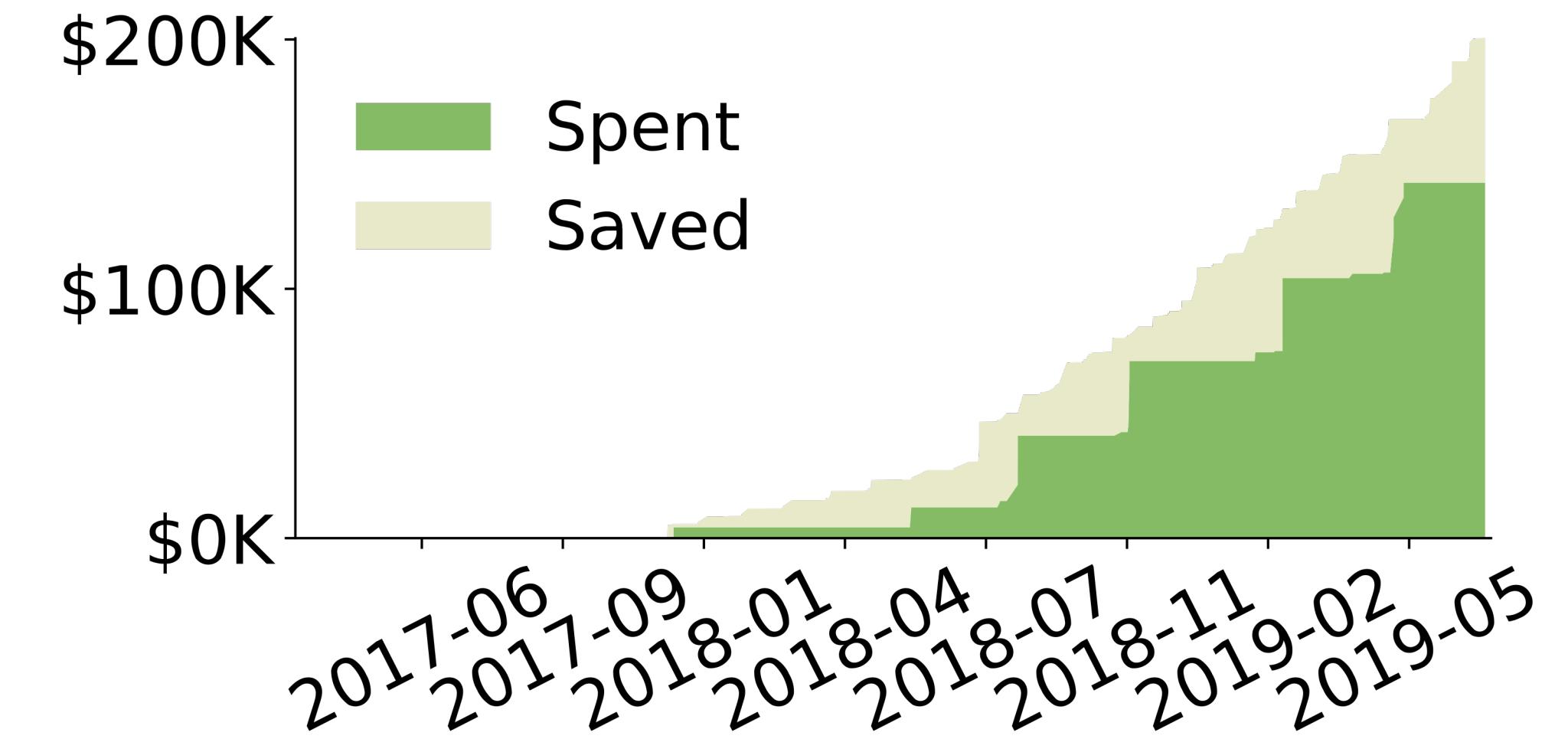
The use of donations varies widely: Savers vs spenders

Census
Characteristics
Expectations
Effects
Usage

64% Savers
spend less than 25% of raised
donations



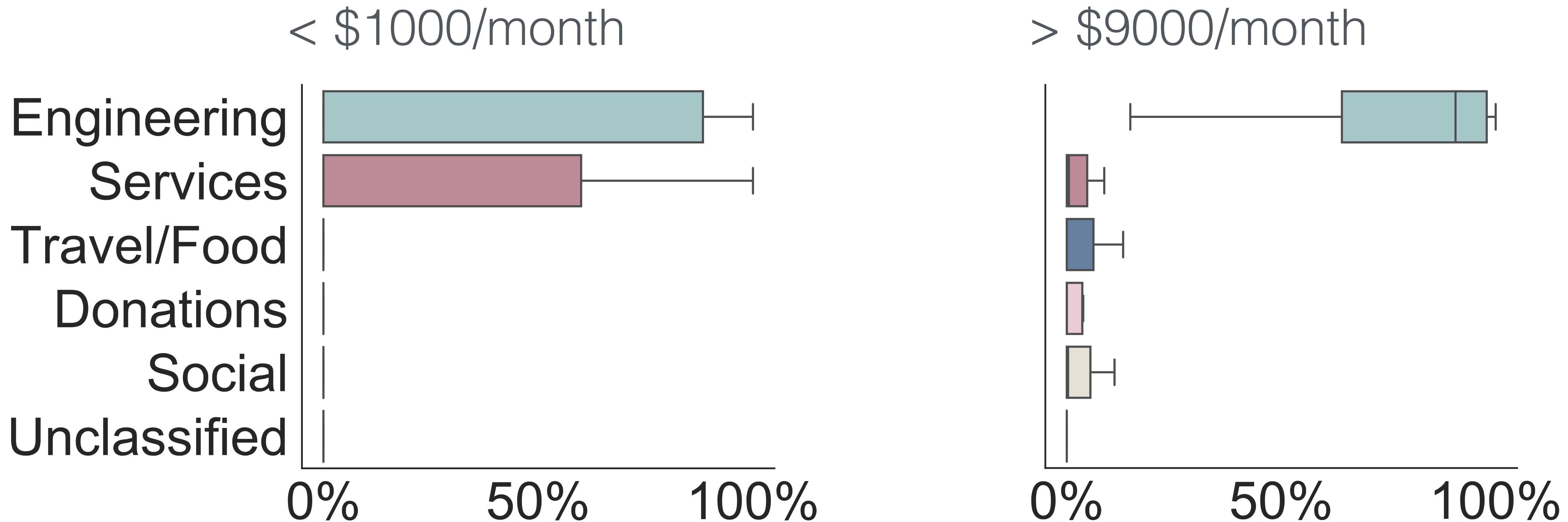
11% Spenders
spend more than 75% of raised
donations



The use of donations varies widely:

Type of expenses

Census
Characteristics
Expectations
Effects
Usage



Takeaways on how to effectively raise donations

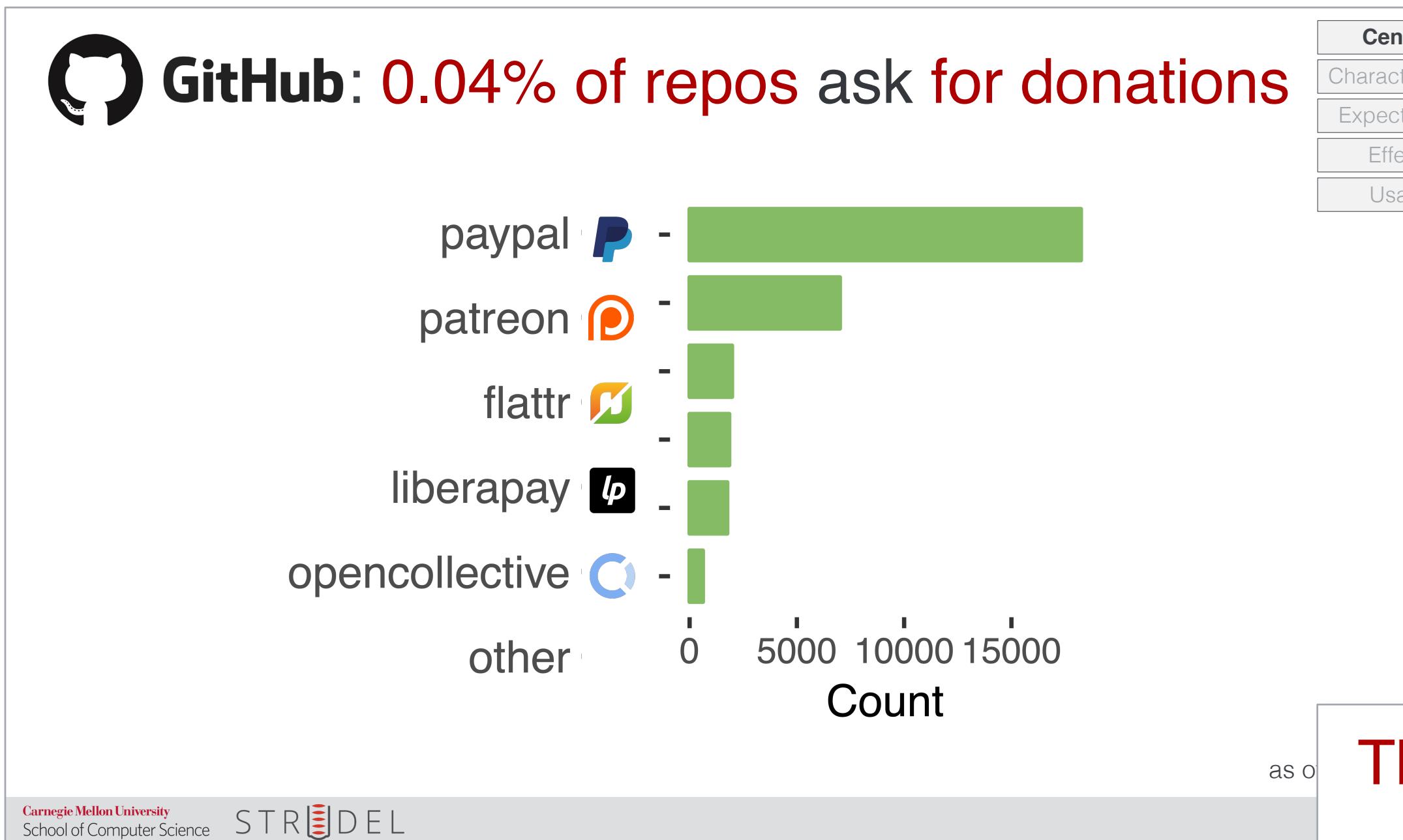
Reputation
matters

Awareness
of need

Efficiency
of using
funds

But there is a dark side
to money in Open Source

We need a better understanding of both positive and negative effects of donations in Open Source, as the practice becomes more widespread



Cassandra Overney @CassandraOvern1
Jens Meinicke
Christian Kästner @p0nk
Bogdan Vasilescu @b_vasilescu

