Is Tipping Economically Meaningful? Evidence from the Beauty Industry

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Research Question

Is tipping **economically meaningful**?

Does tipping depend on service quality or repeat interaction?

A Simple Story

1. Consumer pays an upfront price for a service.
2. Service provider exerts costly effort which impacts quality.
3. After receiving the service and observing quality, the consumer may leave a tip.
4. In SPNE (without repeat interaction), consumer leaves quality invariant tip of $0, provider does not exert effort.
5. Without some social cost or behavioral norm, the outcome will be **inefficient.**

Motivation

- Tipping is a large phenomena in the US.
  - Estimate: total tips in the US $36 billion in 2016 (Shierholz et. al 2017)
- Lots of heterogeneity across countries regarding tipping.
  - No tipping in Taiwan
- Individual tipping behavior can be nudged.

Preview of Results

1. Evidence of **incentive-relevant** tipping: returning customers tip more than one-time customers.
   - On average returners tip 0.34% more.
   - The returner distribution looks like FOSD shift of one-timer distribution.
2. Suggestive evidence that this is because the tip norm is sensitive to quality.
3. No evidence this is due to concerns about the future.

Past Work

1. Repeat restaurant customers do not tip more [Ofer (2007)].
2. Study of Uber riders: 60% never tip, 1% always do [Chandar et. al. (2019)].
3. Tipping is sensitive to service quality [Changer et. al. (2019), Conlin et. al. (2003)].

More

Data

- Salon management software.
- Observe each transaction, can track customers over time within salon.
- All analyses look at the % of the bill the tip represents (tip divided by price).

We focus on salons providing hair-related services. This yields a sample of:

- 157,510 appointments
- 81,691 clients: 62% are one-timers, 38% returners
- 5,235 stylist teams
- 113 locations (firms)

Caveat: We focus on the 11% of client-teams where tips are always observed. 84% never have a tip observed. The rest have a mixture.

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A Simple Framework

Denote the unobserved quality of a haircut as q.

Definition 1

The perceived tipping social norm of customer i for stylist-team j, denoted $\bar{b}_{i,j}(q)$, is the tip the customer would leave if they were myopic.

Intuition: This is the tip that would be left if the customer expects to never see the stylist again. We call this the "Uber tip." *Note that it may depend on quality.*

A Simple Framework

Denote the observed tipping function $B_{i,j}$, the optimal tip when the customer plans to return $b^*_{i,j}(q)$, and the return decision $r_{i,j}$. $r_{i,j}$ depends only on quality and maybe an idioscrynatic shock which is independent of everything else:

$$B_{i,j}(q) = r_{i,j}(q) b^*_{i,j}(q) + (1 - r_{i,j}(q))\bar{b}_i(q)$$

Definition 2

Tipping is **incentive-relevant** if $B_{i,j}(q)$ changes with service quality, q.

Notice that incentive-relevant tipping can come from two sources:

- **Norm-based:** If the tipping norm, $\bar{b}_{i,j}(q)$, increases in quality.
- **Forward-looking:** If $r_{i,j}(q)$ is increasing in quality and $b^*_{i,j}(q)$ is greater than the norm.

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Empirical Strategy

Idea: Customers know when they are not returning, and this makes them default to the norm.

Re-write the equation from before suppressing q:

$$B_{i,j} = (b^*_{i,j} - \bar{b}_i) r_{i,j} + \bar{b}_i$$

it can be shown that this can be re-written in the familiar form:

$$B_{i,j} = \beta_M r_{i,j} + \beta_0 + \epsilon_{i,j}$$

where β_0, β_M are constants and $\epsilon_{i,j}$ is a zero-mean random variable.

Full Derivation

Empirical Strategy

Under the null hypothesis that tipping is not incentive-relevant $E[r_{i,j}\epsilon_{i,j}] = 0$ because:

1. $E[u_{i,j}r_{i,j}^2] = 0$: Since $r_{i,j}$ depends only on $q_{i,j}$ and is independent of zero-mean $u_{i,j}$.
2. $E[\bar{b}_i|r_{i,j}] = \beta_0$: $\bar{b}_i$ does not depend on q.
3. $\beta_M = 0$: Tipping should not change based on whether a client plans to return.

Thus a regression of tip percentage on a return indicator and a constant identifies β_0, β_M.

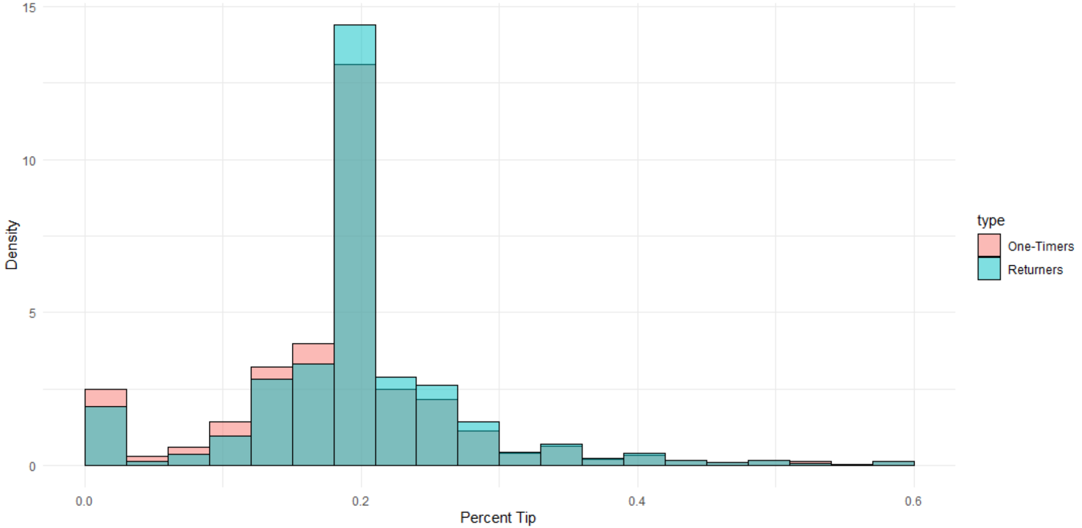
We can check for incentive-relevant tipping by testing if $\beta_M = 0$.

Results: Percent Tip Regressed on Returner Indicator

Model:	(1)	(2)	(3)	(4)	(5)
(Intercept)	0.2093***				
	(0.0008)				
Returners	0.0087***	0.0078***	0.0045***	0.0034**	0.0034**
	(0.0014)	(0.0014)	(0.0014)	(0.0015)	(0.0015)
Fixed-effects					
Firm		Yes			Yes
Team			Yes	Yes	Yes
Date				Yes	Yes
Observations	104,996	104,996	104,996	104,996	104,996

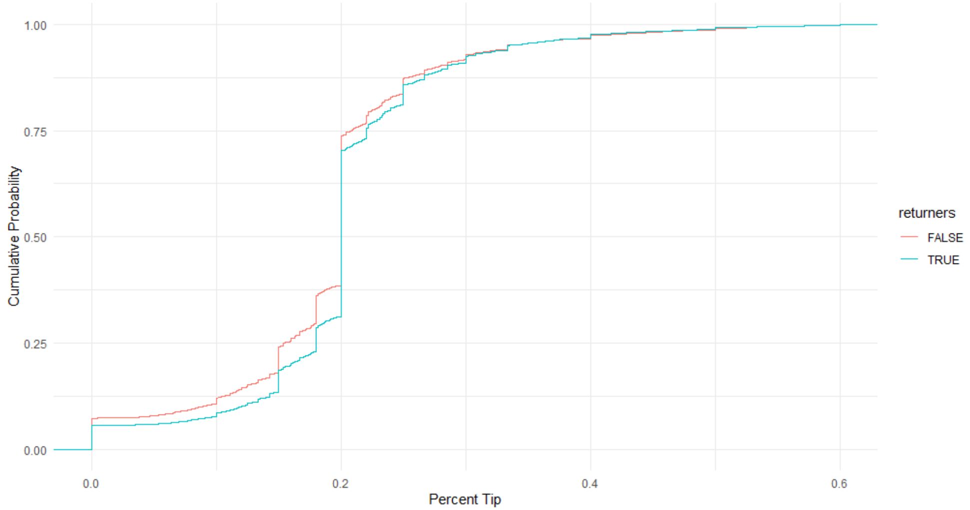
Note: 4 observations with a tip greater than 1,000% of price were removed.

Returner vs. One-Timer Distributions



Note: Limited to tips less than 60% for better visualization.

First-Order Stochastic Shift



Note: Limited to tips less than 60% for better visualization.

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Dynamic Concerns

If the result is driven by concerns about seeing the same stylist again, then we should see that among returners, the last tip is **lower** then the second-to-last tip. But we do not:

Model:	(1)	(2)	(3)	(4)	(5)
Last	0.0015	0.0014	0.0015	0.0037	0.0038
	(0.0016)	(0.0016)	(0.0017)	(0.0026)	(0.0026)
Fixed-effects					
Client	Yes	Yes	Yes	Yes	Yes
Firm		Yes			Yes
Team			Yes	Yes	Yes
Date				Yes	Yes
Observations	28,708	28,708	28,708	28,708	28,708

Quality-Based Norms

The other reason: tips are **quality-based**. Quality is not observed, but we can proxy for it using the average tip given to the stylist by everyone else. We limit the population to just one-timers, although the result holds in the full population:

Model:	(1)	(2)	(3)	(4)
(Intercept)	0.1492***			
	(0.0066)			
Avg. Tip from Others	0.2783***	0.2027***	0.2752***	0.2009***
	(0.0314)	(0.0335)	(0.0312)	(0.0332)
Fixed-effects				
Firm		Yes		Yes
Date			Yes	Yes
Observations	73,421	73,421	73,421	73,421

Note: This excludes 1,836 observations where stylist-teams are only observed with one client.

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Conclusion

Main Finding: Tipping is incentive-relevant, and is sensitive to stylist quality. Tipping is not sensitive to repeat interactions.

Future Work

1. Estimate structural model where the tipping norm is quality-sensitive and clients search for stylists. See how the norm impacts efficient matches.
2. Apply a bounding technique developed by Daniel to the end result, to see how sensitive the results are to differences between the missing and non-missing tips.
3. The software company is interested in running an experiment where the default tip options are changed for some firms.

More Past Work

- Repeat restaurant customers do not tip more (Ofer (2007)).
- 60% of Uber riders never tip, 1% always do.(Chandar, Gneezy, List, and Muir (2019))
- Tipping is sensitive to "nudges." (Chandar et. al (2019) & Haggag and Paci (2014))
- Tipping is sensitive to sports team wins (Gi 2018)
- Riders that match with the same driver again tip 27% more. (Chandar, Gneezy, List, and Muir (2019))
- Tipping is sensitive to service quality (Changer et. al. (2019), Conlin et. al. (2003)).

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Derivation

$$B_{i,j} = (b^*_{i,j} - \bar{b}_i)r_{i,j} + \bar{b}_i$$

Denote the mean of the coefficient on $r_{i,j}$ as:

$$\beta_M := E[b^*_{i,j} - \bar{b}_i]$$

Then use this to decompose the random coefficient:

$$u_{i,j} := b^*_{i,j} - \bar{b}_i - \beta_M$$

where $u_{i,j}$ is a zero-mean random variable. Then we have:

$$B_{i,j} = \beta_M r_{i,j} + \bar{b}_i + u_{i,j} r_{i,j}$$

which can be re-written as:

$$B_{i,j} = \beta_M r_{i,j} + \beta_0 + \epsilon_{i,j}$$

where β_0 is a constant intercept and $\epsilon_{i,j}$ is a zero-mean random variable.

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