

“THE PUZZLE OF THE MISTAKEN MILLIONS”

BY MEIPING SUN (JULY 2016)

Discussed by Linh T. Tô

NBER Summer Institute, 2016

29 July 2016

MetroCards in NYC



NYC MTA changes in 2013

Four simultaneous changes in March 2013:

- **Surcharge introduction** (discussed since 2010):
new MetroCard costs \$1 instead of \$0
- **Fare change:** \$2.25 to \$2.5
(always must purchase at least round trip for new MetroCards)
- **Bonus requirements change:** minimum requirement from \$10 down to \$5, the bonus percentage from 7% to 5%
- **Change in defaults at vending machines (MVMs):**
{ \$10, \$20, \$50 } to { \$9, \$19, \$39 }

NYC MTA changes in 2013

Online comments: pointing to cost of carrying the card

[[-](#)] **8Erinyes8** 3 points 3 years ago

It will only be useful to reuse the cards if they change the durability of the card. Go to Boston and you will be introduced to the wonders of the CharlieCard.

NYC MTA changes in 2013

Online comments: pointing to cost of carrying the card

[\[-\] coohamanga](#) 55 points 3 years ago

The worst is how quickly the metrocards wear out when you reuse them for a while. "Please swipe again at this turnstile" to "insufficient fare" happens way too often. So now you're forced to pay more because the cards wear out.

Should deposit amounts be affected?

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No surcharge

Deposit more and carry card

One card per round trip

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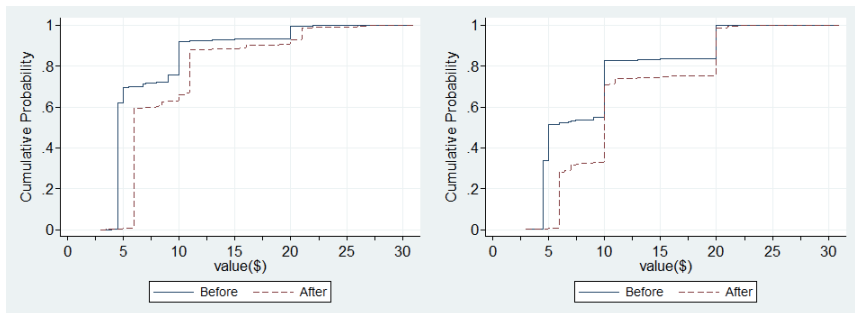
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Changes in behavior

Changes in deposit pattern of new MetroCards (inclusive):

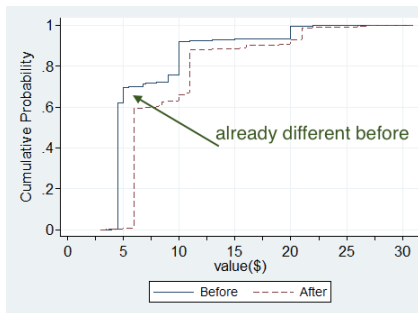


Cash: Booths

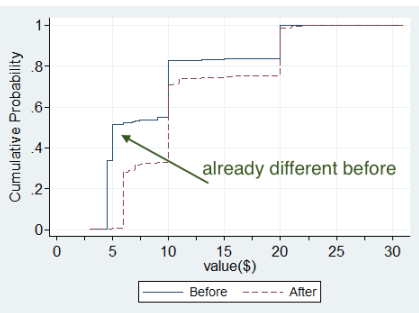
Cash: Vending Machines

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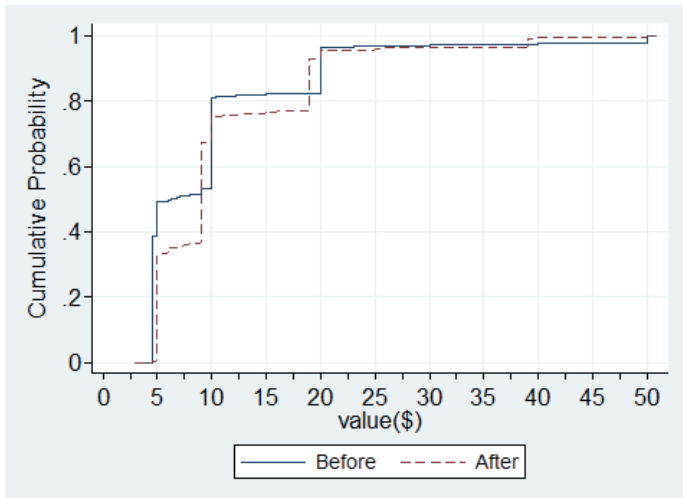
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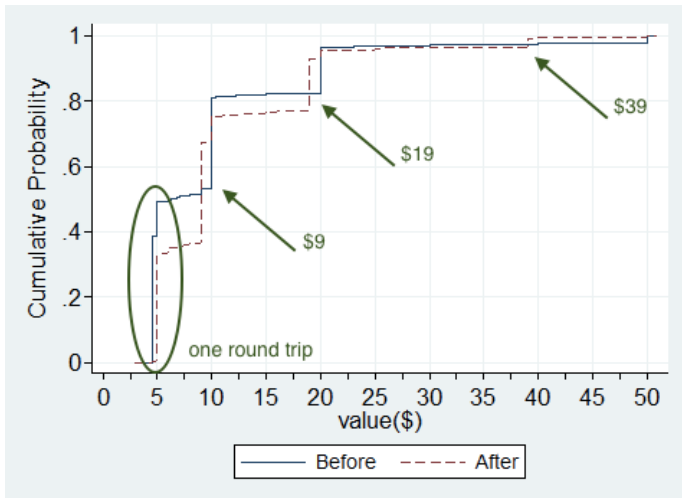
Changes in behavior

Changes in deposit pattern of new MetroCards (net of surcharge):



Changes in behavior

Changes in deposit pattern of new MetroCards (net of surcharge):



Losing by “default”?

		Round trip	First default	Second default
Before	Amount	\$4.50 (52%)	\$10 (20%)	\$20 (7%)
After	Amount	\$5 (33%)	\$9 (33%)	\$19 (16%)

For the 2009 fare hike and bonus change, “with a base fare increase of 12.5%, the expired fare revenue is up over 30%” as riders “do not want to face the math involved in MetroCard calculations.”

Losing by “default”?

		Round trip	First default	Second default
Before	Leftover	\$0 (52%)	\$1.70 (20%)	\$1.15 (7%)
After	Leftover	\$0.05 (33%)	\$1.95 (33%)	\$2.45 (16%)

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Losing by “default”?

		Round trip	First default	Second default
Before	Leftover	\$0 (52%)	\$1.70 (20%)	\$1.15 (7%)

\$0.42 per new non-refilled MetroCard

After	Leftover	\$0.05 (33%)	\$1.95 (33%)	\$2.45 (16%)
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\$1.05 per new non-refilled MetroCard

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Losing by “default”?

SEPTEMBER 5, 2014

How Memorizing “\$19.05” Can Help You Outsmart the MTA

We've all been there. The train is coming into the station, and you grab your MetroCard and quickly try and swipe it at a turnstile.

“Please Swipe Again”. “Please Swipe Again”. “Insufficient Fare”.

The last two words are killer. You think to yourself “I swear I had a balance on this card”. You go and check the card out and you see you have “\$2.45”. Yes, you need \$2.50 to ride the subway, and you have \$2.45 on your MetroCard. Sure enough you miss that train all because of that nickel.

How did you end up in that situation any way? It turns out the MTA has designed it that way. Imagine how many tourists come to NYC and leave with balances that never get used. Imagine how many people lose metro cards with those balances that never get used. And even if it gets used on a later refill, the MTA gets to collect the cash earlier this way! Win win for them, right?

Explanations

MVM vs. Booth Increased deposits

This paper

Saliency

Quick fix

Explanations

MVM vs. Booth Increased deposits

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Quick fix

“At vending machines, riders first learned about the surcharge and then chose the amounts they wanted to put on their cards. In contrast, at booths, riders were likely to first decide how much to put on the card and then learn about the surcharge.”

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“At vending machines, riders first learned about the surcharge and then chose the amounts they wanted to put on their cards. In contrast, at booths, riders were likely to first decide how much to put on the card and then learn about the surcharge.”

- Discussed for 3 years: smaller fraction of purchases at booth the day of the surcharge introduction
- Similar patterns in 2015 as in March 2013

Explanations

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“Some riders may want to make larger deposits when purchasing new cards because larger deposits could minimize (or alleviate) the perceived cost of the surcharge.”

Explanations

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1. “For instance, they may want to compensate for the absolute monetary cost of the surcharge by getting a bonus on pay-per-ride deposits.”

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1. “For instance, they may want to compensate for the absolute monetary cost of the surcharge by getting a bonus on pay-per-ride deposits.”
 - But there is no bunching at \$20 for \$1 bonus.

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2. “Likewise, some riders may want to alleviate the perceived average cost of the surcharge per trip.”

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-
2. “Likewise, some riders may want to alleviate the perceived average cost of the surcharge per trip.”
 - This would only apply if people ignored future trips or misunderstood surcharge
 - Moreover, there’s bunching at \$9 (3 trips and \$1.95 leftover)

Explanations

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This paper

Saliency

Quick fix

Alternative

Defaults

Defaults

The “quick fix” to the cost of carrying may actually be the defaults.

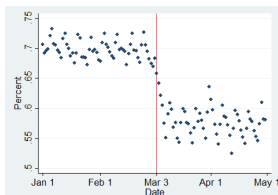
The role of defaults with cost of carrying

New MetroCards came from people who weren't already refilling

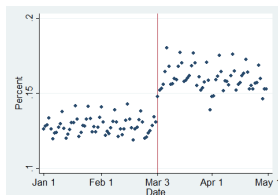
- More bunching at default values instead of one round trip:
 - Previously, \$4.50 buys you **exactly** one round trip and you can discard the card
 - Now, you **cannot** buy exactly one round trip of \$5, as this is the minimum threshold for a 5% bonus and discarding is costly
 - First default option: \$9 (three trips with \$1.95 extra)
- This explains the difference between booths and MVMs, **with and without the surcharge**: At booths, there are no defaults

Are losses bigger for low-income riders?

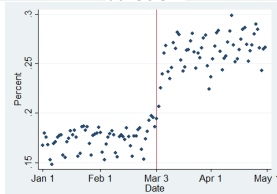
- Payment type is endogenous: caution against conditioning on cash transaction to draw welfare conclusions
- Suggestion: Look at different neighborhoods separately



% Cash



% Debit



% Credit

Suggested future work

- Calibrate a model to incorporate the cost of carrying the card, to back out carrying cost and transaction (refilling) cost
- Add to the model use of defaults
- Re-evaluate the extended model when people load more money as a commitment device to not lose their card:
 - Higher expired fare revenue does not imply more lost cards
 - Do more people **permanently** lose more than one trip's worth?
- Policies involving changes in defaults

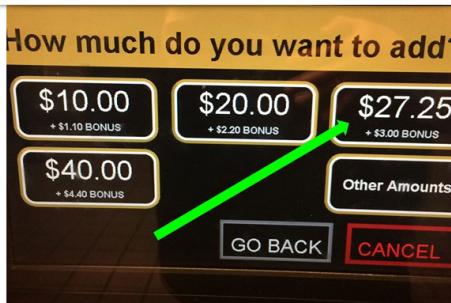
Suggested future work

Changes in defaults:

HOLY CRAP! The MTA Reprogrammed MetroCard Machines to Zero Out After 11 Rides!

BY TOM FINKEL

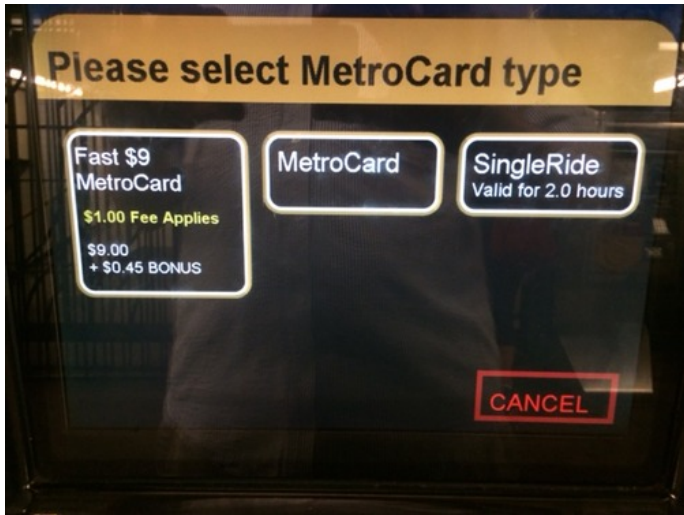
MONDAY, MARCH 23, 2015 AT 8:27 PM.



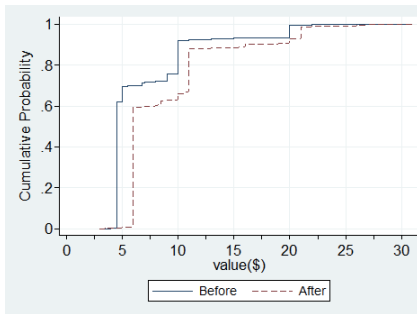
Don't be fooled by those tempting round numbers! Go for the odd one!

Village Voice photoillustration

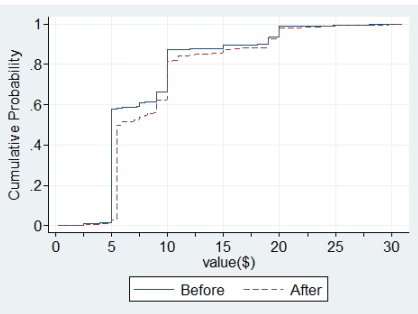
Default suggested deposit amounts



Deposit patterns at booths 2013 vs. 2015



2013 fare hike and surcharge



2015 fare hike