



Research, Analysis & Statistics

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Direct and Network Effects of Alternative Collection Enforcement Treatments: Evidence from a Randomized Control Experiment

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Which Enforcement Treatments Are Most Effective?

- The best (although not flawless) way to find out is do careful randomized piloting of the alternatives.
- This paper reports on the results of such a study aimed at remittance delinquency of businesses.
- It focuses on three aspects of the question:
 - Revenue Officer face-to-face visits versus soft letter interventions
 - Direct versus network effects (but not deterrence effects)
 - One-shot versus two-shot interventions

The Setting—“FTD Alert C” Businesses

- Federal Tax Deposit (FTD) Alerts are used to induce employers’ compliance Federal tax deposit requirements
- The FTD Alert process identifies, before the return is due, taxpayers who may have fallen behind in their deposits.
- FTD Alerts are issued on taxpayers who are classified as semiweekly depositors and who have not made FTDs during the current quarter or who have made them in substantially reduced amounts.

The Direct Effect

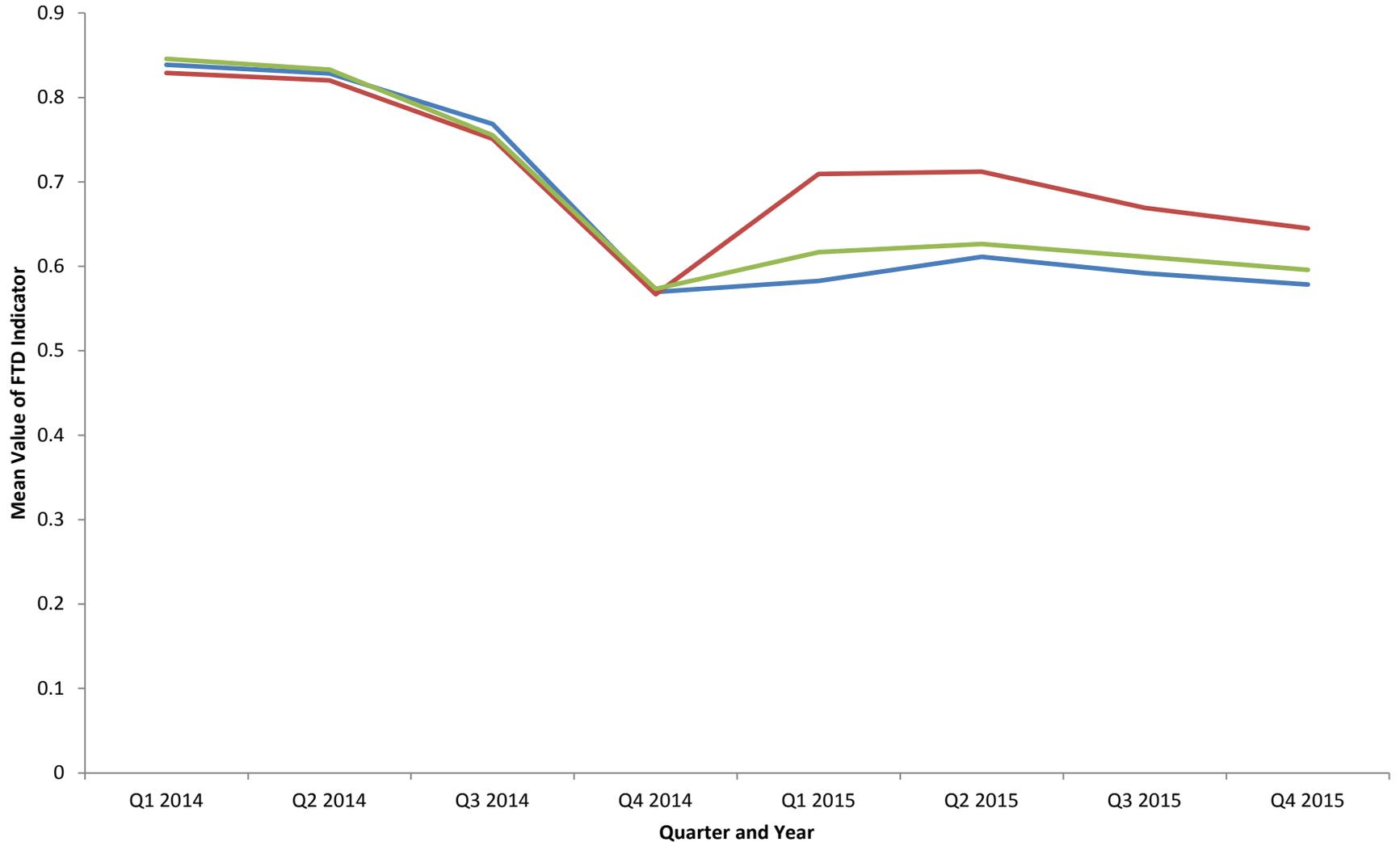
- Divides randomly the Alert C population of 12,171 firms in Q4:2014 into three groups:
 - Those that are assigned to get a revenue officer visit before Q1:2015 payments are due
 - Those that are assigned to get a soft letter before Q1:2015 payments are due
 - A control group that receives neither treatment
- We follow these firms' remittances post-treatment; the results are shown graphically in the following slides.

A Two-Dose Intervention

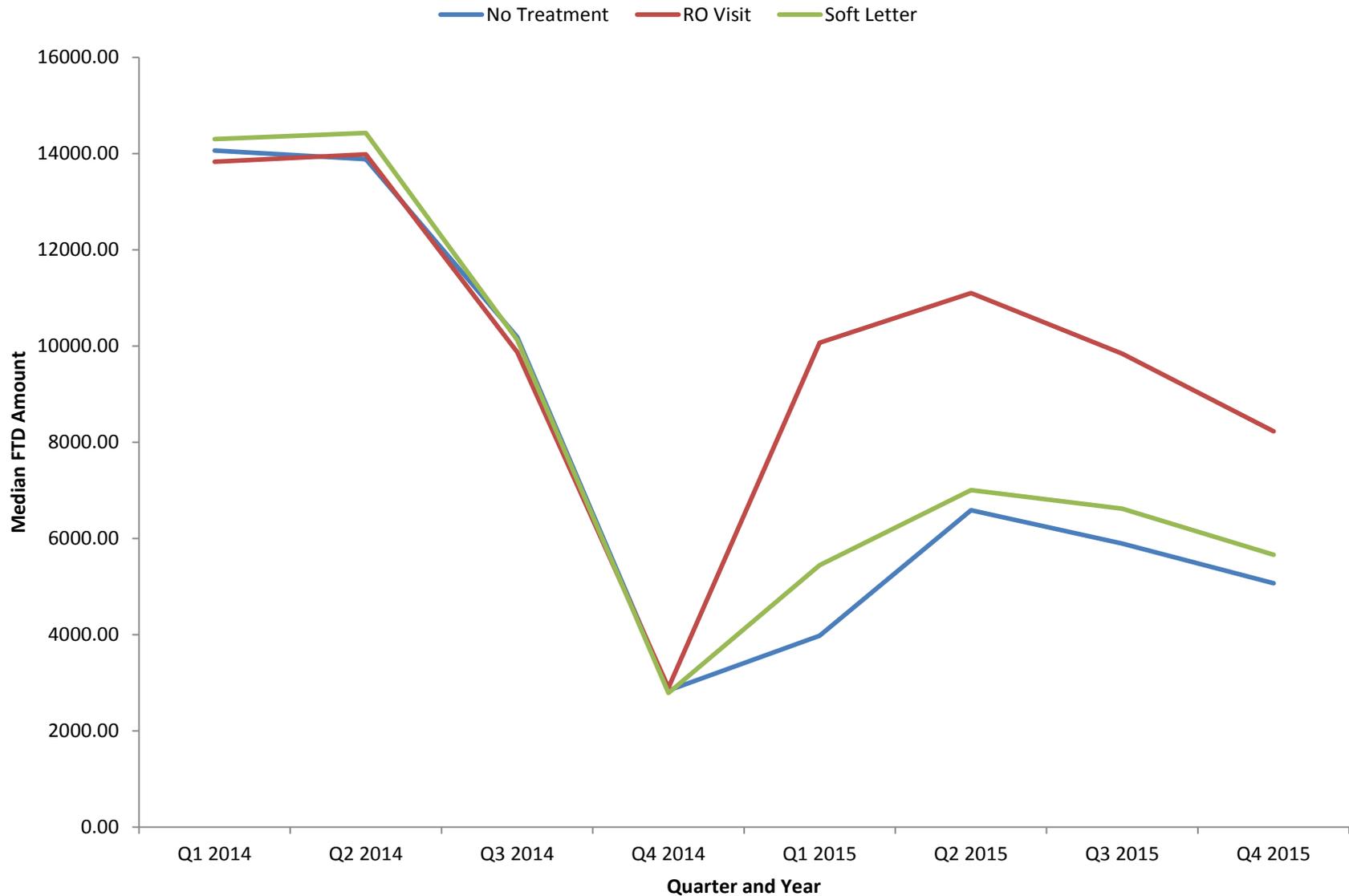
- Concerned by other findings that this type of intervention has very ephemeral effects, the treatment regimen assigned to the firm was repeated for a second quarter.
- Thus, if a pilot company got a revenue-officer visit in Q1:2015, they got another such visit in Q2:2015 if they stayed in the Alert C population.
- If a pilot company got a soft letter in Q1:2015, they got another soft letter in Q2:2015 if they stayed in the Alert C population.
- Many firms in the pilot sample moved out of the Alert C population in Q1:2015, and so did not receive the second dose.
- We observe firms regardless of whether they remain in the Alert C population.

Mean Value of FTD Indicator (Q1 2014 - Q4 2015)

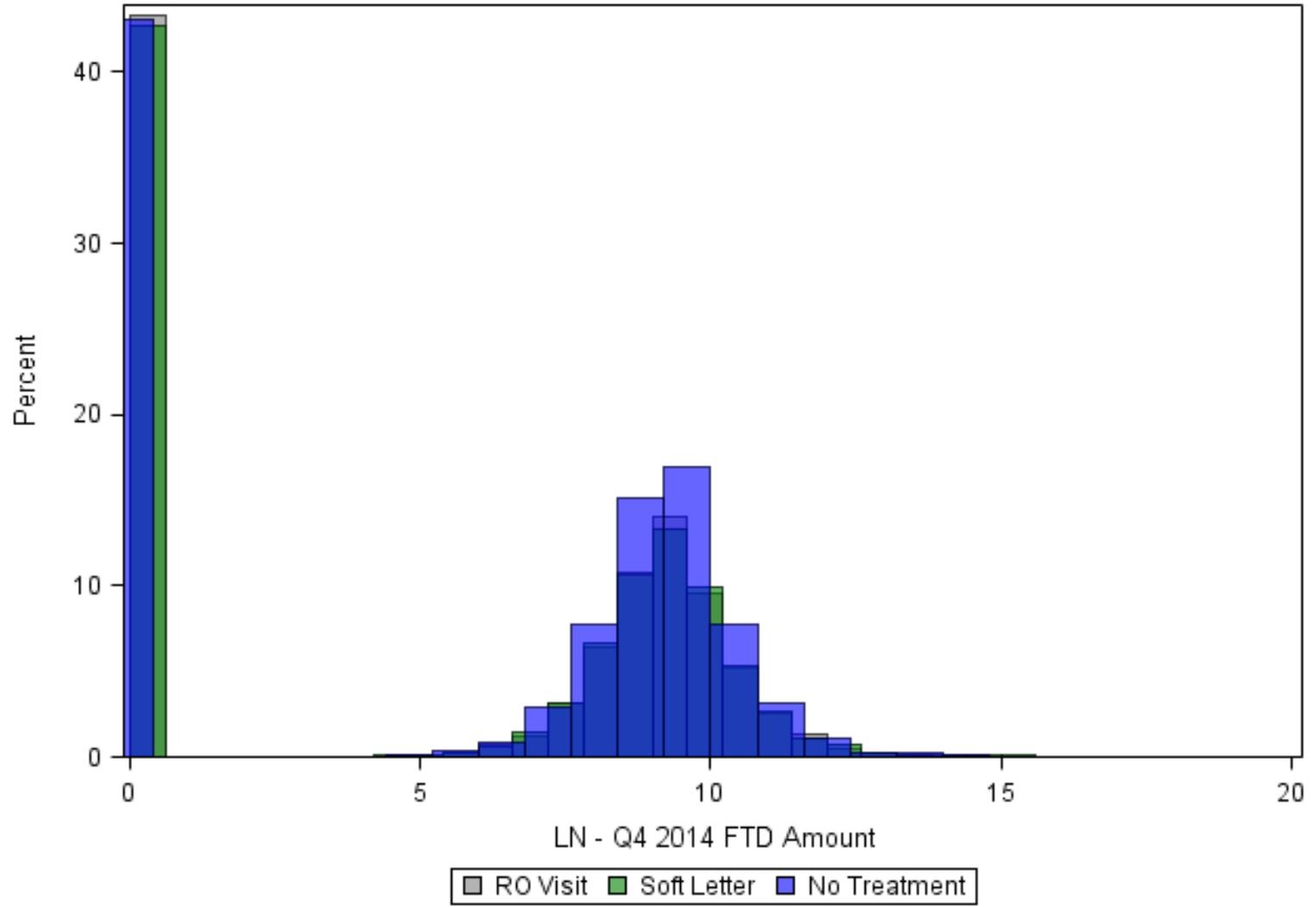
— No Treatment — RO Visit — Soft Letter



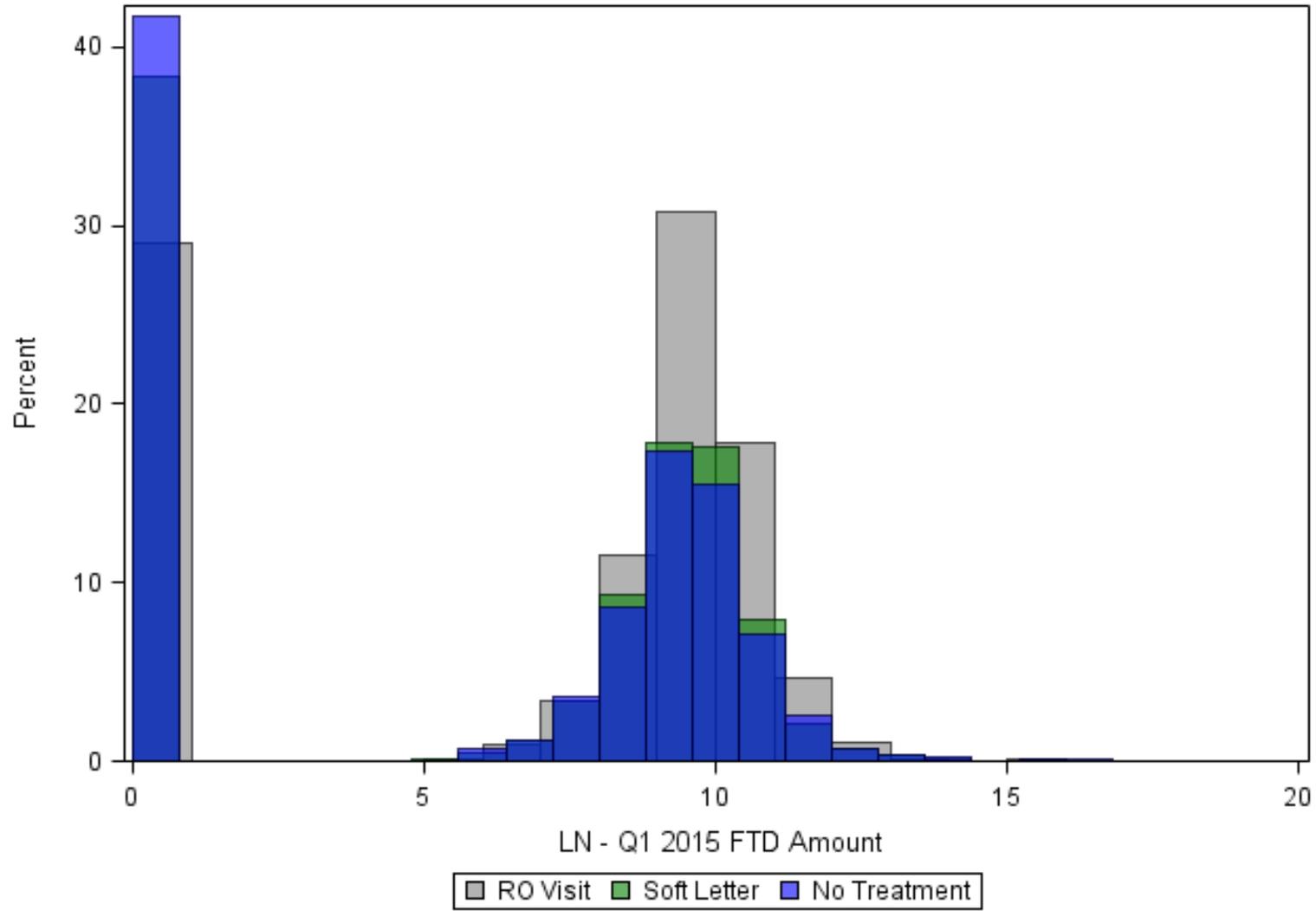
Median FTD Amounts (Q1 2014 - Q4 2015)



Q4 2014 FTD Amounts - All Treatment Groups



Q1 2015 FTD Amounts - All Treatment Groups



Interpretation of Results

- There is a large direct effect of the revenue-officer visit relative to the no-treatment group on the probability of depositing any payment one quarter after treatment (about 72.8% vs. 56.9%), and the median payment amount one quarter after treatment (\$10,067 vs. \$3,977).
- There is a smaller positive effect of the soft-letter treatment (61.5% vs. 56.9% and \$5,444 vs. \$3,977).
- The mean payment amount is sensitive to a small number of very large outliers.

Interpretation of Results – Two Doses

- Two quarters after treatment and beyond, the response we observe is the average effect of the two-dose treatment program, including all firms regardless of whether they received a second dose.
- Because which firms received a second dose was not random, we cannot obtain a causal estimate of the effect of two doses relative to the effect of one dose.
- The effect of the two-dose intervention does seem to persist or grow larger through the second quarter, in contrast to other studies, including Guyton, Manoli, Schafer, and Sebastiani (2016), where the effects of treatment begin to shrink immediately.

The Network Effect

- So far we have focused on the *direct*, or *specific*, effect on those subject to the enforcement intervention.
- This is different from the *deterrent effect* that operates by increasing the perceived chance of sanction for all taxpayers.
- We next consider something in between the direct and deterrent effect, what we call the *network effect*, which operates through word-of-mouth from those directly involved in the enforcement action.
- Even a small average per-linked company effect can aggregate into a significant effect over all links.

Which Networks Can We Investigate?

- We investigate geographical networks, based on the 9-digit and 5-digit ZIP codes of the filing address of the company.
- We also investigate networks linked by the company's tax preparer, either the tax preparer's firm or the tax preparer himself (or herself).

But First...There's An Identification Problem to Be Addressed

- We know for sure that the initial assignment of firms to one of the treatment interventions is purely random.
- But we don't know this about firms linked through a network.
- For example, it could be that there are certain tax preparers, or locations, to which non-compliant firms are “attracted.”
- In this case those firms linked to firms in the Alert C pilot would be systematically different from other firms. Different subsequent behavior would thus not necessarily be the result of a network effect.

Our Proposed Solution

- Because the number of links a non-pilot company has to a company in the pilot is non-random, we compare behavior only within groups characterized by the number of links.
- For example, among non-pilot companies that have one link to a pilot company, does subsequent behavior depend on whether the linked pilot company received a revenue-officer visit, soft letter, or neither?
- We find some evidence of positive network effects, but the results are still preliminary.

Identifying Network Stars

- Can we characterize companies that are more likely to have “productive” links?
- These network “stars” are promising enforcement targets, as any direct effect is more likely to be spread via network effects.

Thank You!

We welcome comments on this ongoing research.