

*Supply Chain Networks and the Macroeconomic Expectations
of Firms*

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Introduction

Bayesian learning equation:

$$(1 - G) \times \text{Prior}_i + G \times \text{Signal}_i = \text{Posterior}_i$$

At the core in empirical literature on formation of expectations, which expanded enormously in past years (elicitation methods, RTCs, agents, countries, periods...)

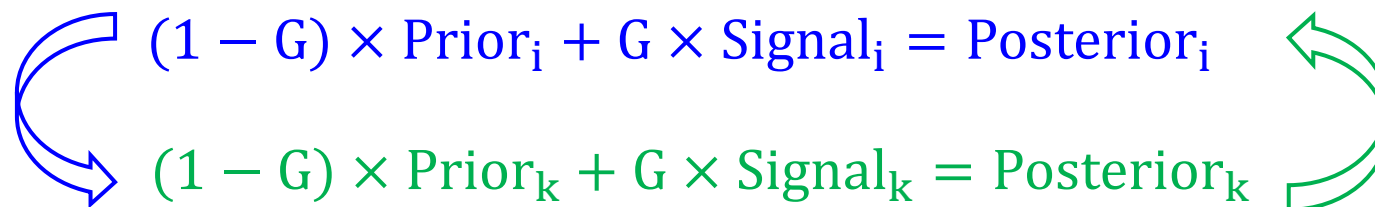
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Innovation in this paper: agents interact and don't learn in isolation


$$\begin{array}{l} (1 - G) \times \text{Prior}_i + G \times \text{Signal}_i = \text{Posterior}_i \\ (1 - G) \times \text{Prior}_k + G \times \text{Signal}_k = \text{Posterior}_k \end{array}$$

Goal and main empirical findings

- **Goal:** how firms form expectations and diffuse information along supply chain
- RCT on supplier–customer pairs (New Zealand, 2 waves)
 - Only one firm in each treated pair receive information
 - Treatment: professional GDP forecasts (mean and range)

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- RCT on supplier–customer pairs (New Zealand, 2 waves)
 - Only one firm in each treated pair receive information
 - Treatment: professional GDP forecasts (mean and range)
- **Main empirical findings:**
 - direct effects → treated firms revise macro expectations and decisions
 - spillovers → untreated firms revise too (with lag)
 - effect magnitudes similar → strong information diffusion via supply chains (through direct communication rather than inference from actions)

Comment # 1: Experimental Design

- Clean and careful survey design, but simplified
- Focus on “**dyads**”; real supply chains are longer and complex (domestic and foreign partners) and **information/signal may deteriorate** while travelling → risk of over/under-estimation of effects
- Identification of causal effects relies on “**no cross-pair contamination**” → checked between pairs, but at a deeper level? Role of third connected firms? How inter-connected are firms in New Zealand?

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- **Low response rates** (13% in wave 1 and even lower in wave 2) → concerns of representativeness/external validity
- On latter point, not much can be done, but check robustness adding controls for **firm characteristics** in regressions (esp. wave 2)

Comment # 2: Treatment Effects on GDP Expectations

Key empirical results are in this Table!

	(1)	(2)	(3)	(4)
$Prior_i^{mean}$	0.972*** (0.008)	0.964*** (0.016)	0.945*** (0.020)	0.938*** (0.013)
$T_1 \times Prior_i^{mean}$	-0.723*** (0.022)	0.017 (0.019)	-0.603*** (0.032)	-0.586*** (0.046)
$T_2 \times Prior_i^{mean}$	-0.492*** (0.039)	0.006 (0.018)	-0.503*** (0.046)	-0.502*** (0.061)
Constant	0.025 (0.024)	0.062 (0.043)	0.080* (0.047)	0.120*** (0.036)
Period Posterior	Baseline	Baseline	Follow Up	Follow Up
Type of firm	Treated	Connected	Treated	Connected
Observations	999	1,020	510	505
R-squared	0.739	0.955	0.760	0.743

Wave 1

Information treatments affect main firm **but not** connected firm.

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Wave 2

Information treatments still affect main firm **and now also** connected firm.

This is a super-interesting finding!

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Effect magnitudes are **remarkably similar** → need more discussion

Detailed descriptive statistics of prior/posterior forecast would help a lot.

Comment # 3: Channels of information diffusion

Channel 1. “*Connected firm observes actions of treated firms*” → empirically ruled out (and in my view not very likely as connected firms needed also observe treated firms’ plans)

Channel 2. “*Direct communication between connected and treated firms*” → empirically confirmed (treated pairs self-reported having communicate more)

see if effect magnitudes correlate with communication frequency

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Channel 3 (alternative): “*Communication triggers active information search by connected (and treated) firms*”

→ not only information diffusion but also **active information collection**

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Google trends: interest in the word “GDP” in the New Zealand



Active information collection → **policy implication** ensure firms can easily access reliable sources of information rather than direct communication to systemic firms.

Comment # 4: Supply chain collaboration

- Literature on **Supply Chain Collaboration (SCC)**, see Kurtulu (2017) for an overview in *Handbook of information exchange in supply chain management*.
- Some testable hypotheses:
 - More communication/stronger effects in sectors where **demand is more unpredictable/volatile?**
 - In collaborative forecasting, firms resolve forecast discrepancies through discussions → **less disagreement** within pairs that communicated more?
 - SCC might entail **synchronization of decisions** → is this in the data?

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 - SCC might entail **synchronization of decisions** → is this in the data?
- Simatupang and Sriharan (2004) **surveyed New Zealand** firms on SCC → might rationalize the finding of similar estimated magnitudes!

Conclusions

- Must-read paper
- Very innovative and well written
- Addresses relevant questions on experimental design
- Documents strong direct and spillover effects among connected firms
- Great potential for many new applications!!!