



Discussion of

**“Is the Pandemic Fast-Tracking
Automation in Developing
Countries? Evidence from
Columbia”**

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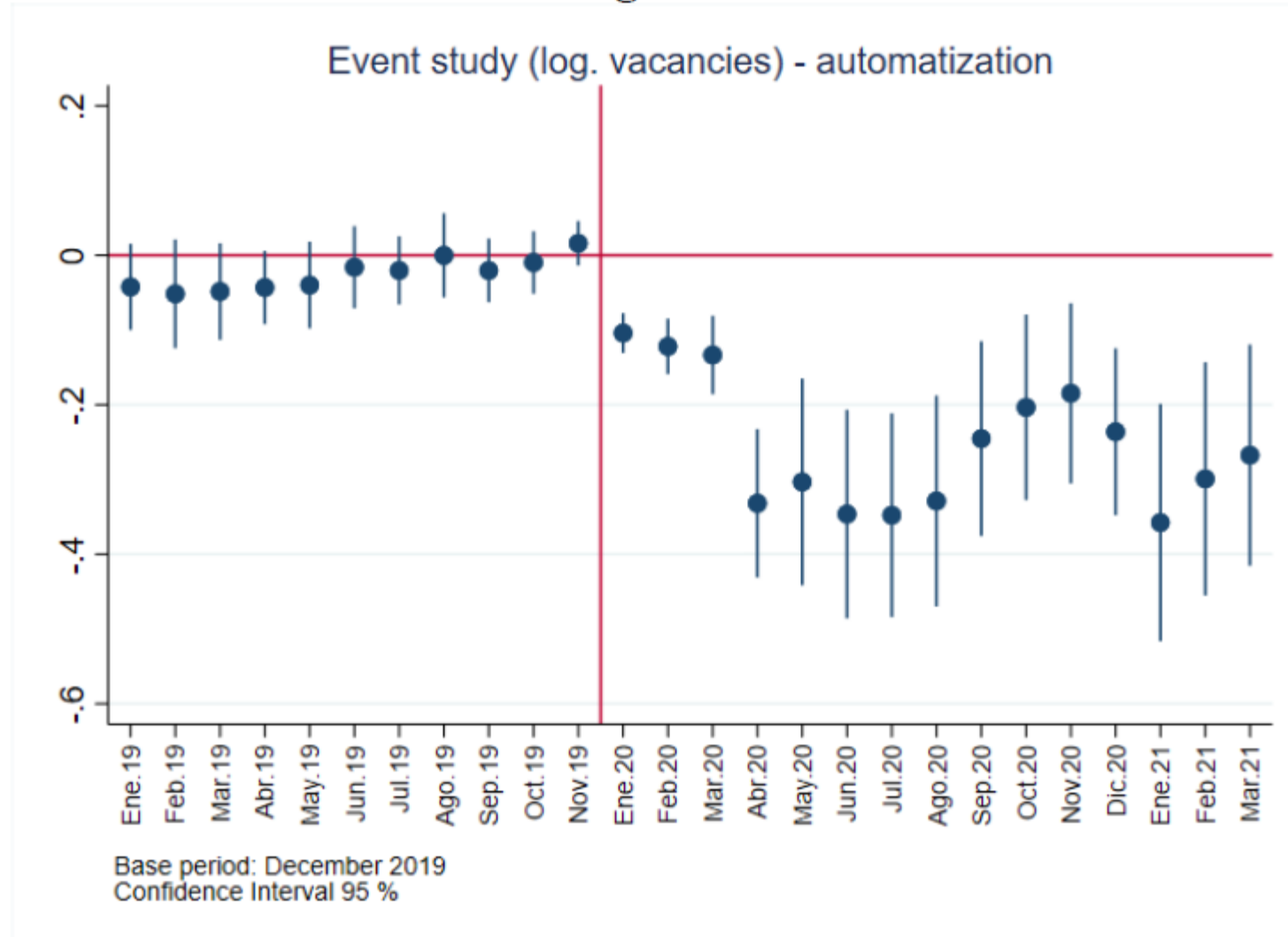
• SF Fed

Is the pandemic accelerating automation?

- **Examine the Columbian experience**
- **Use detailed data set of vacancies by occupations**
- **Use a measure of automatability (Frey and Osborne (2017))**
- **Fewer openings for occupations at greater risk of automation**

Greater decline in occupation at risk of automation

Figure 4



Source: SPE, GEIH-DANE, authors calculations.

Comments along three dimensions

- **Details of empirical specification**
- **Evidence about the degree of automation in Columbia**
- **Are firms automating in a severe downturn?**

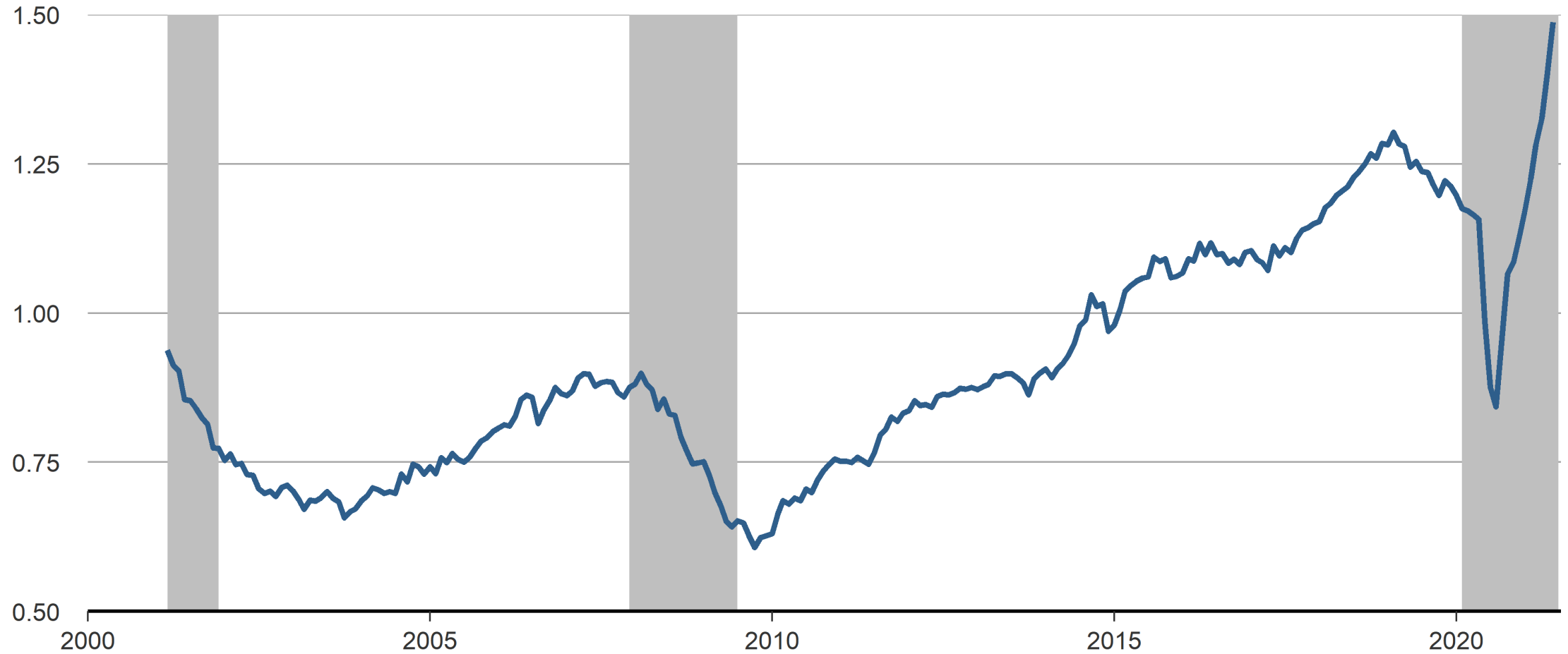
Empirical framework

$$\ln(V_{jct}) = \sum_{\tau=1}^T \beta_{\tau} \text{auto}_{ct} \times D_{\tau} + \gamma \theta_{ct} + \delta_{jc} + \delta_t + \varepsilon_{jct}$$

- **“auto” captures aspects making it technologically feasible to automate and occupation**
- **Should also think about automation in occupations with greater health risk (Chernoff and Warman (2020))**
- **Should control for lags of dependent variable to appropriately capture dynamics of vacancies**

Difficulty in filling vacancies could drive automation

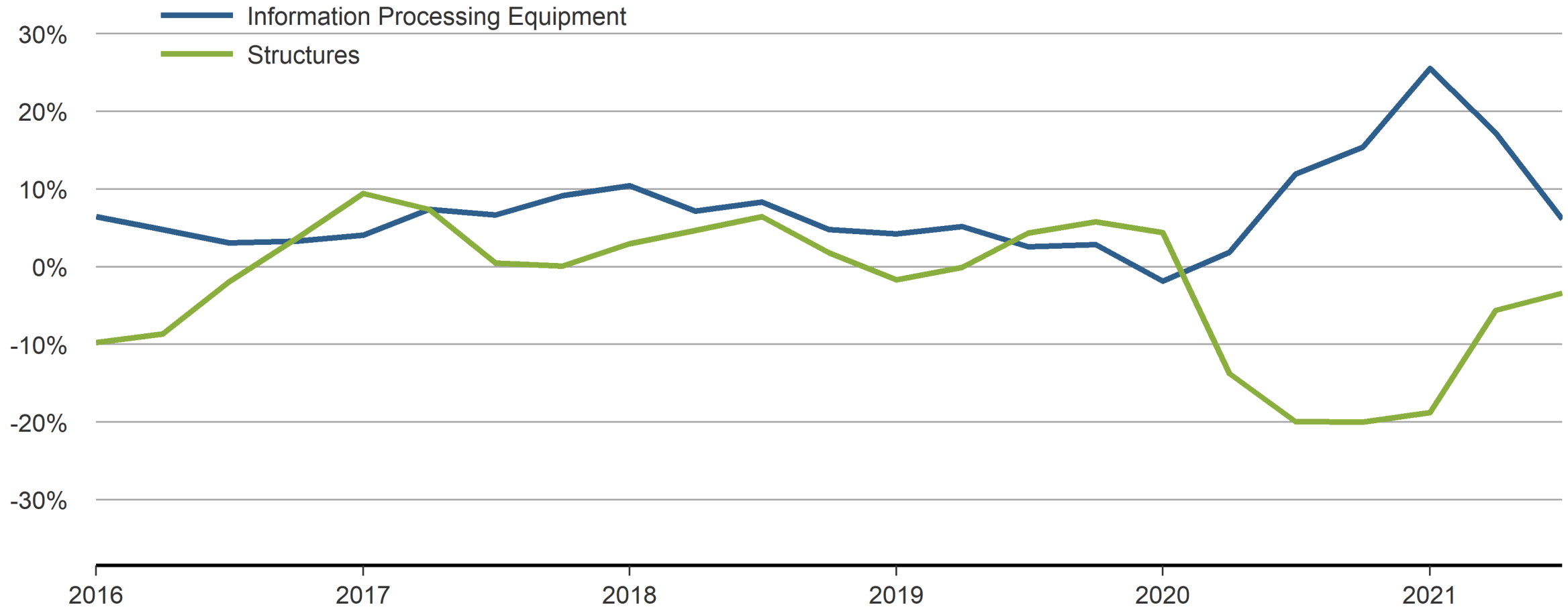
Number of job openings per hire



Note: 3-month moving average
Source: Bureau of Labor Statistics

Pandemic could be boosting automation

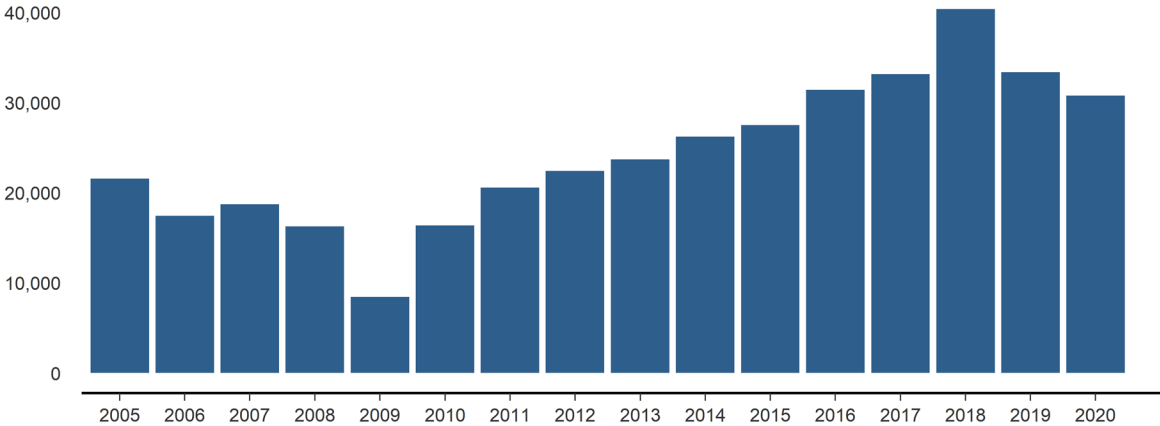
Annual change in real private nonresidential fixed investment



Note: Values shown as percent change - year to year
Source: Bureau of Economic Analysis/Haver Analytics

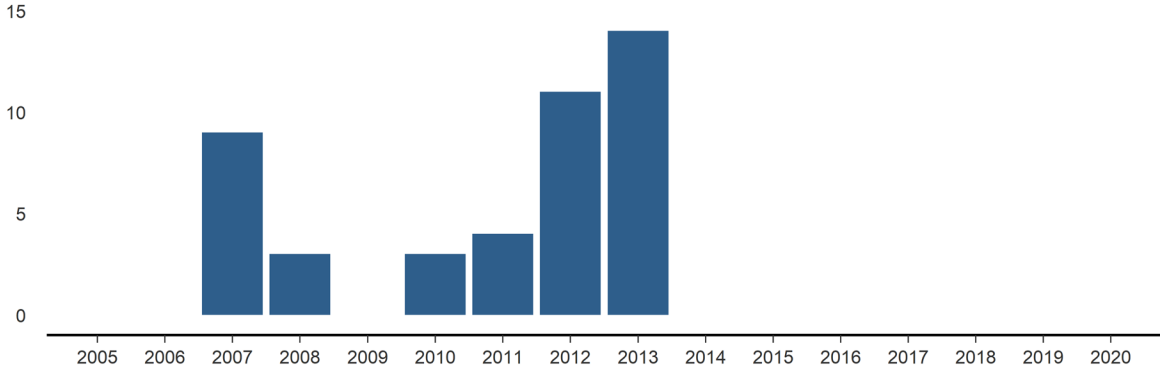
How big is the automation risk is practice?

Annual robot installations, United States



Note: All industries
Source: International Federation of Robotics

Annual robot installations, Colombia



Note: All industries
Source: International Federation of Robotics

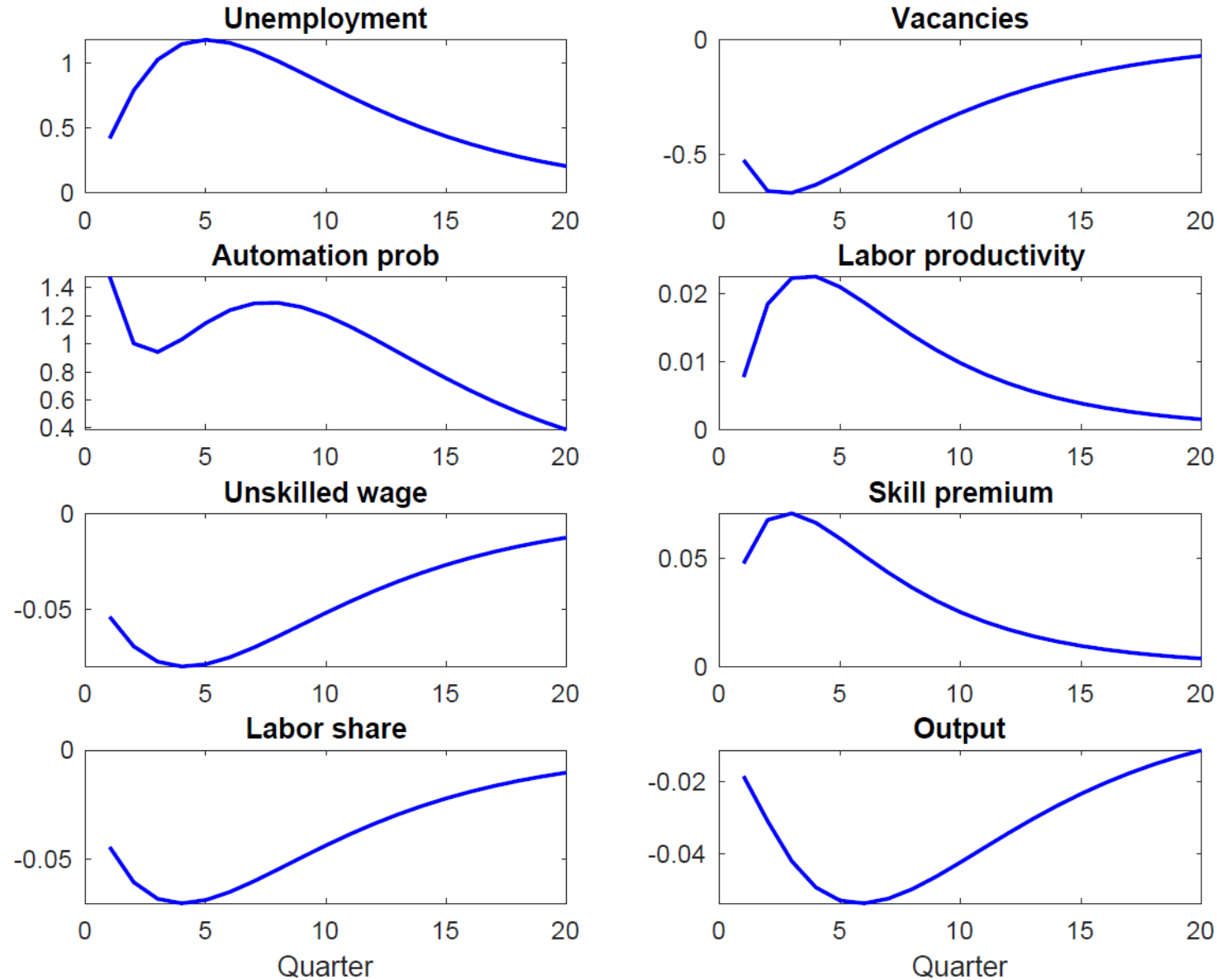
Pandemic-induced automation

- **Economy in which pandemic induces uncertainty in future labor productivity (Leduc and Liu (2020))**
- **Intermediate goods produced by unskilled workers or skilled workers combined with “robots”**
- **Unfilled positions can be automated at a fixed cost**
- **Automation is not a static decision: Automate if fixed cost is below net benefits (value of robot – value of a vacancy)**

Pandemic-induced automation

- **Uncertainty about future labor productivity creates two opposing effects**
 - **Reduces NPV of robots (option-value channel)**
 - **Boosts incentives to substitute robots for workers (technology shifting channel)**
- **Under calibrated parameters, technology shifting channel dominates**
- **But strengths depends on perceived persistence, since it impacts current and future net benefits**

Automation in a pandemic-induced recession?



Conclusion

- **Promising work on a timely topic**
- **More evidence supporting the relevance of automation in Columbia**
- **Make sure results are robust to controlling for vacancy persistence**
- **Looking forward to a theoretical interpretation of the results**