

# SKILL-BIASED TECHNOLOGICAL CHANGE WITHIN AND ACROSS FIRMS

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ROCK

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- The paper measures **competing explanations** for SBTC;
- An important empirical contribution;
- New dataset by merging LinkedIn, BLS, Compustat and O\*NET provides 2.5 million occupation-firm-year tuples.

- **Competing explanations** for SBTC:
  - 1 Firms change their occupational mix;
  - 2 Firms that employ a high fraction of non routine workers grow faster than the rest of firms;
  - 3 New firms employ a larger fraction of non routine workers with respect to the rest of firms;
  - 4 Exiting firms employ a smaller fraction of non routine workers with respect to the rest of firms.

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- Competing explanations for SBTC:
  - Firms change their occupational mix  $\Rightarrow$  **technological change within existing firms**
  - Firms that employ a high fraction of non routine workers grow faster than the rest of firms  $\Rightarrow$  **structural change**
  - New firms employ a larger fraction of non routine workers with respect to the rest of firms  $\Rightarrow$  **structural change**
  - Exiting firms employ a smaller fraction of non routine workers with respect to the rest of firms  $\Rightarrow$  **structural change**

- **Employment growth** of firms with a high fraction of non-routine workers **main driver of SBTC**;
- Within firm rebalancing **second factor** by importance;
- R&D leads firms to employ **more routine workers**;
- Firms **rebalancing** of employment **correlated with shrinking** occupations, **not with growing** occupations.

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- Is the paper measuring  $S(\text{kill})\text{BTC}$  or  $R(\text{outine})\text{BTC}$  ?
- SBTC in title;
- Occupations sorted by *routine intensity*;
- The paper defines a measure of “*non-routine bias*”

## REMARK 1: INTERPRETATION OF THE RESULTS

- *Skill-Biased Technical Change is a shift in the production technology that favors skilled over unskilled labor by increasing its relative productivity and, therefore, its relative demand.* [Violante, The New Palgrave Dictionary of Economics, 2nd Edition.](#)
- *Because the model does not distinguish between skills and tasks (or occupations), it does not provide insights into the systematic changes observed in the composition of employment by occupation in the United States and in other advanced economies — in particular [...] employment polarization* [Acemoglu and Autor \(2011\) Handbook of Labor Economics.](#)
- $\implies$  explicit occupations and tasks need to be modeled to account for this pattern.

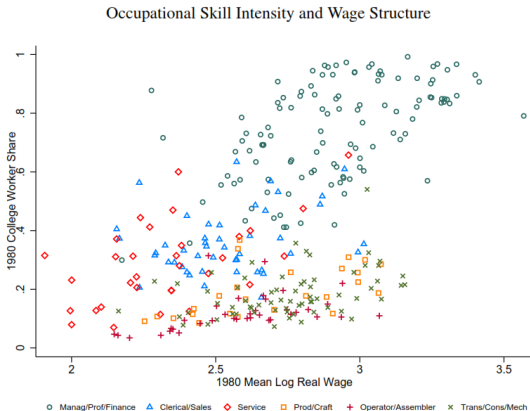
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## REMARK 1: INTERPRETATION OF SBTC

- Routineness is a characteristic of the occupation, not of the employee.
- Little routine intensity does not imply high-skill  $\Rightarrow$  service occupations (Autor-Dorn 2013)
- Using routiness might group together high- and low-skilled occupations.
- The paper suggests that sorting by wage provides similar results.
- How about other measures of skill?

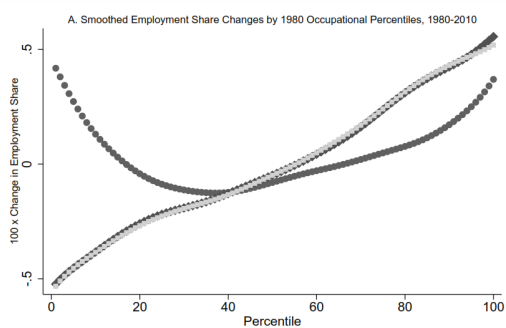
# REMARK 1: INTERPRETATION OF SBTC

- Even wage might be a poor proxy for skills (Sevinc, 2017).



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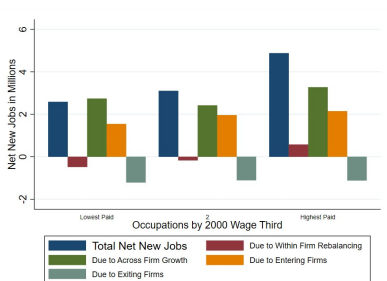
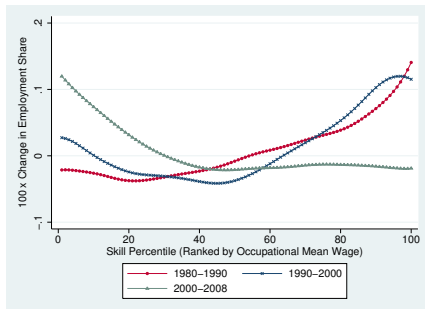
- Sevinc (2017) sorts of occupations by college workers shares in that occupation.



- Important to define which type of technological change the paper is looking for.
- Currently a mix of SBTC and RBTC.

## REMARK 2: TIMING OF SBTC

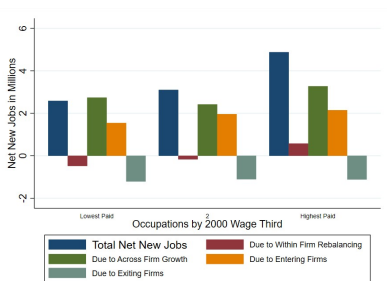
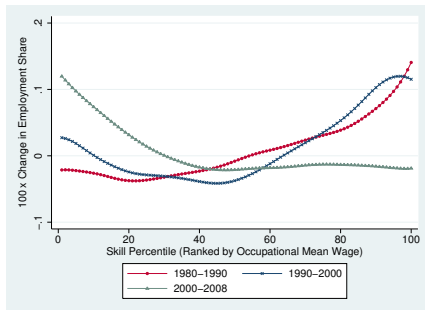
- The literature focuses on the U-shape. But this is generated in different steps;
- The 2000's appear to be a different decade  $\Rightarrow$  growth of low-skilled occupations;
- Beaudry, Green, and Sand (2014, 2016)  $\Rightarrow$  “great reversal” in demand for cognitive skills;
- Restructuring of production toward routine-biased technologies (Hershbein and Kahn, 2018).





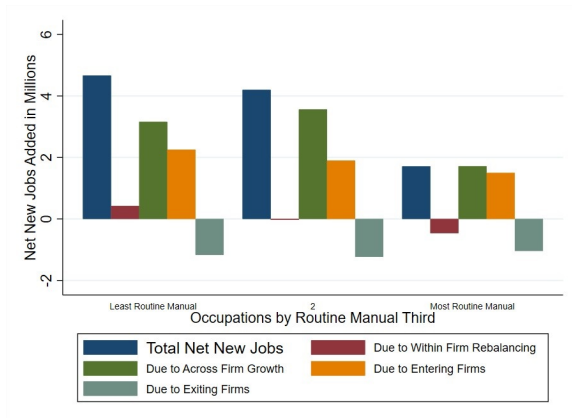
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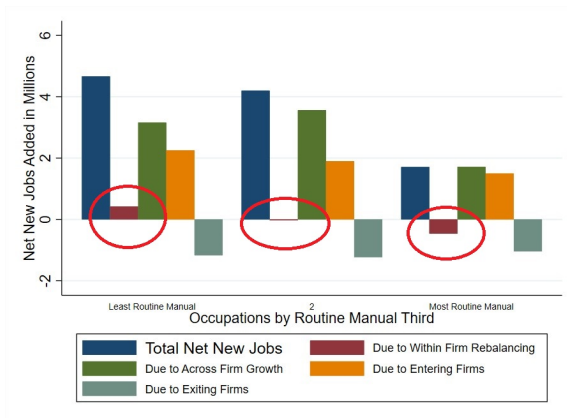
## REMARK 3: CONTRIBUTION OF WITHIN FIRM REBALANCING

- Within firm rebalancing is the second source of SBTC.



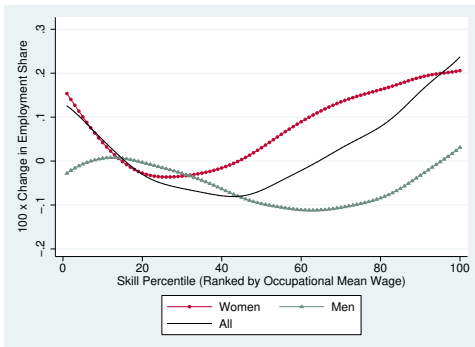
## REMARK 3: CONTRIBUTION OF WITHIN FIRM REBALANCING

- How does the claim square with this figure?
- It appears that the net effect of firms entry/exit is larger for each bin  $\Rightarrow$  **structural change** most important source of SBTC?



## REMARK 4: SBTC ON GENDER?

- Cerina, Moro, Rendall (2017) a large fraction of employment is due to a differential effect of SBTC on men and women;
- Women account for a large fraction of the increase of employment at the top and at the bottom of the skill distribution;
- Can the new dataset be adapted to consider gender-occupation-firm-year tuples?



- Very relevant paper;
- New dataset that can shed new light on the relationship between employment growth and technological change;
- Several potential applications;
- Grouping of occupations key to interpret the quantitative findings.