Discussion of “Trading Down and the Business Cycle”
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US employment after 2007

All employees: Total Nonfarm

Dec-07 Mar-08 Jun-08 Sep-08 Dec-08 Mar-09 Jun-09 Sep-09 Dec-09 Mar-10 Jun-10 Sep-10 Dec-10 Mar-11 Jun-11 Sep-11 Dec-11 Mar-12 Jun-12 Sep-12 Dec-12
What this paper is about
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US employment after 2007

- All employees: Total Nonfarm
- All employees: Retail Trade
- All employees: Manufacturing
Decomposing aggregate employment effects

Consider retail employment $H$ and sales $PY$ as sums over firms of different quality $q \in Q$

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$$h \equiv \frac{H}{PY} = \sum_q \left( \frac{P_q Y_q}{PY} \right) \left( \frac{H_q}{P_q Y_q} \right) \equiv \sum_q s_q h_q$$
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▶ Consider change in $h$ between two short periods

$$dh = \sum_q (ds_q) h_q + \sum_q s_q (dh_q)$$
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- Consider change in $h$ between two short periods

$$dh = \sum_q (ds_q) h_q + \sum_q s_q (dh_q)$$

- Since $\sum_q ds_q = 0$, this is also

$$dh = \text{Cov}_Q (ds_q, h_q) + \sum_q s_q (dh_q)$$
The trading down effect

**Conclusion:** change in aggregate retail employment $dH$ is

$$dH = \left(\text{Cov}_Q(ds_q, h_q) \cdot PY\right) + \sum_q s_q (dh_q) \cdot PY + d(PY)$$

\[1\]  

Macro effect

Trading down effect
The trading down effect

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(1)

- **JRW** perform this calculation over the 2007/2012 period:

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$\text{Cov}_Q(ds_q, h_q) = -0.23$
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Retail jobs lost due to trading down $= -622,500$

Share of initial retail employment $= -3.2%$
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$$dH = \sum_{q} s_q (dh_q) \cdot PY + \sum_{q} Cov_Q (ds_q, h_q) \cdot PY$$

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+ Trading down effect

- Macro effect

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$Cov_Q (ds_q, h_q)$ = -0.23

Retail jobs lost due to trading down = -622,500

Share of initial retail employment = -3.2%

▶ Conclusion: trading down effect is negative...

▶ and accounts for $>80\%$ of the job loss in retail (54 in manufacturing)
Equation (1) is an accounting decomposition

Has some very significant advantages:
- Requires no assumptions!!
- Straightforward to implement with the right data
- Generates new and nice stylized facts

But also has drawbacks:
- Challenging to implement in practice
- Accounting $\neq$ causal decomposition
- Model section helps with some aspects of this, but could do more

Next: discuss empirics and model in turn
Empirical implementation very creative:
- Yelp data to measure quality tier as within-sector price tier
- Related to a literature on quality measurement in trade

Several challenges in practice. For instance:
1. Requires making heroic extrapolation assumptions for $h_q$
   - Why not use Census employment data instead of Compustat?
2. Quantitative results appear quite sensitive to choices
   - Counting 2007-2009 as recession period, share of trading down only
     20% vs 88% in baseline 2007-2012. Why?
   - Equation (1) does not deal well with trends
   - That said, I am convinced that the qualitative pattern is there
From accounting to causal decomposition

- Wanted: 'share of employment loss that was caused by the trading down due to the recession'
  - Empirical issue: we lack identification
  - Theoretical issue: we lack a framework
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- Simple model that captures the story the authors have in mind:
  - Exogenous prices $P_q$, rental rate $R$, wage rate $W$ and income $Y$
  - Consumers have nonhomothetic utility $U(\{C_q\})$, income $PY$,
    demand
    $$P_q C_q = s_q (\{P_q\}, Y) \cdot PY$$
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  \[
  dH = \sum_q dH_q = \sum_q \frac{H_q}{P_q C_q} d (P_q C_q)
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  \[
dH = \text{Cov}_Q (ds_q, h_q) \cdot PY + \sum_q h_q s_q d (PY) \tag{2}
  \]
  \[
  \begin{align*}
  &\text{Trading down effect} \\
  &\text{Macro effect}
  \end{align*}
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Equation (2) is the same as (1), but is model-based

- On labor demand side, need average = marginal to avoid extra term
- Key remaining question is where prices and incomes come from
- This is what GE models help us do!
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The model has these ingredients but loses track of (1)–(2)

- Quality/quantity model has a unique quality in equilibrium
- Used to get RBC amplification and comovement
- Heterogeneous agent similarly a bit underexploited
- **My advice:** use Stone-Geary model instead, see if model and data decompositions can be reconciled
- Would round up the paper very nicely
The model of production

- Production function has the form

\[ Y = A \left[ \alpha \left( \frac{L}{q} \right)^{\frac{\epsilon-1}{\epsilon}} + (1 - \alpha) K^{\frac{\epsilon-1}{\epsilon}} \right]^{\frac{\epsilon}{\epsilon-1}} \]

- Assumptions:

1. If \( q \) doubles, would need to double \( L \) to produce same \( Y \)
2. When \( \epsilon < 1 \), increase in \( q \) raises MPL relative to MPK

\[ \frac{F_L}{F_K} = \frac{\alpha}{1 - \alpha} \left( q^{\frac{1-\epsilon}{\epsilon}} \left( \frac{L}{K} \right)^{-\frac{1}{\epsilon}} \right) = \frac{W}{R} \]
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- Factor demand properties, if \( \bar{\alpha} \equiv \text{initial labor share} \) and \( \epsilon < 1 \):

1. Higher quality goods are more expensive, \( \frac{dP}{P} = \bar{\alpha} \frac{dq}{q} \)
2. Firms employ more capital to produce each unit, with \( \frac{dK}{K} \bigg|_Y = \epsilon \bar{\alpha} \frac{dq}{q} \)
3. Firms also employ more labor \( \frac{dL}{L} \bigg|_Y = \left[ \epsilon \bar{\alpha} + 1 - \epsilon \right] \frac{dq}{q} \)
4. Relative labor intensity increases \( \frac{dL/K}{L/K} \bigg|_Y = (1 - \epsilon) \frac{dq}{q} \)

- Nice homothetic form capturing differential labor intensity by \( q \)
The model of quality/quantity choice

- Consumers choose

\[ \max U(C, q) \equiv \frac{q^{1-\theta}}{1-\theta} \log C \]

s.t. \[ P(q) C = y \]

- FOC is

\[ (1 - \theta) \log C = \frac{qP'(q)}{P(q)} \]

- Recall from production side that \[ \frac{qP'(q)}{P(q)} \text{ = labor share} \]
  - RBC model relies on procyclical labor share as key driving mechanism
  - Would be nice to also confront this prediction to the aggregate data
Conclusion

- Very nice and thought-provoking paper:
  - New stylized fact: consumers traded down in the retail sector during the great recession
  - New decomposition of aggregate employment change, with creative implementation
- The empirical and theoretical sections could be unified by computing the sufficient statistic

\[ \text{Cov}_Q (d s_q, h_q) \]

in the model with multiple goods and comparing it to the data
Thank you!