Cyclicality of Job and Worker Flows: New Data and a New Set of Stylized Facts

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Motivation

- Study cyclical worker flows.
- Plant perspective: Accessions and separations.
- When do workers reallocate?
- Why do workers reallocate?
Worker reallocate predominantly during booms.

Corr(-1) = -0.595
Corr = -0.676
Corr(+1) = -0.732
Motivation

- Traditional approach: Study worker flows resulting from changing labor demand, i.e., job creation and destruction.

- Worker flows exceed job flows.

- Systematic cyclical differences: Informative about sources of TFP and welfare implications.

- Theories carry testable implications that we contrast with the data.
Approach

- We use a newly compiled data set for job and worker flows in Germany (*ELFLOP*).

- Universe of German employment from 1976-2006. Quarterly basis with detailed worker and plant characteristics.

- HP-filtering and the frequency domain.
Worker flows: $ACC_t, SEP_t$

Job Flows: $JC_t, JD_t$

$EM_t = [EE_t + BE_t]/2.$

Flow rates:

$ACCR_t = \frac{ACC_t}{EM_t}$, $SEPR_t = \frac{SEP_t}{EM_t}$

$JCR_t = \frac{JC_t}{EM_t}$, $JDR_t = \frac{JD_t}{EM_t}$
Flow rates about 50% smaller and more volatile than in the US.
Worker flows

Accessions

Separations

Flow rates about 50% smaller and more volatile than in the US.
Linking job and worker flows

- Aggregate plant level data to eleven employment growth categories.

- Yields a distribution of employment over employment growth.

- Measure cyclical changes in the employment growth distribution and in worker flows conditional on employment growth.
- **Boom**: High share of employment located at expanding plants.
- **Recession**: Plants shift to a wait-and-see approach or exit the market.
- **Conditional on plants’ employment growth**, the accession and separation rate are procyclical for each plant category.
Quantifying the importance for the accession rate

Cyclical accession rate: Explained similar by shifts in employment growth and by shifts in conditional worker flows.

Constant distribution

Constant flows
Quantifying the importance for the separation rate

Cyclical separation rate: Mostly explained by shifts in conditional worker flows. Employment growth distribution explains mainly high frequency changes.
## Frequency Analysis

**Table:** Variance and covariance structure accessions

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Business Cycle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rel. var.</td>
<td>correl.</td>
</tr>
<tr>
<td>Fix Distribution</td>
<td>24%</td>
<td>90%</td>
</tr>
<tr>
<td>Fix conditional flows</td>
<td>36%</td>
<td>93%</td>
</tr>
</tbody>
</table>
Table: Variance and covariance structure separations

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Business Cycle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rel. var.</td>
<td>correl.</td>
<td>rel. var.</td>
</tr>
<tr>
<td>Fix Distribution</td>
<td>124%</td>
<td>72%</td>
<td>10%</td>
</tr>
<tr>
<td>Fix conditional flows</td>
<td>64%</td>
<td>22%</td>
<td>68%</td>
</tr>
</tbody>
</table>
Worker flows may be excessive due to growing, non-changing and shrinking plants.

\[ CHR_t = \sum_{k \in \{R, Z, S\}} CHR(k)_t \cdot ec(k)_t \]

So far: Similar churning rates.

Employment shares change over cycle.
Key: plants grow in booms with more worker turnover.
On the job search theory (Schaal (2011) and PVM (2013))

- Job to job transition rate is procyclical.
- Workers search for more productive plants (large, old, high paying) on the job.
- Boom: vacancy creation is more attractive. Workers flow to better plants.
- Vacancy costs make it costly to compete for workers, particularly for the least productive plants.
- Shift in average plant productivity increases aggregate productivity.
Employment growth and plant characteristics

\[ EMP_{t}^{k-l}(i) = EMP_{t}^{k}(i) - EMP_{t}^{l}(i). \]

Table: Inactive: Employment shares relative to 100+

<table>
<thead>
<tr>
<th>SD</th>
<th>AC(1)</th>
<th>Correlation to GDP_{t+j}</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 19</td>
<td>1,26%</td>
<td>0,75 0,64 0,67 0,66 0,68 0,67</td>
</tr>
<tr>
<td>20 – 49</td>
<td>1,11%</td>
<td>0,87 0,62 0,66 0,67 0,69 0,69</td>
</tr>
<tr>
<td>50 – 99</td>
<td>0,63%</td>
<td>0,79 0,58 0,62 0,65 0,66 0,65</td>
</tr>
</tbody>
</table>
Table: Growing: Employment shares relative to 100+

<table>
<thead>
<tr>
<th></th>
<th>Correlation to GDP_{t+j}</th>
<th>SD</th>
<th>AC(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 - 19</td>
<td>5.39%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 - 49</td>
<td>4.42%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 - 99</td>
<td>3.65%</td>
</tr>
<tr>
<td>j = -2</td>
<td>-0.16</td>
<td>-0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>j = -1</td>
<td>-0.16</td>
<td>-0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>j = 0</td>
<td>-0.16</td>
<td>-0.06</td>
<td>0.01</td>
</tr>
<tr>
<td>j = +1</td>
<td>0.11</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>j = +2</td>
<td>0.12</td>
<td>0.02</td>
<td></td>
</tr>
</tbody>
</table>
Worker flows and plant characteristics

- Churning, accession and separation rate are procyclical along the entire age (size, pay) distribution.

- Rates rise more during booms at small (young, low paying) plants.

- Dispersion of the employment growth, accession and separation rate is slightly countercyclical.
Other theories

- Worker flows are related to unobservables.
- Reduction in poor sorting increases aggregate productivity.
Conclusion

- Workers reallocate more during booms.
- Procyclical worker turnover requires theories with procyclical worker churn.
- Controlling for plant exit, job destruction is acyclical. Particularly small plants take a wait-and-see approach during recessions.
- Across the size distribution, plants increase employment during booms.
- All plant types increase accession and separation rates during booms.
- Data consistent with cyclical upgrade based on unobservables and learning.