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# When There is No Way Up: Reconsidering Low-paid Jobs as Stepping Stones

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## Motivation

**Consensus in the economic literature that:**

- Low-paid face a high level of state dependence (see, beside others, Uhlendorff 2006, Cai et al. 2017)
- Low-paid employment being more a *temporary* labour market position, operating as 'a trajectory to 'decent' jobs' [Fok et al. 2015, p. 892] rather than dead-ends.

**However: past literature has relied on survey data**

- Estimates are usually based on earnings information for just one period within each year ('point-in-time' definition)
- Bhuller et al. (2017) show in their Norwegian study on welfare benefit receipt dynamics that findings might change when using monthly information

**Approach:**

- Utilising monthly administrative data on wages and salary to differentiate workers between *strong* low-pay attachment (working at least 6 months of a year in the low wage sector) and *weak* low-pay attachment (less than 6 months)
- Compare findings with prevailing identification strategy

## Literature

*Table 1: Low pay persistence of related studies*

| *Study* | $P(\mathrm{Lp}_t \mid \mathrm{Lp}_{t-1})$ | $P(\mathrm{Hp}_t \mid \mathrm{Lp}_{t-1})$ |
|---|---|---|
| Cai et al. (2017, Table 2) | 0.196 | 0.556 |
| Cai et al. (2017, Table 6) | 0.272 | 0.472 |
| Mosthaf (2014, Table 5) | 0.083 – 0.168 | 0.695 – 0.789 |
| Uhlendorff (2006, Table 7) | 0.050 | 0.888 |
| Clark & Kanellopoulos (2013, Table 4) | 0.033 (Spain) – 0.133 (Portugal) | - |

*Note:* Cai et al. (2017) provides estimates based on the BHPS (Table 2) and Understanding Society data (Table 6). Mosthaf (2014) provides a range of estimates based on different qualification groups. Clark & Kanellopoulos (2013) provides a range of estimates based on data from twelve countries.

## Conceptual framework

**Basic concept:**

- Dynamics of earnings model:

$$Y_{ik_m} = \mu_k + \alpha_i + \nu_{ik_m}$$

- An individual is identified as being low-paid in month $m$ if their monthly wage is below threshold τ:

$$LP_{ik_m} = \mathbf{1}\left(Y_{ik_m} \leq \tau\right)$$

- On an individual level, the share of low-paid employed months can be derived as:

$$LP_{ik}^S = \frac{\sum_{m=1}^{M_{ik}} LP_{ik_m}}{12} \text{ with } LP_{ik}^S \in \{0, {}^1/_{12}, \dots, 1\}$$

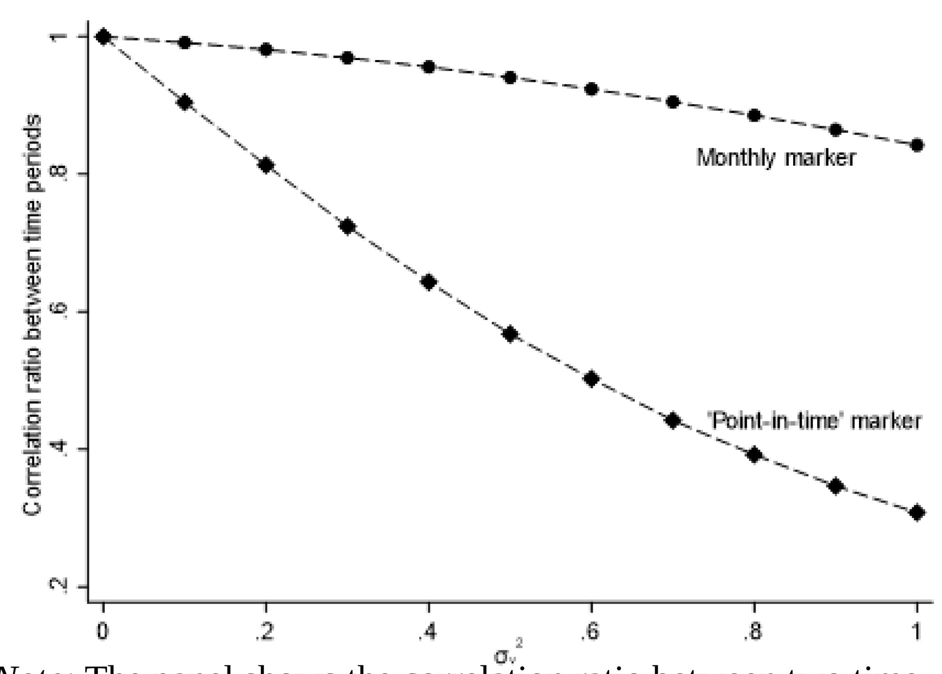
- The prevailing identifcation strategy is: $LP_{ik_{m^+}}$ of month $m^+ \in (1, \dots, 12) \Longrightarrow \boldsymbol{LP_{ik}^S = LP_{ik_{m^+}}}$ **if** $\boldsymbol{\sigma_\nu^2 = 0}$

**Correlation over time:**

- $$corr\left[LP_{ik-1}^S, LP_{ik}^S\right] = \frac{N\left(\sum_i LP_{ik-1}^S LP_{ik}^S\right) - \left(\sum_i LP_{ik-1}^S\right)\left(\sum_i LP_{ik}^S\right)}{\sqrt{\left[N \sum_i \left(LP_{ik-1}^S\right)^2 - \left(\sum_i LP_{ik-1}^S\right)^2\right]\left[N \sum_i \left(LP_{ik}^S\right)^2 - \left(\sum_i LP_{ik}^S\right)^2\right]}}$$
- $$corr\left[LP_{ik-1_{m^+}}, LP_{ik_{m^+}}\right] = \frac{N\left(\sum_i LP_{ik-1_{m^+}} LP_{ik_{m^+}}\right) - \left(\sum_i LP_{ik-1_{m^+}}\right)\left(\sum_i LP_{ik_{m^+}}\right)}{\sqrt{\left[N \sum_i \left(LP_{ik-1_{m^+}}\right)^2 - \left(\sum_i LP_{ik-1_{m^+}}\right)^2\right]\left[N \sum_i \left(LP_{ik_{m^+}}\right)^2 - \left(\sum_i LP_{ik_{m^+}}\right)^2\right]}}$$
- It can be shown that $\left|\frac{\partial\left(corr\left[LP_{ik-1}^S, LP_{ik}^S\right]\right)}{\partial \sigma_\nu^2}\right| < \left|\frac{\partial\left(corr\left[LP_{ik-1_{m^+}}, LP_{ik_{m^+}}\right]\right)}{\partial \sigma_\nu^2}\right|$

## Model

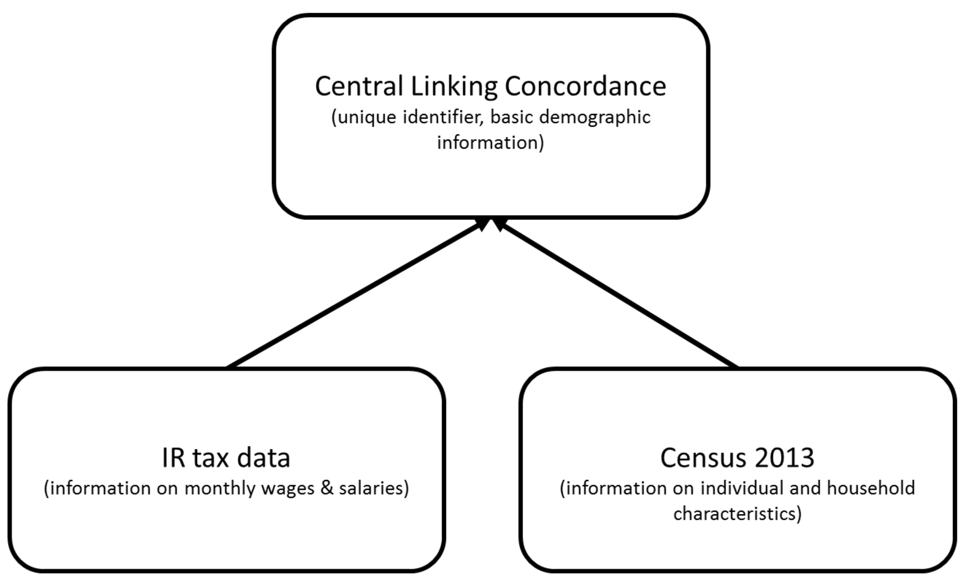
Figure 1: Simulation results (averages over 500 draws)




*Note:* The panel shows the correlation ratio between two time periods, for the monthly and 'point-in-time' markers. $\sigma_\nu^2$ = variation in monthly wages.

## Data & Descriptives

*Figure 2: Data sources*




*Source:* own representation.

**Notes:**

- Focus on the time period of 2007 to 2013 and restrict our sample to male workers aged between 25 to 45 (inclusive) in 2007
- Those men with their earnings belonging to the 10th lowest percentile are defined as low pay.

*Table 2: Prevalence of low pay employment*

| | | 'Point-in-time' marker | | |
|---|---|---|---|---|
| | | *Higher pay$_t$* | *Low pay$_t$* | Share$_t$ |
| Monthly marker | *Higher pay$_t$* | 100.00 | 0.00 | 77.44 |
| | *Weak low pay$_t$* | 81.81 | 18.19 | 12.31 |
| | *Strong low pay$_t$* | 24.78 | 75.22 | 10.26 |
| | Share$_t$ | 90.05 | 9.95 | |

*Notes:* Data sourced from IDI (2018). Authors' calculations. Based on a random subsample of population of interest *N* = 47,496. Time period = 2007 to 2013.

## Econometric Model and Results

**Econometric Model:**

- We apply a dynamic random effects multinomial logit model (Uhlendorff 2006, Mosthaf 2014, Fok et al. 2015, and most recently Cai et al. 2017)
- Accounting for the *initial conditions problem* by following the suggestion of Wooldridge (2005)
- To integrate out the random effects, we use maximum simulated likelihood (MSL) with Halton draws.

*Table 3: Predicted transition probabilities ('Point-in-time' marker)*

| | At $t = 0$ | | |
|---|---|---|---|
| | *Total* | *Higher Pay* | *Low Pay* |
| $P(Higher pay_t \mid Higher pay_{t-1})$ | 0.9643 | 0.9882 | 0.8058 |
| | (0.0847) | (0.0104) | (0.1214) |
| $P(Low pay_t \mid Higher pay_{t-1})$ | 0.0357 | 0.0118 | 0.1942 |
| | (0.0847) | (0.0104) | (0.1214) |
| $P(Higher pay_t \mid Low\ pay_{t-1})$ | **0.8664** | 0.9226 | **0.4185** |
| | (0.1936) | (0.0593) | (0.1800) |
| $P(Low pay_t \mid Low\ pay_{t-1})$ | **0.1336** | 0.0774 | **0.5815** |
| | (0.1936) | (0.0593) | (0.1800) |

*Notes:* Data sourced from IDI (2018). Authors' calculations. Based on a random subsample of population of interest *N* = 47,496. Time period = 2007 to 2013. Numbers in parenthesis refer to standard deviations.

*Table 4: Predicted transition probabilities (Monthly markers)*

| | At $t = 0$ | | | |
|---|---|---|---|---|
| | *Total* | *Higher pay* | *Weak lp* | *Strong lp* |
| $P(Higher\ pay_t \mid Higher\ pay_{t-1})$ | 0.8892 | 0.9617 | 0.7736 | 0.5825 |
| | (0.1631) | (0.0266) | (0.1083) | (0.1482) |
| $P(Weak\ low\ pay_t \mid Higher\ pay_{t-1})$ | 0.1012 | 0.038 | 0.2199 | 0.3555 |
| | (0.1386) | (0.0263) | (0.1027) | (0.1083) |
| $P(Strong\ low\ pay_t \mid Higher\ pay_{t-1})$ | 0.0096 | 0.0003 | 0.0065 | 0.0620 |
| | (0.0301) | (0.0005) | (0.0065) | (0.0469) |
| $P(Higher\ pay_t \mid Weak\ low\ pay_{t-1})$ | 0.7611 | 0.8808 | 0.5016 | 0.2392 |
| | (0.2571) | (0.0706) | (0.1484) | (0.1254) |
| $P(Weak\ low\ pay_t \mid Weak\ low\ pay_{t-1})$ | 0.1856 | 0.1140 | 0.4358 | 0.4222 |
| | (0.1603) | (0.0654) | (0.1117) | (0.0513) |
| $P(Strong\ low\ pay_t \mid Weak\ low\ pay_{t-1})$ | 0.0533 | 0.0052 | 0.0626 | 0.3386 |
| | (0.1263) | (0.0060) | (0.0443) | (0.1342) |
| $P(Higher\ pay_t \mid Strong\ low\ pay_{t-1})$ | **0.4349** | 0.5318 | 0.1011 | **0.0145** |
| | (0.2523) | (0.1605) | (0.0679) | (0.0130) |
| $P(Weak\ low\ pay_t \mid Strong\ low\ pay_{t-1})$ | **0.3089** | 0.3317 | 0.4018 | **0.1219** |
| | (0.1069) | (0.0840) | (0.0760) | (0.0476) |
| $P(Strong\ low\ pay_t \mid Strong\ low\ pay_{t-1})$ | **0.2562** | 0.1366 | 0.4970 | **0.8635** |
| | (0.2653) | (0.0895) | (0.1322) | (0.0593) |

*Notes:* Data sourced from IDI (2018). Authors' calculations. Based on a random subsample of population of interest *N* = 47,496. Time period = 2007 to 2013. Numbers in parenthesis refer to standard deviations.

## Robustness

*Table 5: Predicted transition probabilities (Mean monthly marker)*

| | At $t = 0$ | | |
|---|---|---|---|
| | *Total* | *Higher Pay* | *Low Pay* |
| $P(Higher pay_t \mid Higher pay_{t-1})$ | 0.9596 | 0.9976 | 0.7164 |
| | (0.1288) | (0.0028) | (0.1857) |
| $P(Low pay_t \mid Higher pay_{t-1})$ | 0.0404 | 0.0024 | 0.2836 |
| | (0.1288) | (0.0028) | (0.1857) |
| $P(Higher pay_t \mid Low\ pay_{t-1})$ | **0.8718** | 0.9539 | **0.1769** |
| | (0.2602) | (0.0470) | (0.1467) |
| $P(Low pay_t \mid Low\ pay_{t-1})$ | **0.1282** | 0.0461 | **0.8231** |
| | (0.2602) | (0.0470) | (0.1467) |

*Notes:* Data sourced from IDI (2018). Authors' calculations. Based on a random subsample of population of interest *N* = 47,496. Time period = 2007 to 2013. Numbers in parenthesis refer to standard deviations.

## Conclusions

⇒ **Present evidence that low pay persistence differs with intensity of attachment to the low pay sector:**

- 'point-in-time' marker: the likelihood of being low-paid in time period t if being initially low-paid and likewise in time period t-1 is 58.2 percent, while the likelihood of higher pay in t is 41.9 percent
- Monthly marker: for those with initially strong low pay attachment, the probability of staying strong low pay is 86.4 percent, while the probability of moving into higher pay is just 1.5 percent.

⇒ **Prior empirical evidence has generally been supportive of the 'work-first approach' to work-force participation, 'even if the jobs created are low-paid' [Cai et al. 2017, p. 30].**

⇒ **Findings indicate that not every job contributes to the individuals' human capital level (e.g. Stewart 2007).**