Performance-related Pay and Objective Measures of Health After Correcting for Sample Selection

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Performance-related pay (PRP)

Variable pay depending on worker’s performance

Widespread use in the labour force (10-40% of workers in Europe and US)

Associated with higher productivity (Lazear, 2000) but also...

1. Accidents and injuries: e.g. truckers (Williamson et al., 2009) and shoe manufacturers (Freeman & Kleiner, 2005)

2. Constant low-grade stress and substitution effect: Poor cardiovascular and mental health (Bender & Theodossiou, 2014) and increased drinking and drug use (Artz et al, 2020)

3. Income uncertainty: Higher variable pay than fixed or time-based pay. Long-term stress can compromise the immune system (McEwen, 1998)
Limitations

Confounding variables causing both self-sorting into PRP and poorer health outcomes
- Workers select into PRP and this selection process is not independent of health
- Example: Risk tolerance

Lack of physiological measures of health
- Those with poor mental health are likely to rate physical health as worse
- Allan et al (2021) – but experimental limitations

We can address these issues by 1) statistically correcting for self-selection by using instruments and 2) examining health markers as well as self-reported health
Data from Wave 2

PRP is only asked every other wave (wave 2, 4, 6, 8) in the UKHLS survey.

Nurse assessment took place in Wave 2 and Wave 3 of the UKHLS survey, but only on a subset of the sample.
Health measures of interest

1) Self-report *(higher value = better health)*
   1) GHQ (general health, 0-36)
   2) General health (1-5)
   3) Activity limitation due to physical health (1-100 quality of life measure)
   4) Activity limitation due to mental health (1-100 quality of life measure)

2) Blood pressure *(higher value = worse health)*
   1) Systolic bp
   2) Diastolic bp
   3) High (BP > 140/90 mmHg) vs low-normal BP

3) Inflammatory markers *(higher value = worse health)*
   1) (log of) c-reactive protein
   2) Fibrinogen
Simple comparison of PRP and fixed salary employees

Significant (p < .05) differences in self-reported general health, physical health, c-reactive protein and fibrinogen suggesting that PRP workers have better health.

• No difference in GHQ, mental health or blood pressure.

Is this not the opposite of what we expected?

• Characteristics of the PRP sample
• Self-selection – workers with poor health drop out of sample
Endogenous treatment models

Regressions estimated for each health outcome

Covariates include:

- **Sociodemographics**: Log of monthly net income (/1000), manual work, broad occupation category, age, age squared, gender, education level, marital status, ethnicity, hours worked per week and country of residence in the UK
- **Health covariates**: BMI, ever a smoker and taking prescribed medication
- **Instruments**: Firm size and % share of PRP workers
Results

<table>
<thead>
<tr>
<th></th>
<th>Self-reported GHQ-12</th>
<th>Self-reported general health</th>
<th>Self-reported mental health</th>
<th>Self-reported physical health</th>
<th>Systolic blood pressure</th>
<th>Diastolic blood pressure</th>
<th>Blood pressure &gt; 140/90 mmHg</th>
<th>(log of) C-reactive protein</th>
<th>Fibrinogen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=6100</td>
<td>n=6100</td>
<td>n=6100</td>
<td>n=6100</td>
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<td>n=5648</td>
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<tr>
<td>PRP</td>
<td>-6.91***</td>
<td>-0.01</td>
<td>-11.27***</td>
<td>2.48***</td>
<td>15.10***</td>
<td>-0.29</td>
<td>0.002</td>
<td>-0.09</td>
<td>0.57***</td>
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<tr>
<td></td>
<td>(0.27)</td>
<td>(0.06)</td>
<td>(0.58)</td>
<td>(0.83)</td>
<td>(1.29)</td>
<td>(1.41)</td>
<td>(0.05)</td>
<td>(0.06)</td>
<td>(0.18)</td>
</tr>
</tbody>
</table>

PRP is a significant predictor of **worse** GHQ-12, activity limitation due to mental health, higher blood pressure and higher fibrinogen

Also a significant predictor of **less** activity limitation due to physical health

No significant effect on general health, diastolic blood pressure, likelihood of clinically high blood pressure or c-reactive protein
## Results – broken down into subsamples

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</thead>
<tbody>
<tr>
<td><strong>Full sample</strong></td>
<td>-6.91***</td>
<td>-0.01</td>
<td>-11.27***</td>
<td>2.48***</td>
<td>15.10***</td>
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<td>(0.05)</td>
<td>(0.06)</td>
<td>(0.18)</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>-6.75***</td>
<td>-0.01</td>
<td>-11.24***</td>
<td>3.36***</td>
<td>12.73***</td>
<td>0.17</td>
<td>0.04</td>
<td>0.73***</td>
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<tr>
<td></td>
<td>(0.29)</td>
<td>(0.04)</td>
<td>(0.74)</td>
<td>(0.52)</td>
<td>(4.49)</td>
<td>(2.81)</td>
<td>(0.07)</td>
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<tr>
<td><strong>Female</strong></td>
<td>-6.87***</td>
<td>-0.02</td>
<td>-10.50***</td>
<td>1.23</td>
<td>15.90***</td>
<td>-0.87</td>
<td>-0.03</td>
<td>-0.12*</td>
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<tr>
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<td>(0.65)</td>
<td>(0.05)</td>
<td>(1.27)</td>
<td>(1.34)</td>
<td>(1.47)</td>
<td>(1.59)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.06)</td>
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<tr>
<td><strong>Manual</strong></td>
<td>-2.64***</td>
<td>-0.02</td>
<td>3.76</td>
<td>2.52***</td>
<td>-3.75</td>
<td>-0.50</td>
<td>-0.02</td>
<td>-0.37</td>
<td>0.66***</td>
</tr>
<tr>
<td></td>
<td>(0.75)</td>
<td>(0.06)</td>
<td>(2.05)</td>
<td>(0.48)</td>
<td>(2.35)</td>
<td>(2.69)</td>
<td>(0.26)</td>
<td>(0.20)</td>
<td>(0.06)</td>
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<tr>
<td><strong>Non-manual</strong></td>
<td>0.07</td>
<td>-0.01</td>
<td>-0.77</td>
<td>2.15**</td>
<td>14.59***</td>
<td>-0.55</td>
<td>0.01</td>
<td>-0.13***</td>
<td>-0.03</td>
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<tr>
<td></td>
<td>(0.75)</td>
<td>(0.05)</td>
<td>(1.24)</td>
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<td>(1.45)</td>
<td>(0.02)</td>
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<td>(0.07)</td>
</tr>
</tbody>
</table>

*Note: Standard errors in brackets. Regressions include all previously mentioned covariates but are omitted here for brevity. Full results are available upon request from author.*

### Effect of PRP on less activity limitation driven by male workers

- Sample has few people with severe mobility issues?
- Severe health conditions due to PRP work are only visible over time?

Women in PRP and non-manual workers have slightly lower levels of c-reactive protein

- Workplace flexibility?
Conclusion

Some evidence for PRP workers suffering from worse mental health and biomarkers related to chronic stress

• Some exceptions: Male workers better quality of life re. physical health and female/non-manual workers lower c-reactive protein

Limitations

• Broad measure of PRP
• No further information about risk preference or personality traits

Findings suggest that use of PRP can have widespread detrimental effects on the employed population
Thank you!

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https://www.abdn.ac.uk/business/research/PRPH.php