
Modelling the Differing Impacts of Covid-19 in the UK Labour Market

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Outline

Introduction

- Research Questions & Motivation
- Related Literature

The Data

- The Pre-Pandemic Labour Market
- The Impact of the Pandemic on the UK Labour Market
 - The Structure of Employment
 - Labour Market Transitions
 - The LFS Data

The Model

- The Labour Market
- Firms
- The Wage
- Calibration of the Pandemic Shocks

Results

- The Baseline
- Scenarios

Introduction

- **Research Motivation**

- Research Questions

- Related Literature

At the peak of the pandemic:

- only around 50% of workers were at work
- two thirds of employers made use of the Job Retention Scheme (JRS)
- up to 10 million workers were furloughed
- GDP fell by 20% in April 2020, and was 5% lower in 2020 compared to 2019

According to the ONS:

- graduates typically have higher wages and greater job security than non-graduates
- there is substantial movement of workers between jobs
- most hires come from the employed rather than the unemployed

Introduction

- Research Motivation
- **Research Questions**
- Related Literature

Can the extreme turbulence induced by the Covid-19 Pandemic be explained using a relatively simple macroeconomic model?

- Our results:
 - closely match the changes in output through the pandemic
 - match the small reduction in employment in the UK in 2020

How did the pandemic affect the labour market experience of different types of workers in the UK?

- Larger fall in the employment of non-graduates, compared to graduates
- Real wages in 2021 increase due to composition effect because non-graduate employment is more concentrated in lower wage occupations

What was the impact of the Job Retention Scheme, adopted by the UK Government in March 2020 as the core of their economic policy response to the pandemic?

- The JRS prevented around 48-58% of the furloughed jobs from being lost, equivalent to about 4.18-5.05 million jobs
- Most of the saved jobs were in low wage occupations, largely being done by non-graduates

Introduction

- Research Motivation
- Research Questions
- **Related Literature**

On Covid-19

- SIR-DSGE models (Baqae and Farhi (2020), Eichenbaum et al. (2020))
- DSGE models with adverse aggregate demand & supply shocks (Fornaro and Wolf (2020), Guerrieri et al. (2020), Mihailov (2020))

DSGE models with labour market search

- No on-the-job search, one type of worker, one type of job (Thomas and Zanetti (2009), Blanchard and Gali (2010), Ravenna and Walsh (2011))
- On-the-job search, one type of worker, good and bad jobs (Gertler et al. (2020), and Faccini and Melosi (2020))

Our model

- Four labour markets (graduates & non-graduates in high and low SOC occupations)
- On-the-job search, 12 distinct worker transitions
- A combination of shocks specific to the labour market: aggregate demand and supply shocks, job-specific supply shocks, shocks to job destruction



The Data



Worker & Job Classifications

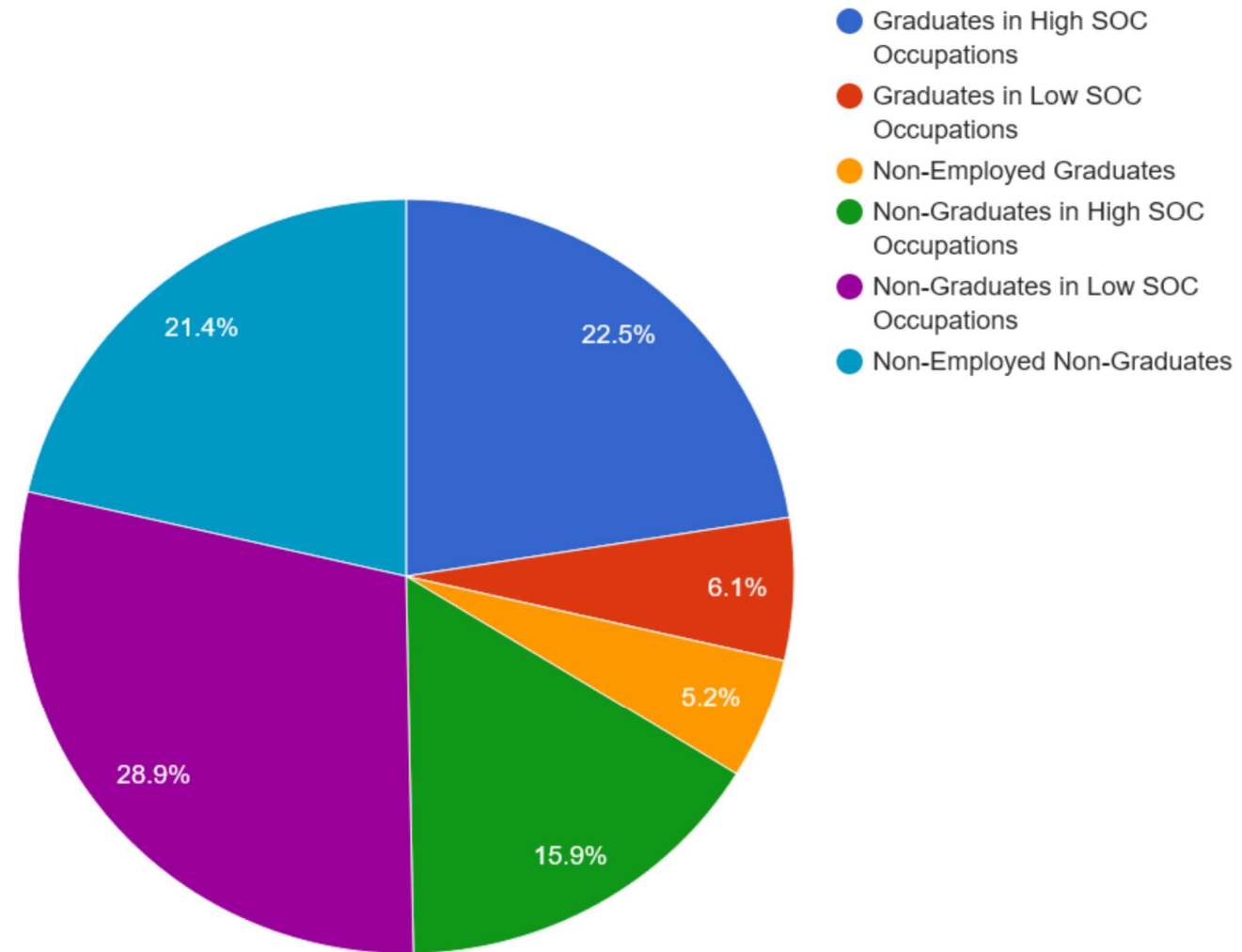
- **Five- Quarter Longitudinal LFS Dataset**
 - 2018Q4 – 2019Q4 for the pre-pandemic period
 - 2019Q4 – 2020Q4 for the pandemic period
- **Age 16 – 64**
- **Graduates** hold at least a First Degree
- **High productivity jobs** are SOC groups 1 – 3; i.e.,
 - 1) Managers, Directors and Senior Officials, 2) Professional, 3) Associate Professional and Technical Occupations
- **Low productivity jobs** are SOC groups 4 – 9; i.e.,
 - 4) Administrative and Secretarial, 5) Skilled Trades, 6) Caring, Leisure & other Service, 7) Sales and Customer Service, 8) Process, Plant and Machine Operatives, 9) Elementary Occupations

2018Q4 – 2019Q4

■ The Structure of Employment

- non-graduates are over four times more likely to be out of work than graduates
- a substantial number of non-graduates have high SOC jobs, but a greater proportion of graduates are in high SOC jobs
- the proportion of non-graduates in low SOC occupations is almost five times the proportion of graduates in similar occupations

The Structure of Employment in the UK, 2018Q4-2019Q4



2018Q4 – 2019Q4

Labour Market Transitions

- Higher rates of job loss for graduates and non-graduates in low SOC employment than for those in high SOC employment
- Non-graduates are more likely to remain in low SOC jobs than graduates
- Graduates are more likely to remain in high SOC employment than non-graduates
- Graduates and non-graduates are more likely to move from job to job and less likely to find work from non-employment
- Non-graduates are more likely to remain out of work than graduates

i) Graduate Transitions	High Productivity Job	Low Productivity Job	Unemployed or Inactive
High Productivity Job	0.956	0.024	0.020
Low Productivity Job	0.107	0.854	0.040
Unemployed or Inactive	0.053	0.043	0.904
ii) Non-Graduate Transitions	High Productivity Job	Low Productivity Job	Unemployed or Inactive
High Productivity Job	0.917	0.055	0.028
Low Productivity Job	0.033	0.935	0.032
Unemployed or Inactive	0.008	0.047	0.945

2019Q4 – 2020Q4

■ The Structure of Employment

- Employment was fairly stable through the pandemic

■ Labour Market Transitions

	2020Q1	2020Q2	2020Q3	2020Q4
$n^{g,H}$, graduates in high productivity occupations	0.246	0.247	0.244	0.245
$n^{g,L}$, graduates in low productivity occupations	0.060	0.060	0.062	0.065
$u^{g,H}$, unemployed or inactive graduates	0.057	0.058	0.063	0.061
$n^{ng,H}$, non-graduates in high productivity occupations	0.156	0.156	0.152	0.148
$n^{ng,L}$, non-graduates in low productivity occupations	0.289	0.279	0.280	0.281
$u^{ng,H}$, unemployed or inactive non-graduates	0.196	0.200	0.199	0.200

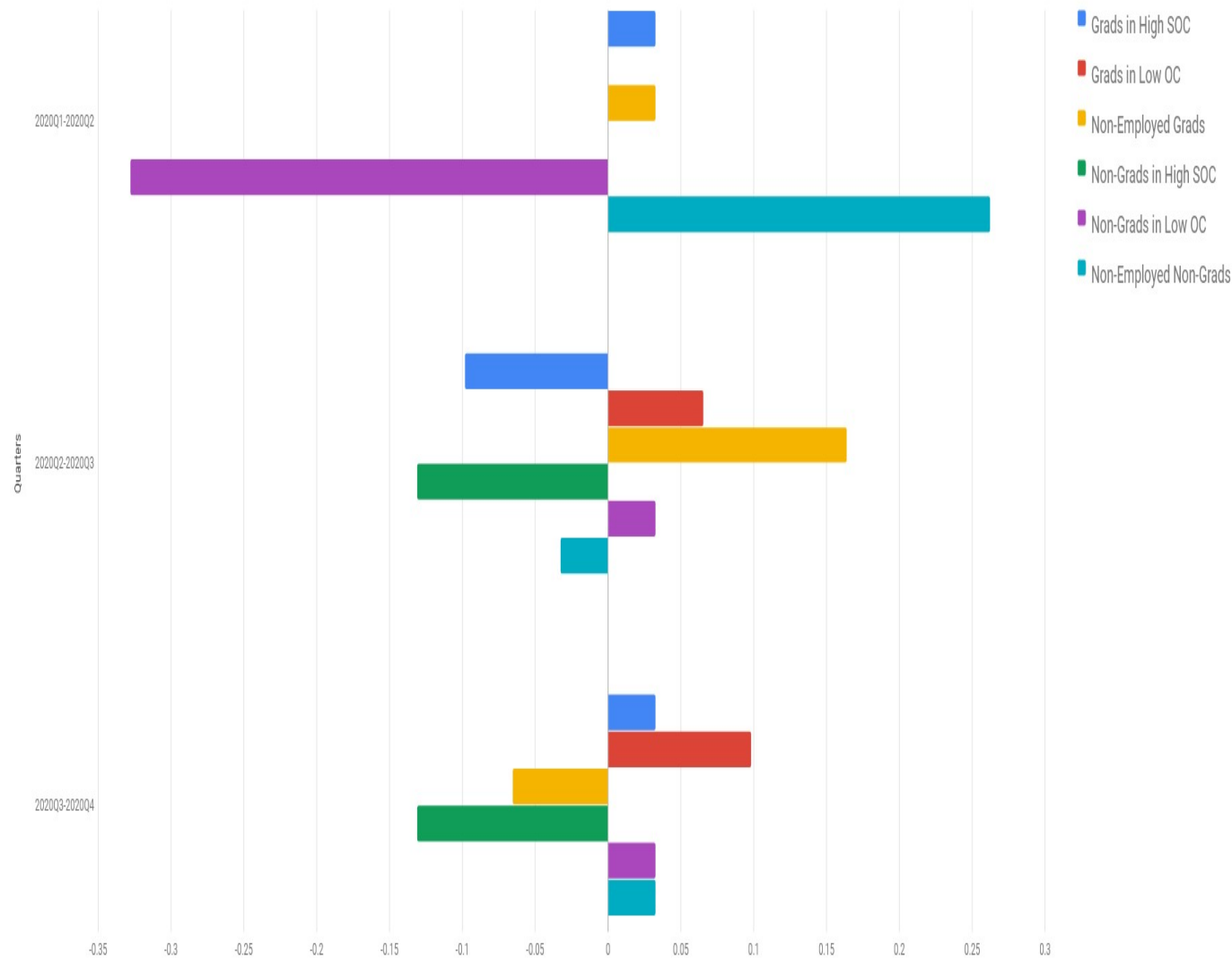
2019Q4 – 2020Q4

■ The Structure of Employment

■ Labour Market Transitions

- Strong adverse impact on non-graduates from the beginning of the pandemic
- The impact of the pandemic on graduates hits later in 2020

Changes in UK Employment
Millions of Workers



The LFS

■ Employment Data during the Pandemic

- According to the ONS:
 - some workers changed their reported status from self-employed to employee, possibly to enable claims for support under the Job Retention Scheme
 - some workers doing no hours, earning no wage and not furloughed, mis-reported their employment status

■ Furloughing

The Labour Force Survey data might understate job loss during the pandemic:

- LFS data imply a loss of 570,000 jobs during the pandemic, but
- tax data show that number of workers on payroll and paying tax fell by around 800,000
- the Workforce Jobs Survey (WJS) data support a larger fall in employment, showing a loss of employment of around 3% across 2020

The LFS

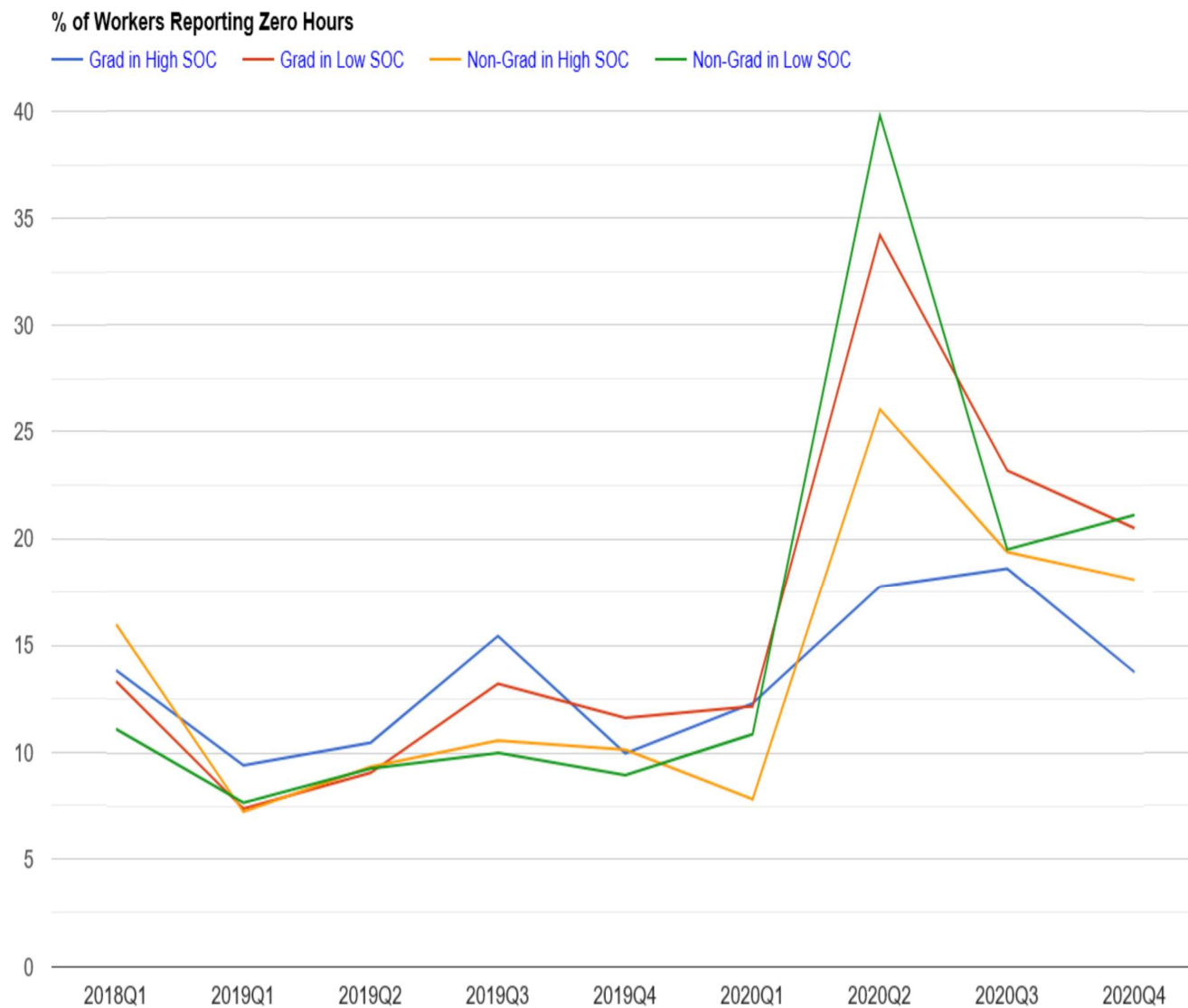
▪ Employment data during the pandemic

▪ Furloughing

○ No information on which workers have been furloughed under the JRS, but

○ the percentages of individuals reporting working zero hours show:

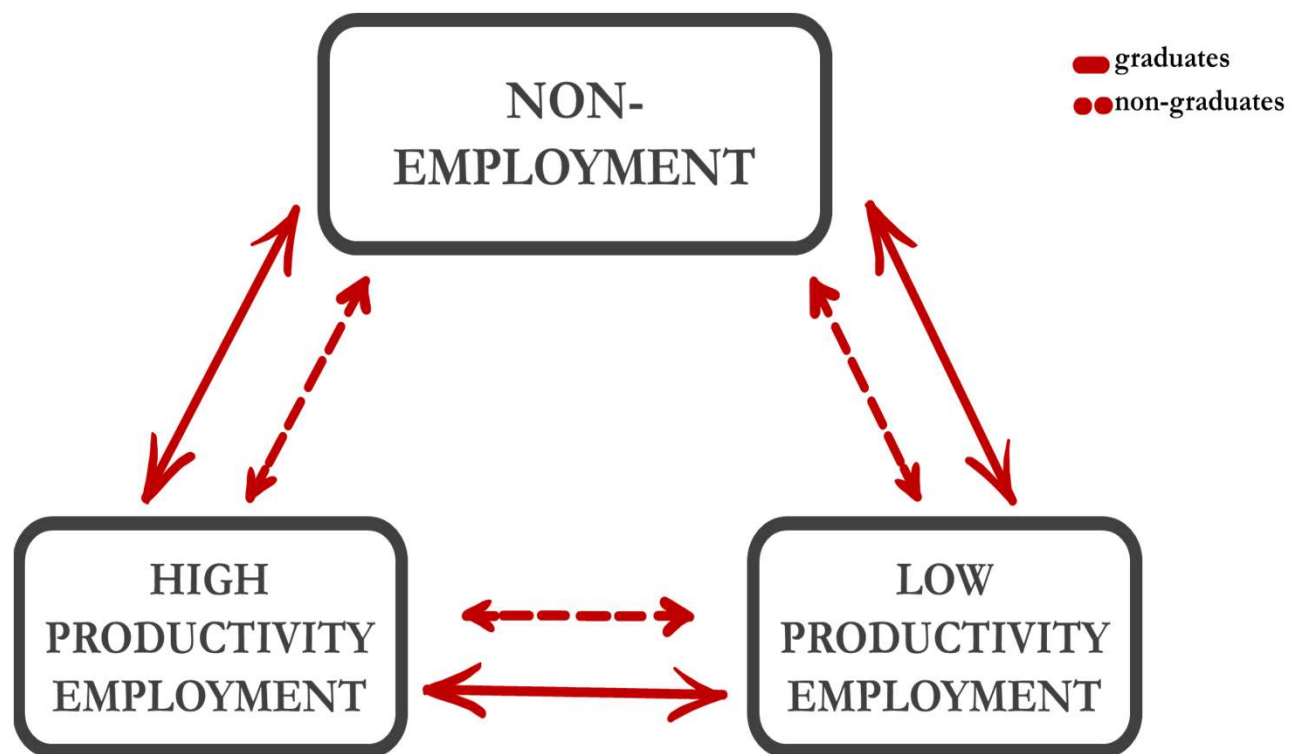
- spikes in employed workers doing no hours
- largest increase for non-graduates in low SOC employment



The Model

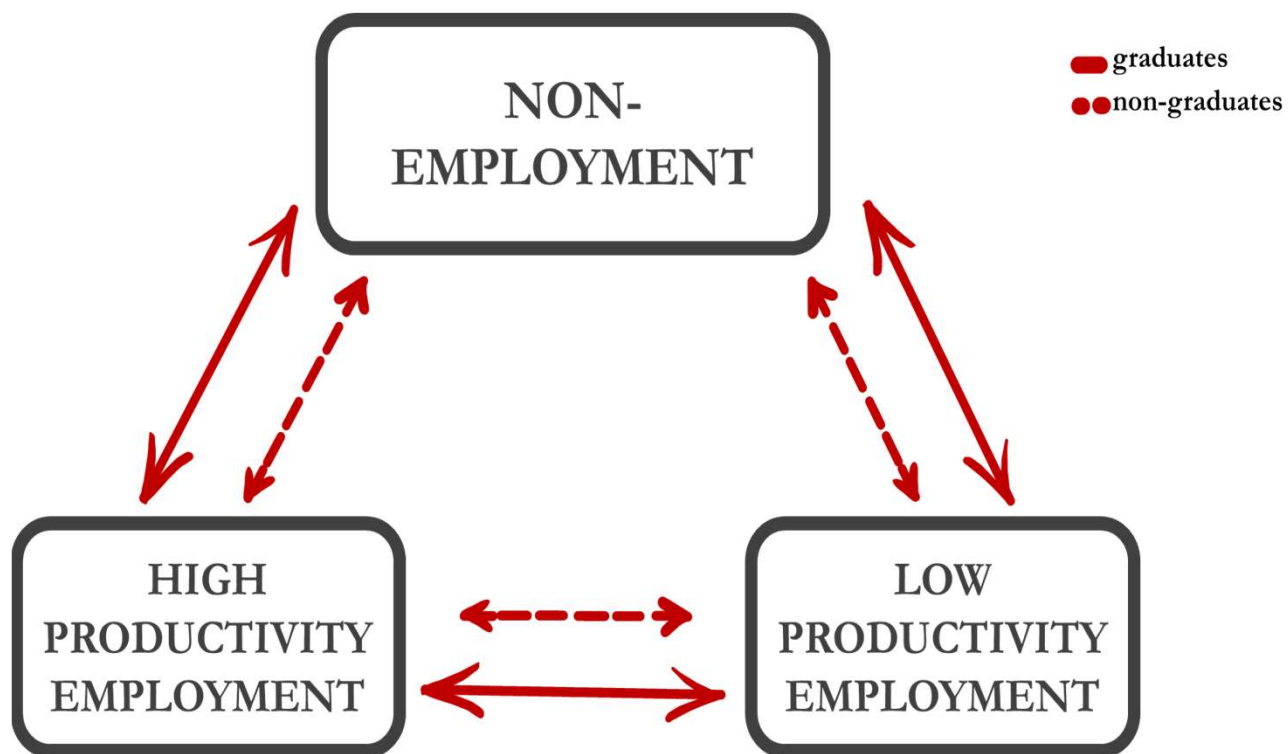
The Labour Market

- Identical graduates, identical non-graduates
- Workers are either employed or non-employed
- Non-employed = unemployed + inactive
- All workers search for work
- Fixed search intensity



The Labour Market

- One firm, four types of job positions
- Differing productivity for graduates and non-graduates in high- and low productivity employment
- The firm bargains with each type of worker in each type of job
- Implies four distinct wage relationships
- Exogenous job destruction



Calibration of the Pandemic Shocks

Deterministic shocks to:

- **Aggregate demand**
 - the pandemic — —
 - the JRS —
- **Aggregate supply**
 - the pandemic: working from home —
 - the JRS: furloughing — —
- **Job-specific productivity**
 - the JRS: more furloughed low productivity workers —
- **Job destruction**
 - the pandemic + +
 - the JRS +
- **Wages**
 - the pandemic — —
 - the JRS —

Variable	Interpretation	(i) Baseline	(ii) JRS:1	(iii) JRS:2
A^H	Productivity: High Prod Jobs	↓ 17%	↓ 6%	↓ 14%
A^L	Productivity: Low Prod Jobs	↓ 23%	↓ 8%	↓ 18%
w^H	Wage: High Prod Jobs	↓ 15%	0%	0%
w^L	Wage: High Prod Jobs	↓ 25%	0%	0%
Y	Aggregate Demand	↓ 11%	↓ 15%	↓ 22%
$\pi^{\{H,U\}}$	Job Destruction: High Prod Jobs	0%	↑ 5%	↑ 5%
$\pi^{\{L,U\}}$	Job Destruction: Low Prod Jobs	↑ 5%	↑ 10%	↑ 10%

Calibration of the Pandemic Shocks

JRS:1

- **In the absence of the JRS**

- aggregate demand falls slightly more than baseline
- little fall in productivity compared to baseline
- no wage subsidy
- more jobs destroyed

Variable	Interpretation	(i) Baseline	(ii) JRS:1	(iii) JRS:2
A^H	Productivity: High Prod Jobs	↓ 17%	↓ 6%	↓ 14%
A^L	Productivity: Low Prod Jobs	↓ 23%	↓ 8%	↓ 18%
w^H	Wage: High Prod Jobs	↓ 15%	0%	0%
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Y	Aggregate Demand	↓ 11%	↓ 15%	↓ 22%
$\pi^{\{H,U\}}$	Job Destruction: High Prod Jobs	0%	↑ 5%	↑ 5%
$\pi^{\{L,U\}}$	Job Destruction: Low Prod Jobs	↑ 5%	↑ 10%	↑ 10%

Calibration of the Pandemic Shocks

JRS:2

- **In the absence of the JRS**

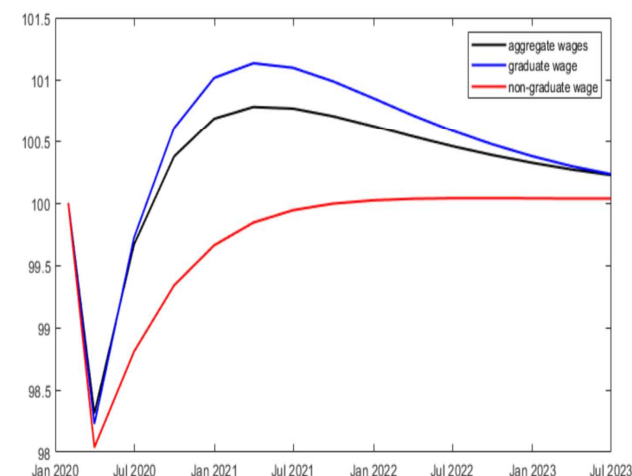
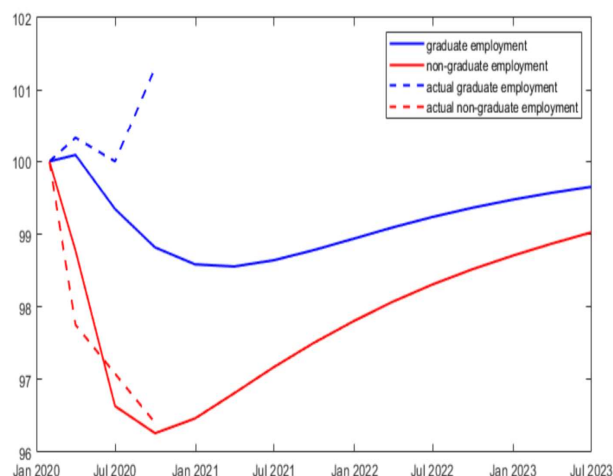
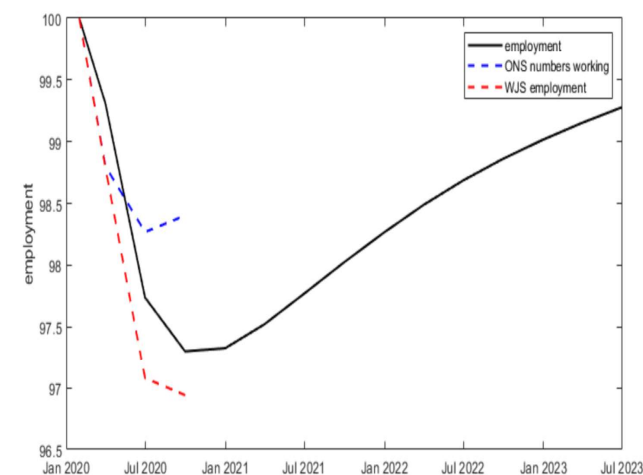
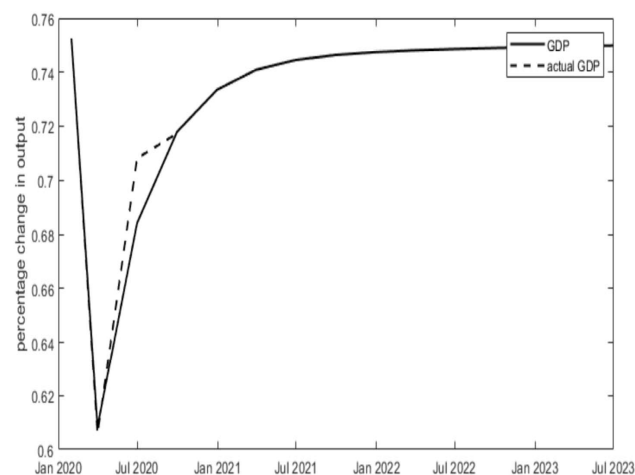
- aggregate demand falls much more than baseline
- large fall in productivity similar to baseline
- no wage subsidy
- more jobs destroyed

Variable	Interpretation	(i) Baseline	(ii) JRS:1	(iii) JRS:2
A^H	Productivity: High Prod Jobs	↓ 17%	↓ 6%	↓ 14%
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Results

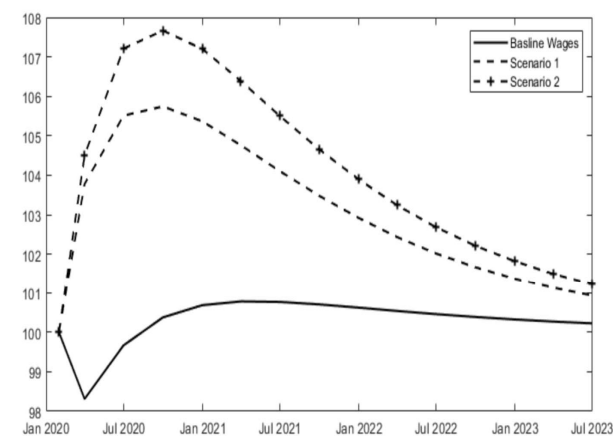
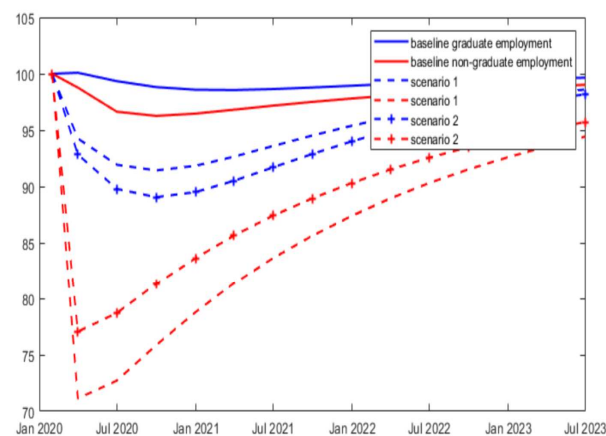
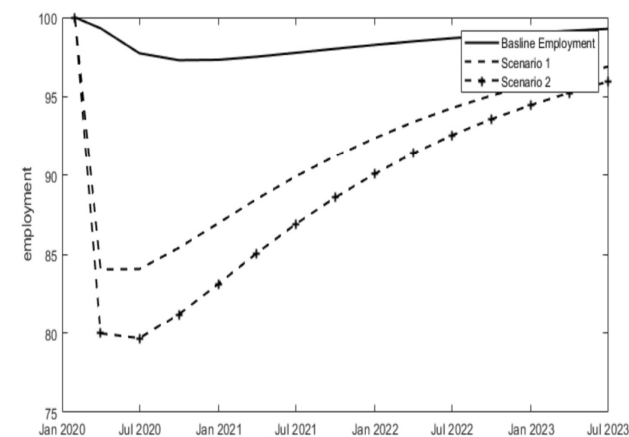
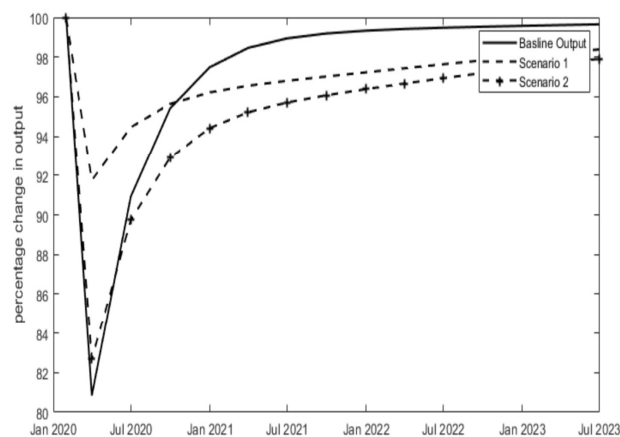
The Baseline

- Closely matches the fall in output at the peak of the pandemic and the recovery
- Matches the relatively small reduction in employment in 2020
- Reflects the larger fall in the employment of non-graduates, compared to graduates
- Shows the increase in real wages in 2021 due to composition effect



Evaluating the JRS

- Large difference in the results for output for Scenarios 1 and 2, but more consistent results for graduate and non-graduate employment
- The scenario results for employment may be more reliable than the results for output for output
- The difference between the baseline graduate and non-graduate employment and the scenarios gives the number of jobs saved by the JRS
- This is between 4.18-5.05 million jobs, mostly jobs held by non-graduates



Summary

- Our standard DSGE model with labour market frictions can give useful insights into the impact of the pandemic and can be useful for policy evaluation
- Our results are based on some strong assumptions including that
 - the economy was in steady-state before the pandemic
 - there is no permanent impact from the pandemic
 - price is a fixed mark-up over discounted future marginal cost, implying fairly constant inflation. There is evidence that mark-ups varied across the pandemic (Jaravel and O'Connell (2020))
- Further analysis is necessary as more data on the pandemic become available
 - analysing the impact on other worker types and hours worked
 - analysing the experience of firms