Article Format

Thesis Defence

Saint–Petersburg, 2023

Impact of COVID-19 on the Job Satisfaction of Russian Employees

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Research motivation: importance of the job satisfaction

- Key to **employee well-being** (Dong & Yan, 2022)
- Crucial for organizational **survival and growth** (Spreitzer & Porath, 2012)
- Mediator between **work environment and turnover intention** (Lambert et al., 2001)
- Positive link with **job performance and work output** (Shobe, 2018)

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COVID-19's impact: shifts in work perceptions and occupations (Kramer & Kramer, 2020)

Research motivation: COVID-19 effect on the job satisfaction

Positive effect

- Increase in incidents of **working from home** (Aksoy et al. 2022)
- Less commuting, more time for **family and leisure** (Gajendran & Harrison 2007; Laß & Wooden 2023)
- **Less stressful** working environment & possible **increase** in job satisfaction (Lass et al., 2023)

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Negative effect

- Increased risk of infection for face-to-face employees, **strain and stress** (Lilja et al., 2022), surge in burnout, up to **80%** among **healthcare workers** (HCWs) (Morgantini et al., 2020)
- Vulnerable workers faced a higher risk of **income loss or job loss** (OECD,2022)
- High risk of **burnout** was across all key workers (Jooshandeh & Grimond, 2020)

Vulnerable to COVID-19 professions

HCWs: doctors, nurses & other HCWs due to their close contact with infected patients (Lilja et al., 2022; Barili et al., 2022)

Transportation workers: bus drivers, taxi drivers etc. due to their close contact with passengers. (Heinzerling et al., 2022)

First responders: police officers, firefighters, and emergency medical personnel (ILO, 2020)

Cleaning and sanitation workers, caregivers: janitors and other cleaning and sanitation professionals due to their close contact with contaminated surfaces (Ng et al., 2022; ILO, 2020)

Service industry workers with customer-facing jobs: retail workers, restaurant workers etc. due to their frequent contact with the public (Wei et al., 2022)

Research Gap

- **Limited studies on job satisfaction in Russia**, particularly in the context of the COVID-19 pandemic
- Existing research primarily focused on **remote workers' satisfaction** (e.g., Toscano et al., 2022)

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Research Problem

- COVID-19 **negatively impacted working conditions**, creating increased job-demands for a certain employee group
- **Effects on job satisfaction** may **differ** between non-vulnerable and vulnerable professions to COVID-19

*RQ: How did the COVID-19 pandemic impact job satisfaction differently for workers at **higher risk** of infection than those at **lower risk**?*

Definitions and concepts

Employee Well-being (SWB)

Four aspects: positive feelings, lack of negative feelings, life contentment, job contentment (Dong & Yan, 2022).

Job Satisfaction

SWB component, pleasurable emotional state from job appraisal (Locke, 1969).

Working Conditions

Interaction with organizational climate, includes psychological and physical elements (Gerber et al., 1998).

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Growth Opportunities

SWB component, pleasurable emotional state from job appraisal (Locke, 1969).

Pay Satisfaction

Positive emotional response to compensation (Miceli & Lane, 1991).

Vulnerable Workers

Occupations with high COVID-19 infection risk due to exposure or proximity to infection (Chirico et al. 2020; Mutambudzi et al. 2021).

Job Demands-Resources (JD-R) model

Employee well-being model categorizing job stress factors into **Job Demands and Resources** (Bakker & Demerouti, 2007)

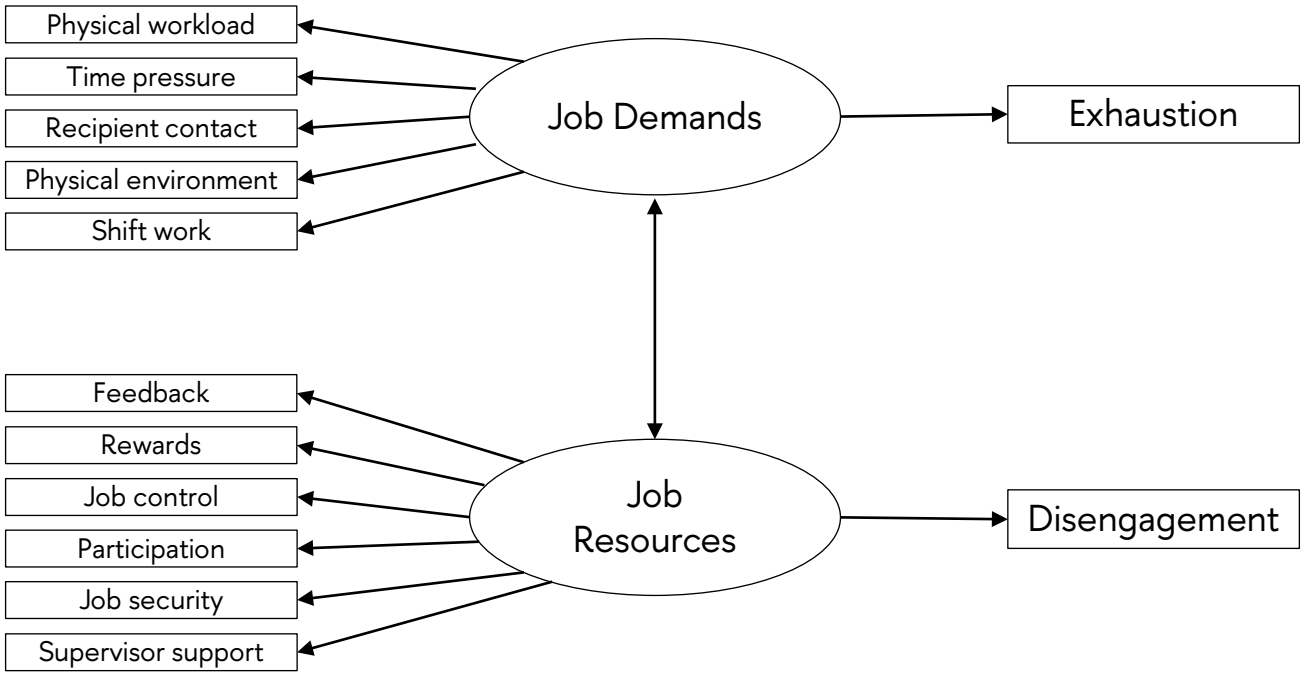

Figure 1: The job demands-resources model of burnout (Demerouti et al., 2007)

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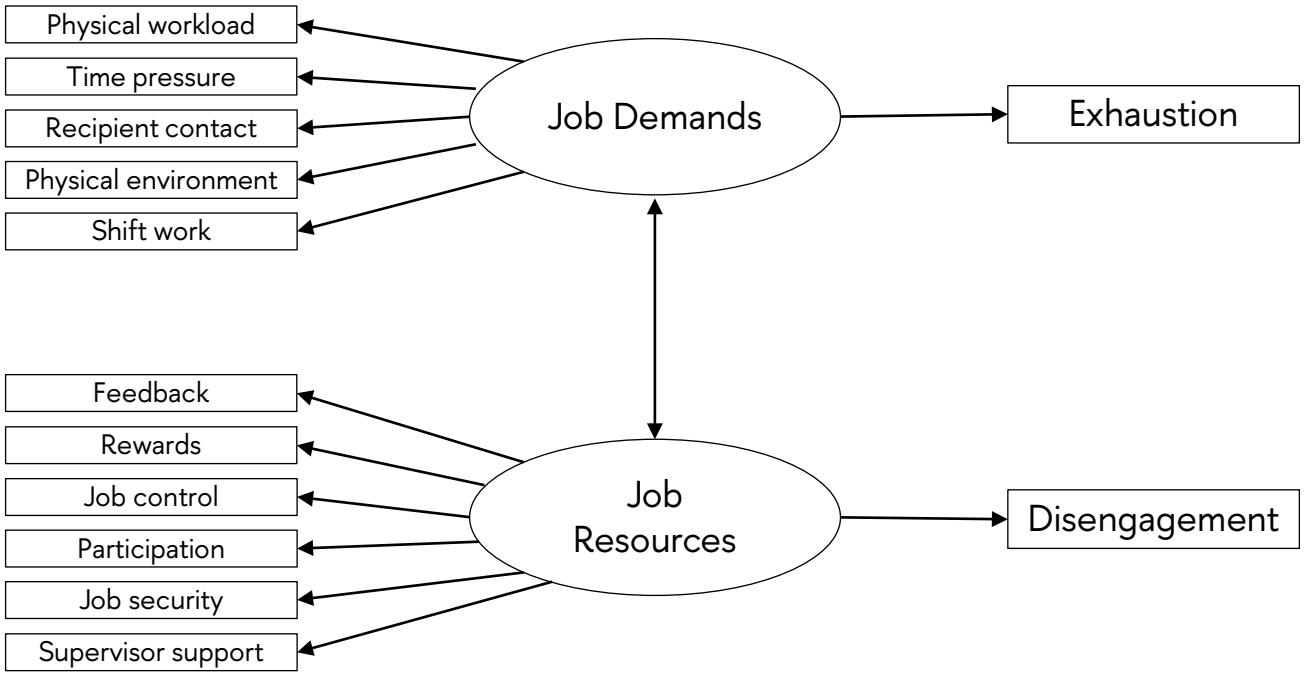

Figure 1: The job demands-resources model of burnout (Demerouti et al., 2007)

Job Demands: Aspects of work requiring physical or mental effort, linked to physiological and psychological costs (Demerouti et al., 2007)

Job Resources: Factors protecting employee health (Demerouti et al., 2000)

Imbalance between job demands and resources negatively impacts **employee well-being and satisfaction**

Hypotheses

COVID 19 & Job Satisfaction

- **Low and Moderate COVID-19 Risk Workers:** increased flexibility and autonomy during COVID-19 may increase job satisfaction (Toscano et al., 2022).
- **JD-R model:** favorable balance between job demands and resources positively impacts the job satisfaction.
- **High COVID-19 Risk Workers:** heightened job demands and insufficient resources may lower job satisfaction (Cabarkapa et al., 2020).

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- **High COVID-19 Risk Workers:** heightened job demands and insufficient resources may lower job satisfaction (Cabarkapa et al., 2020).

H1a: The probability of being satisfied with the job **decreased** among **high COVID-19 risk groups** during COVID-19 (2020 year).

H1b: The probability of being satisfied with the job **increased** among **low and moderate COVID-19 risk** workers during COVID-19 (2020 year).

Hypotheses

COVID 19 & Satisfaction with Working Conditions

- **Low and Moderate COVID-19 Risk Workers:** unchanged or improved working conditions, less commute time allowed more leisure time (Gajendran & Harrison, 2007; Laß & Wooden, 2023).
- **High COVID-19 Risk Workers:** - risk of infection added stress, affecting satisfaction with working conditions (Zhou et al., 2022; Ibrahim et al., 2022).

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H2a: The probability of satisfaction with working conditions **decreased** among **high COVID-19 risk** workers during COVID-19 (2020 year).

H2b: The probability of satisfaction with working conditions **increased** among **low and moderate COVID-19 risk** workers during COVID-19 (2020 year).

Hypotheses

COVID 19 & Satisfaction with Growth Opportunities

- **Upside -** Pandemic accelerated digital technology adoption, promoting new skills and roles (Nicola et al., 2020).
- **Downside -** Economic contraction (3% in 2020) and higher unemployment (6.4% in Sep 2020 vs 4.9% in Jan 2020) undermined growth opportunities (TASS, 2021; Rosstat, 2023).
- COVID-19's impact on growth opportunities likely **similar** across low, moderate and high COVID-19 risk groups.

H3: The probability of satisfaction with growth opportunities increased for low, moderate, and high COVID-19 employees during COVID-19 (2020 year).

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COVID 19 & Satisfaction with Pay

- Certain healthcare and social institution workers received **monetary compensation** due to close COVID-19 contact (TASS, 2020).
- Literature suggests an overall **increase in pay satisfaction** in 2020 (Frutos-Bencze et al., 2022).

H4: The probability of satisfaction with pay increased for low, moderate, and high COVID-19 risk workers during COVID-19 (2020 year).

Data and method

Research method: secondary data analysis

Data: "Russia Longitudinal Monitoring survey, RLMS-HSE"* (2019-2020)

Data collection method: annual nationwide representative surveys (questionnaires)

** RLMS - Russia Longitudinal Monitoring survey, RLMS-HSE", conducted by National Research University "Higher School of Economics" and OOO "Demoscope" together with Carolina Population Center, University of North Carolina at Chapel Hill and the Institute of Sociology of the Federal Center of Theoretical and Applied Sociology of the Russian Academy of Sciences. (RLMS-HSE web sites: https://rlms-hse.cpc.unc.edu, https://www.hse.ru/org/hse/rlms)*

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Data collection method: annual nationwide representative surveys (questionnaires)

Population and sampling type: population of Russia, probability stratified multistage area sampling

Data analysis method: probit and Heckman probit models

Software used: Stata17

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Method: Heckman probit model in detail

- Missing job satisfaction data for not working population
- Active working status is **not random**
- **Heckman Correction** - addresses potential **selection bias** due to non-random active work status of respondents, yielding more reliable estimates (Heckman, 1974, 1976; Greene, 2011; Certo et al., 2015)
- **First stage** (selection equation) estimates labor force participation probability

$$Y1_j = 1 \text{ if } Z_j\gamma + u_{1j} > 0$$

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- **Second stage** (outcome equation) estimates job satisfaction probability conditional on participation

$$Y2_j = 1 \text{ if } X_j\beta + \lambda\rho\sigma + u_{2j} > 0 \text{ otherwise } Y2_j = 0$$

$$u_1 \sim N(0,1)$$

$$u_2 \sim N(0,1)$$

$$corr(u_1, u_{2)} = \rho$$

Data and method: measurements and transformations

Measurements:

Job satisfaction: (dichotomized according to similar study of job satisfaction (Gallie et al., 2016))

- Satisfaction with job in general
- Satisfaction with working conditions
- Satisfaction with growth opportunities
- Satisfaction with pay

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COVID-19 risk group

- Low COVID-19 Risk Group - Individuals working remotely and not engaged in high-risk professions
- Moderate COVID-19 Risk Group - Individuals not in high-risk professions and not working remotely
- High COVID-19 Risk Group - Professionals in high-risk fields not working remotely

Interaction term of main interest: COVID-19 risk group # Year

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Control variables: (outcome equation)

Age, Work Experience, Income, Married, Education Level, Gender, Work Safety (Job Hazards), Trust in Leadership, Job Insecurity, Industry, Year

Control variables: (selection equation)

Age, Married, Education Level, Gender

Exclusion restrictions: (selection equation)

Disability, Chronic Illnesses, Health problems last 30 days, Married # Female, Female # Number of children under 18, Number of children under 18

Interaction term of main interest: COVID-19 risk group # Year

Summary statistics, dependent variables

Variable name	Category	Employee COVID-19 risk group					
		Low risk group		Moderate risk group		High risk group	
		Year		Year		Year	
		2019	2020	2019	2020	2019	2020
Satisfaction with job in general	Not satisfied, %	24,66	19,91	30,85	27,18	29,89	30,28
	Satisfied, %	75,34	80,09	69,15	72,82	70,11	69,72
Satisfaction with working conditions	Not satisfied, %	21,42	20,20	31,83	28,93	28,85	31,06
	Satisfied, %	78,58	79,80	68,17	71,07	71,15	68,94
Satisfaction with growth opportunities	Not satisfied, %	37,57	31,89	46,71	42,89	48,79	43,74
	Satisfied, %	62,43	68,11	53,29	57,11	51,21	56,26
Satisfaction with pay	Not satisfied, %	54,15	51,18	63,82	61,36	69,62	63,69
	Satisfied, %	45,85	48,82	36,18	38,64	30,38	36,31

Table 1: Summary statistics, dependent variables

Results: Heckman probit coefficients

	(5) Heckman probit model		(6) Heckman probit model		(7) Heckman probit model		(8) Heckman probit model	
	Satisfaction with job in general	**SE**	**Satisfaction with working conditions**	**SE**	**Satisfaction with growth opportunities**	**SE**	**Satisfaction with pay**	**SE**
COVID-19 risk group: (reference group: Low COVID-19 risk group)								
Moderate COVID-19 risk group	-0.016	(0.072)	-0.078	(0.075)	-0.165*	(0.069)	-0.087	(0.067)
High COVID-19 risk group	0.088	(0.086)	0.071	(0.089)	-0.191*	(0.083)	-0.124	(0.083)
Year=2020	0.203*	(0.087)	0.075	(0.090)	0.185*	(0.082)	0.135+	(0.076)
Moderate COVID-19 risk group # Year=2020	-0.115	(0.091)	0.004	(0.094)	-0.106	(0.087)	-0.077	(0.081)
High COVID-19 risk group # Year=2020	-0.281**	(0.105)	-0.202+	(0.108)	-0.112	(0.099)	-0.060	(0.095)
Control variables and selection equation omitted for shortness								
Number of observations	20,465		20,459		20,072		20,427	
Number of nonselected observations	9,873		9,873		9,873		9,873	
Number of selected observations	10,592		10,586		10,199		10,554	
Wald test of joint significance: Wald chi2	951		1,019		768		536	
Prob>chi2	0.000		0.000		0.000		0.000	
Wald test of independent equations: (rho=0): chi2(1)	6		2		6		6	
Prob>chi2	0.012		0.130		0.013		0.013	

Clustered standard errors in parentheses: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 2: Heckman probit model coefficients

Results: contrasts of margins, 2020 vs 2019

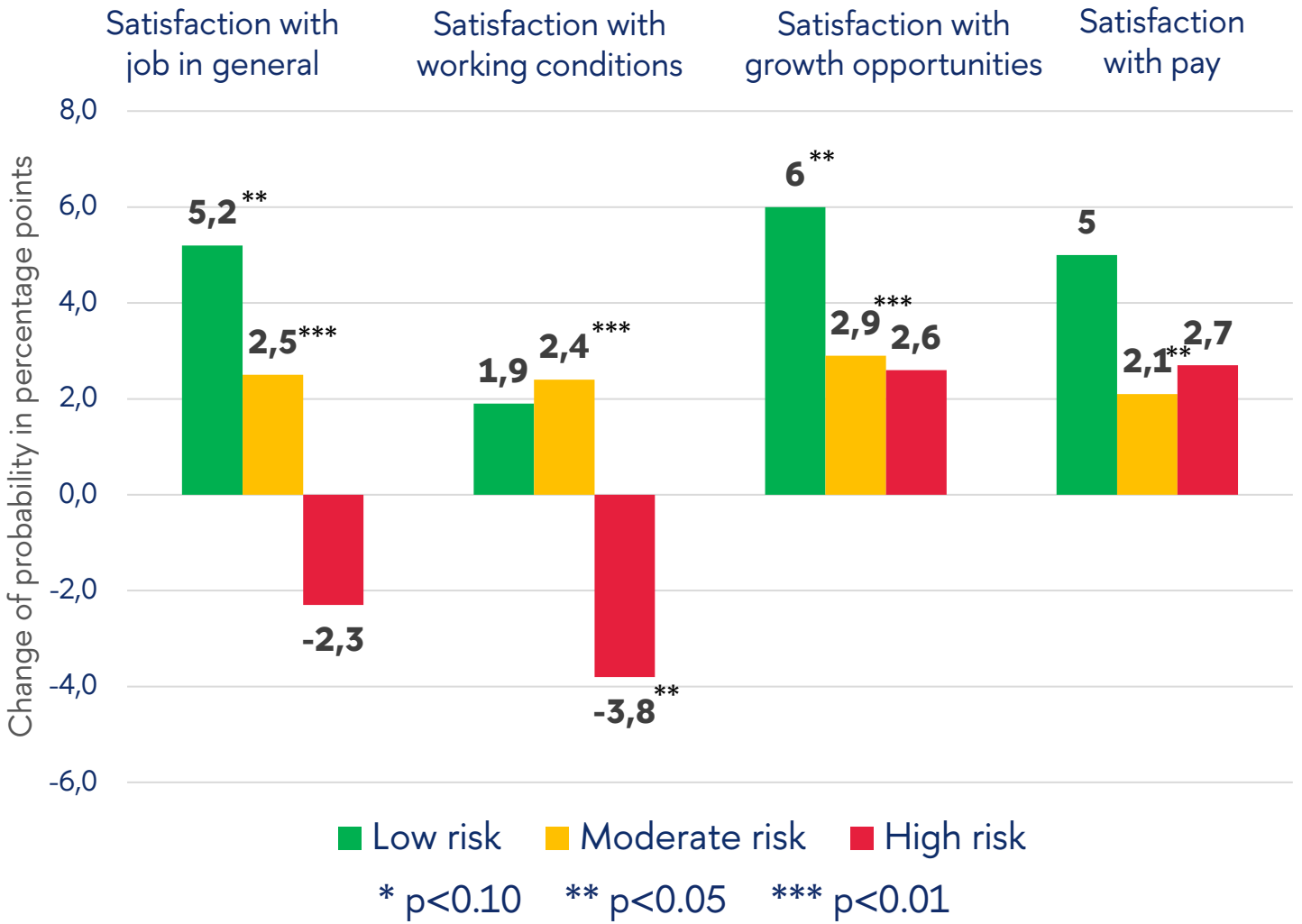

Figure 2: Contrast of predictive margins based on Heckman models, significance based on Chi-Squared Test

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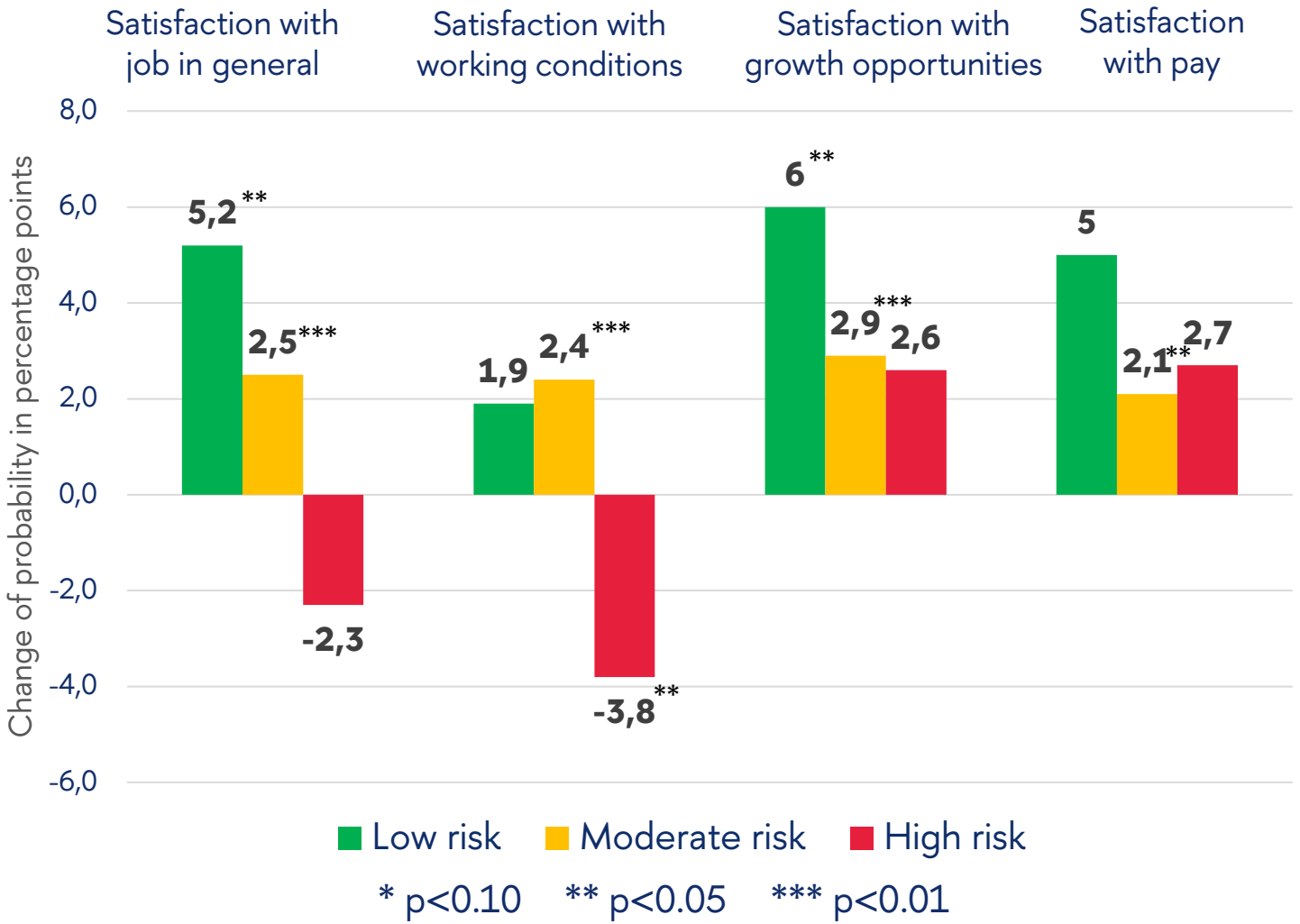

Figure 2: Contrast of predictive margins based on Heckman models, significance based on Chi-Squared Test

- **Satisfaction with job in general: increase** for low and moderate risk groups
- **Satisfaction with working conditions:** increase for moderate risk group, decrease for high risk group
- **Satisfaction with growth opportunities:** increase for low and moderate risk groups
- **Satisfaction with pay:** increase for moderate risk group

Discussion

Hypothesis	Result
H1a	Fail to support
H1b	Supported
H2a	Supported
H2b	Partially supported
H3	Partially supported
H4	Partially supported

Table 3: Hypotheses results

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Table 3: Hypotheses results

Key findings and comparison with previous research

Low and Moderate Risk Groups

Significant increase in general job satisfaction in 2020. This aligns with previous studies (Frutos-Bencze et al., 2022).
More likely to express satisfaction with growth opportunities in 2020, supported by previous studies (Nicola et al., 2020) and JD-R model.

Moderate Risk Group

More likely to be satisfied with pay in 2020.
Significant increase in satisfaction with working conditions in 2020.

High Risk Group

No significant decrease in overall job satisfaction. This contradicts previous research but could be explained by psychological resilience (Caponnetto et al., 2022) or by limitations of our study.
Lower likelihood of satisfaction with working conditions in 2020, aligning with earlier research (Chirico et al., 2020).

Conclusion

Limitations

- **Small sample size** of the vulnerable to COVID-19 group
- **Potential omission** of some relevant categories of vulnerable groups
- Yearly data **may not capture** fast-changing patterns of job satisfaction

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Future Research

- Include **more previous years of data** and obtain a **larger sample size** of vulnerable to COVID-19 groups.
- Acquire **monthly data** to track changes in satisfaction more precisely.
- Explore **other sectors and occupations**, both within and outside the context of the COVID-19 pandemic.
- Monitor job satisfaction over a longer period to reveal long-term trends and potentially lasting effects of the pandemic.

Contributions and implications

Theoretical contribution

- Addresses the research gap by examining COVID-19 impact on Russian workforce, expanding the focus **beyond remote workers and developed economies** and utilizing Heckman probit model.
- By considering various dimensions of job satisfaction, the research provides a **more comprehensive** understanding of COVID-19 effect on the job satisfaction.

Contributions and implications

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Practical significance (managerial application)

- By exploring the differences in various aspects of job satisfaction between low, moderate and high risk workers during the COVID-19 pandemic within the Russian workforce, this research emphasizes the necessity **of implementing customized approaches** to support the well-being of employees across various professions (Dong & Yan, 2022; Spreitzer & Porath, 2012).
- **Implication:** low job satisfaction can lead to **higher turnover rates**, which is not desirable, especially in essential workers.
- The study's results can help companies and policymakers develop **targeted policies.**
- For example, targeted support measures for **high COVID-19 risk workers** with a focus on **improving working conditions**, such as offering flexible work arrangements and ensuring access to necessary protective equipment.


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Method: Heckman probit model in detail

Introduced by Van de Ven and Van Pragg (1981)

The first stage equation (estimating the probability to be included in the sample) :

$$Y1_j = 1 \text{ if } Z_j\gamma + u_{1j} > 0$$

$Y1_j$ - the dependent variable, takes a value of 1 for employed respondents and 0 for unemployed or not working (not active working status);

Z_j - a vector of independent variables for an individual j;

γ - a vector of parameters to be estimated.

Second stage equation (predicting the probability of the job satisfaction):

$$Y2_j = 1 \text{ if } X_j\beta + \lambda\rho\sigma + u_{2j} > 0 \text{ (2), otherwise } Y2_j = 0$$

$$u_1 \sim N(0,1)$$

$$u_2 \sim N(0,1)$$

$$corr(u_1, u_{2)} = \rho$$

$Y2_j$ - a binary variable indicating job satisfaction (1 satisfied, 0 for unsatisfied);

X_j - a vector of independent variables for individual j;

β - vector of parameters to be estimated;

λ - is the inverse Mills ratio computed from the first stage.

Summary statistics, control variables

	Employee COVID-19 risk group			
	Low risk group	**Moderate risk group**	**High risk group**	**Chi-Square Test Significance**
Marital status				
Not married, %	39,3	40,4	45,7	***
Married, %	60,7	59,6	54,3	
Completed education group				
Unfinished secondary education and lower, %	1,5	8,8	7,8	***
Secondary School Diploma, %	8,5	31,2	30,7	
Vocational secondary education Diploma, %	16,9	26	37,6	
Higher education Diploma and more, %	73,1	34	23,9	
Gender				
Male, %	33,4	52,8	36,2	***
Female, %	66,6	47,2	63,8	
Whether job has hazard				
The job does not have hazard, %	84,9	89,4	80,8	***
The job has hazard, %	15,1	10,6	19,2	
Trust for the leadership of the organization				
Does not trust the leadership of the organization, %	34,8	35,1	35,4	***
Trusts the leadership of the organization, %	65,2	64,9	64,6	

Table 4: Summary statistics, control variables

Summary statistics, control variables (continuation)

	Employee COVID-19 risk group			
	Low risk group	**Moderate risk group**	**High risk group**	**Chi-Square Test Significance**
Industry				
Agriculture, Forestry, Fishing, and Food Industry, %	4,3	11,2	4,2	
Extraction and Processing of Natural Resources, %	2,4	8,4	1,3	
Manufacturing, Construction, and Infrastructure, %	8,5	18,3	2,5	
Transportation, Storage, and Communications, %	6,7	11,6	3,1	
Retail, Wholesale, and Consumer Services, %	20,1	19,3	32,4	
Financial, Real Estate, and Business Services, %	9,8	3,7	1,2	***
Public Administration, Defense, and Social Services, %	5,4	9,8	18,3	
Education, Culture, and Sports, %	37,5	12,9	7,3	
Healthcare, %	2,4	3,3	29,2	
Media, Publishing, and Environmental Services, %	1,4	0,5	0,3	
Other Services and Organizations, %	1,5	0,9	0,3	
Age				
Mean	41,7	41,7	43,3	
Standard deviation	11,4	11,5	12,8	X
Minimum value	19	18	18	
Maximum value	87	83	82	
Logarithm of income				
Mean	10,5	10,2	10,1	
Standard deviation	1,0	1,0	1,0	X
Minimum value	0	0	0	
Maximum value	14,7	14,8	12,7	
Experience				
Mean	10,3	9,1	9,2	
Standard deviation	9,6	8,7	8,9	X
Minimum value	1	0	1	
Maximum value	55	55	49	

Table 5: Summary statistics, control variables

Heckman probit coefficients, outcome equation

	(5) Heckman probit model Satisfaction with job in general	SE	(6) Heckman probit model Satisfaction with working conditions	SE	(7) Heckman probit model Satisfaction with growth opportunities	SE	(8) Heckman probit model Satisfaction with pay	SE
COVID-19 risk group: (reference group: Low COVID-19 risk group)								
Moderate COVID-19 risk group	-0.016	(0.072)	-0.078	(0.075)	**-0.165***	(0.069)	-0.087	(0.067)
High COVID-19 risk group	0.088	(0.086)	0.071	(0.089)	**-0.191***	(0.083)	-0.124	(0.083)
Year=2020	**0.203***	(0.087)	0.075	(0.090)	**0.185***	(0.082)	**0.135+**	(0.076)
Moderate COVID-19 risk group # Year=2020	-0.115	(0.091)	0.004	(0.094)	-0.106	(0.087)	-0.077	(0.081)
High COVID-19 risk group # Year=2020	**-0.281****	(0.105)	**-0.202+**	(0.108)	-0.112	(0.099)	-0.060	(0.095)
Age centered divided by 100	0.373	(0.267)	0.236	(0.284)	**0.706****	(0.265)	**0.046+**	(0.238)
Age centered squared divided by 100	**0.073*****	(0.019)	**0.052****	(0.020)	**0.050****	(0.019)	**0.049****	(0.017)
Gender: (reference group: Male)								
Female	0.048	(0.043)	**0.131****	(0.042)	**0.078+**	(0.042)	0.053	(0.041)
Logarithm of income	**0.146*****	(0.020)	**0.090*****	(0.017)	**0.105*****	(0.019)	**0.287*****	(0.048)
Married	**0.095****	(0.034)	**0.136*****	(0.034)	**0.127*****	(0.033)	**0.093****	(0.033)
Industry: (reference group: Retail, Wholesale, and Consumer Service) – omitted for shortness								
Concerned about the chance of job loss	0.017	(0.030)	-0.000	(0.029)	-0.013	(0.028)	**-0.149*****	(0.028)
Education: (reference group: Unfinished secondary education [7-8 grades of school] and lower)								
Secondary School Diploma	-0.017	(0.058)	0.039	(0.057)	**-0.102+**	(0.058)	**-0.132***	(0.059)
Vocational secondary education Diploma	0.032	(0.064)	**0.201****	(0.065)	-0.040	(0.064)	**-0.162***	(0.063)
Higher education Diploma and more	0.063	(0.067)	**0.279*****	(0.068)	-0.094	(0.065)	-0.007	(0.065)
Trusts the leadership of the organization	**0.750*****	(0.030)	**0.728*****	(0.029)	**0.626*****	(0.030)	**0.516*****	(0.030)
The job has a hazard	**-0.180*****	(0.046)	**-0.358*****	(0.046)	-0.017	(0.045)	0.033	(0.045)
Work experience in years	**0.011***	(0.005)	0.004	(0.005)	**0.015****	(0.005)	-0.006	(0.005)
Work experience in years squared	-0.000	(0.000)	0.000	(0.000)	-0.000	(0.000)	0.000*	(0.000)
Constant	**-1.613*****	(0.246)	**-1.106*****	(0.211)	**-1.347*****	(0.233)	**-3.437*****	(0.524)

Table 6: Heckman probit coefficients, outcome equation

Clustered standard errors in parentheses: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Heckman probit coefficients, selection equation

Selection equation	(5)		(6)		(7)		(8)	
Active work status	Heckman probit model Satisfaction with job in general	SE	Heckman probit model Satisfaction with working conditions	SE	Heckman probit model Satisfaction with growth opportunities	SE	Heckman probit model Satisfaction with pay	SE
Gender: (reference group: Male)								
Female	0.020	(0.060)	0.020	(0.060)	0.018	(0.060)	0.020	(0.059)
Age centered	-0.044***	(0.002)	-0.044***	(0.002)	-0.046***	(0.002)	-0.044***	(0.002)
Age centered squared	-0.003***	(0.000)	-0.003***	(0.000)	-0.003***	(0.000)	-0.003***	(0.000)
Education: (reference group: Unfinished secondary education [7-8 grades of school] and lower)								
Secondary School Diploma	0.230***	(0.047)	0.228***	(0.047)	0.225***	(0.048)	0.229***	(0.047)
Vocational secondary education Diploma	0.491***	(0.049)	0.487***	(0.049)	0.500***	(0.050)	0.488***	(0.049)
Higher education Diploma and more	0.671***	(0.049)	0.670***	(0.049)	0.679***	(0.050)	0.672***	(0.049)
Married	0.257***	(0.054)	0.257***	(0.054)	0.270***	(0.055)	0.259***	(0.054)
Married # Female	-0.503***	(0.065)	-0.500***	(0.065)	-0.506***	(0.066)	-0.502***	(0.065)
Health problems last 30 days	-0.136***	(0.027)	-0.133***	(0.027)	-0.138***	(0.028)	-0.132***	(0.027)
Number of children under 18	-0.022	(0.029)	-0.021	(0.030)	-0.030	(0.030)	-0.023	(0.029)
Female # Number of children under 18	-0.258***	(0.031)	-0.259***	(0.031)	-0.254***	(0.032)	-0.259***	(0.031)
Disability class: (reference group: No disability)								
First group	-1.278***	(0.238)	-1.300***	(0.238)	-1.268***	(0.238)	-1.272***	(0.241)
Second group	-1.247***	(0.104)	-1.254***	(0.104)	-1.291***	(0.106)	-1.256***	(0.104)
Third group	-0.664***	(0.094)	-0.671***	(0.094)	-0.698***	(0.092)	-0.666***	(0.094)
Chronic heart disease	-0.181***	(0.045)	-0.177***	(0.045)	-0.164***	(0.046)	-0.176***	(0.045)
Chronic lung disease	-0.017	(0.051)	-0.017	(0.051)	0.001	(0.052)	-0.012	(0.051)
Chronic spinal disease	-0.002	(0.033)	0.002	(0.033)	0.004	(0.034)	-0.000	(0.033)
Constant	0.542***	(0.066)	0.541***	(0.066)	0.524***	(0.067)	0.539***	(0.066)
/ athrho	-0.276*	(0.109)	-0.163	(0.108)	-0.251*	(0.101)	-0.202*	(0.081)

Table 7: Heckman probit coefficients, selection equation

Clustered standard errors in parentheses: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Results: model's diagnostics

Wald Chi-Square Test (joint significance of interaction coefficients)

Model name	Test information	
	Chi-square	Prob>chi2
Satisfaction with job in general, heckman probit model	20.61	0.0010***
Satisfaction with working conditions, heckman probit model	17.01	0.0045***
Satisfaction with pay, heckman probit model	17.58	0.0035***
Satisfaction with job growth opportunities, heckman probit model	37.62	0.0000***

Note: + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Hypothesis:

1. Moderate COVID-19 risk group = 0
2. High COVID-19 risk group = 0
3. Year 2020 = 0
4. Moderate COVID-19 risk group x Year 2020 = 0
5. High COVID-19 risk group x Year 2020 = 0

Table 8. Wald Chi-Square Test for joint significance of interaction coefficients (only Heckman probit for shortness)