

**ECONOMICS ON ICE: RESEARCH ON PEER EFFECTS,  
REHIRING DECISIONS AND WORKER ABSENTEEISM**



**Economics on Ice: Research on Peer effects,  
rehiring decisions and worker absenteeism**

Economie op het ijs: Onderzoek naar peer effecten, contract  
vernieuwingen en werknemers verzuim

Thesis

to obtain the degree of Doctor from the  
Erasmus University Rotterdam  
by command of the  
rector magnificus

Prof.dr. A.L. Bredenoord

and in accordance with the decision of the Doctorate Board.

The public defence shall be held on  
Thursday September 29, 2022 at 13:00 hrs

by

SAMUEL DALTON THOMAS HOEY  
born in Rotterdam.

**Erasmus University Rotterdam**



## Doctoral Committee

Promotor: Prof.dr.ir. J.C. van Ours

Other members: Prof.dr. K.I.M. Rohde  
Prof.dr. O.R. Marie  
Prof.dr. R.H. Koning

Copromotor: Dr. T.L.P.R. Peeters

ISBN 978 90 361 0569 9

Cover design: Crasborn Graphic Designers bno, Valkenburg a.d. Geul

© 2022, Sam Hoey

All rights reserved. Save exceptions stated by the law, no part of this publication may be reproduced, stored in a retrieval system of any nature, or transmitted by any means, electronic, mechanical, photo-copying, recording or otherwise, included a complete or partial transcription, without the prior written permission of the authors, application for which should be addressed to the author.

This book is no. 797 of the Tinbergen Institute Research Series, established through cooperation between Rozenberg Publishers and the Tinbergen Institute. A list of books which already appeared in the series can be found in the back.





---

---

## Acknowledgements

First, I would like to thank my supervisory team consisting of Thomas Peeters and Jan van Ours. I think you two were a great team, me being the first PhD student of Thomas and quite possibly the last of Jan, made it such that I got the best of both worlds in terms of new insights as well as decades of experience. Thomas, I thank you for always being there, whether that be on skype, teams or in real life. I could always bounce a research idea or problem off of you and you would provide me with instant feedback. Jan, I thank you for your great feedback along the way as well as teaching me how to keep things simple. Finally, I thank both of you for allowing me to do research using data from the fastest team sport on the planet, ice hockey.

I am grateful for all the wonderful colleagues that I had at the Erasmus School of Economics and in particular the applied economics department. Also, the support staff of both the department as well as the Tinbergen Institute, made life a lot easier throughout the years. I enjoyed playing squash with Oliver Marie, receiving great advice and learning some French curse words along the way. I also fondly remember the pre-covid times in the N-building, laughing with Kirsten, Eric and Enrico as well as the basketball tournaments in the Mandeville building that followed. I also thank my fellow PhD and postdoc colleagues. In particular, I thank Eric, Joaquim, Gianluca, Vahid and Francesco. We were a great group from the start with many activities and achievements accomplished outside of the department.

Spending a couple months abroad, two weeks at McGill University and two months at the University of Michigan, has been a great experience for me. I am very thankful to both Stefan Szymanski and Francesco Amodio for hosting me. Thanks to Ryan and Christine for helping me out during my stay in Michigan. I hope to return some day.

I also want to thank my family and friends who supported me during the PhD trajectory. A special thanks to my uncle Theo<sup>†</sup>, for believing in me right from the start and convincing me that doing a PhD wasn't such a bad decision after all. I will miss our ski trips in which we discussed my projects and much more of course. I thank both my Dutch and Canadian grand parents, Henk,

Lilly, Catherine and John, for always being interested in the work that I was doing and also providing feedback on my writing. Furthermore, I thank Jesse, Robert and Marian for being great aunts and uncles as well. My friends outside of university – in particular Timo, Niels, Lisa, Benne and Barend – it's great to have you as my friends. I also thank my previous roommates Mirjam and Megan. We had and will continue to have a great time together.

Next, I must not forget to thank the Dutch and Canadian tax payers for funding a large part of my academic life up until this point. I hope it will be worth it one day.

I would like to thank my girlfriend, Chiara, who has been by my side throughout almost the entire PhD. We always found a way to motivate each other for our PhDs, which for sure has contributed to us kicking butt in this field of work. You called me a superstar so many times, that sometimes I believed you. I can't wait for your defense and see what you'll end up doing afterwards. I'm sure life has great things in store for us.

Finally, I want to thank my parents, Els and Dylan, for being the best mom and dad I could ever wish for. Your love and support has gotten me to this point and I will be forever grateful.



---

---

# Table of Contents

Acknowledgements	vii
Table of Contents	ix
List of Figures	xiii
List of Tables	xvii
1. Introduction	1
1.1. <i>Individual Contributions</i>	4
2. One Man's Pain is Another Man's Gain – Early Career Exposure and Later Labour Market Outcomes	5
2.1. <i>Introduction</i>	6
2.2. <i>Institutional Setting</i>	10
2.3. <i>Data</i>	12
2.4. <i>Methodology</i>	17
2.5. <i>Main Results</i>	22
2.6. <i>Mechanisms and Explanatory Analysis</i>	26
2.7. <i>Robustness Checks: Testing the Assumptions of IV</i>	39
2.8. <i>Discussion &amp; Concluding Remarks</i>	44

2.A. <i>Additional Figures</i> . . . . .	47
2.B. <i>Additional Tables</i> . . . . .	52
2.C. <i>Appendix: Information about National Hockey League</i> . . . . .	56
3. Skill Adoption, Learning and Diffusion: Evidence from Soviet-style Hockey	59
3.1. <i>Introduction</i> . . . . .	60
3.2. <i>Background</i> . . . . .	63
3.3. <i>Data</i> . . . . .	65
3.4. <i>Empirical Strategy</i> . . . . .	69
3.5. <i>Results</i> . . . . .	71
3.6. <i>Conclusion</i> . . . . .	80
3.A. <i>Additional Figures</i> . . . . .	82
3.B. <i>Additional Tables</i> . . . . .	85
4. The Impact of Absent Coworkers on Productivity in Teams	101
4.1. <i>Introduction</i> . . . . .	102
4.2. <i>Setting and Data</i> . . . . .	103
4.3. <i>Empirical Strategy</i> . . . . .	108
4.4. <i>Results</i> . . . . .	109
4.5. <i>Robustness</i> . . . . .	113
4.6. <i>Conclusion</i> . . . . .	114
4.A. <i>Additional Tables</i> . . . . .	116
4.B. <i>Appendix: How Ice Hockey Works</i> . . . . .	120
Bibliography	121
Summary	127

Samenvatting	128
About the Author	129
Portfolio	130
TI Publications List	132



---

---

## List of Figures

2.1.	Game-Level Distribution of Rookie Playing Time . . . . .	13
2.2.	Actual vs. Predicted Entry-Level Career Aggregate Playing Time . . . . .	20
2.3.	Veteran Injuries and Rookie Replacements . . . . .	27
2.4.	Schematic Overview NHL Entry-Level Career . . . . .	47
2.5.	Number of Entry-Level Career Games per League . . . . .	48
2.6.	Where Did the Unhired Players go after their ELC? . . . . .	49
2.7.	Veteran Injuries and Rookie Replacements Offense . . . . .	50
2.8.	Veteran Injuries and Rookie Replacements Defense . . . . .	51
3.1.	Penalty Minutes per Game and Fraction of Russian Players . . . . .	61
3.2.	Penalty Minutes per Game by Nationality . . . . .	68
3.3.	Penalty Minutes and Russian Teammates . . . . .	73
3.4.	Penalty Minutes: Player Fixed Effects Distribution (Pre-1989) . . . . .	82
3.5.	Penalty Minutes and Russian Teammates . . . . .	83
3.6.	Points and Russian Teammates . . . . .	84



---

---

## List of Tables

2.1.	Game-Level Injury Count Frequencies . . . . .	15
2.2.	Descriptive Statistics Team-Season Contracts at Start of Season . . . . .	16
2.3.	Outcome Variables Season Level . . . . .	17
2.4.	Relationship Predicted and Actual Playing Time (PT) . . . . .	21
2.5.	Tobit-II Model Game-Level Playing Time . . . . .	24
2.6.	Aggregate Playing Time and Labour Market Outcomes . . . . .	25
2.7.	Veteran Injuries and the Number of Rookies in the Line-Up . . . . .	31
2.8.	Veteran Injuries and which Rookies are Retained . . . . .	34
2.9.	Experience and Performance across Leagues Offense Players . . . . .	38
2.10.	Correlation Actual & Predicted aggregate Playing Time and Draft Round . . . . .	41
2.11.	Relaxing Exclusion Restriction using the “plausibly exogenous” Method. . . . .	43
2.12.	NHL & AHL Games Played during ELC . . . . .	52
2.13.	Aggregate Playing Time and Labour Market Outcomes . . . . .	53
2.14.	OLS Fixed Effects Model Game-Level Playing Time . . . . .	54
2.15.	Direct effect of Instrument on Outcome Variables . . . . .	55
3.1.	Summary Statistics . . . . .	66

- 3.2. Player Nationality and Penalty Minutes . . . . . 72
- 3.3. Player Nationality and Points . . . . . 73
- 3.4. Penalty Minutes, Russian Teammates and Opponents . . . . . 74
- 3.5. Penalty Minutes, Russian Teammates and Opponents: Offense vs. Defense . . . . . 77
- 3.6. Penalty Minutes, Russian Teammates and Opponents – Time on Ice 78
- 3.7. Penalty Minutes, Russian Teammates and Opponents – Close Games . . . . . 79
- 3.8. Penalty Minutes, Russian Teammates and Opponents – Winning Teams . . . . . 80
- 3.9. Time Trends and Penalty Minutes . . . . . 85
- 3.10. Time Trends and Minor Penalties . . . . . 86
- 3.11. Time Trends and Major Penalties . . . . . 87
- 3.12. Player Nationality and Minor Penalties . . . . . 88
- 3.13. Player Nationality and Major Penalties . . . . . 89
- 3.14. Player Nationality and Assists . . . . . 90
- 3.15. Player Nationality and Goals . . . . . 91
- 3.16. Minor Penalties, Russian Teammates and Opponents . . . . . 92
- 3.17. Major Penalties, Russian Teammates and Opponents . . . . . 93
- 3.18. Points, Russian Teammates and Opponents . . . . . 94
- 3.19. Penalty Minutes, Russian Teammates and Opponents – Not Close Games . . . . . 95
- 3.20. Penalty Minutes, Russian Teammates and Opponents – Losing Teams . . . . . 96
- 3.21. Penalty Minutes, Russian Teammates and Opponents – Close Games Won . . . . . 97
- 3.22. Penalty Minutes, Russian Teammates and Opponents – Close Game Lost . . . . . 98



3.23. Penalty Minutes, Russian Teammates and Opponents – Not Close Game Won . . . . .	99
3.24. Penalty Minutes, Russian Teammates and Opponents – Not Close Game Lost . . . . .	100
4.1. Descriptive Statistics . . . . .	107
4.2. Effect of Substitute Worker Absence on Output, Productivity and Working Time . . . . .	110
4.3. Effect of Complementary Worker Absence on Output, Productivity and Working Time . . . . .	112
4.4. The Effect of Injuries on Team Performance, Productivity and Working Time . . . . .	113
4.5. Observations Pre- and Post-Injury per Player Type . . . . .	116
4.6. Effect of Injury on Output, Productivity and Working Time of Individual Regular Worker for Various Analysis Windows . . . . .	117
4.7. Effect of Substitute Worker Absence on Output, Productivity and Working Time - Restricted Sample . . . . .	118
4.8. Effect of Complementary Worker Absence on Output, Productivity and Working Time - Restricted Sample . . . . .	119



# 1

---

---

## Introduction

*“Ask not what economics can do for sports – Ask what sports can do for economics.” - Bar-Eli et al. (2020)*

There are two ways to look at the relationship between economics and sport. First there is the economics of sports, where economic theory and reasoning is used for the benefit of sport itself. Here, problems relating to anti-trust regulations as well as contest design can be investigated and improvements can be suggested by economists. Given the huge size of modern day sports-industries, this sub-field of sports-economics is becoming increasingly important. This is exemplified by Hoey et al. (2021)<sup>1</sup>, who analyse the player transfer market in European soccer. The transfer system enables soccer clubs to receive a transfer fee when their workers switch firms while under contract, a labour market policy which is unique to this industry and puts severe restrictions on worker mobility. The initial reasons for putting this system in place are, firstly, to reward clubs for scouting talent and secondly to redistribute revenue from large clubs to small clubs to increase competitive balance, which in turn increases consumer enjoyment of the game. Our research shows that the current system does not redistribute revenues from large clubs to smaller clubs, in doing so debunking one of the central arguments in favor of its existence.

While sports industries can learn from economists, the reverse is also true. This thesis focusses on this second stream of sports-economics research and in doing so demonstrates the value of sports in answering both economic and managerial questions. More specifically, I establish the existence of peer effects in worker effort allocation, quantify the effect of co-worker absenteeism on team

---

<sup>1</sup>This paper was written during the PhD, but is not contained in this thesis.

productivity and measure the effect of employer learning of worker skill on the later labour market outcomes of said workers. Historically, investigating such topics has been difficult for several reasons. First, detailed data on worker productivity and inter-worker relationship are needed, which in many industries are not available, either because they are not collected or are not publicly available. Second, it can be difficult to establish causal effects when analyzing these questions. Kahn (2000) argues that using data from sports industries has several advantages in this regard. Perhaps because of its popularity and fan interest, there is a large body of statistics and sports data available, providing detailed information on player productivity, health and co-working relationships, which are not as widely available in other settings. Additionally, the unique characteristics present in sports can provide the researcher with natural experiments, enabling them to estimate causal effects. Famous examples include Price and Wolfers (2010), Brown (2011) and Garicano et al. (2005), each of which exploit unique features of sports to establish causal estimates of racism, peer effects and social pressure, respectively.

This thesis uses sports data in a similar fashion, utilizing its unique characteristics to establish key economic relationships. Starting with Chapter two, I evaluate the relationship between early career exposure of junior workers to their employers and their later labor market outcomes. In estimating this relationship it is difficult to make causal claims, primarily because more talented junior workers often get more opportunity to show their skill and at the same time are also more likely to have more favorable labor market outcomes as a result of their talent. To solve this issue, I implement a novel instrumental variable strategy, using co-worker injuries in the National Hockey League as a source of random variation in how many opportunities each junior worker gets to demonstrate their talent to their employer. In essence, the idea is that co-worker injuries open up opportunities for junior workers to step up and show what they're worth. As a result, the junior workers who have more co-worker injuries in their team during their entry-level career, also have more opportunities to show their talent, all else equal. My findings are threefold. First, I find that entry-level players who have more opportunities to show their talent during their entry-level career, have a higher chance of being rehired and obtain higher salaries in their post entry-level contract. Second, this relationship still holds after instrumenting playing opportunities with co-worker injuries during their entry-level career. This means that players who had more opportunities to show their talent resulting from plausibly exogenous co-worker injuries, also have better labour market outcomes. Third, I find that this relationship is most consistent with the employers learning about worker talent as a result of observing

them, rather than the employees themselves becoming more skilled when given an opportunity to show their talent.

The third and fourth chapter study how team composition and disruptions to team composition affect team performance. Chapter three, which is jointly written with Francesco Amodio and Jeremy Schneider, examines how the arrival of workers with new skills affects the behavior of incumbent workers. To this end, we investigate how the large influx of Russian hockey players in the National Hockey League, following the dismantlement of the Soviet Union, affected the already present North American players. International games before 1989 exhibit how vastly different the playing styles of North American and Russian players are. North Americans put more emphasis on aggressive play and physical strength, whereas Russian players have a more skillful playing style. Following the influx of Russian players into the NHL, we ask whether this skillful style of play rubs off on the incumbent North American workers. To answer this question, we leverage 50 years of data at the player-game level, finding that (i) North American aggressive play as measured by the number of penalty minutes obtained increases steadily from 1970 to 1989, while decreasing after that, (ii) these trends are driven by North American players and (iii) the number of penalty minutes obtained by North American players is systematically lower when playing alongside or against more Russian players. From this we conclude that the Soviet style of play is at least partially adopted by North American players upon arrival of Russian players in the NHL. This finding can be seen as evidence in favor of the existence of peer effects in the effort allocation of workers in a multi-faceted work environment.

The fourth and final chapter evaluates the effect of co-worker absenteeism on team performance. This is joint work with Thomas Peeters and Jan van Ours. In our empirical setting all absent workers are replaced by a replacement worker. As such, co-worker absenteeism, following illness or injury, causes a disruption in a team's structure. In this paper we measure how this disruption affects the team's performance and decompose this effect into one part attributable to the skill difference between the absent worker and their replacement as well as a second part attributable to the change in performance of the ever present set of workers. To this end, we use a rich data set from the National Hockey League, containing detailed data on worker performance as well as worker absences, often caused by plausibly exogenous injuries. Furthermore, we distinguish between two types of absentees, those who perform the same task, the substitutable absentees and those who perform a complementary task. First, we find that the both types of worker absenteeism lead to lower productivity of the remaining ever-present set of workers, meaning that they produce less per

minute of work. When a substitute worker is absent, these workers compensate for this loss in productivity by increasing their working time, leading to a net zero effect on output. Replacement workers themselves only account for a share of the lost working time, causing this increase in working time for the remaining set of workers. In contrast, complementary worker absences, do not lead to an increase in working time. Combined with the fact that the productivity effect of these absences are also more severe, we find that the output effect is much more pronounced in the case of complementary worker injuries. At the team level absenteeism decreases production through both a decrease in productivity of the remaining workers as well as the lower ability of replacement workers in comparison to the absent worker whom they replace.

In conclusion, this thesis establishes four main points. First, junior workers' later labour market outcomes are improved when they get more opportunities to demonstrate their talent to their current (and also prospective) employers. Second, introducing a new type of worker into an established industry can have an effect on the working style and effort allocation of the incumbent workers. Third, co-worker absenteeism not only affects team performance through the difference in ability of the absent worker and their replacement, but also through the reduction in productivity of the ever-present set of workers. Finally, this thesis forms a prime example of how sports industries and sports data can be leveraged to answer key economic questions, which are otherwise difficult to answer.

## 1.1 INDIVIDUAL CONTRIBUTIONS

Here I describe the contributions of each author per chapter.

Chapter 2	Sam Hoey	Single-authored with feedback from supervisors
Chapter 3	Francesco Amodio Sam Hoey Jeremy Schneider	Conceptualization, Methodology, Writing, Analysis Conceptualization, Data curation, Methodology, Writing Conceptualization, Methodology, Writing, Analysis
Chapter 4	Sam Hoey Thomas Peeters Jan van Ours	Conceptualization, Data curation, Methodology, Writing, Analysis Conceptualization, Methodology, Writing Conceptualization, Methodology, Writing, Analysis

---

---

## Bibliography

- Altonji, J.G., Elder, T.E., and Taber, C.R. Selection on observed and unobserved variables: Assessing the effectiveness of catholic schools. *Journal of Political Economy*, 113(1):151–184, 2005.
- Altonji, J.G. and Pierret, C.R. Employer learning and statistical discrimination. *The Quarterly Journal of Economics*, 116(1):313–350, 2001.
- Amodio, F. and Martinez-Carrasco, M. Workplace incentives and organizational learning. *Journal of Labor Economics*, forthcoming.
- Angrist, J.D. and Krueger, A.B. Does compulsory school attendance affect schooling and earnings? *The Quarterly Journal of Economics*, 106(4):979–1014, 1991.
- Arcidiacono, P., Kinsler, J., and Price, J. Productivity spillovers in team production: Evidence from professional basketball. *Journal of Labor Economics*, 35(1):191–225, 2017.
- Azoulay, P., Graff Zivin, J., and Wang, J. Superstar extinction. *The Quarterly Journal of Economics*, 125(2):549–589, 2010.
- Bar-Eli, M., Krumer, A., and Morgulev, E. Ask not what economics can do for sports—ask what sports can do for economics. *Journal of Behavioral and Experimental Economics*, 89:101597, 2020.
- Bartel, A.P., Beaulieu, N.D., Phibbs, C.S., and Stone, P.W. Human capital and productivity in a team environment: evidence from the healthcare sector. *American Economic Journal: Applied Economics*, 6(2):231–59, 2014.
- Becker, G.S. Investment in human capital: A theoretical analysis. *Journal of Political Economy*, 70(5):9–49, 1962.

- Berman, S.L., Down, J., and Hill, C.W. Tacit knowledge as a source of competitive advantage in the national basketball association. *Academy of Management Journal*, 45(1):13–31, 2002.
- Borjas, G.J. and Doran, K.B. The Collapse of the Soviet Union and the Productivity of American Mathematicians. *The Quarterly Journal of Economics*, 127(3):1143–1203, 2012.
- Bound, J., Jaeger, D.A., and Baker, R.M. Problems with instrumental variables estimation when the correlation between the instruments and the endogenous explanatory variable is weak. *Journal of the American Statistical Association*, 90(430):443–450, 1995.
- Brown, J. Quitters never win: The (adverse) incentive effects of competing with superstars. *Journal of Political Economy*, 119(5):982–1013, 2011.
- Burke, M.A. and Sass, T.R. Classroom peer effects and student achievement. *Journal of Labor Economics*, 31(1):51–82, 2013.
- Carrieri, V., Jones, A.M., and Principe, F. Productivity shocks and labour market outcomes for top earners: Evidence from Italian Serie A. *Oxford Bulletin of Economics and Statistics*, 82(3):549–576, 2020.
- Chan, T.Y., Li, J., and Pierce, L. Learning from peers: Knowledge transfer and sales force productivity growth. *Marketing Science*, 33(4):463–484, 2014.
- Coates, D. and Oguntimein, B. The length and success of NBA careers: Does college production predict professional outcomes. *International Journal of Sport Finance*, 5(1):4–26, 2010.
- Conley, T.G., Hansen, C.B., and Rossi, P.E. Plausibly exogenous. *Review of Economics and Statistics*, 94(1):260–272, 2012.
- De Paola, M., Scoppa, V., and Pupo, V. Absenteeism in the Italian public sector: The effects of changes in sick leave policy. *Journal of Labor Economics*, 32(2):337–360, 2014.
- Farber, H.S. and Gibbons, R. Learning and wage dynamics. *The Quarterly Journal of Economics*, 111(4):1007–1047, 1996.
- Ganguli, I. Immigration and ideas: What did russian scientists ‘bring’ to the united states? *Journal of Labor Economics*, 33(S1):257–288, 2015.
- Garicano, L., Palacios-Huerta, I., and Prendergast, C. Favoritism under social pressure. *Review of Economics and Statistics*, 87(2):208–216, 2005.



- Ghosh, A. Religious divisions and production technology: Experimental evidence from India, 2021. Mimeo.
- Gibbons, R. and Katz, L.F. Layoffs and lemons. *Journal of Labor Economics*, 9(4):351–380, 1991.
- Godøy, A. and Dale-Olsen, H. Spillovers from gatekeeping—peer effects in absenteeism. *Journal of Public Economics*, 167:190–204, 2018.
- Gould, E. and Winter, E. Interactions between workers and the technology of production: Evidence from professional baseball. *The Review of Economics and Statistics*, 91(1):188–200, 2009.
- Gregory-Smith, I. Wages and labor productivity: Evidence from injuries in the National Football League. *Economic Inquiry*, 59(2):829–847, 2021.
- Grohsjean, T., Kober, P., and Zucchini, L. Coming back to Edmonton: Competing with former employers and colleagues. *Academy of Management Journal*, 59(2):394–413, 2016.
- Hamilton, B., Nickerson, J., and Owan, H. Team incentives and worker heterogeneity: An empirical analysis of the impact of teams on productivity and participation. *Journal of Political Economy*, 111(3):465–497, 2003.
- Herrmann, M.A. and Rockoff, J.E. Worker absence and productivity: Evidence from teaching. *Journal of Labor Economics*, 30(4):749–782, 2012.
- Hjort, J. Ethnic divisions and production in firms. *The Quarterly Journal of Economics*, 129(4):1899–1946, 2014.
- Hoey, S., Peeters, T., and Principe, F. The transfer system in european football: A pro-competitive no-poaching agreement? *International Journal of Industrial Organization*, 75:102695, 2021.
- Kahane, L., Longley, N., and Simmons, R. The effects of coworker heterogeneity on firm-level output: assessing the impacts of cultural and language diversity in the National Hockey League. *Review of Economics and Statistics*, 95(1):302–314, 2013.
- Kahn, L.B. and Lange, F. Employer learning, productivity, and the earnings distribution: Evidence from performance measures. *The Review of Economic Studies*, 81(4):1575–1613, 2014.
- Kahn, L.M. The sports business as a labor market laboratory. *Journal of Economic Perspectives*, 14(3):75–94, 2000.

- Kandel, E. and Lazear, E.P. Peer pressure and partnerships. *Journal of Political Economy*, 100(4):801–817, 1992.
- Lange, F. The speed of employer learning. *Journal of Labor Economics*, 25(1):1–35, 2007.
- Lazear, E.P. Globalisation and the market for team-mates. *The Economic Journal*, 109(454):15–40, 1999.
- Leonard, J.S. and Levine, D.I. Diversity, discrimination, and performance. *Institute of Industrial Relations Working Paper No. iirwps-091-03*, 2003.
- Markussen, S., Røed, K., Røgeberg, O.J., and Gaure, S. The anatomy of absenteeism. *Journal of Health Economics*, 30(2):277–292, 2011.
- Mas, A. and Moretti, E. Peers at work. *American Economic Review*, 99(1):112–45, 2009.
- McIntosh, S., Jackson, K.B., and Robertson, S. Apples and oranges? Comparing player performances between the Australian Football League and second-tier leagues. *Journal of Sports Sciences*, pp. 1–10, 2021.
- Menzel, A. Knowledge exchange and productivity spill-overs in Bangladeshi garment factories. *Journal of Economic Behavior & Organization*, 185:721–746, 2021.
- Merron, J. *Russians regroup on other side of the red line*. ESPN, 2002. Available at <https://www.espn.com/olympics/winter02/hockey/story?id=1326249>.
- Ohinata, A. and Van Ours, J.C. How immigrant children affect the academic achievement of native dutch children. *The Economic Journal*, 123(570):F308–F331, 2013.
- Ozanian, M. and Badenhausen, K. NHL team values 2020: Hockey’s first decline in two decades. 2020.
- Pallais, A. Inefficient hiring in entry-level labor markets. *American Economic Review*, 104(11):3565–99, 2014.
- Papay, J.P., Taylor, E.S., Tyler, J.H., and Laski, M.E. Learning job skills from colleagues at work: Evidence from a field experiment using teacher performance data. *American Economic Journal: Economic Policy*, 12(1):359–88, 2020.
- Peeters, T., Szymanski, S., and Terviö, M. The Survival of Mediocre Superstars in the Labor Market. *The Journal of Law, Economics, and Organization*, forthcoming.

- Price, J. and Wolfers, J. Racial discrimination among NBA referees. *The Quarterly Journal of Economics*, 125(4):1859–1887, 2010.
- Prinz, J. and Wicker, P. Diversity effects on team performance in the Tour de France. *Team Performance Management*, 2016.
- Sandvik, J.J., Saouma, R.E., Seegert, N.T., and Stanton, C.T. Workplace knowledge flows. *The Quarterly Journal of Economics*, 135(3):1635–1680, 2020.
- Sanful, J. *Russian Revolution: Exodus to the NHL*. Malvern Pub Co Ltd, 1999.
- Schönberg, U. Testing for asymmetric employer learning. *Journal of Labor Economics*, 25(4):651–691, 2007.
- Scully, G.W. Pay and performance in Major League Baseball. *American Economic Review*, 64(6):915–930, 1974.
- Shamsie, J. and Mannor, M. Looking inside the dream team: Probing into the contributions of tacit knowledge as an organizational resource. *Organization Science*, 24(2):513–529, 2013.
- Stanton, C.T. and Thomas, C. Landing the first job: The value of intermediaries in online hiring. *The Review of Economic Studies*, 83(2):810–854, 2016.
- Stuart, H.C. Structural disruption, relational experimentation, and performance in professional hockey teams: A network perspective on member change. *Organization Science*, 28(2):283–300, 2017a.
- Stuart, H.C. Structural disruption, relational experimentation, and performance in professional hockey teams: A network perspective on member change. *Organization Science*, 28(2):283–300, 2017b.
- Stuart, H.C. and Moore, C. Shady characters: The implications of illicit organizational roles for resilient team performance. *Academy of Management Journal*, 60(5):1963–1985, 2017.
- Szymanski, S. and Weineck, S.M. *City of Champions: A History of Triumph and Defeat in Detroit*. The New Press, 2020.
- Terviö, M. Superstars and mediocrities: Market failure in the discovery of talent. *The Review of Economic Studies*, 76(2):829–850, 2009.
- Todd, J. They skated to glory. *Montreal Gazette*, pp. 1–4, 1999.
- Trax, M., Brunow, S., and Suedekum, J. Cultural diversity and plant-level productivity. *Regional Science and Urban Economics*, 53:85–96, 2015.

van Kippersluis, H. and Rietveld, C.A. Beyond plausibly exogenous. *The Econometrics Journal*, 21(3):316–331, 2018.

VanDerWerff, E. *How Soviet hockey ruled the world — and then fell apart*. Vox, 2019. Available at <https://www.vox.com/2015/2/25/8108397/soviet-hockey-red-army>.

Waldman, M. Up-or-out contracts: A signaling perspective. *Journal of Labor Economics*, 8(2):230–250, 1990.

---

---

## Summary

In this thesis I use ice hockey data from the National Hockey League to answer various questions within the domain of labour economics. Chapter two investigates whether early career exposure of entry-level workers to their employers improves their later labour market outcomes. The research finds that entry-level workers who get more opportunities to demonstrate their talent are more likely to be rehired and obtain higher post entry-level salaries. Mechanisms analyses indicate that this effect is primarily attributable to employers learning about worker talent as a result of observing them and updating their beliefs about their talent. Chapter three shifts the focus to inter worker dynamics and team performance. Here I find that an unexpected influx of foreign workers with a different working style into an established industry changes the behavior and effort allocation of incumbent workers to be more similar to the behavior of the incoming workforce. Chapter four evaluates the effect of worker absenteeism on team performance. Findings indicate that team performance decreases as a result of worker absenteeism. This is a combination of the replacement workers being less skilled than the absent worker they replace as well as the ever-present set of workers being less productive following coworker absences. Further results show that this loss in productivity is compensated for by an increase in working time when the absent worker is substitutable, whereas this is not the case when there is a complementary worker absence.

---

---

## Samenvatting

In dit proefschrift gebruik ik ijshockey data van de National Hockey League om verschillende vragen binnen het domein van de arbeidseconomie te beantwoorden. Hoofdstuk twee onderzoekt of vroege blootstelling van beginnende werknemers aan hun werkgevers hun latere arbeidsmarkresultaten verbetert. Uit het onderzoek blijkt dat beginnende werknemers die meer kansen krijgen om hun talent te laten zien, meer kans hebben om opnieuw te worden aangenomen en hogere salarissen te krijgen. Mechanisme analyses geven aan dat dit effect voornamelijk toe te schrijven is aan werkgevers die leren over het talent van werknemers door hen te observeren en hun opvattingen over hun talent bij te werken. Hoofdstuk drie verschuift de focus naar de dynamiek tussen werknemers en teamprestaties. Hier vind ik dat een onverwachte toestroom van buitenlandse werknemers met een andere werkstijl in een gevestigde industrie het gedrag en de toewijzing van inspanningen van al aanwezige werknemers verandert en assimileert met de werkstijl van de inkomende werknemers. Hoofdstuk vier evalueert het effect van arbeidsverzuim op teamprestaties. Uit de resultaten blijkt dat de teamprestaties afnemen als gevolg van ziekteverzuim. Dit resultaat is een combinatie van het feit dat de vervangende werknemers minder kundig zijn dan de afwezige werknemer die ze vervangen, en omdat de altijd aanwezige groep werknemers minder productief is na de afwezigheid van een collega. Verdere resultaten tonen aan dat dit productiviteitsverlies wordt gecompenseerd door een toename van de werktijd wanneer de afwezige werknemer vervangbaar is, terwijl dit niet het geval is wanneer er sprake is van een complementair werknemersverzuim.

---

---

## About the Author

Sam Hoey was born on the 24th of May in 1996 in Rotterdam, The Netherlands. In 2016, he obtained the degree of Master of Arts (MA) in Economics at the University of Toronto. In 2018, Sam started as a Ph.D. candidate under the supervision of Prof.dr. Jan van Ours and Dr. Thomas Peeters. He carried out his research within the Department of Applied Economics at the Erasmus



School of Economics. During this period Sam was also affiliated with the Tinbergen Institute and the Erasmus Center for Applied Sports Economics (ECASE). In 2021 Sam visited the School of Kinesiology at the University of Michigan for a period of three months. During his research visit he was supervised by Prof.dr. Stefan Szymanski.

Sam's research focuses on using sports data to answer questions in the field of labour economics. In particular, he is interested in topics relating to peer effects and team production. Sam will continue his career as a Postdoctoral Scholar at the University of Luxembourg.

---

---

# Portfolio

## PEER-REVIEWED PUBLICATOINS

- **The transfer system in European football: A pro-competitive no-poaching agreement?** S. Hoey, T. Peeters and F. Principe, 2021, *International Journal of Industrial Organization*, 75, 102695.

## WORKING PAPERS

- **Skill Adoption, Learning and Diffusion: Evidence from Soviet-style Hockey.** F. Amodio, S. Hoey and J. Schneider.
- **The Impact of Absent Coworkers on Productivity in Teams** S. Hoey, T. Peeters and J. van Ours.

## GRANTS AND PRIZES

- 2021 Best Young Researcher Paper Award, 12th European Sports Economics Association Conference.

## TEACHING ACTIVITIES

- Sports Economics: Teaching assistant
- Seminar Strategy Economics: Teaching assistant
- Methods & Techniques: Teaching assistant
- Applied Microeconomics: Teaching assistant
- Intermediate Accounting: Teaching assistant



- Thesis supervision
- Internship Supervisor

#### PHD COURSES AND CERTIFICATES

- Research Qualification (*Tinbergen Institute*)

*Courses:*

- Fundamental Mathematics
- Statistics
- Econometrics I
- Econometrics II
- Econometrics III
- Labor Economics
- Development Economics
- Economics of Education
- Health Economics
- New Insights from Big Data into Inequality and Risk
- Applied Microeconometrics
- Economic Policy Research Workshop

#### CONFERENCES, WORKSHOPS, AND MEETINGS

- Society of Labor Economist Conference (Minneapolis, United States, 2022)
- European Sports Economics Association Conference (Online, 2021)
- ECASE Workshop (Rotterdam, the Netherlands, 2020)

#### EDUCATION

- **Master of Arts in Economics** (2017-2018, *University of Toronto*)
- **Bachelor of Science in Economics and Business Economics** (2014-2017, *Erasmus University Rotterdam*)

---

---

## TI Publications List

The Tinbergen Institute is the Institute for Economic Research, which was founded in 1987 by the Faculties of Economics and Econometrics of the Erasmus University Rotterdam, University of Amsterdam and Vrije Universiteit Amsterdam. The Institute is named after the late Professor Jan Tinbergen, Dutch Nobel Prize laureate in economics in 1969. The Tinbergen Institute is located in Amsterdam and Rotterdam. For a full list of PhD theses that appeared in the series we refer to List of PhD Theses – Tinbergen.nl. The following books recently appeared in the Tinbergen Institute Research Series:

- 747 M.H. COVENEY, *Modern Imperatives: Essays on Education and Health Policy*
- 748 P. VAN BRUGGEN, *On Measuring Preferences*
- 749 M.H.C. NIENTKER, *On the Stability of Stochastic Dynamic Systems and their use in Econometrics*
- 750 S. GARCIA MANDICÓ, *Social Insurance, Labor Supply and Intra-Household Spillovers*
- 751 Y. SUN, *Consumer Search and Quality*
- 752 I. KERKEMEZOS, *On the Dynamics of (Anti) Competitive Behaviour in the Airline Industry*
- 753 G.W. GOY, *Modern Challenges to Monetary Policy*
- 754 A.C. VAN VLODROP, *Essays on Modeling Time-Varying Parameters*
- 755 J. SUN, *Tell Me How To Vote, Understanding the Role of Media in Modern Elections*
- 756 J.H. THIEL, *Competition, Dynamic Pricing and Advice in Frictional Markets: Theory and Evidence from the Dutch Market for Mortgages*

- 757 A. NEGRIU, *On the Economics of Institutions and Technology: a Computational Approach*
- 758 F. GRESNIGT, *Identifying and Predicting Financial Earth Quakes using Hawkes Processes*
- 759 A. EMIRMAHMUTOGLU, *Misperceptions of Uncertainty and Their Applications to Prevention*
- 760 A. RUSU, *Essays in Public Economics*
- 761 M.A. COTOFAN, *Essays in Applied Microeconomics: Non-Monetary Incentives, Skill Formation, and Work Preferences*
- 762 B.P.J. ANDRÉE, *Theory and Application of Dynamic Spatial Time Series Models*
- 763 P. PELZL, *Macro Questions, Micro Data: The Effects of External Shocks on Firms*
- 764 D.M. KUNST, *Essays on Technological Change, Skill Premia and Development*
- 765 A.J. HUMMEL, *Tax Policy in Imperfect Labor Markets*
- 766 T. KLEIN, *Essays in Competition Economics*
- 767 M. VIGH, *Climbing the Socioeconomic Ladder: Essays on Sanitation and Schooling*
- 768 YAN XU, *Eliciting Preferences and Private Information: Tell Me What You Like and What You Think*
- 769 S. RELLSTAB, *Balancing Paid Work and Unpaid Care over the Life-Cycle*
- 770 Z. DENG, *Empirical Studies in Health and Development Economics*
- 771 L. KONG, *Identification Robust Testing in Linear Factor Models*
- 772 I. NEAMȚU, *Unintended Consequences of Post-Crisis Banking Reforms*
- 773 B. KLEIN TEESELINK, *From Mice to Men: Field Studies in Behavioral Economics*
- 774 B. TEREICK, *Making Crowds Wiser: The Role of Incentives, Individual Biases, and Improved Aggregation*
- 775 A. CASTELEIN, *Models for Individual Responses*
- 776 D. KOLESNYK, *Consumer Disclosures on Social Media Platforms: A Global Investigation*

- 777 M.A. ROLA-JANICKA, *Essays on Financial Instability and Political Economy of Regulation*
- 778 J.J. KLINGEN, *Natural Exptients in Environmental and Transport Economics*
- 779 E.M. ARTMANN, *Educational Choices and Family Outcomes*
- 780 F.J. OSTERMEIJER, *Economic Analyses of Cars in the City*
- 781 T. ÖZDEN, *Adaptive Learning and Monetary Policy in DSGE Models*
- 782 D. WANG, *Empirical Studies in Financial Stability and Natural Capital*
- 783 L.S. STEPHAN, *Estimating Diffusion and Adoption Parameters in Networks New Estimation Approaches for the Latent-Diffusion-Observed-Adoption Model*
- 784 S.R. MAYER, *Essays in Financial Economics*
- 785 A.R.S. WOERNER, *Behavioral and Financial Change – Essays in Market Design*
- 786 M. WIEGAND, *Essays in Development Economics*
- 787 L.M. TREUREN, *Essays in Industrial Economics - Labor market imperfections, cartel stability, and public interest cartels*
- 788 D.K. BRANDS, *Economic Policies and Mobility Behaviour*
- 789 H.T.T. NGUYEN, *Words Matter? Gender Disparities in Speeches, Evaluation and Competitive Performance*
- 790 C.A.P BURIK, *The Genetic Lottery. Essays on Genetics, Income, and Inequality*
- 791 S.W.J. OLIJSLAGERS, *The Economics of Climate Change: on the Role of Risk and Preferences*
- 792 C.W.A. VAN DER KRAATS, *On Inequalities in Well-Being and Human Capital Formation*
- 793 Y. YUE, *Essays on Risk and Econometrics*
- 794 E.F. JANSSENS, *Estimation and Identification in Macroeconomic Models with Incomplete Markets*
- 795 P.B. KASTELEIN, *Essays in Household Finance: Pension Funding, Housing and Consumption over the Life Cycle*
- 796 J.O. OORSCHOT, *Extremes in Statistics and Econometrics*