LABOUR MARKET DATA THROUGH THE ANALYTICAL FRAMEWORK OF CONJOINT ANALYSIS

Gabriela Koľveková

Abstract

The method of conjoint analysis can focus on suggesting new products, which in labour market situation can mean to suggest new occupation. This actually can be stimulating to know which occupation will be demanded and which will be appalling. The influence of artificial intelligence is believed to be substantial on job creation and job destruction, meaning that the some attributes are important for new occupation. This paper chooses to be theoretical and discuss the possibilities to simulate labour market changes. Use of empirical data will have illustrative character. Discussion is focused on attributes: migration attribute may have plenty levels regarding country of origin, gender, length of stay and original occupation. Working hours as an attribute can be distinguished for normal, flexible, shift, AI assisted might consider the levels of high, medium and low levels of assistance. The design of conjoint analysis is based on designs used in previous studies published on this topic. The paper aims to support the use of conjoint analysis as a tool for finding linkages in the signalling on labour market.

Key words: labour market, region, conjoint analysis

JEL Code: R23, R12, P26

Introduction

Let us assume only an employee who wishes to find the job. Under such assumption a potential employee is focusing on estimating the characteristics the future employer looks for. This means the matching of companies preferences levied upon the employees and employees` adaptability on this changing preferences. Such a matching of preferences can be done if the preferences are revealed and measured with help of conjoint analysis.

The conjoint analysis has been used for over 30 years primarily for the analysis of consumer preferenses. Meaning of the conjoint analysis is that product`s feature is not observed separately, but product as a whole in its uniqueness. It is a time to extend this method for the analysis of stakeholder groups, particularly on employees (Green et al., 2001). This method is growing, which is proven by the following literature review and the analytical part of this paper.

For instance, the method apllyied in pricing of transportation that included attributes such as duration of transportation, means of transport and its influence on the environment as separate attribute (Axhausen et al., 2021). The consumers in this case the transport users would like or prefer that Piguvian tax was used for new transport projects.

In this paper the perspective is of vacation that has its unique features. Thus the employee shall fullfill it and the employer shall estimate what is needed for production or service provision. The exchange of skills for salary is possible if the employee is capable and willing to join the occupation. This means employers are having sets of attributes that employees are matching to certain degree. The degree is the scale that conjoint analyisis is using the attributes. The paper provides partial conclusions that are closely tied with discussion about three main attributes, which are migration, working hours and artificial intelligence (AI) assistance at work.

1 Brief overview of the literature on migration, AI assistance and working hours

The labour market situation is evolving and changing in terms of the three attributes, i.e. migration, AI assistance at work and working hours. The combination of the three factors was intriguing for several reasons. Reason one: is that the Czech Republic is facing unfavorable demographic trends of ageing population that was pictured with workforce ratio apart from other characetristics (Koľveková, 2024). Reason one together with reason two, i.e. the low unemploymend rates in Czechia (among the lowest in European Union) are suggesting to solve the unfavorable demographic trends with the migration support policy for younger and skilled foreign workers.

In history an example of migration supprt was seen on Vietnamese comunity. Many Vietnamese were invited out of communist solidarity in the 1970s and 1980s and till 21st century represent the largest group of permanent residents and migrant entrepreneurs. In next decades the government has tried to attract highly-skilled non-EU workers through the Active selection of Qualified Foreign workers pilot programe. (Niessen et al., 2007, p. 44) The results of this programme were changed by the Ukrain war and its consequend immigration flows.

Lately, the high-skilled job in the receiving country, should mean that the immigrants selected in high-skill jobs are also inteded to be placed at such a position (Arcarazo & Wiesbrock, 2015). However, the dialog is missing around high-skilled migration workers. The

popular dialog around this issue diverts signifcantly from work done on these questions, stated by Arcarazo and Wiesbrock (2015).

Another paradigm is expressed in quotation: "Life-long nomads and other herders have greatly diminished as a proportion of the human population as farming and the urban-based industries have attracted ever more immigrant settlers.", claims Fisher in his book of History of migration (2013, p. 124). The energy use for new technologies enables employees to be working from distant places and not have to migrate or even because of it migrate as digital nomads. But this leads to changes in environment and this again changes the migration strategies. The strategy includes the destination itself and time horizon for the stay, either migrating for specific time range or for indefinite time. Nonetheless, new form of technology nomads appeared (Bonneau & Aroles, 2021), digital nomads as a life-style for certain period of life.

Nomads are one option of adaptation to changes. Creativity is another option of such and adaptation. Job seeking could be conditioned by the rate of adaptation and creativity. Furthermore, the "*choice of job-search strategy by a jobless worker is simultaneuously a choice of wage-offer distriubitons*" (Osberg, 1993, p. 352). The adaptation strategies are typical for workers who are forced to migration. When such a migration worker sets for route of adaptation then the need for creative solutions begins to be pressing. The theft as an expressive way of labelling the migration of creative workers is foreced by idea theft as dissatisfaction about the creative behaviour of companys` employees (Lua et al., 2024) that could be inhenced by artificial inteligence (AI). Continuing with relatively new approach to work as gig workers (Wu & Huang, 2024). Working for little chuncks means even more adaptation.

The perspective of migration can become increasingly important in the light of environmental migration that is either forced or voluntary. Similarly proactive or reactive migration. This paper agrees with Martiniello and Rath (2012, p. 244) „*Unlike refugees or internally-displaced persons, no specific legal framework addresses environmental migration*."

AI assistance at work has link to working hours. One could expect that normal working hours would be less present, flexibility would be favoured, while shifts will be a neccessary obligation. In the scope of the three attributes briefly introduced above, the research question is to investigate how the new trends in labour market are suitable for the conjoint analysis in order to serve as a signaling tool of the preferences on the labour market.

2 Combining three methods

First two methods are (1) the literature inspection and (2) descriptive statistics of Eurostat. Third method is synthesis to develop an understanding of changes at labour market and preferences that are frequently examined with help of conjoint analysis. However, the conjoint analysis is often linked with goods at other markets, not the labour market. The skills are trade at labour market. The preferce of companies is to have skilled workers or up to date professionals.

2.1 Towards overlap of artificial intelligence and its impact on working hours and migration

The Inclusion Iniciative - TII (Jolles & Lordan, 2025, p. 14) provides insight on artificial intelligence (AI) use in global world of work, when this Initiative together with Londen School of Economics acquire the data from professionals and executives (N=2794, N=240, respectively), creating a sample with responses from across generations. Using regression analysis to understand the adoption of AI. In connection with working hours the result was that for part-time worker it is more valueable to save 8 hours a week (out of 20) than to full-time worker (40 hours a week). The full-time employee report the saving of 20% of their working time. The training helps and encourages the use of AI. The personal motivation to use AI and trust in this tool that it helps in decision making is lowest in generation X and higest in generation Z.Trustworthness was questioned several times and it can be summed up that the trust is around 50% (Ibid.).

AI perceptions correlate with economic expectations, i.e. uncertain economic environment leads to less trust or less positive view of the AI use at work (Dias Da Silva et al., 2026). According to the Consumer Expectation Survey, managers prefer traditional methods of work and this was among the reasons for not using AI (In Dieas Da Silva et al., 2026). This report is less positive in comparison to previous report by TII (Julles & Lordan, 2025). Especially, when it comes to different occupations, where the tasks vary. The variability of tasks is obstacle that makes use of AI less uniform. In respect to conjoint analysis this transforms as the different groups of workers (following the Standard Classification of occupations) have differet skills that are preferred differently from companies who are demanding such skills. Be it the side of supply or demand it is naturally a set of skills of one worker, but then it is complemented by the other worker at team. Most work is done in teams

and therefore the approach to this issue is to find the exact missing team member for the demand side, while the supply needs to find the team, where offered skills are missing.

2.2 The questionnaire preparation for conjoint analysis

The questionnaire itself was created with questions of the research focus. Thre research focus was on three attributes, i.e.

- migration prone persons with the country of origin and the destination country, original occupation in line with International Standard Classification of Occupations - ISCO distinctions,
- working hours preference – normal, flexible, shifts
- and the skills of AI assistance.

The question crucial for conjoint analysis is the question containing the scale evaluation of job offering. The respondent should evaluate the three characteristics that influence respondent`s decision about applying for the job. The respondent is a potential applicant and the approval to work for the company`s offering the job depends on his/her preferences and experience in life. These experiences are reflected in the characteristics of the respondent, i.e. age, gender, education. These characteristics of job offering are type of AI assitance, working hours and migration and the evaluation is in the scale 0 – 100. Evaluation 0 means that the offering is not accepted at all, and 100 means that the offering is accepted without any objections.

Thus, the potential respondent is evaluating on the question:
How much you are prone to accept the job offering from the point of view set by criterias that are the combinations of the following:

- working hours; (1) flexible, (2) normal, (3) shifts
- AI asistance is (1) high, (2) medium, (3) low
- migration within (1) Europe, (2) within Europe and Asia

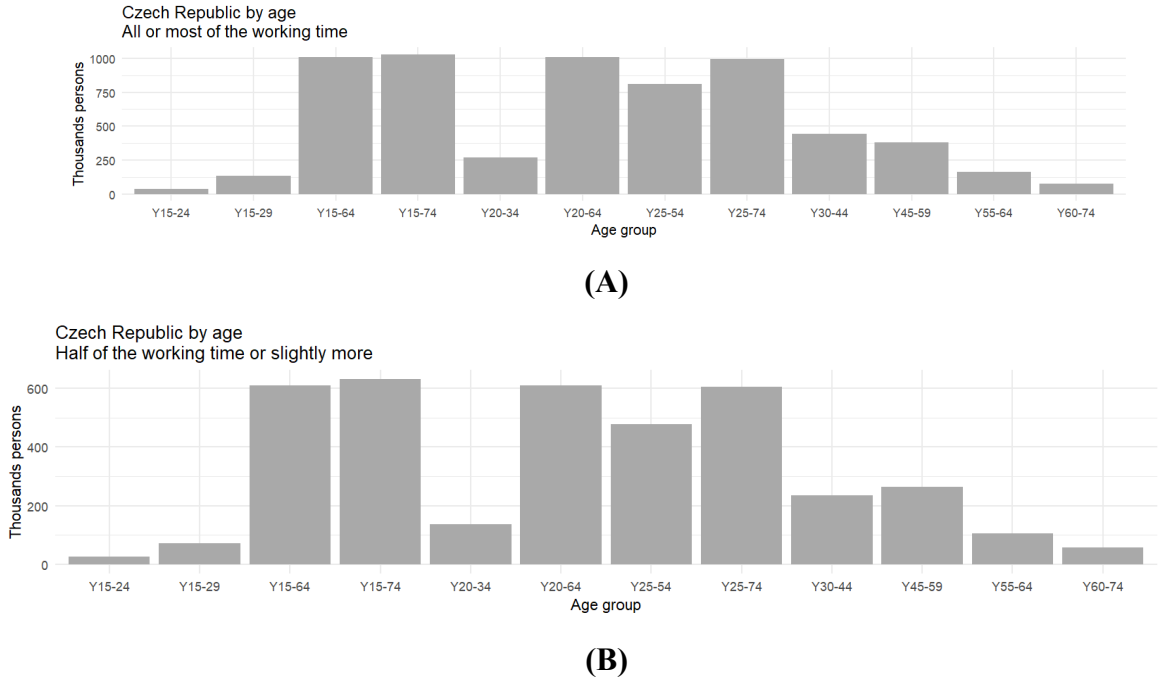
These three factors were constituting in nine out of 17 combinations. These set of nine selected combinations are fractional factorial design that can be potentially used for the future conjoint analysis.

3 Results of combing the three methods and its discussion

Job skills at labour market are both presented and observed. Specifically, the use of the artificiall intelligence or the digital skills as such is observed. The observation is conducted

within EU-LFS, subject module Job-skills. The module has three parts and includes 11 variables. The main concept is what is the proportion of time spent on specific task. The answers include also a combination of task, for instance reading, interaction with other people, calculating. Households were answering the Labour Force Survey and this allowed the creation of figure 1.

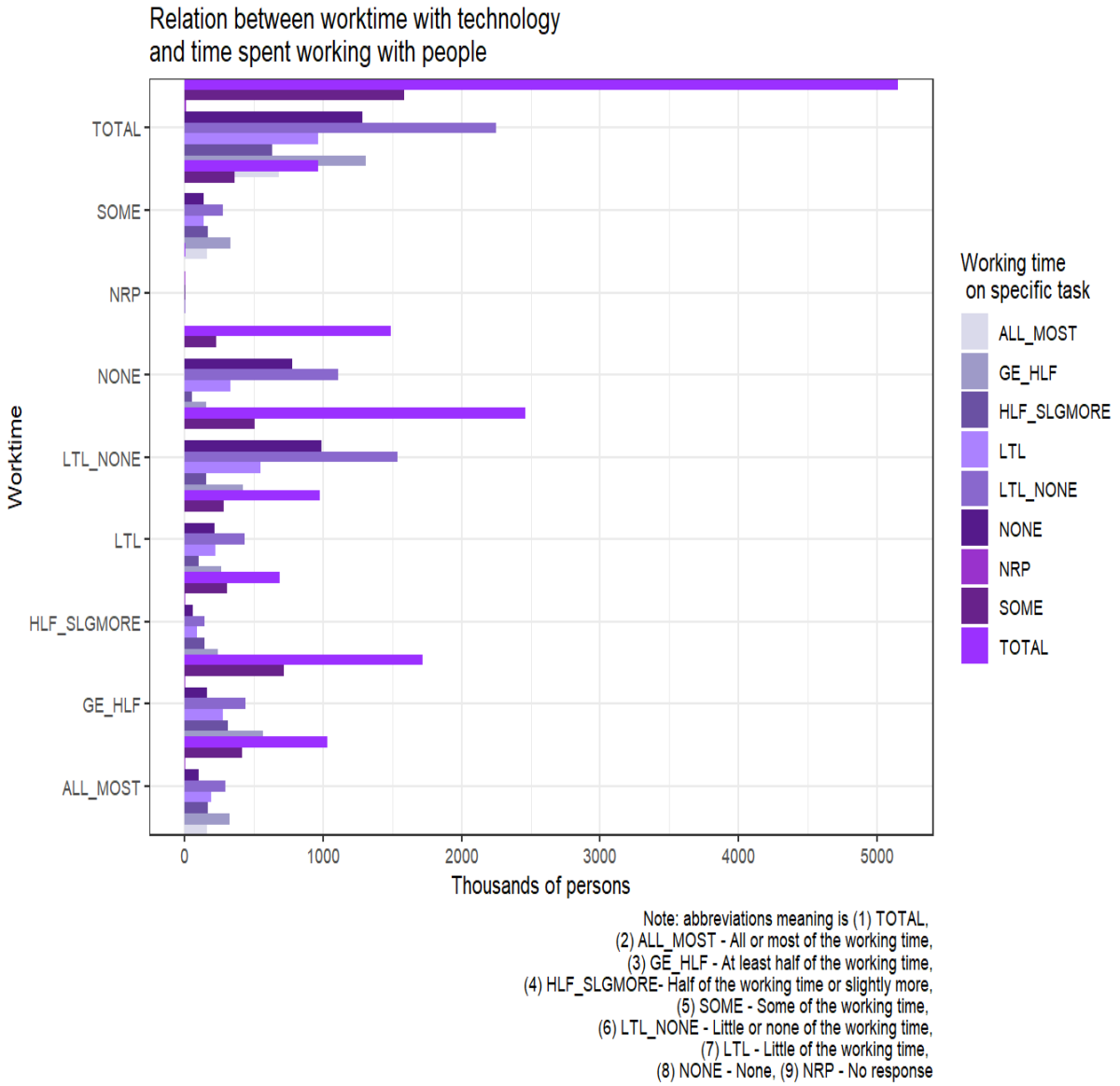
Fig. 1: Comparison of the age groups and its working time using technology



Source: own, based on data (Eurostat, 2026)

The figure 1 does not allow to notice the small differences there are. This is not the case for figure 2, where is it possible to think about the occupations features. The occupation features that are using a technology all day long and have no intereaction with people (combination of specific task as none or little and wortime as all_most, stands for all or most of the time), this can be IT specialists. For a salesperson the opposite applies, all working hours or most of the day spents with people. Both figures were based on data retrieved from Eurostat, sample is only one country - the Czech Republic and only one year - 2022.

Fig. 2: Descriptive statistics on working time with digital technology and on task



Source: own, based on data (Eurostat, 2026)

Thinking about how to turn these objective data of households to generalized data with least cost, one could think of using the simulations. Most probably the simulations in cooperation with concreate labour office, as presented for instance in Baruffini (2015).

Conclusion and limitation of the paper

The outcome of the paper is twofold: preparing questionnaire for the conjoint analysis from the conceptual point of view. Testing the attributes meaning, the skills of the workforce that are most preferable. The testing was based on literature review and descriptive statistics that should point out the possible understanding of scaling of the use of technology. The scaling

can respect the time spent on task and the technology as it is established at Eurostat statistics for EU countries. Althought the paper was limiting itself only on data for the Czech Republic.

Other paper`s limitation is that the signaling of preferences was not separated from the point of view of employee and employers. It deserves detailed elaboration in the future.

The literature review showed that preferences to be expected at labour market would most probably favour the high use of artificial intelligence and normal working hours, while avoiding shifts. Concerning migration: to move within the Europe is not considered for migration really.

The research question was to investigate how the new trends in labour market are suitable for the conjoint analysis in order to serve as a signaling tool of the preferences on the labour market. Each category of job (ISCO) has its justification at work and preferences for finding a position and this could be tested as well. The advantage of the conjoint analysis is to look at the skills in one bulk of one employee. The inspiration is to look at it as well on team level. As a consequence, the help of human resources and team leaders does not have to rely on inutition, references and other factors heavily.

Acknowledgement

Publication of this paper was supported by the institutional support "VŠE FPH IP300040". The support is greatly acknowledged.

References

Arcarazo, D. A., & Wiesbrock, A. (2015). *Global migration: Old assumptions, new dynamics [3 volumes]*. Bloomsbury Publishing USA.

Axhausen, K. W., Molloy, J., Tchervenkov, C., Becker, F., Hintermann, B., Schoeman, B., Götschi, T., Castro Fernández, A., & Tomic, U. (2021). *Empirical analysis of mobility behavior in the presence of Pigovian transport pricing* (p. 243 p.) [Application/pdf]. ETH Zurich. https://doi.org/10.3929/ETHZ-B-000500100

Baruffini, M. (2015). An Agent-Based Simulation of the Swiss Labour Market: An Alternative for Policy Evaluation. *Journal on Policy and Complex Systems*, *2*(1). https://doi.org/10.18278/jpcs.2.1.4

Bonneau, C., & Aroles, J. (2021). Digital Nomads: A New Form of Leisure Class? In J. Aroles, F.-X. D. Vaujany, & K. Dale (Eds), *Experiencing the New World of Work* (1st edn, pp. 157–178). Cambridge University Press. https://doi.org/10.1017/9781108865814.011

Dias Da Silva, A., Lebastard, L., & Sondermann, D. (2026, August 26). *AI adoption and the productivity promise: What workers report*. https://www.ecb.europa.eu/press/blog/date/2026/html/ecb.blog20260826~e1c1a89999.en.html

Eurostat, E. (2026). *Employed persons by working time spent on using digital devices and on another specific task (interacting with people from outside the enterprise or organisation) (2022)* ([Lfso_22dmsc04]) [Data set]. 10.2908/lfso_22dmsc04. https://doi.org/10.2908/lfso_22dmsc04

Fisher, M. H. (2013). *Migration: A world history*. Oxford University Press.

Green, P. E., Krieger, A. M., & Wind, J. (2001). Thirty Years of Conjoint Analysis: Reflections and Prospects. *Interfaces*, *31*(3), 556–573.

Jolles, D., & Lordan, G. (2025). *When generation meet. The productivity potential of multigenerational meetings. Bridging the Generational AI Gap*. The Inclusion Iniciative LSE.

Koľveková, G. (2024). *The structure of the workforce underpinning regional economic activities*. *LANGHAMROVÁ, Jitka, VRABCOVÁ, Jana (Ed.).*, 155–164. https://relik.vse.cz/2024/download/pdf/816-Kolvekova-Gabriela-paper.pdf.

Martiniello, M., & Rath, J. (2012). *An Introduction to International Migration Studies: European Perspectives*. Amsterdam University Press. https://doi.org/10.2307/j.ctt6wp6qz.4

Niessen, J., Huddleston, T., Citron, L., Geddes, A., & Jacobs, D. (2007). *Migrant Integration Policy Index.*

Contact

Gabriela Koľveková

Prague University of Economics and Business

Department of Managerial Economics

W. Churchill Sq. 1938/4, 130 67 Prague 3

gabriela.kolvekova@vse.cz