



10.15678/IER.2023.0901.01

The impact of the Covid-19 pandemic on the operations of real estate agencies and the attitudes of their clients in Poland

Bartłomiej Marona, Mateusz Tomal

ABSTRACT

Objective: The objective of the article is to evaluate the impact of the Covid-19 pandemic on the operations of real estate agencies and the attitudes of their clients in Poland.

Research Design & Methods: A survey questionnaire with open-ended questions distributed among all Polish real estate agents associated in the Polish Real Estate Federation.

Findings: The Covid-19 pandemic changed the operations of real estate agents and the attitudes of tenants and landlords. Real estate brokers turned to remote work using state-of-the-art technologies, landlords became more flexible to the market conditions, and tenants were looking for flats in a better technical condition with a balcony or garden.

Implications & Recommendations: The changes caused by the Covid-19 pandemic in real estate agencies' operations and in the attitudes of their clients in Poland are permanent and highly likely to uphold in the post-Covid-19 times. The findings provide a reference for new housing projects as well as the way real estate agents operate.

Contribution & Value Added: This is the first study considering the entire housing market in Poland and analysing the durability of the Covid-19 pandemic impacts.

Article type: research article

Keywords: housing market; Covid-19; housing brokers; housing preferences; real estate agencies

JEL codes: D22, D23, H12, R00

Received: 1 December 2022 Revised: 26 January 2023 Accepted: 23 February 2023

Suggested citation:

Marona, B., & Tomal, M. (2023). The impact of the Covid-19 pandemic on the operations of real estate agencies and the attitudes of their clients in Poland. *International Entrepreneurship Review*, 9(1), 7-16. https://doi.org/10.15678/IER.2023.0901.01

INTRODUCTION

The Covid-19 pandemic, which was one of the most severe health crises in recent years (Machaczka & Stopa, 2022; Migała-Warchoł & Pichla, 2021; Kinnunen *et at.*, 2021; Banaszyk *et al.*, 2021), affected many aspects of economic activities, including the housing market processes (Bełej, 2022) and even caused fear and anxiety (Loan *et al.*, 2021). Previous studies revealed that coronavirus occurrence contributed to a decrease in the rental prices of flats, altered housing preferences (Tomal & Helbich, 2022), and caused changes in the real estate professionals' operations (Kania & Kmieć, 2022). Still, some significant research gaps can be identified in the last of the mentioned items. First and foremost, previous studies were sectional and focused only on selected local housing markets. Secondly, most studies were developed at the beginning of the pandemic, so it is not known if the pandemic effects are permanent or transient. Considering the premises above, this article aims to evaluate the Covid-19 pandemic's impact on the operations of real estate agencies and the attitudes of their clients in Poland. Taking into account the abovementioned goal, this article shall provide answers to the following research questions:

RQ1: How did the Covid-19 pandemic affect the operations of real estate agencies and the attitudes of their clients in Poland?

RQ2: Are the changes triggered by the pandemic outbreak permanent or transient?

This study continued the analyses performed by Marona and Tomal (2020), which aimed to determine the impact of the pandemic on the operations of real estate agencies and the attitudes of their clients in Krakow. This research contributes to the current literature in several ways. Firstly, it takes into account the entire residential market in Poland rather than its narrow section, increasing the credibility and general nature of the conclusions drawn. Secondly, this article presents the durability evaluation of the Covid-19 pandemic's impact on the operations of real estate agencies and their clients' attitudes.

The rest of this article is organised as follows. The next section will provide a literature review on the impact of the Covid-19 pandemic on the operations of real estate agencies and the attitudes of their clients. Next, the methodology of the research will be presented, followed by the study results and their discussion. The last section will contain the main conclusions and limitations of this research and directions for future studies.

LITERATURE REVIEW

Impact of the Pandemic on Real Estate Agencies' Operations

Scientific literature investigating how the appearance of coronavirus affected the business operation of real estate agencies is scarce, but some significant studies can be pointed out. For instance, Koszel (2021) analysed the pandemic's impact on the real estate market professionals in Poland. In April 2020, the author surveyed 247 people working as estate surveyors, real estate brokers, and property managers in Poland. The study results revealed that the pandemic caused a significant drop in businesses' revenues and the number of new contracts and telephone calls. Furthermore, over half of the respondents noticed a decrease in their work effectiveness (measured as the ratio of the number of signed versus finalised agreements) and a generally lower interest in real estate. On the other hand, the respondents noticed a significant increase in the number of online meetings and emphasised that the pandemic contributed to much extended remote work time. In turn, Straczkowski and Bartkowiak (2021) observed that, as a result of the pandemic, some real estate agents in Poznan were even considering closing their businesses. Further, Marona and Tomal (2020) focused on the issue of higher use of digital technologies by the real estate market entities, in their study based on the example of Krakow. Questionnaire answers submitted by twenty-two real estate brokers were analysed. It helped conclude that the pandemic caused the digitalisation of traditional business models. Real estate agents started using such tools as Zoom, WhatsApp, Skype, and Messenger. The same conclusions were drawn by Kania and Kmieć (2022) and Najbar (2021) in the analysis of the pandemic's impact on the operations of property brokers and managers in Poland. The pandemic's impact on real estate entities' businesses was also investigated in other countries. For instance, Bakar and Yaacob (2020) concluded that real estate agencies in Malaysia undertook five measures to digitalise their business models; the measures included (i) implementing an agency management system, (ii) using social media for marketing purposes, (iii) video content development, (iv) optimising the content for search engines (SEO), and (v) training the staff on the use of digital technologies. Serbulova et al. (2020) highlighted that Virtual Reality technology was the key digital innovation in real estate companies, broadly implemented as a result of the pandemic's outbreak. A similar conclusion was reached by Starr et al. (2020) as well as Maalsen and Dowling (2020), who concluded that the pandemic was one of the main factors accelerating the development of property technology.

Considering the abovementioned studies on the pandemic's impact on real estate agencies, it shall be emphasised that the coronavirus occurrence came as a shock to such companies and had negative consequences first, and then caused adaptation of the studied companies to the new reality by utilising the increasingly common digital technologies.

Impact of the Pandemic on the Attitude of Real Estate Agencies' Clients

The outbreak of the pandemic affected the behaviour of real estate agencies' clients, *i.e.* buyers and tenants for their housing preferences, and sellers and landlords for the strategy of housing property selling or renting. The issue was investigated both theoretically and empirically. A theoretical investigation was carried out in the study by Nanda *et al.* (2021). The authors claimed that as a result of the pandemic

outbreak, preferences concerning the desired housing location, physical characteristics, and surroundings have changed. In reference to location, the authors emphasised that houses away from the city centre would be preferred, which results from many companies implementing remote work. According to the study authors, more work and generally more time spent at home will stimulate the demand for larger houses with convenient Internet access, featuring gardens or balconies. Health aspects such as the quality of indoor air or the materials that the house is made of shall be of significance as well. The assumptions outlined by Nanda et al. (2021) were confirmed in successive empirical analyses. First of all, the researchers noticed that housing preference changes apply to a very large group of residential market participants. For instance, Pagani et al. (2021) surveyed 5378 people living in Switzerland. As much as 60% of them claimed that the pandemic outbreak had changed their housing preferences. Delbosc and McCarthy (2021) studied a population of twenty-six Australians and discovered a significant change in their housing preferences giving priority to place over the location and the will to have a house with a garden. Interestingly enough, the study revealed that because of the likely remote work in the future, many people started preferring to live in the countryside rather than in a city, which was also observed by Boesel et al. (2021) and Kang et al. (2021). According to Duque-Calvache et al. (2021), such mobile behaviours result from a search for larger area flats. Zarrabi et al. (2021) noticed that the inhabitants of Teheran started paying attention to houses supporting a healthy lifestyle, i.e. those that have access to natural light and are characterised by good acoustic parameters. The conclusions were also confirmed by Peters and Halleran (2020), who stated that houses promoted after the pandemic offer the possibility to recover from stress owing to the optimum arrangement of the windows. Finally, Akbari et al. (2021) proved that the pandemic led to a situation in which health factors play the most significant role in the change in housing preferences. The change in housing preferences as a result of the pandemic outbreak was also confirmed by Tomal and Helbich (2022) and Guglielminetti et al. (2021), who used econometric methods instead of a survey for analysis. Tomal and Helbich (2022) demonstrated that the pandemic contributed to a drop in the interest in flats for rent in the centre of Krakow and those located in big blocks of flats. Guglielminetti et al. (2021) proved that the inhabitants of Italy started looking for larger flats during the pandemic. As presented above, the pandemic's impact on housing preferences has been quite well investigated. Nonetheless, the behaviour of sellers and landlords has been analysed previously in the literature in a very limited range. Previous articles primarily indicated that real estate owners who had been renting their flats for short periods changed their strategies in favour of long-term rental (Hesse & Vilchez, 2022; Tomal & Marona, 2020; Trojanek et al., 2021). Reina et al. (2020), who investigated the real estate market in Philadelphia, also pointed out the significant impact of the pandemic on landlords. The authors noticed that as much as 60% of the respondents had been affected by the pandemic by being forced to lower the rent or introduce elastic payment forms. The same was reported by Marona and Tomal (2020) for the Krakow real estate market.

Scientific literature provides no comparative studies that answer the question of whether the pandemic's impact on the real estate agencies' clients is permanent or occurred only temporarily as a result of shock caused by the pandemic outbreak.

RESEARCH METHODOLOGY

To execute the research process, a CAWI survey was carried out among Polish real estate brokers associated in the Polish Real Estate Federation (PREF). The respondents were asked about the pandemic's impact on the real estate agencies' operations and on their clients' attitudes:

- Did the Covid-19 pandemic contribute to changes in organising the work of your real estate agency with the use of new technologies?
- Has the work organisation of the real estate agency you work for changed (except for the potential development of new technologies) under the impact of the Covid-19 pandemic, and if so, how has it changed? If the changes have occurred, are they expected to be permanent, i.e. remain as part of the agency's operations after the pandemic?
- Have you noticed any changes in the flat tenants' preferences under the impact of the Covid-19 pandemic?

– Have you noticed a change in the flat landlords' strategies (rental period, rent rates) under the impact of the Covid-19 pandemic?

The survey was carried out in November-December 2021, *i.e.* during the fourth pandemic wave in Poland. Finally, forty responses were received, which means a response rate of 1.85%. Even though the response rate is very low, the study results can still be considered reliable, which results from the analysis carried out by Holbrook *et al.* (2008) and from the fact that the study sample was relatively representative of the entire population of real estate brokers being members of the Polish Real Estate Federation (Table 1).

Table 1. Characteristics of the study sample versus the general population

Characteristics	Category	Ratio [%]		Test for two propor-
		Study sample	Population	tions†
Gender	Man	37.50	47.06	Z value = 1.20 P-value = 0.23
	Woman	62.50	52.94	Z value = 1.20 P-value = 0.23
Work experience	1-2 years	2.50	No data	No data
	3-5 years	12.50	No data	No data
	6-10 years	20.00	No data	No data
	Above 10 years	65.00	No data	No data
Size of the market	1-100 000 inhabitants	15.00	28.57	Z value = 1.88 P-value = 0.06
	100 001-500 000 inhabitants	30.00	36.23	Z value = 0.81 P-value = 0.42
	500 001-1 000 000 inhabit- ants	37.50	18.10	Z value = 3.13* P-value = 0.00
	Above 1 000 000 inhabitants	17.50	17.10	Z value = 0.07 P-value = 0.95

Note: significant codes - '*' 0.01; \dagger null hypothesis: there is no difference between the proportions.

Source: own elaboration.

RESULTS AND DISCUSSION

Changes in Real Estate Agencies' Operations

Two questions in the study were related to the issue of new models of office work organisation and the use of new technologies. Although both issues were raised in the context of the Covid-19 pandemic, they are directly linked to the fourth industrial revolution that accelerated some changes in the real estate sector (Jeon & Suh, 2017; Kania & Kmieć, 2022) and profoundly altered the way societies, economies, and enterprises work; it also reshaped relations between actors. As for the question concerning the impact of the Covid-19 pandemic on the organisation of real estate agencies' work, 63% of the respondents noticed such an impact while 34% of the respondents were of a different opinion. This suggests that the study results for real estate agencies from all over Poland, associated in the Polish Real Estate Federation, are highly similar to the results obtained in a study carried out at the beginning of the pandemic only for Krakow (Marona & Tomal, 2020). The respondents mainly pointed out online or hybrid work. An example can be found in an answer given by a respondent representing a real estate agency from Warsaw:

'Yes, we work remotely more often now than we used to before the pandemic (more hours/days a week, depending on the needs) and it will probably stay like that.'

Another example is a statement from a respondent from Krakow:

'The staff come to the office no more than once a week. Essentially, we work remotely and we expect to follow this work pattern after the pandemic.'

Noteworthy, many respondents indicated remote work to be the consequence of the pandemic and – importantly – expressed a conviction that this element will turn out permanent in a long-term perspective. This confirms the findings of a number of market analyses carried out at different stages of the pandemic (Colliers Hybrid and Beyond Report, 2022). Notably, the answers indicating the pandemic's impact or a lack of such impact on the agency's work organisation did not reveal the answers' dependence on the size of the serviced local real estate market or the agency's experience.

In the answer to the question concerning the pandemic's impact on the scope of use of new technologies in real estate agencies operations, 57% of the respondents indicated such an impact, while 43% of the respondents were of a different opinion. These findings contradict that the real estate sector's operation is traditional and conservative and not quick to adopt technological innovations (Baum 2020; Kania *et al.*, 2020). A higher approximation of positive and negative opinions likely results from the fact that many agencies had introduced some technological solutions before the global pandemic. For instance, a representative of a real estate agency from Lublin who mentioned a lack of changes claimed:

'I was technologically ready for such a situation.' The person pointed out that 'virtual tours implemented before the pandemic proved that was the right direction to follow.'

We received a similar response from a real estate agency in Gdansk:

'We had such solutions as virtual walks and online presentations before Covid-19, so we did not add anything.'

For many real estate companies, the pandemic provided an impulse to introduce some changes in the scope and type of technologies used. It was determined in the course of the study that particular development occurred in the scope of disseminating real estate presentation videos and organising virtual tours or online meetings, *e.g.* via Zoom. In this context, let us emphasise that some respondents challenged the effectiveness of such tools but still implemented them. A good example confirming the above was provided by a real estate broker from Szczecin who said:

'Since many agencies introduced 3D virtual tours and videos, we felt we should also use it not to be left behind.'

Importantly, other new technological tools used in the work of real estate companies were scarcely introduced or not introduced at all (Ullah *et al.*, 2018). The technologies can be grouped into nine categories including drones, unmanned aerial vehicles, the Internet of Things (IoT), clouds, software as a service, big data, 3D scanning, wearable technologies, virtual and augmented realities (VR and AR), artificial intelligence (AI), and robotics (Ullah *et al.*, 2018). Moreover, we should note that the catalogue listed above is not exhaustive, but it only presents digital technologies currently and practically used in real estate. However, the sector of modern technologies has been changing rapidly so a significant part of its inventions can be expected to be employed in real estate in the near future. A real estate agency from Goleniow, in its response mentioned:

'Preparing the presentations using spherical and bird's eye view photos - drone.'

It was the only case when the use of a drone was mentioned by a real estate agency. It shall be added that employing drones in a real estate agent's work is practical in special cases, not necessarily related to presenting flats located in densely built-up residential areas.

Finally, the possibility of using new technologies is directly related to the changes within new models of the agency's work organisation and team management methods. A good example was provided by a real estate agent from Krakow who answered the question on new technologies in the following way:

'It is a very positive aspect: (1) we learnt how to work remotely, (2) we learnt to manage a dispersed team, (3) we attach higher significance to Customer Relationship Management tools, (4) we save quite much time on remote (visual) contact with internal and external clients, (5) communication is more substantive and based on work performance and effects (or lack of them), (6) we started using new tools, time planning and task delegation.'

The above somehow confirms Mączyńska's thesis (2018), which points out that the digital revolution keeps creating new, previously unknown phenomena and thus shapes the new economy and its new entities, which have previously been completely unknown. In practical terms, modern technologies make it possible to increase the digitisation processes dynamics, including digitalisation in the real estate sector. The former relates to the analogue data conversion to digital forms (Gobble, 2018), and the latter means the transformation of business models used so far by real estate companies into models that increasingly utilise advanced digital technologies (Piazolo, 2018).

Attitude Changes in Real Estate Agencies' Clients

Most respondents noticed attitude changes in real estate agencies' clients. The previously described changes in real estate agencies' functioning and a broader scope of new technologies utilisation were highly stimulated by the clients' expectations. Considerable changes were observed in the housing preference area, which was the main focus of the study. In this context, 65% of the respondents noticed changes in the clients buying and renting residential premises. Some changes were noticed regardless of the city/town where the real estate agency participating in the study was operating. For instance, a respondent representing a real estate agency from Katowice noticed that:

'Quite many people started appreciating flats on ground floors with access to gardens.'

Similarly, a real estate agent from Poznan stated:

'Tenants are looking for flats ready to move into, featuring a balcony or a garden.'

Meanwhile, a real estate agent from Warsaw mentioned:

'Balconies were commonly expected elements of flats.'

Moreover, many real estate brokers paid attention to the lower significance of location when making housing decisions. A real estate agent from Krakow observed:

'A higher interest in bigger flats, with more rooms. The location has become less significant.'

Both these aspects were mentioned by a real estate agent from Lodz, who said:

'Yes, I have noticed changes in the tenants' preferences; suburbs and balconies are preferred.'

The changes in the location perception result from the widespread remote and hybrid work which does not require as frequent commuting as before the pandemic and directly contributes to changes in housing preferences (Shamshiripour *et al.*, 2020). In this context, many real estate agents pointed out the need for Internet access in flats and the possibility of arranging a place to work; it has become a subject of separate literature studies on corporate real estate management (Marzban *et al.*, 2021).

On the other side of the market participants, the survey questions focused on landlords. In the majority of the study respondents' opinions (75%), the landlords tried to adapt to the pandemic situation (lower rent, shorter rental period, more flexible agreement termination conditions, changing the rental strategy from a short-term to long-term), whereby the changes were only a temporary adaptation to the market situation (a momentary prevalence of supply over demand), which has now changed completely because of the war in Ukraine (Trojanek & Głuszak, 2022).

Finally, Table 2 synthetically summarises this study's results against a previous analysis carried out by Marona and Tomal (2020). Based on the comparison, it can be stated that from the beginning of the pandemic to the end of 2021, the changes in real estate agencies' operations and their clients' attitudes are permanent. Firstly, in both studies, at least half of the agents indicated significant changes in their agencies' operations and their clients' attitudes. Secondly, the changes identified in both studies were generally the same.

	idule 2. The durantity of the dovid 25 particilities enedes					
Area of change	Marona and Tomal (2020): July 2020	This study: November-December 2021				
Real estate agencies' operations	70% of the agencies noticed changes involving remote and hybrid work using modern technology solutions.	_ =				
Real estate clients' attitudes	80% of the agencies observed changes in their clients' attitudes. For landlords, they involved changing the form of rent, i.e. short-term rather than long-term rental and lower rent. Tenants were looking for flats in new buildings with a little garden or a balcony.	their clients' attitudes. For landlords, they involved changing the form of rent, i.e. short-term rather than long-term rental and lower				

Table 2. The durability of the Covid-19 pandemic's effects

Source: own elaboration.

CONCLUSIONS

This study presented the impact of the Covid-19 pandemic on real estate agencies' operations and their clients' attitudes in Poland. The analysis revealed that from the beginning of the pandemic, the changes have become permanent and essentially involve a higher share of remote work in real estate agencies and using modern technologies to that end. Real estate agencies' clients, in turn, changed their housing preferences and started looking for flats in new buildings featuring a balcony or garden. Landlords became more flexible to market conditions resulting from the Covid-19 pandemic.

This study has implications for housing market actors. Firstly, real estate agents should increase their competencies in the use of modern technologies. Secondly, when starting new investment projects, real estate developers should adjust the new housing stock to the post-pandemic housing preferences by increasing the size of flats and providing access to a balcony or garden.

The main limitation of this study was the low number of respondents, which is typical for business surveys. A second limitation related to the lack of consideration of the impact of the war in Ukraine on the persistence of the identified changes. Therefore, future studies should investigate if the war in Ukraine changed the post-Covid-19 landscape of the flat rental market within the real estate agents' operations and their clients' attitudes.

REFERENCES

- Bakar, N.A.A., & Yaacob, A. (2020). The Role of Service Digitalisation in Realty Business during Pandemic from the Perspective of Real Estate Agency in Klang Valley, Malaysia. *International Journal of Real Estate Studies*, 14, 9-16.
- Banaszyk, P., Deszczyński, P., Gorynia, M., & Malaga, K. (2021). The Covid-19 pandemic as a potential change agent for selected economic concepts. *Entrepreneurial Business and Economics Review*, 9(4), 35-50. https://doi.org/10.15678/EBER.2021.090403
- Baum, A. (2020). *PropTech 2020: The future of real estate*. Oxford, UK: University of Oxford.
- Bełej, M. (2022). Analysis of the Relationship Between COVID-19 Infections and Web-Based Housing Searches. *Real Estate Management and Valuation*, *30*, 89-102. https://doi.org/10.2478/remav-2022-0031
- Boesel, M., Chen, S., & Nothaft, F.E. (2021). Housing preferences during the pandemic: effect on home price, rent, and inflation measurement. *Business Economics*, *56*, 200-211. https://doi.org/10.1057/s11369-021-00241-4
- Delbosc, A., & McCarthy, L. (2021). Pushed back, pulled forward: Exploring the impact of COVID-19 on young adults' life plans and future mobility. *Transport Policy*, 107, 43-51. https://doi.org/10.1016/j.tranpol.2021.04.018
- Duque-Calvache, R., Torrado, J.M., & Mesa-Pedrazas, Á. (2021). Lockdown and adaptation: residential mobility in Spain during the COVID-19 crisis. *European Societies*, *23*, S759-S776. https://doi.org/10.1080/14616696.2020.1836386
- Gobble, M.M. (2018). Digitalization, digitization, and innovation. *Research-Technology Management*, *61*, 56-59. https://doi.org/10.1080/08956308.2018.1471280
- Guglielminetti, E., Loberto, M., Zevi, G., & Zizza, R. (2021). Living on my own: the impact of the Covid-19 pandemic on housing preferences. *Bank of Italy Occasional Paper*, 627, 1-55.

- Hesse, C.L., & Raya Vílchez, J.M. (2022). The effect of COVID-19 on the peer-to-peer rental market. *Tourism Economics*, *28*, 222-247. https://doi.org/10.1177/13548166211044229
- Holbrook, A., Krosnick, J.A., & Pfent, A. (2007). The causes and consequences of response rates in surveys by the news media and government contractor survey research firms. In James M. Lepkowski, Clyde Tucker, J. Michael Brick, Edith D. de Leeuw, Lilli Japec, Paul J. Lavrakas, Michael W. Link, Roberta L. Sangster (eds.), *Advances in Telephone Survey Methodology* (pp. 499-458). Hoboken, NJ: John Wiley & Sons. https://doi.org/10.1002/9780470173404.ch23
- Jeon, J., & Suh, Y. (2017). Analyzing the Major Issues of the 4th Industrial Revolution. *Asian Journal of Innovation and Policy*, 6, 262-273. https://doi.org/10.7545/ajip.2017.6.3.262
- Kang, B., Won, J., & Kim, E.J. (2021). COVID-19 Impact on Residential Preferences in the Early-Stage Outbreak in South Korea. *International Journal of Environmental Research and Public Health*, 18, 11207. https://doi.org/10.3390/ijerph182111207
- Kania, K., Małkowska, A., & Uhruska, M. (2020). *Profesjonalizacja obsługi obrotu nieruchomościami*. Wyzwania dla pośredników i rzeczoznawców majątkowych. Cracow, Poland: Wydawnictwo Uniwersytetu Ekonomicznego w Krakowie.
- Kania, K., & Kmieć, Ł. (2022). The Impact of Covid-19 on the Use of Modern Technologies By Real Estate Brokers. Real Estate Management and Valuation, 30, 73-83. https://doi.org/10.2478/remav-2022-0015
- Kinnunen, J., Georgescu, I., Hosseini, Z., & Androniceanu, A.-M. (2021). Dynamic indexing and clustering of government strategies to mitigate Covid-19. *Entrepreneurial Business and Economics Review*, 9(2), 7-19. https://doi.org/10.15678/EBER.2021.090201
- Koszel, M. (2021). The COVID-19 Pandemic and the Professional Situation on the Real Estate Market in Poland. *Hradec Economic Days*, *11*, 412-425. https://doi.org/10.36689/uhk/hed/2021-01-042
- Loan, L., Doanh, D., Thang, H., Viet Nga, N., Van, P., & Hoa, P. (2021). Entrepreneurial behaviour: The effects of the fear and anxiety of Covid-19 and business opportunity recognition. *Entrepreneurial Business and Economics Review*, 9(3), 7-23. https://doi.org/10.15678/EBER.2021.090301
- Maalsen, S., & Dowling, R. (2020). Covid-19 and the accelerating smart home. *Big Data & Society*, 7. https://doi.org/10.1177/2053951720938073
- Machaczka, K., & Stopa, M. (2022). The influence of remote work in particular during the Covid-19 pandemic on changes in human behaviour patterns within organisations. *International Entrepreneurship Review*, *8*, 67-78. https://doi.org/10.15678/IER.2022.0802.05
- Marona, B., & Tomal, M. (2020). The COVID-19 pandemic impact upon housing brokers' workflow and their clients' attitude: Real estate market in Krakow. *Entrepreneurial Business and Economics Review*, 8, 221-232. https://doi.org/10.15678/EBER.2020.080412
- Marzban, S., Durakovic, I., Candido, C., & Mackey, M. (2021). Learning to work from home: experience of Australian workers and organizational representatives during the first Covid-19 lockdowns. *Journal of Corporate Real Estate*, 23, 203-222. https://doi.org/10.1108/JCRE-10-2020-0049
- Mączyńska, E. (2018). Państwo i rynek w warunkach rewolucji cyfrowej i przesilenia cywilizacyjnego. *Studia i Prace Kolegium Zarządzania i Finansów, 161,* 99-109.
- Migała-Warchoł, A., & Pichla, M. (2021). Forecasting the number of cases and deaths from Covid-19. *International Entrepreneurship Review*, *7*, 73-82. https://doi.org/10.15678/IER.2021.0701.06
- Najbar, K. (2021). Świadczenie usług zarządzania nieruchomościami w dobie pandemii COVID-19. *Horyzonty Polityki*, *12*, 157-177. https://doi.org/10.35765/hp.2133
- Nanda, A., Thanos, S., Valtonen, E., Xu, Y., & Zandieh, R. (2021). Forced homeward: The COVID-19 implications for housing. *Town Planning Review*, *92*, 25-31. https://doi.org/10.3828/tpr.2020.79
- Pagani, A., Fritz, L., Hansmann, R., Kaufmann, V., & Binder, C.R. (2021). How the first wave of COVID-19 in Switzer-land affected residential preferences. *Cities & Health*, 1-13. https://doi.org/10.1080/23748834.2021.1982231
- Peters, T., & Halleran, A. (2020). How our homes impact our health: using a COVID-19 informed approach to examine urban apartment housing. *Archnet-IJAR: International Journal of Architectural Research*, *15*, 10-27. https://doi.org/10.1108/ARCH-08-2020-0159
- Piazolo, D. (June, 2018). *Real estate digitalization and the underlying modes of operation*. Paper presented at the 25th Annual European Real Estate Society Conference, Reading, UK. https://doi.org/10.15396/eres2018_106

- Colliers. (2020). *Colliers Hybrid and Beyond*. Retrieved from https://www.colliers.com/pl-pl/research/hybrid-and-beyond on December 12, 2022.
- Reina, V., Goldstein, S., Dowdall, E., Goldstein, I., & DeYoung, E. (2020). *Residential Rental Property Owner Perspectives and Practices in Philadelphia: Evaluating Challenges during the COVID-19 Pandemic*. Philadelphia, PA: Housing Initiative at Penn & The Reinvestment Fund.
- Serbulova, N., Morgunova, T., & Persiyanova, G. (2020). Innovations during COVID-19 pandemic: trends, technologies, prospects. E3S Web of Conferences, 210, 02005. https://doi.org/10.1051/e3sconf/202021002005
- Shamshiripour, A., Rahimi, E., Shabanpour, R., & Mohammadian, A.K. (2020). How is COVID-19 reshaping activity-travel behavior? Evidence from a comprehensive survey in Chicago. *Transportation Research Interdisciplinary Perspectives*, 7, 100216. https://doi.org/10.1016/j.trip.2020.100216
- Starr, C.W., Saginor, J., & Worzala, E. (2020). The rise of PropTech: Emerging industrial technologies and their impact on real estate. *Journal of Property Investment & Finance*, 39, 157-169. https://doi.org/https://doi.org/10.1108/JPIF-08-2020-0090
- Strączkowski, Ł., & Bartkowiak, P. (2021). Pandemia COVID-19 a lokalny rynek nieruchomości mieszkaniowych przypadek Miasta Poznania, In A. Jaki & B. Ziębicki (Eds.), *Wiedza Gospodarka Społeczeństwo. Wyzwania współczesnych organizacji i gospodarek* (pp. 273-287). Warszawa, Poland: Instytut Nauk Ekonomicznych PAN.
- Tomal, M., & Helbich, M. (2022). The private rental housing market before and during the COVID-19 pandemic: A submarket analysis in Cracow, Poland. *Environment and Planning B: Urban Analytics and City Science*, 49, 1646-1662. https://doi.org/10.1177/23998083211062907
- Trojanek, R., & Gluszak, M, (2022). Short-run impact of the Ukrainian refugee crisis on the housing market in Poland. *Finance Research Letters*, *50*, 103236. https://doi.org/10.1016/j.frl.2022.103236
- Trojanek, R., Gluszak, M., Hebdzynski, M., & Tanas, J. (2021). The COVID-19 pandemic, Airbnb and housing market dynamics in Warsaw. *Critical Housing Analysis*, *8*, 72-84. https://doi.org/10.13060/23362839.2021.8.1.524
- Ullah, F., Sepasgozar, S.M., & Wang, C. (2018). A systematic review of smart real estate technology: Drivers of, and barriers to, the use of digital disruptive technologies and online platforms. *Sustainability*, *10*, 3142. https://doi.org/10.3390/su10093142
- Zarrabi, M., Yazdanfar, S.A., & Hosseini, S.B. (2021). COVID-19 and healthy home preferences: The case of apartment residents in Tehran. *Journal of Building Engineering*, *35*, 102021. https://doi.org/10.1016/j.jobe.2020.102021

Authors

The contribution share of authors is equal and amounted to 50% for each of them. BM, MT – conceptualisation, writing, methodology, calculations, discussion.

Bartłomiej Marona

PhD, Associate Professor at the Krakow University of Economics, Department of Real Estate and Investment Economics, Krakow. His research interests include real estate economics and real estate management.

Correspondence to: Bartłomiej Marona, PhD, Department of Real Estate and Investment Economics, Krakow University of Economics, Rakowicka 27, 31-510 Krakow, Poland, e-mail: maronab@uek.krakow.pl

ORCID © http://orcid.org/0000-0002-0490-5945

Mateusz Tomal

PhD, Assistant Professor at the Krakow University of Economics, Department of Real Estate and Investment Economics, Krakow. His research interests include the housing market, real estate economics, land market, econometric modelling, and local government efficiency.

Acknowledgements and Financial Disclosure

The publication was financed from the subsidy granted to the Krakow University of Economics - Project nr 072/EEN/2022/POT. Mateusz Tomal is also supported by the Foundation for Polish Science (FNP) under the START programme.

The authors would like to thank the anonymous referees for their useful comments, which allowed to increase the value of this article.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright and License



This article is published under the terms of the Creative Commons Attribution – NoDerivs (CC BY-ND 4.0) License http://creativecommons.org/licenses/by-nd/4.0/

Published by Krakow University of Economics – Krakow, Poland



The journal is co-financed in the years 2022-2024 by the Ministry of Education and Science of the Republic of Poland in the framework of the ministerial programme "Development of Scientific Journals" (RCN) on the basis of contract no. RCN/SP/0251/2021/1 concluded on 13 October 2022 and being in force until 13 October 2024.