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Zoran Čekerevac**

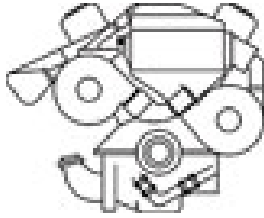
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Editorial on MEST Journal 2023-1

Prof. Dr. Dr. h. c. Zoran Čekerevac¹
Editor-in-Chief
(1) MESTE, Knez Mihailova 33, 11000 Belgrade, Serbia

Belgrade, January 15th, 2023

When we founded the MESTE organization, we desired to join the group of publishers who promote science and scientific achievements. In 2012, we launched two academic journals. One of them published works in English (The MEST Journal). The second promoted scientific achievements in Serbian and related languages (The FBIM Transactions), enabling researchers from the Balkans to express themselves more simply and reach readers that cannot understand English. We are particularly pleased that we realized our desire to promote the author's native languages in the scientific community for ten years. I take this opportunity to thank all the authors and reviewers who contributed to the publication of the FBIM Transactions. In comparison to publications written in English, we believe that writing in the author's native language significantly contributes to raising the scientific level in the authors' native country. Writing scientific papers in English can help promote the author, but the community from which the author comes hardly benefits.

But times have changed. Citation indexes (h-index, i10-index, etc.) appear to be a measure of the authors' scientific achievements impact and they enable the advance of authors' careers. Citation indexes and the very justification of their existence can be a separate topic for analysis. Under normal circumstances, they might be considered usable, but they seem to have become an end unto themselves and turned into likes on web pages. Unfortunately, it is easy to increase the citation rating if the author wants to. This approach to the evaluation of scientific achievements in many ways violates the very idea of quantifying achievements.

It is much harder to increase the citation index in languages that are not considered "world languages". Due to the possibility of using automatic translators, many authors decide to write in English, unjustifiably believing that the translation is correct and will allow them to become better known in the scientific community. That makes the work of reviewers and proofreaders difficult. The number of works rejected, based only on the quality of the English language is increasing. When authors try to improve the quality of the language of their work, challenges arise with finding quality translators and publishing costs rise. Some hope that by repeatedly submitting a revised work step by step, they will be able to publish the work. Because of the aforementioned phenomena and the lack of interest of the competent authorities to stimulate the publication of scientific papers in the native language, the quality of submitted works in Serbian and related languages is in decline. Not to get into a situation where, due to a reduced supply of good papers, the FBIM Transactions would start to be published irregularly, in the past year, within the MESTE we considered the justification of having two academic journals. At the end of September, that culminated in the decision to join the FBIM Transactions to the MEST Journal. The merger is facilitated by the fact that the topics covered in both journals are mostly the same.

Therefore, starting in 2023, the FBIM Transactions and the MEST Journal will be published under the unique name of the MEST Journal. The journal will continue to be published in English, but we leave the possibility of publishing the best works in Serbian and related languages in their original form in the chapter that will be called the FBIM Transactions in the next three years.



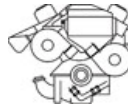
Compared to the previous edition of the MEST Journal, the situation in the world has not fundamentally changed. The pandemic is still ravaging the world, moving from one mutation to another. The health systems of many, even the most developed countries, are strained to the limit. The war in Ukraine has been going on for 326 days, bringing numerous victims and material destruction. The parties directly or indirectly involved in the conflict are becoming more and more infuriated. Other war conflicts are also announced. All in all, we can say that this is an ideal time for the development of war technology and military industry, while everything else is in big trouble.

In the MEST Journal, we try to work as usual. We succeed in this thanks to the enthusiasm of our authors, reviewers, and editors. This edition is published online and in paper form. In this issue, we have published 12 works. Three of them are original research articles. Seven articles belong to review papers, one paper belongs to the scientific discussion group, and one is a case study.

We thank authors and reviewers who did their job well and conscientiously to preserve the quality of the MEST journal and the works we publish.

We invite you to publish your works in the MEST Journal. We will help you with the process.

Prof. Dr. Zoran Čekerevac



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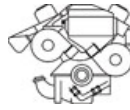
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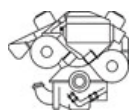


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REJOINDER TO KINSELLA ON OWNERSHIP AND THE VOLUNTARY SLAVE CONTRACT

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Abstract

Kinsella (2022) separates selling from ownership. He denies the claim that if you can't sell it, you don't (fully) own it. He rejects the notion that if you fully own it, you can sell it. He also rejects voluntary slavery and specific performance contracts. The present paper is an attempt to defend both claims. Does this debate between Kinsella and I have any practical consequences? Certainly not vis a vis the voluntary slave issue. That can only have theoretical implications for the establishment and refinement of libertarian theory. But the specific performance issue does have some. Suppose a doctor, during a surgical operation, decides to walk out of the operating room right in the midst of this procedure, leaving the patient to die. Can he or can he not be compelled, with the full force of the law, to get back on the job? Or may a guard forcibly prevent the quit right at the moment of danger? These are some of the issues explored in the present paper.

Keywords: Property; ownership; selling; libertarianism; deontology; voluntary slavery; specific performance contracts

REJOINDER TO KINSELLA ON OWNERSHIP AND THE VOLUNTARY SLAVE CONTRACT

Stephan Kinsella is one of the most gifted and creative libertarian authors now active. I am honored to be his several times coauthor (Block, Kinsella, & Hoppe, 2000; Tinsley, Kinsella, & Block, 2004; Block, Kinsella, & Whitehead, 2006). I am deeply indebted to him for his superlative

work on intellectual property (Kinsella, 2001, 2008, and 2012), and am a follower of his on that subject (Block, 2014, 2020; Mukherjee & Block, 2012.)

But he and I sharply depart from one another on the topic of selling and ownership, the voluntary slave contract and specific performance contracts (Kinsella, 2022)¹, the subjects of the present essay.

Kinsella accurately attributes the following position to me:

"If you own yourself—that is, you own your body—you should be able to sell it. So, a

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¹ Unless otherwise specified, all mention of this author will refer, only, to this one publication of his. However,

Kinsella (2003) makes many of the same arguments as does this one.



voluntary slavery contract should be enforceable. And if the legal system does not permit voluntary slavery, then it means you really don't own yourself. So, the implicit assumption behind this argument is that one inherent aspect of ownership is the right or ability to sell. In other words, it is assumed that 'ownership' necessarily includes the ancillary 'right to sell.' It's taken for granted that 'if you own something, you can sell it.'"

Why does Kinsella diverge from this perspective of mine? He starts to lay down his position as follows:

"... this argument is also used to argue for intellectual property. People say, 'well, if you can sell your idea, you must have owned it, so intellectual property is a legitimate concept.'"

Here, he attempts to demonstrate a logical inconsistency on my part. On the one hand, I do agree with him that intellectual property is a fallacious concept. On the other, he maintains that my linkage of selling, and ownership enmeshes me in accepting the validity of intellectual property almost against my will, so to speak. If I am to be logical, he in effect avers, I must give up one or the other of these to incompatible positions.

I think his argument fails. Consider the mathematics teacher who is trying to drum into the heads of his students that $2+2=4$. Now, the idea of this equation of course, cannot be owned since it is not scarce. However, the teacher's statement to this effect most certainly can be owned. Indeed, he is paid for selling this idea to the students, via his school. He does so with the words that come out of his mouth, and with what he writes on the blackboard with his hands, both body parts of which are indeed scarce, and can and are owned by him. Kinsella, here, is failing to distinguish between the teacher's statement to the effect that

$2+2=4$, which most certainly can be owned, indeed, is owned, on the one hand, and on the other hand, the disembodied notion that this equation is correct, which, along with Kinsella, I agree, cannot be owned.²

This scholar's next criticism of me is as follows: "So it's actually better to refer to property as the relationship between a person and a thing, although, over time, we sometimes are careless with language, and we will refer to the thing itself as property. Like we'll say, 'that car is my property.' But precise language would be, 'I have a property right in that thing, in that car,' or 'I own that car.'"

Kinsella and I are both native speakers of the English language, but we are very far apart from each other on this issue. In my view, "that car is my property" is a perfectly good equivalent, or synonym, for all of the other examples he uses. My claim is that he is here guilty of a stipulative definition, and as a result falsely rules out of court the phrase "that car is my property." This sentence would be accepted by 99 out of 100 speakers of English, and the one holdout would disagree out of pure obtuseness.

My critic next avers as follows: "... the essence of a property right is the right to exclude others, not the right to use." No, it is both. Certainly, the right to exclude. But, also, the right to use, so long as this use doesn't violate the rights of others. For example, I own my fist.³ I may legally swing it around all I want, but certainly not if it impacts your nose. Not even if it comes close enough⁴ to your proboscis to constitute a threat to you. Ditto for this gun I own. It is my property. I may use it to shoot it in any direction I please, except, of course, if it in any way violates anyone else's rights.

² Kinsella uses the phrase "intellectual property" no fewer than 17 times in his relatively short essay. This is more than passing curious, given that I fully agree with him on this subject, indeed, am an appreciate student of his on this issue.

³ Is the human body private property? Kinsella states: "So for the body, the link is a self-ownership link. You own your body, and the reason is because of your direct control over it." There is a lively debate in libertarian circles as to the genesis of this ownership, given that

none of us consists of anything other than parts of our parents' bodies, and resources they have given to us. See on this: Alstott, 2004; Block, 2016, forthcoming; Cohen, 1992; Curchin, 2007; Fried, 2004, 2005; Hicks, 2015; Jeske, 1996; Kinsella, 2006; Okin, 1991; Shnayderman, 2012; Torsell and Block, 2019; Woollard, 2016; Young, 2015.

⁴ How close may it venture in that direction? For an attempt to wrestle with that question, see Block and Barnett (2008).

Norman Malcolm said this of his teacher and mentor, Ludwig Wittgenstein, "On one walk he 'gave' to me each tree that we passed, with the reservation that I was not to cut it down or do anything to it or prevent the previous owners from doing anything to it: with those reservations it was henceforth mine."⁵ Precisely. This joke of Wittgenstein's is very apropos. He succinctly dramatizes what are the requirements of ownership: the opposite of everything he mentions to Malcolm. Kinsella stands refuted by Wittgenstein.

Kinsella's next foray is into the thicket of why we own ourselves. He states as follows: "the basis here of self-ownership, or body-ownership, is not homesteading, but it's the direct control over your body." And again, since this is a crucial part of his thesis: "So for the body, the link is a self-ownership link. You own your body, and the reason is because of your direct control over it."

I shall have much to say not so much in criticism of this claim, but of the use to which he puts it. However, initially, here is a push-back: suppose there is a super-duper mesmerizer, who can take over control of your body. Then, you no longer have "direct control" over your body. But from a deontological point of view, you are still the rightful owner of yourself. The uninvited hypnotist is a trespasser, a criminal. Moreover, we have very little direct control over ourselves when we are unconscious, or asleep. But our rights to not recede then, even by one single iota.

According to our author, "We could say that when a child 'wakes up' at the right moment when he becomes sapient enough to be said to have rights, he homesteads himself. But it's really a loose analogy. It just means that's the point in time in which he's a person with rights. It's not like his body was unowned, and he just homesteaded it."

However, I don't think you have to "wake up" in order to have rights. Sleeping people, comatose people, unconscious people, young babies all have (equal) rights. I go so far (Block, 2021) as to claim the same sort of rights for fetuses in the

womb, and they have certainly not yet "woken up" in any sense whatsoever.

Nor can I see my way clear to going along with Kinsella when he opines: "...like Crusoe on an island, he can never 'own' anything because there's no society to have norms with respect to. He controls, and he uses things. He possesses these things as means, he exercises 'actual authority' over these things—but he doesn't own them."

But ownership means the right to use, sell, lend, and exclude others from so doing with a given piece of property. Crusoe, the first one on the island, certainly is the owner of his hut, his rowboat, the land he homesteaded, etc. He built these items. He homesteaded the material out of which he manufactured them. He "mixed his labor"⁶ with at least some of the territory of the island. When Friday comes along, it would be a crime for him to take over any of these of Crusoe's belongings without the latter's permission.

This claim of Kinsella's, too, is problematic: "In society, you can also do the same thing. You can just possess something and not intend to own it—you pick up a stick and throw it away."

I have a different interpretation of this scenario. In my view, you owned this stick for a brief time, and then you abandoned it. If someone grabbed that stick from out of your hands before you threw it away, he would have been a thief; he would have stolen *your* stick. True, you had intended to throw it away, even were in the very act of so doing, but this makes no-difference; that stick is yours, whether you like it or not, at least for the time being. If in the process of throwing away that stick you accidentally hit some innocent person with it in the snout, you would have been guilty of attacking that person with *your* stick."

At this point, we arrive at the nub of Kinsella's thesis:

"... what about selling yourself, your 'self,' i.e., your body...? Keep in mind: external things can be sold because they were previously unowned and acquired by an actor-owner who is already a self-owner, and they can abandon

⁵ Malcolm (1958, pp. 31-32).

⁶ Bylund, 2005, 2012; Grotius, 1625; Hoppe, 1993, 2011; Kinsella, 2003, 2006, 2009A, 2009B; Locke, 1948

(pp. 17-19), 1955 (chapter 5); Paul, 1987; Pufendorf, 1673; Rothbard, 1973, 32; Rozeff, 2005; Watner, 1982

it. But your body rights don't arise by homesteading or by your intent to own yourself. They arise because of the best link based upon your direct control."

My response is that how your ownership over your own body "arises"⁷ is of little importance in this context. It is sufficient that now, you, no one else, are the clear owner of your own person.

Nothing daunted, Kinsella continues:

"So, if I try to make a contract, 'I promise to sell' or 'I promise to be your slave forever,' those words do not change the fact that I still have the best link to my body. And because my words are not an act of aggression—which is the only way to come to own someone else's body—if they commit an act of aggression—then promising to be someone's slave is simply not enforceable because it doesn't transfer any title to anything. You still own your body. You can always change your mind, in other words."

This is troublesome. You can change your mind about that shirt or car you just purchased. But suppose it was bought under a no "backsies" understanding. The sale was final, and no returns will be allowed. Let us posit you have a dog who is heart and soul with you. K9 dogs are said to have this sort of connection with their masters. According to Kinsella, not only would it be illegal to sell this dog, particularly to a neighbor who could still see him, influence him, but, also, well-nigh logically impossible for this to occur. Just as we all "have the best link to my body", you, too, have the best link to this dog. You snap your fingers, and the dog does your bidding, not that of the neighbor, to whom you have sold the dog. The point is, "the best link to, in terms of control," is clearly way outside the bounds of libertarian homesteading and property rights theory. Merely because someone has "the best link" to something, does not mean he is necessarily the legitimate owner of it, Kinsella to the contrary notwithstanding.

But he is on a roll. This author attempts a knock-out blow:

"It is true that man, being what he is, cannot absolutely guarantee lifelong service to another under a voluntary arrangement. Thus,

Jackson, at present, might agree to labor under Crusoe's direction for life, in return for food, clothing, etc., but he cannot guarantee that he will not change his mind at some point in the future and decide to leave. In this sense, a man's own person and will is 'inalienable,' i.e., cannot be given up to someone else for any future period."

Alright, I agree, no one can alienate his will. Will schmill! We are not talking will. Rather, we are discussing the legal status of a master who kills his voluntary slave. Is he a murderer, or is he not? This has nothing whatsoever with will, or links, or control, or any other irrelevant issue raised by our author. Of course, Kinsella's insight is correct: no one can alienate their will. We are sort of stuck with our wills. But what is the relevance of this correct claim? There is no relevance. Rather we are discussing an entirely different subject: the legal status, not the psychological status, of the person who signs a contract, for consideration, to renounce his otherwise existing rights not to be killed.

Both Kinsella and I have sons who we love very much. Suppose, god forbid, they both contracted a serious disease which, if left untreated, would kill them. Happily, there is a full cure. Unhappily, it costs \$50 million and neither of us dads have anything like that amount of money at our disposal. Happily, there is a billionaire, no, make that a trillionaire, who is willing to purchase both of us as slaves for this amount of money, but only if it would be legal for him to kill us without being accused of committing a crime. We both love our sons more than our own freedom and might well be more than willing to sign any such contract. However, under Kinsella's theory, both sons would have to die. Under the theory I am espousing, in very sharp contrast, both sons would live, and both fathers would go off to the rich man's plantation, there to do his bidding as slaves, at the risk of our lives. We benefit, since we rate our son's lives higher than our own freedom. The rich slave master, too, gains, as in all cases of voluntary commercial arrangements, at least ex ante, since he regards our servitude to him more

⁷ See fn. 3, supra.

highly than the piddling \$100 million, he has to pay for the pair of us.⁸

My learned friend's thesis is that the voluntary slavery contract is illicit since the will of the slave cannot be alienated. To be sure, that is correct. But the sale has nothing to do with the will. I stipulate it cannot be alienated. What is being sold, in sharp contrast, is not the will; rather, it is the right to object to being beaten, or killed, by the slave master. Note, I say "killed" but not murdered since under the aegis of voluntary slavery, the master has the right to end the life of the slave if he wishes to do so, at his own discretion.

Kinsella emphasizes the fact that "... your direct control or your will is the reason you own your body."

Alright, we are now at the point where we all own our bodies. Control over them may not legally be taken away from us.⁹ But it is entirely irrelevant how this came to be in the first place. It is now a fact. Kinsella should get used to this state of affairs. What is now of interest, in sharp contrast, is whether we may sell ourselves or not. One of the aspects of ownership is the right to sell. If we cannot sell ourselves into bondage, then, to that extent, we are not really full owners of ourselves.

Kinsella concludes: "...in (libertarian) law, 'sell' refers to transferring title to an owned thing. So, you don't literally sell your labor. You just perform your labor. You perform some action."

This seems to be made out of the whole cloth. It is as if Kinsella wants to alter accepted language. Yes, we perform labor. But we also sell it. We do indeed own our own labor. If someone takes it away from us, for example, by kidnapping us, they have, among other more serious things, also stolen our labor. What is going on here? What is

going on is that Kinsella is attempting to undermine specific performance contracts. A hires B to sing at his wedding. At the last minute, B has a better offer and refuses to appear at A's wedding as a performer. According to Kinsella, there are only two things that A can rely upon to ensure that B shows up. One, A will tell all and sundry that B is unreliable¹⁰. Two, A can get B to post a bond such that if he does not show up at the wedding, he forfeits a certain amount of money. What A cannot do is physically compel B to sing at his wedding: frog march him to the stage and threaten to shoot him if he does not exercise his tonsils. Namely, Kinsella opposes specific performance contracts. But why should such contracts be forbidden by law, if both parties agree to engage in them? For Kinsella, it is because these contracts reek of voluntary slavery, and he at all intellectual costs opposes that institution.

Let us use a more powerful scenario to demonstrate an alternative view. Bob is a high tightrope walker. He walks on a thin wire, 200 feet above the ground. If he falls, he dies. He hires Dave to hold a net under him, such that if Bob falls off the wire, Dave will be situated so as to be able to save his life. So, the performance begins. Halfway through it, Dave starts to walk off the job. May Bob, or one of his agents, compel Dave to fulfill a specific performance contract? That is, may Bob use (defensive) violence against Dave if he refuses to carry through? It all depends upon the specifics of the contractual arrangements between them. If it specifies that Dave will forfeit his bond, and that will be the only legal response of Bob, then so be it. But if the contract specifies specific performance, then Dave may properly be compelled to carry through on his assignment. Voluntary agreement is the key here, not control over one's body or will.

⁸ One objection to the foregoing is that the master could order his slaves to return the money he just paid for them. The response is that the contract could specify this could not occur.

⁹ I abstract from issues such as the death penalty for murderers, where we do indeed take the murderer's life away from him.

¹⁰ In the libertarian legal code, there are no slander or libel laws, so A need not fear telling the truth about B, even if it harms the reputation of the latter. See on this: Block 1976, ch. 7, 2008; Pillard and Block, 2020; Rothbard, 1998, ch. 16; Westley, 2008

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MARKETING PARADOXES: EXPLICATION OF SOME BASIC MARKETING PARADOXES

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*Dark wolf, what are you looking through those thick branches? I am looking to grab a lamb.
So grab, who bothers you? I am looking for a reason for the sake of the world.
Grigor Vitez*

Abstract

This paper aims to clarify the relationship between marketing and important economic/business categories and the internal relationship between two fundamental marketing principles. The author used a qualitative approach to determine the existence of mentioned paradoxes, i.e., using logic-verbal methods is usual in economic theory/philosophy where rational discussion is the essence of understanding economic phenomena and delivering significant insights. The results showed three existing contemporary marketing paradoxes. The first is the paradox of marketing and sales/entrepreneurship, i.e., a paradox between satisfying the wishes and needs of the customers and the salesman/entrepreneur. The second is the paradox of marketing and rational consumer/homo economicus because of their conflicting goals. The third is the intramarketing paradox, i.e., between old and new basic marketing principles, because of substantial incompatibility and dubious effect on consumer well-being. A limitation of this paper is the lack of a mainstream marketing approach that does not emphasize significant concepts contradictions and the absence of quantitative methodology for testing the theses/conclusions. The theoretically unsolvable marketing paradoxes solving can be facilitated by finding a dialectical compromise between achieving contradictory goals closest to the optimal win-win principle. Solutions where only one of the parties in the relationship should dominantly benefit (win-lose) are of no use.

Keywords: marketing paradoxes, sales/entrepreneurship, rational consumer/homo economicus, new wishes creation, existing wishes and needs satisfying, win-lose, win-win

1 INTRODUCTION

Although it is ideal when the goals of different economic actors are in the same direction, i.e., one-way, this is often not the case. Conflicting goals of the business and economic actors are

relatively common. The scarcity of resources and the demand for them are dominant facts (Samuelson & Nordhaus, 2007). A typical example is a goal of increasing profit by reducing costs (one side goal) at the expense of reduced utility and increased costs of another side. That is by the principle of one-sided utility maximization, i.e., by the win-lose principle. In game theory, win-lose situations result when only one side

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perceives the outcome as positive (Spangler, 2003). In the world of resource scarcity, this principle is dominant and usually marked by wisdom: *One man's loss is another man's gain*.

If there are conflicting variables in the utility equation¹ it is impossible to increase both critical variables and have a win-win final situation. Win-win outcomes occur when each side of a dispute feels they have won, i.e., both sides benefit from such a scenario (Spangler, 2003). It is not a win-win if such a good win-feeling should be achieved by mind manipulation when the factual situation for one side is a losing position. While increasing one size decreases the other, and vice versa (e.g., costs increasing reduces profit, increased profit needs reduced costs), a win-win cannot appear without human mind manipulation. In fact, in scarce resources, this is a mathematical-logical law.

A contradiction/paradox arises if undesirable variables and their regular direction of actions simultaneously try to be changed according to the wishes, wills, and needs of the actors. For example, the utility and income increase of one actor while reducing uselessness/harmfulness and costs of other actors in the relationship.

Thus, the paradox is a consequence of seeking maximum utility for all actors in a conflict (scarcity) when it is impossible due to the nature of conflicting variables and seemingly consistent goals. For example, maximum profit/satisfaction for the entrepreneur and maximum satisfaction of consumer desires and needs). Ignoring or denying such firm logical law or human desire to change such firm logical law creates paradoxes that can be natural, logical/mathematical.

It is well known that all situations in economics and business are not only mutually beneficial (win-win). Some are optimal for only one side and less beneficial or even harmful for the other (win-lose). So, no technique, ideology, manipulation, or panacea can turn it into a win-win situation. For example, if costs/spending are higher than savings potential investments must be lower. For one economic actor to get/have more prosperity (by redistributing goods/power, transferring harmful effects to another) other economic actors need to get/have less. Also, what is good/useful for one party (e.g., one individual/group) does not have to be for another party (e.g., another individual/group/society). High utility for one side, may not result in the same or equal utility for the other side. A utility for the individual/smaller part of the whole may also conflict with the usefulness of the whole. So, the benefits of the state budget, achieved, e.g., by increasing taxes, inflationary financing, and collection of import legal duties can be beneficial for some actors, and completely harmful to other actors (Samuelson & Nordhaus, 2007). In a situation of limited economic resources (they are always limited by something), for someone to have exceptional/maximum well-being, others must have lower/minimum well-being by the logic of limited economic resources.² In many business/economics situations, it is not possible, or even not socially (politically) desirable to always achieve a mutually beneficial win-win principle.³

Although contemporary marketing is considered a key business and economic function, we can note its dubious relationships:

- a. Marketing with sales/entrepreneurship.

¹ One variable is acting in one direction and the other one in the other, opposite/not the same direction.

² It is a simple fact that there are not enough economic resources even in societies of maximum well-being (Zelenika, 2007.) for the standard of living of the highest social class/caste (e.g., 1% of the richest). This legality is vividly illustrated by the existence of socio-economic formations throughout history to the present day, with socio-economic stratification based on fundamental relations: slave owner-slave; feudal owner-serf; employer/owner-hired labor/non-owner. Due to the nature of the limitations of economic resources and the nature/psychology of humans, there is a difference in the level of well-being of different social strata that range from maximum well-being to minimum (barely sufficient for life) well-being (Zelenika, 2007).

³ Win-win principle can be illustrated by the popular saying: *Let the wolf be full, and the sheep count!* Due to the nature of things, i.e., diverse/conflicting goals and possible negative effects due to unilaterally defined goals, in practice this is impossible. However, although in theory regarding the realization of win-win principles seemingly good solutions appear/may appear, e.g. figuratively/metaphorically speaking: *To make a wolf drink sheep's milk and so satiate*, in reality, it is used as a way of manipulation (fraud), and often results in the detriment of the deceived (manipulated) or figuratively/metaphorically speaking: *The sheep will be mutilated/ eaten, despite the promise of the wolf to the sheep that it will not die if it gives a little milk*.

- b. Marketing with rational consumer behavior/homo economicus.
- c. Intramarketing in principle conflict between new consumers' wishes creation and satisfying their existing needs and wishes.

There is almost no talk/writing about marketing paradoxes about sales, rational consumers (homo economicus), and intramarketing paradox about the two basic marketing principles (old and newer one, which is dominant in the placement of new technological products). They are very poor and in fragments elaborated, discussed, and written. There is also an obvious lack of sources on these topics. The observed two marketing paradoxes and one intramarketing paradox are discussed below.

2 MARKETING AND SALES/ ENTREPRENEURSHIP PARADOX

The marketing concept developed during the industrial revolution (18. and 19. century) so for the first time in history production of goods was separated from their consumption. Mass production, developing transport infrastructure, and growing mass media meant that producers needed to, and could develop more sophisticated ways of managing the distribution of goods (Brace, Moore, Perl, & Weaver, without year). Before the appearance of marketing, it was produced and sold mainly according to human needs (what people/customers need), and later due to the development of productive forces, and hyper production of goods and services (to absorb increased supply), efforts were made to stimulate human desires (which are unlimited by nature) in hedonism direction, so emerges marketing philosophy and marketing business practice. Therefore, the basic (needs) are supplemented with hedonism (desires), sales are supplemented and transformed by marketing, and a new

philosophy of satisfying customers' desires and needs arose.

The prime goal of marketing is to create satisfaction of customers/consumers (satisfying their wishes and needs⁴, i.e., creating customer well-being). The goal of sales is to create satisfaction for the seller/entrepreneur/business organization (by satisfying the wishes and needs of the entrepreneur). This creates a paradox between the possibility of maximizing the satisfaction of the wishes and needs of customers (marketing) and maximizing the satisfaction of the wishes and needs of entrepreneurs/business organizations (sales).

The source (cause) of this paradox between marketing and sales, is a contradiction between the goals of buyers and sellers/entrepreneurs (conflict of goals, conflict of satisfaction) since the customer wants a top product with a minimum price and the entrepreneur the maximum price with a product of minimum quality/costs) (Adams, 2000). To reconcile this contradiction, it is possible to theoretically claim that the marketing goal is profitable in satisfying the desires and needs of consumers, which is an oxymoron, because then logically it is actually about dominant satisfying the desires and needs of entrepreneurs/business organizations and sales.

To make these relationships clearer, it is good to see how marketing and sales achieve their goals. Marketing achieves its goals of satisfying the wishes and needs of customers in a way that maximizes the goals (satisfaction) of customers, so-called four basic marketing strategies (cf. Kotler, 1988; cf. Bennett, 1988, 117) by:

1. making the product⁵ according to the wishes and needs of customers,

⁴ Need is an objective lack (or surplus) of something in the body (Pastuović, 1999), usually refers to the physiological state of the body caused by a certain imbalance/heterostasis (e.g. need for water, food), may or may not have an experiential aspect (e.g. the body's need for a vitamin) (Petz, 1992, p. 325), and desire is a psychic sense of lack (or surplus) (Pastuović, 1999).

⁵ Here is adapted Kotler's opinion (1988) i.e., products include all types of offers, e.g. different types of services can be included, even persons (legal, natural) that provide a certain satisfaction to consumers (therefore

products are: business organization, institution, brand, logo, as well as a beautiful/capable man/child). Although it may be unusual for individuals to be products, it is because they provide a service of pleasure (positive emotions) that they offer to other people (similar to trees that can pleasure with flowers, leaves, and shade). After all, it has value for humans. Potential product is everything that gives/can give pleasure to humans, and what gives satisfaction/pleasure according to the marketing concept can be sold/charged.

2. making the price acceptable to the buyer (low enough, or sometimes, high enough for some prestigious products)⁶,
3. making the place and manner of purchase convenient/easy for the buyer and that the buyer has a pleasant shopping experience, and
4. promoting the product creating/stimulating a strong desire to buy the product.

So, using these four basic strategies, marketing achieves its purpose.

Sales achieve their goals to satisfy the wishes and needs of sellers/entrepreneurs similarly, but with cost rationalization and entrepreneurial interests/satisfaction, i.e.:

1. to make the product approximately (seemingly) according to the wishes and needs of customers, but as cheap as possible,
2. to make the price high as possible (achievable) i.e., maximal,
3. to make the place and methods of sale appropriate but concerning costs,
4. to make effective promotion (to create a desire to buy the product), but cheap (ideally if it is not needed, because then it costs nothing, and as a rule, the promotion makes up a significant part of entrepreneurial costs).⁷

It would be ideal for an entrepreneur not to need and not to have a marketing function (because of no costs) because that would maximize profits (as the difference between total revenue and total costs). In theory, this would be possible when products are sold by themselves, without marketing and sales functions (ideally without administrative sales costs). When demand is higher than supply, marketing is not needed, and when supply is higher than demand marketing is

needed, because products cannot find a buyer on their own, i.e., sales cannot happen by themselves. In theory, there should be no sales if there were automated *just-in-time* sales.⁸

Is it possible to maximize customer satisfaction (low price, high quality) and entrepreneurial satisfaction (high price, low quality/low cost) at the same time? If we consider the goals of the rational consumer and the rational entrepreneur or the producer, we can get a clear answer. Namely, for the rational consumer, the product should be of high quality and cheap, which is often logically and technically impossible (Adams, 2000). A rational economic actor/consumer buys cheaply (as cheaply as possible) and sells his products and services (results of his work/business in the context of residual income) expensively (at the maximum price, trying to increase the price of his own work/business combination). A rational entrepreneur behaves the same, buying inputs as cheaply as possible, and selling outputs as expensively as possible, also trying to minimize the cost of his own work/business combination. There is an evident conflict of goals/interests. Therefore, it is only possible to mitigate the conflict of goals/interests in the relationship between the customer and the entrepreneur and the inherent conflict of the goal/interest function. It is impossible to maximize both, customer satisfaction (low price, high quality) and entrepreneur satisfaction (high price, low quality/low cost), as these are conflicting goals. The paradox is apparent, and to alleviate the conflict a compromise is needed.

After the chapter, we can state that there is an evident paradox between marketing and sales/entrepreneurship.

⁶ Some prestigious products (e.g. cars, perfumery) sell well only if their price is high. It is a symbolic purchase where emotional, not utilitarian criteria are dominant. By making a symbolic purchase, the consumer builds an image of himself (Milas, 2007, pp. 41-42). There is also a paradox of increasing bread demand due to the general increase in prices because the poorer in such a situation can only buy more bread (to survive) at the expense of more expensive food (Jašić, 1998).

⁷ As a rule, any cost is harmful if it is not needed. Therefore, a rational entrepreneur does not have a positive emotional attitude towards non-value-added costs that can be avoided.

⁸ In this case the products go immediately to the customers and the price is deducted directly from the

customers' current payment account (purchase by standing order, for example by automatic payment of telecommunications services, etc.). This way of automated *just-in-time* sales is possible where there is a constant need/demand for a product and the willingness of the customer. However, this way of buying and selling is not possible in all types of buying and selling relationships, especially in those where there is no consent/willingness of customers. It is also possible somewhere, but some people do not accept the option of automated *just-in-time sales* (e.g. there are people that want to buy only by cash, without automatized electronic payment).

3 PARADOX OF MARKETING AND RATIONAL CONSUMER/HOMO ECONOMICUS

With the marketing appearance, more and more are produced and sold according to the hedonistic nature of humans (desires), although this is in contradiction with the rational consumer (homo economicus) because human desires are huge/unlimited, and purchasing (economic power)/consumer income is very limited, so consumer behavior toward desires is irrational. It is irrational for the material and psychological well-being of consumers.

Therefore, marketing is also in conflict with rational consumers and the thrift (economy) of consumers/customers, the so-called homo economicus. Homo economicus (rational human) is adorned with the principle of *better is more* in profit, and *better is less* in loss/cost. There are objections that people do not always behave rationally, are not always selfish and driven by their profit, and are not always guided by logic, planning, and facts. Also, they are sometimes altruistic, driven by passions, with a lack of planning, impulsiveness, and that they are indecisive and negligent (they have weaknesses in decision-making), pieces of evidence from behavioral economics are insufficient to support the rejection of rational choice theory in resource and environmental economics (Đorić, 2022, 77 & 84).

Namely, the marketing goal is to find and create consumers, which achieves by strengthening the desires and needs and helping sales to meet the desires and needs of entrepreneurs (to achieve maximum sales or earnings). Marketing thus maneuvers between the wishes and needs of two parties (rational consumer and rational entrepreneur) which are in one significant part immanently mismatched (opposite direction of interest). The overlap of fields of interest, goals, and values is a mutually beneficial situation, and non-coverage means mismatched values, interests, and goals.

For marketing from the position of employer/entrepreneur, it is therefore not rational/desirable that consumers (people) have modest desires and needs because then they will buy less (creating low total income for the entrepreneur and consequently lower earnings).

The philosophical view that a rich/wise man has modest desires and needs (frugal) and that people should strive to be as frugal as possible (rational in spending) conflicts with marketing goals.

Therefore, marketing is contrary to the principle of economy and the economy of the rational consumer. Here we could conclude justifiably that maximum customer satisfaction is not the real/primary goal of marketing (this is a proclaimed, but not a real goal that is hidden, so we could talk about hypocrisy in principle). Namely, if the consumer were satisfied, marketing would achieve its goal, and this would be the reason for the termination of its existence (it should self-abrogate). This is also evident when considering the length of time consumer satisfaction. If it is very long or lifelong (e.g., cars, computers, furniture... last a very long time, e.g., 50 years or has human life duration), it is undesirable because it would mean low turnover of products and weak demand. This is a contradiction because the goal for the rational consumer (homo economicus) is that the product meets his needs in the long run. After all, it is also cheaper (more economical). Namely, it is not the same (economical) for a rational consumer to buy, for example, 5-10 cars instead of 1-2 in a lifetime.

All people behave most of the time rationally and within the mental model by which they interpret reality. If consumers internalize a mental model that distorts thrift/rational economical behavior (creates a mental model that is less or not rational) they become prone to irrational buying behavior. Therefore, a distorted perception of reality is possible, also buying above rational desires and needs (e.g., buying not necessary goods on debt by shifting repayments into the future). Buying on debt (credit) is therefore one of the most important social innovations in marketing, as it stimulates consumption but reduces consumer rationality.

We can conclude that maximizing the function of the marketing goal is possible only by strengthening the irrationality of people (to buy according to their wishes, not according to their needs). If such goal maximization is brought to extremes, market anomalies are possible. Therefore, marketing associated with sales can be unethical and manipulative (e.g., advertising and selling low-quality and even harmful products). That is practically achieved primarily by acting on the emotional-motivational complex of the consumer with the asymmetry of information possessed by actors in the sales business. The rational consumer aims to achieve individual well-being by the following basic principles:

1. Increasing their revenues. A rational man wants to sell or earn, not just buy consumer goods and be a mere consumer (reduce his earnings/wealth and so his economic safety)!

2. Reducing/rationalizing consumption (purchases). Any cost is bad/undesirable if it is not necessary!
3. Increasing savings (to invest and increase one's security and well-being)!⁹
4. Increasing investments. Savings investing brings future income and a sense of security and increases individual material and psychological well-being.

The goal of marketing for buyers/consumers to increase their spending on consumer goods (have at least some irrational consumption) is contradictory from the point of view of achieving individual well-being (individual thrift).¹⁰ Marketing seeks to identify and locate irrational consumers (so-called market segmentation) because this is much easier and simpler (cheaper) than achieving top-quality products (the best product in its category - the so-called differentiation) that are sold *alone*. Since completely rational people *in a permanent position* do not exist, there are very few of them, it makes sense to use marketing in identifying and gaining irrational consumers. Good advertising (promotion) can encourage purchasing of practically worthless and even harmful products. Some examples can be "men's water" elixir, stomach eliminator, corsets, absinthe, gambling - lotto.¹¹ A common strategy in marketing is to act on a person's emotional and erotic complex, technically called *a wide range of intellectual and aesthetic tendencies* (Adams, 2000).

As the chapter conclusion, we can state that there is an evident paradox between marketing and rational consumer/homo economicus.

4 PARADOX BETWEEN OLD AND NEW BASIC MARKETING PRINCIPLE

The standard old marketing strategy is: *Find the desire/need and satisfy it*. It is an old so-called *Technology pull* strategy. The disadvantage of this approach is that many people do not know exactly their wishes and needs, so a significant number of these wishes/needs remain unmet. Therefore, a new, more advanced marketing strategy is created: *Create a new desire/need and satisfy it*. So, according to the new contemporary marketing strategy creating consumer wishes becomes significant. It is a newer so-called *Technology push* strategy present in almost all new technological products (Byers, Dorf, & Nelson, 2015), especially high-tech products (e.g., printing machines, typewriters, airplanes, computers, laptops, printers, scanners, mobile phones, smartphones, smartphone card readers, drones, Kevlar clothing, nanotechnology products, new generation vaccines...), social innovations (e.g., banking products, electronic voting, internet products) and social entrepreneurship.

Considering the compilation of both marketing principles, one can conclude that old/new products can satisfy existing desires and needs

⁹ The problem noticed and explained by Keynes, J. M., is the so-called *savings paradox* which says that an increase in savings by an individual leads to his real decrease and that an increase in savings can reduce the overall wealth of the nation (Jašić, 1998, pp. 44-46). This paradox is being solved by investment. Ideally, investments should be productive, i.e., economical, which means that they maximize the return on investment. Unproductive investments, and failed investments, in particular, reduce wealth because they devastate/destroy material substances that could have been a creator of surplus value. Savings (treasure) itself, if it does not create surplus value, it is considered *dead capital* that reduces overall welfare (such a historical example was experienced by Spain (Landes, 2004). Human labor (past labor = culture and current labor) in all its forms (physical, intellectual, creative, spiritual/value) proves to be the most complex but the only factor in long-term well-being (Bogdanović, 2008).

¹⁰ Due to the phenomenon of *price scissors*, it was irrational to buy manufactured/industrially produced bread in the Republic of Croatia. For example, in 2021., the purchase price of wheat at harvest time (July 2021) was about 1 HRK/kg (.133 euro/kg), and the price of bread for which you need to spend approx. ½ kg of wheat for plain standard bread (white, semi-white)

weighing 1 kg and with a selling price of up to 10 HRK. After calculating all the costs, it turns out that it is most rational to buy wheat/flour and bake bread at home in approx. 1/3 of the price (hence the mass appearance of bakeries in the Republic of Croatia). This is also an economic paradox because mass industrial production should result in lower prices (it is a paradox that the individual/home price of bread is lower than the industrial one). The conclusion is that here in the bread business in Croatia someone makes an extra profit. Such a situation exists also with other products. It is especially irrational to produce and consume unnecessary/harmful products with pronounced externalities (for example, plastic packaging that accumulates unnecessary/harmful garbage). In addition to irrational production, it is also irrational to create jobs (employ people) that do not justify their income or create surplus value (fictitious jobs that have only cost). Market and political marketing have a great influence on the creation and maintenance of such irrationalities.

¹¹ In this context, political irrationalities, strategic irrationalities (strategic failures), and war irrationalities (attacks on a strong and/or tough opponent) can be mentioned. It is also worth noting old folk wisdom: *There is no profit from a smart/rational man!*

(*technology pull* marketing principle), but also a new product can create desires and needs (*technology push* marketing principle).

The paradox between old and new marketing principles is that by old principle it should satisfy existing human wishes and needs (i.e., increase their well-being) and by a new principle, the human wishes should be created regardless of increasing their well-being, they can also diminish consumer wellbeing, but this is irrelevant for the opposite (supply) side. Therefore, these two principles are in contradictory/paradoxical relationship. This is most obvious if we discuss the so-called *dark side* (shortcomings) of new technological products. The negative side of new technology products is that in addition to the cost price (an expense that initially reduces an individual's savings and investment potential), they typically consume other valuable customer resources, such as:

- *increase economic risks* to consumers/technology users, such as the use of:
 - credit,
 - expensive compulsory (experimental) vaccines,
 - electronic money that is easy to block if the consumer behavior is undesirable/unfit (e.g., in Canada during the Covid-19 crisis),
- systematic electronic surveillance and social scoring (e.g., social credit in China) deepen existential threats and risks.
- *increase time risks*, i.e., reduce the free time of consumers/high-tech product users (e.g., unproductive multi-hour dealing with smartphones, computers/internet, new technological toys/programs-videogames, unfruitful hours of watching television). A specific problem is the creation of pathological psychological dependence/dominant psychological preoccupation with high-tech products because technologically trapped people no longer have enough time for other life roles (or their time is significantly limited/reduced).
- *increase health risks* because of deterioration of the physical condition due to reduced movement, obesity, the risk to psycho-physical health (due to dominant communication with electronic interfaces, reduced interpersonal communication, and changes in the perception of the world due to marketing promotion of the *perfect world*, high risk of shortening attention time, as well as reduced learning abilities, mental disorders, emotional crises, and illnesses such as

depression and anxiety). Also, there are other health risks due to ionizing and non-ionizing radiation (e.g., radiation from telecommunication and wireless networks), pollution by particles, nanoparticles, and substances with toxic, mutagenic, and unknown properties. New compounds, biological and chemical agents, GMO food, and industrial and municipal waste are present in the air, water, and soil, as well as in finished food products and medicines, with long-term known or unknown/risky effects on human health. For example, plastics and microplastics as technology products of the older generation are ubiquitous in new technology products (in mass use) and increase the risks to human health. There is more and more evidence of the negative impact of plastic on flora and fauna and the significant pollution of oceans and marine organisms by plastic. Currently, there is growing evidence of the negative impact of plastic on flora and fauna and significant pollution of the oceans and marine organisms with plastic.

- *increased additional now unknown risks*. New technology products can create additional risks which are now not known. For example, the industry creates garbage and externalities (pollution of air, soil, water, flora/fauna/humans) which were not known or not so obvious a couple of years ago and were not treated as a cost/risk for consumers. Today we have real *green risks* so consumers must pay for garbage remediation/pollution risks, although the industry is responsible for such risks (e.g., garbage remediation). Therefore, in the future is possible that consumers will have other risks from used products that today are unknown (e.g., economic in the form of additional taxes or health risks because of unknown effects on new *healthy* technology products).

Although the products of new technologies should be designed to increase overall individual and collective well-being (welfare), because entrepreneurship/selling interest marketing should create huge (irrational) wishes, consumer well-being becomes less important/irrelevant. Since new technological products have their disadvantages and dangerous sides and can bring hidden different risks for people and nature, the marketing principle of new desires unconditional creation promotes the manipulation of the human mind (non-critical thinking), so they should be treated dialectically (critically) and with caution.

Also, the creation of irrational human beings by the programming principle: “*You want this, this is what you need!*” is a dubious practice where the goal is not the well-being of the consumer but the entrepreneur/producer/seller. A similar principle is present in modern propaganda where new ideologies are created and normalized using the Overton window.¹² Thus, the modern marketing principle (creating new desires while providing such satisfaction), the Overton window (creating new thinking while normalizing), and creating problems with programmed (desired) solutions are the same principles of modeling human behavior and mind manipulation (Bogdanović, forthcoming).

Based on the above mentioned, it is increasingly clear that marketing (with the mission of increasing consumer welfare in the context of meeting their desires and needs)¹³ with the realization of the principle of creating new wishes has controversial, contradictory, paradoxical, therefore often negative impact on individual welfare (e.g., new technologies consumers), especially if marketing promote and sell problematic high-tech products in the asymmetric mode of communication (what is desirable it is communicated and even exaggerated, and what is undesirable is not communicated or even marketed as an advantage/potential utility).¹⁴

After the chapter, we can state that there is an evident intramarketing paradox between two famous basic marketing principles (old and new one).

5 CONCLUSION

This paper noted and discussed three theoretical types of unsolvable economic paradoxes in the marketing field:

1. **Marketing and sales/entrepreneurship paradox.** This contradiction is conceptual and cannot be resolved due to the essential difference between marketing goals (satisfying the wants and needs of customers)

and sales/entrepreneurship goals (satisfying the wants and goals of the sales/entrepreneur/business organization).

2. **The paradox between marketing and the rational consumer/homo economicus.**

Contrary to the idea and assumption that man is a rational actor in economic processes (the so-called homo economicus), marketing wants and needs an irrational consumer. The rational consumer is a contradiction to marketing because buying according to desires (which by the nature of things are almost unlimited), with income (which is limited) is not rational. It is not rational to promote a product with fictional characteristics that are completely different from the real ones (marketing is then not aligned with satisfying the wants and needs of the consumer, and the rational customer is rejected). The marketing treatment of people as irrational beings (consumers) is in contrast because rational people and societies primarily want to sell their products and services, accumulate values, and reduce their risks with a higher level of personal/social well-being.

3. **The intramarketing paradox between old and new marketing principles.** A new paradox arises with replacing the old classic marketing that followed the business principle *Find a desire and fulfill it* (technology pull strategy) with the principle *Create a new product (create a new desire/need) and satisfy the consumer* (technology push strategy). The paradox between old and new marketing principles is that by old principle it should satisfy existing human wishes and needs (i.e., increase their well-being) and by the new principle the human wishes should be created regardless of increasing their well-being, so the realization of such principle can also diminish consumer well-being, but this is

¹² The Overton window is a model for policy change. It can dramatically change public opinion i.e., from firstly inappropriate ideas, behavior can be normalized to the normal even desired idea, or behavior (e.g., homosexuality, hypocrisy, hostility, etc.). This is the process of how from an unthinkable idea, gradually through a radically, acceptable, reasonable, popular idea finally becomes policy on default. (The Overton Window, n.d.).

¹³ It is possible to critically note that marketing can't increase human well-being if human desires and needs are pathological. However, the task of marketing is not only to stimulate/promote pathological desires and

needs (e.g. various oddities) and normalize abnormal/strange behavior but also to discourage the above-mentioned undesirable behavior (so-called *anti-marketing*), because otherwise, it is a deviation of the original marketing mission and vision.

¹⁴ The consumer who decides to buy should also have mechanisms to verify the information offered to him, and if this is not the case, or there is only one monopolized/oligopoly source, it is very likely a matter of manipulation (fraud). A dark example is the purchase of an experimental vaccine that can have a markedly detrimental effect (e.g. the death of a customer/consumer).

irrelevant for the opposite (supply) side. These two principles are in contradictory/paradoxical relationships. This is most obvious if we discuss the so-called *dark side* (shortcomings) of new technological products. New contradictions between new and old marketing principles are mostly evident in incidental effects (externalities) from new technology products, that are not directly visible, such as increased economic, technology user time, and health risks for the buyer/consumer. Dealing with the potential risk and contraindication of the product for consumers is not in the description of marketing activity and this contradicts its mission of satisfying the wishes and needs of customers/consumers i.e., *maximizing/optimizing customers- well-being*. Marketing's new principle contradicts its old basic principle if it does not maximize/optimize the well-being of customers/consumers.

a dialectical compromise between achieving contradictory goals so that it is closest to the optimal win-win principle. Solutions that should dominantly benefit one of the parties (win-lose) are of no use. Namely, the win-win principle in an optimal sense is hard to achieve because each thing, decision, policy, and solution have its advantages and disadvantages (yin and yang) and as such different consequences for those concerned (shareholders on supply and demand side). Such a compromise that maximizes the satisfaction of all actors in the marketing and sales process, marketing and rational mind, creation of new wishes, and satisfaction of existing wishes is closest to the realization of the win-win principle. Achieving a compromise of opposing interests and goals is not a simple and easy task. The conflict of interests and the achievement of an optimal solution in a conflict of general and specific interests are still not satisfactorily resolved on a mental (philosophical), practical, political, legal, and business level.

Solving theoretically unsolvable marketing paradoxes can be alleviated in practice by finding

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IMPACT OF COVID-19 AND UKRAINE-RUSSIA WAR ON THE INTERNATIONAL TRADE AND LOGISTICS

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Abstract

The COVID-19 pandemic has caused a series of disruptions in production and transportation. After the reduction in mortality from COVID-19, trade, and tourism began to accelerate sharply, which resulted in increased demand, primarily for air transport. And then, there came a special intervention of Russia in Ukraine. During the ongoing intervention, the transport infrastructure in Ukraine was damaged significantly. The EU actively joined the war and adopted a series of sanctions to undermine Russian economic and financial ability to wage war. That led to the closure of the EU airspace for Russian aircraft, the closure of the EU ports to Russian ships, the banning of Russian transport operators, and bans on the export of goods and technology to the aviation, maritime, and space sectors. Pipeline transport is also under attack. The United States and several countries introduced similar bans. The sanctions caused a backlash and also affected transport in the EU, leading to difficulties in traffic, gas, and oil supply. Western airlines also cannot fly to or through Russia. Bottlenecks emerged in supply chains and the need to bypass traditional routes. That increased travel time and costs significantly. Transport companies faced restrictions from both the the Western countries and the Russian Federation. In connection with the 'special' operations in Ukraine and the Western sanctions, the transport situation in the Russian Federation has also deteriorated significantly. This paper will not deal in detail with the causes of crises but their effects on transport.

Keywords: transport, logistics, sanctions, COVID-19, war.

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1 INTRODUCTION

The COVID-19 pandemic has caused enormous problems in production and transportation. The problems caused by the lockdown affected the entire world trade. China responded to the spread of the coronavirus with harsh measures. It reacted to every case of infection with isolation, even in big



cities. One of the most significant cases was the closure of the port of Shanghai, which handles 20% of China's exports. (trans.info, 2022) The port operated with significantly reduced capacity for three months, so the transportation of goods was directed to other ports, which caused great difficulties in supply. During the pandemic, vaccination and air-travel games began. Western countries did not recognize Russian vaccines and prevented the travel of Russian citizens vaccinated with Russian vaccines. Countermeasures immediately followed. Even citizens vaccinated with Russian vaccines could not fly from EU airports to airports in Russia. For example, Serbian travelers could fly to Russia only from Serbian airports. A ban on passenger air traffic also appeared between the USA and the EU. If the pandemic limited passenger traffic and threatened global supply chains, the war in Ukraine has set them back. Each day of the war brings increasing challenges to supply chains on various grounds. The main characteristic of today is uncertainty. While the impact of the pandemic was considered a natural calamity, although opinions on the origin of the virus are divided, the war in Ukraine led to huge divisions in society that artificially led to a global economic crisis. Without considering other influencing factors, one can say that two large countries somewhere in Eastern Europe have gone to war, but this is unlikely to have a major impact on global supply chains since both countries express their desire to participate in world trade. Both countries could use land connections for road and rail transport, and the Black Sea for maritime transport. If there were no other factors, Ukraine and Russia could be at war without anyone noticing. But the ambitions of individual countries' governments have led to barriers being erected in supply chains, impeding the movement of goods such as auto parts, oil, and grain. Paradoxically, it seems as if they do not consider the consequences for their countries and their population, and ultimately for themselves. Every day there is an increase in prices, and this necessarily encourages inflation. As a result, most businesses and millions of consumers are suffering worldwide. All governments are talking about how the winter will be difficult and uncertain, without looking for realistic alternative solutions. It seems as if they are sweeping the problems under the rug, hoping that something will happen at the

right moment. However, the problem will not resolve itself satisfactorily. It may resolve itself as a result of big earthquakes. On the other hand, the population oppressed by the heat that swept Europe this summer does not pay attention to the announcements of the cold. No one knows how they will react when they become aware of the shortage.

Until recently, only experts were aware of the importance of the influence of the Ukrainian and Russian economies on the world economy. A recent Dun & Bradstreet report (Russia-Ukraine Crisis - Implications for the global economy and businesses, 2022) states that more than 600,000 businesses worldwide rely on Russian and Ukrainian suppliers, with just over 90% of them located in the US. These high numbers are partly due to the oil, gas, corn, wheat, sunflower seeds, other basic foodstuffs, and semi-finished iron exported from Russia and Ukraine. Because we cannot do without them, finding new ways for these products has become a priority task.

The Russian action shocked the Ukrainian economy. The World Bank reports that it will decrease by 45% this year. It could fall even lower depending on the severity and length of the war. The Russian economy has also sunk into a deep recession. Production will decrease by 11-12% this year. (Noble, 2022)

Due to difficult supply and difficulties in production and transportation, many producers have left Ukraine, and those who try to maintain business in Ukraine are fewer and fewer. However, from mid-summer, some of the companies that had left Ukraine began to return to western areas far from the battlefield.

2 SITUATIONS DURING THE PANDEMIC AND BEFORE THE WAR

In addition to passenger traffic, transportation between the EU and Ukraine, and Russia is largely related to the transport of basic products, especially food and energy. Russia and Ukraine are key suppliers of agricultural staples, including wheat, corn, and sunflower oil.

The top exports of Ukraine are Seed Oils (\$5.32B), corn (\$4.89B), wheat (\$4.61B), iron ore (\$4.27B), and semi-finished iron (\$3.03B), exporting mostly

to China (\$7.26B), Poland (\$3.26B), Russia (\$2.97B), Turkey (\$2.5B), and Egypt (\$2.39B) (OEC, Ukraine, 2022) The top imports of Ukraine are refined petroleum (\$3.59B), cars (\$3.35B), packaged medicaments (\$2.04B), petroleum gas (\$1.59B), and coal briquettes (\$1.25B), importing mostly from China (\$7.46B), Russia (\$6.31B), Poland (\$5.68B), Germany (\$5.25B), and Belarus (\$3.15B). (OEC, Ukraine, 2022)

The top exports of Russia are crude petroleum (\$74.4B), refined petroleum (\$48B), petroleum gas (\$19.7B), gold (\$18.7B), and coal briquettes (\$14.5B), exporting mostly to China (\$49.3B), United Kingdom (\$25.3B), Netherlands (\$22.5B), Belarus (\$15.8B), and Germany (\$14.2B). In 2020, Russia was the world's biggest exporter of wheat (\$10.1B), semi-finished iron (\$4.5B), non-fillet frozen fish (\$2.58B), raw nickel (\$2.26B), and pig iron (\$1.34B). (OEC, Russia, 2022) The top imports of Russia are Cars (\$7.75B), Motor vehicles; parts and accessories (8701 to 8705) (\$7.28B), Broadcasting Equipment (\$7.15B), Packaged Medicaments (\$7.06B), and Computers (\$4.1B), importing mostly from China (\$50.7B), Germany (\$26.1B), Belarus (\$12.8B), South Korea (\$7.93B), and Italy (\$7.71B). (OEC, Russia, 2022)

From Ukraine, cargo is transported by all modes of transportation, but the largest volume is delivered by sea. Before the war, Ukrainian Black Sea ports covered 90% of Ukraine's grain and oilseed exports.

When it comes to transporting passengers, air transport played a key role. According to data from 2021, 3.3% of European air passenger traffic was between Europe and Ukraine and 5.7% between Europe and Russia. (Kiss, 2022)

The coronavirus pandemic has had a significant impact on transportation worldwide. Many airlines have been grounded. Some maintained a minimum number of flights to keep their licenses and maintain contracts with airports. The volume of air passenger traffic in Ukraine decreased from 7,604,522 in 2019 to 1,790,621 in 2020. Most companies have reduced the number of employees to a minimum to reduce costs. The

reduction of employees had a particularly negative impact at the time of the abolition of sanitary measures followed by the sudden increase in the number of passengers, in the middle of 2022. Airline companies experienced record demand for personnel. The situation aggravated the absence of workers from work due to illness. And while passenger traffic was returning to normal, that was not the case with global supply chains, which were still disrupted. Road transport, which requires a lot of human resources, was hampered by sanitary and road restrictions. Meanwhile, rail freight transport between China and Europe achieved record results during the pandemic, which was positive for Ukraine and the promotion of the New Silk Road.

3 CRISES

The impacts of the conflict are forcing companies to rethink their existing supply chains and partner ecosystems. (Stackpole, 2022) In addition to problems in supply chains, there was also a reversal in the supply and demand of goods. Due to the various restrictions, there was a disproportion between the supply and demand for certain goods. The situation seen in Yugoslavia in the nineties is repeating itself. Now everything is at a quantitatively higher level. While Western Europe was not affected by the conflict in Yugoslavia, and while it observed events from a safe distance and realized the growth of its economy, it has now become an active participant in a conflict that shows no signs of abating. The number of refugees from Ukraine has exceeded the number of refugees from Yugoslavia multiple times. Combined with the already-arrived refugees from Asia, it represents a significant burden on the budget.

Intervention in Ukraine in February 2022 may have been the final straw, but it is certainly not the only factor contributing to the current global supply chain crisis. The crisis became pronounced in the recent past due to Trump's trade war with the world in 2018 which involved multiple battles with China and American allies (Bown & Kolb, 2022). Kosovo's trade war with Serbia in 2018 was also noted. Kosovo¹ introduced taxes on products from

¹ The Autonomous Province of Kosovo and Metohija under the Provisional Administration of

the United Nations (UN) per United Nations Security Council Resolution 1244 (UN, 1999)

Serbia in the amount of 100% (Filipović, 2018). The crisis intensified during the COVID-19 pandemic and continues today, although not always in the same territories. Today, the focus is on the Russian invasion and sanctions. Interestingly, there is currently less and less talk about human sacrifices and tragedies. People have become numbers, and there is more talk about how many ships left Ukrainian Black Sea ports and how many thousands of tons of grain sailed from these ports. Sometimes it is mentioned to which ports the grain was sailed but, rarely, who are the end users and under what conditions they will receive the food. The possibility of global hunger is used for political propaganda purposes.

As if the war in Ukraine was not enough, instabilities are being fueled in Asia, first about North Korea and then about Taiwan and the People's Republic of China.

The situation with COVID-19 led to a major disruption in the flow of electronic components, but also raw materials and parts originating from China. Since it is a scarce commodity, the lack of electronic components very quickly affected the automotive and mobile phone industries. To overcome supply problems, even those who did not even think of producing electronic components started preparing their produce in their factories. But it is not that simple.

We have witnessed proclaimed globalization, the single market, and the international division of labor have begun to collapse. One can ask whether liberalism still exists and what its prospects are. It is difficult to answer this question unambiguously because liberalism in the American and European sense is quite different and even opposing philosophies. The first is socialism, and the second is its negation. (Novaković, 2021) We will not deal with that here, but as soon as artificial barriers are set up in the flow of goods and services, and other people's private property is frozen, it is clear that there is no mention of the freedom of movement of capital and goods.

Now, more than ever, "supply chain managers must think carefully about the opportunities and risks when looking for new sources and when thinking about how to coordinate a change from one source or method to another," said Joachim Arts (Stackpole, 2022).

3.1 Sanctions

In response to the Russian invasion of Ukraine on February 24, 2022, the EU adopted punitive measures with incredible speed. In the first set of sanctions, on February 25, 2022, the EU banned the sale of aircraft, parts, and equipment to Russian companies, including insurance and maintenance services. On February 28, 2022, in the third set of sanctions, the EU banned all Russian aircraft, including private jets, from its airspace. In return, Russia has banned all EU airlines and airlines from 36 other countries that have adopted similar sanctions. Air Serbia was granted flights to Russia, but it was sabotaged by daily reports of bombs planted in aircraft.

The fifth package of EU Sanctions, dated April 8, 2022, banned Russian-flagged vessels from entering EU ports, and EU ports are obliged to implement the ban. The ban does not apply to medical, food, energy, or humanitarian shipments. The sanctions package also banned Russian-based road carriers from transporting goods to the E. U., including in transit. A parallel list of sanctions the EU adopted against Belarus (with similar exceptions). They prohibit Belarusian road carriers from entering the EU. It banned EU exports to Russia of goods and technology for the aviation and space industry and jet fuel.

On April 16, 2022, Russia and Belarus responded by banning E.U.-registered goods transport vehicles from entering the Eurasian Economic Union unless they entered certain border crossings for formalities. Transport operators registered in the EU can enter Russia and Belarus only if they transport goods to destinations in Belarus or Russia.

The sixth package of EU sanctions from June 3, 2022, contains a partial ban on the import of Russian oil. Most imports of crude oil and oil derivatives to the EU, transported by sea, will be banned until the end of 2022. A special derogation has been agreed upon for Bulgaria due to its geographical exposure allowing it to continue importing crude oil and derivatives by sea until the end of 2024. A similar exemption has been granted to Croatia for vacuum gas oil (VGO). There are also temporary exemptions that allow some EU member states to continue receiving Russian oil via pipelines. (Kiss, 2022)



Fig. 1 EU transport sanctions

Source: (Infographics, 2022)

3.2 Food supply in an ongoing crisis

One of the most pressing supply chain issues associated with the Russian-Ukrainian war is potential food shortages. It is particularly associated with low-income countries in Africa. Ukraine and Russia account for about a third of the world's wheat production and a quarter of barley production, and about 75% of the sunflower oil supply. (Stackpole, 2022) The Russian blockade of Ukrainian ports is considered so harmful that EU foreign policy chief Josep Borrell even called it a war crime. But it turned out that with a little goodwill food exports from Ukrainian ports can be ensured. However, there remained a problem with the export of Russian food and artificial fertilizers. The U.S. removed the blockade of those exports, but there are still obstacles to the export of Russian fertilizers and agricultural products. Those obstacles should be removed "because the risk of a world food crisis may threaten already next year" (Antonio Guterres in (Beta-AFP, 2022)). However, no one mentions that only in the USA 30 percent of all food, worth \$48.3 billion, is thrown away each year. It is estimated that about half of the water used to produce this food also goes to waste since agriculture is the largest human use of water. (FAO, 2013) According to FAO, the food currently lost or wasted in Latin America could feed 300 million people. United Kingdom households waste an estimated 6.7 million tonnes of food every year, around one-third of the 21.7 million tonnes purchased. (FAO, 2013) Also, the food currently wasted in Europe could feed 200 million people. It is similar to other regions. For example, inefficient processing and drying, poor storage, and insufficient infrastructure are instrumental factors in food waste in Africa. In

Sub-Saharan Africa, post-harvest food losses are estimated to be worth \$4 billion per year - or enough to feed at least 48 million people. (FAO, 2013)

There is no doubt that COVID-19 and the war crisis in Ukraine have led to the disruption of food flows, but it is also certain that these are not the only problems, there are also droughts and floods, fires, and many other negative factors. Analyzing the data shows that there is food, but that it is unevenly distributed and that it is necessary to change the way of thinking and find ways to cooperate. A completely new approach is needed that would involve establishing public-private partnerships and using advanced analytics to forecast food consumption and identify opportunities to reallocate resources globally. It is not just people in Africa who are hungry. There are also hungry people in the developed world.

3.3 Routes China - Europe

Transport routes connecting China to Europe have experienced a boom in recent decades and during the COVID-19 pandemic, this was especially true for the rail link, which was extremely popular to meet the needs of the automotive industry. The primary corridor passed through Russia, Belarus, and Poland, and then extended toward Germany, France, and other European countries. Due to the boycott of Russia, that route is no longer dominant. Some companies are re-routing products to an alternative rail route, but most are reverting to an ocean freight mode, which means more time to get goods to market. In the middle of 2022, it has become quite difficult to buy a new car because, for many cars, the waiting time for a vehicle has become longer than a year.

In Serbia, the wait for new Korean-made vehicles was the shortest.

The additional problem is that some Western countries, including the US, view China with suspicion and try to limit the purchase of certain Chinese products. Thus, the supply situation becomes even more complex. And the world began to return to local production. The almost forgotten phrase "import substitution" appears more and more often. In some areas, import substitution becomes an opportunity for SME development. Entrepreneurs and SMEs get a chance to fill gaps in the market, but this is not possible for all types of goods and services. In any case, producers must pay more and more attention to alternative sources.

Modeling can help optimize supply chain changes, but this approach has limitations. Most supply chain models assume a steady state, which does not apply to redesigning something that is in transition. Crises are our normality. Decision-makers need to think of systems and include crises when designing supply chain networks. The key to sustaining growth in uncertain times is adaptability. It is never possible to predict everything, but it is important to adapt to the new situation. (Stackpole, 2022)

3.4 The impact of hostilities and sanctions on transport

EU sanctions target the Russian economy with the idea of imposing problems on it that will force it to ... This is where the main problems arise, in defining the target. The EU has not clearly defined the final goal of the sanctions. The declaration "to increase direct costs, impairing its (Russian) economic and financial ability to sustain its war effort (Kiss, 2022)" is insufficiently clear. The goal to stop hostilities is not the same as the goal to withdraw the Russian army from part or all of Ukraine's territory or to ultimately destroy the Russian Federation. At the moment, it seems that the sanctions are intended to weaken the Russian Federation at the expense of Ukraine, which is borrowing money to buy weapons and whose people are dying, and whose economy is collapsing. The situation is in many ways similar to the situation in SFR Yugoslavia in the 1990s. The difference is only in the size of the countries participating in the conflict and in the fact that in the case of Yugoslavia, the attackers were

members of the NATO pact, and in the case of Ukraine, the Russian Federation, and nobody helped Yugoslavia defend itself. Even under those conditions, the situation in the territory of the former SFR Yugoslavia is not stable more than 30 years after the beginning of its disintegration. The current situation in Ukraine does not indicate an imminent solution, and if the events in the SFRYu are mirrored, some new transport corridors need to be established.

Only after the end of the conflict will it be possible to determine the actual state of infrastructure facilities. For the time being, figures are appearing in the public that cannot be trusted, so we will not even mention them here, but the results will be bad.

EU sanctions affect the Russian Federation, but the consequences also affect the EU to a large extent. The closure of Ukrainian airspace and sanctions against Russian aircraft significantly affect air passenger traffic. Bypassing Ukraine and Russia increases flight time, increases fuel and personnel costs, aircraft depreciation, and thus transport costs. Air freight rates have soared, to 120% above pre-crisis levels by March 7, and continue to rise. Sanctions and bans are expected to reduce flight capacity, particularly between Europe and Asia. In addition, more than 500 commercial aircraft owned by Western companies and leased to Russia are in Russia. (Kiss, 2022)

The EU sanctions also targeted Russian railways. Freight trains can still run through Russia, but they are not allowed to stop there. Many logistics companies transporting goods between China and the EU avoid transit through Russia for security reasons. This leads to increased use of the Middle Corridor causing longer journeys and additional costs.

Maritime sanctions limit seafarers' employability. Ukrainian and Russian seafarers make up 14.5% of the global shipping workforce, and EU fleets rely heavily on them. Fearing a possible shortage of seafarers, European shipowners have called on EU regulators to guarantee the mobility of seafarers and their rights as essential workers. Even before the crisis, the situation in Ukraine was difficult due to the COVID-19 pandemic.

The immediate consequences of the war also include damaged transport infrastructure,

transport disruptions, and a massive influx of refugees needing transport into the EU. The closure of Ukraine's borders meant that many truck drivers were trapped. The International Road Transport Union (IRU) estimated that at least 12,000 truck drivers of many nationalities were stuck in Ukraine and the region on February 25, 2022. Due to the sanctions, Russian road haulers are not allowed to transport goods to the E. U., and rising fuel prices further negatively affect commercial road haulers. Similarly, the sharp rise in bunker fuel prices has pushed up sea freight rates and is putting further pressure on international transport, logistics, and supply chains.

The maritime sector and ports have been hit hard. As commercial ships became targets in the conflict, operators were forced to divert ships and cargo. Most major shipping companies, citing unpredictable operational impact, have suspended shipments to and from Russia and Ukraine. Traffic in EU ports has increased. They are trying to keep supply chains operational and provide needed energy supplies, but increased transport volumes could lead to congestion at some port terminals, increasing maritime security risks.

The New Silk Road still works. It can be noted that freight forwarders are trying to find alternative routes to the Silk Road. More and more Western companies operating in Europe and Asia are actively seeking to switch from the China-Europe-China rail route to maritime routes. The railway line transports approximately one million containers per year. If all that volume moves to the sea corridors, there will be an increase in the price of transportation, especially for shipping from Asia to Europe. On the other hand, there will be a reduction in capacity in the transport market, which was already a weak link in the supply chain in 2021.

3.5 The impact of the war on some neighboring countries

Economists of the World Bank assessed the impact of the war in Ukraine on the work of companies in Kyrgyzstan, Tajikistan, and Uzbekistan based on a survey. The research aimed to study the business environment in

Central Asia, a region with strong trade and investment ties with Russia. The companies surveyed were facing increased production costs, reduced imports, and other problems that could eventually lead to the closure of the company.

According to the survey results, 65 percent of the companies faced rising production costs as of February 2022. That hit Kyrgyz companies to a greater extent (87%), as they buy more products and materials from Russia. In Uzbekistan, 56% of surveyed companies faced such problems.

In total, 43% of companies reported a reduction or complete cessation of imports from Russia and Ukraine. Rising production costs have forced businesses to raise product prices or face declining profitability. Businesses that sell their products to exporters or corporations from Russia or Ukraine reported an average 5% drop in sales, although some saw an increase. For companies that do not sell products in these countries, revenues increased by an average of 5%.

About a quarter of the surveyed companies encountered financial difficulties, which makes it difficult for them to adjust their loans and reduce their debt burden. These problems were felt most strongly in Kyrgyzstan (32%), while in Tajikistan and Uzbekistan these values were 24% and 17%, respectively.

In April 2022, the World Bank reported that Russian intervention in Ukraine would slow the economic growth of Uzbekistan to 3.6% in 2022, compared to pre-crisis estimates of 5.6%. However, in June it improved the forecast to 4.3%.

Military operations in Ukraine continue, and the conflict also affects Belarus, which is not an active participant in military operations. Ukraine has closed all checkpoints on the border with Belarus. It is not clear how the current situation will affect the international transport and logistics system in general, and how will it affect Belarusian business. "Pro-Business" collected comments from representatives of this market and summarized them (Avramenko, 2022):

1. Rail transport: there is no reason to stop freight flows. Due to the hostilities in Ukraine,

Belarus remained the only land link between Europe and China in the communication of high-speed container rail transport. Dozens of logistics

railway chains connect Europe and China. The vast majority of them pass through the territory of Russia and Belarus. It is a huge amount of money

and the question is whether the political aspect will be a priority over the economic one.



Fig. 2 The New Silk Road - All main EURASIA rail connections

Source: Authors' modification of (Avramenko, 2022)

In Ukraine, there are two strategically significant routes for the continent. They connect the Chinese cities of Xi'an and Chongqing with the Hungarian Budapest. No one will transport goods in a country where there is a war. This fact can benefit Belarus but also bring certain risks of overloading the railway infrastructure.

The container rail transport industry is out of danger for now. At the time of writing, none of the parties have made official statements to the contrary.

The New Silk Road is too important for Europe and China, so the two sides are likely to continue transiting goods under almost any conditions. If there were no events in Ukraine in 2014, this country could have become the center of the New Silk Road. But from that year, all transport went to the territory of Belarus.

2. International road transport: the main events are yet to come

Companies that transported goods to Ukraine were forced to adjust their plans by suspending all cargo deliveries from Belarus to Ukraine. Communication with Ukraine is not expected to be restored soon. On the border between Belarus and Poland, traffic is slow. Due to the slow work of the Polish border authorities and the detailed

verification of documentation, kilometer-long columns of freight vehicles are created. (Logistics, 2022)

3. Maritime transport

Belarusian companies whose business is related to maritime transport also have problems related to the organization of goods delivery. An example can be the container delivery of cars imported from the USA. The company dealing with it encounters numerous obstacles throughout the supply chain, from the demand for full advance payment to the fact that almost all European carriers refuse to carry cargo to Belarus without explanation. The company still has contracts with Russian and Belarusian carriers, but because the number of organizations ready for cooperation has decreased, and the transported goods are not, there is a risk that demand will exceed supply. This negatively affects both sellers from the US and Canada and buyers in Belarus. (Avramenko, 2022)

4 HOW TO ADJUST BUSINESS TO THE NEW REALITY

First, the COVID-19 pandemic, and then the war in Ukraine and sanctions against Russia and Belarus led to radical changes in supply chains. We should also not forget the tension between the

US and China, which has existed for a long time and was intensified recently by the crisis over Taiwan.

In today's environment, access to real-time supply chain and cargo location data is more significant than ever. Modern software allows monitoring of operations in real-time, and tracking algorithms take into account many data that allow the generation of expected delivery times. Currently,

disruptions in the markets are, as expected, the greatest in Ukraine and Russia. Deliveries to Russia have dropped significantly since February 22. By March 15, the weekly volume of imports into Russia by all modes of transport decreased by 59 percent compared to the week of February 16-22. It affected various industries: manufacturing, chemical industry, retail, food industry, and consumer goods.

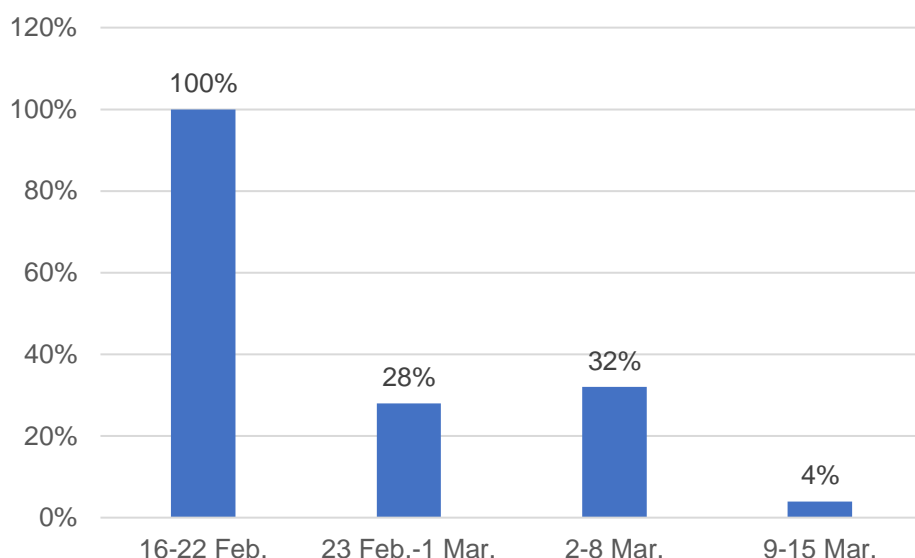


Fig. 3 Decrease in imports to Ukraine

Source: FourKites (Koepke, 2022)

In Ukraine, at the same time and by the same standards, the volume of imports decreased by 96 percent. (Koepke, 2022)

In Central European countries, there were import disturbances, but at a low level.

Due to the state of war, the specific position in the case of Ukraine, and sanctions against Russia and Belarus, companies from Western Europe are forced to cancel orders and look for new suppliers worldwide. Exports from the west to the east (to Russia and Belarus) have decreased to a great extent. But as in the case of sanctions against Yugoslavia, so-called *parallel imports* are taking place. In May, Russia published a list of Western goods that are acceptable for parallel import. Some of the brands on the list were Mercedes-Benz, Volkswagen, Continental, Ferrari, Apple, Samsung, Microsoft, Siemens, Duracell, Canon, and PlayStation. Between May and July 2022, Russia imported goods worth about 6 billion euros through parallel imports or purchases on the black

market. (Pandej, 2022) Sanctions have made goods available but at a higher price.

5 CONCLUSIONS

The COVID-19 pandemic and the special military intervention of the Russian Federation in Ukraine have led to fundamental changes in world trade, and the circulation of goods and services. Considering the duration of the pandemic, we cannot say that the change occurred suddenly. And the special military operation was not a surprise but was anticipated much earlier. The acceleration in delivering goods to the Russian Federation in the weeks before the operation and, also, the speed with which the otherwise bureaucratic EU introduced sanctions against the Russian Federation and Belarus speak of that. But, observed over a longer period, we will see drastic business and transport changes. Participants in trade and transport are forced to manage as best they know how to deal with the new situation. Further disruptions in supply chains

can be expected, especially in Poland and countries bordering Belarus and Ukraine.

The question is how the EU countries will behave in the winter period, when the lack of energy sources is felt and when road and rail transport conditions become difficult. Fuel prices are already very high, and will probably continue to rise together with the service deterioration.

There is no end to the war in Ukraine in sight, and probably no end to the sanctions against Russia and Belarus. Although the US complicates the situation with China and Taiwan, it is difficult to expect that the sanctions will now be extended to China, with which Russia has strong economic relations. That would be an economic war for which the Western economy is not ready. It allows Russia to overcome the current sanctions challenges more easily.

Some Western governments intend to continue to impose harsh sanctions that will stifle the Russian economy to force it to end the war, but this is a dangerous approach. They did not define what they mean by a reasonable end to the war and what is an acceptable solution. War can end in many ways. If the war ended today, the consequences of the war Europe and Russia would feel for years and Ukraine for decades. It is a false assumption that the longer the war lasts, the longer it will take for Russia to regain its position in world trade after the war because this assumption considers world trade as trade with the West. We think it would be much better for the world if there was no war at all, but when it has already started, it should end as soon as possible.

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THE BENEFITS OF INCOME INEQUALITY

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Abstract

In this essay, we maintain that income inequality has positive effects on the economy. This is so because it leads to an increased quality of life, decreases poverty, and maintains the freedom of the individual. For all too many people, even experts who really should know better, reducing income inequality is the best, perhaps, even, the only, way to reduce poverty. We take the diametric opposite position: as Smith (1776) saw so clearly, a necessary and sufficient condition for increasing the “wealth of nations” is via adherence to private property rights, the rule of law, and free enterprise. To say this is a contentious claim would be an understatement of the year. However, the present essay is an attempt to help right the balance in this important debate. All men of good will wish to wrestle poverty to the ground; the main disagreement concerns the appropriate and efficacious means to that end.

Keywords: *Equalitarianism, income inequality, justice, poverty, liberty.*

1 INTRODUCTION

One of the most contentious and prominent topics in the world of political economy today is income inequality. One of its benefits is that members of that society can choose their ways of life. A person who goes his way in this regard does so based on his talents, therefore, distinguishing himself from others. This freedom leads to specialization, the division of labor, more innovation, and increased quality of life for all. There are complaints from the mainstream media and socialist politicians about the 1% and their supposed hoarding of wealth. If

a government official forced equality of income and equal job distribution then there would be less opportunity to get ahead and make one's self a unique individual. Income inequality is beneficial in a free market society because it leads to an increased quality of life, decreases poverty, and maintains the freedom of the individual.

In section 2 we discuss how well we are all doing, economically, including the poor. The burden of section 3 is to discuss the popularity of income inequality. Section 4 is given over to our thesis: the positive effects of income inequality. In section 5 we explore the role of economic freedom and maintain that it leads to income and wealth inequality. In section 6 we criticize Rawls, who is perhaps the most important egalitarian,

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philosophically speaking. We conclude in section 7.

2 THE WELL-TO-DO POOR

Americans continue to invest in themselves and material things, and their quality of life continues to grow. Products are easier and cheaper to obtain than ever before.¹ Companies like Amazon can deliver packages in one day. Big technology companies like Apple release a new iPhone every year or so. The only difference that can be seen in the new model is usually only the camera quality. Americans are quick to ditch the old iPhone for the new one because it is trendy. The quality of life in America is high because of the freedom to be an entrepreneur or to specialize. The innovations that are being made because of the specialization of labor are enjoyed by all. But this is all part and parcel of inequality. If we continually had to iron our matters so that equality could be maintained, none of this would be possible. Buchanan (2014) states:

“Among American families in poverty today, 1 in 4 have a freezer. Nearly half have automatic dishwashers. Almost 60 percent have a home computer. About 2 in 3 poor families have a clothes washer and dryer. Eighty percent have cell phones”.

The rich are getting richer; however, that does not mean that the poor are getting poorer. It is quite the opposite.²

There is nowhere in American history where the poor were treated better. Steve Jobs, Steve Wozniak, and Ronald Wayne all founded Apple, the company that produces iPhones and other trendy tech gear. Sure, they increased the division of wealth inequality but they “also improved the well-being of tens of millions of people who are less wealthy” (Henderson, 2018). Not only did the

founders of Apple invent new and improved technology they also created thousands of employment slots. Steve Jobs’s net worth was \$7 billion³ before his death.⁴ His wealth was earned from his perseverance in creating something that millions would enjoy.

3 THE POPULARITY OF INCOME INEQUALITY

The topic of income inequality has grown in popularity among mainstream media, politicians, and the average American citizens who read about it in newspapers or online. The argument against income inequality increasing the quality of life begins with the idea that no one should hoard all their wealth. Simply put, no one should be that rich. The counterarguments become based not on economics but morals and ethics. Senator Bernie Sanders, a Democratic Presidential Candidate in 2019, told the Bennington Banner, a Vermont newspaper in 1971 that it was “immoral” to be a millionaire and that they represent, “-the interests of corporations and big businesses,” (Chasmar, 2019). This claim “does reveal a real problem, which is the reduced aim of our society from virtue to material abundance,” in the view of Weinberger (2017). However, the average low-income American’s quality of life is better than ever before in American history. All of us, rich and poor, enjoy the products and innovations of those entrepreneurs with the initiative to create something that enriches our daily lives.

4 THE POSITIVE EFFECTS OF INCOME INEQUALITY

Income inequality has positive **effects** on the economy as a whole and helps low-income Americans greatly. We are not all equally talented. Each person fashions and establishes their unique

¹ In saying this we abstract from the temporary economic glitch caused by the Covid 19 and the government’s response to it.

² See on this Stossel, 2019; Money Tips, 2018; Mitchell, 2019; Rector, 1990.

³ Steve Jobs. (2011, September 1). Forbes Magazine Profile.

⁴ Every penny he earned from the market from these sales enriched him. But the people with whom he dealt, suppliers, employees, customers, lenders, and landlords, also gained, at least in the ex-ante sense,

otherwise, necessarily, they would not have dealt with him. In other words, in enriching himself, he did precisely the same for all these others. Without him, they would have been poorer. The market is not a zero-sum game. Parker Brothers’ game, “Monopoly” in contrast, is a zero-sum game. When you land on Broadway and stay at the hotel perched on that property, you lose, and the owner of that property gains. In sharp contrast, if you stay a night at a Trump hotel, both parties gain, almost always ex-post, and necessarily ex-ante.

contribution. But this necessarily leads to inequality, given human differences.⁵

A free nation allows us to use our abilities most effectively. The more industrious and talented a person is, the more he will excel and reap greater rewards. 'Inequality...is rooted in the biological nature of man,' said James Fenimore Cooper," (Henderson, 2018). The invisible hand, a concept coined by Adam Smith (1776) more than two hundred years ago, allocates resources efficiently; however, that does not mean that they are distributed equally. Many of those who oppose income inequality would like to redistribute wealth; however, social programs like those are costly and weaken the motivation to work hard. Winston Churchill delivered a speech in 1945 to the House of Commons in London and famously said, "The inherent vice of capitalism is the unequal sharing of blessings. The inherent virtue of Socialism is the equal sharing of miseries." If there was no willingness to work to raise yourself higher on the economic ladder, then there would be no improvement in society or innovation. "High inequality provides the incentives to work harder, invest and undertake risks to take advantage of high rates of return" (Mirrlees, 1971). High inequality like that in the United States "fosters aggregate savings, and therefore capital accumulation, because the rich have a lower propensity to consume," (Kaldor, 1956). When the government issues policies to make "the distribution of income more equal, it distorts incentives, alters behavior, and makes the allocation to resources less efficient," (Mankiw, 2015).

When in history has government intervention ever acquired positive results? The most corrupt industries in America are healthcare and education. Yes, when the state throws tons of money in any one narrow direction, bloom occurs; but this does not demonstrate overall benefit. In contrast, in the market, every interaction benefits both parties' ex-ante, without exception.

"The top 1 percent of U.S. earners pay nearly 40 percent of U.S. income taxes. The top 10 percent pay 70 percent. The top 50 percent pay more than 97 percent of income taxes. The poor pay

nothing," (Buchanan, 2014). The income inequality gap shrinks if one compares consumption instead of income. The gap closes somewhat since income taxes are disproportionately taken from the most productive. "Tax high incomes or wealth heavily and you will have fewer people trying to make high incomes and get wealthy," (Henderson, 2018). If politicians cared about the Americans living in poverty in the United States they would continue to "cheer for policies that lead to higher economic growth," (Henderson, 2018) instead of continuing to highly tax the rich. Redistribution is not one of these policies.

5 ECONOMIC FREEDOM

Economic freedom is what accounts for economic growth (Gwartney, et al, 1996). If every man or woman was the same in his or her abilities and tastes, then there would be no human improvement. As Murray Rothbard demonstrated in 1971:

"If men were like ants, there would be no interest in human freedom. If individual men, like ants, were uniform, interchangeable, and devoid of specific personality traits of their own, then who would care whether they were free or not? Who, indeed, would care if they lived or died? The glory of the human race is the uniqueness of each individual, the fact that every person, though similar in many ways to others, possesses a completely individuated personality of his own."

For there to be any improvement there needs to be a division of labor, which breeds not equality, but inequality. As Smith (1776) wrote, "the division of labor is limited by the extent of the market". For there to be a division of labor men and women that contribute to the economy need to specialize. There can be no specialization without individuality.

"The developed economy makes room for and encourages an enormously greater specialization and flowering of the powers of the individual than can a primitive economy, and the greater the degree of such

⁵ See this claim Block, 1990, 2000, 2014A, 2014B; Buchanan, 2014; Cathey, 2020; Engelhardt,

Lingenfelter, and. Block, 2016; Mulcahy, and Block, 1997; Murray, 2005; Rothbard, 1971, 1974, 2017

development, the greater the scope for each individual,” (Rothbard, 1971).

Specialization of trade creates new job slots and increases the quality of life for the individual. “Lest we forget, it is the freedom that produces inequality,” (Rothbard, 1970). Without the freedom to improve oneself individuality is gone.

Many mainstream politicians criticize the gap between the rich and the poor. Massachusetts Senator Elizabeth Warren (2019, Dec 16) opposed income inequality. During her run for the 2020 Presidential election, she continuously explained her plan to decrease the income gap in America. Part of her plan states:

“I’ve proposed a two-cent wealth tax on the wealthiest 75,000 families in America. I’ve proposed imposing a 14.8% payroll tax on wages above \$250,000 and a 14.8% tax on investment income for high earners as part of my Social Security expansion plan. I’ve also proposed returning the estate tax thresholds to their levels at the end of the George W. Bush administration and instituting more progressive rates above those thresholds,” (Warren, 2018).

Mainstream and free-market economists do not agree on much; however, they both agree on one thing; Warren’s plan is radical. It would demonize rich Americans. If taxes were raised as high as her plan calls for, the wealthy would leave the country in droves. The once-rich would start earning less. They would save less money, work fewer hours, and there would be a higher risk of tax avoidance (legal) and evasion (illegal). There is a reason that big companies or intelligent people leave countries that have many restrictions on their companies and lifestyles. Ultimately, the inventions or services that are produced by these people are enjoyed by those in other countries.

Warren and her mainstream media politicians and friends miss the essence of the problem when they proffer plans such as this. Income inequality is not the most alarming problem in the United States. The difficulty is the income tax. It is corrupt, to say the least. Bedard (2010) states:

“It damages the economy. Income taxes are levied on work, savings, and investments. In essence, the government grows by taking money from what makes the economy grow. Such a system retards capital formation, job growth, and a higher savings rate and, as such, stymies economic growth or recovery.”

The income tax undermines the hard work of American men and women. Income inequality that has been birthed by the free market pales into insignificance as a challenge that the United States faces in the present day. The biggest issue is big government and its even bigger hand in the back pocket of the American taxpayer. Many mainstream politicians get away with hurling the term “income inequality” as a charge of unfairness because it aggravates people who support the noxious notion of social justice. This phrase is then flipped on its back and turned into almost the only negative connotation in the media. Income inequality in America increases the quality of life of many Americans and is ultimately beneficial to the free market society.

Income inequality and the fact that not everyone has the same skills is an inevitable characteristic of our species. Nevertheless, beneficial in a free-market society because it leads to an increased quality of life, decreases poverty, and maintains the freedom of the individual (Rothbard, 1974). Not every man or woman is the same. Yes, whoever honed their skills and or has good luck travels up the economic ladder faster than others. The only way to make “people who are unequal in talents equal in rewards is to use government power to dispossess some and favor others,” (Buchanan, 2014). To put it simply, if one’s talents and quality of work were worth \$15 per hour then he would tend to be earning \$15.⁶ It is disturbing that many governments and people have fallen for the trick of favoring a restricted market with socialistic tendencies. Governmental intervention always stamps out the individuality of man and specialization (Rothbard, 2014). “The New Leftist admires Che Guevara, Fidel Castro, and Mao Tse-Tung not simply because of their role as revolutionaries and guerrilla leaders, but more because of “their repeated attempts to leap into

⁶ In equilibrium, he would be grossing precisely that amount. True, we are never in equilibrium. But the economy is forever moving in that direction.

communism as rapidly as possible" (Rothbard, 2011). Income inequality harbors improvement and always assumes opportunities to improve. If every person was equal, there would be no incentive to work hard and no reason to save money. The United States GDP would fall rapidly and the America that many once knew would cease to exist.

6 RAWLS

One of the most famous and powerful arguments on behalf of egalitarianism was penned by Rawls (1971). He argued under the "veil of ignorance" that if people were to choose their role in life in advance, they would want a society if not of absolute equality, then something very close to that. To wit, no one should have any more wealth than the poorest, unless that would improve the economic welfare of the most poverty-stricken. But Nozick (1974) put paid to that argument with his Wilt Chamberlain example. Wilt is willing to show us his skills on the basketball court. We are willing to pay him \$20 to witness the exhibit. There are 1000 of us. We strike a deal. Mr. Chamberlain is now \$20,000 richer than before. We are all out of pocket that \$20.⁷ However, inequality has now reared its ugly head. What to do about this horror? Get Wilt to return the money to the rest of us? But then he wouldn't have agreed to the performance in the first place, and our economic welfare plummets. Nozick's brilliant point against Rawls is that any egalitarian scheme faces an overwhelming roadblock. It is incompatible with human freedom. Any plan that obviates "capitalist

acts between consenting adults" (Nozick, 1974, p. 163) of this sort is hardly worth serious consideration.

Another argument on behalf of stealing money from the rich and giving it to the poor stems from the diminishing marginal utility of money. A rich man's last \$100 bill is the difference between lighting his cigar with it, or not. Whereas, for the poor man, that amount of money spells the difference between a full belly and going to bed hungry. Thus, if we transfer this sum from the former to the latter, there is a gain in utility. But this argument founders on the shoals of interpersonal comparisons of utility. There is no scientific way to compare the enjoyment garnered by these two men from that amount of money. Maybe the wealthy man would invent a cure for a disease with that \$100, and the poor man would just use it to attain an alcoholic stupor. If so, it is difficult to maintain this argument.

7 CONCLUSION

Finally, there is the charge of hypocrisy. Many advocates of redistributionism are college professors. They earn an upper-middle-class level of income, and sometimes more. They have fine houses, cars, wristwatches, clothes, money for travel, etc. If they held fast to their supposed principles, they would divest themselves of these luxuries, and enrich the poor with the savings thereby afforded. In contrast, the principles of the free-market supporter are merely to refrain from violating rights (such as robbing the wealthy), and they are quite able to adhere to these.

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⁷ But we valued the experience more than that amount, so we, too, gained.

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LEAN APPLICATIONS TO IMPROVE CHEMICAL LABORATORY PRODUCTION CAPACITY IN THE TEXTILE INDUSTRY

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Abstract

Lean literature suggests that the attitude of “wait and see” has not yet allowed textile professionals to adopt Lean in production, especially in the laboratory. To fill this gap, the author illustrated a case study in a chemical laboratory of a renowned knit composite industry in Bangladesh. A team of textile and industrial engineers observed all processes in the laboratory from start to end for two years to detect problems and then conducted four brainstorming sessions with Lean experts to generate solutions to those issues which are finally presented for capacity improvement through dyeing machines’ capacity optimization, lead time evaluation, lab room temperature optimization, facility layout redesign, quick worksheet preparation, and workplace organization. This study proves that Lean applies to any process improvement. Also, data obtained in this research is highly valuable for textile engineers for future research and readily available for Value Stream Mapping.

Keywords: *Lean production; production capacity; lead time; chemical lab; textile industry.*

1 INTRODUCTION

History suggests that Bangladesh, previously known as East Bengal, was self-sufficient in textiles; and in the eighteenth century, its people produced Muslin, Jamdani, and various cotton and silk fabrics so well that after the growth of mechanized textile mills in the English Midlands, according to popularly held beliefs, the British imperialists responded to the competition for their emerging textile industry by cutting off the thumbs of the craftsmen to force them to stop production (Islam et al., 2013). Now, Bangladesh, a developing market economy (Riaz & Rahman,

2016), is ranked the 39th largest in the world in nominal terms, and 29th largest by purchasing power parity; and is classified among the “Next Eleven” emerging market middle-income economies and a frontier market. In the first quarter of 2019, Bangladesh is the world’s seventh fastest-growing economy with a rate of 7.3% real GDP annual growth (Real GDP Growth, 2019). The main source of this rapid growth is the textile and clothing industries. Bangladesh has become the world’s second-biggest exporter of clothing (Latifee, 2016) with US\$28.14 billion in the financial year 2016-2017, which was 80.7% of the country’s total export earnings and 12.36% of the GDP (Latifee, 2017).

To face “global competition, uncertain demand environment, and higher consumer expectations”,

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companies are adopting Lean to build “manufacturing systems characterized by having high-velocity order-to-delivery and flexible processes which improve the overall business performance” (Deif & ElMaraghy, 2014). Now some developed countries like Germany even started to think about industry 4.0 applications blended with Lean in the textile industry (Kuesters et al., 2017); but with a decade’s close observation of apparel industries in Bangladesh, the author has found that although garmenting (cut-sew-pack) areas have got huge attention from the Industrial Engineering (IE) and Lean point of view from 2000 and 2005 respectively, the fabric side has remained totally out of focus.

For fabric production in the textile industry, the chemical lab is the place where the first step is performed. The main recipe of the dyeing is developed here to ensure the desired shade of fabric for bulk production. Generally, the process is performed on 10 grams of fabrics or 5 grams of yarn. The initial recipe is developed from the spectrophotometer based on the buyer’s given standard specifications. Following the initial recipe, different samples are developed to match the desired shade of the fabric. If the matched sample is approved by the buyer, the respective recipe is used in the bulk production of the dyeing operation. In the chemical lab, different processes are performed to develop the sample, such as preparing the recipe; preparing the dye stock solution; preparing the worksheet according to the solution, dyeing process, hot and cold wash, soaping, squeezing, drying, conditioning, and sample assessment, etc.

2 LITERATURE REVIEW

According to the Institute of Industrial Engineers: IE is “concerned with the design, improvement, and installation of integrated systems of people, material, information, equipment, and energy. It draws upon specialized knowledge and skills in the mathematical, physical, and social sciences together with principles and methods of engineering analysis and design to specify, predict and evaluate the results to be obtained from such systems” (Salvendy, 1992; Dastkhan & Owlia, 2009).

“Lead time is the amount of time that passes from the start of a process until its conclusion.

Companies review lead time in manufacturing, supply chain management, and project management during pre-processing, processing, and post-processing stages. By comparing results against established benchmarks, they can determine where inefficiencies exist” (Kenton & Abbott, 2019). Even value-added (VA) activities are not expected to be performed inefficiently, VA activities are the work that the customer is willing to pay for (Beels, 2019). “In processing operations, the value-added activities are those that make physical changes to the raw material up to finish product” (Islam, 2019) and the work also needs to be done right the first time (RFT). On the contrary, non-Value added (NVA) activities just consume resources without adding any value to the product or service (Beels, 2019).

Lean production (LP), a philosophy to improve performance in production systems by eliminating waste and delivering value for customers, has already been proven with empirical evidence of benefits in terms of lead times, productivity, quality, and other business dimensions (Soliman & Saurin, 2017). It is characterized in short by “doing more with less”. “Lean philosophy focuses on the elimination of waste and excess from the tactical product flows and represents an improvement and sometimes an alternative model to that of capital-intensive mass production with its large batch sizes, dedicated assets and hidden wastes” (Deif & ElMaraghy, 2014). “Womack and Jones (Wong & Wong, 2011) define waste as any human activity which absorbs resources but creates no value. ‘Muda’ is a Japanese word for waste and Ohno (Lewis, 2000) has identified seven types of waste which are also known as Ohno’s seven Muda. They are overproduction, waiting, transportation, unnecessary motion, inappropriate processing, and defect. Waste is always linked to lean. But later, the eight wastes have been added to Ohno’s original list by other authors, namely as “underutilized people”. However, Liker (Goodson, 2002) uses a different term for the same type of waste which is known as “unused employee creativity” (Wahab et al., 2013).

Lean methodology like ‘5S’ helps to organize the workplace by removing items that are no longer needed, setting the necessary items to visualize wastes, cleaning the work area, and developing behaviors to keep the workplace organized over

the long term. A lean system like Kanban is used "to control and create lean production without delays. The system compares supply with current consumption. A message tells the provider to manufacture and deliver another batch. That system works in a cycle connected between the supplier, producer, and buyer" (Zapara & Naumova, n.d.). Kanban's act as the nerve of any Just-In-Time system as a means of material transportation and production information exchange between workstations (Jothishankar & Wang, 1992).

In this study, the author investigated IE and lean implementation status in a chemical lab – Is the lab production going on as per capacity? Is the lab room temperature set for fast production? Are processing time, waiting time, lead time, etc. known to lab managers? Is the room layout designed for efficient production? Is the Worksheet being prepared in efficiently? Is there any production planning activity? And if there any workplace organization practices it in place?

3 METHODOLOGY

According to the researcher (Islam, 2019), a case study is a systematic inquiry into a group of related events to describe and explain the phenomenon

Table 1 Data Collection Form

Sl. No.	Activity	Activity Type	Frequency	Independent (I) / Followed by	Time Duration (Sec)	Distance Traveled (cm)	Parallel Activity	Waiting Time	Responsible Person	Remarks

After observing the current condition of the chemical laboratory, the researcher decided to perform some analytical and situational observations to analyze the current situation and assess the current capacity. To remove non-value-added activities and to propose improvement suggestions based on Lean concepts, brainstorming sessions were conducted. Brainstorming is a group process used in a variety of applications in quality and reliability work to generate a diverse set of original ideas, approaches, theories, or points of view (Plesk, 2008). The researcher worked as both team leader of the group and "head cheerleader" while the participants discussed that hard work in a

of interest. Usually, it is used prospectively but, in this research, it is applied retrospectively (Zucker, 2009). The main reason for selecting the case study method is that it is the preferred method when attempting to answer "why" and "how" research questions about events over which the researcher has no control (Yin, 2017).

After checking a dozen of large textile industries in Bangladesh, the researcher selected the most renowned and best customer-oriented high-volume company for the case study. The company has two fabric units with two chemical labs working on three types of fabric/yarn construction: 100% cotton; 50% cotton & 50% polyester; and 100% polyester are used. Data was collected from direct observations and participant observations" (Yin, 1994; Islam, 2019). A point-to-point observation was planned to perform during this research. Every movement and activity of an individual employee was observed during the operation as well as recorded the time consumed during that period using a stopwatch. The author himself remained stood up in the lab and followed the workflow. Three batches were followed individually from the first activity to the last activity as per the below form in Table 1.

team-based engineering environment would be personally rewarding to everyone concerned (Payton, 2005). Participation of production personnel was highly encouraged. The sessions were done in two distinct stages, "first a 'brain dump' for rapid idea generation and verbalization" (Hartman, 2005) with no evaluation to ensure the complete flow of ideas (Sloane, 1998). In the second stage, the ideas were addressed collectively as themes and/or individually as ideas within themes (Claxton, 1980) and evaluated "in terms of expense, workability, practicality, and feasibility given the resources available" (Boddy, 2012).

4 DATA AND RESULTS

4.1 Capacity Utilization

Tasks in a chemical lab in the textile industry are mixed with manual and machine-based activities. Although the design run time per machine per day of three shifts in 24 hours is 1440 minutes, for highly manual (by hand) tasks the allowance time usually ranges from 15 to 25% (Tanvir & Ahmed, 2013), where personal needs consist of up to 5% for men and 7% for women: restroom, smoking, drinking water, lunch, etc.; and basic fatigue:

$$\begin{aligned}\text{Working time per day per machine} &= 1440 \text{ minutes} - \text{Allowance } 15\% \\ &= (1440 - 216) \text{ minutes} \\ &= 1224 \text{ minutes}\end{aligned}$$

The researcher analyzed 500 samples of different batches of 100% cotton; 50% cotton & 50% polyester; and 100% polyester. On average, five trials of shade were required to develop a sample. With 12 beakers per run and five shades per batch, the summary of the capacity analysis is

energy spent during working consists of 4%. Instead of just taking 10% allowances without recording and considering any delay (Starovoytova, 2017), this study followed that any delay/time spent as low as 8 seconds would be recorded appropriately (Ackerman et al., 2014) and on top of that 15% allowance was considered to improve the credibility of the results. The effective run time of the machine is also considered 15% less than the designed run time which is 1440 min per whole day of 3 shifts of 8 hours each.

presented in Table 2. From the acquired data, no. of development of approved samples per day in August 2019 was found as 33. Hence, for that month Dyeing Machines' Capacity Utilization was 51%.

Table 2 Capacity of dyeing machines

Fabric/yarn type	Maximum observed time (minutes) per batch	Batch capacity per machine per day	Batch capacity of 7 machines per day	% of customer orders	Average batch capacity per day
100% cotton	112	10.93	76.5	70%	65
50% cotton & 50% polyester	227	5.39	37.7	20%	
100% polyester	216	5.67	39.7	10%	

4.2 Room Temperature Optimization

The case study company has two chemical labs in two fabric units (FU) and these labs were maintained at two different room temperatures: 23.5°C and 28.0°C in FU-1 and FU-2 respectively. The ventilation and air conditioning machine was not efficient in FU-2, that's why it got hotter than the outside natural temperature. As a result, dyeing times for the same programs were found different in FU-1 and FU-2 as given in Table 3. The

total non-value-added time for three observations was found 24 minutes in the FU-1 lab and 94 minutes in the FU-2 lab. On average per observation, the FU-2 lab took 23.33 minutes more than the FU-1 lab only due to high room temperature. So, by just maintaining a better room temperature of 23.5°C in FU-2, even with the highest dyeing time of 227 minutes per batch, 770 minutes were saved from 33 batches per day. Now FU-2 can produce three more batches each day.

Table 3 Comparison of temperature facts in two labs

FU-1 Room Temperature: 23.5°C				FU-2 Room Temperature: 28.0°C			
Obs. No.	Program time (minute)	Actual Working Time (minute)	NVA Percentage	Obs. No.	Program time (minute)	Actual Working Time (minute)	NVA Percentage
1	76	84	10.52%	1	90	112	24.40%
2	142	147	3.53%	2	110	140	27.27%
3	141	152	7.80%	3	130	172	32.30%

4.3 Lead Time

Each working process of the 3 types of fabric/yarn was structured into 17-24 sub-processes and further detail of each activity in a sub-process was studied for two years. The movement of the working personnel was carefully observed from the beginning to the end of the operation in both the cases of performing manually and using the

machine. Through rigorous discussion, three batches were selected as suitable/representative for further analysis. Data in detail - Activity, Activity Type, frequency, Dependency, Time Duration, Distance Travelled, Parallel Activity, Waiting Time, Responsible person, and Remarks are presented in Appendix A, Appendix B, and Appendix C. Data summary of the five batches are presented in Table 4.

Table 4 Data summary of five selected batches

Obs. No.	Fabric/ Yarn Type	No. of beakers	Total Process	Total Sub-Process	Lead Time (Min)	Processing Time (Min)	Waiting Time (Min)
1	100% Cotton	14	17	47	311.07	268.72	42.35
2	50% Cotton & 50% Polyester	4	20	55	290.50	281.45	9.05
3	100% Polyester	19	18	50	378.82	341.87	36.95

A different batch contained different numbers of beakers per batch based on situational management, also a different number of processes and sub-process. As a result, the total time required to complete any batch was also differing. The average lead time for a batch was found 326.80 min while the average VA (processing) time was 91%.

4.4 Facility Layout

Through some brainstorming sessions, a new layout is developed to minimize transportation and free space. The old and new layouts are given in Fig. 1 and Fig. 2 respectively. From the new layout, it can be inferred that the distance between the spectrophotometer and the management table was reduced by 360 cm. The reduction of this

distance helped the management personnel to collect the document of buyer standards from the management table and to transfer it to the spectrophotometer table in a shorter time. But the frequency of this activity was high. Hence, lots of time was saved.

As an overall result, the new layout requires smaller floor space for production. In the previous place of the spectrophotometer, a machine (approx. 42.5 square meters) can be placed and in between two data storing racks, sufficient space is free to place two more dyeing machines (approx. 8.52 square meters) which helps to improve and balance the capacity of the chemical laboratory.

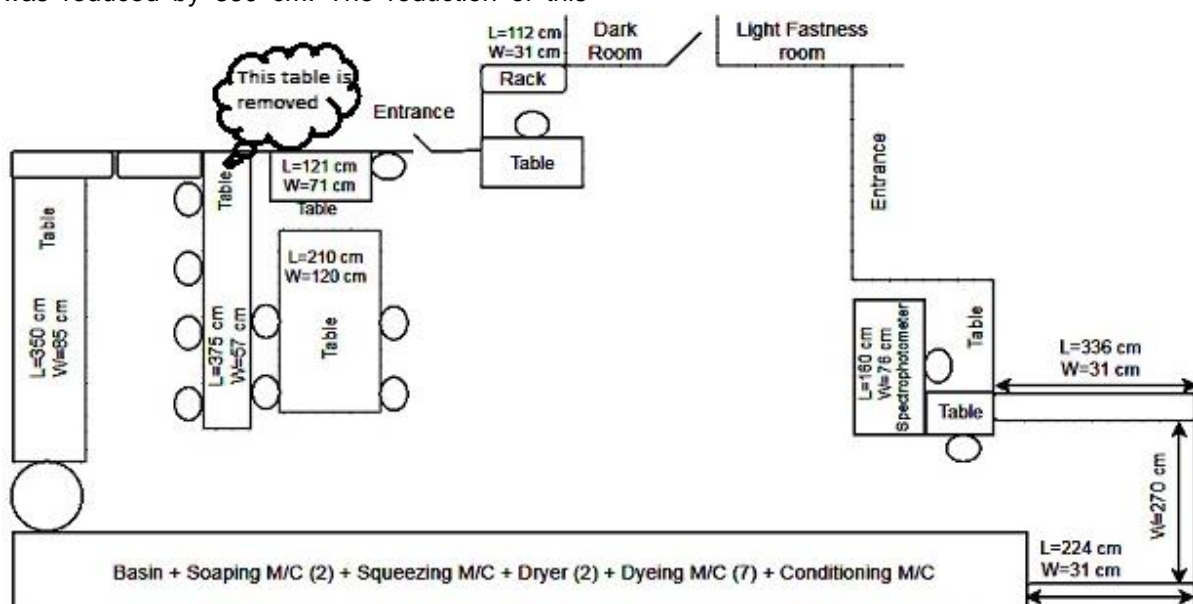


Fig. 1 Old Layout

Source: Author's creation

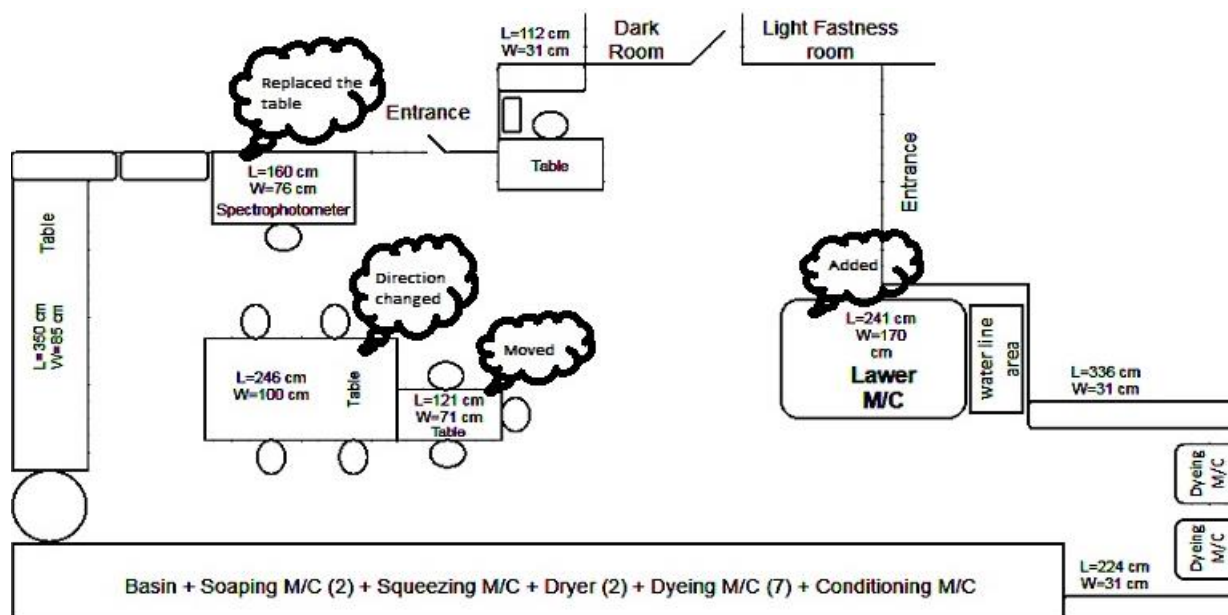


Fig. 2 New Layout

Source: Author's creation

4.5 Worksheet Preparation

According to the buyer's given standard specifications, the laboratory assistant develops the recipe using the spectrophotometer; writes down the details of the recipe using pen and paper and transfers the document to the laboratory supervisor who develops the worksheet

accordingly. This worksheet contains information – sample details and required chemical details. The researcher suggested that the worksheet could be developed using the MS Excel format given in Fig. 3 which would take less time to prepare the worksheet and improve the writing process efficiency. It is practically found that -

Traditional Worksheet preparation time with calculation = 6 min per sheet
Proposed Excel-oriented worksheet preparation time = 2 min per sheet
The average number of worksheets prepared per day = 50
Hence, total time saved per day = 200 min

Chemical Lab Dept. Worksheet

RECIPE NO .	YARN/FAB. :	L : R	1	6
CUSTOMER :	COUNT :	SAMPLEWT :	10	
SHADE :	QUALITY :	GSM :	175	
Dyes / Axiliaries	% / g / l	dE	TIRAL SAMPLE	Water
reddish	0.011 0.22 0.5		25/9/19	53.26
reddish	0.01 0.1 1	-1-		
yellow	0.021 0.42 0.5	Date		
Sub Total	0.74	Dosing by		
Salt	65 3.9			
Green Buff/ Soda Ash(20%)	7 2.1			
Caustic Soda (38 Be)				
Total	6.74			

Fig. 3 Proposed MS Excel Worksheet

Source: Author's creation

4.6 Production Planning

Sometimes urgency-based sample development was done in the chemical laboratory. At that moment, it was observed that only two or three beakers were used in that batch though the machine capacity was 11-19 beakers for a single batch in a dyeing machine. When these kinds of urgency-based sample development were done, the machine utilization was as low as producing even one shade only. Again, other than some documents of RFT, no other KPIs at the department/section and individual level were found maintained.

4.7 Methodology

According to the information of the laboratory personnel, the standard rule was to store hard copies of recipes from the last three years, but it was found that recipes as old as five years still existed in the storage rack. Multiple copies of the same recipe along with some other unnecessary documents were also occupying the space. As a result, searching and finding a specific document was quite difficult and time-consuming. To sort, shine, organize, standardize, and sustain, the author suggested the common 5S methodology, and the lab responsible accepted the methodology and discussed it with all his subordinates who are maintaining organized storing of necessary items labeled properly.

5 DISCUSSION

Dyeing machines in chemical labs in textile industries in Bangladesh are being utilized less than 50%. With a proper production plan, consistent workflow, NVA activities elimination, and line balancing; these labs can perform quite efficiently. The interesting part of this research is that maintaining proper Room Temperature can be a huge saving of productive time. Also, the facility layout has the scope for improvement to reduce traveled distance during work and space to add more resources to increase capacity. To manage capacity efficiently, the chemical lab should track and prioritize samples requirement, and plan the analyst's work to manage high work in process (WIP) using a laboratory information management system (LIMS). Also, by using software like Recipe Manager and ERP system lab managers can control information and keep

enough records of both trial and final approved sample recipes.

Lab managers need to keep a record – of how many additions are required to produce non-RFT samples so that they can analyze and plan the work effectively. Again, sometimes the number of incoming orders for sample production becomes inherently volatile with significant peaks and dips which causes low productivity during dips and/or long lead time during peaks (Lean laboratory, 2019). To tackle this unstable workload, Kanban (leveling workload) can be used. But when many urgent samples with long lead times are ordered, lab management should plan the production wisely, and prepare the batches with a proper combination of urgent and regular samples.

Textile engineers need to be trained on basic IE and lean concepts – Levelling workload with Kanban, 5S, Capacity, Lead time calculation, etc. Then they can simply look at the current process from IE and lean angle from time to time, describe the problem, and then present and evaluate the solutions continuously. It is easily caught in an industrial engineer's eye that if distances among machines are reduced, operators must move less, and productivity is increased. Also, at a natural room temperature, cooling machines in the lab work most efficiently. Again, the implementation of 5S always helps to decrease not only the usage of material and wear-off of tools and equipment but also the stress of employees. Also, credible measurements of improved usage of space and improved happiness of employees could be obtained after reaching the 5S auditing level (Pentti, 2014).

Overall, this case study has produced strong and verifiable data from direct observations presented in Appendix A, B, and C. There were no assumptions when concluding from the data and facts which has added validity to the outcome of this study over time. The facts presented here can be looked at continuously for further improvement. The easy approach used in this research provides everyone with analytical power to increase IE and lean knowledge. The limitation of this research is that it is done in a single company. More studies in a couple of labs in different textile industries producing different products could help to generalize the results.

6 CONCLUSIONS

Although chemical lab management is mainly focused on the development of samples and getting approval from buyers, contrary to common belief, lab managers should have some concern about productivity. The pace for sample production is usually much slower than the bulk production, but still, they should have expected a sample production rate per day, and managers should follow up on productivity accordingly. Also, 5S is found obvious to maintain cleanliness,

discipline, and safety in the lab room as per two years of close observation and comments from lab workers, staff, and visitors. A future recommendation is to estimate any tangible results achievable from 5S. Further research can also be carried out with data captured in this study for value stream mapping to enlighten lab managers to visualize further opportunities to reduce waste (Yang et al., 2015) in the sample production process in all chemical labs in any textile industry in Bangladesh.

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APPENDIX A

Number of the batch: 1

Number of beakers: 14

Fabric type: 100% Cotton

Sl. No.	Activity	Activity Type	Frequency	Independent (I) / Followed by	Time Duration (Sec)	Distance Traveled (cm)	Parallel Activity	Waiting Time	Responsible Person	Remarks
P-1	Prepare the Recipe			I	255				Sr./ Executive	
1.1	Receive the mail from merchandising department	Computer		I						
1.2	Check the mail and print out the TCX/TPX value	Computer		1.1	94					
1.3	Go to Spectrophotometer with the printed copy	By Hand		1.2	27	840				
1.4	Enter the TPX/TCX value and select dyes for the recipe	Spectro-meter		1.3	16					
1.5	Observe the suggested color combination considering cost and select the best one	Spectro-meter		1.4	102					
1.6	Save the selected data as standard and print out the recipe	Spectro-meter		1.5	16					
P-2	Prepare Dye stock solution		102	I	120				Lab Assistant	3 Persons do the tasks together
2.1	Take the funnel from the table	By Hand			10					
2.2	Put the dyes on the weight machine	Weight Machine		2.1	30	360				
2.3	Dyes poured into the funnel	By Hand	Varies	2.2	25					
2.4	Add water into the funnel according to the requirements	By Hand	Varies	2.3	30	360				
2.5	Mixing the dyes and water	By Hand		2.4	25					
P-3	Prepare the worksheet according to the recipe	By Hand		P-1	300				Sr. Lab Assistant	This time has given for 5 recipes in 1 worksheet
P-4	Shaking Conical flask for mixing solution properly	By Hand	Varies	P-2	135				Lab boy	Total time is divided by 3 persons as they work at the same time
P-5	Prepare the dyes solution according to the recipe			P-1	1480				Jr. Lab Assistant	

Sl. No.	Activity	Activity Type	Frequency	Independent (I) / Followed by	Time Duration (Sec)	Distance Traveled (cm)	Parallel Activity	Waiting Time	Responsible Person	Remarks
5.1	Pour the dyes into the beaker	Electronic Digital Pipette	Varies		960					
5.2	Add leveling agents	Electronic Digital Pipette			120					
5.3	Add water according to the requirements	By Hand	Varies		130					
5.4	Weighing Salt (NaCl, Glubar) on the weight machine and poured into the beaker	Weight Machine	Varies		270	60				
P-6	Prepare the fabric or yarn for the dyeing operation			I	1240			1268	Lab boy	
6.1	Cut the fabric/yarn from the tube	By Hand	Varies		308					
6.2	Weighing the fabric/yarn on the weight machine	Weight Machine	Varies	5.1	592	240				
6.3	Wet the fabric/yarn into the mug and squeeze	By Hand		5.2	50	300				
6.4	Dip the fabric/yarn into the beaker	By Hand		5.3	290					
P-7	Fix the cap of the beaker	By Hand		P-4 & P-5	103			425	Lab boy	
P-8	Dye process			P-6	6716				Lab Assistant	
8.1	Transfer the beaker from the basin to the machine area	By Hand			11	900				
8.2	Set the beaker into the machine	by Hand		7.1	51					
8.3	Close the door and the program set up	By Hand		7.2	54					
8.4	Start the program	Dyeing Machine		7.3	6600		At half-time add Soda Ash, Caustic Soda, and Green buff			
P-9	Dispose of the beaker from the machine	By Hand		P-7	70			660	Lab boy	
P-10	Cold & Hot Wash with Neutralization				470				Lab boy	
10.1	Take the beaker on the basin	By Hand			10	900				

Sl. No.	Activity	Activity Type	Frequency	Independent (I) / Followed by	Time Duration (Sec)	Distance Traveled (cm)	Parallel Activity	Waiting Time	Responsible Person	Remarks
10.2	Release the cap of the beaker	By Hand			80					
10.3	Put off the fabric/yarn from the beaker	By Hand			67					
10.4	Cold wash	By Hand			66					
10.5	Hot wash	By Hand			53					
10.6	Pour fabric/yarn into the acetic acid solution (Neutralization)	By Hand			194					
P-11	Soaping procedure				2041				Lab boy	
11.1	Soaping with chemicals	Soaping Machine			886	180				
11.2	Cold wash	By Hand	2		55	180				
11.3	Hot wash	By Hand	2		51					
11.4	Soaping with detergent	Soaping Machine	2		919	180				
11.5	Hot wash	By Hand	3		62	180				
11.6	Cold wash	By Hand	3		68					
P-12	Squeeze the fabric/yarn	Squeezing Machine			58	240			Lab boy	
P-13	Drying				1322			188	Lab boy	
13.1	Fold the fabric/Yarn & put it into the machine	By Hand			110	420				
13.2	Dry the squeezed fabric	Dry Machine			1212	480				
P-14	Attach the fabric/yarn to the paper	By Hand			660	60			Executive/ Lab Assistant	
P-15	Conditioning	Conditioning Machine			602	840			Lab Boy	
P-16	Sample Assessment				366				Manager / Sr. / Executive	Time considers per sample
16.1	Attach fabric/yarn on paper to check into the dark room	By Hand			244	840				
16.2	Check the sample and make comments according to the requirements	By Hand			122	1260				
P-17	If the sample is approved, prepare the production card	Computer			185	1260			Sr. / Executive	

APPENDIX B

Number of the batch: 2

Number of beakers: 4

Fabric type: 50% Cotton & 50% Polyester

Sl. No.	Activity	Activity Type	Frequency	Independent (I) / Followed by	Time Duration (Sec)	Distance Traveled (cm)	Parallel Activity	Waiting Time	Responsible Person	Remarks
P-1	Prepare the Recipe			I	255				Sr./ Executive	
1.1	Receive the mail from merchandising department	Computer		I						
1.2	Check the mail and print out the TCX/TPX value	Computer		1.1	94					
1.3	Go to Spectrophotometer with the printed copy	By Hand		1.2	27	840				
1.4	Enter the TPX/TCX value and select dyes for the recipe	Spectrometer		1.3	16					
1.5	Observe the suggested color combination considering cost and select the best one	Spectrometer		1.4	102					
1.6	Save the selected data as standard and print out the recipe	Spectrometer		1.5	16					
P-2	Prepare leveling agent solution		102	I	221				Lab Assistant	3 Persons do the tasks together
2.1	Take the funnel from the table	By Hand			12					
2.2	Put the dyes on the weight machine	Weight Machine		2.1	58	360				
2.3	Dyes poured into the funnel	By Hand	Varies	2.2	34					
2.4	Add water into the funnel according to the requirements	By Hand	Varies	2.3	85	360				
2.5	Mixing the leveling agent and water	By Hand		2.4	32					
P-3	Prepare the worksheet according to the recipe	By Hand		P-1	306				Sr. Lab Assistant	This time has given for 5 recipes in 1 worksheet
P-4	Shaking Conical flux for mixing solution properly	By Hand	Varies	P-2	142				Lab boy	Total time is divided by 3 persons as they work at the same time
P-5	Prepare the dyes solution according to the recipe			P-1	1227				Jr. Lab Assistant	

Sl. No.	Activity	Activity Type	Frequency	Independent (I) / Followed by	Time Duration (Sec)	Distance Traveled (cm)	Parallel Activity	Waiting Time	Responsible Person	Remarks
5.1	Pour the dyes solution into the beaker	Electronic Digital Pipette	Varies		1053					
5.2	Add leveling agents	Electronic Digital Pipette			130					
5.3	Add water according to the requirements	By Hand	Varies		44					
5.4	Weighing Salt (NaCl, Glubar) on the weight machine and poured into the beaker	Weight Machine	Varies		0	60				Salts are not added
P-6	Prepare the fabric or yarn for the dyeing operation			I	296				Lab boy	
6.1	Cut the fabric/yarn from the tube	By Hand	Varies		88					
6.2	Weighing the fabric/yarn on the weight machine	Weight Machine	Varies	5.1	184	240				
6.3	Wet the fabric/yarn into the mug and squeeze	By Hand		5.2	0	300				wet & Squeeze are not needed
6.4	Dipping the fabric/yarn into the beaker	By Hand		5.3	24					
P-7	Fix the cap of the beaker	By Hand		P-4 & P-5	58				Lab boy	
P-8	Dyeing process			P-6	8385				Lab Assistant	
8.1	Transfer the beaker from the basin to the machine area	By Hand			18	1020				
8.2	Set the beaker into the machine	by Hand		7.1	38					
8.3	Close the door and the program set up	By Hand		7.2	49					
8.4	Start the program	Dyeing Machine		7.3	8280		At half-time add Soda Ash, Caustic Soda, and Green buff	543		135 Degree Centigrade Temperature
P-9	Dispose of the beaker from the machine	By Hand		P-8	55				Lab boy	
P-10	Cold Wash			P-9	104				Lab boy	
10.1	Take the beaker on the basin	By Hand			39	1020				
10.2	Releasing the cap of the beaker	By Hand			22					

Sl. No.	Activity	Activity Type	Frequency	Independent (I) / Followed by	Time Duration (Sec)	Distance Traveled (cm)	Parallel Activity	Waiting Time	Responsible Person	Remarks
10.3	Put off the fabric/yarn from the beaker	By Hand			20					
10.4	Cold wash	By Hand			23					
P-11	Reduction Clean Process		2	P-10	3059					Required 2 times but for urgency, RC is doing 1 time
11.1	Add caustic soda, hydrosol	By Hand			246					
11.2	Fix the cap of the beaker	By Hand			18				Lab boy	
11.3	Transfer the beaker from the basin to the machine area	By Hand			15	180				
11.4	Set the beaker into the machine	By Hand	2		32	180				
11.5	Close the door and the program set up	By Hand	2		48					
11.6	Start the program	Dyeing Machine	1		2700	180				80 Degree Temperature
P-12	Dispose of the beaker from the machine	By Hand	3	P-11	53	180				
P-13	Cold & Hot wash			P-12	230					Required 2 times but for urgency cold & hot wash are done 1 time
13.1	Take the beaker on the basin	By Hand	3		51					
13.2	Releasing the cap of the beaker	By Hand			23					
13.3	Put off the fabric/yarn from the beaker	By Hand			22					
13.4	Cold wash	By Hand			65					
13.5	Hot Wash	By Hand			69					
P-14	Neutralization Process			P-13	84					
14.1	Adding water, Acetic acid	By Hand			84					
P-15	Squeeze the fabric/yarn	Squeezing Machine		P-14	48	240			Lab boy	
P-16	Drying			P-15	1448				Lab boy	
16.1	Fold the fabric/Yarn & put it into the machine	By Hand			36	480				
16.2	Dry the squeezed fabric	Dry Machine			1412	480				
P-17	Attach the fabric/yarn to the paper	By Hand		P-16	182	60			Executive / Lab Assistant	

Sl. No.	Activity	Activity Type	Frequency	Independent (I) / Followed by	Time Duration (Sec)	Distance Traveled (cm)	Parallel Activity	Waiting Time	Responsible Person	Remarks
P-18	Conditioning	Conditioning Machine		P-17	183	840			Lab Boy	Required conditioning is 10 min but urgency purpose conditioning is doing 3 min
P-19	Sample Assessment			P-18	365				Manager / Sr. / Executive	Time considered per sample
19.1	Attaching fabric/yarn on paper to check into the dark room	By Hand			242	840				
19.2	Check the sample and make comments according to the requirements	By Hand			123	1260				
P-20	If the sample is approved, prepare the production card	Computer		P-19	186	1260			Sr. / Executive	

APPENDIX C

Number of the batch: 3

Number of beakers: 19

Yarn type: 100% Polyester

Sl. No.	Activity	Activity Type	Frequency	Independent (I) / Followed by	Time Duration (Sec)	Distance Traveled (cm)	Parallel Activity	Waiting Time	Responsible Person	Remarks
P-1	Prepare the Recipe			I	270				Sr. / Executive	
1.1	Receive the mail from merchandising department	Computer		I						
1.2	Check the mail and print out the TCX/TPX value	Computer		1.1	97					
1.3	Go to Spectrophotometer with the printed copy	By Hand		1.2	29	840				
1.4	Enter the TPX/TCX value and select dyes for the recipe	Spectrometer		1.3	18					
1.5	Observe the suggested color combination considering cost and select the best one	Spectrometer		1.4	107					
1.6	Save the selected data as standard and print out the recipe	Spectrometer		1.5	19					
P-2	Prepare Stock solution		102	I	124				Lab Assistant	3 Persons do the tasks together
2.1	Take the funnel from the table	By Hand			13					
2.2	Put the dyes on the weight machine	Weight Machine		2.1	33	360				
2.3	Dyes poured into the funnel	By Hand	Varies	2.2	24					
2.4	Add water into the funnel according to the requirements	By Hand	Varies	2.3	29	360				
2.5	Mixing the leveling agent and water	By Hand		2.4	25					
P-3	Prepare the worksheet according to the recipe	By Hand		P-1	308				Sr. Lab Assistant	This time has given for 5 recipes in 1 worksheet
P-4	Shaking Conical flask for mixing solution properly	By Hand	Varies	P-2	145				Lab boy	Total time is divided by 3 persons as they work at the same time
P-5	Prepare the dyes solution according to the recipe			P-1	2035				Jr. Lab Assistant	

Sl. No.	Activity	Activity Type	Frequency	Independent (I) / Followed by	Time Duration (Sec)	Distance Traveled (cm)	Parallel Activity	Waiting Time	Responsible Person	Remarks
5.1	Pour the dyes solution into the beaker	Electronic Digital Pipette	Varies		1623			461		Calculation of dyes, water pouring, Talking to each other
5.2	Add leveling agents	Electronic Digital Pipette			260			15		Worksheet handling
5.3	Add water according to the requirements	By Hand	Varies		152			82		Hovering around
5.4	Weighing Salt (NaCl, Glubar) on the weight machine and poured into the beaker	Weight Machine	Varies		0	60				Salts are not added
P-6	Prepare the fabric or yarn for the dyeing operation			I	1788				Lab boy	
6.1	Cut the fabric/yarn from the tube	By Hand	Varies		660					
6.2	Weighing the fabric/yarn on the weight machine	Weight Machine	Varies	5.1	437	240				
6.3	Yarn knotting	By Hand			579			1659		Waiting for another person
6.4	Dipping the fabric/yarn into the beaker	By Hand		5.3	112					
P-7	Fixing the cap of the beaker	By Hand		P-4 & P-5	197				Lab boy	
P-8	Dyeing process			P-7	9452				Lab Assistant	
8.1	Transfer the beaker from the basin to the machine area	By Hand			17	1020				
8.2	Set the beaker into the machine	by Hand		7.1	65					
8.3	Close the door and the program set up	By Hand		7.2	21					
8.4	Start the program	Dyeing Machine		7.3	9349		At half-time add Soda Ash, Caustic Soda, and Green buff			145 Degree Centigrade Temperature
P-9	Dispose of the beaker from the machine	By Hand		P-8	48				Lab boy	
P-10	Cold Wash			P-9	101				Lab boy	
10.1	Take the beaker on the basin	By Hand			35	1020				
10.2	Releasing the cap of the beaker	by Hand			25					

Sl. No.	Activity	Activity Type	Frequency	Independent (I) / Followed by	Time Duration (Sec)	Distance Traveled (cm)	Parallel Activity	Waiting Time	Responsible Person	Remarks
10.3	Put off the fabric/yarn from the beaker	by Hand			23					
10.4	Cold wash	by Hand			18					
P-11	Reduction Clean Process		2	P-10	3962					Required 2 times but for urgency, RC is doing 1 time
11.1	Add caustic soda, and hydrose	by Hand			241					
11.2	Fix the cap of the beaker	by Hand			19				Lab boy	
11.3	Transfer the beaker from the basin to the machine area	by Hand			23	180				
11.4	Set the beaker into the machine	By Hand	2		61	180				
11.5	Close the door and the program set up	By Hand	2		43					
11.6	Start the program	Dyeing Machine	1		3575	180				80 Degree Centigrade Temperature
P-12	Dispose of the beaker from the machine	By Hand	3	P-11	57	180				
P-13	Neutralization Process			P-12	206					
13.1	Beaker takes on the basin area				25					
13.2	Yarn put off				15					
13.3	Hot wash	By Hand			20					
13.4	Cold Wash	By Hand			21					
13.5	Adding acetic acid	By Hand			125	240			Lab boy	
P-14	Yarn Squeezing			P-13	122					
P-15	Drying			P-14	1014				Lab boy	
15.1	Fold the fabric/Yarn & put it into the machine	By Hand			125	480				
15.2	Dry the squeezed fabric	Dry Machine			889	480				
P-16	Attach the fabric/yarn to the paper	By Hand		P-15	132	60			Executive / Lab Assistant	
P-17	Sample Assessment			P-16	365				Manager / Sr. / Executive	Time considers per sample
17.1	Attaching fabric/yarn on paper to check into the dark room	By Hand			242	840				
17.2	Check the sample and make comments according to the requirements	By Hand			123	1260				
P-18	If the sample is approved, prepare the production card	Computer		P-17	186	1260			Sr. / Executive	

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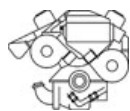
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FRAMEWORK FOR SUCCESSFUL PROBLEM-SOLVING IN LEAN: A FOCUS GROUP RESEARCH IN MALAYSIAN AUTOMOTIVE

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Abstract

From household issues to complex organizational cases, problem-solving is a common but critical matter in our life. Organizations have tried to harness maximum benefit from lean, but evidence of implementing problem-solving principles is rare. This study intends to emphasize on importance and expose the highly influencing success factors to establish continuous problem-solving and learning in any organization with the example of an automotive industry case in Malaysia. A list of elements of problem-solving principles of lean and another for success factors to implement lean has been compiled through a comprehensive review of contemporary literature. Then a focus group of sixteen professional experts selected meticulously from a reputed Malaysian Automotive industry thoroughly discussed the subject matter in group meetings to get their judgments based on experience and shared knowledge. The approach of grading success factors at the element level of principles of lean is an added methodology to the existing knowledge, and the results of highly influencing success factors for the implementation of elements of principles of problem-solving in lean is a new and helpful insight for organizational leaders and researchers. The author assumes this research may take lean implementation to the next level of success. Modern organizations must build lean problem-solving culture by motivating and empowering management employees who have process-level understanding and are accountable with different metrics. The key to success also depends highly on operators' inclusiveness and managing their reactions to change. Both management and process workers must drive lean as a team.

Keywords: *Lean; problem-solving principle; success factor; focus group; analysis of influence; Malaysian automotive*

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1 INTRODUCTION

For Toyota Production System (TPS), or what is now called 'lean' (Parsley, 2018), now is the time for it to remain a thing for only true believers (Hohmann, 2017a). A few organizations become able to implement lean successfully (Drew et al., 2016), but most of them did not reach the goals



(Anand & Kodali, 2011). In the book 'Lean Implementation: Why Lean Fails and How to Prevent failures', Asefeso (2014) conducted a large survey in 2012 that resulted in only 2% of the companies have achieved their anticipated results from lean. Many researchers found that lean fails in more than 50% of cases (Anand & Kodali, 2011), and the range of failure is between 50% and 95%, and among those who succeed, only 30% sustain (Asefeso, 2014).

Lean has mostly emphasized on waste (activities adding no value) elimination and time (lead time, processing time, development time etc.) reduction (Islam et al., 2018a, 2018b) to build fast and flexible manufacturing system to meet modern competition and customer demand (Islam, 2021). Again, Coetzee et al. (2016) have shown concern that so far, strategies for lean implementation have focused alarmingly minimum on principles of problem-solving, although continuous improvement (CI) is at the core of objectives to implement lean principles that are not achievable if problem-solving is excluded. Some companies, in practice, take limited initiative and work on some split and irregular kaizen workshops to fix broken processes or some easy and quick waste elimination (Hohmann, 2017b), and think they are already lean. People are reluctant to change by nature. Neuropsychology favors this by demonstrating that due to well-worn neural pathways, people find it comfortable to do things the same way repeatedly (Asefeso, 2014). Hence research on finding ways to implement new principles of lean at different levels in an organization, from upper management to frontline employees (Choo et al., 2015) is inevitable.

Liker (2005) has introduced a 4P model of lean: Philosophy, Process, People and partners, and Problem-solving. There he proposed fourteen principles. Principles number 12, 13, and 14 were grouped into the category of problem-solving which covers the tenets of continuous improvement and learning (Liker, 2005; Jeffrey & Meier, 2006). Principle number 12 is articulated to spot improvement opportunities and recognize problems in the organization. And together with principle number 13, it is essential to engage people in the total process of problem-solving. But in existing research, although principle 14 has gotten some attention to encourage CI to be a learning organization, there is not enough concern for direct observation (principle 12) or making

decisions slowly with the total agreement (Principle 13) (Coetzee et al., 2016).

Recently, the method and implementation of problem-solving of lean have received attention. Parsley (2018) studied the impact factors to engage employees in problem-solving to implement lean. In an article titled "Comparison of problem-solving tools in lean organizations", Iuga and Rosca (2017) analyzed and compared the problem-solving methods. Another study titled 'Organizational structure, employee problem-solving, and lean implementation' presents an investigation of how lean employee grows their problem-solving skills through the journey through lean implementation (Worley & Doolen, 2015).

Malaysia started a lean program under Malaysian-Japan Automotive Cooperation (MAJAICO) in November 2006 (SME Corp., 2010). Until 2011, 87 companies had participated, and 220 improvement projects were completed, under Japanese industrial experts with vast experience in the automotive industry (Chay, 2014). Then Malaysian Automotive Institute (MAI) took another program under Automotive Technical Expert Assistances (ATEA) for Lean Production System (LPS) implementation and 20 companies saved a total amount of RM18.36 million. Now, to benchmark with global automotive industries like JAPAN, a program named the Automotive Supplier Excellence Program (ASEP) program has been taken. This program also includes LPS as a tool for improving the manufacturing process. This sustainable manufacturing with lean production program (SMLP), was driven towards transforming 120 companies and raising their competence and skill levels to a world-class standard by 2020 (Malaysia Automotive Institute, n.d.).

Bon and Karim (2011) raised the issue that transparency in Malaysian industries is not evident enough in the case of lean implementation. Additionally, they pointed out that case study of lean in the Malaysian industry is limited. Within the automotive industry in Malaysia, studies have been done on lean implementation considering 12 success factors (SFs) (Rose et al., 2014); and 12 perceived barriers (Roslin et al., 2014). Another study has been made based on a survey of empirical data but excluded some significant factors "such as cultural differences, project management competence, and employee participation" (Fadly & Mohd, 2013). Marodin and Saurin (2013) studied and declared that 86% of all

lean pieces of literature published from 1996 to 2012 were based on research in only developed western countries.

Putri et al. (2016) found in their both case study companies in Malaysia that have taken lean initiatives, that the Kaizen initiatives, one of the principles within lean (Coetzee, 2016) represent a continuous improvement aspect (Bhuiyan & Baghel, 2005), have not been effectively implemented. The teamwork approach to solving problems was not founded enough on team members. Also, they were reluctant to build skills for continuous improvement at the individual level. Also, the team was not entitled to practice power to make decisions to solve problems. In case of any problem found by team members, they had to report first to middle management, and then middle management could report to top management. Top management was not interested in both, observing issues and providing training directly on the production floor. Only middle management participated in direct observations, while top management only waited for their report (Putri et al., 2016). But to solve problems in lean management, leaders have no excuse, must see and thoroughly understand the situation for themselves (Liker, 2005), and face relentless unpredictability because of non-stop interruption and fast changes (Myszkowski et al., 2015).

All these studies (Rose et al., 2014; Roslin et al., 2014; Fadly & Mohd, 2013) have been carried out based on the overall impact on lean implementation though the top factors based on overall influence may miss some, for the overall score, not dominant factors although they have a high impact on a specific element of a single lean principle. Maybe Malaysian automotive companies which are trying to be lean still do not know the highly influencing SFs to implement the problem-solving principle (PSP) of lean and/or are not giving enough importance to implementing PSPs of lean to adopt continuous learning and improvement culture.

But the Automotive industry is at the heart bridge of the development of a nation (Sultana & Ibrahim, 2014; Rashid et al., 2015) and is currently one of the world's largest economic contributors with 98.9 million motor vehicles produced globally in 2017 ("World production," 2018). The industry is also a vital financial driver of the Malaysian

economy (Sultana & Ibrahim, 2014; Mamat et al., 2015) and is projected to add to the nation's development so much that the country can turn out to be an advanced country by 2020 (Sultana & Ibrahim, 2014).

2 LITERATURE REVIEW

There is little consensus on the definition of problem-solving (Hall, 2017). Mayer and Wittrock (2006) have defined problem-solving as "cognitive processing directed at achieving a goal." Atuahene-Gima and Wei (2011) define problem-solving as "a process of seeking, defining, evaluating, and implementing solutions". The process of any problem-solving naturally begins when someone appeals to any "goal-directed sequence of cognitive operations" (Anderson, 1985). In the first stage, simply knowing about effective tools provide some hypothetical insight into the processes. Then these tools may be combined to develop training programs supported by experimental research (Vernon et al., 2016). In case of a process problem like bottlenecks or defects, after receiving the information about the current practice and objective, analysts develop some solutions and identify the preferred one, and then develop the future process. Finally, the assessment of the new process is done concerning the original objective (Figl & Recker, 2016). But the implementation of problem-solving in most organizations is practiced with just a form where all the boxes are to fill in. As such, problem solvers direct their thinking towards solving the problem without focusing on methodology. Upon completing the activity, they document the results on pre-made templates. So, a new tactic for solving problems has no impact on users' thinking because the thinking of other employees has remained the same. To change an individual; the norms, values, and beliefs of his or her organization need to be addressed (Marksberry et al., 2011).

The principles of lean are a set of beliefs about what works. Lean connects the organizational rules of the manufacturing system and organizational culture (Liker & Hosesus, 2008). It always begins with the buyer considering value-added processes for them and then identifying the waste in any process. It takes time and experience to get waste out of the process - a learning process in continuous improvement. Only process

possessors and supervisors who work closely with the process can improve it daily. *Kaizen* (change for the better) drives organizational learning continually (Principle 12), and this learning is contained by making decisions slowly but with everyone's consent at a time after looking into every detail of all possibilities, but the implementation of solutions is performed rapidly (Principle 13). The decision-making process also considers the mindset of managers to attend directly to the floor to recognize the situation comprehensively (Principle 14) (Alpenberg & Scarbrough, 2009).

Lean supports organizations to standardize problem-solving methods in a simple but sustainable way (Mohamed, 2016). Flinchbaugh and Carlino (2006) list five practices for 'personal lean' in the Hitchhiker's Guide to Lean – the fifth practice is mentioned to “see more with your own eyes”. The fifth practice mentioned: see more with your own eyes. Examples of application of this significant element of problem-solving principle are missing in the extant lean literature, but they are abundantly discussed in *The Toyota Way*. The presentation of principle number 12 is much different in the lean literature and “*The Toyota Way*” written by Jeff Liker because the eastern culture and the western way of thinking are not the same. While Liker stresses the “deep understanding” and the Japanese view; lean is all about adapting the TPS principle to the western culture. To summarize in this direction, both TPS

and Lean have essentially the same objective to fulfill through principle number 12 (Kochnev, 2007).

According to Iuga and Rosca (2017), the whole TPS philosophy is mainly standing on problem-solving and decision-making, but decision-making has not got that much attention in lean. TPS principle 13 talks about analyzing decisions considering all alternatives and obtaining ideas from all involved. This way, at a time, it creates total agreement on solutions between all engaged, and all the tasks are shared on a single piece of A3 paper. The evidence of these steps of the decision-making process is not revealed much in extant lean literature. Only *The Hitchhiker's Guide to Lean* (Flinchbaugh & Carlino, 2006) has talked a bit about this TPS principle 13 and formulated the lean principle: ‘Establish agreement on WHAT and HOW’. This lean principle mainly talks about collaborative standardization to achieve the “what”. Cappelli and Rogovsky (1998) investigated workers' involvement in decision-making and the legal and psychological propositions but not the agreement and thought of all options. The absence of guidance in good decision-making and consensus-building for problem-solving is noticed in the Lean literature (Kochnev, 2007).

The author compiled elements of PSPs of lean from the contemporary literature and presented them along with the respective sources in Table 1.

Table 1: Elements of PSPs of Lean

Sl. #	Elements of PSPs	Source(s)
1	Use Reliable Data	Spear (2004), Liker (2005), Jeffrey & Meier (2006), Vermaak (2008)
2	Structure Problem-Solving Procedure	Staats et al. (2011), Jeffrey & Meier (2006), Marksberry et al. (2011)
3	Root Causes & Alternative Solutions	Liker (2005), Jeffrey & Meier (2006), Vermaak (2008), Mann (2010)
4	Implement Quickly	Liker (2005), Jeffrey & Meier (2006), Vermaak (2008), Marksberry et al. (2011)
5	Make Problems Visible	Bowen & Spear (1999), Liker (2005), Jeffrey & Meier (2006)
6	Approach Problems Categorically	Spear (2004), Jeffrey & Meier (2006)
7	Reflect Mistakes & Standardize Processes	Liker (2005), Vermaak (2008), Marksberry et al. (2011)
8	Encourage Continuous Improvement	Spear (2004), Liker (2005), Jeffrey & Meier (2006), Vermaak (2008)
9	Best Practices & Strengthening	Liker (2005), Jeffrey & Meier (2006)
10	Knowledge Protection	Liker (2005), Jeffrey & Meier (2006), Vermaak (2008)

Lean represents a holistic approach to change. Even the base of lean requires a momentous organizational transformation, and this amendment is a radical process and not an effortless task (Smeds, 1994). While a few organizations are successful, many organizations get trapped in the primary lean execution efforts (Smalley, 2006). Even with grave investments, lots of organizations have failed to attain the

projected benefits (Donovan, 2005). Lean practices have also been attempted in some developing countries, but the level of consideration in lean thinking is not the same (Mohamad et al., 2013). Many researchers have worked on enablers, barriers, and SFs of lean. The author compiled and presented a list of SFs of lean (Islam, 2020) along with their sources shown in Table 2.

Table 2: List of Success Factors of Lean

Sl. #	Success Factors	Sources
1	Vision and business plan	Rosario (2000), Hamid (2011), Asefeso (2014)
2	Manageable goals	Manville et al. (2012), Asefeso (2014), Salonitis & Tsinopoulos (2016)
3	Organizational structure	Faron (2012), Siemerink (2014)
4	Human resource empowerment	Jurado et al. (2013), Doustar et al., (2014)
5	A compelling need to change	Asefeso (2014), Salonitis & Tsinopoulos (2016), Alefari et al. (2017)
6	Leadership from top management	Hofmann (2015), Baviskar (2015), Salonitis & Tsinopoulos (2016), Lande et al. (2016), Zhou (2016)
7	Financial capabilities	Achanga et al. (2006), Salonitis & Tsinopoulos (2016)
8	Organizational culture	Salonitis & Tsinopoulos (2016), Zhou (2016), Lande et al. (2016), Alefari et al. (2017)
9	Total commitment to theories & tools	Roslin et al. (2014), Asefeso (2014), Salonitis & Tsinopoulos (2016), Alefari et al. (2017)
10	Resistance to change	Asefeso (2014), Zhou (2016)
11	Resources allocation	Marodin & Aurin (2015), Salonitis & Tsinopoulos (2016), Singh & Singh (2016), Alefari et al. (2017)
12	Timing for change	Asefeso (2014), Salonitis & Tsinopoulos (2016)
13	Project management	Manville et al. (2012), Lande et al. (2016)
14	Engagement of Process Owners	Manville et al. (2012), Asefeso (2014), Roslin et al. (2014)
15	Knowledge and Mindset	Furukawa (2016), Zhou (2016), Lande et al., 2016), Salonitis & Tsinopoulos (2016)
16	Skills and expertise	Dora et al. (2013), Zhou (2016)
17	Utilize Technology	Slack & Lewis (2017), Nightingale (2000)
18	Attitudes and behaviors	Asefeso (2014), Hoffman (2015), Singh & Singh (2016), Kumar et al. (2017)
19	Understand the process	Asefeso (2014), Womack (2017)
20	Create internal consultant	Vermaak (2008), Womack (2017)
21	Effective communication	Lande et al. (2016), Salonitis & Tsinopoulos (2016), Alefari et al. (2017), Islam (2019)
22	Teamwork	Asefeso (2014), Roslin et al. (2014), Furukawa (2016), Salonitis & Tsinopoulos (2016), Alefari et al. (2017)
23	Right kind of training	Singh & Singh (2016), Salonitis & Tsinopoulos (2016), Lande et al. (2016)

Sl. #	Success Factors	Sources
24	Downtime management	Jeffrey & Meier (2006), Asefeso (2014)
25	Metrics and accountability	Womack & Jones (2003), Aberdeen Group (2006)
26	Keep track of progress	Holland et al. (1999), Sumner (1999), Rosario (2000)
27	Extend beyond production & to suppliers	Jeffrey & Meier (2006), Asefeso (2014), Lande et al. (2016)
28	Manage reactions	Bollbach (2012), Asefeso (2014),
29	Motivation	Jeffrey & Meier (2006), Haleem et al. (2012), Asefeso (2014)
30	Supplier's performance	Singh & Singh (2016), Salonitis & Tsinopoulos (2016)
31	Business strategy	Manville et al. (2012), Lande et al. (2016)
32	Detailed Implementation Plan	Narang (2008), Norani et al. (2011)
33	Apply the full set of lean principles and tools	James (2006), Herron & Braiden (2007)
34	Quality awareness and management	Salonitis & Tsinopoulos (2016), Lande et al. (2016)
35	Inventory control	Lande et al. (2016), Salonitis & Tsinopoulos (2016)
36	Organizational infrastructure	Coronado & Antony (2002), Manville et al. (2012)

3. METHODOLOGY

To find SFs for the elements of PSPs of lean first, the three principles of the Toyota 4P PSPs model are compiled from the literature and divided into distinct groups per contemporary literature. In parallel, we consolidated SFs of lean and other relevant management. We used, in the next step, the opinion of industry experts to evaluate the SFs for each element of the PSP. Some ethical guidelines we strongly maintained from the start to the end of this research ensured uprightness and eminence in the research design and review. The purpose, methods, and potential risks we communicated to all concerned. The discretion of information and the secrecy of respondents are stringently maintained. Participants are requested to join willingly; the research is carried out independently without any conflict of interest.

We selected the automotive industry for this study because of the capability and capacity of operation, manufacturing and management system, diversity of expertise, implementation status of lean, age of the company, number of employees, etc. The company has the capability of a wide range of services like automobile

Assembly/Production, Any Motor-part production, Industrial Consultation, etc.

It operates using world-class production facilities with an efficient management system. It provides complete solutions for individual systems like vehicle module assembly and production from extra-low volume to high volume. The company is enough old and big and more likely can adopt lean principles (Tam & Chin, n.d.) and has been abiding by strict global standards in operation and quality.

Focus groups frequently used across a broad variety of research disciplines, including operation management and social sciences (Guest et al., 2017) are the participants of this research. To ensure in-depth group discussions participants are selected based on low age difference, social closeness, and personal relations (Richardson & Rabiee, 2001). Participants are tolerant and excellent problem solvers. Selected respondents have had at least a bachelor's degree and more than 5 years of professional experience, an excellent understanding of lean concepts (Lila, 2012), and work closely with operators (Bollbach, 2012) on the shop floor.

The more participants, the less group decision error! (Skulmoski et al., 2007) A group of eight to twelve (Stewart & Shamdasani, 2014) or even four individuals with a high degree of knowledge (Romney et al., 1986) is enough for a focus group. In this study, for reasons of control and consistency, there is an attempt to limit the size of the focus groups to four groups with four members in each group, i.e., a total of sixteen participants. And the head of the lean department was selected as the moderator. He led the process improvement teams for a decade and has 18 years of experience in operational excellence. He is a certified Six Sigma Black Belt as well. He took up a relatively passive role and allowed the discussion to be led primarily by the group respondents and facilitated the expression of potentially sensitive or emotive issues.

Most employees were found very busy at any working hour in the organization. The meeting schedule we agreed on in advance by the company human resources manager. Meetings we tape-recorded to enable verbatim analysis, but we did not use the records as it was difficult to understand who said what on the tape recorder. Video recording is also disregarded to avoid any adverse reaction. As a solution, in this research, at the meetings and when it was likely to be significant for the subsequent analysis, we wrote notes about who said what. First, to get an idea of the participant's knowledge and experience of lean, we asked general questions as presented in Table 3. From the answers, we verified instantly whether such a company understood lean and was practicing it or not.

Table 3: General questions for industry experts

Please mention your department/section.
How many years of practical experience have you had with lean? (<2 years or 2 – 5 years or >5 years)
What was your role with lean?
How successful is your organization with lean? (Laggard or Average or Failed)

Face validity (FV) refers to the extent to which measurement instrument items look usable to evaluate linguistically and logically. Common FV methods are Expert assessments of items, Post hoc theory, Cohen's Kappa Index (CKI), etc. For content validity (CV), the measurement instrument items need to be related and representative of the goal construct. Common CV methods are literature review, expert panels or judges, content validity ratio (CVR), etc. This research has used the judgmental approach to set up content validity through literature reviews followed by the evaluation by a focus group of experts. Along with experts, the researcher took part in the discussion to facilitate validations (Taherdoost, 2016).

To ensure the validity of data, in this study, elements of PSPs of lean and SFs to implement them are compiled by literature review and will be assessed by the industry experts' scoring based on '0' for 'no influence', '1' for 'low influence', '2' for 'influence', '3' for 'high influence' and '4' for 'extreme influence'. First, the average of all sixteen experts' scores will be calculated as the average for each factor separately, for each element, and then for all elements, together. If the average score of a factor for all elements is below '3' (high influence) and no score for any element is close to '4' (extreme influence); the factor will be considered not highly relevant and will keep outside of the study. The followed method is more robust; because in the traditional CVR method, items are assessed using only a "three points scale (not useful, useful but not essential, and essential) where the number of "experts" agreed on an item as essential is considered" (Lawshe, 1975).

This study uses the most used internal consistency measure of the Cronbach Alpha coefficient (Taherdoost, 2016) with the Likert scale. Because Cronbach Alpha coefficient is used as the most appropriate measure of reliability when Likert scales are used (Whitley, 2002; Robinson, 2010). The minimum internal consistency coefficient will be considered 0.70 because there are no set rules for internal consistencies, but most investigators agree on 0.70 as a minimum (Whitley, 2002; Robinson, 2010; Taherdoost, 2016). All calculations we will make using Microsoft Excel instead of any costly statistics software package (Mondal & Mondal, 2017).

This study has one very experienced moderator, and most participants are lean six sigma black

belts. They have similarities in terms of their background in society, education, employment, industry, etc. Well-structured instruments with fixed questions and response ranges are asked to literally all groups and in the same order. Study one can classify between simple and moderately complex. The participants were asked about their opinions and experience with the research topic. Also, as the range of SFs is wide, the subject topic is management with a frequent issue. The

experienced participants expressed their views while arguing general issues (Guest et al., 2017), and the results from this study were highly expected to be generalizable.

4. RESULTS

General questions to selected participants provided information as in Table 4.

Table 4: General information of participants

Occupation category	Experience with lean	Experienced lean as	Perceived lean success
Production/Operations	2 – 5 years	Manager	Laggard
Production/Operations	2 – 5 years	Non-management	Laggard
Quality	>5 years	Manager	Average
Quality	2 – 5 years	Non-management	Laggard
Process Engineering	<2 years	Manager	Laggard
Process Engineering	2 – 5 years	Manager	Laggard
Marketing/sales	2 – 5 years	Manager	Average
Marketing/sales	>5 years	Manager	Failed
Engineering/Technical/ Maintenance	>5 years	Non-management	Average
Engineering/Technical/ Maintenance	2 – 5 years	Non-management	Laggard
Human Resources/Training	2 – 5 years	Manager	Average
HSE	2 – 5 years	Manager	Average
IE	<2 years	Non-management	Failed
Finance/Administration	2 – 5 years	Non-management	Failed
Logistics/Distribution/ Procurement	2 – 5 years	Non-management	Failed
IT	<2 years	Manager	Laggard

In focus group discussions, to identify which SFs are influencing at what level, separately for the ten elements of PSPs of lean, they scored based on '0' for 'no influence', '1' for 'low influence', '2' for 'influence', '3' for 'highly influence' and '4' for 'extremely influence'. Using a 4-point scale data validity was ensured, and for reliability, the

Cronbach Alpha coefficient was calculated and found as 0.99926. Hence the data is highly reliable. Table 1 shows the average scores of SFs for elements of PSPs of lean given by sixteen experts where the score more than or equal to 3 is shown in bold in Table 5.

Table E: Element-wise success factor(s)' score analysis

Sl.	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	Average	Rank (R)	Con- sider
F1	0.7	2.8	3.8	3.4	2.8	3.8	1.7	3.8	3.4	3.8	2.988		Y
F2	0.7	1.7	2.3	2.8	0.6	2.8	1.7	3.8	1.7	3.4	2.138		
F3	2.5	3.8	1.7	2.8	0.6	1.3	2.3	2.8	2.8	3.8	2.425		
F4	3.2	3.8	3.8	2.8	3.8	1.7	3.8	3.8	2.8	3.8	3.325	R3	
F5	0.7	3.4	2.8	3.8	2.8	3.8	3.8	3.4	3.8	0.6	2.881		
F6	1.8	3.8	1.3	2.8	2.8	2.8	2.8	3.8	3.8	3.8	2.925		Y

Sl.	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	Average	Rank (R)	Con- sider
F7	0.7	2.8	0.6	2.8	0.6	2.3	0.6	0.6	2.8	3.8	1.756		
F8	3.9	2.8	2.8	2.8	3.8	2.8	3.8	3.8	3.4	3.8	3.350	R2	
F9	1.8	2.8	3.8	3.8	2.3	1.7	1.7	3.8	2.8	0.6	2.500		
F10	1.8	2.8	3.8	3.8	3.8	1.7	3.8	3.8	3.8	0.6	2.969		Y
F11	1.8	3.8	2.3	3.8	0.6	3.8	2.3	3.4	3.8	3.8	2.944		Y
F12	0.7	0.6	2.8	3.8	1.7	1.7	1.7	2.8	3.4	1.7	2.075		
F13	0.7	2.3	0.6	3.8	0.6	1.7	1.7	1.7	1.7	1.7	1.650		
F14	3.1	3.8	3.8	3.8	3.8	2.8	1.7	3.8	2.8	2.3	3.069	R6	
F15	1.8	2.8	2.8	3.8	2.3	2.8	3.8	3.8	1.7	2.8	2.819		
F16	1.8	3.8	3.8	2.8	1.3	1.7	1.7	2.8	1.7	1.7	2.288		
F17	1.8	2.3	1.7	1.7	1.3	0.6	0.6	0.6	2.3	0.6	1.350		
F18	1.8	1.5	2.2	1.3	1.6	1.4	0.9	1.7	1.3	2.2	1.575		
F19	3.9	3.8	3.8	3.8	2.3	3.8	2.8	2.8	3.4	0.6	3.094	R5	
F20	0.4	2.0	2.0	3.9	0.3	2.3	1.4	2.0	2.0	0.3	1.663		
F21	3.9	3.8	3.8	2.8	3.4	2.3	1.7	3.8	2.3	1.7	2.944		Y
F22	2.8	3.8	3.4	3.8	1.7	1.7	3.4	3.8	3.4	2.8	3.050	R7	
F23	1.8	2.8	3.8	3.8	1.7	2.8	2.8	2.8	2.8	1.3	2.606		
F24	0.7	2.8	0.6	3.8	0.6	2.3	2.8	2.8	2.8	0.6	1.969		
F25	2.8	3.8	3.8	3.4	2.8	3.8	1.7	3.8	2.8	3.4	3.200	R4	
F26	2.8	2.8	1.7	2.8	1.7	2.8	2.3	3.8	3.8	2.8	2.713		
F27	3.3	2.8	2.8	2.8	2.3	2.8	2.8	2.8	3.8	2.8	2.819		
F28	1.8	3.8	3.8	3.8	2.8	2.8	2.8	3.8	2.3	2.8	3.031	R8	
F29	2.8	3.8	3.8	3.8	3.8	1.7	3.4	3.8	3.8	3.8	3.456	R1	
F30	0.7	1.7	1.7	2.8	0.6	1.3	1.7	2.9	2.3	0.6	1.625		
F31	0.7	1.7	2.3	1.7	0.6	3.4	1.3	2.8	2.8	3.8	2.094		
F32	0.7	2.8	2.8	2.8	0.6	2.8	3.8	2.8	2.8	2.8	2.438		
F33	0.7	3.4	3.8	3.8	2.8	1.7	2.8	3.8	3.8	0.6	2.713		
F34	1.8	2.8	3.8	3.8	3.8	3.4	2.8	2.8	3.8	0.6	2.925		Y
F35	0.7	1.7	3.4	2.8	2.8	0.6	2.8	3.8	2.8	0.6	2.181		
F36	1.8	1.7	1.7	2.8	0.6	1.7	1.7	1.7	1.7	0.6	1.588		

F29 (Motivation), F8 (Organizational culture), F4 (Human resource empowerment), F25 (Metrics and accountability), F19 (Understand the process), F14 (Engagement process owners), F22 (Teamwork), and F28 (Manage reactions) are highly influencing success factors in descending order. Also, F1 (Vision and business plan), F6 (Leadership from top management), F10 (Resistance to change), F11 (Resources allocation), F21 (Effective communication), and F34 (Quality awareness and management) should be considered as significantly influencing to the overall implementation of PSPs in lean. F17, F18,

F30, and F36 have appeared as less influencing success factors. Based on these results, a conceptual framework has been drawn and given in Figure 1.

5. DISCUSSION

Motivated employees will always perform better in a culture favorable for continuous improvement and learning. Additionally, if the people who understand the process are empowered to take decisions, results will come faster and better. So, we need to empower shop floor workers with the maximum number of tasks and responsibilities to

create the need to think actively and proactively. A performance measurement system should be used to monitor the evolution of performances and assess whether the decisions taken by them are compliant with the plan. When employees like to

work in a team, it becomes easy to manage their reactions to changes. Working in small groups as teams with long-term focus is always highly advantageous.

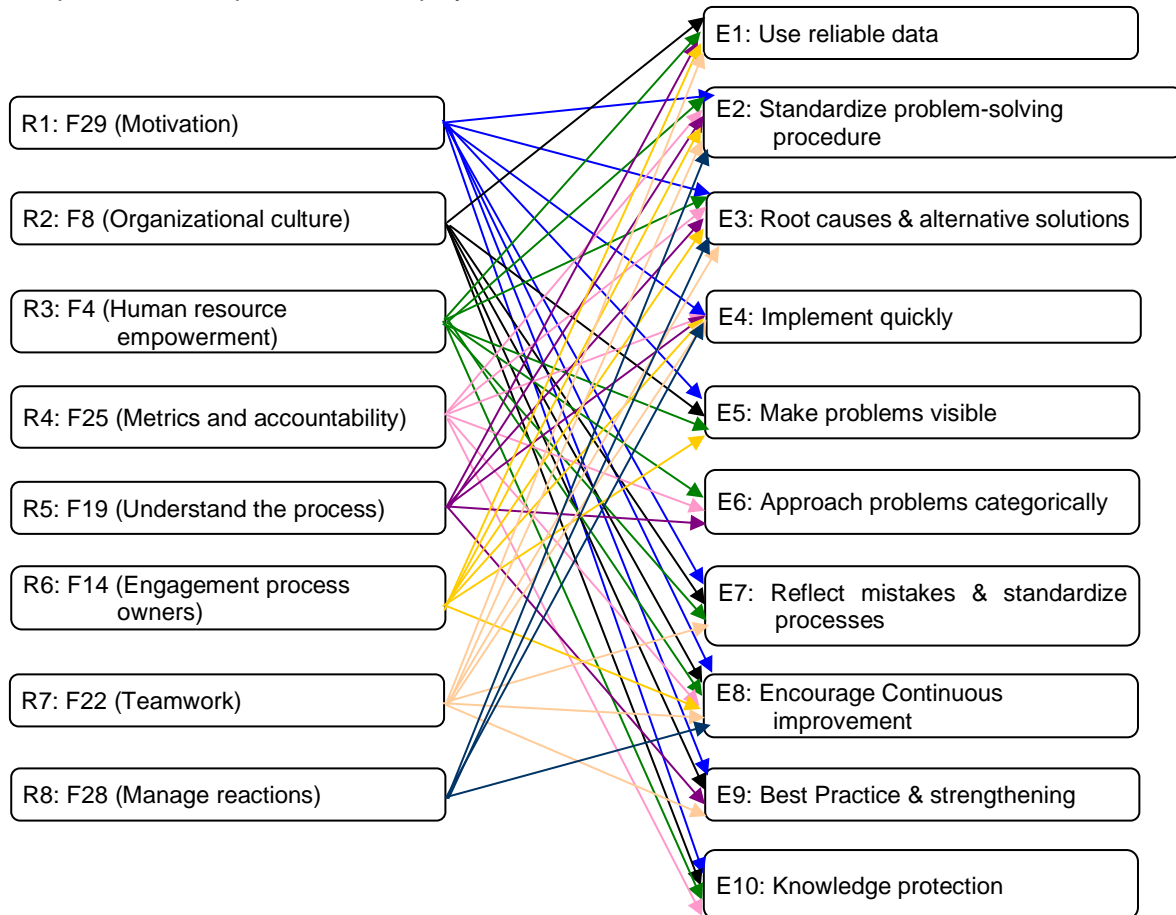


Figure 1: Conceptual framework for highly influencing SFs and Elements of PSPs

Continuous improvement must be inspired by top management who instill it in other members of the organization and create the paramount conditions for the diffusion of principles and minimize the resistance to change. Management needs to be efficient at relaying the vision of change to all employees and aligning their goals. Everyone in the organization should be alert to quality issues and manage them properly. In some cases, resources are required to implement the solutions. But all the initiatives should be effectively communicated (Touhidul & Sorooshian, 2019). Problems and ideas need to be shared timely and openly. Communication is an imperative way for lean transformation, which creates a strong motivational force in employees to share the best thoughts, results, and practices of lean programs across the whole organization.

This research intends to create a new approach to enhance the success rate of lean implementation. In place of considering the overall impact of SFs on the implementation of lean as available in contemporary literature, going into deeper details of principles and even their elements, this study will render more reliability and confidence to implement lean more successfully. Segregating SFs as per elements of principles of a management system and compiling them as per criticality found at the element level, is an added methodology to the existing knowledge. Some factors may not be in the higher rank in overall implementation but for a specific element of a specific principle, they can be highly influential. Hence, they should be considered while implementing the corresponding elements. Using the same approach and methodology we can find and subsequently address all the highly

influencing SFs for all elements of all principles to implement and sustain any advanced management system like lean.

However, some issues remain open for future research. First, some factors have scored on average for all elements lower than 3, but for some elements, they scored more than 3, and avoiding them might be wrong. Including all such factors to solve this issue in further research can be done by applying Multi-Criteria Decision Making (MCDM) methods like Decision Making Trial and Evaluation Laboratory (DEMATEL). In this study, the researcher has been able to contact local experts in a Malaysian automotive company only. Hence, if international lean experts from different industries are included the results might be more interesting, and thus the research could be free from cultural influences – in that case, the outcomes of the research will be more broadly applicable. Since process owners are at the center of problem-solving and are deeply engaged, a future researcher in this field can also investigate their opinions.

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6. CONCLUSION

When there is a need to build a culture of problem-solving as per lean principles, top management needs to align employees to the business vision and plan and lead the transformation journey across the whole organization. The human resource department is empowered to take decisions, create quality awareness, and manage continuous improvement and learning. Tremendous resistance to change the behavior pattern of employees and the old work process is expected. The motivation of all employees, including process workers, helps to manage this resistance. Sometimes a little confusion about a new method creates chaos. So, every activity and result must be communicated effectively (Islam, 2019) and everyone must work as a team. Finally, linking performance metrics to responsibility will ensure the accountability of all employees and the successful implementation of lean problem-solving principles in a company.

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FUNCTIONING OF PRIVATE DENTAL ORGANIZATIONS DURING THE COVID-19 PANDEMIC

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Abstract

The epidemic with SARS CoV-2, known as the acronym COVID - 19, had and still has a lot of impact on the entire health system, i.e., reanimation of the health system and return to a "new normal", starting at the end of 2019. The special impact of this pandemic has been reflected in the work in dental practice. Addressing emergencies and providing emergency dental care were a priority and standard during severe quarantine measures during the pandemic. This topic aims at transversal research of the cross-section of the functioning of dental practice in the private dental sector, which is the leading in the field of treatment of oral health diseases in our country because according to official data in private dental practice, 92% of procedures are performed during the state of emergency and inability to work normally caused by the COVID-19 pandemic. The survey was conducted during the period when most health institutions exited the COVID system from February 23 to March 30, 2022. A 22-question authored survey was sent to dentists across Serbia. The number of dentists who participated was 176. Considering the high risk, most emergency interventions were not carried out, while the economic consequences are minimal and insensitive in most clinics.

Keywords: COVID-19, dentistry, private dental practices, personal protective equipment, dental environment

1 INTRODUCTION

The COVID-19 pandemic has impacted healthcare delivery around the world. The World Health Organization declared COVID-19 a global pandemic on March 11, 2020, leading to changes

in the functioning of dental organizations around the world. (Marcenes, 2020) COVID-19, caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), is thought to spread through close contact via respiratory droplets and aerosols. Due to the specific characteristics of dental services, such as the formation of aerosols, the immediate proximity of patients, it is considered that dentistry is the

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branch of medicine that is perhaps most associated with the spread of infection. The risk of a two-way spread of infection between patients and dentists requires additional precautions to mitigate the spread of COVID-19. (Tonkaboni, Amiryade-Iranaq, Ziaei, & Ather, 2021). Guidelines for providing dental treatment during the COVID-19 pandemic differ, and dental practices should work according to regional guidelines. Dentists are at the highest risk of contracting the disease, but they can also be the biggest carriers of the disease, because they have communication with the patient "face-to-face", high exposure to saliva, blood, and other oral fluids of the oral cavity (Checchi, Bellini, Bencivenni, & Consolo, 2021).

This paper aims to examine the impact of COVID-19 on the functioning of private dental practices and to discuss measures to effectively provide dental services during the pandemic. The results of the conducted research will be mitigated by GEP researchers due to the lack of experience in investigating the functioning of private dental practice in our country and will form the basis for future research in this field.

In accordance with the objective of the paper, the following research questions were defined:

- Q1** – *What are the key challenges faced by employees during the impact of COVID-19 that can be identified as characteristic of private dental organizations?*
- Q2** – *How was the practice and activity of working and managing private dental practices during the COVID-19 pandemic designed?*

2 METHODOLOGY

The original empirical research was conducted in order to test and analyze the research questions raised. A cross-sectional study using designed questionnaires by researchers included dentists working in private practice in the territory of Serbia. The sample includes doctors of dentistry and specialists of private organizations of the Republic of Serbia. The survey was designed in electronic form and included four parts: demographic data of survey participants, management in dental practice during the COVID - 19 pandemic, data on patient admission and knowledge, practice and attitude of dentists towards the COVID – 19 virus, and financial consequences. Demographic data

are important due to the diversity of responses in response to the characteristics of the respondents and did not compromise the privacy and ethical sensitivity of the respondents. The questions were closed-ended with the possibility of answering the offered yes and NO answers, except for the last question about the economic consequences on the business where the Likert scale was used.

At the end of the questionnaire, there was room for everyone to give their personal opinion on the topic of the research, while before solving the questionnaire, each respondent was informed that it was aimed at identifying the attitudes of dental professionals and the work of dental practice during the quarantine period due to the COVID-19 pandemic and that the results of the survey would be used exclusively for writing this scientific paper, with the guarantee of anonymity.

Table 1 Demographic data of the respondents

Criteria	Range	No.	%
Age:	20 – 34	83	47.2
	35 – 44	60	34.1
	45 – 54	27	15.3
	54 – 64	6	3.4
Gender	Male	45	25.6
	Female	131	74.4
Qualification	Doctor of General Dentistry	130	73.9
	specialist	46	26.1
Work experience	0.5	68	38.6
	6 – 10	56	31.8
	10+	52	29.5
Region	Belgrade	51	29.0
	Central Serbia	26	14.8
	Western Serbia	20	11.4
	Southern Serbia	22	12.5
	Eastern Serbia	7	4.0
	Vojvodina	47	26.7
	Kosovo and Metohija	3	1.7
Total		176	100.0

Source: Author's research

The total sample consists of 176 respondents, and all private practice dentists who were ready to cooperate were included in the survey. The survey was conducted from 23 February to 30 March 2022. The collected data were entered into the program IBM SPSS (Statistical Package for the

Social Sciences), version 25, and the derived data are presented by descriptive statistics, t-test, correlation, and graphs.

The research also considered the personal experience of the author.

In this research, 176 private dental practitioners took part.

The demographic data of respondents is presented in Table 1.

Table_2 Results of the t-test of the subject structure by sex

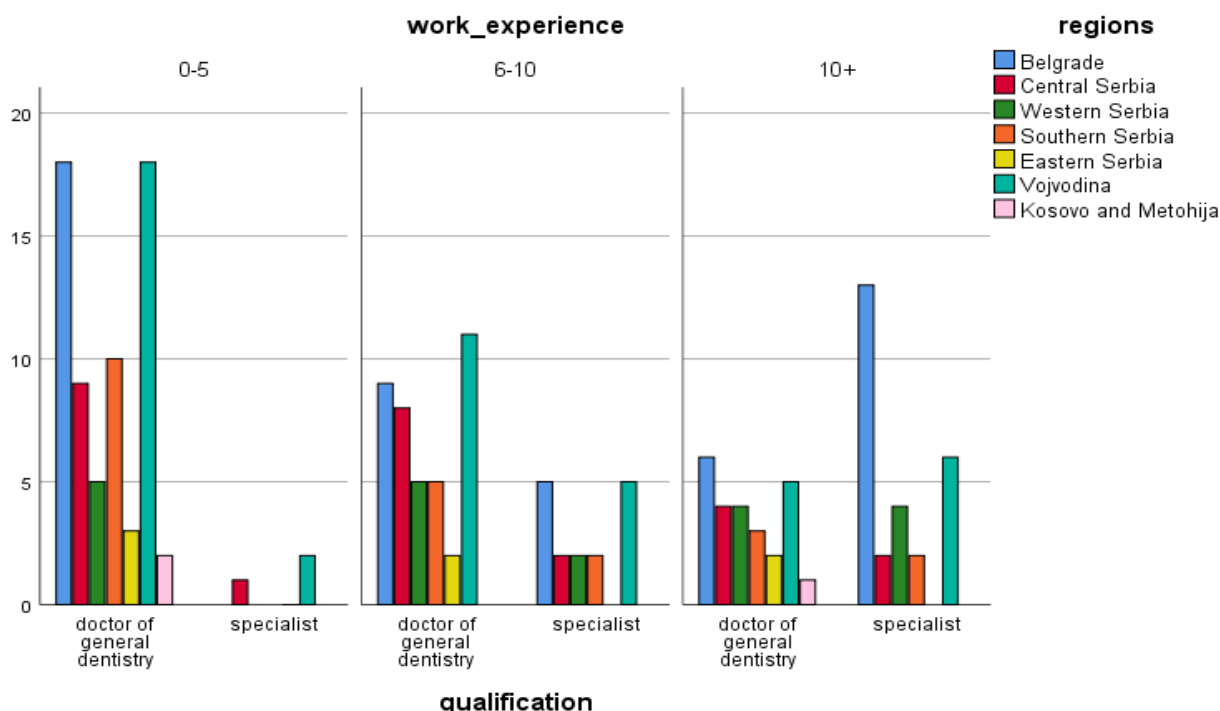
		Levene's Test for Equality of Variances	t-test for Equality of Means		
		Sig.	t	DF	Sig. (2-tailed)
Qualification	Equal variances assumed	853	0.093	174	926
Work experience	Equal variances assumed	0.259	-1,031	174	304
Age	Equal variances assumed	789	979	174	329
Region	Equal variances assumed	561	472	174	637

Source: Author's research

The demographic data or structure of respondents, which are shown in Table 1, tell us that 136 Doctors of General Dentistry and 46 specialists of different branches of dentistry, from 20 to 34 years of age, with work experience up to 5 years, took part. When it comes to regions, most respondents are from the parts of Belgrade (51) and Vojvodina (47). In Table 2, based on the results of the t-test of the respondent's structure by sex.

From the results of the t-test of the structure of the respondent according to gender presented in Table 2, we conclude that there is no statistical difference in terms of qualification, work experience, age, and region according to the gender of the respondent.

In Fig. 1, we can see the representation of respondents through work experience and qualifications according to regions.



Figure_1 Work experience and qualification according to regions

Source: Author's research

Most respondents agreed on the prescribed screening questionnaire and in practice, this was done in 3 ways (fig 2): by telephone (25 respondents), in the office by completing the survey (71 respondents), and in the office by answering the questions orally (80 respondents).

Teledentist services or communication with the patient by telephone developed during the pandemic period, which can be seen in Table 3 or graphically in fig 3 and fig 4. Table 4 shows the correlation between dental practice and qualification management variables. The correlation between the qualification and the claim

that the dental practice has a patient screening questionnaire on COVID – 19 has a negative direction and a weak connection, as well as the correlation between the qualification and the claim of possession of isolation in the dental practice for patients with suspicion of COVID – 19, while the correlation between the qualification and the claim of teledentist services before the visit to dentistry has a positive direction and a strong connection. This tells us that teledentist services have a future in the application in the private dental practice of the Republic of Serbia. Statistical significance does not exist.

Table_ 3 Dental Practice Management

	Does your dental practice have a patient screening questionnaire for COVID-19?		Does your dental practice have isolation for patients with suspected COVID-19?		Does your dental practice offer teledentist services to patients before visiting a dentist?	
Answer	yes	no	yes	no	yes	no
Doctor of General Dentistry	71	59	7	123	51	79
Specialist	32	14	4	42	17	29
TOTAL	176		176		176	

Source: Author's research

Table_ 4 Correlation between qualification and variable management of dental practice

		Does your dental practice have a patient screening questionnaire for COVID-19?	Does your dental practice have isolation for patients with suspected COVID-19?	Does your dental practice offer teledentological services to patients before visiting a dentist?
Qualification	Pearson Correlation	-133	060	0.021
	Sig. (2-tailed)	0.078	428	787

Source: Author's research

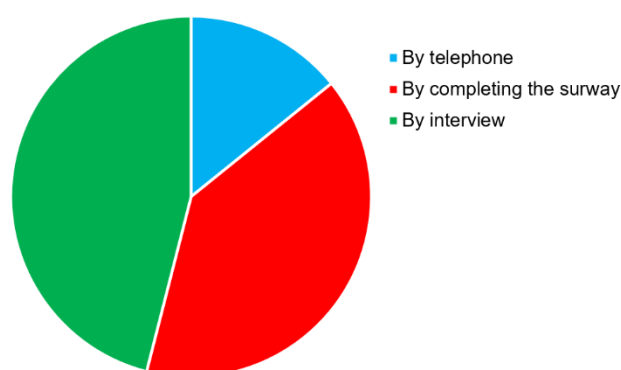


Figure 2 Completing the screening questionnaire
Source: Author's research

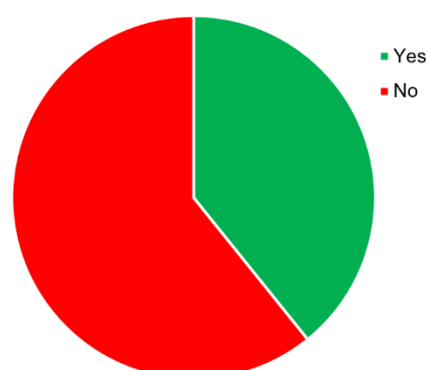
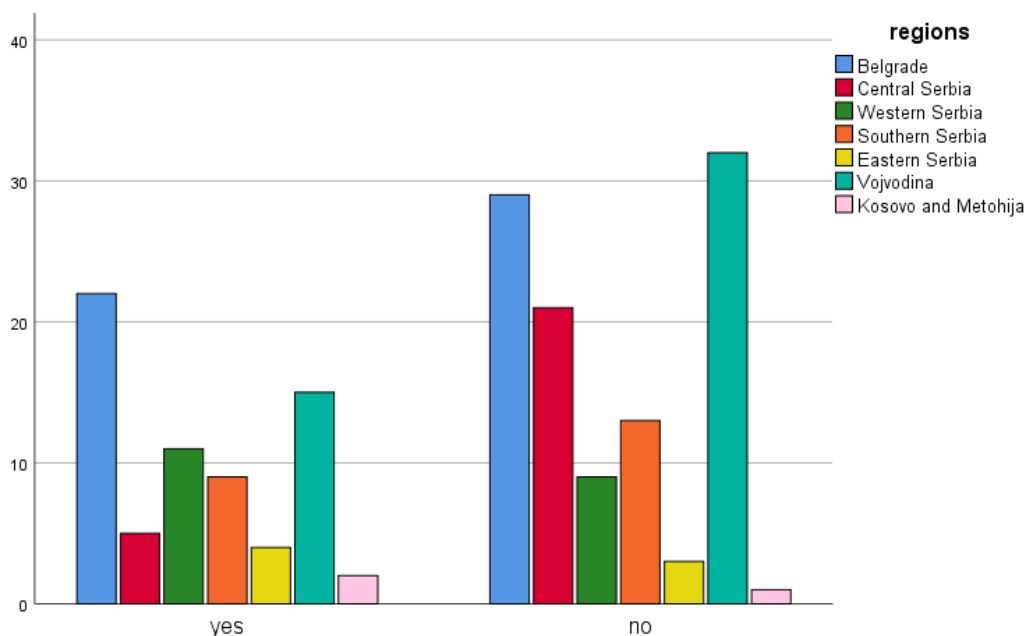


Figure 3 Application of teledentistry in dental practice
Source: Author's research



Figure_ 4 Application of teledentistry in dental practice according to regions

Source: Author's research

The protocol of patient admission was also defined by the competent institutions and applied in practice. Table 5 is a breakdown of the survey results by the number of respondents, Table 6 shows the application of the patient admission flow according to the qualification of the respondents, while Table 7 is a breakdown of the parametric t-test of patient admission according to the qualifications of the respondents, which shows that there is no statistically significant difference, except for the statement on whether patients must wash/disinfect their hands before entering the waiting room, where there is a significant statistical difference (observed first order sign, second column, sig = 0.001).

In the dental practice, the services were provided only by a doctor of dentistry or a specialist, without other medical staff, except for more complex dental procedures.

Admission of patients on arrival at the dental practice is shown graphically in Figure 5 where they can see the data on the application of the protocols prescribed by the relevant institutions and the extent to which our dentists respected this. The most practiced was wearing a protective mask in the waiting area on the face, even 88.6% of the "physical" distancing in the waiting area was also applied by 81.8% of dentists who were torn out.

Table_ 5 Admission of patients

Question	Answer	No.	%
Is the patient's body temperature measurement mandatory at admission before the dental procedure?	yes	57	32.4
	no	119	67.6
Is it mandatory for the patient to use an antiseptic for mouthwash before a dental procedure?	yes	70	39.8
	no	106	60.2
Do patients have to wear a face mask in the waiting area?	yes	156	88.6
	no	20	11.4
Do patients have to wash/disinfect their hands before entering the waiting room?	yes	111	63.1
	no	65	36.9
Do patients practice wearing protective gloves?	yes	1	0.6
	no	175	99.4
Is physical distancing practiced in the waiting zone?	yes	114	81.8
	no	32	18.2
TOTAL		176	100.0

Source: Author's research

Table_ 6 Admission of patients according to qualification

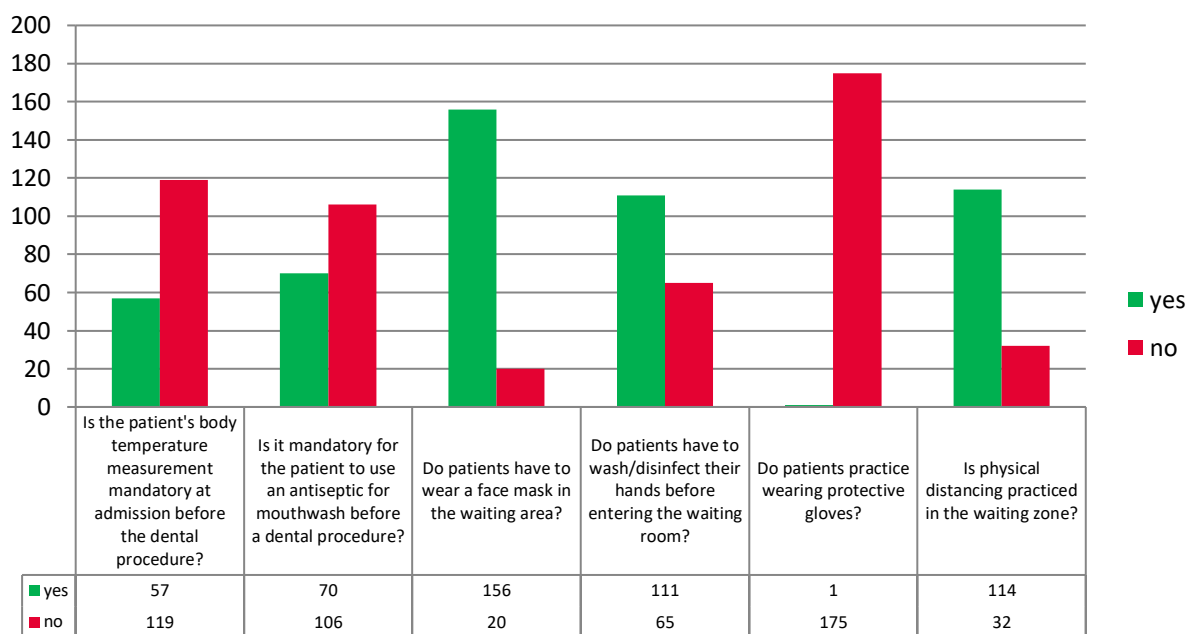
Question	Qualification	N	Mean	Std. Deviation	Std. Error Mean
Is the patient's body temperature measurement mandatory at admission before the dental procedure?	Doctor of General Dentistry	130	1.69	463	0.041
	Specialist	46	1.63	488	0.072
Is it mandatory for the patient to use an antiseptic for mouthwash before a dental procedure?	Doctor of General Dentistry	130	1.62	486	0.043
	Specialist	46	1.54	0.504	0.074
Do patients have to wear a face mask in the waiting area?	Doctor of General Dentistry	130	1.12	0.321	0.028
	Specialist	46	1.11	315	0.046
Do patients have to wash/disinfect their hands before entering the waiting room?	Doctor of General Dentistry	130	1.40	492	0.043
	Specialist	46	1.28	455	0.067
Do patients practice wearing protective gloves?	Doctor of General Dentistry	130	1.99	0.088	0.008
	Specialist	46	2.00	0.000	0.000
Is physical distancing practiced in the waiting zone?	Doctor of General Dentistry	130	1.19	396	0.035
	Specialist	46	1.15	0.363	0.054

Source: Author's research

Table_ 7 The t-test results according to qualification, admission of variable patients

Question		Levene's Test for Equality of Variances	t-test for Equality of Means		
		Sig.	t	DF	Sig. (2-tailed)
Is the patient's body temperature measurement mandatory at admission before the dental procedure?	Equal variances assumed	164	768	174	444
Is it mandatory for the patient to use an antiseptic for mouthwash before a dental procedure?	Equal variances assumed	145	945	174	0.346
Do patients have to wear a face mask in the waiting area?	Equal variances assumed	806	0.122	174	0.903
Do patients have to wash/disinfect their hands before entering the waiting room?	Equal variances assumed	0.001	1,418	174	158
Do patients practice wearing protective gloves?	Equal variances assumed	233	594	174	553
Is physical distancing practiced in the waiting zone?	Equal variances assumed	0.214	604	174	547

Source: Author's research



Figure_ 5 Graphical representation of the admission of patients on arrival at the dental organization
Source: Author's research

It was important to follow all the latest news on the spread of the pandemic and to be updated with the guidelines of the Ministry of Health and other competent institutions in the fight against the COVID-19 viruses. This was done by most dentists, but what the research showed (Table 8) is that the majority did not use ONLINE resources, which certainly made it difficult to get them

informed during the pandemic, but did not hinder them from having adequate information (77.3% of respondents were up to date with the latest news, while 71% were updated with the guidelines of the Ministry of Health, the Dental Chamber, the Institute of Public Health " Dr. Milan Jovanovic – Batut" and other competent institutions).

Table_ 8 Knowledge, practice, and attitude of dental professionals

Question	Answer	No.	%
Are you up to date with the latest information on the spread of COVID-19?	yes	136	77.3
	no	40	22.7
Are you up to date with the latest healthcare ONLINE resources for COVID-19?	yes	75	42.6
	no	101	57.4
Are you up to date with the current guidelines of the Ministry of Health, the Dental Chamber, and other competent institutions in the fight against COVID - 19?	yes	125	71.0
	no	51	29.0
Before the COVID-19 pandemic, were you familiar with the "Infection Transmission Based Precautions" in dental procedures?	yes	155	88.1
	no	21	11.9
Has your infection control routine changed after the COVID-19 quarantine period?	yes	109	61.9
	no	67	38.1
TOTAL		176	100.0

Source: Author's research

By Figure 5 and 6, we can compare the dentists whose infection control routine changed after the quarantine period, 109 of whom, 63 of whom agreed that the N-95 mask should be worn as a new precaution in dental practices. This can also

be a consequence of the inability to find a protective mask during the pandemic part and personal impression and the most effective measure of protection against microparticles.

Tables 9 and 10 are dedicated to the research question regarding the wearing of the N-95 mask as a new precaution. Out of 176 respondents, 92 responded negatively to this claim and believe that there should be no new precautionary measure for wearing the N-95 mask, also probably due to the

inability to find them on the market. The results of the t-test according to the infection control routine after the quarantine period in the claim that N-95 masks are used as a new precautionary measure have no statistical difference.

Table_ 9 Wearing a mask marked N-95 in dental practice as a new precautionary measure

Question		Do you think the N-95 mask should be routinely worn in the dentist's office as a new precaution?		
		yes	no	
Has your infection control routine changed after the COVID-19 quarantine period?	yes	63	46	
	no	21	46	
TOTAL		84	92	176

Source: Author's research

Table_ 10 The t-test results: Routine of infection control

Question		Levene's Test for Equality of Variances		The t-test for Equality of Means	
		Sig.	t	DF	Sig. (2-tailed)
Has your infection control routine changed after the COVID-19 quarantine period?	Equal variances assumed	0.000	-3,510	174	0.001

Source: Author's research

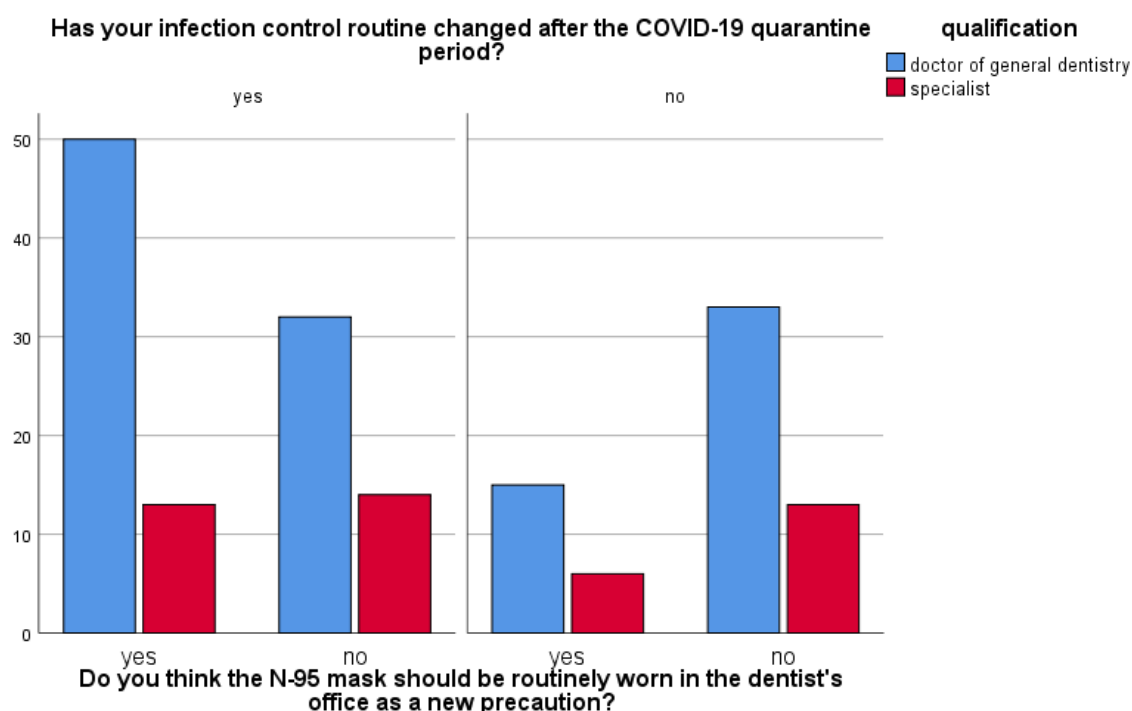


Figure 6 Wearing a mask marked N-95 in dental practice as a new precautionary measure according to qualification

Source: Author's research

Table 11 and Figure 7 show that the digital skills and abilities of dentists and practical applications are not at an enviable level because ONLINE resources for COVID – 19 and online information

were not practiced by 57.4% of respondents. Figure 8 can confirm this, where we can see the application of teledentist services in dental practice compared to the age of the dentist.

Table 11 Are you up to date with the latest healthcare ONLINE resources for COVID-19?

Question		Age:			
		20 – 34	35-44	45 – 54	55-64
Are you up to date with the latest healthcare ONLINE resources for COVID-19?	yes	38	22	12	3
	no	45	38	15	3
TOTAL		176	83	60	27

Source: Author's research

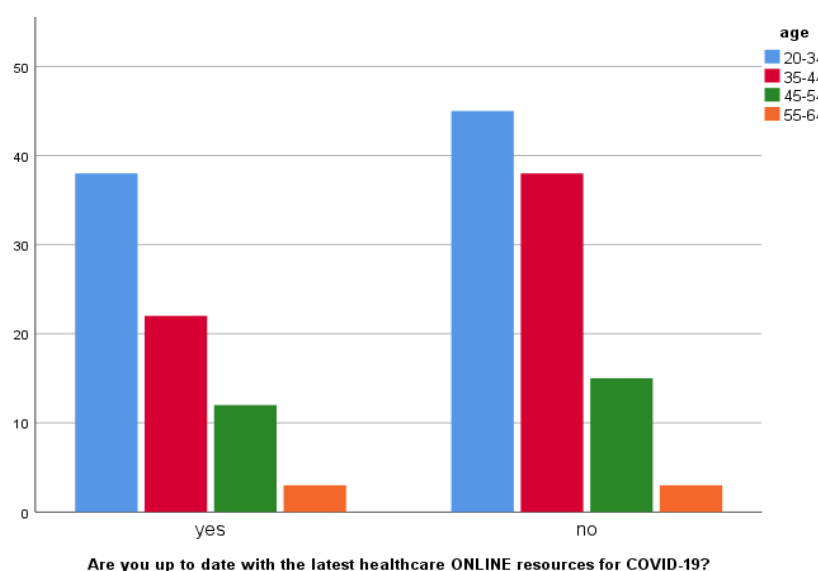
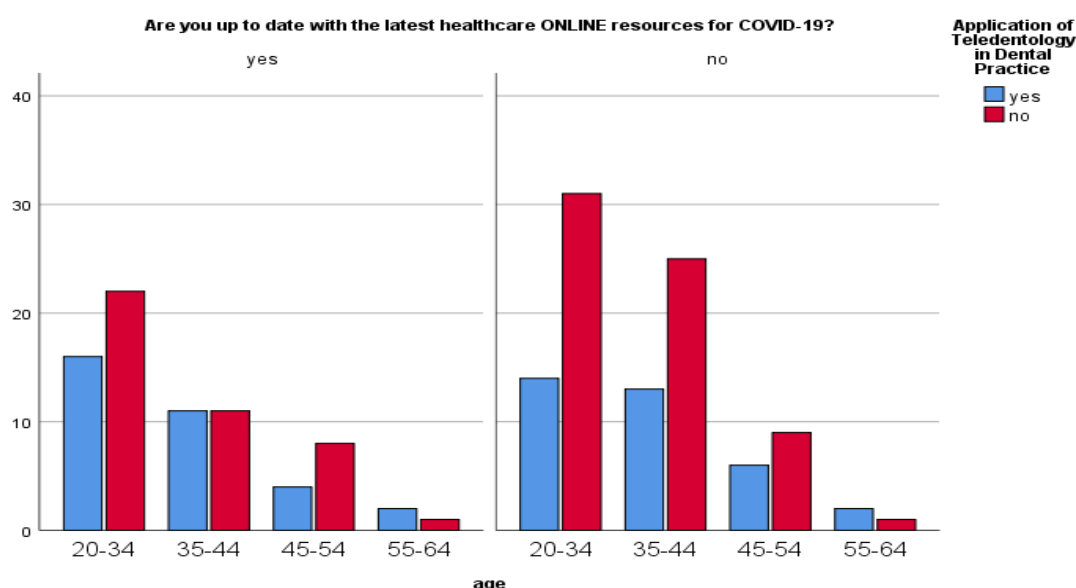


Figure 7 Informing through online resources

Source: Author's research



Figure_ 8 Informing through ONLINE resources and applying teledentistry according to the age of the respondents

Source: Author's research

Dental practices did not have significant economic consequences, as almost all dental practices operated according to the established scope of work, as shown in Figure 9. The answer to this

question is given according to the audited financial statements and profit and loss accounts of dental practices for the mentioned pandemic period.

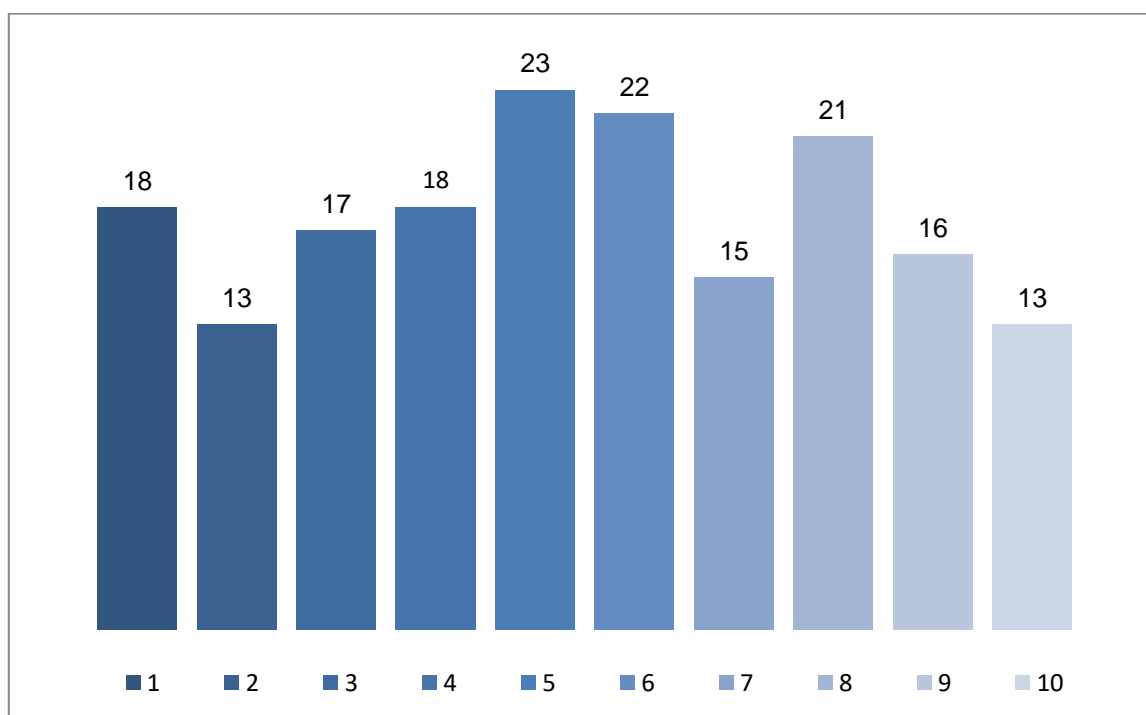


Figure 9 The scale of presentation of economic consequences on the business of dental practice (1 – low economic consequences, 10 - high economic consequences)

Source: Author's research

3 DISCUSSION

In Serbia, according to the official data of the Statistical Office of the Republic of Serbia, dental practice is performed in 90% of cases in private dental offices. Therefore, the owners of dental practice are also managers, so they have a more difficult task: primary treatment of patients, and secondary the organization of dental practice. Such an increased number of dental services in private practice is a major problem in the state sector due to the retention of human capital.

The available data suggest that the virus cannot be controlled despite all the applied guidelines and protocols that have been prescribed, which we can observe during the review of world research. The demographic data from research in Saudi Arabia indicate that about 40% of respondents are also 20 to 34 years of age, while 60% are men, unlike us, where women are a more dominant category of respondents. Respondents to both surveys are mostly from work experience of up to 5 years. In Saudi Arabia, we come across data

that there is a dominant region of over 40% of respondents, whereas in our country from the city of Belgrade, but not in such a huge number - only 29% of respondents, from which the majority of specialists who have more than 10 years of working experience come from (Al-Khalifa, et al., 2020). The screening questionnaire was prescribed by the competent institutions. It was necessary to determine whether the patient was in a contingent with an infected person in the last 30 days or suspected of COVID-19 infection. If the patient was sick with COVID-19, it was necessary to confirm this with proper documentation (Izzeti, Nisi, Graziani, & Gabriele, 2020). Although the recommendation was that the screening questionnaire should be completed on the spot, which was done by the majority of respondents to this survey in writing or in writing, while at least one dentist did so by telephone, in spite of it being the best option since it could have been established during the interview and prior to the arrival of a patient whether he/she had been in contact with an infected person or a person with

suspected infection for the previous 30 days. Paper materials could have been a source of contamination and made it difficult to sanitize the room. At the same time, all printed promotional material was removed from the waiting room. (Kochhar, Bhasin, Kochhar, Dadlani, Thakkar, & Singh, 2020) Due to the lack of rooms in most dental practices, there was no special room to isolate patients with suspected COVID-19, but the infection was prevented by one unescorted patient coming and the staff was minimized. When it comes to Europe, the screening program of patients upon arrival at the dental clinic was mostly respected by Switzerland, with application in about 70% of dental organizations, which is compared to our research, i.e. research in Germany where 55.7% and Austria 55.6%. (Wolf, Zeyer, & Campus, 2020).

Patients with the COVID-19 virus, if they have a dental problem should first see, through telephone consultation, whether the intervention can be postponed. It is often necessary to administer analgesics or antibiotics (Kengne Talla, Levin, Glogauer, Cable, & Allison, 2020). If the therapy does not work within a certain period, the patient needs a dental examination and intervention. If an intervention was required, it was sought to perform intervention with disposable instruments, as well as the use of cofferdam during operation and maximum prevention of aerosol formation. Preferably cover the nose of the patient unless it caused an inconvenience.

The application of teledentistry, i.e., communication with patients by telephone or some other form of communication through the network, developed in dental practice during the pandemic. (Kengne Talla, Levin, Glogauer, Cable, & Allison, 2020). In Saudi Arabia, researchers came to the data that as many as 43% of their respondents applied this in their dental practice (Al-Khalifa, et al., 2020), while in our country it is the most crowded in the city of Belgrade, if we look at regions, and in practice, as many as 61.4% of respondents. Telemedicine was also applied in Austria (16.7%), Germany (2.6%), and Switzerland (12.6%). Data were collected during the first pandemic lockdown. (Wolf, Zeyer, & Campus, 2020)

Isolation for patients with suspected infection was enabled in 6.3% of respondents, while in Saudi

Arabia this number is significantly higher at 43% (Al-Khalifa, et al., 2020). This tells us that they were more cautious and thoughtful, but also had larger spaces and possibilities. Regarding research in Europe (Wolf, Zeyer, & Campus, 2020), with no significant difference, about 5% of respondents treated patients with suspected (or confirmed) infection with the application of all prescribed personal protection measures for medical staff.

Upon arrival, there was a disinfectant (hydroalcoholic solution) in front of the dental office, thus disinfecting the shoes, in order to reduce contamination and the introduction of viral particles into the office (Izzeti, Nisi, Graziani, & Gabriele, 2020). Then, put the jacket and other items in the indicated place, followed by hand disinfection. It was not practiced in the practice to be more than one patient during the intervention, but when this was the case, they were distributed 2 meters apart (81.8%).

In Saudi Arabia, researchers came to the data that only 77% of respondents adhered to physical distancing, which in this case brings us to an advantage in this segment of research, as more carefully, when it comes to direct physical contact. (Al-Khalifa, et al., 2020)

In Austria, protective measures integrated into the daily routine during the first closure regarding physical distancing were applied in as many as 93.5% of dental organizations. This prevention measure was most respected in Switzerland (98% of dental organizations). (Wolf, Zeyer, & Campus, 2020)

At admission in 67.6%, the body temperature before a dental procedure was not measured, while in Saudi Arabia this was the case at 92% (Al-Khalifa, et al., 2020), Austria at 32.3%, Germany at 9.5%, and Switzerland at 43.7% of dental organizations. (Wolf, Zeyer, & Campus, 2020)

Before the intervention, the patient was covered with a sterile compress, which was also used repeatedly and sterilized in a similar manner to masks, according to the established standards prescribed before the epidemic.

It was desirable for patients to organically rinse the oral cavity with appropriate mouthwash prior to each intervention, but this was also not applied in

60.2% of cases, which is the same as in the study with which we compare our results.

The reason for this is proof that oral flushing does not prevent the transmission and further spread of the virus, because the virus spreads through the entire respiratory tract. When it came to wearing a protective mask in the waiting zone, as many as 88.6% of respondents practiced wearing a protective mask, which is significantly higher than in Saudi Arabia, where this number was 68% of respondents (Al-Khalifa, et al., 2020). In Switzerland, which was the leader in the implementation of prevention measures in Europe, this number was very low, so the wearing of protective masks in the waiting room was applied only in 34% of dental organizations, and Austria was the leader with as many as 94% of dental organizations that applied this prevention measure. (Wolf, Zeyer, & Campus, 2020)

Hand disinfection was carried out with a disinfectant spray, by applying the disinfectant to the palm of the hand, and in order for it to be well done (Izzeti, Nisi, Graziani, & Gabriele, 2020), it is necessary that the hands are rubbed against the palm of the hand on both sides and cross-fingered, until the disinfectant is dried, which is a confirmation of the action of the same and well performed disinfection.

The wearing of protective gloves in patients was practiced or observed by only one dental practice. In the case of protective gloves, there were no problems with the demand on the market and they were used only once, as before the pandemic.

During the pandemic, it was difficult to find adequate equipment on the market for purchase, so employees resolved the shortcomings incidentally, i.e., at a given moment, all in the service of protection against the virus transmission and preservation of health both of themselves and patients.

When it comes to adequate personal protective equipment, we have already stated that there was a problem in finding the equipment on the market. After disinfecting the hands, a special sterilized uniform and cap were put on. The uniform and cap are made of cotton material and therefore were not subject to single use, but their disinfection was mandatory after each patient according to a special procedure. Also included in the non-disposable uniform is a visor – a face shield.

Dentists could also use safety glasses, but for those who wear glasses due to poor vision, this was not possible. The visor protects the face from touching and transferring microparticles and potential infection.

The precautions represented a higher level of infection control, which was supposed to prevent its further development and transmission through aerosols, blood drops, etc. In each country, they were prescribed by the relevant institution. What we came to conclude during the research was that the protocol of the Institute of Public Health "Dr. Milan Jovanovic Batut" General Prevention Measures for Dental Practices (Opšte mere prevencije za ordinacije dentalne medicine, 2020.) was mostly followed by 88% of respondents, as well as in Saudi Arabia (Al-Khalifa, et al., 2020).

Protective masks were almost impossible to find during the pandemic. It was desirable to wear masks marked: N-95, because they were the most effective protection against microparticles, due to a lack of market, and they were used several times, which was confirmed and approved by the Center for Disease Control and Prevention. The decontamination procedure was carried out in an autoclave with dry heat or dry hot air. The masks thus sterilized could be used two to three more times. This type of sterilization did not harm the material from which the mask was made, and the mask provided complete protection in the next use. In world surveys, 72% of respondents had the same procedures and felt that the mask N-95 should be part of the daily personal protective equipment of the dentist, regardless of whether it was a state of emergency.

When it comes to monitoring ONLINE resources for COVID – 19, that is, information through the Internet network and data collection, more than half of the respondents stated that they did not follow, 57.4% of them, which, we must admit, is a large number, since this was one of the main forms of information during the pandemic that happened to the entire world. The problem with this part can be the age of the respondents, that is, the difference between millennials and millennials – a way of growing up in different social circumstances. Younger generations who have known information systems since early childhood and have communication skills are easier to adapt and create a new form of communication in the

future. From research in practice, it has been shown that premillennials do not show interest in mastering new technologies, although the use of the information system in healthcare requires a level of knowledge similar to "surfing" on the Internet, while millennials – generations of the new age - help them master the use of the system or help them enter data. We can also link this segment to the application of tele- dental services in dental practice. The goal of the introduction of the information system should be electronic communication and connectivity that enables mutual communication between those involved in the patient's treatment with the patient himself, with insight into all materials, reports, medicines, and administrative processes with home monitoring. (Lukas, Xu, Yu, & Gao, 2020)

After each patient, all surfaces were cleaned and disinfected – stool and work surfaces in the office, but before that, disposable equipment was disposed of in a special place for contaminants and material and then removed, while reusable equipment was also disposed of in a special place and prepared for sterilization to be used adequately during the next procedure.

At the beginning of the pandemic, everything that was not necessary was removed from the worktops, i.e. the worktops contained only what was necessary for the current performance of the service. The surfaces were first cleaned and then disinfected with spray disinfectants. When we were able to use disinfectant wipes, we used the same principle: the first one was to clean and the second one was to disinfect the surface.

The breaks between the two patients were 30 minutes, in order to ooze the room. The floors have been cleaned several times a day. All instruments used to treat the patient are sterilized according to standard protocols. The prosthetic works, before being sent to dental technicians for production, were disinfected with a disinfectant with chlorine in its contents. No economic impact on business was observed anywhere. A study in Liechtenstein (Wolf, Zeyer, & Campus, 2020) came up with data that less than 2% had economic consequences on business.

4 RESTRICTIONS AND POLICIES

One of the primary limitations of this research is the insufficient sample size and number of

participants. It should be noted that the research was carried out before the health system was completely out of COVID – 19 regimens. What may be guidelines for future research are possible modification and correction of the survey according to the period in which the new research will be done and adaptation to the current system by which health care works, as well as the motivation of dentists to be part of scientific research practice through education on the importance of these data for further work, development, and improvement of the entire dental practice, but also readiness if another type of emergency similar to COVID – 19 occurs.

5 CONCLUSION

The first person at risk of covid-19 infection is the dentist himself. The COVID-19 pandemic will not stop anytime soon, and the social system will not recover, but it will be necessary to get used to the new functioning and performing dental procedures in a slightly different environment. With the development of vaccines and medicines, it is necessary to follow the protocols and regulations for dental care prescribed by the competent institutions in the country and based on that manage personal protective equipment, dental resignations and devices and surrounding premises.

Nothing was changed in the performance of the (surgical) procedure alone. The exception is that now they are done under special circumstances and with additional caution. Protective equipment is used, so the transmission and spread of viruses is prevented.

In the future, a greater development of teleodontological services is expected, but the first step is to apply digitalization in dental practice, educate employees and then further develop other segments at all ages.

In accordance with the aim of the research and the questions asked, we can conclude that the most practicable use was wearing a face mask in the waiting zone, while wearing protective gloves by patients was completely discriminatory.

More money was spent on disinfectants, medical equipment, and disposable materials, but the economic consequences on dental practice were minimal.

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FINANCIAL ANALYSIS OF THE IMPACT OF THE INFORMAL ECONOMY ON THE ECONOMY OF SERBIA AND EUROPEAN COUNTRIES

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Abstract

In this paper, the authors point out the informal economy of the Republic of Serbia and European countries as the biggest problem for every country. The following is the share of industries as well as the gross domestic product of nations. They are reasons why the informal economy is so ubiquitous as well as the idea that it is necessary to decrease it. The paper deals with research aimed at determination of the impact of the informal economy, in which sector of the economy it has the biggest, why it persists, and financial losses because of the informal economy. The paper discusses secondary damages due to the informal economy and the causes of why they go on. The paper also analyzes the influence of the shadow economy on the EU and OECD countries' GDPs. The authors discuss why the informal economy persists and what measures should be taken to prevent or at least reduce it.

Keywords: financial analysis, informal economy, shadow economy, illegal work, economic loss.

1 INTRODUCTION

Informal economy according to the Economic Dictionary: "It is a part of the economy characterized by irregular and illegal business. It can be seen as a shadow economy, i.e., a business that can be legalized by taking certain actions (for example, paying taxes), and a black economy that cannot be legalized (for example,

drug trafficking). It exists in underdeveloped and developed countries, but an increase in economic development decreases its share in the social product. All countries implement measures to suppress it to increase tax revenues." (Acimovic, 2010, p. 465).

The United Nations Development Program defines the informal economy as: "Economic activities, funds and transactions, often illegal, which are not registered or otherwise reported to the appropriate state authorities, and which thus avoid taxation or other types of inclusion in state economic statistics, sometimes described by

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synonyms in the shadow, underground or as the gray economy." (Glovackas, Woolfson, & Tuch, 2012, p. 29)

The International Labor Organization defines informal employment as "employment without secure contracts, benefits for workers or without social protection." It consists of two basic components: self-employment in informal enterprises and paid employment in informal jobs."

According to the Economic Dictionary, the informal economy or shadow economy is "a set of activities carried out outside the institutionalized economic environment, fictitious economy, informal economy, and other hidden or illegal business transactions." It is classified statistically into registered and unregistered. From the aspect of legality, it can be legal and illegal. From the fiscal aspect, it can be:

- taxed,
- taxable (but the entire income or part of the income is hidden from the tax authorities; so-called gray economics), and

- other (for it, there are no clear tax regulations, and it exists in gaps the legal regulations).

Particular attention states should pay to the so-called third economy (black economy), which is strictly prohibited and whose activities bind with criminal and organized crime activities.

2 INFORMAL ECONOMY IN THE REPUBLIC OF SERBIA

In the Republic of Serbia, the gray economy includes:

1. Illegal economy (illegal business entities)
2. Illegal work (employees who work illegally)
3. Money laundering and financial fraud (illegal transactions, tax evasion, etc.)

In 2018, the Union of Employers of Serbia conducted research within the project Effective Suppression of the Gray Economy, which we will present below. Based on their previous experiences, they concluded that the informal, gray economy is best known by directors and managers of the formal economy.

Table 1 *Illegal traffic by industry*

Agricultural branch	Participation in %
Trade (all forms)	32.55
Construction and construction material industry	14.58
Services	12.88
Agriculture, forestry, and water management	8.81
Tourism and catering	4.75
Craftsmanship and entrepreneurship	4.75
Traffic and connections	4.41
Leather and textiles	4.40
Lumber industry	4.07
Media, publishing, and graphic activity	3.05
Chemistry and non-metals	2.03
Metal industry	2.03
Healthcare and pharmacy	1.69

Source: (Poslodavci, 2018)

The share of goods turnover in trade is 32.55% and thus it is convincingly in the first place in the structure of the total turnover of goods in the gray zone, which leads to the conclusion that there is insufficient control of the market by the competent inspection authorities and the existence of parallel channels for trade in unregistered goods on the whole territory of the Republic of Serbia. In second place is the construction industry with the building materials industry due to fictitious companies with

one, two, or no employees, without significant assets and founding capital. They operate for an average of two to three years, complete a few jobs obtained in the public procurement process, and then disappear from the market. Fictitious companies for the completion of contracted jobs often hire construction companies that have been in business for years, assuming the role of intermediaries between the client and the contractor, during which between 10 and 50% of

the value of the ordered work disappears. That phenomenon in construction can be prevented if only companies with significant references, a certain number of permanent employees and assets, and an annual turnover not less than the value of the specific public procurement could participate in the procurement process.

The service sector has the largest share in the gray economy in the EU. in Serbia it is in third place in terms of participation, where small, subcontracted services and so-called household services dominate.

The only branch that records a surplus in the foreign trade exchange of the Republic of Serbia with the rest of the world, agriculture, forestry, and water management are in fourth place in terms of participation. Every second small agricultural producer works in the gray zone, which is a significant loss for the state on the one hand, while it prevents these individuals from receiving loans, subsidies, etc. from the state. The consequence of this is a long-term attachment to small holdings and a small volume of production, thereby losing the possibility of development and raising the standard of living.

The total number of obligations depending on the economic branch and the activities of companies and entrepreneurs is higher, so it is clear to what extent companies operating in the gray zone are at an advantage compared to legally registered companies.

Who represents unfair competition? 83.26% of the surveyed respondents cited natural persons as unfair competition operating in the gray zone, 46.46% cited legal entities operating illegally, and 38.33% of respondents answered that natural and legal entities operate illegally in their activities. Note: respondents could circle more than one answer to the above question.

Regarding the distribution of illegal goods, most complaints are about sales through advertisements, 51.98% of respondents said so. It is followed by the sale of illegal goods in the markets at 47.14%, and in third place is the sale in undeclared shops at 44.05%. Then, improvised stalls on the street 38.77%, illegal distribution centers 29.96%, illegal sales at doorsteps 18.5%, sales of illegal goods in legal establishments "underhand" 15.42%, and illegal sales in establishments of legal entities 14.54%.



Fig. 1 Distribution of illegal goods

Source: (Poslodavci, 2018)

Illegal provision of services by natural persons such as bookkeeping, engineering, consulting, and marketing and propaganda services is very pronounced. Goods arriving in the country through illegal channels are also a big problem.

Figure 1 shows the distribution of illegal goods in Serbia.

In the Western Serbia region, the sale of illegal goods on the markets is highly widespread, and 66.7% of respondents from this region stated that goods reach customers in this way. This type of distribution of illegal goods is less widespread in the larger cities of the Republic of Serbia. In the city of Belgrade, the sale of illegal goods through

improvised stalls is lower than the average at the level of the Republic of Serbia.

Doorstep sales are specific to western Serbia. Sales through advertisements are more pronounced in large cities. 33.3% of respondents from central Serbia reported that method of distribution, while the average for the Republic of Serbia is 51.98%. Sales in undeclared improved street stalls were expressed in central Serbia by 63.3%. The lowest number of complaints about this type of distribution was in Belgrade, 31.34%. That is lower than the average at the level of the Republic.

3 FINANCIAL AND OTHER LOSSES DUE TO THE INFORMAL ECONOMY

The total financial losses among survey participants on an annual basis were estimated at 4,420,240,000 RSD¹. Fig. 2 shows the data on the structure of financial losses of economic entities.



Fig. 2 Secondary types of damage due to the informal economy

Source: (Poslodavci, 2018)

As secondary damages due to the work of the informal economic sector, the largest number of respondents mentioned a decrease in turnover and difficult placement of goods and services on the market 44.05%, then the occurrence of price reductions resulting from unfair competition from the informal sector 19.38% and loss of reputation among consumers 18.5%.

In addition to the secondary damages due to the shadow economy, there are also other damages

such as difficulty in legal employment and more difficulty finding workers ready for legal work with lower wages. Entities operating illegally avoid paying taxes and contributions on wages and all other allocations to the state and can offer (seemingly) higher wages. Large companies state the impossibility of technological development due to reduced income due to shadow economy activities including avoiding quality control of goods offered to customers through illegal channels. Due to the activities of the informal sector, 6.17% of respondents said they were forced to stop doing business partially or completely.

4 WHY DOES THE SHADOW ECONOMY PERSIST?

Answering the question of what enables the existence of the informal economic sector in Serbia, most of the respondents, 46.7% of them, indicated the weak work of the market and financial inspection and the lack of political will to solve this problem. 17.18% of respondents stated that the problem is corruption, and 4.41% of the respondents stated that the problem lies in deficiencies in the legal regulations.

From the above-mentioned data, the main reason for maintaining a high level of the informal economy in Serbia is the weak work of state authorities in suppressing this form of economic activity. A measure that could repress illegal work is the reduction of taxes and contributions. There is also an extensive burden on legal business entities, while those from the informal economy are uncontrolled, which sends a message to them to continue with illegal work. One gets the impression that businesses have had enough of an expensive and inefficient state that fails to bring order to economic flows.

5 INFORMAL ECONOMY IN EUROPE

The informal shadow economy is a big problem at the global level. A chart presented in figure 3 shows shadow economy participation expressed in % of GDP in central and Eastern Europe.

¹ approximately 37.7 million euros

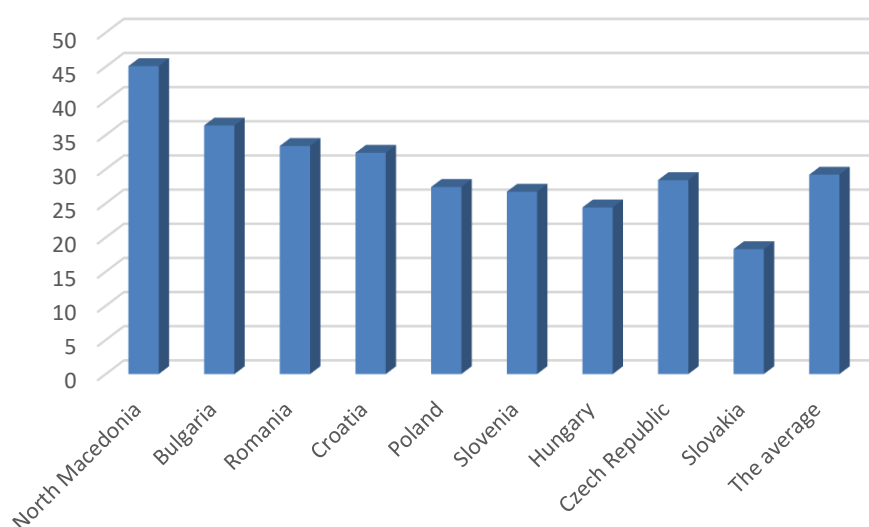


Fig. 3 Share of the shadow economy in %GDP in Central and Eastern Europe

Source: (Kelmanson, Kirabaeva, Medina, Mircheva, & Weiss, 2019)

From figure 3 one can conclude that the largest share of the gray economy in GDP is in North Macedonia at 45.1%, Bulgaria at 36.4%, Romania at 33.4%, Croatia at 32.4%, Poland at 27.4%, Slovenia at 26.7%, Hungary at 24.4%, the Czech Republic at 28.4%, and Slovakia at 18.3%, while

the average of the countries of Central and Eastern Europe is at 29.2%.

Figure 4 shows the participation of the gray economy of 21 OECD countries.

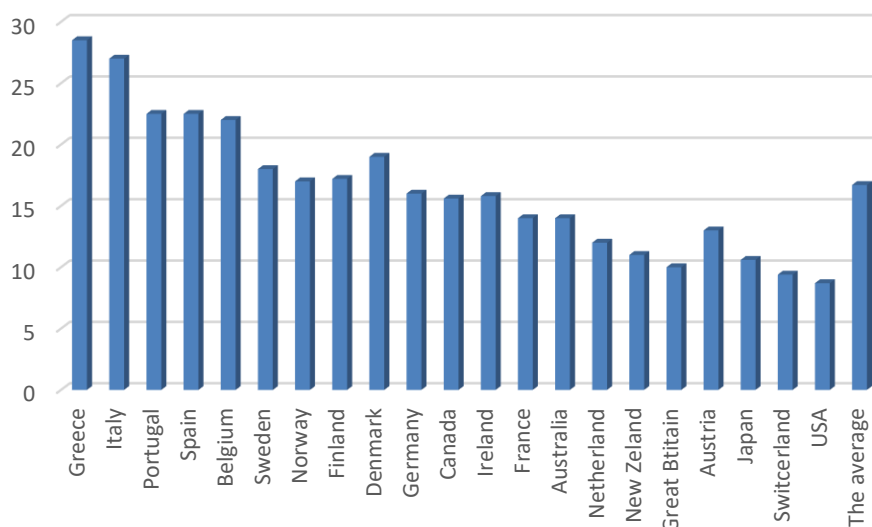


Fig. 4 Share of gray economy %GDP in OECD countries

Source: (OECD, 2022)

The largest share of the shadow economy is in Greece at 28.5%, followed by Italy at 27% and Portugal at 22.5%. The shadow economy shares in GDP are in Spain and Belgium at 22%. Sweden, Norway, Finland, and Denmark have shares of 19 to 17% of the shadow economy in GDP. Germany, Canada, Ireland, France, and

Australia have shares of 16%-14%, the Netherlands, New Zealand, Great Britain, and Austria 13%-10%, Japan 10.6%, and Switzerland 9.4%. The minimum participation of the shadow economy shows the USA with 8.7%. The average participation of the informal economy of 21 OECD countries is 16.7%.

Effects on the Official Economy

A change in the size of the shadow economy can reflect in changes in:

- Monetary indicators. Shadow economy transactions tend to be in cash. The growth of the gray economy will most likely increase the demand for cash.
- Labor market participation rates and working hours. As growing numbers of people work in the hidden sector, participation rates in the official economy may fall. Similarly, as people work more hours in the hidden sector, hours worked in the official economy may fall.
- Output statistics. As the shadow economy grows, production inputs, especially labor, move at least partly out of the official economy. This displacement may depress the official growth rate of the economy. (Schneider & Enste, 2002)

6 CONCLUSION

Like in the Republic of Serbia, in the countries of Central and Eastern Europe, and in the 21 countries of the OECD, the problem of the gray economy is not negligible. The reasons for the creation and survival of the informal economy are significant taxes, contributions, and state levies. It is difficult to calculate the participation of the shadow economy in the total economy, but not impossible. There are various methodologies:

- *Direct approach.* It implies research. The disadvantages of the effects of the shadow economy research reflect in how many examinees are ready to cooperate and give sincere answers. If the questionnaire is composed well and examinees reply correctly, the research can give a more detailed analysis of the shadow economy, which is a significant advantage. In addition, field research can be used for tax monitoring.
- Indirect access implies indicators that are usually of macroeconomic type. The most significant are currency demand and electricity consumption. They show the share or the effects of the shadow economy on the legal economy.

We have concluded that the size and share of the gray economy in the Republic of Serbia, Central and Eastern European countries (developing countries), and OECD countries are similar. The shadow economy is a complex phenomenon, results they say that it will increase cargo taxes, contributions, and social protection of employees in combination with increased state regulatory activities are the strongest driving force of power strength, size, and growth grey economy. The biggest role in the shadow economy suppression has the state. The states are expected to their regulations and regulations reduce grey the economy.

The largest share of the shadow economy is 28.5% in Greece. The next are Italy with 27% and Portugal and Spain with the participation of the shadow economy in GDP of 22.5%. Belgium has a share of 22%. Sweden, Norway, Finland, and Denmark have shares of the shadow economy in GDP of 19 to 17%. Germany, Canada, Ireland, France, and Australia are at 16%-14%, the Netherlands, New Zealand, Great Britain, and Austria at 13%-10%, Japan at 10.6%, and Switzerland at 9.4%. The lowest participation of the gray economy is the USA, with 8.7%. The average participation of the informal economy of 21 OECD countries is 16.7%.

The share of goods in the turnover is 32.55% and is convincingly in first place in the structure of the total turnover of goods in the shadow zone. That leads to the conclusion that there is insufficient market control by the competent inspection authorities and the existence of parallel channels for the circulation of unregistered goods throughout the territory of the Republic of Serbia. In second place are the construction industry and the building materials industry due to the existence of fictitious companies with one, two, or no employees, without significant assets and founding capital. They usually exist for an average of two to three years, finish a few jobs obtained in the public procurement process, and then disappear from the market. The service sector has the largest participation in the gray economy in the EU, while Serbia is in third place in terms of participation. Small, subcontracted services and so-called household services dominate there.

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THE ROLE OF FINANCIAL DERIVATIVES IN FINANCIAL RISKS MANAGEMENT

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Abstract

Financial derivatives are financial instruments whose price is derived from the basic financial instruments' prices. They represent derivative financial instruments created based on the existence of primary instruments, such as shares, bonds, stock market indices, or other forms of assets. It is precisely the benefit of using derivatives that point to their basic function. The primary function refers to risk protection and reduction of exposure to some instruments, markets, currencies, countries, regions, and others. In this case, we are talking about derivatives for hedging investments or currency positions. Those positions are taken on financial markets in specific instruments or currencies. Likewise, exposure to certain entities that issue financial instruments can be replaced or reduced to reasonable or prescribed measures by using derivatives. Derivatives offer a significant advantage: risks are transferred when they are used. Market and price risks of the underlying asset are contractually transferred to the financial derivative through the contract design. Of course, derivative financial instruments also have disadvantages. For example, there is a risk of total loss for some. The research subject in this paper is the role of financial derivatives, derived financial instruments, and their role in financial risk management. In this paper, the author emphasizes the basic types and characteristics of financial derivatives, their benefits, and the risks market participants may face if they use the derivatives.

Keywords: *financial derivatives, risk, financial risks, management, financial derivatives significance*

1 INTRODUCTION

Derivatives represent financial instruments, and their value is derived from basic financial instruments such as stocks, bonds, loans, interest rates, exchange rates, commodities, and mortgages. Financial derivatives are not original financial instruments. They are derived from classic financial instruments due to the need to solve financial difficulties that arise precisely because of the use of basic financial instruments and the impossibility of providing them with a

higher return on investment and lower financial risk.

Many previous studies have shown that derivative transactions have exceeded the value of the total trade transactions carried out in the world. Derivatives trading on the financial market in the world is much higher than the economic activities globally. The use of derivatives is generally accepted in the financial markets precisely because it is almost impossible to imagine a transnational company that does not use these instruments when managing financial risks.

It is precisely the benefits of using derivatives that point to their basic function. The primary function

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is related to risk protection and reduction of exposure to some instruments, markets, currencies, countries, regions, and others. In that case, we are talking about the use of derivatives for hedging investments or currency positions. Those positions are taken on financial markets in specific instruments or currencies. Likewise, exposure to certain entities that issue certain financial instruments can be replaced or reduced to reasonable or prescribed measures by using derivatives.

The research subject in this paper is the role of financial derivatives, derived financial instruments, and their role in financial risk management. In particular, the basic types and characteristics of financial products, their benefits, and the risks market participants may face are emphasized.

2 FINANCIAL DERIVATIVES

2.1 A term

Financial derivatives are financial instruments whose price is derived from the prices of other, basic financial instruments. They represent derivative financial instruments, created based on the existence of primary instruments such as shares, bonds, stock market indices, or other forms of assets. Financial derivatives represent financial contracts that appeared in the eighties of the last century, after the introduction of foreign exchange policy measures in the most developed world economies. Their emergence is related to the time when the foundation of the monetary system, based on the Bretton Woods agreement, was destroyed, and Britain adopted restrictive foreign exchange regulations. Then the first contracts on currency packages and interest rate swaps were developed. (Slakoper, 2009, p. 407)

As a very significant financial innovation in modern finance, financial derivatives have contributed to the progress in the field of financial risk management by expanding the number of financial instruments and facilitating the allocation of risks and thus supporting the realization of the primary functions of the financial system. Also, there is efficiency in risk distribution, which has influenced economic growth by enabling the financing of larger projects in the economy. Financial derivatives are instruments that allow for

flexible and efficient portfolio management only if they are used with the aim of risk protection, not if they are used for speculation.

The financial derivatives, or derivative financial instruments, are, therefore, forms of investment derived from simple direct financial investments. The derivative value depends on the underlying instrument (asset).

There is no universally accepted definition of derivatives. In any case, derivatives must fulfill a future contractual obligation between two or more contracting parties whose market value depends on conditions specified at the time of the conclusion of the contract (usually a change in the price of the underlying asset). At the time of the contract conclusion, significant purchase payments are not required (Beike & Barckow, 2002, p. 1f). The main criterion is the time difference between the conclusion and the fulfillment of the contract. In this sense, derivatives are also defined as "futures contracts that give the right, but not the obligation, to buy the underlying asset at the price agreed in the transaction on a date in the future (European option) or some future period (American option) or sale" (Berge, 2005, str. 44).

2.2 Characteristics of financial derivatives

When analyzing the literature, we notice that three primary characteristics of derivatives stand out, namely:

- The value of the instruments is based on changes in the interest rate, exchange rate, price of certain goods, etc.
- To enter the transaction, a small initial investment is required.
- The end is depicted in the form of money or the conclusion of a new financial derivative, i.e., by taking contrapositions, and does not include direct exchanges of derivative objects.

Derivative instruments are traded on the organized stock market but also outside the market. Derivative instruments are traded on the organized stock market but also outside the market. Apart from organized stock exchanges, there are other stock exchanges - the futures exchange.

2.3 Basic types of financial derivatives

According to the theory, it is possible to identify the following forms of financial derivatives:

- forwards
- futures
- swaps
- options
- credit derivatives.

A derivative financial instrument is a contractual agreement between at least two contracting parties which risks transfers from the basic (original) value to the other party. Derivatives refer to financial instruments whose value is derived from the market price of one or more underlying instruments and on so-called futures markets. For market participants, the reasons for futures transactions are speculation, hedging, or arbitrage. The work then deals neither with speculation nor arbitrage but attempts to hedge against commodity price risk and approximate commodity price volatility, which is called hedging. The first division is based on the base value of the derivative. Raw materials, stocks, currencies, interest rates, fixed-income securities, stock indices, or other derivatives can be used as underlying values. That protects against a wide range of market price fluctuations. Derivatives refer to futures transactions not settled immediately after the transaction is concluded, but at some point, in the future. Unlike the cash market, where the contract to buy or sell the underlying instruments on the stock, the exchange must be fulfilled immediately or very shortly within two trading days after the conclusion of the contract, the conclusion of the contract and the fulfillment of the contract differ in time for a futures transaction. Futures transactions also differ in terms of whether they are conditional or unconditional transactions, i.e., whether an exchange of services must take place, or whether the buyer of the derivative has the right to choose in terms of execution.

The term futures can most simply be interpreted as a liquid futures contract. Historically, it has roots in classic forward contracts, which are denoted by the term forward. Both instruments based on the classification fall into the so-called category of derivatives or derived securities. In essence, both futures and forwards are sales contracts. In both

cases, there are two parties, the buyer and the seller, who define the conditions for the purchase and sale of certain goods or financial instruments, and the specificity is that the delivery of the given asset and its final payment is not made immediately, but on a certain day in the future. (Erić, Bradić-Martinović, & Stefanović, 2007, p. 462). A forward is a real futures contract. If the bill of lading proves the existence of goods that are not physically present at the place of purchase, with a forwarder, the goods are not only not present but do not yet physically exist (Žarkić Joksimović, Benković, & Milosavljević, 2013, p. 164).

Table 1. Characteristics of futures contracts

1. All elements of the contract are standardized (quantity, quality, date, place)
2. Contracts are more liquid compared to forwarding contracts
3. Contract positions can be closed at any time
4. Payment of the contract is present while it lasts (margin system)
5. A clearinghouse is present as a guarantor of trading
6. The contracting parties place a deposit to protect against credit risk
7. In most cases, contracts are canceled before the expiration date
8. The contracted assets are not physically delivered, only the price difference is paid
9. The contract can be traded on the secondary financial market
10. Contracts are sold on a forward basis

Source: (Birovljev & Ercegovac, 2012, pp. 16-17)

The subject of an option transaction is the right to exercise the option, which, if exercised, consists of the purchase or sale of the underlying asset at a fixed base price. The buyer pays the option seller an option premium for that right. There are two basic forms of options transactions: In the case of a call option, the buyer acquires the right to buy a certain underlying asset, for example, a certain number of shares, at an agreed price from the seller of the call option. In return, the buyer pays the seller a premium for the option. The right

to buy these securities, which the option writer would then have to deliver, is given to the buyer only for a limited period, the term of the option. However, he is not obliged to use the option, that is, to buy the shares at the agreed base price. This transaction occurs because the buyer and the seller have opposite expectations regarding the development of the underlying asset price, the buyer expects the price to rise.

Generally, a swap is understood as the exchange of two streams of payments between two contracting parties over a specified period under predetermined conditions. Payment obligations or payment claims are exchanged. The reason for such an exchange is that the actors have different positions in different financial markets. These differences in creditworthiness can be reflected, for example, in different credit terms (terms, interest rates, credit lines). That results in certain cost advantages for individual actors, which they make available to others in exchange for cash flows for compensation. Swaps also serve to hedge against interest rate or currency risks.

Credit derivatives are a subtype of derivatives and tradable financial instruments that have loans, credits, bonds, or similar assets as their basis and hedge the potential risk of default for the protection buyer and increase the protection provider. In addition, there is a purely speculative variant of uncovered credit derivatives without the underlying asset.

3 FINANCIAL RISKS

Risk, in general, is defined as the possibility of suffering damage or loss, that is, as a factor, thing, element, or course that involves uncertainty and danger. Risks viewed as an economic category are labeled, in theory, as speculative risks. Risk and uncertainty are accompanying circumstances in economic activities. Regardless of the science and economic science progressing constantly, ignorance can have different effects on economic phenomena and processes of modern times. Human behavior in circumstances related to risk and uncertainty contributes to distinguishing one person from another. Risk tolerance, i.e., reluctance, should be evaluated for possible outcomes during decision-making.

Risk can be divided into different ways. However, the most common division in the literature

recognizes the following types of risks (Barjaktarović, 2013):

- *financial and non-financial risks*. Financial risk includes situations in which there is the uncertainty of financial (monetary) loss, while in the case of non-financial risk there are no financial consequences.
- *dynamic and static risks*. Dynamic risk is the one that arises due to changes in the economy (changes in the price level, consumer taste), and static risk includes losses that would occur even if there were no changes in the economy.
- *fundamental and special risks*; Fundamental risk includes losses that are impersonal in origin and consequences, special risk includes losses that arise because of individual events and are noticed by individuals more than the whole group.
- *pure and speculative risks*. Speculative risk represents a situation where there is a possibility of loss but also a gain. Pure risk is a situation that includes only the loss possibility (personal risk, property risk, liability risk, risk due to mistakes of others).

As for financial risk, it means risk related to money. Namely, financial risks usually refer to possible losses in the financial markets due to, for example, changes in interest rates or exchange rates. They are also characterized by complex interconnections, which can significantly increase the overall risk of exposure (Cvetinović, 2009, p. 45).

Financial risks can be grouped into several categories (Djukanović, 2009, pp. 109-111):

- *Market risk* - represents the risk of changes in market prices and exchange rates, which lead to a decrease in the value of certain financial assets and their packages (portfolios). One can further decompose market risk into two main components: the general market risk component (which applies to all market participants) and the specific market risk component (which applies to individual transactions).
- *Credit risk* - is the risk of changes in the creditworthiness of clients (customers or debtors), which can affect the change in the value of financial assets of creditors (companies or banks).

- *Liquidity risk* - covers both funding liquidity risk and asset liquidity risk.
- *Operational risk* - a specific type of financial risk that refers to potential losses of value due to inadequate organization, poor management, faulty control, fraud, theft, and human error.
- *Legal and Regulatory risk* - is a general name for various risks related to non-compliance or changes in legal norms.
- *Business risk* - involves overcoming classic obstacles in the business world, such as uncertainty regarding the movement of market demand, then determining the optimal level of the product market price, production costs, storage costs, and delivery of finished products.
- *Strategic risk* - is the risk of undertaking large investments, where there is high uncertainty regarding success and profitability, and
- *Reputation risk* - is a new dimension of risk, created after the great accounting scandals of the late twentieth century.

4 FINANCIAL DERIVATIVES AND FINANCIAL RISK MANAGEMENT

Financial derivatives have long been recognized as very effective instruments for protection against financial risks. They began to be used in risk management practice as early as the 18th century in commodity futures markets (Acharya, Brenner, Engle, Lynch, & Richardson, 2009, p. 1) in Japan and Chicago. Originally, the use of derivatives referred to the exchange of one position for another to reduce the risk of changes in the price of goods. After that, instruments were developed to protect against the declining value of foreign currencies. Thus, wholesale exporters who were affected by currency risks more often than others, to be able to ensure the values of their collections in the value valid on the day of the conclusion of the foreign trade deal, first contracted financial derivatives to protect themselves from exposure to currency risks.

Derivatives can involve high risks. However, derivatives are not inherently riskier than spot transactions. From a microeconomic point of view, derivatives are inherent in the same type of market risk as the spot transactions on which they are based. In terms of their scope, derivatives do not

create any risks that would not already exist in cash markets in the same way.

Differences in risk arise only in a direct comparison between the futures transaction and the underlying. For example, the pricing of derivatives is often less transparent, especially for private investors, as this is not (only) determined by supply and demand, as is the case with cash market securities, but other parameters (e.g., remaining maturity) can also play a decisive role in addition to the price of the underlying asset. This is often difficult for private investors to understand (complexity risk). In addition, depending on the structure of the financial agreement, there may be a risk that additional funds will have to be raised on the maturity date, contrary to the original intention.

In addition, derivative prices are also subject to the same stochastic uncertainty as the underlying asset (market risk), although the leverage effect also causes greater participation in negative price movements and thus can lead to disproportionate losses including total loss.

The risk management process goes through the following stages (Adelsberger):

- *Communication and consultation* – carried out with interested parties at any level of the risk management process and consideration of the process.
- *Determining the context* – involves determining the external, internal, and risk management context in which the rest of the process will take place.
- *Identifying risks* – when, where and why, and how events can be prevented, reduced, delayed, or increased to achieve objectives.
- *Risk analysis* – identifying and evaluating existing controls, and determining the consequences and probability, as well as the level of risk.
- *Risk assessment* – comparing the estimated level of risk with previously determined criteria and considering the balance between possible benefits and unfavorable results. That contributes to making decisions regarding the extent and nature of risk treatment.
- *Risk management* – implies specific cost-effective strategies development and implementation and plans to increase potential benefits and reduce potential costs.

- *Monitoring and review reporting* – It is necessary to monitor the effectiveness of all steps of the risk management process. That is important to make continuous progress.

Until recently, the strategy of managing the risk of changes in the balance sheet was used, thus protecting the bank from risks. However, nowadays off-balance sheet derivative financial instruments such as forwards, futures, options, and swap contracts are more often used. Along with the increase in the use of these derivatives, the fees and revenues generated by financial institutions also increase.

The primary reason financial institutions and companies enter derivative transactions are to protect themselves from the various forms of financial risk associated with their operations. The reasons market participants enter derivatives transactions differ from the perspective of the subject of the transaction. Consequently, the benefits and the risks also differ. Banks are motivated to protect the market and the credit risk of export companies, which are subject to high currency volatility, but it can also be market speculation or arbitrage. On the other hand, companies usually enter derivatives to reduce currency and interest rate risk, for example, by entering a contract with a bank, buying foreign currency on a forward basis, or changing interest rates. If commodities are traded on an exchange, futures can be concluded. They may buy a currency option if they expect the domestic currency to weaken in the future. In essence, derivatives more flexibly, efficiently, and accurately manage risks arising from business, reducing market uncertainty, and limiting risks both at the level of individual participants and on the level of the financial and economic system.

CONCLUSIONS

Risk management is a legal obligation and an indispensable part of any good management. There is a noticeable tendency to increase organizations' material, energy, and economic potential. It contributes to the increase in the scale and severity of the consequences of a risky event. The field of action of the hazard factor does not only include the system environment but very often covers the broader territory, thus endangering people, material resources, and the environment.

Therefore, it is necessary to take measures aimed at eliminating the causes of occurrence and/or minimizing the effects of a risky event, as well as ensure minimal losses and eliminate the consequences if risky events occur, which forms the basis for risk management. Risk represents uncertainty, which due to unfavorable changes in risk factors can be expressed in the form of loss. Risk factors include all causes that have an impact on risk, but which cannot be influenced.

Today, all organizations do business in an environment that is constantly changing. That is why quickly responding to changing circumstances and adapting to them are significant. Management in every organization should be ready for changes that may have to be made due to the direction of the organization changings and changes in priorities and significant parts of the business. Risk management is a tool that helps anticipate and respond to change. And so, it allows managers to foresee unfavorable circumstances or events that can be prevented, to achieve the organization's goals, and to direct control procedures and resources to the primary activities and the risks associated with them.

Financial engineers created the futures contract as one of the most significant derivative instruments to reduce the increasing risks of price and interest rate changes. Futures are instruments derived from a specific asset (commodity, securities, currency, stock index). They essentially represent purchase contracts with a forward clause, which refers to the delayed delivery and payment of market material. However, over time, the independent market life of futures and other derivatives as a sign of value about the basic asset of the contract came to be separated. Futures and other derivatives become independent objects of trade, and the asset represents only the source that indirectly affects the final value of the derivative at maturity. Also, in most cases, especially in the case of financial derivatives, the stock market effect is not delivered at the time of maturity of the contract, but only until the price difference.

Derivatives offer a significant advantage: the risks are transferred when used. Market and price risks of the underlying asset are transferred contractually to the financial derivative through the contract design. Of course, derivative financial

instruments also have disadvantages, for example, there is a risk of total loss for some.

In addition, the investment period is much shorter than with stocks or bonds, which means that it is needed to follow the development of the underlying asset much more closely and have a certain level of experience in the field of trading.

Financial derivatives have no intrinsic material value. Their value depends on the value of the underlying instrument (asset).

When trading derivatives, the trader bets on the performance of this underlying asset, such as a stock.

A prerequisite for trading financial derivatives is that the two involved parties have different expectations regarding the performance of the underlying asset.

Financial derivatives thus make it possible to separate physical ownership of the underlying asset from participation in its market opportunities and risks.

A high degree of flexibility creates an opportunity for contractual partners to design contracts individually according to their risk preferences.

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ADDRESSING AIR POLLUTION THROUGH PROPERTY RIGHTS AND NUISANCE LAW

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Abstract

Our thesis is that the best way to deal with the challenge of air pollution is based on private property rights and nuisance law. In this perspective, pollution of the air is akin to trespass, not a negative externality or external diseconomy. Thus, pollution of the air is not an instance of a market failure. Rather, the opposite is the case: it constitutes government failure. The government has taken on the role of protecting the environment by quelling air pollution. It has done so by implementing a plethora of regulations, requirements, and prohibitions. These have been deemed necessary since the government first began its efforts in this regard by eliminating the legal possibility of suing those who emitted pollution into the air and were thus guilty of trespass. In other words, the government first disallowed the free enterprise way of solving the problem; when pollution continued, they blamed the very institution they had prohibited from operating in the first place for the problem. Then, they instituted a “solution” that would not have been needed had they not proscribed the free enterprise resolution. What should now occur? We should “turn back the clock” to what would have naturally occurred did the state not become involved: allow the victims of pollution trespass to sue for damages.

Keywords: Pollution; externalities; property rights; law.

1 INTRODUCTION

In the US, much of today’s political dialogue focuses on climate change and the environment – a worthy concern considering the number of scientists who warn of its damaging and irreparable consequences. Often this debate on environmental issues places the onus to save the

planet on private actors. Manufacturers, energy producers, transportation industries, fisheries, and consumers are often blamed for pollution and the destruction of natural environments. Perhaps this culpability is reasonably directed. After all, 70% of global greenhouse gas emissions, which are the primary climate change contributors, come from the energy production and utilization industry, manufacturing, and transportation. This gaslighting of private actors, though, ignores the coordination problem which explains the difficulties of organizing disparate and remote

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groups with wide-ranging interests. Every environmental actor has an interest in enhancing his position and it is nearly impossible to coordinate every industry and consumer around environmental issues.

The only group that has the power and enforcement capability to compel coordination is the state, which has consistently failed to protect the environment. So long as the government allows private actors to pollute without penalty, air quality will continue to worsen. In the US, easements are given to industries that move into towns and poison air and water sources. Eminent domain allows companies with some claimed semblance of public value to seize property and expose outlying areas to undue risks with the government's approval. If one seeks injunctive relief for the violation of one's property rights, one is all too often denied because of a perverse weighting of social equity. Ultimately, the legal standards for holding environmental violators accountable often don't allow victims to seek justice, thus propping up groups that pollute.

Some argue the solution to environmental challenges is to give the state more coercive power to control polluters. This paper will argue that there is an alternative approach based on the proper enforcement of property rights. Rothbard's (1982) paper outlines how an alternative normative legal philosophy based on libertarian values can tackle one of the more controversial environmental property rights violations: air pollution.

For many, the idea of free enterprise rules saving the environment is, at first glance, absurd. Aren't markets what got us into this mess? No. The problem is that, in the US, property rights have been undermined and not allowed to perform their proper function. The philosophy of private property rights has failed the environment because the government and legal systems have all but prevented it from operating. A reordering of environmental law and property rights would allow individuals to hold polluters accountable. In looking at how this would work, it is easy to see how an oil spill, or the disposal of toxic waste would constitute an enforceable property rights violation, but oftentimes it can be hard to conceptualize how the same principles apply to air pollution. This present paper outlines a new

normative approach to property rights, air pollution, and torts based on Rothbard's libertarian approach and will attempt to address the unanswered concerns of those unconvinced by free market environmentalism.

2 LEGAL STANDARDS

Before establishing a libertarian analysis of property rights and environmentalism, it is important to acknowledge the current legal standards for private nuisance violations - an interference in someone's ability to use or enjoy his land. The two often cited cases on the issue are *Madison v Ducktown Sulphur, Copper & Iron Company* and *Hulbert v California Portland Cement Company*. In the first, Tennessee law outlined nuisance violations and the Tennessee Supreme Court acknowledged that the Ducktown mining company's pollutants were affecting the complainants' ability to use their farms and land as they did before the mining company's arrival. The complainants sought injunctive relief, but the courts refused, arguing that, in balancing the social equities of the two parties, the mining company was just too important to the town. Although the courts allowed Madison to sue for damages, they effectively stripped the complainants of their property rights and minimized their damages to the actual estimated costs. Similarly, in *Hulbert*, the California Portland Cement Company was releasing cement particles through the air onto Hulbert's property. The dust crusted all of the complainant's plants and found its way through the house vents, making life unpleasant. The court, in its decision, emphasized the size of the cement company's payroll and denied injunctive relief as a balancing of suffering. When it comes to rights, in contrast, there can be no conflict, and thus no need for any "balancing" between them. If there is a seeming conflict between them, one or the other or perhaps both are misspecified. For example, the "right" of a tenant to pay a low rent seemingly conflicts with the right of the landlord to charge whatever fee he wishes. But no, there is no such thing as a "right" of a renter to pay any particular amount. What about the right to engage in free speech on the property of other people? There is no such right.

This "balancing" approach to nuisance violations strips people of their property rights and is the reason pollution goes largely unpunished.

Although the courts do sometimes allow victims of nuisances to sue for damages, it is important to recognize that most only receive compensation for only monetary damages, which often doesn't properly describe a property owner's valuation of damages.

The libertarian alternative to this system of weighing social efficiencies would give each person absolute property rights that extend to nuisance violations. The standardized enforcement of these property rights would lead to more accountability against polluters who would prioritize the proper negotiation, management, and minimization of pollutants to avoid costly litigation or injunctive relief. For this reality to take shape, though, a normative approach to property rights must have clear boundaries and be consistently enforced. Rothbard offers a concise understanding of what this would look like: "No action should be considered illicit or illegal unless it invades, or aggresses against, the person or just property of another. Only invasive actions should be declared illegal and combated with the full power of the law. The invasion must be concrete and physical" (Rothbard 1982, p. 127).

Though effective in outlining a basic standard, there are holes in this legal approach that Rothbard and libertarian theory adequately fill relating to, the burden of guilt, causality, and liability. On the burden of proof, libertarian theory tells us that this should fall squarely on the plaintiff. If the axiom of libertarian law is that no person should threaten or initiate an act of aggression against other persons or their property and that everything else should be allowed, then it should follow that punishable acts of aggression should be overt. In any cases where it is unclear whether the defendant is guilty, nothing should be done. The plaintiffs, if they want the present situation changed, must prove that they have been wronged. At present, this line can be hard to draw, but, with clear and defined property rights, a bright line should be more easily distinguishable. Contrary to contemporary law, the libertarian theory holds that the presumption of innocence for defendants and the strict burden of proof for plaintiffs in criminal cases should also apply to civil tort cases. Rothbard (1982, p. 138) explains this by saying "For libertarians, the test of guilt must not be tied to the degree of punishment." The

coercive nature of guilt in tort suits requires, for supporters of this philosophy, the same standard of proof as contemporary criminal cases.

Regarding causality, Rothbard (1982) suggests the rigid proof beyond a reasonable doubt test. That means that correlation and, according to Epstein, "substantial factors" have little to do with proximate causation. In the case of air pollution, if an insensible pollutant is released at a level deemed insignificant to one's health, despite that chemical being cancerous in large quantities, the polluter cannot be considered at cause for a property rights violation. If, however, a certain level of that pollutant is found to have statistically significant damaging effects on one's health, exceeding natural risk factors beyond a reasonable doubt, a polluter would be at fault for depositing a greater amount than that level into someone's air. This may seem like an insurmountable causality standard for the layperson, and perhaps it is under the current legal system. It is easy for lawyers who specialize in air pollution law to cast doubt on the causality of pollution to health risks when judges and juries have no knowledge or expertise on the issue. Libertarian legal theory, however, would implement a system of private courts that would allow jurists to specialize in specific areas of law that the public court system simply cannot fulfill. These private courts are presently common in some industries and allow expert judges who know the issues at play to decide cases more efficiently between industry insiders (Richman 2004). This would create more uniform expectations and causality standards for air pollution cases.

3 HOMESTEADING AND NUISANCE LAW

Ultimately, enforcing air pollution property rights violations is an issue plagued by unclear and degraded property rights. As it stands, courts have thrown out individuals' rights to injunctive relief in most air pollution-related torts. Reframing property rights using libertarian values would help create clear and defined understandings of air pollution rights and violations. The two bedrock values of libertarian theory, according to Rothbard (1982, p. 145), are "Everyone has an absolute property right over his or her own body; and (b) everyone has an absolute property right over previously unowned

natural resources that which he first occupies and brings to use.” This “homesteading” principle prioritizes the first use of land or resources as the mechanism for ownership. Staking off the land does not imply ownership; mixing labor with the land and/or resource utilization does. As much as property rights focus on land and tangible property, one can also homestead the right to emit noise, divert water, or even pollute. A common example of this is that of an airport. Airports emit noise at a level that can severely impact people’s ability to use and enjoy their land. Property near airports is consistently valued lower than might otherwise be the case for this reason. If an airport is built in the middle of nowhere, it has every right to land and sends off the loudest planes it can find. They are not violating anyone’s right to reasonable noise levels as there was no one around before them to disturb them. In mixing their labor with the land, so to speak, the airport created a noise easement right that extends to whatever maximum decibel they were contributing before the surrounding areas developed. Although the airport might only own the land its buildings and runways rested upon, its noise easement extends as far as the noise it had first emitted. Anyone who correspondingly homesteaded the airport’s surrounding areas knows what they are getting into and has no right to quiet.

In applying the homesteading principle to air pollution, the same rules apply. Air is unique, though, in that its utilization is often less well-defined. There are several theories of ownership for air. The first is the *ad coelum* rule which says that a person owns all the land above and below his property, in the form of a decreasing-sized triangle downward, and an increasing-sized triangle upward. This is not compatible with the homesteading principle, which requires a person to contribute value to the miles of land and airspace above and below to own them.

Another suggests that private airspace should be scrapped altogether. Unfortunately, clean and uncrowded air is a scarce resource, and planes buzzing just a couple hundred feet above head would constitute a clear violation of the use and enjoyment of a person’s land. The logical implication here is that planes may of course take off and land near airports, at increasing or decreasing altitudes, since they have

homesteaded that right by being the first to do so. However, when they are flying over other people’s property not under the aegis of homesteading, they must fly at a high enough height to not interfere with the property rights of those located below.

The third, which is often applied in law is a “zone” theory that grants the lower airspace above one’s head ownership. Prosser (1971, p. 70) defines the zone as “so much of the space above him as is essential to the complete use and enjoyment of the land” This understanding of airspace aligns well with the homesteading principle and would certainly grant someone ownership of the immediately visible and consumable airspace they had homesteaded.

So, if an industrial factory is built in an unoccupied area, they have every right to pollute as much as they desire up to the limit when they do so at an amount or in a fashion that aggresses against another person’s prior appropriated zone of airspace. That factory could emit cancerous chemicals into the air, but the more quantity it emits the more likely those chemicals are to travel further into prior appropriated areas owned by others. This system of property rights would force polluters to choose between building in areas where their smog wouldn’t affect others or properly managing and minimizing pollutants. Because each person has an absolute right against invasions of their property, a polluter who wanted to build in an occupied area would have to negotiate terms with every person whose property would be affected by their pollution or risk tort action against them. Unlike the current legal system, there would be no weighing of subjective social benefits in tort suits which overwhelmingly sway in favor of polluters.

Even clearly defined property rights are only as good as the uniformity and degree of their enforcement. The current method for enforcing air pollution violations is nuisance law which generally involves the intangible invasion that interferes with a person’s economic use or enjoyment of property. Unlike trespass, which requires an invasion by a tangible mass, nuisances require damages to be enforceable. Intangible objects such as noise, odors, air pollution, excessive light, or other disturbances of comfort must be damaging to the use or

enjoyment of property to be considered a nuisance. For example, radio waves carry satellite tv and radio channels across various frequencies, which invade people's property. They do not, however, constitute a nuisance as they are insensible and do not cause damage to anyone's health or property. If, however, a new factory begins emitting smog, visible and odorous, onto a person's property, the unsettling gas would be a clear nuisance violation subject to a tort action. Similarly, insensible but objectively harmful pollutants or radiation would constitute nuisances as they are damaging to a person's health. Air pollution that is neither detectable nor damaging to a person's health or property, though, does not constitute a nuisance as it does not damage or interfere with the use and enjoyment of property. Air pollution of this variety, therefore, should not constitute an act of aggression. Radio waves are yet another example.

It is important, also, to note that no person has the right not to be affected by nuisances of nature. This is to say that no person is responsible for naturally occurring damages or nuisances on their property that affect their neighbors. If a privately owned volcano erupts, discarding a foot of soot onto a neighboring property, the volcano owner has no responsibility for damages. Tort action should only be taken if there is strict causality between a property owner's actions and an act of nature.

4 DISPELLING MYTHS AND CONCERNS

So far, this paper has set forth a libertarian approach to property rights and air pollution that establishes homesteading as the mode of absolute ownership of property, defines nuisances, distinguishes aggression from legal and allowable pollution, and properly extends the burden to prove strict causality at the door of the plaintiff. Under this normative approach to air pollution, people aggressed against by smog, toxic pollutants, or other damaging air pollutants would be able to seek both injunctions and damages. Better yet, polluters without prior appropriated pollution easements would be encouraged to negotiate the terms of their existence before polluting. Ultimately, this would internalize environmental "externalities" and force responsibility onto those who wish to pollute. This

would incentivize research into cleaner alternatives to transportation, manufacturing, and energy extraction and development while manifesting stricter pollution management standards. The remainder of this essay will seek to dispel various concerns about the efficacy of free-market environmentalism in addressing air pollution.

If homesteading rules applied and public and unowned land was suddenly up for grabs, wouldn't there be a dash to claim that land and establish pollution easements? Wouldn't all polluters rush to establish as many pollution easements as possible?

There quite possibly might be an influx of industries, which might want to establish pollution easements on newly privatized land before others arrive. Currently, the federal Government owns 28% of land in the US- about 640 million acres (Vincent 2020). One could only assume that many investors are salivating at the prospect of being able to utilize the vast forests and resources found on this land. Of course, potential polluters will have to compete with the millions of other actors who might consider moving to, developing, or farming this land. The more individual owners stake claims on newly privatized land, the more polluters who want to move to nearby locations will have to negotiate their entrance. This concern, though, minimizes the huge number of current polluters who would, suddenly, be held to new pollution standards. Any person who held his property before a nuisance polluter's entrance into the airspace could seek injunctive relief against them. Most already established polluters would have to minimize pollutants to unactionable levels, negotiate the terms of their polluting, or relocate. This would, likely, more than offset any new polluters that might take advantage of unclaimed land.

It cannot be denied, however, that a sudden move in the direction of the libertarian legal code would indeed introduce more than just a little bit of chaos. But this would not constitute the dreaded "market failure," the bane of free enterprise. Rather, the disorder is the result of *any* unexpected and abrupt change in the legal code, whether an improvement or the very opposite. For example, when alcohol prohibition was introduced in the United States,

and then, again, when it was rescinded, upon both occasions disorder and confusion ensued.

Wouldn't this system of homesteading and nuisances inhibit the creation of new businesses that pollute? How could anyone ever pollute under this system?

New industries that sought to pollute would be expected to negotiate payments and pollution terms with the neighboring property owners for as far as their pollution traveled, to be sure. This would raise the barrier costs of entry for those industries that expect to pollute at nuisance levels. Thankfully, markets are flexible, and polluters would innovate new methods of production, energy extraction, and pollution management that are cleaner. Those industries that cannot adapt can find relief from the burdens of negotiating with large numbers of property owners by working with "sky trusts" (Torres 2001). These organizations are an intermediary between polluters and pollutes. They negotiate, collect, and manage fees for air pollution disposal. They pay persons whose property is adversely affected and collect fees from those who engage in these activities. Of course, a refocusing of property rights is always going to be at the expense of those actors and industries that benefited from their degradation. Many polluters, who have been propped up by a coercive legal system, will inevitably have new costs imposed upon them associated with their nuisance and trespass violations. What is wrong with that, though? Increased costs to new polluters are the cost of justice in the absence of coercion.

It is important to distinguish, though, that not every industry or factory that pollutes will be liable for nuisance violations. Only those who emit particularly dangerous or sensible gases into other's property would be held responsible. Many pollutants, in low quantities, pose no danger to anyone's health. Nature- including humans themselves – emits carbon dioxide and other chemical pollutants at low levels. *De minimus* is the rule here; the law does not concern itself with trifles. The expectation should be that each person is allowed to pollute at reasonable levels below the threshold of damaging neighbors' health.

Air pollution comes from so many places, how can people possibly protect their property from every

polluter when each one is responsible for just a fraction of total pollutants?

Oftentimes, smog, noxious air, etc. is a result of many individual polluters who might be polluting at insignificant levels. The best example of this is transportation. Millions of cars around the world contribute significant amounts of soot, nitrogen oxides, carbon monoxide, and sulfur dioxide. Especially in cities, cars are one of the main contributors to dangerous air quality. It would be impossible, though, to sue every car owner in New York City for the quality of air as each, individually, contributes an unactionable amount of pollution. Block (2009) demonstrates that private roads hold the answer. In a free-market system that prioritizes homesteading as the mode of ownership, all roads would be privatized. Busy roads that produced a lot of pollution would be responsible for the amount that entered neighboring properties. Although a case could be made for suing the individual automobile owners as well, it is much more feasible to bring a tort action against the road owner. They, in turn, would have an economic incentive to minimize car pollutants on their roads. To do this, they can exact penalties on those cars that produce more pollutants and provide discounts for those that run cleanly.

Transportation is relatively unique, though, as most polluters own the land from which they emit. In cases where many individual factories that each pollutes at reasonable levels collectively contribute dangerous levels of pollutants, mass torts could be applied. This would look different than joinder cases which, conveniently for plaintiffs, combine multiple defendants who acted in concert with each other into one tort. Most nuisance cases involve several individual defendants who separately contribute to the nuisance. These defendants may differ in variety, percentage, and quantity of pollutants and the injuries are, therefore, separate. It is up to the plaintiff, then, who always bears the burden of proof, to appropriate fractional damages among the various defendants in multiple torts. Plaintiffs must be able to show a systematic approach to appropriation. This can be an arduous task- especially when some defendants might have homesteaded their low-level pollution easement before others.

Rothbard, himself, notes that plaintiffs might accomplish very little if proof beyond a reasonable doubt is strictly adhered to. Again, though, a system of private courts would be able to approach data and air pollution science more technically. Perhaps that plus clear and well-defined property rights, and some experimentation in mass nuisance cases involving individual torts can work to create a universal standard for apportioning damages in such cases. This, however, is the job of an air pollution jurist.

Air pollution can travel across the world. How can property rights help reduce air pollution from other countries?

As it stands, very little is stopping global polluters from spilling greenhouse gases and toxic chemicals into the atmosphere. Worldwide environmental agreements such as the Paris climate accord include no enforcement mechanisms and underwhelmingly constitute nothing more than a set of goals. There have been many other overlapping international treaties signed throughout the 20th century that outline property and liability rules relating to the environment. These treaties, collectively, establish some semblance of international tort law and private actors would have an interest in preserving these systems. These tort laws might help deal with nuisances like air pollution, but oftentimes they are not enforceable and the only thing holding international polluters accountable are reputation mechanisms. Perhaps leading by example and showing other states how the enhancement of property rights can positively impact the environment is the best we can do.

How could the poor afford to litigate against massive polluters with much more money?

Again, private courts could be more efficient and tailored to fit the needs of a particular industry. Private courts would not be bogged down with the procedure of overloaded dockets and the jurists would become expert fact finders in whatever industry they worked in. Similarly, clear, and succinct understandings of universal property rights and their normative enforcement would take much of the uncertainty out of court deliberations. Environmental lawyers would often know, more certainly than now, whether a tort case was winnable and may provide their services for free on the assumption that they would receive a

percentage of winnings on a contingency basis. Normative property rights and air pollution standards too would help avoid the litigation process. Polluters, who would know whether they were violating their neighbor's property rights, would have a financial incentive to negotiate their entrance to an area before they polluted. Collectively, these factors would significantly lower the costs of resolving pollution disputes.

Even better, due to the nature of air movement, it is rare that there is only one victim of damaging air pollution. So long as the victims are of common, singular interest, class action lawsuits can pool the damages of many individuals into a single suit, which could be more efficient and convenient for victims. Class actions are almost always free for victims to hop on to and are a little risk to those who sign on.

The poor would have affordable paths to litigation against even the biggest national polluters because reputation is highly important in this field. Let the word get out that the Acme Court favors rich litigants over poor ones, and that would pretty much end its continued operation. Also, there is the matter of comparison. Do government courts never favor the wealthy vis-a-vis the impoverished? Of course, they do. It is, alas, part of the human condition. So, the question is not whether private courts would succumb to this sort of evil. It is, rather, which institution would be *more* vulnerable to it. Here, the free enterprise system looks good in comparison, in that it is based on voluntary contributions and payments, not coercive taxation. A government court, no matter how corrupted, has never gone out of business. This would not at all apply to private counterparts.

What about pollutants that don't constitute a nuisance, but contribute to climate change?

Carbon dioxide in the atmosphere is the main contributor to climate change. In turn, climate change can cause massive destruction of property in the form of more intense and unpredictable storm seasons, sea level rise, and temperature changes. These all present themselves as acts of nature but can be exacerbated by global carbon polluters. This is tricky because, of course, carbon polluters cannot be held responsible for every out-of-season hurricane or statewide freeze in Texas. Under the burden of strict liability, it is nearly impossible to tie polluters to these acts of nature.

Carbon dioxide pollutants, in large quantities, can cause headaches, dizziness, and fatigue, but rarely does it pool in large enough quantities to cause this health damage. Outside of locations immediately proximal to mass carbon polluters, then, property owners have no recompense against the creators of climate change. In this sense, climate change is difficult for free market environmentalism to address.

Normative property rights enforcement can, hopefully, reduce the carbon pollution that brings smog to a neighboring property and, in doing so, reduce overall carbon emissions. As other pollutants that are more obviously damaging to health become more expensive to emit, the development of clean energy technologies will be accelerated, too. These technology alternatives can replace carbon-emitting technologies in time. Perhaps this is better than current environmental legal standards, which have no answer to climate change outside of coercive regulation and subsidies, which act as transfer payments.

In saying the foregoing in this section, we are allowing, arguendo, that climate change is anthropomorphic. There is an alternative view, however. It is that these claims of left-wing socialist environmentalists are false, merely an attempt to blame capitalism and promote central planning. In the 1970s, these critics claimed there was global cooling, and it was all the fault of economic freedom. In the 1990s, the charge was global warming, and again the free enterprise system was the culprit. Earlier in this century, the criticism of laissez-faire capitalism was that it brought about temperature change. The

indictment kept changing, but the verdict stayed the same. It is difficult to take these reproaches seriously.

5 CONCLUSION

Ultimately many concerns about free market environmentalism boil down to a distrust of capitalism. They are rooted in the philosophy that the government can save the environment more adequately and efficiently. If that were the case, though, would the government not have saved the environment by now? Instead, the state props up polluters by degrading their nuisance liabilities and removing their financial incentives to research cleaner alternatives.

This paper has presented an alternative normative model for property rights and nuisance torts that relies on libertarian theory to effectively moderate air pollution. This Rothbardian approach prioritizes homesteading as the mode of ownership, absolute rights of individuals to use and enjoy their property free from interference, the strict burden of proof on plaintiffs who allege damages against that right, and the normative enforcement of these standards by private courts.

Ultimately, this will lead to less air pollution and financial incentives to innovate cleaner alternatives to dirty industries. While doing so, would create a more just system of individual liberty without coercion. Torts against polluters have been stripped of their teeth for centuries and a reframing of property rights and nuisance law is necessary if we want to see a cleaner and more just world.

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APPROACHES TO THE RUSSIAN TOURISM DEVELOPMENT ON THE EXAMPLE OF THE VYBORG CITY

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Abstract

More and more countries, regions, and cities are beginning to come to grips with improving their tourism product, raising the level of service, and developing various events. The tourism industry, in the context of the structural restructuring of the Russian economy, is one of the most dynamically developing sectors and has a stimulating effect on the development of traditional sectors of the national economy, acts as a catalyst for the economic and social development of the regions, and improves the quality of life of the population. The article deals with the development of problematic areas of the tourist center in the city of Vyborg. The real reason why Vyborg has long attracted Russian and foreign tourists lies in its unique architecture and sights. More than 300 historical, architectural, sculptural, garden and park art, and archaeological monuments are in Vyborg. Among the prerequisites for the confident development of Vyborg as a tourist center, it is necessary to note its favorable geographical position, rich cultural and historical heritage, good transport accessibility, and high potential for various types of tourism. The tourism development program in Vyborg is designed for a long period. It includes several stages and considers the specifics of the economic and social development of the territory. It is significant to consider the interdependence and synergy of projects as a unit of approach and activity aimed at using the already developed aspects of organizing the tourist attractiveness of the city. The authors conducted the study before the start of the conflict in Ukraine.

Keywords: *tourism, tourist, recreational complexes, Russia, development.*

1 INTRODUCTION

In many countries of the world, tourism accounts for a large share of the income of regions and cities. Tourism is a rapidly developing sector in Russia, which actively accelerates the socio-economic

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development of cities, and improves the quality of life of their population. The formation of tourist and recreational complexes makes it possible to ensure the development of regional tourism and meet the needs of the population in tourist and recreational services.

Consider the municipality "City of Vyborg" of the Leningrad Region with serious tourist and recreational resources that can be used to create new excursion and tourist programs on a project basis, given the increased interest in domestic tourism. Nevertheless, the tourist potential of the city of Vyborg is realized, unfortunately, today insignificantly.

For all its tourist attractiveness, the infrastructure of the city of Vyborg must be recognized as a weak point, which currently does not meet, not only, the exacting requirements, but also the minimum comfort of a large flow of tourists. It is on these problems that the city administration and citizens who are interested in the prosperity of the city are now actively working.

2 HISTORICAL AND CULTURAL RESOURCES OF THE CITY OF VYBORG

Vyborg is a unique city in the Leningrad region with a history of more than 700 years of existence. The city is close to Finland, which makes it an ideal tourist destination for both Russian and foreign tourists. In our opinion, its historical, cultural, and natural attractiveness¹ should be used more diversely to increase the tourist flow to the city.

The beauty of the ancient city cannot fail to impress even the most sophisticated traveler. A majestic old castle, perfectly preserved boulder houses of the 15th-16th centuries, as well as many museums and historical sights - all this allows one to plunge into the atmosphere of the real Middle Ages.

The real reason why Vyborg has long attracted Russian and foreign tourists is, of course, its unique architecture and sights. In total, more than 300 various monuments are concentrated in Vyborg: historical, architectural, sculptural, landscape art, and archaeological. (Adaskina, 1969)

In 2010, Vyborg won the status of a historical settlement. The restoration of cultural heritage sites is carried out under the programs: "Culture of Russia", "Preservation and development of small towns in Russia", as well as "Development of culture in the Leningrad region" (Drozdenko, 2019). Sixteen objects of federal-, 72 objects regional-, and 123 objects of local cultural heritage government identified in 2014.

At the same time, the main principle of the preservation and restoration of Vyborg was determined - an integrated approach to preserving the complex historical environment of the medieval city, the main landmark - the urban landscape for 1939 and the preservation of the historical function of buildings and structures with adaptation for modern use. The capital repair program includes 16 multi-apartment buildings that are objects of cultural heritage, 12 of them have been restored and have already been commissioned and four more are in the process of an overhaul. (RIA Novosti, 2020)

The most prominent monument of the classicism period in Vyborg is the Spaso-Preobrazhenskiy sobor², founded in 1787 by the decree of Catherine II. The architect N. A. Lvov designed it. The cathedral was recognized as the monastery cathedral in 1892, after the establishment of the Vyborg diocese.

The only functioning Lutheran church in the city is the Cathedral of Saints Peter and Paul. It was founded at the end of the 18th century when Governor Engelhard asked Catherine II to allow fundraising for the construction of a church for the German Lutheran community. The temple, built on donations from the people, was originally wanted to be called the Cathedral of St. Catherine but since the construction was completed under Paul I, the temple was lit up as the Cathedral of the Holy Apostles Peter and Paul. The utensils of the temple, as well as the church organ, were destroyed in Soviet times, and only in 1991, the cathedral was illuminated again.

The Church of St. Hyacinth is a monument of Gothic architecture of the 16th century, built of stone for the needs of the monastery school at the Franciscan Monastery. That is one of the oldest buildings in

¹ Attractiveness is one of the key properties of tourist resources, indicating their value, the ability of a resource to attract the attention of a tourist, evoke

emotions, and arouse interest. (Vorob'yeva & Gorshkov, 2019)

² The Transfiguration Cathedral

Vyborg, and, even today, its walls have remained intact. The building often changed its role. So, from the 1650s, the noble assembly of the city was located here, and in 1799 Paul I contributed to the building becoming part of the church, and it housed the church parish. In 1802, the premises were given to the Roman Catholic parish. So, the building became the Church of St. Hyacinth, which existed until 1940. Nowadays, offices and an art gallery are in this building.

The oldest residential building in Russia is in the city of Vyborg, the townsman's house, built in 1583.

Undoubtedly, the pearl among the sights of Vyborg is the Vyborg Castle, founded in 1293 by the Swedes. By the decision of the Swedish king, the fortress was erected on Castle Island and was named Vyborg. Several times a year, knightly tournaments are held on the castle territory, allowing participants to plunge into the Middle Ages atmosphere. The main hallmark of the castle is the tower, which offers a breathtaking view of the entire city, the Vyborg Bay, and the Annenskiye (*in English: Annenkrone*) fortifications of the mid-18th century.

Speaking of Vyborg, one cannot fail to mention the founder of the Vyborg castle, Torgils Knutsson. A monument to him, the author of which is Ville Vallgren, stands on the square of the Old Town Hall, and it was placed with the personal permission of Nicholas II.

Mon Repos Park is located near Vyborg Bay, on the coast of Zashchitnaya Bay. In French, the park's name means rest and peace. This is a rock-landscape park, which is also a historical, cultural, and natural museum reserve, its area is 180 hectares. The basis for the park formation was the aesthetic concept of Ludwig Heinrich Nicolai, by which the romantic and poetic Mon Repos Park was created. (n.d., Mon Repos Park. Northern nature., 2011)

3 INCREASING THE EFFICIENCY OF THE MANAGEMENT OF THE TOURIST AND RECREATION COMPLEX DEVELOPMENT IN VYBORG

The Vyborg adopted the Concept of Tourism Development aimed at creating a modern and competitive tourist and recreational complex.

The concept is based on the following principles:

- consistency,
- completeness,
- priority,
- balance,
- environmental friendliness. (n.d., 2012)

The purpose of the development of the tourist center of the municipality "City of Vyborg" is the formation of a variety of tourist and recreational services that meet modern quality standards, focused on creating conditions for the recreation of the local population and tourists.

Among the prerequisites for the successful development of the city of Vyborg, we highlight the favorable geographical position, rich cultural and historical heritage, transport accessibility, and high potential for the development of water, environmental, and other types of tourism.

The city has significant tourism potential. Medieval monasteries and temples, palaces and park ensembles, and noble estates have been preserved in Vyborg. The summer festivals held in the city will make the tourist completely forget what time he is in and allow him to plunge into the atmosphere of history.

Due to the existing global and local trends, we will single out the following five types of tourism:

- recreational,
- cultural and educational,
- water,
- business tourism, and
- ecological tourism.

Any of these directions involves the development of additional services with the help of small businesses in the presence of significant investment and support from the local administration of Vyborg in the tourism infrastructure. In addition, when positioning Vyborg as a tourist center, such directions as *history* (for example, *Vyborg - the Hanseatic city*) and *geography* (for example, *Vyborg - the gateway to Scandinavia*), as well as *art* (for example, *Vyborg - the capital of cinema*). Moreover, the city annually successfully hosts the festival of Russian cinema *Window to Europe* - the third most important competition for the creators of domestic films. There are festive banners on the streets, where city residents buy tickets to the main cinema. On the avenue of stars, which is next to it, a new name will appear during the festival. The winners

are awarded a gold and a silver boat for the best films.

It is necessary to solve the following tasks to increase the tourist flow:

- implementation of the activities of the Program for the Preservation of the Historical Part of the City of Vyborg.
- organization of a visa-free regime for visiting the territory of the Russian Federation for up to 72 hours when crossing the Russian border in the Vyborg region upon arrival on yachts and cruise ships by sea and along the Saimaa Canal (from Finland), organization of 2-3 border crossing points for water transport in Vyborg,
- formation of a joint tourist product with St. Petersburg and Vyborg inclusion in interregional tourist routes,
- promotion of the rich cultural heritage of Vyborg,
- creating conditions for the accelerated development of hospitality infrastructure, primarily hotel infrastructure.
- promoting the creation of multifunctional information and service centers for tourists.
- stimulating the implementation of international projects in the field of tourism and the formation of a massive foreign tourist flow.
- facilitating the repair and restoration of architectural monuments.
- development of mass cultural and sports events and expansion of the *calendar of events*.

For the successful implementation of these tasks, sustainable socio-economic development of the city is necessary:

1. increase in the throughput capacity of highways: St. Petersburg - Helsinki, Petrozavodsk - Priozersk -Vyborg; Vyborg - Lappeenranta, Vyborg - Svetogorsk - Imatra, etc.,
2. construction of transport and logistics complexes,

3. construction of port facilities on the coast of the Gulf of Finland,

4. reconstruction of the airport for the development of local civil aviation.

Such large-scale capital construction will require the involvement of a significant amount of labor and the implementation of costly measures to protect landscapes, water basins, and the use of environmentally friendly technologies in construction. Under this scenario, we can expect an increase in the city's population to 230 thousand people already in 2025. (n.d., 2020)

4 CONCLUSIONS

In our opinion, the city of Vyborg has one of the highest development potentials not only in the Leningrad region but also in Russia.

Achieving the goals of the city tourist and recreational complex's successful management is associated with the various types of resources use, both financial and labor, as well as information.

After the start of the military conflict in Ukraine, the development programs of Vyborg, as well as other tourist centers, may be partially suspended.

We note the problem of limited resources of the municipality, in connection with which it is necessary to raise the issue of determining the priority areas of tourism. However, one must understand that the choice of only one or two directions is unproductive since the synergistic effect is lost.

In this regard, it is necessary to develop compromise models of tourism development that combine different areas, considering the synergy between promising areas and the formation of a close partnership between government and business in this area.

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KEY IMPACTS OF DIGITAL TECHNOLOGIES ON THE WELL-BEING OF THE WORKING ENVIRONMENT

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Abstract

Digitalization implies the continuous adoption and use of digital technologies in social and human activities. That process requires significant changes and forces people to use digital technologies during and after digital transformation. Digitalization promotes process management, optimizes public space, and brings practical benefits to all. The fast development of digital technologies is undoubtedly responsible for many positive effects on human life in all aspects - education, professional realization, everyday life, and progress in all areas of human activity. However, the excessive use of digital technologies, like the use of any other good beyond what is necessary and sufficient for the goals of a specific activity, has accentuated the negative effects. They become especially visible during the COVID-19 pandemic. As a result of digital overload and excessive use of information and communication technologies, we observed a significant decline in communication skills and capacity for live communication. That inevitably affects the atmosphere within the organization and the communication of organizations with their employees, clients, counterparties, and partners. This article talks about the most significant impacts of digital technologies and their impact on the comfort of the work environment.

Keywords: digitalization, digital, well-being, working environment, impacts.

1 INTRODUCTION

Digitization supports process management, optimizes public costs, and brings practical benefits to everyone.

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Information and Communications Technology (ICT) has changed people's lives and working conditions. Nowadays it is easier than ever to travel, communicate, and connect with people worldwide through one click only.

The development of information and communication technologies at the speed of light allows humanity to learn, produce, invent, and achieve faster and easier than at any other



moment in history. It makes any knowledge, information, and resources accessible immediately and thus gives us the ability to make life and this world a better living place.

The development of information and communication technologies at the speed of light allows humanity to learn, produce, invent, and achieve faster and easier than at any other moment in history. It makes any knowledge, information, and resource accessible immediately and thus gives us the ability to make life and this world a better living place.

ICTs are everywhere around us in a household, the office, transportation, education, and healthcare. They are just around the corner waiting for us to take advantage of them. The impact of digitization on doing business is analyzed in more detail by Bogavac, Prigoda and Cekerevac (2020). Digitalization was extremely useful during the COVID pandemic making the educational process possible and helping people to do their job from the couch or the dining table at home. ICT influence life so deeply that it's inconceivable to maintain a such high quality of life without them.

Paradoxically technologies help us to communicate practically unlimited but the bigger the quantity the lesser the quality. While pretending to communicate with others it gets more and more difficult to establish the most important bond in human life – the one with our beloved people and even more importantly – the one with ourselves. Technologies create so much buzz in our minds that it gets harder and harder to even notice our thoughts, reflect on our own experiences acknowledge and process our own emotions, and express ourselves and our thoughts and ideas.

Ironically while giving us access to the knowledge, art, and information from the whole history of the human species technologies tend to limit our creativity as it seems almost impossible to create something original or completely new.

Furthermore, ICT gives us the feeling that we can get and achieve whatever we want in the blink of an eye. That it's not necessary to make long-lasting efforts because we only need to click here and there, and we can get everything. We've lost

the notion that the greatest things take time. Making ourselves and our path in life and being, takes time, effort, and persistence.

And persistence is what is most needed in every human activity – education, sport, healthcare, career, and science.

Lack of persistence is one of the key problems of the Millennials who face difficulties staying in a job position for more than a few months because they need to see the impact, they make. The problem is that a few months are quite a short time to make an impact, especially in large companies or structures. Sometimes a few months is not enough time even to get through all the inner pieces of training of the specific organization. (Sinek, 2020)

2 DIGITAL WELL-BEING AND SUSTAINABILITY

In Bulgaria, businesses and the entire economy are facing the Digital Era. Every modern business needs to balance growth, risk-taking, and providing staff accordingly. The introduction of technologies increases productivity and guarantees business planning which leads to the lowering of possible risks. At the other end of this spectrum are consumers and enterprise employees. It is important to note here that ease of access intersects with productivity when an enterprise introduces and implements some new technologies, as well as the improvement in the quality of life that they bring.

Digitization means the use of digital technologies and data (fully and relatively digital) to generate income, improve business, replace/transform business processes (not simply through their digitalization) and create a digital business environment in which digital information is the basis.

In Bulgaria, in terms of business, digitization most often refers to the resolution, and improvement of business operations, business functions, models, as well as other activities through the application of the mechanisms of digital technologies and their wider use in the context of digitized data. That requires the digitization of information, but the latter is more important and based on data.

The second aspect often mentioned, digitalization we understand as a specific *environment* in the

field of business. For example, digital jobs. Often, by working in such an environment, we strive to keep the use of paper to a minimum, but the digital work environment encompasses also other things.

Its use means that the workforce works differently, using tools such as mobile devices and other technologies that allow employees to be mobile and use communication platforms. This, on the other hand, creates many possibilities for a different course of action and requires more than the simple availability of digitized data. The process of digitalization requires a major change, which is why many people use digitalization and digital transformation interchangeably.

Digitalization leads to the continuous adoption and use of digital technologies in all social and human activities. In Bulgaria, the increasing number of digital users, the development of digital healthcare, the growing digitalization of government services, marketing, and consumer services, and others, led to the overall digitalization of services in all possible spheres.

3 MAIN IMPACTS OF DIGITAL TECHNOLOGIES ON THE COMFORT OF THE WORKING ENVIRONMENT

The vigorous development of digital technologies is deserving undoubtedly of the many positive effects they have on human life in all its aspects – in education, professional realization, daily life, and the progress of all areas of human activity. But its overuse as the overuse of any other good beyond the necessary and enough for the goals of the specific activity has emphasized negative effects that became especially visible during the COVID pandemic. One of the ways for coping with the COVID-19 restrictions was increased usage and application of digital technologies that allowed many people to do their job from their living place and not from their working place.

The positive effect of this solution is expressed in flexibility concerning working time and place which made it possible to save the job for many people and prevented the closure of businesses that are hospitable for this kind of versatility. But a lot of impacts of another, more negative character occurred.

The abundance of all kinds and quality of information, its easy and fast availability, presence, and opportunity to use all possible digital applications and tools make multitasking more common than ever. In its essence, multitasking is executing several different or of the same kind of tasks with the intention and assumption that this will save time and will increase the productivity of labor measured in the number of tasks completed per unit of time. But what happens is that even in similar tasks we constantly shift from one task to another which tires and damages the human brain, worsens its function, and achieves the effect of decreasing efficiency and quality of work done.

A similar effect is context-switching — quickly switching between different types of tasks and work modes. It is somewhat normal given the dynamics of work activity, but the situation is exacerbated when social media, instant messaging applications, e-mails, and increasingly video conferencing tools introduce into everyday and professional life. One can be impressed with high productivity, but context-shifting takes brain resources so huge that virtually there is no time and space left for deep thinking. Thinking is the essence of some old professions, and in the recent past, it was considered that it will also be the essence of all future prosperous careers.

The result of these two phenomena for employees is the more and more widely spread emotional burnout and drastic increase of stress levels in the physical and psychological aspect that can lead to a durable inability to do their jobs and other kinds of value-producing activity. That inevitably impacts both the social function of the individual and his/her performance at work so, therefore, it has economic consequences.

Another consequence of digital technology overuse is gaining the belief that results are easy and fast achievable without much effort which creates especially in young people limiting persuasion that there is no need to make consistent systematical purposeful efforts as well as a lack of patience.

As a result of digital overload and overuse of informational and communication technologies, significant decay in communication skills and capacity for live communication is observed which

inevitably impacts both the intra-organizational atmosphere and communications of organizations and their employees with customers, counterparties, and partners.

The main consequences for the physical health of employees because of digital overload are stagnant life with all arising from it negative effects (decreased motor activity, unhealthy weight increase, deteriorated general condition, headache, exhaustion, etc.). The deteriorated eyesight because of long exposure to light-radiating devices is distinctive of digital overload and often one of its first symptoms is a headache and dry eyes.

The main apprehensions of employers and employees regarding the impact of digital technologies on physical and mental health at the workplace relate primarily to a decrease in productivity and quality of work done, and potential negative consequences over physical health in the first place. We cannot see the negative effects on mental health immediately, because their emergence takes more time, they stay in the background while we address the consequences of digital overload.

4 DIGITAL TECHNOLOGIES AND IMPROVING DIGITAL WELL-BEING IN THE WORK ENVIRONMENT

It is typical in recent years that labor relations have developed exclusively dynamically, and the labor market gets more and more flexible. More and more employment contracts are in non-standard forms and over half of all new working places fall into this category. Digitalization also contributes to the creation of "new forms of employment".

New forms of employment are challenging for knowledge and practice and for the way of understanding and regulating the labor market. The growth of new forms of employment can be considered a purposeful practice and strategy of employers. New forms of employment spread out in certain economical sectors with seasonal fluctuations, for example, agriculture, construction, and the non-typical until now aircraft and telecommunications industries. Many companies use "new forms of labor" to meet specific short-term needs of the workforce.

Technologies are one of the most powerful factors that determine the development of some of the fast developing "new forms of labor".

The development of work through online platforms, crowdsourcing, and mobile work is due to some of the following technologies:

- *Cloud technologies* enable access to information, data, processes, control, and joint activities of workers and others. From this point of view, the cloud represents not only an engine for the growth of all forms of remote and virtual work but also, a valuable tool for implementing outsourcing and offshoring strategies, especially in the IT services and call center industry.
- *Large Databases'* storage and processing capabilities enable user, employee, behavior profiling, modeling, motion tracking, interaction mapping, and diagnostics from automotive to human disease. From a work perspective, the collection and analysis of big data have implications for monitoring work-process and the workplace and tracking employee activities
- *Mobile applications* - Most platforms have mobile applications that can be downloaded on smartphones and tablets. They allow access to work, services, information, and data and provide an easy and efficient way to operate and communicate from different points and times of basic work processes and groups of people.
- *Geolocation technology* is suitable for identifying the geographical location of people, goods, services, and processes. From a doing business perspective, geolocation has a significant impact on the planning, monitoring, and tracking of mobile workers. They are also suitable for making deliveries, performing maintenance, repair, and inspection operations in industrial plants, and conducting site visits, as well as the ability to track processes, goods, and services from the persons that can have an impact on the organization of work in various sectors. The combination of geolocations with other new digital technologies such as big data, applications, the Internet of Things, online platforms, and peer-to-peer networks

represent a particularly rich source of innovation.

- *The Internet of Things (IoT)*, an organized set of communication protocols and operating systems, enables the exchange of digitized data between objects (physical or virtual) equipped with sensors, telemetry tools, chips or QR codes, and applications embedded in the hardware of computers, phones or robots. When relevant interoperability conditions are met on common technical standards, miniature interconnected objects can play a significant role in:
 - the work environments (component and product tracking, employee tracking, sales tracking, access control),
 - public spaces (city traffic, public transport, water supply, waste management), and
 - private spaces (home automation, digital clothing, sports equipment).

The application of IoT in smart cities is discussed in detail in (Čekerevac, Prigoda, & Bogavac, 2020).

- *Connecting objects* increases their potential to create value because services can be embedded in them, and data can be mined from them. From a work perspective, the changes that are occurring are related to the management of the flow and availability of goods, services, and people in all sectors of industry.
- *Self-learning* systems and mobile robots – By definition, a robot is a programmable automaton with feedback capabilities, ie. the ability to adapt to changes in the environment. Improvements in these feedback systems are therefore not a truly new development, but the new generation of robots is characterized more precisely by their learning and perception skills. Self-learning systems build on recent years of advances in computing power and memory (big data, electronic vision, shape, and speech recognition) to adapt their behavior based on their knowledge of past events and analysis of their environment. From a work perspective, the impact of developments in these areas will not be limited to sectors with a history of automation but will cover a wider range of tasks, including goods handling, maintenance, and repair of industrial plants,

waste management, spare parts, parcels, and letters, restocking and performing operations in hostile environments. It is an integral part of the processes of restructuring production (Industry 4.0).

The described technologies and digitization are already having a profound impact on both existing organizations and emerging entities. Their impact on new working methods, for example, the rapid penetration of remote employment in many sectors, is a phenomenon that is gaining momentum. According to a recent Eurofound study, within the EU-28 on average around 17% of employees are remote or mobile workers in the field of information and communication technologies (ICT). The increase in the number of remote and mobile workers obliges the social partners to find new ways and innovative methods to reach these workers who are not physically present on the premises of enterprises. (EU, 2019)

5 MEASURES FOR IMPROVING DIGITAL COMFORT IN THE WORK ENVIRONMENT

5.1 Policy level

Professional comfort in general and the digital belong to additional benefits of a job. The Bulgarian state policy hardly covers the minimum engagement and care for employees. That is why organizations have absolute independence and rely only on their initiative to develop and implement strategies and programs for professional and digital comfort.

Given the structure of business in Bulgaria for most of the enterprises which fight for survival on daily basis, especially in the current political and economical situation, such programs are rather the exception and are inherent to foreign companies that operate in Bulgaria, and which possess the necessary financial resources and human capital.

Even laid in hands of the organization public context and public image of digital well-being should be established as a significant element of human well-being in general in which time, efforts, and motivation of employees should be invested. We should analyze the benefits of digital

transformation and potential risks simultaneously. (Dzhermanska, 2020)

5.2 Organizational level

At the organizational level, some employers, mainly in the ICT sector, where the specific operations contain an inherently high risk of digital overload, applied corporate strategies and programs for employees' well-being (Andonova, 2022). They include a series of actions contributing to digital well-being and the prevention and limitation of consequences of digital overload.

- Allocation of recreation areas, including sports facilities and green spaces, where employees can relax, recharge, and take a little rest tuning to the new contexts and tasks that constantly emerge.
- Building and application of inner process management systems and time management systems allow the limitation of the necessity of and avoiding multitasking.
- Building and maintenance of an organizational culture that creates prerequisites for limitation and/or overcoming stress caused to digital overload by motivating employees to participate in activities away from the screens., for example, sports, hobbies, casual communication, clubs of interests, etc.
- Limit or ban the usage of devices during work meetings, meetings with clients, and any other kind of direct communication.

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One can analyze professional well-being at the employees' and organizational levels. As the initiative for taking care of the professional well-being of employees has been laid down as the responsibility of employers it is not well communicated at the political level. The state does neither limit nor regulates any kind of activities related to the professional well-being of employees. Government supports it through various programs funded by the European Union (for example Operational Program Human Resources Management) allowing opportunities for qualification improvement and different pieces of training, courses, and informal education. That

contributes to the most important value related to professional well-being according to a study of professional happiness conducted by Milen Velikov (2021) and namely opportunities for professional improvement.

The following structure of the main factors that impact the overgrowth of happiness in the professional aspect is defined through a questionnaire survey.

- To develop own capacity and skills - 68.8%
- To have diverse and interesting life - 58.7%
- To inspire others - 57.1%
- To have free time for own interests - 56%
- To have flexible working hours - 50.8%.

These answers can be very usable and help both employers and employees. The employer needs to unify the values and behaviors of the company with what makes people happier and more fulfilled. It is favorable if the manager himself shares these and similar principles for professional happiness by showing, sharing, and tolerating them. It is necessary to show that he is a leader – to be a model to be followed and imitated, to have his aspirations, mindsets, and expectations. Because very often the employer is a kind of role model whose example is copied by the employees. (Marinova, Todorov, & Shopova, 2022)

If managers embody values like growth, leadership, diversity, flexibility, and balance between work and personal life employees are likely fulfilled.

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Expectations of the employees themselves relate to different wishes and mindsets – someone to develop them, to give them higher and different positions. Each one of these factors for greater happiness in the professional aspect as a quest can be satisfied in the work and can be developed out of it. This relates to additional efforts that create opportunities. New knowledge and skills that accelerate chances. Each of us has experienced professional happiness. That is why it is crucial to know what happiness is and what its

components are and to search for its meaning for us. (Todorova & Marinova, 2018).

It is impossible to limit digital well-being only to professional well-being due to deep penetration and even the human life takeover by ICT technologies. This transfers digital well-being to the field of intervention of getting more and more popular coaching – a process of training and development in which a specially trained coach or mentor helps the person to achieve his own personal, professional, and life goals. Law did not regulate education in coaching and its practice, and they are executed and monitored by different non-government organizations.

All programs for the human resources management experts training and single courses in other programs can be helpful for organizations and companies while managing the digital well-being of employees at the workplace.

Sample topics to be included and implemented in existing programs or to be included in brand new programs especially aimed towards digital wellbeing are:

- Measurement of digital overload
- Self-reflection on digital well-being – monitoring and self-assessment
- Building healthy habits for digital life management
- Motivation for digital life management
- Digital life of employee – factor for performance and development of the organization

Sample lapses in skills and needs of training of these professional profiles

The most significant mistake that can appear in the training of digital well-being managers is to assume that a certain model or system can prevail over the specific needs and characteristics of a particular employee. The next is that the method is more important than the person applying it or the person to whom it is applied. Professional well-

being in general and the digital one are strictly individual to the degree of uniqueness for every single person and each program for their achievement should consider this specificity.

6 CONCLUSION

Digital well-being is the development of skills and habits for the healthy and beneficial use of informational and communication technologies in a way that favors and does not harm the quality of life, productivity, and relationships. It helps us use them in a way that drives us up following the set goal without distractions. In its essence, it is a way that allows us to control technologies to take advantage of their potential.

Healthy and balanced relations with technologies have several benefits for the general well-being of employees and organizations. The many helpful uses and the comfort that technologies give can make it very hard to set boundaries in technology use although it is a prerequisite for emerging negative consequences. Their prevention is related to establishing positive habits for ICT technologies' moderate use. There are a lot of tools that help to establish this kind of habit – from inner systems for screen time monitoring to applications for smartphones that monitor different indicators – screen time, how long we use each application, and allow the limitation of device use. In this process, the major role has the digital well-being manager.

The more important task of a digital well-being manager is to help employees realize and accept the necessity of purposeful efforts in the direction of reasonable and controlled use of technologies aiming to prevent digital overload and its negative consequences. The next step is creating sustainable motivation in employees to work and to take care of their digital well-being it is possible only under the condition of their active and engaged participation.

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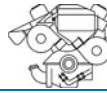
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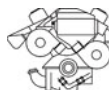
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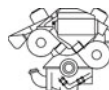
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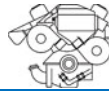


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