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Economics and Commerce



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Highlights

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Discovering Thoughts, Inventing Future

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Unlocking Concert Experiences: Mobile Economy Maximization Bundles Transforming Ticketing Dynamics

By Derek J. Streidl, MBA

Indiana University

Abstract- Mobile Economy Maximization Bundles are theoretical all-inclusive bundling packages, curated to out-of-town travelers coming into a specific municipal city for a live music event. The packages include hotel stays, base and premium food options and tickets to the event itself, dynamically priced based on forecasted demand by a demand rate λ . Bundles would open to public sale at a pre-destined time, but because hotels will be able to buy a select number of tickets ahead of time, they do not need to contend with the general sale, giving them a fixed number of tickets at MSRP prices which can be passed to the customer, and customers would gravitate to hotel providers offering this system over competitors who do not. The structuring of these entertainment bundles is an effort to improve the experience for traveling consumers but also a response to rising scalper prices of concert tickets where, in 2023, in-demand concerts such as the Taylor Swift Eras Tour, scalper tickets were priced anywhere from 614.29% to 2665.1% higher than their original MSRP price, prompting a critical need to address the rising costs to consumers.

Keywords: consumer, demand, assumption, concert tickets, resale market, demand structure, demand function, economic bundling, bundles, behavior, consumer theory, all-inclusive, theory, Taylor Swift, Eras Tour.

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UNLOCKINGCONCERTEXPERIENCESMOBILEECONOMYMAXIMIZATIONBUNDLESTRANSFORMINGTICKETINGDYNAMICS

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Unlocking Concert Experiences: Mobile Economy Maximization Bundles Transforming Ticketing Dynamics

Derek J. Streidl, MBA

Abstract- Mobile Economy Maximization Bundles are theoretical all-inclusive bundling packages, curated to out-of-town travelers coming into a specific municipal city for a live music event. The packages include hotel stays, base and premium food options and tickets to the event itself, dynamically priced based on forecasted demand by a demand rate γ . Bundles would open to public sale at a pre-destined time, but because hotels will be able to buy a select number of tickets ahead of time, they do not need to contend with the general sale, giving them a fixed number of tickets at MSRP prices which can be passed to the customer, and customers would gravitate to hotel providers offering this system over competitors who do not. The structuring of these entertainment bundles is an effort to improve the experience for traveling consumers but also a response to rising scalper prices of concert tickets where, in 2023, in-demand concerts such as the Taylor Swift Era's Tour, scalper tickets were priced anywhere from 614.29% to 2665.1% higher than their original MSRP price, prompting a critical need to address the rising costs to consumers. Furthermore, using Lagrangian multipliers to maximize utility with wealth constraints, we will show these all-inclusive options come at a better deal to the traveler by an average of 37.63% per consumer, leading to a higher embrace of this system by consumers, as the resale of concert tickets would not be possible when tied together through this all-inclusive package. Out-of-town travellers benefit most from this system, as they enjoy an inclusive lodging experience where tickets are sold with the package itself, freeing them the need to buy inflated resale tickets, or worry about food and lodging during their stay in the city hosting the event.

Keywords: consumer, demand, assumption, concert tickets, resale market, demand structure, demand function, economic bundling, bundles, behavior, consumer theory, all-inclusive, theory, Taylor Swift, Eras Tour.

I. INTRODUCTION

In the recent few years, the popularity of live music performances skyrocketed amidst a return to post-pandemic living. The concerts have returned in full force, and this time, seemingly bigger than they previously were. One such highly talked about event was The Taylor Swift Era's Tour, a 3-hour per show extravaganza of the Grammy-winner's entire catalog, which made huge headlines throughout 2023, grossing an estimated \$4.6 billion in consumer spending between

ticket sales & concert merchandise to local stores, restaurants & hotels in cities it played in [3] dethroning Elton John's Farewell Tour record of \$949 million and becoming the highest-grossing stadium tour ever put on. The Era's Tour created a buzz across many topics, but none more interesting than its effect on the local economies of the cities it was stopping in during its 52-date 2023 schedule, generating thousands of additional revenue dollars for businesses within the vicinities of the venues and hotels out-of-town concertgoers were traveling too for the shows. From concert tickets to hotel rooms, outfits, merchandise, food and drinks, out-of-towners (OOT) have a hefty bill to front sometimes for traveling to see a concert, especially one where the average concert-goer spent an average of \$1300, per person, to attend in all these costs summed; resale tickets soared much higher, with an average of \$3800 [3].

One of the largest surges to cost for concert-goer's over the past year was the resale/scalper issue, caused by a "fundamental lack of supply, [with] U.S. President Biden proposing legislation targeting ticketing companies [14]. The "Junk Fee Protection Act" would require an all-in-pricing model, requiring brokers to fully disclose all fees upfront [15]. The solution proposed in this paper does not require legislation but aims to further break-up the monopoly of resale tickets, and fully embraces the spirit of all-in-pricing through a community-based all-inclusive model.

The prices of the Era's Tour did not strictly come from external costs such as hotel stay and food, but from the costs of resale tickets on the open market system in place today. With some shows having over 70,000 tickets, the resale values for Taylor Swift's Era's Tour were mind-blowing, and showed no signs of slowing down, the lowest price ticket for the worst quality section is up 2655.1% from their MSRP price for her end of 2024 dates already on sale [8] [9] [10]. The high resale value left thousands of people unable to afford tickets, another example of the unequal balance of wealth tipping the scales in favor of a single party. Taylor Swift wasn't the only tour affected by surging resale prices, in fact, the typical price of tickets has more than doubled since 2019, from "\$125 to \$252 in 2023 [with] sold-out acts like Beyonce, Bruce Springsteen, John Mayer, Bad Bunny and more" [13].

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The solution to this, or at least in part, would be through the creation of entertainment consumption bundles, aimed specifically at the out-of-towner (OOT) concert-goer. The idea is to create levels of all-inclusive packages, available through patches to current hotel booking applications/websites, that employ different combinations of common commodities such as hotel room and tickets, hotel room, tickets and buffet food, and then more premium options which would include vouchers to local restaurants.

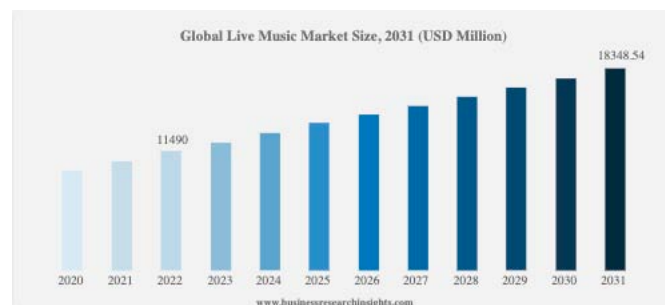
In the study of mathematical optimization, Lagrangian multipliers are effective in showing the maxima and minima of a function subjected to conditions, particularly with equality and inequality constraints. This makes showing the most beneficial choice to the consumer amongst a set group of choices subject to the same constraints, easier for the reader. Using Lagrangian multipliers to maximize utility with wealth constraints, we will show these all-inclusive options come at a better deal to the OOT consumer, which would lead to a higher embrace of this system by consumers, as the resale of concert tickets would not be possible when tied together through this all-inclusive package.

A new domestic LLC, the Mobile Economy Bundle Commission – MEBC, would need to be established to implement agreements between ticket providers such as Viagogo (StubHub) or LiveNation, hotel providers and local businesses within each municipality served, creating not only new permanent

jobs but hundreds to thousands of regular unskilled temp work across the nation to cover new necessary labor. A small percentage of tickets available would be held from public sale for the purposes of selling as part of these packages, named Mobile Economy Bundles (MEB), and will be defined further in the methodology section. Over the next few pages, we will show models based on lagrangian multipliers for all-inclusive entertainment bundles and compare these models to the current spending structure and averages for out-of-town concert-goers, showing first that bundling benefits the consumer and secondly, that local municipalities can also benefit from a bundle structure, by being able to better meet demand rather than unprecedented demand. We then introduce a dynamic pricing model based on the lagrangian outcomes.

II. BACKGROUND

The OOT has to always contend with the costs of traveling and with the resurgence of live music, traveling for concerts is expected to rise over the next decade. In a 2023 report by Business Research Insights, “the global live music market size was USD 11490 million in 2022, as per our research, the market is expected to reach USD 18,348.54 million in 2031, exhibiting a CAGR of 5.3% during the forecast period” [1]. The below bar graph is sampled from the summary of this report.



Source: Business Research Insights

Factors such as “an upsurge in disposable income, development and a modification from outdated entertainment concerning live music shows, the growing number of social events & festivals and the rising ability of fans to become prominent players in the improving growth market” contribute to the growth rate found by Business Research Insights [1]. The cost of traveling in general has risen over the years, as most industries do. In the post-pandemic marketplace, consumers have decided it is once again time to explore and spend, but do so now in a much more inflated and cost-heavy world.

For concert travelers, the costs can be even higher. In a 2023 Wall Street Journal article, one couple traveling to a Phoenix, AZ Taylor Swift show flew halfway

to Las Vegas and renting a car for the rest of the trip, costing over \$1000 one-way [13]. For the average family to travel for a concert, or even a group of friends, transportation, lodging and food are the highest costs outside of tickets to the actual event. As reported on a 2023 analysis by BudgetyourTrip.com, with data provided by the travel booking website Kayak.com, a one-night stay in the United States is ≈\$171, a 3-night stay is ≈\$513, a week-stay is ≈\$1,197 and two-week will cost you ≈\$2,393 [7]; we used data from this analysis to construct the below cost tables. Kayak.com is a global meta search engine owned by Booking Holdings used for the comparison of rates of hotels and travel options in operation since 2005. Concerts like the Era’s Tour, Bruce Springsteen and Bad Bunny had

thousands of consumers traveling hundreds and even thousands of miles to see the shows. We will break down the average costs of traveling over the next two pages for a typical group or family of four to travel.

Table A shows some basic transportation needs for a traveling family:

Table A

Transportation Type	Average Cost (Family of Four)
Domestic Plane Tickets	\$ 1,320.00
Airport Parking	\$ 130.00
Rental Car	\$ 292.00
Gas	\$ 228.00
Total	\$ 1,970.00

We can get more granular with the transportation costs themselves, breaking out the averages on a per-person basis in Table B.

Table B

Transportation Type	Average Cost (Per Person)
Domestic Round-Trip Flight	\$ 330.00
International Round-Trip Flight	\$ 810.00
Rental Car (Daily)	\$ 73.00
Gas (Daily)	\$ 57.00
Airport Parking (Average, Daily)	\$ (42.50)
Public Transit/Rideshare (Daily)	\$ 36.00

Once travelers arrive in their destination city, they must then contend with the next two variables of travel, lodging, and food/drink. Table C shows these averages on a per-night basis, please note that average room rates vary greatly based on a number of external factors not controlled for in these averages.

Table C

Lodging	Average Cost (Per Night)
Single-Person hotel/hostel room	\$ 102.00
Double-occupancy Hotel Room	\$ 204.00
RV Campsite	\$ 40.00
Vacation Rental	\$ 137.00

Finally, the cost of food and drink is a large and often overlooked variable. Table D shows the average per-person meal costs while traveling.

Table D

Meal Type	Average Cost (Per Day, Per Person)
3 Meals (one person)	\$ 46.00
Average Restaurant Meal	\$ 18.00
Alcohol (one person)	\$ 21.00

Costs for an average family of four traveling within the United States to attend a live concert experience, excluding the cost of event tickets and assuming no alcoholic beverages are purchased, can be in table E.

Table E

Cost Type	Average Cost (Per Person)
Domestic Round-Trip Flight	\$ 1,320.00
Double-occupancy Hotel Room	\$ 401.88
Rental Car	\$ 292.00
Gas	\$ 228.00
4 Meals (Four People)	\$ 552.00
2 Restaurant Meals (Four People)	\$ 144.00
Total	\$ 2,937.88

OOT also generates quite a substantial additional revenue for the local municipalities they travel to for the concert itself, often at an unprecedented rate for the local businesses. During the stop in Chicago, travelers for the Era's concert occupied 44,000 hotel rooms in the city, a 97% booking rate, nearly half the direct spending coming from consumers that came into town just for the show, spending an average of \$575 more than local fans did [4]. As Time reports, "typically every \$100 spent by [music] artists & management to put on a show, generates \approx \$300 in local ancillary spending, but consumers on the Era's Tour spent \approx \$1300-1500" [11].

With our common traveling commodities now defined and shown by averages, we can now review the cost of the tickets. While general sale tickets of the typical U.S. concert have not risen dramatically, they have certainly changed. As reported by CNBC, data

from music trade publication firm Pollstar shows that "overall, concert ticket prices are up an estimated 17.8% compared with 2019; halfway through this year, the average ticket price hit \$108, compared to about \$92 in 2019" [5]. For the Taylor Swift Era's show, tickets were much higher, falling victim to the resale structure of the free-market ticket system.

In this system, resale users who make it out of the holding queues and into the general sale rooms will often buy as many tickets at MSRP value as possible, only to resell them later through the same ticketing system at markups sometimes thousands of percentage points higher.

Table F below shows some of these figures, gathered from StubHub.com, and focuses on three late-2024 U.S. shows that the Era's Tour will stop in: Indianapolis, New Orleans & Miami.

Table F

Table F: StubHub averages from three 2024 US tour dates (Oct 18-20, 25-27, Nov 1-3 2024 – accessed 11/9/23)

Section	Standard Ticket Price (Average)	Resale Ticket Value (Average)
Farthest Section (Bad View)	\$ 49.00	\$ 1,350.00
Farthest Section (Good View)	\$ 98.00	\$ 2,025.00
Third Up (Bad View)	\$ 147.00	\$ 1,710.00
Third Up (Good View)	\$ 196.00	\$ 3,319.00
Second Up (Bad View)	\$ 245.00	\$ 1,630.00
Second Up (Good View)	\$ 294.00	\$ 3,150.00
Immediate Section (Bad View)	\$ 343.00	\$ 2,032.00
Immediate Section (Good View)	\$ 395.00	\$ 3,148.00
Pit Section (Far View)	\$ 435.00	\$ 2,790.00
Pit Section (Best View)	\$ 499.00	\$ 3,395.00

The last piece of background information we should review is the rising popularity of the "all-inclusive" package. The idea behind this type of consumer bundle stems from the original Club Med design, the idea that travelers pay one fee and have all their basic essential needs taken care of including lodging, food, and in some cases transportation. In December 2022,

hospitality analytics firm STR reported that travelers booked an estimated 9.2 million all-inclusive rooms, an 80,000 unit increase from December 2019 [6]. Some of these chains offer packages which also include vouchers for local dining outside of the resorts, allowing consumers to choose whether they eat their meals for free at the resort or eat more premium meals offered by

local restaurants at a discount to the consumer through the vouchers. The Washington Post also reported that in 2021, major hotel chains like Hyatt, Wyndham, and Hilton have all expanded their all-inclusive options, both domestically and abroad, by nearly 75% since 2021 [6].

Based on our background review, an average family of four will spend around \$3000 traveling to a Taylor Swift Era's Tour show and another \$4000-4600 on tickets for the show at resale rates, an average cost of \$7000-7600. Though the average rate of a sellout for concert tickets is approximately 20 minutes [12], because of the demand for shows such as these, tickets sell out typically within minutes, leaving the average consumer to contend with the resale price. Over the next few pages, we will show how an all-inclusive domestic bundle within our Mobile Economy Bundles (MEB) structure would have saved the family of four some money while increasing the potential local spending within the municipality of the concert venue. The idea is to reduce the impact of the resale market for in-demand shows on the consumer's budget while spreading revenue at a greater distribution to the surrounding local economies.

III. METHODOLOGY

An economic bundle is a microeconomic tool used to sell two or more commodities together as a package, with the aim of reducing either cost or complexity to the consumer. Typical examples of these range from the Microsoft Office bundle (Word, Excel, PowerPoint together) to Black Friday deals, where a consumer might be able to purchase a TV, speaker system, and entertainment console for a fraction of the cost if purchased separately.

In this empirical approach, we will build three all-inclusive bundles tailored around the out-of-town (OOT) traveler's needs when they are coming to a particular municipality for a concert or similar entertainment show. First, a small LLC (Mobile Economy Bundle Commission - MEBC) dedicated to facilitating Mobile Economy Bundle (MEB) structuring would be instituted, focusing on working with ticketing providers and hotel chains, as well as brokering partnerships between hotel providers, ticket agents, increased food supply, labor coordination and system implementation. The MEBC provides a "middleman" to the entire structure of the bundles, as well as a technological hubspot. The initial construction of this commission would also be responsible for creating a central database and assimilating it into the existing booking applications used by hotel providers today. This central database would entail the demand rate function (explained further below) and be responsible mainly for purchasing the tickets used in the MEB structure, ensuring an autonomous source from the hotel providers and providing an equal share of tickets for

events amongst the hotel providers participating in MEB in any given city. The hotels benefit from this by not needing to be a part of the ticketing process and the guests benefit from one hotel provider raising or lowering ticket prices in tandem with local competitors. MEBC is essentially responsible for creating and maintaining this interactable database and continue to provide booking applications with current MEB pricing.

We would structure pricing tiers through new "Reason for Stay" gathering functionality built into booking applications/websites, mandated by new user-agreement regulation requiring booking providers to collect "Reason for Stay" from guests during the check-out process. Users would be informed of the existence of this through marketing campaigns as hotel providers roll out their various MEB upgrades to their individual apps. The coordination of this setup would also fall to the responsibility of the MEBC, ensuring the functionality follows a framework uniformity to MEB's overall intention, which is namely making the OOT experience easier on the guests. Though each provider can approach it in their own way, generally each redesign would need to ensure that guests booking stays for Entertainment are sorted into rooms allocated for MEB guests, while those coming for non-Entertainment are not affected. Built into all booking apps (required now by hotel providers) options customers may choose:

1. Business
2. Entertainment (Seeing a concert or play)
3. Other (please specify)

We then allocate confirmed guests based on their responses to these questions, where "Business" and "Other" responses do not have access to the all-inclusive entertainment bundle structure and are not charged as an MEB customer. Hotel booking apps would be refitted with a MEBC integration, which focuses mainly on the MEB customer. If a user selects one of the other options, they will be passed into the current-day booking application, whereas choosing "Entertainment" will now pass users to the redesigned version of the booking application, now fitted with MEBC framework to handle the new setup, all designed and implemented through the MEBC.

Those who choose "Entertainment" will then be able to search for entertainment bundles based around the date of the show and the availability of packages left for the specific entertainer, all updated in hotel booking apps through integration to the MEBC databases. These packages would be non-transferrable, and returns are authorized only to the original purchaser, which then places the returned package back into the general queue. Customers would all be able to return purchased packages for their original payment amount, and the packages themselves would be cycled back into the available rooms through the MEBC database. The MEBC would operate the ticketing sales through their



central database, preventing any customers from re-selling their own packages to others, as the tickets are ultimately held by the MEBC framework until day of show. Checking into one's room would grant access to the tickets, but only after check-in has occurred, further preventing resale of the tickets themselves.

We will construct three bundles to demonstrate different levels of all available options to consumers under the MEB structure, applying lagrangian multipliers to maximize the utility with wealth constraints of varying consumer spending budgets. Because langragian multipliers work well for showing achieved utility at varying price and budget points, we will construct functions to show the benefit to the customer through the MEBC system using three different MEB package options.

First, the MEBC would buy a fixed percentage (relative to maximum availability) of available show tickets prior to the general sale, one that allows them to buy a specific number of tickets in specific sections at MSRP prices, which can later be fixed into the function for the three bundles at three different price points of a particular bundle shown as $[(x_1p_1), (x_2p_2), (x_3p_3)]$. The percentage of general tickets purchased by the MEBC should never be higher than 9% of the total availability in general sales. From section types categorized in Table F:

- *Basic packages* would include tickets in the farthest sections (both views)
- *Standard packages* would include tickets in the Second Up sections (both views) and Third Up sections (both views)
- *Premium packages* would include tickets in the Immediate Sections (both views) and Pit Sections (all views)

The pricing for rooms and basic food package (buffet/on-demand style) will be semi-fixed costs variable only to local inflation& taxes, with the bundle price being primarily determined by the demand for the show; all packages include a room and basic buffet mealplan. Sales for MEB packages to shows will go on sale the day immediately following the general sale, allowing demand for the current show to be more accurately gauged for sales in the entertainment bundles. The sales of each section in the general ticket sale will then be converted to a demand rate γ which can be inserted into our later overall bundle price function. The equation for demand rate can be shown as:

$$\gamma = \frac{f(\Delta(x * qa) - (x * qs))}{f(\theta)qa}$$

Where $f(\Delta(qa))$ and (qs) are variables representing the change in quantity sold and quantity available in each section and θ represents the value of

the derivative of the tickets sold over the passage of time since the tickets went on sale in the general sale.

The application of the demand rate will allow the MEBC to price packages according to the demand of both the show in general, and to the specific seating section the consumer is seeking. The demand rate also replaces the string of booking fees, mobile fees, and otherwise "surprise" or "hidden" fees consumers typically face in both the resale market and the separate (non-packaged) buying experience in general. We then can price bundles by:

$$\Sigma = ((\gamma * bt) + bt)x + R + (M * x)$$

where bt represents the base price of the MSRP ticket cost, R represents the quality of room desire, M shows the meal plan cost and x represents the number of guests in a package, all in summation of a customers total cost Σ . If consumers choose local dining voucher options (based on local availability), a cost equal to some fixed percentage of the value of said voucher would be added to this above summation function.

IV. RESULTS

We will continue to use the Taylor Swift Era's show to work through our example. Per CNN Business and Question Pro Data, the "average attendance per show was 72,459, accounting for closed-off areas and floor seats" [4]. To make the math easier to show, we will round this off at 70,000. Our example is an extremely in-demand show, so we will have the MEBC buy the maximum number of allowed tickets prior to the general sale (9%) so the MEBC purchases 6,300 tickets, divided up amongst the five seating section types deemed by the MEBC.

Our customer is booking a one-night stay and is in need of two tickets for the best seating available, which would be the pit section. Demand for this section was incredibly high, selling all available seats in the 200-seat pit area and accounting for 55 of those available tickets to be sold prior to general sale, to either pre-holders or the MEBC. We can first find our demand rate:

$$\gamma = \frac{f(\Delta(200 * 200) - (200 * 155))}{f(\theta)(155)} = 58.06\%$$

Per Table F above, we see that the best possible tickets in the pit section are priced at \$499. Let's also suppose the consumer chooses a standard room (\$130/night) and no local dining voucher, just the standard buffet plan (\$30/day). These average prices are obtained from our earlier analysis of the Kayak.com data. A limitation here is that buffet plans would need to be priced based on supplier pricing, so we can only use assumed averages, the actual cost of the buffet plan may be higher in cities with less infrastructure or higher taxes on food. We can show a bundle price as:

$$\begin{aligned}\Sigma &= ((.5806 * 499) + 499) * 2 + 130 + (30 * 4) \\ &= \$1,827.44\end{aligned}$$

In our background review on page 6, we showed the average family of four would spend around \$7000-7600 reserving and purchasing concert tickets separately, then securing travel, lodging, and food, or

between \$3500 and \$3800 for two people, and with pit seats reselling for $\geq \$3000$, that \$7600 would likely not get you seats even near the section you are wishing for. With the MEB structure in place, table G shows the same consumer would've been able to get pit seats, as well as their whole trip, at a fraction of the cost to consumers doing it themselves.

Table G

Cost Type	Traditional Spending (Per Person)	MEB Spending (Per Person)
Domestic Round-Trip Flight	\$330	\$330
Hotel Room	\$171	\$171
3 Meals, One Day, One Person	\$46	\$30 (average buffet price)
Rental Car + Gas	\$407	\$407
Tickets	\$1350 (cheapest resale)	\$499 (most expensive seats)
Total	\$2304	\$1437

We can further show the impact of the MEBC's maximization through a lagrangian utility function, subject to a consumer's personal wealth restraint. Showing the total, fixed value as $(x_1p_1) + (x_2p_2) + (x_3p_3) = \omega_0, \Rightarrow \omega_0 > 0$ is a positive fixed constant, assume the utility is given by $U = x_1x_2x_3$. The maximum of U on the commodity bundles given by the wealth constraints satisfies the following:

$$\begin{aligned}x_2x_3 &= \lambda p_1 \\ x_1x_3 &= \lambda p_2 \\ x_1x_2 &= \lambda p_3 \\ \omega_0 &= p_1x_1 + p_2x_2 + p_3x_3\end{aligned}$$

Showing they are all equal:

$$x_1x_2x_3 = \lambda p_1x_1 = \lambda p_2x_2 = \lambda p_3x_3$$

When $\lambda = 0$, this forces one variable to be equal to zero, making the utility zero. Because $\lambda \neq 0$ in our case, we show:

$$\begin{aligned}p_1x_1 &= p_2x_2 = p_3x_3 \\ \omega_0 &= 3p_1x_1 \\ \frac{\omega_0}{3} &= p_1x_1 = p_2x_2 = p_3x_3\end{aligned}$$

The three commodities in our case are tickets, hotel, and food. Assuming you were unable to buy a ticket at the general price, you are left with two options, either find one for a hopefully good deal on the resale market or buy an MEB package, where your ticket price is determined by a preset demand rate. At resale rates of \$3300 and \$2500, we compare the MEBC price of \$1827.

$$\begin{aligned}\omega_0 &= (1827) + 130(2) + 2(0) = \$2087 \\ \omega_0 &= (3300 * 2) + (171 * 2) + (46 * 2) = \$7034 \\ \omega_0 &= (2500 * 2) + (171 * 2) + (46 * 2) = \$5434\end{aligned}$$

The MEB structure is still the best price for the consumer who was not able to get the concert tickets during the general sale. The idea of bundling lodging and experience together also fosters the idea of these bundles being exclusively for out-of-town travelers, as domestic guests and consumers local to the area would not rent lodging for the event, which may create unforeseen burdens on local concert-goers, such as a smaller availability of tickets. This structure would benefit the average consumer, but not all, as some are better "bargain-shoppers" and through loyalty programs, discounts and other heterogeneous factors. This structure also does not take into account special needs of some consumers, such as dietary restrictions or customizations, which would result in additional spending on behalf of the consumer, which is absent from the calculations and should be considered in a real-world application. There is also no inclusion of alcohol or merchandise sales allocated in this structure, which may make it more appealing to larger mass if offered.

V. CONCLUSION

Consumers are always on the prowl for better, more beneficial deals, and municipality cities are always going to want new and innovative ways to bring out-of-town consumers to their cities. Consumers getting a deal such as the mobile economy bundles will save more on the overall cost of travel, reducing their personal spending barriers into a more relaxed approach once they are actually in the city for the event. Without the financial anxiety and decision fatigue of where their meals will come from, whether or not they will have a decently priced place to sleep, or even whether or not they even have tickets to the event at reasonable prices, can all be reduced through the implementation of a system such as MEBC.

This will also reduce the amount of resale tickets being scalped from the general sales as it reduces the availability of tickets scalpers can buy initially and resell for profit down the line, closer to the actual show date and while the initial reduction in general sales tickets may cause a temporary surge in the pricing of resold tickets, the demand should meet closer to equilibrium as the MEBC system becomes more ingratiated and experienced. The MEBC would expect to grow its availability in multiple hotel providers, both national and local, over time as the market reacts to its existence, which will lead to a balancing in pricing of tickets, as now people have more ways of buying them past general and pre sales. The reactionary demand rate introduced by the MEBC also allows it to fluctuate with future market changes, such as the introduction of more ticketing providers, performing spaces and hotel providers, as it calculates bundle prices in real time and based on demand of tickets. This would realistically make the MEBC both scalable and secure in longevity, due to the adaptiveness of its composition. The improvements in technology like A.I., data retrieval and manipulation and anti-laundering would continue to aid the system as well, giving it more resources to utilize in its mission, while creating both skilled labor jobs in the MEBC itself down to the surge of skilled & unskilled labor required to implement and maintain it.

The success of a system like the MEBC would not only bring more tourists into participating municipalities resulting in more traffic through local businesses, but could also create more permanent jobs in the restaurants and hotels, which incentivizes local businesses like these to adapt and promote the system itself. MEBC is structured very much as a "community-model", meaning that the more collaborative the communities are in promoting and harnessing their MEB structures, the more returns they will see from it. The concert-goer benefits as well, not only do they already have lodging and food in place (and paid for), they are also able to get generally better seating than they would've in the resale market, which comes with far less anxieties than buying through a scalper.

Going out of town to see a show should not cost the price of a college semester, and making memories does not need to be a credit card bill for years to come. Through coming together, we can all experience more.

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Theory of Resources and Capabilities Applied to Organizations from a Quantum Perspective

By Dena Yaqueline Cabrera

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Keywords: *resources and capabilities, quantum management, enterprises.*

GJMBR-B Classification: *LCC: HD30.28*



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Theory of Resources and Capabilities Applied to Organizations from a Quantum Perspective

Teoría De Recursos Y Capacidades Aplicada A Las Organizaciones Desde Una Mirada Cuántica

Dena Yaqueline Cabrera

Abstract- The study determines the elements of the theory of resources and capabilities from the theoretical perspectives of the quantum approach in organizations, metacognition, epistemological and ontological approach to the approach of capabilities in the organization, rethought trialectics to enhance business capabilities. The method of the study was documentary with analysis of organizational research and intertwined with philosophical perspectives. Among the results of the study is the fact that the resources and capabilities of the organization are linked to the quantum view through the management processes and holistic composition of the individuals working in a company, contrary to the mechanistic position in the quantum practice the resources of the company are maximized using an integrative approach, totalizing and direct and permanent communication of all the components of the organization, both structural and factual, as well as personal and/or subjective, to create synergies between all parties.

Keywords: resources and capabilities, quantum management, enterprises.

Resumen- El estudio determina los elementos de la teoría de recursos y capacidades desde las perspectivas teóricas del enfoque cuántico en las organizaciones, la metacognición, enfoque epistemológico y ontológico del abordaje de capacidades en la organización, trialectica repensada para potenciar las capacidades empresariales. El método del estudio fue documental con análisis de investigaciones organizacionales y entrelazadas con las perspectivas filosóficas. Entre los resultados del estudio se encuentran el hecho que los recursos y capacidades de la organización están ligados a la mirada cuántica a través de los procesos de gestión y composición holística de los individuos que laboran en una empresa, contrario a la posición mecanicista en la práctica cuántica los recursos de la empresa son maximizados utilizando un enfoque integrador, totalizador y de comunicación directa y permanente de todos los componentes de la Organización, tanto estructurales como fácticos, así como personales y/o subjetivos, para crear sinergias entre todas las partes.

Palabras Clave: recursos y capacidades, gestión cuántica, empresas.

I. INTRODUCCIÓN

Las organizaciones se encuentran en constante cambio y los procesos de gestión han evolucionado desde una actividad paralela que

complementa la dominación organizacional al conductismo de la psicología organizacional. En algún momento, los conceptos de la teoría de sistemas fueron retomados y sus horizontes ampliados para incluir el mundo globalizado y la incertidumbre e imprevisibilidad resultantes, actualmente se utilizan conceptos de relatividad propios de la física cuántica y se incorporó la idea de posibles conexiones y contingencias en materia administrativa; Se reconoció el predominio cada vez mayor de los aspectos intangibles sobre los aspectos tangibles en las organizaciones y la tecnología de la información (Chiavenato, 2019).

Es importante afrontar nuevos retos como el cambio disruptivo, el aprendizaje organizativo, el conocimiento corporativo, la flexibilidad, la innovación, el capital intelectual, el gobierno corporativo, la competitividad y la sostenibilidad, así como las relaciones interactivas con muy diferentes stakeholders desde una óptica de aprendizaje constante y con miras a democratizar el trabajo desde una perspectiva cuántica (Chiavenato, 2019).

El estudio identifica elementos de la teoría de los recursos y la capacidad desde las perspectivas teóricas de los enfoques cuánticos, de metacognición, epistemológicos y ontológicos en las organizaciones, repensando los enfoques de capacidad en las organizaciones para mejorar las capacidades comerciales.

II. BASES TEÓRICAS

a) Antecedentes De La Teoría De Los Recursos Y Capacidades

A finales de los setenta y principios de los ochenta, el mejor conocimiento del entorno supuso que la orientación principal de la Dirección Estratégica fuese el análisis sectorial y de la competencia, siendo Porter (1980) el pionero en la aplicación de la organización industrial o análisis sectorial al análisis de los determinantes de la rentabilidad de la empresa, Ibarra & Suarez (2002).

Para Ibarra & Suarez (2002) en los últimos años de la década de los ochenta e inicios de los noventa, el centro de interés del análisis de la ventaja competitiva se desplazó rápidamente hacia los aspectos internos

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de la empresa, apreciándose esta ventaja menos dependiente de las elecciones de la empresa sobre su posición en el mercado y más de la explotación de recursos y capacidades internas únicas, a partir de la influencia de autores como Penrose (1959), Nelson y Winter (1982), Wernerfelt (1984), Prahalad y Hamel (1990), Mahoney y Pandian (1992) y Peteraf (1993).

El origen de la Teoría de Recursos y Capacidades se sitúa habitualmente en el año 1984, con la publicación del artículo «The resource-based view of the firm» del profesor Binger Wernerfelt, López, Martínez & Riveros (2004) como se cita en Fernández y Suárez, (1996), trabajo que posteriormente dio nombre a esta corriente del pensamiento.

En concreto, el enfoque de la Teoría de Recursos y Capacidades trata de explicar los motivos por los cuales las empresas, que desarrollan su actividad en el mismo entorno competitivo y que, estarían sujetas a los mismos factores de éxito identificados en el sector económico, obtienen niveles de rentabilidad diferenciados López, Martínez & Riveros (2004).

i. *Teoría De Los Recurso Y Capacidades*

Se considera que la teoría de los recursos y capacidades está dentro del campo de la estrategia, basada en los recursos de la empresa, se le da importancia a la estructura interna de la organización, para la formulación y desarrollo de la estrategia de la compañía. Sánchez & Herrera (2016) como se cita en Penrose (1959), citada por Rugman & Verbeke (2002), crea los fundamentos de la teoría y describe los procesos mediante los cuales una empresa crece, conceptualiza a la firma o a la empresa como un conjunto de recursos productivos con organización administrativa.

Sánchez & Herrera (2016) como se cita en Teece (1982) amplía la contribución de Penrose (1959), manifestando que las empresas poseen un exceso de recursos, que pueden ser utilizados con fines de diversificación. Siendo esto, el elemento clave para las empresas *Sostenibilidad* de multiproducto, por otro lado, Sánchez & Herrera (2016) como se cita en Wernerfelt (1984), refiere a las empresas como un conjunto más amplio de recursos para tener el equilibrio de la explotación de ellos y el desarrollo de otros nuevos.

ii. *Ventaja Competitiva*

Los recursos y capacidades son los que hacen que las empresas se diferencien entre sí y la interacción entre ellos la que convierte a la empresa en un ente único e irrepetible. Independiente que existan recursos en el mercado, no todos están a disposición de la totalidad de las empresas, debido a que uno de ellos, el dinero, es necesario para que los inputs a la operación interna sean los adecuados o por lo menos existan Riveros (2010).

No sólo se trata de renovar los recursos y capacidades sino de generar competencias, para asegurar la sostenibilidad de la ventaja competitiva, Riveros (2011) como se cita en Bueno, Morcillo y Salmador 2006) y para ello no sólo se deben hacer continuas inversiones sino estar atentos al comportamiento del mercado, pues de lo contrario se pueden desperdiciar los esfuerzos en factores que no den buenos rendimientos.

Para Riveros (2011) un punto por destacar, en cuanto a las competencias básicas distintivas, es que partiendo de la generación de valor y de concentrarse en lo que mejor sabe hacer la empresa, se hace necesario también que, de acuerdo con Riveros (2011) como se cita Prahalad y Hamel (1995), se cumplan tres condiciones:

1. Su valor sea percibido por el cliente.
2. Su propiedad sea exclusiva de la empresa y le permita diferenciarse de la competencia.
3. Sean extensibles o aplicables a varias líneas de bienes y servicios.

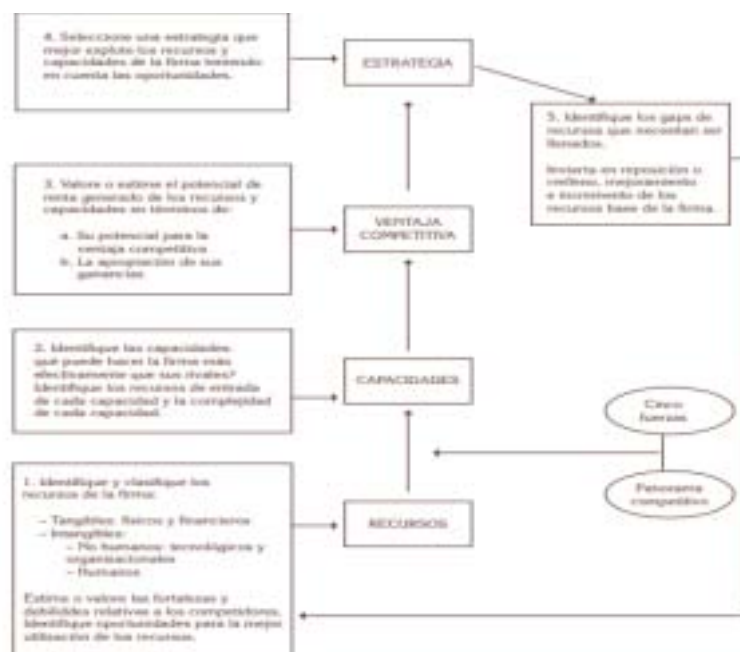
Los recursos son los activos disponibles y controlables por la empresa, tanto físicos, tecnológicos, humanos y organizativos. Ello significa que la ventaja competitiva de la empresa dependerá sustancialmente de activos tangibles como intangibles, entendiéndose que los segundos, hoy por hoy, son la base en la que se configura la competitividad empresarial Narváez, Guerrero, & Villaprado (2017) como se cita en Bueno y Morcillo (1993).

iii. *Recurso*

La Economía ha determinado como recursos los factores productivos, tierra, capital y trabajo; a nivel estratégico, los recursos productivos de la empresa se clasifican en físicos, financieros, tecnológicos, humanos y de capital organizacional. Cardona (2011). Para Arbelo & Pérez. (2001) como se cita en Barney (1991) los recursos son los factores de producción controlados por la empresa que le permite formular e implantar estrategias que mejoren su eficiencia y eficacia.

iv. *Capacidades*

Habilidades o competencias organizativas, que le permiten a la empresa desarrollar adecuadamente una actividad a partir de la combinación y coordinación de los recursos individuales disponibles López, Martínez & Riveros (2004) como se cita en Navas y Guerras (2002). La competitividad de la empresa depende entonces de su capacidad para configurar un conjunto único de recursos difícilmente imitables por los competidores que, movilizados con la ayuda de los sistemas de organización y gestión que desarrolle la empresa, le aportará una serie de capacidades distintivas que le permitan generar una renta sostenible a largo plazo Perlines, & García-Pardo (2008) como se cita en Fernández Rodríguez (1995).



Fuente: Riveros (2011)

Figura 1: Elementos Del Proceso Estratégico De Capacidades Organizacionales

III. MATERIALES Y MÉTODOS

Los materiales utilizados para la recolección de información fueron documentos de tesis y artículos científicos mediante revisión sistemática al que según Becker (1986) como se cita en Valencia (2019) permite identificar las investigaciones elaboradas con anterioridad, las autorías y sus discusiones; consolidar autores para elaborar una base teórica; hacer relaciones entre trabajos; observar metodologías de abordaje y distinguir los elementos más abordados.

Para ello se extrajeron los documentos utilizando palabras clave como análisis cuántico, el enfoque cuántico en las organizaciones, metacognición y teoría de los recursos y capacidades. El estudio presenta una metodología cualitativa de enfoque documental, el análisis de revisión se realizó a través de procesos de búsqueda, selección, organización y disposición de fuentes de información; integración de la dimensión hermenéutica y un proceso de comprensión que converge en una visión global y en una comunicación de resultados condensados (Villafañez, Palacio & Granados, 2014, p. 5).

IV. RESULTADOS

a) Teoría De Los Recursos Y Las Capacidades Desde Una Óptica Cuántica

Zúñiga, Solano Cordero & Bolaños (2016) aplican los conceptos de los modelos tradicionales de la ciencia administrativa, entonces amparados bajo la denominada escuela "newtoniana", hacia los más contemporáneos y confiados, amparados bajo la

perspectiva de los novedosos enfoques administrativos de un corte "cuántico" donde basados en la teoría de recursos y capacidades, todos los componentes de la organización están cuánticamente vinculados y forman parte del núcleo de energía que circula y se transforma en unación.

Los teóricos de la gestión han encontrado que la naturaleza eminentemente relacional e interconectada de todos los componentes del universo se aplica a las personas y, por supuesto, a las organizaciones. Esto quiere decir que los humanos son seres cuánticos, sujetos con la capacidad de discernir la naturaleza relacional de las organizaciones, es decir, entienden que existe una relación perdurable de flujos de información, decisiones, sentimientos, relaciones, ideas y poder entre la organización y el entorno, que delimitan su funcionamiento (Shelton y Darling, 2001).

La autorregulación organizacional parece ser la consecuencia obvia, dado el énfasis en el liderazgo y la gestión de las relaciones humanas, el análisis de entornos cada vez más caóticos, la innovación y el aprendizaje individual y colectivo; todo para tomar las decisiones correctas para articular un trabajo en equipo coherente y sistemático (Deardoff y Williams, 2006). En cambio, el modelo tradicional, anclado en las ideas de la física del siglo XVII, configura lo que algunos llaman la organización newtoniana.

Esto enfatiza una visión jerárquica que mantiene una estricta separación entre los que 'piensan' y los que 'hacen', así como un liderazgo carismático y cohesionado. Además, la organización se basa más en la estructura que en el proceso, siguiendo instrucciones

detalladas desde "arriba" y relaciones humanas subordinadas a los roles estructurados que cumple cada parte de la máquina.

Utilizar un modelo de equipos autodirigidos e interconectados a través de mecanismos tecnológicos para compartir información y catapultar los esfuerzos de toma de decisiones en colaboración es uno de sus factores críticos fundamentales de éxito (Hasan et al., 2009). Estas empresas necesitan urgentemente reinventarse, independientemente de su nivel de madurez organizacional, ya que esto refleja la capacidad de la empresa para absorber e implementar la gestión del conocimiento en su totalidad (Plaz y González, 2005). Obviamente, la conexión entre tecnología y paradigmas organizacionales es muy relevante para este tipo de empresas:

El cambio de paradigma debe comenzar con una transformación de la infraestructura cultural de la empresa: los elementos compartidos e interconectados de creencias sobre cómo funcionan las cosas, sus valores y las normas que le dicen a la gente cómo comportarse. Esto es extremadamente importante ya que las normas y valores culturales disfuncionales reducen el rendimiento y la moral. Así, al verlos cara a cara de forma participativa en la organización, se puede determinar cuáles se deben retener y cuáles se deben descartar (Kilmann, 2001).

Esto se vuelve más complejo cuando las empresas cuentan con equipos multiculturales, ya que se intensifica la relación entre la cultura interna de la organización con la del país de origen y con la de personas de otras sociedades a partir de las cuales la empresa puede crecer: "(...) La buena noticia es que los desafíos culturales son manejables cuando los líderes y los miembros del equipo eligen la estrategia correcta y evitan imponer una visión unicultural en situaciones multiculturales" (Brett, Behfar y Kern, 2006, p. 90).

Es crucial que las organizaciones impulsadas por el conocimiento, independientemente de los plexos culturales que las alimenten, construyan una cultura organizacional de colaboración y colaboración mutua frente al modelo individualista: tolerancia a los errores para aprender de ellos, innovación, experimentación, buen actitud ante la incertidumbre, flexibilidad en la gestión, coexistencia de lo formal y lo informal en la toma de decisiones, y excelencia, calidad y motivación al poder (Plaz y González, 2005).

En las organizaciones complejas de hoy en día, es necesario explorar estrategias para enfrentar la tremenda complejidad del entorno que requiere adaptación para identificar y cerrar brechas culturales, adaptar equipos para resolver problemas, adaptar reglas administrativas para evitar conflictos y mejorar la comunicación catalizar, y solo en última instancia alentar, la salida de un miembro cuando todo lo demás falla (Brett et al., 2006).

El trabajo en equipo permite la resolución oportuna de problemas mediante la aplicación de un modelo mental analítico (racional, cognitivo) y creativo (emocional, imaginativo). La definición clara de los problemas, la generación de alternativas de solución, la evaluación y selección de las más adecuadas, su ejecución y seguimiento forman la base 266 del primer modelo de trabajo.

Repensar los problemas, proponer soluciones creativas, generar pensamiento lateral, superar los bloqueos de pensamiento y mejorar las alternativas de solución existentes son los elementos del segundo (Whetten y Cameron, 2005).

Un aspecto central del funcionamiento cuántico de los equipos de trabajo se relaciona con la elucidación de los supuestos implícitos de sus miembros que subyacen a su funcionamiento, habilidades analíticas y tendencias de toma de decisiones. Estos serpentean en la mente de los miembros en relación con temas complejos y necesitan materializarse y hacerse explícitos para que sus premisas falsas sean probadas y reconocidas a través de talleres grupales (Kilmann, 2001).

b) Caso De Una Organización Con Enfoque Cuántico

Transportation Investment Corporation (TI-Corp), empresa que desarrolla puentes, carreteras y proyectos de infraestructura, fue analizada por Zúñiga, Solano Cordero & Bolaños (2016), donde se contrastaron las tendencias newtonianas con las capacidades cuánticas de interrelación que podrían integrarse al de la cual se concluye que su equipo directivo tiene un enfoque de liderazgo clásico, en su configuración organizacional se sigue construyendo un liderazgo piramidal, la toma de decisiones es asertiva por ser una empresa que trabaja en un ambiente hiperdinámico y que tiene la enorme flexibilidad organizativa necesaria para poder satisfacer adecuadamente las necesidades de sus clientes, no se basa en un análisis del entorno.

En cuanto al modelo de toma de decisiones, los directores de cuerpos de TI no tienen una cultura cuántica, por lo que muestran un fuerte arraigo en la estructura jerárquica, lo que les impide evolucionar hacia modelos de toma de decisiones más autónomos y auto-suficientes.

Finalmente, el ejercicio del liderazgo cuántico en la empresa estudiada no muestra una evolución clara en las respuestas de las personas estudiadas, aunque se aprecian algunos patrones tímidos en la materia, que permiten pensar en un empoderamiento del liderazgo que encabece una transformación cuántica para la empresa.

c) Metacognición En Las Organizaciones

Según Levy (2020) la cognición estratégica genera procesos de aprendizaje, metacognición y dinámica en el núcleo estratégico-operacional de las

organizaciones, en vista que las organizaciones humanas de todo tipo pueden verse como sistemas psico sociotéc- nicos complejos (SPSTC) que en su dinámica estratégico-operativa deben desafiar continuamente sus propios mapas mentales para no ser víctimas de paradigmas que podrían haber sido exitosos en el pasado pero que ya no funcionan servir más. A esto lo llamamos "cognición estratégica".

Los mapas mentales más importantes son aquellos con los que la organización formula su estrategia, sus propósitos básicos y los mapas mentales de los que se derivan pirámides de metas que vinculan estos propósitos básicos con acciones concretas, toda estra- tegia, todo propósito básico y toda pirámide de metas orientadas a la acción deben ser consideradas como "construcciones preliminares de interpretación" que deben poder ser abordadas desde diferentes niveles y teorías de aprendizaje (Levy, 2020).

Los niveles de aprendizaje metacognitivo en la organización son aprendizaje, aprender a aprender, aprender a desaprender, aprender a reaprender y aprender nuevas formas de aprender, estos análisis provienen desde diversos enfoques epistemológicos como: la teoría directa, la teoría interpretativa y la teoría constructivista, donde la integración de estos conceptos en las organizaciones humanas requiere un nuevo enfoque cognitivo: la cognición estratégica, en el que el SPSTC se convierte en el catalizador para desafiar los mapas mentales para lograr una cognición estratégica entendida, compartida y comprometida que maximice la inteligencia colectiva de este sistema (Levy, 2020).

d) *Enfoque Cuántico Del Abordaje De Capacidades En La Organización*

La gestión cuántica, se refiere a que comprende el enfoque de gestión tendiente a definir una filosofía organizacional de la cual se derivará un proceso de gestión que involucre a la organización desde una perspectiva holística, integradora, totalizadora y de comunicación directa y permanente de todos los componentes objetivo de la Organización, tanto estructurales como estructurales o fácticos, así como personales y/o subjetivos, para crear sinergias entre todas las partes (Chávez, 2018).

El contexto empresarial actual hace necesario crear nuevas formas de gestión y cuidar la redefinición de la filosofía organizacional, ya que se deben desarrollar nuevas estrategias y nuevos enfoques para enfrentar los cambios y circunstancias que afectan a las organizaciones Cambios en las metas propuestas a alcanzar. Existe una creencia generalizada en los negocios de que hay beneficios al enfatizar la calidad del servicio. Por ello, en el presente estudio se analizan los elementos que integran el proceso de prestación del servicio desde sus respectivas perspectivas, pero su comprensión global se dirige fundamentalmente a la

creación de un servicio, que a su vez es consecuencia de la combinación de estos elementos, y parte de ellos también. De acuerdo a lo señalado, el Quantum Management se propone como un nuevo enfoque de gestión que cuenta con los referentes teóricos referidos por los autores Zohar (2001) y Llanos (2009).

Como resultado de la extrapolación de algunos elementos de la física cuántica, potenciados por Extensión metafórica aplicable a las organizaciones. Este enfoque de gestión tiende a mirar a la organización desde una perspectiva totalizadora, holística, a favor de la interrelación de los diversos componentes o niveles, pero vuelve a enfatizar principalmente la importancia de identificar no solo metas sino también elementos subjetivos que intervienen en el proceso de servicio en relación con el personal de contacto (cliente interno) (Chávez, 2018).

La propuesta de gestión cuántica como filosofía organizacional está inspirada en la mecánica cuántica, un campo que se originó en la física y surgió a principios del siglo XX. Así, se implantó un nuevo paradigma en las ciencias naturales, revolucionando la concepción clásica del sentido común sobre el comportamiento de la materia. Por lo tanto, es necesario comprender los orígenes de este campo de la física, así como sus descubrimientos y significado. De esta forma, la analogía presentada en el modelo de gestión desarrollado que es la base de este estudio puede entenderse en el entendido de que una de las categorías estudiadas está contenida en él.

Gestión Cuántica Para ver la novedad de la perspectiva adoptada por la gestión cuántica, es necesario considerar brevemente el significado de gestión en general, y algunos aspectos generales de ciertos modelos históricos que han tenido mayor aceptación e impacto en las organizaciones. De esta manera, los conceptos tradicionales de gestión organizacional pueden contrastarse con el enfoque cuántico propuesto, que en todos los aspec- tos -entre los que se destaca la interpretación de los miembros organizacionales- trasciende e intenta trascender esta visión.

Una de las propuestas con mayor popularidad y probada eficacia es la de Zohar (2001). Este autor, quien ha sido consultor de varios centros económicos como Volvo, Shell, Motorola, entre otros, propone la mecánica cuántica en lugar de Newton como metáfora para interpretar la dinámica de las organizaciones. Para Zohar (2001) es necesario interpretar al hombre tanto en su fisicalidad como en su conciencia como energía dinámica, ondas de energía con comportamiento impredecible, así como a nivel subatómico se ha demostrado la dualidad onda-partícula y la incertidumbre en la Posición de electrones y otras partículas diminutas. Este paradigma está conduciendo a un replanteamiento de la estructura y dirección de las organizaciones con el objetivo de una mayor

participación en la toma de decisiones de los empleados.

e) *Liderazgo Y Trabajo En Equipo Desde La Óptica Cuántica*

El fomento de la creatividad, el desarrollo de relaciones de trabajo en torno a objetivos comunes (entendiendo la conexión subyacente de los individuos en torno a una conciencia común, su comportamiento es cuántico) para enfatizar el valor de la pasión por lo que se está haciendo para impulsar un gran cambio y el éxito empresarial. Un factor clave en el modelo de gestión cuántica, según Zohar (2001), es el fomento de la inteligencia espiritual, que guía las acciones del individuo con un propósito, una razón de ser. De acuerdo con esta consideración, las organizaciones deben promover la libertad creativa y la motivación de sus miembros; Al mismo tiempo, deben entenderse como una unidad con una misión histórica y no como una pura estructura de lucro. En esta línea de pensamiento, afirma que "las corporaciones no pueden continuar funcionando como robots sin cuestionar su

propósito histórico último y más profundo" (Zohar; 2002, s.p.) cuya pasión y estilo creativo inspiran a sus empleados.

f) *Factores Críticos En La Ruta Cuántica De Los Estudios Organizacionales*

Existen relaciones de dependencia entre recursos y capacidades de las empresas del sector industrial colombiano. De forma concreta, se han seleccionado los recursos tangibles (entre ellos los recursos físicos y financieros), y las capacidades dinámicas; en concreto: la capacidad de absorción, que está definida como la habilidad que tiene la empresa para adquirir conocimiento del entorno, asimilarlo, transformarlo y explotarlo (Zahra and George 2002; Torres-Barreto et al. 2016) el sector industrial es uno de los que se ve más presionado por el dinamismo del mercado, se podría afirmar que esta situación lo obliga a desarrollar más rápidamente estrategias que le permitan competir y adaptarse a los cambios y demandas del entorno (Alvarez-Melgarejo & Torres, 2018).

Modelo De Análisis Cuántico De La Productividad En Las Organizaciones



Figure 1. Conceptual model of research.

Fuente: Sanavi, Razavi, Talebpour & Nezhad (2020).

De acuerdo al análisis cuántico realizado por Sanavi, Razavi, Talebpour & Nezhad (2020) los procesos de productividad organizacional involucran diversos aspectos como la metacognición a nivel supra entre los colaboradores, esto permite desarrollar habilidades cuánticas que maximizan el uso de los recursos en las empresas.

V. CONCLUSIONES

Este estudio revela una ventana de oportunidad previamente inexplorada para la investigación a nivel nacional y regional. Es de suma importancia que las universidades y centros de investigación económica del país impulsen un debate más intenso sobre la gestión cuántica, lo que implica triangular más estudios de casos sobre el tema para abrir los espacios de reflexión para el cambio de paradigma requerido en nuestro negocio.

La evolución hacia la gestión cuántica de las organizaciones, aunque percibida como novedosa para nuestro entorno doméstico, nos muestra un camino claro: es posible e incluso necesario sentar las primeras bases rompedoras de una nueva forma de gestionar y organizar las empresas y dar continuidad a proyectos empresariales que incluir los modelos más modernos que la administración aporta a esta tarea.

La teoría de recursos y capacidades desde la óptica cuántica utiliza el enfoque de gestión mediante una filosofía organizacional holística. En su liderazgo predomina una visión integradora, totalizadora y de comunicación entre los engranajes de la Organización generando estructuras coordinadas que unen los recursos físicos, humanos y metacognitivos para un objetivo o propósito común, implantando la visión y pasión en las personas.

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Analysis on China's Import Trade of Agricultural Products from Thailand

By Wan Ning

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Abstract- The trade of agricultural products between China and Thailand is thriving, especially China's import trade of agricultural products from Thailand. Even in the period of significant external environmental disruptions to trade, it has shown a vibrant and rapid growth. China has already become Thailand's largest trading partner and export market for agricultural products. This research is based on HS classification data from 2013 to 2022, studies the trade scale, product structure, and market share of China's import trade of agricultural products from Thailand. It also analyzes the influencing factors from the perspectives of import demand, export supply, and opportunities for the further development. It concludes that China's import of agricultural products from Thailand are growing rapidly, the product structure has undergone significant changes and there is still great potential for further development in the future.

Keywords: sino-thai, agricultural product, import trade.

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I. INTRODUCTION

China and Thailand are important and friendly economic and trade partners. During 40+ years of China's reform and opening up, the scale and level of trade and investment cooperation between the two countries are continuously developing. In 2010, China-ASEAN Free Trade Area was officially launched, and economic and trade cooperation between the two countries entered a fast lane of development. In 2022, the Regional Comprehensive Economic Partnership Agreement (RCEP) officially came into effect, and the level of openness in various fields such as trade in goods, trade in services, and economic cooperation has significantly improved compared to the commitments made in WTO. The further development of economic and trade cooperation between the two countries has ushered in new opportunities.

China and Thailand are both important producers of agricultural goods. The differences in climate and natural resources give each country its own endowment advantages in agricultural products. And at the same time, the two countries are near in geography and close in economic and trade cooperation, therefore, agricultural trade between the two countries has a very good foundation for development. In recent years, the bilateral trade of agricultural products between the two countries has developed rapidly, especially the significant rapid growth of China's import of agricultural products from Thailand. In 2022, China's import of

agricultural products from Thailand reached 12.59 billion US dollars, an increase of 6.02%. Thailand's well-known agricultural products such as durian, mango, and fragrant rice have become common delicacies on the dining table for Chinese consumers. In fact 90% of Thailand's export of fresh durian and manioc are shipped to China. The gradual integration of high-quality agricultural products from Thailand with the huge market demand in China has led to sustained and stable development of agricultural trade between the two countries.

The scope of agricultural products in this article is based on the basic agricultural product scope in the WTO Agreement on Agriculture, but not less fish and fish products, which means it includes all products listed in HS codes 1-24, plus other products listed in ANNEX 1 of the WTO Agreement on Agriculture, such as mannitol, sorbitol, essential oils, wool, raw cotton, and etc. The data used in the analysis is classified according to HS codes in the UN Comtrade database. Considering the research needs and data availability, the sample space is mainly from 2013 to 2022.

II. CURRENT SITUATION OF CHINA'S IMPORT OF AGRICULTURAL PRODUCTS FROM THAILAND

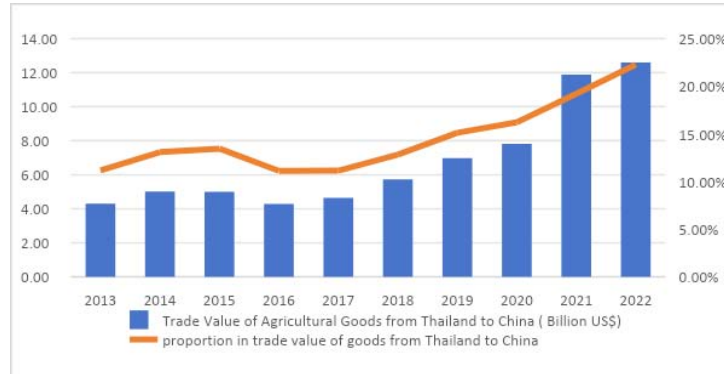
The bilateral trade of agricultural products between China and Thailand has developed rapidly. In 2022, the import and export value of agricultural products between China and Thailand reached 17.48 billion US dollars, an increase of 5.9%. Among them, China imported agricultural products of 12.59 billion US dollars from Thailand and export value is 4.89 billion US dollars. China has a 7.7 billion US Dollars deficit in agricultural product trade with Thailand, and the deficit increased 6.27% compared to year 2021. As to the share of import from Thailand in China's import of agricultural products from world, the figure is 3.64% in 2013 and 5.34% in 2022. Thailand has become an important sources of China's agricultural product imports.

Agricultural products are an important component of Thailand's export to China. Trade goods between China and Thailand are diverse, including agricultural products, mechanical and electrical products, services and etc. With the increasingly close trade cooperation between China and Thailand, the

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bilateral trade between the two countries continues to grow. Among them, the growth rate of China's import of agricultural products from Thailand is significantly higher than its export. As shown in Figure 1, in 2013 China imported 4.3 billion US dollars of agricultural products from Thailand, accounting for 11.16% of China's total imports of goods from Thailand. In 2022, China

imported 12.59 billion US dollars of agricultural products from Thailand, accounting for 22.28% of China's total imports of goods from Thailand. Over the past decade, China's import of agricultural products from Thailand has increased by 1.93 times, now accounting for nearly a quarter of China's import of goods from Thailand.

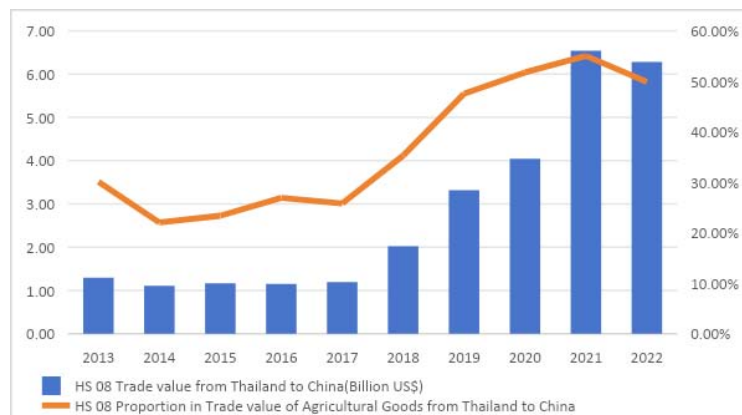


Data source: Calculated based on UN Comtrade Database (China as the Reporter)

Figure 1: 2013-2022 Trade Value of Agricultural Goods from Thailand to China and its Proportion

The proportion of fruit products in China's import of agricultural products from Thailand is increasing rapidly. Agriculture is a traditional industry in Thailand, the world's largest exporter of rice and a major producer and exporter of rubber, manioc, sugarcane, and aquatic products. At present, the trade value of cereal products in China's import of agricultural products from Thailand is far less than that of fruits, vegetables and roots. From 2013 to 2017, the trade value of vegetables and roots (commodity code HS07) imported from Thailand by China was the highest,

accounting for over a quarter of the total. But after 2018, as shown in Figure 2, the import of fruit and nuts (commodity code HS08) began to increase and surpassed the vegetables and roots. China's import value of fruit and nuts from Thailand has increased from 1.45 Billion US dollars in 2013 to 6.28 Billion US dollars in 2022, an increase of 2.33 times. Since 2021, fruit and nuts accounts for about 50% of China's import of agricultural products from Thailand.



Data source: Calculated based on UN Comtrade Database (China as the reporter)

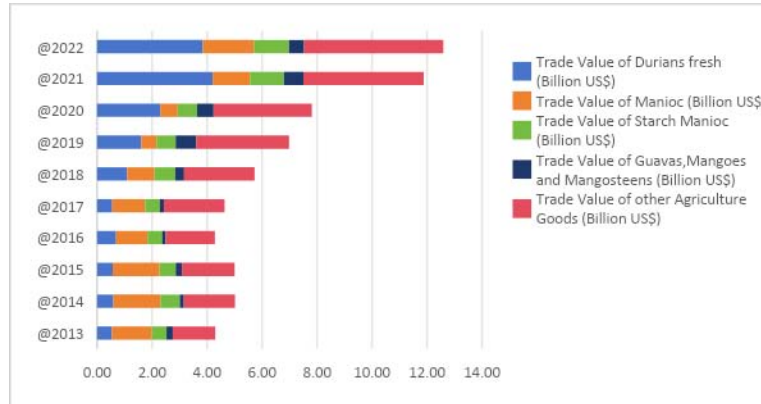
Figure 2: 2013-2022 Trade Value of Fruit and Nuts (HS08) from Thailand to China and its Proportion

Fresh durian, manioc, manioc starch, guava, mango and mangosteen are the top four agricultural products imported by China from Thailand. As shown in Figure 3, the total import value of the four products has increased from 2.75 billion US dollars in 2013 to 7.53 billion US dollars in 2022, which has similar growth rate

with China's import of agricultural products from Thailand. Therefore, the proportion of the above four products in China's import of agricultural products from Thailand has not changed much, basically ranging from 50% to 60%, in 2022 the figure is 59.79%. Further analysis shows that before 2018, the import value of

manioc was greater than that of the other three products, after 2018 the import value of fresh durian has grown at an astonishing rate and surpassed the import value of manioc. In 2022, the import value of fresh durian from Thailand to China was 3.85 billion US dollars, accounting for 30.54% of China's import of agricultural products from Thailand. This means that

fresh durian alone accounts for nearly one-third of China's import of agricultural products from Thailand. Fresh durian, a popular and unique tropical fruit, has become a star product. In addition, the import value of manioc starch, guava mango and mangosteen has grown rapidly as well, ranking just after fresh durian and manioc.



Data Source: Calculated based on UN Comtrade Database (China as the Reporter)

Figure 3: 2013-2022 Trade Value of Selected Products from Thailand to China

China is the largest export market for Thai agricultural products. The main export markets of Thai agricultural products are China, Japan, the United States. In recent years, there have been slight adjustments in exports to the Japanese and American markets, and exports to the Chinese market have increased significantly. Now China has become the largest export market for Thai agricultural products for years. As shown in Table 1, according to UN Comtrade Database (Thailand as the reporter), China has the largest share in Thailand's agricultural product export

market, rising from 15.55% in 2019 to 25.48% in 2021 which means that about a quarter of Thailand's agricultural product exports are sold to the Chinese market. In addition, several agricultural product exports rely heavily on the Chinese market. As shown in Table 2, from 2019 to 2021 the Chinese market share in Thailand's fresh durian, manioc, and manioc starch exports was high and increasing. In 2021, the Chinese market share in these three product exports was 90.04%, 99.48%, and 71.84% respectively.

Table 1: 2019-2021 Market Structure of Thai Agricultural Products Export

Period	Market Share of China	Market Share of Japan	Market Share of USA	Market Share of others
2019	15.55%	13.00%	10.39%	61.06%
2020	18.70%	12.52%	12.02%	56.77%
2021	25.48%	11.29%	10.63%	52.60%

Data source: Calculated based on UN Comtrade Database (Thailand as the Reporter)

Table 2: 2019-2021 Chinese Market Share of Thai Durian Fresh, Manioc, and Starch Manioc Export

Period	Durian fresh: Market Share of China	Manioc: Market Share of China	Starch Manioc: Market Share of China
2019	58.01%	98.99%	53.24%
2020	72.79%	99.41%	62.70%
2021	90.04%	99.48%	71.84%

Data source: Calculated based on UN Comtrade Database (Thailand as the Reporter)

III. FACTORS INFLUENCING CHINA'S IMPORT OF AGRICULTURAL PRODUCTS FROM THAILAND

With the increase of GNI, the demand for imported goods by Chinese consumers grows rapidly. According to the World Bank Data, GNI per capital PPP of China is 11,780 current international dollars in 2013 and 21,250 current international dollars in 2022. Considering the increase of GNI per capita and China's population, the change in market demand is a huge volume. The impact of increased income on demand is also influenced by the income elasticity of demand. Some agricultural products such as oil seeds, animal or vegetable fats and oil have a relatively low income elasticity of demand, so the market's demand for these products is less affected by income changes. However, other agricultural products such as meat and edible meat offal, fruit and nuts edible have a relatively high income elasticity of demand. As consumer income increases, the quantity of demand for such products will significantly increase as well. China imported from world meat and edible meat offal of 5.93 billion US dollars in 2013 and 30.88 billion US dollars in 2022, an increase of 4.2 times, and fruit and nuts edible of 4.10 billion US dollars in 2013 and 16.64 billion US dollars in 2022, an increase of 3.06 times. The tropical fruits and other agricultural products from Thailand matches the demand of the Chinese market just in time. Taking fresh durian as an example, Thailand exported fresh durian of 3.41 billion US dollars in 2021, of which the largest demand came from China.

Thailand is a major producer and exporter of rice, natural rubber and tropical fruits in the world, and has its own unique natural endowment advantages in the production and export of these agricultural products. During the five years from 2017 to 2021, Thailand's main agricultural product export markets were China (export value 30.99 billion US dollars, export market share 17.05%), Japan (export value 22.91 billion US dollars, export market share 12.61%), and the United States (19.52 billion US dollars, export market share 10.75%). The export value continued to grow, and China has become the largest market. The distance between China and Thailand is relatively close, and the transportation of goods is well developed, which increases the timeliness and convenience of agricultural products, especially fresh fruit transportation. The continuous development of cold chain transportation for fruit has improved efficiency and reduced costs, 6-hour rapid customs clearance facilitates trade of perishable goods, as well as trade tariff reduced further, all of these helps to provide new impetus for Sino-Thai agricultural product trade. However, the production and export of agricultural products are susceptible to natural factors such as climate. And the inspection and quarantine issues

caused by pests cannot be underestimated. In addition, Thailand's competitors in Southeast Asia have also begun to compete for global market share in agricultural exports. For example, China has officially allowed the import of fresh durian from Vietnam since 2022, and Vietnam is reducing costs through land border transportation. Vietnam's fresh durian exports to China are showing a rapid growth trend, which may challenge dominant position of Thailand's fresh durian in the Chinese market.

In addition, regional economic cooperation is also an important influencing factor in the trade of agricultural products between China and Thailand. After the establishment of the China-ASEAN Free Trade Area and the launch of the RCEP negotiations, bilateral trade between China and Thailand has continued to expand and cooperation has become closer. RCEP is the world's largest free trade agreement, consisting of 10 ASEAN member countries and 5 trading partners (China, Japan, South Korea, Australia, and New Zealand). After its implementation in the Philippines in June this year, this agreement will enter into force for all 15 members. According to the RCEP agreement, 65% of the tariffs and quotas on trade of goods between member countries will be abolished, and this proportion will increase to 90% over time. For example, China will maintain zero tariffs or immediately reduce tariffs on agricultural products under 960 categories, accounting for 65.3% of all agricultural products. Partly tax reductions and exceptions only accounts for 7.2%. RCEP also includes simplifying customs procedures, investment and e-commerce regulations, and introducing more free trade measures, all of which are favorable factors for the sustained and rapid development of China's import of agricultural products from Thailand.

IV. CONCLUSION

In recent years, China's import of agricultural products from Thailand have grown rapidly. China's import of agricultural products from Thailand is much greater than its export, the trade deficit is large and still increasing. The growth rate of China's import of agricultural products from Thailand is greater than the growth rate of China's total imports of goods from Thailand. Therefore, the proportion of agricultural products in China's total imports of goods from Thailand has significantly increased, reaching nearly a quarter.

Since 2018, the product structure of China's import of agricultural products from Thailand has undergone significant changes. Before 2018, vegetables and roots accounted for the largest proportion, with manioc being the most prominent. After 2018, the import of fruit and nuts has grown rapidly, with fresh durian being the most prominent. Now fruit and nuts accounts for about 50% of China's import of agricultural products

from Thailand, significantly surpassing vegetables and roots. Among fruit and nuts, fresh durian is really a star product.

China has become the largest market for Thai agricultural exports for years. Thailand's main agricultural product export markets are China, Japan, the United States. In recent years, exports to the Chinese market have grown rapidly. In 2021, about a quarter of Thailand's agricultural product exports were to China. Fresh durian and other agricultural products have a high dependence on the Chinese market.

China's import of agricultural products from Thailand still has great potential for development. Thailand's abundant tropical fruit and other agricultural products have unique natural endowment advantages and are widely popular in the international market. The income elasticity of demand of these products is relatively high. As long as they can meet the huge market demand of the Chinese market and continuously improve the timeliness and convenience of delivery, there is still great development potential. In addition, the comprehensive launch of the RCEP agreement, which includes measures such as canceling tariffs, simplifying customs procedures and etc., is also a favorable factor for promoting the further development of China's import of agricultural products from Thailand.

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Enhancing RMG Supply Chain Efficiency through Automation: A Path to Cost Reduction in Bangladesh's Garment Industry

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Enhancing RMG Supply Chain Efficiency through Automation: A Path to Cost Reduction in Bangladesh's Garment Industry

Sumaiya Zaman ^α, Md Rahat Alam ^ο, Ahmed Shamil ^ρ & Saju Shaha ^ω

Abstract- Bangladesh's RMG sector is the cornerstone of nation's economy and currently grappling with rising cost due to transportation inefficiencies within the supply chain. This study delves into the escalating product prices attributed to the transportation cost and highlighted the role of transport and logistics operations. Analyzing data from RMG Companies this study unveils the impact of transportation in product pricing and identifies various challenges contributing to the problem at hand. The research emphasizes the need for automation and Industry 4.0 RMG logistics operation (www.fibre2fashion.com) [22] and explores the hurdles faced by emerging economy in adopting 21st century technologies. The aim of this study is to envision cost efficient supply chain and enhance global competition readiness of the RMG sector of Bangladesh.

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I. INTRODUCTION

Bangladesh is the second largest supplier of quality garments in the world. The growth of Bangladesh clothing industry has been observed through whole world. But there is still some lacking in supply chain. Due to lack of availability of data and technology, the price of the RMG product is increasing. We know one thing that, product is rarely use where there are produced, and need to be transport the product to where the demanded. Manufacturing, procurement, and transportation are the main areas of the Supply Chain Management which include, what need to be use, what is the production quantities, inventory level, etc. Here transport operation plays an important role to maintain its price.

The purpose of this research is to identify transport operation can be useful in the RMG Sector in Bangladesh. It starts with introducing transportation based on a historical review. Then it reviews the relation between transportation and RMG Sector. Finally this study discusses the development in transport operation in the supply chain of RMG Sector in Bangladesh.

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II. LITE REVIEW

Bangladesh, one of the largest growing economies in the world owes 9.25% of its GDP to readymade garments industry in fiscal year 2022 (Uddin, 2022) [19] and total export earnings from Readymade Garments (RMG) stood at USD 12722.35 million in October-December FY23. This lifeline of economy of Bangladesh is affected by the transportation costs due to inefficiency. These elevated costs have led to a substantial 35% increase in the price of garments (Uddin, 2022) [19].

Carrying costs, which make up a significant portion of logistics expenses, range from 17% to 56% of the total costs. Inconsistent deliveries and congestion due to infrastructural problems have resulted in an additional inventory burden, accounting for approximately 53% to 75% of the total inventory. In terms of global rankings, Bangladesh was positioned at 105th out of 141 countries in the World Economic Forum's Global Competitiveness Index in 2019 and at 100th out of 161 countries in the World Bank's Logistics Performance Index in 2018.

Road Transportation makes up for 84% of the transportation industry. Usually 7 ton trucks are used for transportation and the average cost of carrying per ton per kilometer is \$0.095. The Chattogram port that handles 92 percent of Bangladesh's export-import trade and has dwelling time of 9.99 days (Illius & Chowdhury, 2022) [8]. This inefficiencies cost Bangladesh's economy.

III. SCM & INDUSTRY 4.0

The application of automation and industry 4.0 is recently increasing day by day. Gocindan et al (2015) [5] conducted a survey of closed loop supply chains. Wang et al (2016) [20] and Gunasekaran et al. (2017) [6] explored the big data and information technologies in logistics and supply chain management. Yang et al (2019) [23] provided an in depth analysis of big data application on maritime studies while A. Alop (2019) [1] explored the problems of smart shipping. Kaffash et al. (2021) [9] centered on big data applications in intelligent transportation systems (ITS) in the context of supply chain and transportation. Ben-Daya et al. (2019) [2] explored the impacts of the Internet of Things (IoT) on



supply chain management. Sharma et al. (2020) [15] also carried out a systematic review on machine learning applications with the main focus on sustainable agriculture supply chain performance. Winkelhaus and Grosse (2020) [21] gave an excellent discussion on Logistics 4.0 and explained how Logistics 4.0 is supported by various technologies.

IV. OBJECTIVE OF THE RESEARCH

The purpose of this research is to understand the present situation and determine the actual problem, then ensures the problem is solved through the given solution that reduce the transportation cost in order to reduce product price. The main objective is to how efficiently the products can be transported and how this contributes to the RMG Sector in Bangladesh.

The Research objectives are-

1. To determine current situation and analyze the relationship between transportation logistic in SCM and RMG Sector in Bangladesh.
2. Identifying the effective way for transportation system in RMG considering the current barriers.
3. Use the best way to reduce the product price of RMG.

V. METHODOLOGY

a) Data Sources

Data collected through primary and secondary sources such as taking interviews, journals, books, articles, etc.

i. Primary Data

These data are collected through interview with garments exporters via phone call and face to face. Here several questions are asked to understand their working process. Questionnaires are developed through FGD.

ii. Secondary Data

Secondary data collected from various journals, articles, newspapers, magazines, books, publications and websites.

b) Cost Analysis

Here the cost analysis is applied to identify the rise of product price of RMG Sector in Bangladesh. This will also help us to see the difference between the product price without including transportation cost and the product price after including transportation cost. Cost can be differ for various number of factors.

$$C = (C1 + C2) + C3$$

Here,

C: Refers to the total cost of the product after reaching the product for shipment.

C1: Refers to the raw material cost used in to produce the product.

C2: Refers to the production cost where labor and machinery costs are included.

C3: Refers to the transportation cost of delivering the final product for shipment.

VI. ROAD TRANSPORTATION LOGISTICS

Transportation has a major effect on logistics activities from moving resources to deliver the final product for the shipment. Almost every product need to pass through this sector in order to meet customer requirements. This is the fastest way with possible short time maintenance and requires less investment rather than in water and rail transportation. Also south part of the Bangladesh has few waterways which is more expensive than road maintenance.

Most of the factories use 3PL support for transportation in order to reduce overhead cost. 70% of companies handle transportation themselves, while 30% of companies are 3PL (Shohag, 2018) [18]. 30% of the companies believed that the current road width was sufficient for logistics transportation. Forty percent of respondents agree that 3PL can be used to maintain a proper supply chain for a plant, while 50% agree that the state government should monitor infrastructure development in the transportation logistics industry. Most companies don't know the width of roads for transportation and logistics (Shohag, 2018) [18]. Also, maintaining the vehicles with limited resources is difficult for the garment factory. This identifies the knowledge gap. The cost of trucks for delivering the product from Dhaka to CTG is about Taka 25,000 to Taka 30,000 (Mirdha, 2021) [11].

a) Data Collection and Analysis

Data collected through various sources among them, the data that is collected through direct interview from the garment factory, considered the true.

One such company is Mk Fashion. They export their product to Singapore and Vietnam. According to their Managing Director, MD Mizanur Rahman, their transportation cost from Dhaka, Uttara to Chittagong Port is about Taka 30,000. They use 3PL to transport their product. Their transportation truck can fully loaded with 300 carton box. Each carton box is loaded based on their product category such as for T-shirts, cartons loaded with 200 pieces. For jeans pants, the carton is loaded with 80 pieces and for the hoodie jacket, the carton is loaded with 60 pieces.

Here, we will discuss with 3 product. The cost of producing these products are-

T-Shirt: 120 Taka

Jeans Pant: 320 Taka

Hoodie Jacket: 300 Taka

The company loaded a truck with only one category of the product and 300 carton box can be stored in a truck.

Now, the value of total product in a single truck is-

Product Category	Number of Cartons	Number of products per carton	Total Products in a truck	Per product price (Taka)	Total value in the truck (Taka)
T-shirt	300	200	60,000	120	7,200,000
Jeans Pant	300	80	24,000	320	7,600,000
Hoodie Jacket	300	60	18,000	300	5,400,000

So, the Mk Fashion deliver 60,000 t-shirt or 24,000 jeans pant or 18,000 hoodie jacket in a single truck from Dhaka, Uttara to CTG port. The total value a truck carry for t-shirt is 7,200,000 Taka, for jeans pant is 7,600,000 Taka, for hoodie jacket is 5,400,000 Taka.

Now, the cost after including the transportation cost when the truck reached at the CTG port.

$$C = (C1 + C2) + C3$$

Here,

C: Refers to the cost included with transportation cost.

(C1 + C2): Refers to the production cost which included raw material cost, labor and machinery cost.

C3: Refers to the transportation cost.

$$\text{Cost of per product price} = \text{Total cost} / \text{number of quantities.}$$

Now,

For T-shirt,

$$> C = 7,200,000 + 30,000 = 7,230,000 \text{ Taka}$$

$$\text{Cost of per T-shirt} = 7,230,000 / 60,000 = 120.5 \text{ Taka}$$

For Jeans Pant,

$$> C = 7,680,000 + 30,000 = 7,710,000 \text{ Taka}$$

$$\text{Cost of per Jeans Pant} = 7,710,000 / 24,000 = 321.25 \text{ Taka}$$

For Hoodie Jacket,

$$> C = 5,400,000 + 30,000 = 5,430,000 \text{ Taka}$$

$$\text{Cost of per Hoodie Jacket} = 5,430,000 / 18,000 = 301.7 \text{ Taka}$$

So, after including the transportation cost to the total value of the product in a single truck, the total cost after the delivering the products, T-shirt is 7,230,000 Taka, for Jeans Pant is 7,710,000 Taka, for Hoodie Jacket is 5,430,000 Taka. Here, the cost per product is 120.5 Taka for t-shirt, 321.25 Taka for jeans pant and 301.7 Taka for hoodie jacket.

VII. RESULT

Here, per product price is increased due to transportation cost.

For T-shirt, the increased amount is, $(120.5 - 120) = 0.5$ Taka. The Mk Fashion approximately deliver 500,000 quantities of t-shirt per month. Then their transportation cost in a month for t-shirt is, $(500,000 * 0.5)$ or 250,000 Taka. For a year, the cost is, $(250,000 * 12)$ or 3,000,000 Taka.

Now for Jeans Pant, they deliver approximately 200,000 quantities in a month. Their transportation cost in a month for jeans pant is, $(200,000 * 1.25)$ or 250,000 Taka. Here, the Mk Fashion spend $(250,000 * 12)$ or 3,000,000 Taka per year for jeans pant in transportation.

Now for Hoodie Jacket, they deliver approximately 150,000 quantities in a month. So, their transportation cost in a month for hoodie jacket is, $(150,000 * 1.7)$ or 255,000 Taka. Here they spend $(255,000 * 6)$ or 1,530,000 Taka for 6 months.

The RMG sector based garments actually spend a lot of money in a month or in a year to transport their product from Dhaka to CTG port. Which results in a decrease in their revenue system. Exporters of garments say extra transportation costs have caused additional problems at a time when production costs have increased. However, worldwide brands and merchants do not pay higher price for the extra transportation cost. According to Ahmed Fazlur Rahman, chairman of Kappa Fashion Wear Ltd, due to the Eid holiday and a lack of containers in the port, the fare has been extremely unpredictable (Mirdha, 2021) [11]. Consequently, there was a highly demand for trucks and covered vans. Abdul Hannan, a manager of Edo Mia Transport Agency, blamed the abnormal traffic congestion for the higher transport cost (Mirdha, 2021) [11] and sometimes, the fare declines when the unloading of goods at the port slows in line with a lower import of goods. The president of the Bangladesh Garment Manufacturers and Exporters Association, Faruque Hassan, said the cost of production had gone by up to 30 per cent over the last eight years for various reasons. Now the higher transport costs have added to the woes of the garment exporters. Each part of the national transportation system is affected by congestion and delays, from road to seaports and land ports. The cost of regular transporting goods doubles due to traffic congestion alone.

a) *Industry 4.0 & Automation: How It Can Help*

In today's world logistics operations are using automation technology – artificial intelligence and machine learn. This technology can help solving problems stated in this study by

1. *Route Optimization*: Intelligent algorithms can identify delivery distance, cargo capacity, and traffic congestion and create an optimum route thus leading to minimized distance, avoiding congestion, less use of fuel and time. [12].
2. *Real-time Tracking and Visibility*: Modern internet of things tracking devices can track many variables like distance, congestions and collect data on the current state of the operation.
3. *Predictive Analytics*: Using historical data and predictive analytics, intelligence systems can predict market supply, road condition, delivery time etc. [7].
4. *Automated Dispatch*: Intelligent Delivery Management can automate the dispatching of delivery personnel or vehicles. It takes into account factors like location, availability, and capacity to ensure efficient resource allocation. [10]
5. *Integration with Other Platforms*: By integrating with port and freight system it can collaborate the operation to achieve maximum efficiency.

In heavily congested conditions, optimal drive cycles may reduce energy consumption by 35-50%. For freight trucks, Tsugawa [16] (2013) has reported a 10% reduction in energy consumption for a 3-truck 9 platoon at 80 km/h, with a 20m gap between trucks (15% reduction at 5 m gap). Extrapolating his 10 results toward zero gap implies a 25% reduction for the middle truck. This represents a plausible 11 upper bound for the middle vehicles in a long platoon. Lu and Shladover (2013) [17] reported savings of 12 4%, 10%, and 14% in fuel use for first, second, and third trucks, respectively, in a 3-truck platoon 13 with 6 m spacing. Since the large majority of freight kilometers are on the highway, we can use these 14 energy savings estimates directly and estimate an upper range of 10-25% energy intensity reduction 15 from platooning of heavy trucks. Data-driven search analysis, automated deliveries (e.g. via drones) and reduced administrative burdens could cut costs by 51%, says the 2018 Global Truck Study. [4]

b) *Modern Ports*

Port of Rotterdam & Port of Antwerp introduced automation technologies to handle the port operations more efficiency. A case study shows that Port of Rotterdam reduced the wait time 20% using an automated app called Pronto [3]. Technologies they used are –

1. *Digital Twin*: A real time replica of the port with every possible variable which helps them with making data driven decisions. [13]

2. *Drones*: Drones are used for surveillance and monitoring, berth management and oil spill or floating waste detection.
3. *NxtPort*: A data sharing platform for merchants, cargo agencies, regulatory bodies and port management creating a collaborative effort between stakeholders.
4. *Smart Sensors*: For checking water quality and human less navigation.
5. *Smart Camera*: Smart cameras can recognize objects such as ships thanks to artificial intelligence. They also support with incident and berth management. [14]

c) *Technologies Helps in Land Transportation Logistics Operation [15]*

1. *Artificial Intelligence and Machine Learning*: They use historical data and machine intelligence to generate optimized delivery routes and make accurate predictions. They learn and adopt with time and provide accurate analysis.
2. *Internet of Things (IoT)*: IoT uses smart devices and sensors to provide real time location, condition and performance to provide visibility and provide data for data driven decision making. [21]
3. *Cloud Computing*: Cloud computing provides solution for real time collaboration, real time update and accessibility from various devices, ensuring seamless integration with existing systems.
4. *Geofencing and Location-Based Services*: Geofencing technology allows businesses to set virtual boundaries around specific areas or delivery zones. By utilizing location-based services, businesses can automate actions when a delivery vehicle enters or exits a geofenced area.
5. *Dynamic Routing*: Dynamic routing algorithms integrates real time traffic and road conditions to adjust route constraints to create optimum route and reduce time.
6. *Pareto front*: Since route optimization often involves multiple conflicting objectives, such as minimizing delivery time, reducing fuel consumption, and maximizing resource utilization, Pareto front create multi-objective optimization algorithms considering these competing objectives and provide alternative optimum routes.
7. *Real-Time Traffic Data Integration*: Integrating real-time traffic data into route optimization algorithms allows businesses to dynamically adjust routes based on current traffic conditions.

d) *The Challenges and Barriers to Adopting Automated in Emerging Economics.*

1. *Coordination Problems*: Implementing automated supply chain systems in exporting requires coordinated effort from government, government agencies , freight and cargo agencies and many

other stakeholder which is hard in an emerging economy.

2. *Lack of Data-Driven Decision-Making*: Emerging economies usually lack the needed infrastructure and framework for data driven decision making.
3. *Insufficient Incentives to Employees*: Digitalization requires employees to learn new technologies and skills. A good incentive structure helps to avoid the issues of moral hazard whereas fewer incentives to employees lead to an increase in time, corruption, agency problems.
4. *Lack of Training & Domain Expertise*: For implementing advanced technologies employees should have to learn additional skills and competencies which take time.
5. *Non-supportive Policy Ecosystem*: Government policies in emerging economies does not provide any incentive and require permissions and approval from different government agencies.
6. *Lack of Stakeholder's Participation*: An automated system integrates different stakeholder to provide efficiency. If a stakeholder is not willing to adapt to new system then it cannot provide optimum.
7. *Low return on investment*: Transition into a new system is costly and needs time to return the investment to the business which discourages the businessmen.

VIII. CONCLUSION

Bangladesh's RMG sector stands on a crucial point as the new industrial revolution unveils itself. This study focuses on the increase in the cost of products due to transportation inefficiencies and highlights the need for embracing the 4th industrial revolution in transportation of goods.

The result of this study indicates that transportation costs play a crucial role in increasing the price of RMG products with cost analysis. We conclude that additional cost of transport leads to an increase in the price of t-shirt, jeans pants, hoodies jackets which affects their competitiveness in the global market.

The study suggests that using Industry 4.0 and automation technologies can lower the cost and inefficiencies of transportation. Furthermore ports in Bangladesh should imply newer technology to reduce time and increase efficiency. This research also acknowledges that implementing newer technology is hard in emerging economies like Bangladesh. Also, Bangladesh Government has a responsibility to ensure fair transportation system and they should regulate their monitoring system in highway roads to prevent the unlawful money collection and unwanted congestion on road.

In conclusion, this research emphasizes the need for the RMG sector in Bangladesh to adopt automation to optimize their logistics operations and

reduce costs and increase profit. Overcoming the challenges to adopt automation is must to sustain in the post 4th industrial revolution world.

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Research Questionnaire

Can we ask some questions about you and your company? Your information will help our study to go further.

1. Which position do you hold at the company?
2. What does your company do?
3. How many products do you export and where do you export?
4. How many products do you export in a month or a year?
5. What modes of transportation do you use for your transport operations (From production house to port)?
6. Which port do you use for exporting and from where your company deliver the final products to the port?
7. Do you have a preferred transportation provider or do you work with multiple carriers to deliver the product from production house to port?
8. How many product do you load in a single vehicle that you use for transportation?
9. How do you handle transportation logistics, such as route planning and scheduling?
10. What is the overall budget allocated for each transportation vehicles?
11. Are transportation costs included in the product pricing?
12. What is the cost of per product? Cost without including the transportation cost and cost after transporting the product to the port. Can you tell us about this for some products?
13. How do you calculate transportation costs? (per mile/ per product)
14. Are there any additional costs associated with transportation, such as unlawful money collection on the road?
15. How do you handle unexpected events in transportation, such as weather delays or traffic congestion?

16. Do you use any transportation management software or technologies to optimize routes and track your transport vehicles?
17. Does every RMG company export their products in this way? (For example, transportoperation from Dhaka to Chittagong Port).





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Developing a Comprehensive Approach to Green Investment Risk-Management

By Ihar Dzeraviaha

Abstract- Green investments play an important role in achieving the sustainable development goals and creating an environmentally friendly structure of the economy as a whole. At the same time, at the present stage there is a significant deficit of green investment, which is largely a consequence of the imbalance between short-term financial and long-term environmental interests. Among the main reasons for the lack of green investments attractiveness is their increased riskiness from the point of view of existing financial markets. The existing system for assessing investments within the framework of the risk-return matrix does not fully take into account a number of social and environmental effects that do not have a direct monetary value and do not contribute to increasing market returns. Based on the analysis of the category of green investments itself, as well as the risks associated with it, the article proposes a comprehensive approach to managing investment risks based on their structurally functional classification and inclusion of potential effects from reducing environmental risks in the analysis.

Keywords: *environmental effects, green investments, green infrastructure, green technologies, risk management, sustainable development.*

GJMBR-B Classification: LCC: HC79.E5-HC79.E5



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Developing a Comprehensive Approach to Green Investment Risk-Management

Ihar Dzeraviah

Abstract- Green investments play an important role in achieving the sustainable development goals and creating an environmentally friendly structure of the economy as a whole. At the same time, at the present stage there is a significant deficit of green investment, which is largely a consequence of the imbalance between short-term financial and long-term environmental interests. Among the main reasons for the lack of green investments attractiveness is their increased riskiness from the point of view of existing financial markets. The existing system for assessing investments within the framework of the risk-return matrix does not fully take into account a number of social and environmental effects that do not have a direct monetary value and do not contribute to increasing market returns. Based on the analysis of the category of green investments itself, as well as the risks associated with it, the article proposes a comprehensive approach to managing investment risks based on their structurally functional classification and inclusion of potential effects from reducing environmental risks in the analysis. Implementation of the proposed approach while simultaneously expanding information, technological, technical and institutional capabilities for adequate assessment of the environmental effects can become an important factor in increasing the attractiveness of green investments.

Keywords: environmental effects, green investments, green infrastructure, green technologies, risk management, sustainable development.

I. INTRODUCTION

Within the modern economic paradigm, growth of consumption is considered as one of the key measures of social progress. As a result, human development is accompanied by considerable pressure on the environment, which today has reached a critical level in a number of parameters. Climate change, resource depletion, ecosystem degradation and a number of other environmental problems threaten the possibility to maintain and improve the quality of life in the long run. Elimination (significant mitigation) of this threat is possible only with a fundamental systemic restructuring of the existing model of production and consumption, which requires significant investments. In recent years, economics and related sciences have paid much attention to the category of green investments, the distinctive feature of which is the focus on achieving an environmental effect. These investments play a decisive role in environmentally friendly structural transformation

and the development of an environmentally sustainable economic model. According to some assessments, to achieve climate change goals the global economy needs at least \$6 trillion investments per year only in green infrastructure [1]. However, their actual volume today is about \$500 billion annually [2]. At the same time, affordable savings potential allows to overcome the shortage. The amount of private capital under management in various financial funds in the world is over \$100 trillion. [3]. Nevertheless, the increased risk associated with the implementation of green projects and the financing of environmentally oriented activities makes it hardly possible to close the investment gap. From this perspective, the problem of risk-management in the field of green financing requires special consideration.

a) *Methodological Aspects of Risk-Management in the Field of Green Finance*

Increasing interest in green investments among researchers and practitioners is a cause of a rapid growth of the number of publications on this topic, which concern a wide range of aspects related to the definition of the category itself, the analysis of various investment instruments, the necessary investment institutions, etc. One of the least studied aspects and, at the same time, one the most important for the attractiveness of green investments is risk. Its assessment and the development of an effective risk-management system assume the development of a classification system necessary for the identification and typology of green investments in accordance with the most significant parameters for risk measurement. However, this task is complicated by the lack of a clear, generally accepted definition of the category of green investments itself [4]. Although there has been progress towards some unification in recent years, various institutions and organizations establish their own criteria, which can be quite widely interpreted.

There are a number of approaches to green activity taxonomy that can be used as a basis for identifying if the investment is green. One of them is the EU taxonomy for sustainable activities [5]. Its development was aimed at solving the problem of defining and measuring environmentally sustainable economic activities, but serious usability challenges are emerged when the taxonomy is applied for practical purposes [6].

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The more detailed taxonomy system for determining green investments is developed at the project level as well as for specific financial assets and instruments, for example, green bonds, green loans, green insurance [2], etc. According to the definition of International Capital Markets Association (ICMA) [7], green investments are aimed at financing projects which help to solve environmental problems, including slowdown and prevention of climate change, combating pollution, preserving biological diversity, etc. As a rule, the top priority of environmentally friendly finance is low-carbon projects and assets that contributes to decreasing of greenhouse gases emission [8].

An OECD study [9] ranks green investments based on the nature of their contribution to achieving environmental goals, distinguishing direct and indirect investments. Direct investments are usually associated with participation in the creation of green jobs and green infrastructure. Indirect investing is related to buying green securities or funding financial institutions, which are engaged in green projects. The mediating character of indirect investments may affect their effectiveness in the achievement of environmental goals.

A wider interpretation of green investments is offered in the G20 report [10], according to which green investments provide environmental benefits and contribute to the implementation of environmentally sustainable development goals. In line with such an approach, it is more correctly to speak about sustainable or ESG investments [2]. Their classification can be based on the broad system of criteria, including the objective of investments, their impact, the specifics of pre-investment and post-investment strategies and so on [11]. However, this approach to taxonomy, as well as the ones considered earlier, are not openly related to risk-management.

Given the specifics of green investments, it is reasonable to take the interrelations of risk and environmental effect as the basis of classification. The impact of risks on the attractiveness of green investments can be considered in two aspects.

On the One Hand: Green investments as a separate financial category became relevant due to the need for improving the environmental sustainability of development and mitigating the risks caused by the negative consequences of human impact on the environment. According to a widespread in finance practice approach [2, 12], there can be distinguished three groups of risks, the reduction of which is driven by green investments: physical, transition and liability risks. Physical risks are the cause of damage resulting from the changes in the physical characteristics of the natural environment, for example, an increase in the concentration of greenhouse gases, growing precipitation deficit, a decrease in the area of natural ecosystems, etc. In turn, investments aimed at prevention of these

changes and mitigation of anthropogenic impact make it possible to reduce the level of physical risks.

The emergence of transition or transformation risks is caused by a decrease in the value of assets or inability to use assets because of structural reorganization of the economy. For example, the development of the carbon market could lead to the inefficiency of coal energy, and consequently to the depreciation of hard coal deposits and the stock of coal power plants. Environmentally oriented structural changes through green investments and a decrease of the environmentally unfriendly assets share on the balance will reduce the level of transformation risk.

Liability risks are associated with the potential litigation damage and depend on the probability of being sued for the environmental impact caused by the company activity. In that case, not only direct, but also indirect damage, like reputational losses, should be taken into account. The level of this type of risks is to a great extent determined by the nature of the legal system under consideration, the characteristics of environmental legislation and law enforcement practice in a particular country. An additional uncertainty is caused by the fact that the potential losses can be based on the subjective assessments and judgments. As a result, the damage from the liability risks is largely depend on the reaction on the environmentally hazardous activities from consumers, contractors, government agencies and other stakeholders.

Integrating the risks considered above into the system of risk-management can have a significant impact on investment decision-making [13], since risk-profitability relationship forms the basis of performance measurement in finance. It suggests the increasing influence of green investments on efficiency assessments. Unlike traditional investments, the notion "green" implies the focus on environmental results. The latter have become an important part of investment decision-making mainly due to the negative environmental consequences of regular economic activity, which adverse impact on the quality of life is increasingly evident. From this perspective, green investments should not be considered as an alternative to traditional investing. They are rather a compensating component of investment portfolio (investment strategy of any entity or state) aimed at mitigation (prevention) of environmentally related risks [14].

The appropriate way to demonstrate such an approach to green investments is to use the Sharpe ratio [15], which is calculated as an additional portfolio yield per unit of risk measured in terms of volatility. This ratio can be improved by not only enhancing the profit on investments, but also reducing the risk of portfolio. Even decreasing profitability is regarded as acceptable, if the degree of risk reduction is sufficient to ensure the Sharpe ratio growth.

Representing environmental risks in terms of market volatility is a challenge that hardly can be adequately addressed today. Nevertheless, including them in any implicit or explicit way into consideration when assessing profitability-risk ratio essentially changes the role of green investments in decision-making. Green investments becomes an important component of diversification, which, in line with the approach of H. Markowitz [16], is the most efficient way of portfolio risk optimization.

On the other Hand: The orientation of green investments towards achieving an environmental effect, which in modern conditions cannot always be transformed into financial income for a number of institutional and other reasons, becomes a source of risk given the uncertainty regarding the monetization of this effect. In these circumstances, if decision-making is based on risk-profitability matrix, green investments may be too risky in comparison with the expected return. From this perspective, improving the risk-management system becomes the key factor of improving the attractiveness of green investments.

When identifying the sources of additional uncertainty and risks in the green finance sector, it is reasonable to distinguish two types of them – conditioned by the green economy specifics and not conditioned. Risks of the first type are associated with the uncertainty of assessing the environmental consequences of investments. Analyzing their main sources, the following issues should be paid special attention to:

- Imperfections of institutional environment, including the underdevelopment of the markets for green products and ecosystem services, the lack of effective non-market tools for the transformation of environmentally oriented demand into financial flows, the insufficient role of environmental taxation in the economy regulation, etc.;
- Technical and technological reasons, including the lack of technical capabilities to measure the environmental effects of green investments timely and adequately, the high cost of technologies necessary for such measurements, insufficient personnel qualifications, the lack of infrastructure needed for the effective application of information technologies, satellite monitoring, big data analysis, artificial intelligence, etc.;
- Vague nature of environmental effect caused by the difficulty to ensure its precise spatial and temporal localization. Given that the environmental benefits of green investments may become tangible only in the long run, as well as have an indirect form manifesting through different components of the natural environment, their economic assessment, even made with the application of cutting-edge

technologies, may raise doubts about its relevancy and credibility;

- Information uncertainty caused by the lack of necessary information about the environmental consequences of investments. Investors may be intentionally or unintentionally misled about the actual impact of investments, which may not meet certain environmental standards. This phenomenon is also known as green washing. One of the reasons for such a risk is the lack of generally accepted standards that can help to define green investments unambiguously. For example, a company may announce that it will invest in reducing negative environmental impact by replacing dirtier coal with a cleaner grade. Despite the possible environmental improvements when burning new grade of coal, the project itself is based on the development of coal energy, which is difficult to regard as green.

The sources of green investment risks due to the specifics of the green sector are not limited to the factors listed above. At the same time, it is necessary to understand that as the green sector becomes more integrated into the economy, the environmental benefits will be increasingly monetized and transformed into the financial flows. As a result, the green specificity of risks can disappear and the second type risks, which are not conditioned by the peculiar features of the green sector, will become increasingly important. They can be categorized according to various criteria. Theory and practice of risk-management offers a variety of approaches to classification depending on the scope and nature of activity, management goals, and other factors. In particular, dividing risks into systemic and non-systemic is essential for the assessment of an investment portfolio. In the financial sector, special attention is paid to credit, interest rate, and liquidity risks. Special risk assessment systems are used to justify and implement investment projects. From the point of view of risk-management, the promising approach can be the risk classification depending on the role green investments play (or the function they perform) in the development of green economy and formation of its structure.

b) Risk-Adjusted Typology of Green Investments

The most important areas that require green investments to ensure the balanced structure of green economy include green innovations, green infrastructure, the production of green goods and services, environmental protection and safety [9]. From this position, four enlarged groups of investments can be distinguished:

1. Investments in green technologies;
2. Investments in green infrastructure;
3. Investments in the conservation and restoration of ecosystems;



4. Investments in improving the environmental and resource efficiency of the traditional sector of the economy.

The proposed classification is somewhat arbitrary. It is obvious that the development of green technologies requires the creation of appropriate infrastructure, natural ecosystems can become part of this infrastructure and green technologies can be used to restore them, as well as to increase the resource efficiency of the traditional sector of the economy. However, dividing investments into the specified structural-functional groups makes it possible to take into account the peculiarities conditioned by how an environmental effect is achieved, to identify the most characteristic risks for each group and to manage them more effectively. Any of the presented four groups can be divided into smaller subgroups, for example, environmental protection activities for various industries, conservation of various types of ecosystems, etc. At the same time, the functional approach to analyzing the risk of green investments should not fundamentally change. The risks associated with the first type of investment depend primarily on novelty and the degree of development of the technology. A number of green technologies, for example, wind or solar energy, have become quite widespread on the market. Many companies in this area have an established business model and receive stable income; their shares are listed on the well-known stock exchanges. The last aspect is important from the risk-management perspective, as publicity helps to reduce uncertainty, since companies whose shares are put up for trading on exchanges are required to make their reporting publicly available, although the degree of information disclosure may vary depending on the requirements of the specific exchange or national legislation. Investments in such companies are quite reliable, and sensitivity to systemic risk, although it varies depending on the region, type of technology and other factors, is within the market average [17, 18]. This conclusion is confirmed by the analysis of the β parameter for various companies in the green sector of the economy based on data from the world's leading stock exchanges. At the same time, investors, depending on their risk appetite, can choose more risky financing instruments (for example, green company stock) or less risky ones (for example, green bonds).

With regard to the development of new green technologies, we can talk about the existence of risks inherent in venture financing. All other things being equal, the level and character of venture risks depend on the stage of technology development. As a rule, the initial stages are characterized by the greatest uncertainty. As technology progresses and a target market grows, the level of risk decreases. In this context, effective venture risk management assumes that the

choice of financing tools and investment goals is determined by the stage of commercialization of the green innovative project [19].

As a whole, the risks associated with investments in the development of green technologies include both – risks proper to innovative business in general and risks caused by the specifics of the green sector of the economy. The latter are largely determined by institutional factors, including the presence of appropriate legislation, the level of development of the market for green goods and services, the character of policy measures regarding the green economy, etc., which determines the possibility of monetizing the environmental benefits that green technologies are aimed at achieving.

The second type of investment is closely related to the risks characteristic of infrastructure projects. Their distinctive feature is high capital intensity and a long (sometimes extremely long) planning horizon. As a rule, upgrading and creating new infrastructure requires significant financial resources, and its service life is usually characterized by an increased duration that often exceeds the time frame adopted in the decision-making of most investors and financial institutions. In view of the above, the level of risk of infrastructure projects is often too high for market participants. This is also true for green infrastructure, although, it is worth noting that this category can be interpreted quite broadly. Given that new infrastructure in many cases involves the use of modern, more resource-efficient materials and technologies, such projects can be conditionally considered green, even if they are not directly aimed at the development of any element of green economy.

The need for significant amounts of initial investment and a long payback period make infrastructure projects too risky limiting the possibilities of their financing. Effective risk management in this situation involves creating conditions for attracting so-called “long money”. Most investors in the market, including commercial banks, are focused on optimizing the risk-return ratio and cannot afford investments that take more than ten years to pay off. A feature of this group of investments is the disproportionate shift of risks for the initial period. As analysis shows, the cost of infrastructure bonds and their riskiness decrease as the project is implemented (5, 10 years from the moment of operation) [20].

Therefore, financial institutions such as pension funds and development banks play an important role in attracting infrastructure investments. The former accumulate the savings of investors for the period of working activity until retirement, and therefore have the resources to invest for a sufficiently long period. The latter are not only an important source of long-term investments, but also the providers of associated services, including various tools for reducing risks, expert assistance in the assessment and management

of projects. Development banks play a special role in countries with underdeveloped financial markets and limited availability of private capital. At the same time, in developed countries these institutions can also play an important role for financing green infrastructure. They are often specialized, may be called green investment banks or green development banks. Typical examples of such institutions are the UK Green Investment Group or the German Reconstruction Bank (Kreditanstalt für Wiederaufbau)[2]. The latter has specialized in green finance since the early 2000th and played an important role in the development of renewable energy.

For a number of reasons, investments in the conservation and restoration of ecosystems can be considered among the most risky. Firstly, the possibilities for implementing such projects are often limited by natural reproduction processes and require considerable time. For example, restoration of forest and wetland ecosystems can take decades. Secondly, the natural environment is characterized by many complex and entangled relationships between various elements. Changes in one ecosystem can lead to various unforeseen effects (both negative and positive) in other ecosystems, which further increases the level of uncertainty when making investment decisions. Thirdly, the financial attractiveness of this type of investment largely depends on the institutional environment necessary for monetizing the environmental effect, in particular, the development of the market for green products, the availability of other effective payment systems for ecosystem services. A typical example is the carbon market. Forest and wetland ecosystems are regarded as the main natural absorber of carbon dioxide. So integrating landowners and forestry companies in the carbon market may create an additional source of income and encourage new investments in the forest restoration [21, 22]. As an assessment carried out for the forest growing sector in Belarus showed, the participation of the republic in the European carbon trading system would become an important source of the financial revenues for its forestry. This will increase the profitability of investments in the restoration of forest ecosystems by more than 2 times and significantly increasing their attractiveness for a wide range of investors [23].

At the present stage, a number of technical and institutional factors limits the possibility of generating income from projects in the field of the restoration of natural ecosystems and the conservation of biological diversity. This makes them risky for commercial investors. Therefore, an important role in financing such projects is played by budgetary funds, non-profit, sovereign funds, international and other financial institutions that provide resources on a free or preferential basis. The key factor in reducing the risk of this group of investments to an acceptable level is shaping a stable institutional environment capable of

providing the necessary financial flow from the use of ecosystem services.

Investments of the fourth group are primarily associated with risks characteristic of the type (object) of economic activity within which projects on the improvement of environmental efficiency are being implemented. Since organizational, production, and technological processes can vary greatly in their complexity, danger, and degree of impact on the environment, the risks that must be assessed and taken into account can also vary significantly. In this case, effective risk management requires good knowledge of the field of activity in which the project is being implemented, as well as an understanding of the main trends in its development.

Despite the fact that investments in this group are associated with a variety of risks caused by production and technological differences, their common feature is the ability to reduce operational risks of economic activity. Increasing resource and environmental efficiency implies reducing the consumption of raw materials and energy, abating environmental pollution, which should lead to a decline in material costs and environmentally related tax payments. Lower resource intensity means not only cost savings, but also reduced dependence on suppliers of energy and materials and at the same time limits the impact of the risk of price volatility, which is especially important for the imported resources.

One of the most typical areas of such investments is the implementation of energy saving projects in both the manufacturing and housing utility sectors. Reducing operational risks by cutting costs for the consumption of heat, electricity, water, various types of raw materials and decreasing their impact on the final financial results is an important factor in investment attractiveness. The investor's decision-making depends on how he assesses the level of operational risks reduction in the future in comparison with the risks associated with capital investments now. This relationship can be demonstrated using the example of a green mortgage. According to some estimates, among green mortgage loans borrowers the percentage of non-payments is lower than in the case of a conventional mortgage [24]. This is due to the lower financial burden on owners of environmentally efficient housing, since they consume comparatively less water and energy resources. Since the risk of a green mortgage is lower than for a conventional one, some financial institutions offer mortgages for the purchase of green (resource- and energy-efficient) housing at reduced rates, increasing the attractiveness of financial investments in environmentally efficient construction projects.

When assessing the risks of the fourth group of investments, the key role is played by the price factor and institutional regulation of environmental protection.

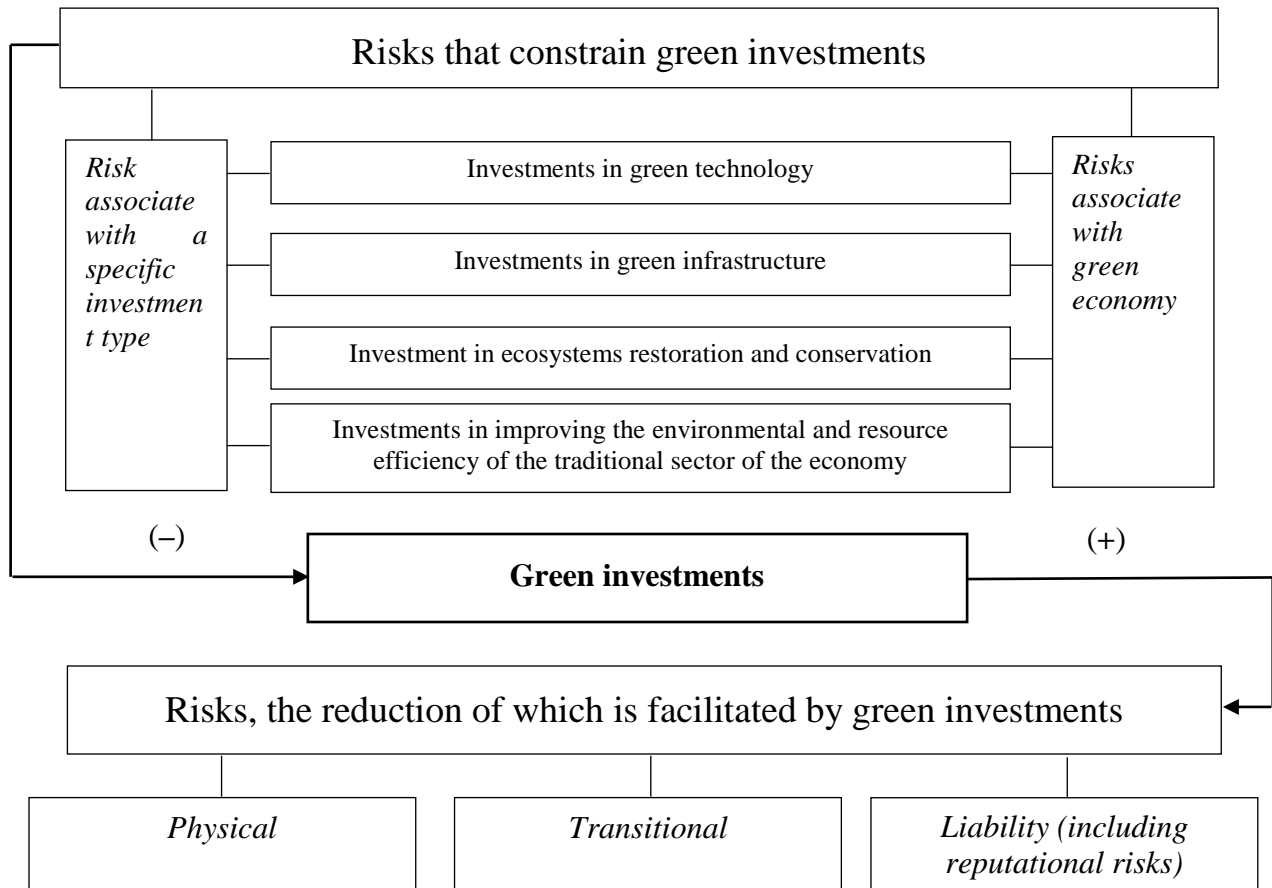


The rising cost of raw materials and energy, increasing environmental taxes and tightening environmental standards will contribute to the attractiveness of green investments. At the same time, under the conditions of market pricing, additional risks may be associated with the dynamics of resource prices and their volatility.

c) *General Framework for Developing a Comprehensive Approach to Green Investments Risk Management*

A systematic approach to risk-management involves their comprehensive consideration, including both risks that constrain green investments and risks

that green investments contribute to reducing. In view of the above, the comprehensive approach to green investments risk-management in its most general form may be represented by the scheme shown in the figure. As you can see, the upper part of the scheme presents the risks that hinder green investments. They are grouped according to the structurally functional principle, highlighting specific and non-specific green risks. The lower part includes three enlarged groups of risks, the reduction of which is facilitated by green investments.



Source: Developed by the Author

Figure: The Basic Scheme of Comprehensive Approach to Green Investment Risk-Management

The proposed comprehensive approach is based on the integration of key risks for making decisions on green financing. This should help to make assessments more adequate and complete, better understand the relationship between risks and the results of investment activities (including the environmental effects) and improve the quality of information necessary for investors. Applying the comprehensive approach allows more efficient use of risk-management instruments. It should encourage green investments and increase their attractiveness, which according to the proposed scheme is determined by the possibility of reducing the group of risks in the

upper part of the figure (focus on risk reduction is indicated by a “minus” sign) and the potential of investments to influence risks in the lower part of the figure (focus on increasing potential is indicated by a “plus” sign).

Successful implementation of the presented approach depends on a number of technical, institutional and managerial factors and involves the use of a wide range of tools necessary to more clearly identify risks, improve comparability and increase the adequacy of their assessments. In this context, solving the problem of green investments encouragement requires additional research into many aspects related

both to the specifics of the green sector, including the peculiarities of environmental effects assessment and accounting, as well as to the functional and sectoral differences in investment objects. At the same time, one of the key trends that is important to consider when changing investment priorities is the transformation of the risk profile. Since a typical green business model implies a reduction in the consumption of material resources and energy through the use of more modern technologies and updated infrastructure, it can be assumed that green projects will require higher (compared to traditional) initial investments, ensuring reduction of operating costs in the future. This means that the risk profile of green investments is characterized by a relatively higher level at the initial stage of green project (capital investment stage) and a lower level at the operation stage. An illustrative example is the comparison of business models in the fields of wind (hydro, solar) energy and energy built on fossil fuels.

Comparing the key differences of two business models allows us to conclude that one of the main reasons for the increased risk of green investments is the shift of a significant part of the costs to earlier stages of project implementation, while additional income is expected in the longer term. Under conditions of positive interest rate, all other things being equal, long-term projects are more risky than short-term ones. In this regard, an important financial tool for increasing the attractiveness of green investments is regulating the size and composition of interest rate [14], bringing it into line with the long-term interests of economic development.

The time factor and the interest rate, which is essentially the price of time, are the most important elements of the risk management system in finance, and the risks associated with green investments are no exception. However, the proposed comprehensive approach cannot be limited to these aspects. Its efficient practical implementation presupposes the most complete coverage and disaggregation of risk factors, since the quality of their assessment and the quality of investment decisions depend on this. In turn, the quality of the assessments implies the availability of the necessary information, the availability of technologies for obtaining it, as well as improving the appropriate regulatory framework and increasing the degree of integration of environmental priorities and financial interests in general. Further expansion of technical capabilities for risk assessment, including the development of big data analysis systems, artificial intelligence, the Internet of things, etc. on the one hand, and shaping of the institutional environment necessary for transforming the environmental effects into financial results, on the other, will contribute to increasing the attractiveness of green investments in the wide circles of investors.

II. CONCLUSION

The proposed comprehensive approach to green investments risk-management implies an expansion of the scope of analysis, going beyond the traditional system of investment risk assessment. The latter does not fully take into account a number of effects, including environmental ones, which can hardly be monetized within the traditional framework of decision-making and have a limited impact on investment profitability. This is one of the key reasons for the lack of attractiveness of green investments. Systematization of risks on a structurally functional basis and widening the scope of analysis by including impact related to the long-term goals of green finance to improve the environmental sustainability of development will help overcome the limitations inherent in the existing financial systems allowing for a more balanced risk-return assessment. Thus, the implementation of a comprehensive approach to green investments risk-management while simultaneously improving the technical and institutional aspects of assessing the environmental effects will be an important factor in increasing the attractiveness of green investments within the based on the risk-return assessments decision-making framework.

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8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

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14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.



21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

INFORMAL GUIDELINES OF RESEARCH PAPER WRITING

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.



- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.



Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.



Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.



Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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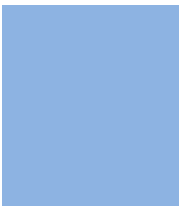


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	A-B	C-D	E-F
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring





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