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Original Research

Potential Development of Mini-Scale Shrimp Aquaculture in Plastic Ponds in Pasuruan Regency, Indonesia

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Abstract

Vannamei shrimp farming on a mini-scale plastic pond ("busmetik") in Pasuruan Regency has been implemented since 2015. This study aims to analyze financial feasibility and potential for busmetik development in this region. The research was conducted in three sub-districts with a population of 120 farmers. Sample was determined by simple random sampling and 37 farmers were selected. Data collected through interviews, and analyzed by financial feasibility and SWOT. The results showed that busmetik vannamei shrimp farming in Pasuruan Regency was feasible to be developed based on investment criteria: R/C and B/C greater than one, short payback period, BEP price and production lower than real price and production, positive NPV, and IRR is higher than bank interest rate. Sensitivity analysis on the decline in production and prices by 20% resulted in the conclusion that this business is just feasible. Analysis of internal factors (IFE) and external factors (EFE) resulted in six strategies for developing vannamei shrimp farming business with busmetik technology. Those strategies were to classify product sizes based on quality; increase production volume with optimal land use; integrated production management; product differentiation; training program planning; and work with third parties for assistance. Government and investors can promote the business by supporting financing, providing integrated production management training in order to increase production and income of farmers.

Keywords: Business feasibility, vannamei shrimp, strategy, busmetik

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Introduction

Development of national marine and fisheries in the era of globalization aims to create a healthy, productive and creative society through strong fisheries based on local resources. Fisheries sector development is a priority because it is a main source of livelihood for people in coastal areas, especially fishermen and rural communities who work as fish cultivators, including shrimp. The sector is also a foreign exchange earner whose number is increasing from year to year. According to (Rumaijuk & Lubis, 2020), export potential of shrimp commodities was able to provide the country's foreign exchange from fishery products of more than 50%.

Increasing demand for exports illustrates improvement in development and business in the fisheries sector. However, export of this commodity must pay attention to domestic needs so as not to cause a negative trade balance (Pudjiastuti, 2014; Pudjiastuti et al., 2013; Pudjiastuti & Kembauw, 2018). It is a potential of the fisheries economy that must be developed, but remains in the blue economy corridor. The implication is that an economy that is focused on the marine and water sector must also emphasize balance between economic development and environment carrying capacity. It is hoped that this activity will not only affect the welfare of wider community, but also sustainable economic development (Ervianto, 2018; Saksono, 2013).

Vannamei shrimp cultivation benefits farmers based on the empirical studies that have been carried out in Lamongan Regency (Chusnul et al., 2010), Purworejo (Utomo et al., 2012), Pemalang (Pasaribu et al., 2017), Pekalongan (Untara et al., 2018), Serdang (Nainggolan et al., 2018), Parangtritis DIY (Khatimah, 2019), Kolaka (Kasmin et al., 2020). On the other hand, income of vannamei shrimp cultivation is higher than that of tiger shrimp (Tobing et al., 2021) and smallholder shrimp (Saragih et al., 2015). Government is just trying to increase capacity of vannamei shrimp ponds through various technologies, including cultivation of mini-scale plastic shrimp ponds (*busmetik = budidaya udang skala mini empang plastik*) that are environmentally sound (*ecoshrimp*). Several studies on the shrimp business feasibility had also been carried out by (Makalingga et al., 2018) in Purworejo Regency, (Ariadi et al., 2019) in low salinity cultivation systems, (Aprilia et al., 2020) in supra-intensive ponds, (Amsari et al., 2021) in cultivation through demonstration farming, (Amri & Haris, 2022) on various shrimp culture technologies, all of them stated that the aquaculture is financially feasible. However, no one had studied financial feasibility of busmetik technology.

Busmetik is a technology that has been the result of empirical studies since 2009 and is currently at the stage of accelerating adoption to the level of shrimp cultivators. This technique was developed because it has advantages: 1) easy to manage because the plot is not too wide ($\leq 1000 \text{ m}^2$), 2) operational costs incurred for one cycle are just affordable for middle to lower class cultivators, 3) soil quality is not a factor barriers in the application of technology because pond construction is coated with plastic (HDPE), 4) pest and disease control is easier so that it can reduce risk of disease attacks, because it applies biosecurity measures and probiotic applications, 5) maintains balance of the ecosystem through a growth of mangrove vegetation in the cultivated area which functions as a biofilter, 6) is very suitable for cultivation of *Litopenus vannamei* because

it can be reared in high density, above 100 shrimps/m³, 7) vannamei has faster growth, is more resistant to disease, and has a flexible market segment (Aisyah et al., 2022; Fatalattof et al., 2022; Suriawan et al., 2019).

Busmetik in Pasuruan Regency has continued to expand from 2016 to 2020. In 2016, this area had a pond of 4.06 ha, which increased in 2017 to 9.52 ha. In the following year (2018) those area decreased to 8.40 ha, and in 2019 it decreased by 1.63 ha. But in 2020, busmetik pond area would increase again to 15.41 ha. The development shows that busmetik vannamei shrimp is able to improve regional economy (Nardianto et al., 2019). The purpose of this study was to analyze the potential for busmetik vannamei shrimp development in Pasuruan Regency in order to support government policies so that aquaculture develops from year to year.

Methodology

We carried out this research in Pasuruan District, precisely in Kraton District, Rejoso District and Lekok District. Population in the three sub-districts was recorded at 120 vannamei shrimp farmers who apply busmetik system with an operational area of 400 m² per plot. Sample was randomly selected and consisted of 37 farmers. Data were collected through interviews with farmers using a questionnaire. After data was compiled, it was then tabulated and analyzed quantitatively with two approaches, i.e. feasibility study for busmetik business and its development strategy using SWOT analysis. Financial feasibility was carried out using following parameters: R/C, B/C, payback period, BEP (unit and price), NPV and IRR, and their sensitivity if prices and production fall by 20%.

1. Return Cost Ratio (R/C) according to (Anindita et al., 2015) is calculated by formula:

$$R/C = \frac{\text{Return}}{\text{Total cost}} \dots\dots\dots (1)$$

where: R/C > 1, it means that the business is feasible; R/C = 1, it means that the business is in break-even condition, and R/C < 1, it means that the business is not feasible.

2. Benefit Cost Ratio (B/C) is a comparison between total revenue and total cost, which shows the value of revenue obtained from each rupiah spent. A business is said to be feasible if this parameter ≥ 1. The formula used is:

$$B/C \text{ Ratio} = \sum_{t=1}^n \frac{(B_t - C_t)}{(1+IRR)^t} \dots\dots\dots (2)$$

where: B_t = gross profit of t-month; n = economic age; C_t = gross cost of t-month; t = 0, 1, 2, 3, ...

3. *Break Even point* (BEP), were classification into BEP price and BEP unit. They were calculated by formula:

$$BEP_{\text{price}} = \frac{FC}{P-VC} \dots\dots\dots (3)$$

$$BEP_{unit} = \frac{\text{Total cost}}{\text{Selling price}} \dots\dots\dots (4)$$

where: FC = fixed costs; P = selling price per unit; VC = variable cost per unit

4. *Payback Period* (PP) is the estimated payback period for the busmetik business investment which is determined by formula:

$$PP = \frac{\text{Initial investment}}{\text{Revenue}} \times \text{time period (month)} \dots\dots\dots (5)$$

Business is said to be feasible if payback period is less than or equal to business investment age.

5. *Net Present Value* (NPV) is the difference between present value of profits and costs, calculated by formula:

$$NPV = \sum_{t=1}^n \frac{B_t - C_t}{(1+i)^t} \dots\dots\dots (6)$$

Where: i = compound rate or interest rate (%). Criteria: NPV > 0, business is feasible; NPV = 0, business on breaks even point; NPV < 0, business is not feasible.

6. *Internal Rate of Return* (IRR) is the rate of return of busmetik business which shows the present value (NPV) equal to zero.

$$IRR = i_1 + (i_2 - i_1) \frac{NPV_1}{(NPV_1 - NPV_2)} \times 100\% \dots\dots\dots (7)$$

Where: i_1 = interest rate resulting in NPV > 0; i_2 = interest rate that generates NPV < 0; NPV₁ = NPV at interest rate i_1 ; NPV₂ = NPV at interest rate i_2 .

Busmetik development strategy was determined by a SWOT analysis that begins with identifying internal and external factors, assessing internal and external factors, evaluating internal factors (IFE) and external factors (EFE), determining position of current strategy, and formulating a new strategy to be implemented. IFE and EFE were done by determining rating, weight and score.

IFE stages include: (1) identifying internal factors, (2) giving weights from 0.0 (not important) to 1.0 (very important) for each factor. Weight indicates importance of each factor to the overall internal factor. Total number of weights must be 1.0, (3) giving a rating of 1 to 4 for each factor to indicate whether the factor is a major weakness (rating = 1), or a minor weakness (rating = 2), a minor strength (rating = 3), or major power (rating = 4), (4) multiply each factor weight by a rating to determine weighted average for each factor, (5) add up the weighted average of each factor to determine total weighted average. Average value is 2.5. A weighted average total below 2.5 represents internal weakness, while a total score above 2.5 indicates a strong internal position.

EFE stages include: (1) identifying external factors, (2) giving a weight of 0.0 (not important) to 1.0 (very important) for each factor. Weights indicate relative importance of the factor to business success in the industry. Sum of all weights must be 1.0, (3) giving

a rating of 1 to 4 for each external factor, where 4 = superior response, 3 = above average response, 2 = average response, 1 = bad response. Ratings are based on the effectiveness of company's strategy, while weights are based on industry, (4) multiply each factor weight by its rating to determine weighted value, (5) add up weighted of each factor to determine total weighted score. Highest weighted value is 4.0 and lowest weighted is 1.0. Total weighted average is 2.5. Total weighted score of 4.0 indicates that the business responds very well to the opportunities and threats that exist in its industry. Strategy is selected based on the position of these factors in a matrix consisting of four quadrants.

Results and Discussions

Overview of Pasuruan Regency

Territory of Pasuruan Regency with an area of 1,474,015 km² is located between 112°33'55" to 113°05'37" East Longitude and between 7°32'34" to 7°57'20" South Latitude. In the north, it is bordered by Pasuruan City, Madura Canal and Sidoarjo Regency. In the south, it is bordered by Malang Regency. In the west, it is bordered by Mojokerto Regency and Batu City. In the east, it is bordered by Probolinggo Regency. Geologically, Pasuruan Regency is very diverse, and there are 3 types of rocks including surface rocks, sedimentary rocks, and volcanic rocks of the young and old quarters.

Geographically, several sub-districts located at an altitude of 0-12.5 masl have a potential for developing fisheries and aquaculture businesses. Potential districts for the development of the business include: Gempol, Beji, Bangil, Rembang, Kraton, Pohjentrek, Gondangwetan, Rejoso, Winongan, Grati, Lekok, and Nguling sub-districts. Implementation of busmetik technology in Pasuruan Regency had continued to increase from 2016 to 2020. Lekok District, especially in Tambak Lekok Village, has an area of 9.52 ha of shrimp ponds with the technology. Rejoso District, especially in Rarangan Village and Patuguran Village had 4.64 ha. Kraton District had Gerongan Village and Pulokerto Village, that covering an area of 10.78 ha. Farmers with busmetik technology initially have a pond area of between 400 – 2,000 m² per plot. But, then they changed it to an area of 400 – 700 m² per plot because it was considered more efficient, the profit was greater, and technically controlling water quality was also easier.

Financial Feasibility of Busmetik Vannamei Shrimp

Vannamei shrimp cultivation carried out in plastic ponds with a plot size of 400 m² consisted of two production cycles in a year. In general, farmers have been cultivating vannamei shrimp for 4 years. Shrimp cultivation begins with operational land preparation, seed stocking and maintenance. Shrimp harvest is done two times per cycle, when it is 60 shrimps per kg which is sold for IDR 57,000 per kg and size 45 (45 shrimps per kg) with selling price of IDR 72,000. Selling price was assumed to be fixed with interest rate for small businesses is 7%. Busmetik financing comes from own capital. Feasibility analysis consists of several details about cash outflows and inflows.

Investment Cost

Investments in shrimp cultivation generally include equipment that must be prepared at the beginning of production. Equipment used are water wheels, water pumps, tarpaulins and generators and have an economic life of five years. Investment is calculated as depreciation which was using flat method over the business life. Detailed calculation of depreciation is presented in Table 1. Equipment depreciation was IDR 4,333,333 per year. Generator functions as a provider of electricity when farmers experience problems. Wheel serves as a means of delivering air and oxygen into the pond. Oxygen carried then dissolves into the water and becomes dissolved oxygen (Amri & Haris, 2022).

Table 1. Investment depreciation costs

Equipment	Selling price (IDR/unit)	Total	Value of equipment (IDR)	Economic age (year)	Depreciation (Rp)	Percentage (%)
Water wheel	5,800,000	2 unit	11.600.000	5	2.320.000	53
Water pump	4,500,000	1 unit	1.000.000	5	200.000	5
Tarpaulin	16,000	400 m	6.400.000	5	1.280.000	30
Generator	24,000,000	1 unit	2.666.667	5	533.333	12
Total			21.666.667		4.333.333	100

Operational Cost and Income of Busmetik

Operational costs are all funds spent in the production process (Witoko, et al., 2022). The costs include variable and fixed costs incurred during the production process. Every production activity would be faced with a problem of assigning costs to facilitate necessary production factors. Costs were all cash and non-cash expenditures for busmetik process in one year with two production cycles on a business scale of 400 m². Based on Table 2, it can be seen that operational costs are dominated by variable costs with 69.02%. The largest fixed costs were electricity and labor wages, while the largest variable costs are feed and seeds. It is also similar to the results of previous studies, although the technology used was different.

Revenue is total harvest in one year multiplied by selling price. Shrimp production results were divided into two categories, i.e. size 60 and size 45. Revenue and income of shrimp cultivation were presented in Table 3. It is clear that the business is profitable because total costs are much smaller than revenue. It is similar to the previous studies.

Table 2. Operational costs of the busmetik vannamei business per year per 400 m²

No.	Component	Price (IDR/unit)	Description	Cost per cycle (IDR)	Cost per year (IDR/400 m ²)
1	Fixed cost				
	Salary	3,200,000	1 year	1,600,000	3,200,000
	Tax	2,784	1 year	1,392	2,784

No.	Component	Price (IDR/unit)	Description	Cost per cycle (IDR)	Cost per year (IDR/400 m ²)
	Electricity	8,023,043	1 year	3,677,228	7,354,456
	Water	183,363	1 year	84,042	168,083
	Transportation	180,040	1 year	82,519	165,037
	Fuel oil	1,061,702	1 year	486,614	973,227
	Total fixed cost			5,931,795	11,863,587
2	Variable cost				
	Shrimps seed	48	44,445 shrimps	2,133,360	4,266,720
	Shrimps feed	14,600	643 Kg	9,387,800	18,775,600
	Probiotics	22,000	11 L	242,000	484,000
	Omya	8,500	106 Kg	901,000	1,802,000
	Mineral	23,000	24 Kg	552,000	1,104,000
	Total variable cost			13,216,160	26,432,320
3	Total cost (1+2)			19,541,627	38,295,907

Table 3. Revenue and income busmetik per year per 400 m²

No	Size (shrimps/kg)	Production (kg)	Price (IDR/kg)	Total (IDR)
1	60	328	57,000	18,696,000
2	45	702	72,000	50,544,000
Total Revenue				69,240,000
Total Cost				42,629,240
Total Income				26,610,760

Criteria of Busmetik Business Financial Feasibility

Based on the calculations of regarding investment costs, operational costs and shrimp business income, cash flow can be arranged which is feasibility analysis (Table 4). As previously explained, the analysis was carried out of one year and two cycles. Activities carried out every month: 1) land preparation, 2) stocking and maintenance, 3) maintenance, 4) maintenance and harvesting, 5) harvesting and area drying, 6) land preparation, 7) stocking and maintenance, 8) maintenance, 9) maintenance and harvesting, 10) harvesting and drying, 11) area drying, and 12) there were no activity.

Table 4. Cash flow for vannamei shrimp busmetik (thousand IDR/month/400m²)

No.	Descriptions	Month												
		0	1	2	3	4	5	6	7	8	9	10	11	12
I	In Flow													
	Revenue					9,348	252,720				9,348	252,720		
II	Out Flow													
A	Investment Cost													
1	Water wheel	2,320	193.33	193.33	193.33	193.33	193.33	193.33	193.33	193.33	193.33	193.33	193.33	193.33
2	Water pump	200	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67
3	Tarpaulin	1,280	106.67	106.67	106.67	106.67	106.67	106.67	106.67	106.67	106.67	106.67	106.67	106.67
4	Generator	533.33	44.44	44.44	44.44	44.44	44.44	44.44	44.44	44.44	44.44	44.44	44.44	44.44
B	Operational Cost													
1	Shrimps seed			2,133.36					2,133.36					
2	Shrimps feed			3,129.27	3,129.27	3,129.27			3,129.27	3,129.27	3,129.27			
3	Probiotics			80.67	80.67	80.67			80.67	80.67	80.67			
4	Omya			300.33	300.33	300.33			300.33	300.33	300.33			
5	Mineral			184.00	184.00	184.00			184.00	184.00	184.00			
6	Labor (salary)		266.67	266.67	266.67	266.67	266.67	266.67	266.67	266.67	266.67	266.67	266.67	266.67
7	Tax													2.78
8	Electricity		668.59	668.59	668.59	668.59	668.59	668.59	668.59	668.59	668.59	668.59	668.59	
9	Water		15.28	15.28	15.28	15.28	15.28	15.28	15.28	15.28	15.28	15.28	15.28	
10	Transportation		15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	
11	Fuel oil		88.48	88.48	88.48	88.48	88.48	88.48	88.48	88.48	88.48	88.48	88.48	
	Total Outflow (A+B)	4,333.33	1,415.12	7,242.75	5,109.39	5,109.39	1,415.12	1,415.12	7,242.75	5,109.39	5,109.39	1,415.12	1,415.12	630.56
III	Net Benefit (I-II)	-4,333.33	-1,415.12	-7,242.75	-5,109.39	4,238.61	251,304.88	-1,415.12	-7,242.75	-5,109.39	4,238.61	251,304.88	-1,415.12	-630.56

Costs in the financial feasibility were calculated on monthly basis. Farmers get revenue in each cycle in the 4th month through harvesting shrimp with a size of 60 shrimps per kg, and in the 5th month through harvesting shrimp with a larger size of 45 shrimps per kg. It also applies to the second cycle. Proceeds from the first harvest turned out to be able to cover all the costs. It is a manifestation of the business efficiency so that farmers continue to exist in this mini-scale business.

Feasibility is also proven by parameters (Table 5) that meet the existing criteria. R/C and net B/C that are greater than one indicate that each unit of money invested in this business will generate greater revenues and profits. BEP price is even lower than selling price of 60 shrimps per kg. Meanwhile, BEP unit is also much lower than the number of shrimp produced $(702 + 18696000/72000) = 962$ kg (equivalent to 45 shrimps per kg).

Table 5. Parameters of busmetik financial feasibility and its sensitivity

Parameters	Normal conditions	Price decrease 20%	Production decrease 20%
R/C	1.6		
BEP unit (kg)	753		
BEP price (IDR/kg)	47,142		
NPV (IDR)	24,940,641	11,274,508	11,682,880
IRR (%)	251.9	133.9	137.8
Net B/C	1.4	1.37	1.38
Payback period	4 months 5 days	4 months 8 days	4 months 8 days

$R/C > 1$, indicating that busmetik business is feasible to develop. It is similar with the results of research by (Ariadi et al., 2021) and (Sa'adah, 2019). Time required to return investment costs is relatively fast, namely 4 months and 5 days, even compared to the age of production cycle. A positive NPV indicates that income generated in the business exceeds operational costs. It shows that busmetik business with private capital at an interest rate of 7% is feasible, provided that for one year investment in shrimp business scale of 400 m² generates a profit of IDR 24,940,641. Return on capital in this business is relatively very high, i.e. 251.9% compared to the bank's interest rate of 7% per year. Based on the financial feasibility analysis criteria, busmetik business in Pasuruan Regency is feasible to be developed. Even if, shrimp production and prices drop by 20%, the business is feasible to develop yet. Feasibility of shrimp with similar technology does not yet exist, but it is in line with (Khatimah, 2019) on shrimp cultivation on sandy land and (Witoko et al., 2019) on vannamei shrimp cultivation in marine floating net cages.

Development Strategy of Busmetik Business

Evaluation of Internal and External Factors

Identification of internal factors (strengths-weaknesses) and external factors (opportunities-threats) were assessed based on the level of importance. These level were determined based on the results of interview (questionnaire) using a weighted value.

Criteria for assigning a level of importance are as follows: if a weighted value of 4 means very important, a weighted value of 3 means important, a weighted value of 2 means somewhat important and a weighted value of 1 means that it is not important. Assessment of internal factors and external factors of vannamei shrimp culture are presented in Table 6 and Table 7.

Identification results on the strength factor in Table 6 show that the range of farmers' choices is between important to very important. It revealed that for farmers, information on how to implemented busmetik is easier to manage and the yield of vannamei shrimp has good quality due to the availability of quality seeds. Weakness factor according to farmers has an important to very important value. On the other hand, quality of human resources is also a very important factor for farmers in continuity of busmetik business.

Table 6. Internal factors importance of the busmetik strategy

Symbol	Strengths	Level of importance
S1	Availability of quality seeds	very important
S2	Shrimp produced is high quality	very important
S3	Information about maintenance of busmetik is perfectly	important
S4	Easy in busmetik management	very important
Symbol	Weakness	Level of importance
W1	Limited capital owned	important
W2	Evaluation is carried out when harvest failure occurs	important
W3	Human resources quality that is not optimal	very important
W4	Limited land occupied	important

Table 7 shows that opportunity factor had an important and very important value for farmers. Market availability was a very important factor in continuity of the business. Likewise with threat factor, which had an important to very important value. Difficult terms for borrowing capital are a very important threat factor because it takes a relatively long time to disburse loans.

Table 7. External factors importance of the busmetik strategy

Symbol	Opportunity	Level of importance
O1	Market availability	very important
O2	Shrimp prices are relatively stable	important
O3	Market information is easy to get	important
Symbol	Threat	Level of importance
T1	Disease attacks that can cause harvest failure	important
T2	Increasingly difficult capital loan requirements	very important
T3	Competition of shrimp quality produced by other farmers	important
T4	Environmental pollution	important

Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE)

IFE and EFE matrices were arranged by giving a score of 1-4 on each factor according to the level of importance. Internal and external evaluations carried out through rating, weighting and scoring were presented in Table 8 and Table 9. Table 8 shows the results of IFE getting a score of 3.51, where strength factor received a score of 1.78 and weakness with a score of 1.72. The biggest strength of busmetik business lies in the availability of quality seeds, while the biggest weakness is limited capital. Table 9 shows that EFE get a score of 3.38, where the opportunity factor gets a score of 1.40 and the threat factor with a score of 1.97. The biggest opportunity for the busmetic business is availability, while the biggest threat factor lies in environmental pollution caused by the business in the form of waste. However, this last aspect has a solution, namely every farmer must have a waste control facility (WWTP).

Table 8. Matrices of Internal Factor Evaluation (IFE)

Symbol	Strength	Rating	Weight	Score
S1	Availability of quality seeds	3.8	0.17	0.64
S2	Shrimp produced is high quality	3.5	0.12	0.41
S3	Information about maintenance of busmetik is perfectly	3.1	0.10	0.32
S4	Easy in busmetik management	3.6	0.12	0.42
Total strength			0.50	1.78
Symbol	Weakness	Rating	Weight	Score
W1	Limited capital owned	3.4	0.15	0.50
W2	Evaluation is carried out when harvest failure occurs	3.2	0.12	0.37
W3	Human resources quality that is not optimal	3.7	0.13	0.49
W4	Limited land occupied	3.4	0.10	0.35
Total weakness			0.50	1.72
Total Internal			1.00	3.51

Table 9. Matrices of External Factor Evaluation (EFE)

Symbol	Opportunity	Rating	Weight	Score
O1	Market availability	3.7	0.16	0.58
O2	Shrimp prices are relatively stable	3.5	0.09	0.32
O3	Market information is easy to get	3.2	0.16	0.50
Total Opportunity			0.41	1.40
Symbol	Threat	Rating	Weight	Score
T1	Disease attacks that can cause harvest failure	3.1	0.18	0.56
T2	Increasingly difficult capital loan requirements	3.5	0.18	0.61
T3	Competition of shrimp quality produced by other farmers	3.1	0.05	0.16
T4	Environmental pollution	3.5	0.18	0.64
Total Threat			0.59	1.97
Total External			1.00	3.38

Based on the evaluation results, it is possible to predict the strategic position of busmetik vannamei. Strategic position of the business in the SWOT quadrant is

determined as follows: 1) X axis is determined by reducing strength factor score by the weakness factor score, which is $1.78 - 1.72 = 0.06$, 2) Y axis is determined by reducing opportunity factor score by the threat factor score, which is $1.40 - 1.97 = -0.57$. Mapping of values on the X-axis and Y-axis (coordinates) into the SWOT quadrant can be seen in Figure 1.

Figure 1 shows that busmetik business strategy is in the position of diversification strategy. Its position has an implication that implementation of busmetik technology had a greater opportunity than the threat. Opportunities available include market share available at relatively stable prices because market information for vannamei shrimp is easy to obtain. In addition to great opportunities, busmetik business had threats, such as disease, competition for quality of shrimp circulating in the market, to environmental pollution due to waste water and shrimp that have died during the rearing process. Therefore, to minimize threats, it is necessary to improve quality of human resources so that proper maintenance management based on vannamei shrimp rearing standards can be well controlled by farmers. Based on the SWOT analysis, there are 6 (six) alternative strategies in shrimp farming with busmetik technology: (1) classifying product size based on quality; (2) increase production volume with optimal land use; (3) integrated production management; (4) product differentiation; (5) training program planning; and (6) cooperate with third parties for assistance.

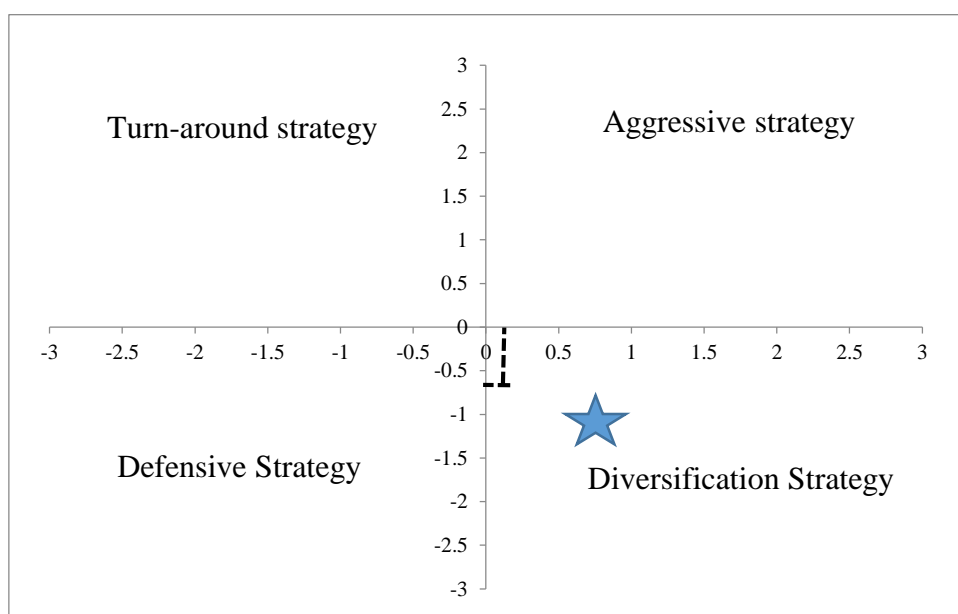


Figure 1. Matrix of SWOT quadrant of the busmetik strategy

Classification based on quality (size) is one step in maintaining and increasing price of vannamei shrimp. Shrimp marketed with similar size and quality, will have a high economic value compared to shrimp marketed with various qualities. Limited land owned is not an obstacle to increase income. One way is to optimize land use so that production volume increases by continuously rearing shrimp. It will create an integrated production management so that it can meet market demand both in terms of quantity and quality of vannamei shrimp.

Busmetik business continues to grow so as to bring in competitors with similar products and equal quality. One of the steps to overcome it is to differentiate shrimp products by increasing the types of shrimp that are cultivated. New type of shrimp must be able to meet market segment. To make it happen, it is necessary to present programs that are able to improve quality of human resources, such as training in shrimp rearing management to handling waste.

Conclusions

Busmetik vannamei shrimp farming in Pasuruan Regency is feasible to be developed based on investment criteria: R/C and B/C greater than one, short payback period, BEP price and production lower than real price and production, positive NPV, and higher IRR higher than the bank interest rate. Sensitivity analysis on the decline in production and prices by 20% resulted in the similar conclusion that the business is just feasible.

Strategy analysis using a SWOT approach shows that the relevant development position is diversification strategy. There are six strategies recommended for the development of busmetik vannamei shrimp farming business, namely 1) classifying product size based on quality; 2) increase production volume with optimal land use; 3) integrated production management; 4) product differentiation; 5) training program planning; and 6) cooperate with third parties for assistance.

Government can facilitate farmers through provision of loan funds considering receipt of indirect payments in cash, so that business will be sustainable. In the future, further research with focus on the business sustainability will be conduct because to be able to carry out this cultivation, farmers must pay attention to environmental conditions. WWTP must be made first.

Author Contributions

The first author is in charge of collecting and analyzing data, as well as compiling a draft manuscript. The second author is in charge of compiling tabulation results and data analysis, revising draft articles, adjusting templates, submitting and correspondence. The third author collects articles for reference.

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Original Research

The Prediction of Professional Skepticism Components Based on the Big Five Personality Traits of Auditing Partners

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Abstract

Professional skepticism is an integral part of successful auditing. The trait of professional skepticism has been identified in psychological research as an enduring personality trait. This study aimed to investigate the prediction of professional skepticism components based on the Big Five personality traits of auditing partners of the Iranian Association of Certified Public Accountants (IACPA). To that end, the participants consisted of 231 male auditing partners. Our research results suggest that personality traits, including extroversion, agreeableness, conscientiousness, and openness to experience, positively predict the professional skepticism components, including a search for knowledge, self-esteem, interpersonal understanding, autonomy, and a questioning mind. Neuroticism negatively predicts the professional skepticism components mentioned. Also, extroversion, agreeableness, conscientiousness, and openness to experience negatively predict suspension of judgment. Neuroticism positively predicts the suspension of judgment. These findings can aid audit firms in the recruitment procedure of auditors and assist accounting and auditing educators in guiding students in their career tracks.

Keywords: Auditing partners, big five personality traits, professional skepticism.

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Introduction

The complexity and uncertainty of economic conditions worldwide have sharpened the public expectation for more reliable and accurate financial statement information. Auditing is the only profession in the Netherlands that legally approves skepticism, treating it as a vital component of auditing (Quadackers, 2009; Yankova, 2015). The significance of this profession has increased more than before following financial scandals such as Enron and WorldCom in the United States, as well as Ahold and Parmalat in Europe (Sanusi et al., 2010).

The primary cause of many audit problems is not applying professional skepticism on the part of auditors (Beasley et al., 2001; Glover and Prawitt, 2014). As a result, auditors are invariably advised to maintain a desirable level of professional skepticism (Payne and Ramsay, 2005). This will enable them to identify any significant misstatements in the financial statements (Larimbi et al., 2013) and prevent many deficiencies in auditing (Glover and Prawitt, 2014; Hamshari et al., 2021). Auditors who characteristically display such an attitude of professional skepticism could have an extraordinary advantage for the auditing profession (Hussin et al., 2017; Hussin et al., 2019).

Research indicates that professional skepticism is a psychological construct that varies among individuals (Hurt, 2010). Therefore, depending on their different personality traits, auditors can employ various levels of professional skepticism (Nelson, 2009; Regbiantari and Narsa, 2021). Accordingly, Personality traits affect auditors' behavior and ability to apply professional skepticism accurately in various situations (Crant, 2006; Glover and Prawitt, 2014; Samagaio and Felício, 2022).

Some studies addressed the factors affecting professional skepticism (Agarwalla et al., 2017; Andreas, 2016; Brazel et al., 2016; Persellin et al., 2019). Also, some sought to explain the role of personality traits on professional skepticism in accounting students (Farag and Elias, 2016; Karahan, 2022). But, so far auditing partners have not been investigated. So, the present study evaluates whether auditing partners' Big Five personality traits predict their professional skepticism. Our theoretical prediction is that the Big Five personality traits will predict the traits of professional skepticism in auditing partners. If such an effect is found, it will help audit firms to recruit the best candidates for audit jobs and highlight which employees may need additional training or oversight to ensure they are sufficiently skeptical. Also, it will help accounting and auditing educators to guide students better in making choices for a career path.

The contributions of the present research to the literature are as follows: First, it presents the extent of the trait of professional skepticism among auditing partners. Second, it shows which personality traits are related to auditing partners' professional skepticism.

The paper is structured as follows: This introduction is followed by a review of the relevant literature concerning professional skepticism and personality traits. This is followed by discussing the research method and the study's results. Finally, the outcome of our findings discusses as well as future research directions.

Literature review and hypothesis

Personality traits

Numerous studies show that personality is composed of five primary traits: neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A), and conscientiousness (C) (Cobb-Clark and Schurer, 2012; Gosling et al., 2003; John and Srivastava, 1999; McCrae and Costa, 2003; Van Kuijk, 2020). Research in psychology has shown the influence of personality characteristics on organizational behavior. (Farak and Elias, 2016). Neuroticism is how a person responds to stressful situations (Costa and McCrae, 2008; Horzum et al., 2017; Parlak and Sazkaya, 2018). Extraversion is associated with an individual's vitality and freshness (Kajonius and Mac Giolla, 2017; Van Dijk et al., 2017; Van Kuijk, 2020). Because, Extroverts often experience positive emotions and enjoy interacting with others (Milfont et al., 2015; Soto, 2018; Van Kuijk, 2020). Openness to experience reflects a person's intellectual curiosity, and high levels characterize people who enjoy the exploration process (McCrae and Costa, 1997; Mhlanga, 2019; Van Dijk et al., 2017; Van Kuijk, 2020). Individuals with agreeable personalities tend to trust, be altruistic, and be more eager to help others (Costa and McCrae, 2008; Kvasova, 2015; Van Kuijk, 2020). Conscientiousness is an individual's natural tendency to be fair, accountable, and hardworking (Costa and McCrae, 1998; Khalid and Sekiguchi, 2019; Van Kuijk, 2020).

Professional skepticism and its measurement

The leading cause of most lawsuits against auditors is their failure to exercise professional skepticism (Messier et al., 2010; Juliana et al., 2021; Winantyadi and Waluyo, 2014). According to the US Public Company Accounting Oversight Board (PCAOB, 2021), the Audit Inspection Unit of the UK's Professional Oversight Board (Unit AI, 2010), and the Australian Securities and Investment Commission (Securities, 2011), the application of professional skepticism is essential in auditing (Doty, 2011). Therefore, auditors must maintain such an attitude by challenging information and evidence throughout the audit process (Noldera and Kadousb, 2018).

In fact, there are more likely more skeptical auditors to question and evaluate information before making decisions (Hurt et al., 2013). Auditors make better decisions when they have more accurate and convincing evidence. It has been established by Hurt et al. (2010) skeptical auditors systematically exhibit more different behaviors and act more independently as well (Bunge, 1991; Kurtz, 1992; Graham, 2019). Additionally, there are less likely to easily accept others' claims (Bunge, 1991; Graham, 2019). Such auditors can better detect inconsistencies in the evidence and claims of others (Kurtz, 1992; Graham, 2019).

By way of analysis of the relevant standards led Hurt (2010) to identify six behavioral characteristics associated with auditors' professional skepticism. These six characteristics are labeled: questioning mind, suspension of judgment, search for knowledge, interpersonal understanding, autonomy, and self-esteem. In the field of auditing, several academic papers Hurt's six-factor scale which measures auditor skepticism is supported. (Janssen et al., 2020; Popova, 2013; Quadackers et al., 2009).

In the US, the Audit Quality Center regards The Hurtt Professional Skepticism Scale as a credible measure in this domain. Additionally, academic and professional sources support the importance of these six factors presented (PCAOB, 2021).

1. Questioning mind: an auditor's questioning mind in professional skepticism plays a vital role, because finding whether evidence obtained indicates that significant distortion occurred due to fraud or not (AICPA, 2020; Dimitrova and Sorova, 2016).

2. Suspension of judgment: Auditors should avoid making decisions before gathering sufficient evidence (AICPA, 2016; Nickell, 2012).

3. Search for knowledge: Searching for knowledge reduces uncertainty by acquiring more information (Sorova and Dimitrova, 2016).

4. Interpersonal understanding: Interpersonal understanding indicates that the motivations and behaviors of individuals providing audit evidence can affect the quality of evidence; due to the fact that people may have different perceptions of an event. These different perceptions can lead to misinformation and misleading (Fullerton and Durtschi, 2004; Hussin and Iskandar, 2015).

5. Autonomy: Researchers in auditing regard autonomy as a fundamental feature of the auditing profession (Ciolek, 2017), as auditors need to be independent in their judgments and not influenced by the beliefs and opinions of others (Kurtz, 1992; Hussin and Iskandar, 2015).

6. Self-esteem: refers to one's attitude towards oneself (Boyle et al., 2016). Therefore, the higher an individual's self-esteem, the more independent their thought processes are when performing audit procedures (Kurtz, 1992), and having such an attitude makes the auditors act more independently (Ciolek, 2017).

Research hypotheses

Personality is one factor that can be used to determine a person's level of performance (Regbiyantari and Narsa, 2021). Auditing is a profession that requires different personality traits in different stages of auditing.

Farag and Elias (2016) and Karahan (2022) suggest that the Big Five personality traits predict six professional skepticism components: knowledge, self-esteem, interpersonal understanding, autonomy, suspension of judgment, and a questioning mind.

The Big five personality traits are expected to predict the questioning mind because previous research showed that the personality trait of agreeableness is positively associated with the questioning mind (Witt et al., 1991). Farag and Elias (2016) showed that accounting students with positive personality traits would be more inclined to question, thereby impacting positively on their work. Karahan (2022) showed that extraversion with a questioning mind had a significant and positive relationship. This relationship can be attributed to extroverts' stronger tendency to share their opinions with others, their proneness to seeking thrills, and skepticism in investigations. With these traits, extroverts perform better in their careers and also have more professional

skepticism (De Bruin and Rudnick, 2007; Farag and Elias, 2016; Watson and Clark, 1992; Wilmot et al., 2019).

H1. The Big Five personality traits predict a questioning mind.

The Big five personality traits are expected to predict the search for knowledge because previous research indicates that individuals with positive personality traits are more inclined to seek information and have more professional skepticism (Fullerton and Dourtschi, 2004; Farag and Elias (2016). Also, in complex and challenging conditions, individuals with high professional skepticism can easily control these conditions and overcome their skepticism by collecting enough evidence (Hurtt, 2010; Linn et al., 1982). Accordingly, Conscientiousness, extraversion, and openness to experience contribute significantly to explaining the variable of the search for knowledge. Individuals with conscientiousness and openness to experience are curious and enthusiastic about discovering more, therefore, displaying higher skepticism (Karahana, 2022).

H2. The Big Five personality traits predict the search for knowledge.

The Big five personality traits are expected to predict the suspension of judgment because extraversion, conscientiousness, and openness to experience have an inverse and significant relationship with the suspension of judgment, while neuroticism has a significant positive relationship with it (Farag and Elias, 2016; Karahan, 2022). Individuals with personality traits of extraversion, conscientiousness, and openness to experience will continue to collect and objectively evaluate the evidence until their evidence satisfies them sufficiently to decide the integrity and accuracy of their financial statements (Karahana, 2022).

H3. The Big Five personality traits predict the suspension of judgment.

The Big five personality traits are expected to predict interpersonal understanding because previous research showed the Big five personality traits have efficacy on job performance. Therefore, this rule also applies to the auditing profession (Barrick and Mount, 1991; Rothmann and Coetzer, 2003; Salgado, 1997; Seibert and Kraimer, 2001). Extraversion and openness to experience significantly correlate with interpersonal understanding (Farag and Elias, 2016; Karahan, 2022).

H4. The Big Five personality traits predict interpersonal understanding.

The Big five personality traits are expected to predict self-esteem because personality traits with self-esteem have a significant relationship (Farag and Elias, 2016). Positive self-perception is associated with better performance among individuals with more self-esteem. (Tkach and Lyubomirsky, 2006; Barrick et al, 2001). Therefore, its existence is an indispensable factor in professional skepticism (Bunge, 1991) because in applying auditing procedures auditors appear more independent (Ciolek, 2017). Self-esteem is influenced significantly by personality traits such as conscientiousness and openness to experience (Karahana, 2022).

H5. The Big Five personality traits predict self-esteem.

The Big five personality traits are expected to predict autonomy because personality traits have a positive relationship with autonomy (Farag and Elias, 2016). The personality trait of openness to experience is an autonomy valid predictor as auditors who are greater freedom of choice are less likely to trust management's claims and it is unlikely to be influenced easily by management's claims (Bing and Lounsbury, 2000; Karahan, 2022).

H6. The Big Five personality traits predict the autonomous.

The Big five personality traits are expected to predict professional skepticism due to the significant correlations between them and professional skepticism components (Farag and Elias, 2016; Karahan, 2022). Pacini and Epstein (1999) believe extraversion positively correlates with experientiality and rationality. Oreg and Sverdlik (2014) state that extroverts can convince others more effectively which indicates their assertiveness. Linn et al. (1982) also believes that individuals with higher professional skepticism have more effective face-to-face communication skills with the employer, which can originate from their self-esteem. Individuals with agreeable personalities are usually self-sacrificing towards others or life events (Rothmann and Coetzer, 2003). Additionally, agreeable individuals maintain that dishonesty reduces the credibility of financial statements and has a negative effect on those using financial statements. Thus, these individuals apply a high degree of skepticism in auditing (Muntada, 2013; Farag and Elias, 2016). Similar to extraversion, Pacini and Epstein (1999) believe that rationality, experientiality, and agreeableness have a positive relationship. Conscientious individuals are hardworking and want to do their best, making them behave cautiously (Burch and Anderson, 2009). Professional skepticism is a crucial factor in the success of an auditing process (Steel, 2007). Individuals with neuroticism tendencies have less control over stress (Hough et al., 1990). Having stress prevents them from dealing with problems and displaying professional skepticism (Carver and Connor-Smith, 2010). People with high openness to experience are more curious, this characteristic leads them to seek out new ideas, and also have high skepticism (Farag and Elias, 2016; McCrae and Costa, 1997).

H7. The Big Five personality traits predict professional skepticism components.

Research method and statistical results

Participants

The statistical population of this research includes all male auditing partners working in audit firms under the membership of the Iranian Association of Certified Public Accountants (IACPA) in 2019 in Iran. Based on Cochran's Formula and by accepting an error of 5%, the required number of samples reached 300 people. In order to observe conservatism, 350 paper questionnaires were distributed among the community, of which 231 out of 300 returned questionnaires were usable.

In this study, personality traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience) were the predictor variables, and the criterion variables were professional skepticism subscales (suspension of judgment, search for knowledge, self-esteem, interpersonal understanding, autonomy, and questioning mind).

Data were analyzed using IBM SPSS Statistics 26 and IBM SPSS Amos 24 to calculate descriptive and inferential statistics (Pearson correlation coefficients, multiple linear regression, and path analysis).

Research instruments

Big Five personality characteristics

In order to measure the Big Five personality characteristics, we used the NEO Five-Factor Inventory (Costa and McCrae, 1992). It consists of 60 items (12 for each trait) answered with a Likert Scale ranging from 0 (absolutely disagree) to 4 (absolutely agree). Many studies have administered a valid Persian version of this questionnaire to Iranian samples: Faramarzi et al., 2013; Faramarzi and Salmalian, 2014. As reported in the Anisi study, Cronbach's alpha values for extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience were respectively .75, .75, .82, .84, and .74 (Anisi, 2012). In this study, Cronbach's alpha coefficients for neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness were .83, .82, .85, and .80 respectively.

Professional skepticism

The questionnaire developed by Hurtt (2010) was used to measure professional skepticism traits. It is a scale composed of 30 items that are scored on a six-point Likert scale from 1 (strongly disagree) to 6 (strongly agree). The questions are in the form of positive statements in twenty-two cases. The remaining eight questions are reversed statements. The total professional skepticism score ranges from 30 to 180, and higher scores reflect higher levels of professional skepticism. As reported in the Royale et al. study, Cronbach's alpha value for suspension of judgment, search for knowledge, self-esteem, interpersonal understanding, autonomy, and a questioning mind were respectively .59, .72, .60, .92, .59, and .78 (Royae et al., 2013). In this study, Cronbach's alpha coefficients were the suspension of judgment, search for knowledge, self-esteem, interpersonal understanding, autonomy, and questioning mind, respectively (.71, .52, .61, .63, .66, and .50).

Results

Table 1 shows the descriptive statistics (minimum, maximum, means, standard deviations, skewness, kurtosis) of the variables for the Big Five personality traits and the six components of professional skepticism.

Table 1. Descriptive statistics (N = 231)

Variable	Min	Max	Mean	SD	Skew	Kurt
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Personality Traits	-	-	-	-	-	-
Extraversion	31	51	37.14	5.93	0.63	- 0.76
Agreeableness	28	55	37.43	5.90	0.112	- 0.55
Conscientiousness	29	53	37.51	5.47	0.66	- 0.56
Neuroticism	25	43	28.86	6.14	- 0.36	0.48
Openness to experience	26	55	38.01	6.62	0.65	- 0.70
Professional Skepticism Components	-	-	-	-	-	-
Search for knowledge	10	30	20.17	4.42	-0.58	-0.27
Suspension of judgment	7	29	19.70	4.61	-0.43	-0.11
Self-esteem	6	25	17	4.02	0.04	-0.626
Interpersonal understanding	4	25	16.07	4.30	-0.22	-0.374
Autonomy	7	31	20.32	4.92	-0.37	-0.402
Questioning mind	4	15	9.14	2.45	-0.09	-0.119

Table 2 shows the correlation results. There were positive and significant correlations between professional skepticism subscales (search for knowledge, self-esteem, interpersonal understanding, autonomy, and questioning mind) and personality traits (extraversion, agreeableness, conscientiousness, and openness to experience). Table 2 shows negative statistically significant correlations between suspension of judgment and personality traits (extraversion, agreeableness, conscientiousness, and openness to experience). There is a positive statistically significant correlation between suspension of judgment and neuroticism and a negative statistically significant correlation between neuroticism and several professional skepticism subscales (search for knowledge, self-esteem, interpersonal understanding, autonomy, and a questioning mind).

Table 2. Correlation matrix between personality traits and professional skepticism components

Variable	Search for knowledge	Suspension of judgment	Self-esteem	Interpersonal understanding	Autonomy	Questioning mind
Extraversion	0.37**	-0.71**	0.55**	0.58**	0.54**	0.55**
Agreeableness	0.57**	-0.58**	0.62**	0.66**	0.57**	0.51**
Conscientiousness	0.55**	0.59**	0.66**	0.66**	0.60**	0.52**
Neuroticism	-0.44**	0.69**	-0.56**	-0.60**	-0.59**	-0.50**
Openness	0.51**	-0.64**	0.58**	0.64**	0.62**	0.52**

**Indicates significance at the 0.01 level.

*Indicates significance at the 0.05 level.

Multiple regression was used to examine the predictive role of personality traits on professional skepticism and its subscales (see Table 3). Results show that each personality trait was predictive of the professional skepticism subscales.

According to the findings, personality traits significantly predict a questioning mind ($R=0.32$, $R^2=0.566$, $F=21.1$, $P=0.001$). Among the dimensions of personality,

extraversion ($\beta=0.399$, $t=2.726$, $P=0.007$), agreeableness ($\beta=0.495$, $t=8.884$, $P=0.001$), conscientiousness ($\beta=0.363$, $t=6.451$, $P=0.001$), and openness to experience ($\beta=0.226$, $t=5.955$, $P=0.001$) were positive and meaningful predictors of questioning mind thus neuroticism ($\beta=0.188$, $t=-3.474$, $P=0.001$) was a negative and significant predictor of questioning mind. In other words, the analyses indicated that personality trait scores could explain 32% of the total variance in the questioning mind (Table 3, model 1).

The second model indicates that personality traits significantly predict the search for knowledge ($R=0.412$, $R^2=0.642$, $F=31.4$, $P=0.001$). Extraversion ($\beta=0.692$, $t=5.092$, $P=0.001$), agreeableness ($\beta=0.426$, $t=3.062$, $P=0.002$), conscientiousness ($\beta=0.423$, $t=2.848$, $P=0.005$), and openness to experience ($\beta=0.359$, $t=2.807$, $P=0.005$), among the dimensions of personality, were positive significant predictors of the search for knowledge, whereas neuroticism ($\beta=-0.467$, $t=-5.820$, $P=0.001$) was a negative and significant predictor. Thus, based on the analyses, personality trait scores can explain 41% of the total variance in the search for knowledge.

In the third model, findings indicate that a suspension of judgment is significantly predicted by personality traits ($R=0.116$, $R^2=0.34$, $F=54.4$, $P=0.001$). Extraversion ($\beta=-0.604$, $t=-5.068$, $P=0.001$), agreeableness ($\beta=-0.530$, $t=-12.138$, $P=0.001$), conscientiousness ($\beta=-0.239$, $t=-2.835$, $P=0.038$), and openness to experience ($\beta=-0.276$, $t=-6.330$, $P=0.001$) were significant and negative predictors of suspension of judgment, while neuroticism ($\beta=0.367$, $t=3.429$, $P=0.001$) was positive and significant. According to the findings of the analyses, personality traits explained 11% of the total variance in the suspension of judgment.

According to the study, personality traits predict interpersonal understanding significantly ($R=0.476$, $R^2=0.69$, $F=40.7$, $P=0.001$). Extraversion ($\beta=1.137$, $t=21.678$, $P=0.001$), agreeableness ($\beta=0.294$, $t=2.242$, $P=0.026$), conscientiousness ($\beta=0.279$, $t=1.987$, $P=0.048$), and openness to experience ($\beta=0.248$, $t=2.054$, $P=0.041$), among the dimensions of personality, were positive and meaningful predictors of an interpersonal understanding, whereas neuroticism ($\beta=-0.526$, $t=-10.347$, $P=0.001$) was a negative and significant predictor. Therefore, it appears that personality traits explain 47% of the total variance in interpersonal understanding (Table 3, Model 4).

The fifth model demonstrates that self-esteem is significantly predicted by personality traits ($R=0.448$, $R^2=0.669$, $F=36.4$, $P=0.001$). It was found that Indicators of extraversion ($\beta=0.874$, $t=14.666$, $P=0.001$), agreeableness ($\beta=0.337$, $t=8.312$, $P=0.001$), conscientiousness ($\beta=0.618$, $t=4.464$, $P=0.001$), and openness to experience ($\beta=0.158$, $t=4.426$, $P=0.001$) most significantly and positively predict self-esteem whereas neuroticism ($\beta=-0.426$, $t=-7.365$, $P=0.001$) significantly and negatively predicts self-esteem. Accordingly, it has been determined that personality trait scores can explain 44% of self-esteem variance. 2.547

Table 3. Results of multiple regression analysis between personality characteristics and professional skepticism

**Indicates significance at the 0.01 level.

Model	Criterion Variable	Predictor Variables	R	R ²	Adjusted R ²	F	Sig.	β	t	Sig.
1	Questioning mind	Constant	0.566	0.32	0.305	21.1	0.001		61.33	0.001**
		Neuroticism						0.188	-3.474	0.001**
		Extraversion						0.399	2.726	0.001**
		Agreeableness						0.495	8.884	0.001**
		Openness						0.226	5.955	0.001**
		Conscientiousness						0.363	6.451	0.001**
2	Search for knowledge	Constant	0.642	0.412	0.399	31.4	0.001		2.36	0.019*
		Neuroticism						-0.467	-5.820	0.001**
		Extraversion						0.692	5.092	0.001**
		Agreeableness						0.426	062.3	0.002**
		Openness						0.359	2.807	0.005**
		Conscientiousness						0.423	2.848	0.005**
3	Suspension of judgment	Constant	0.34	0.116	0.096	54.4	0.001		5.279	0.001**
		Neuroticism						0.367	3.429	0.001**
		Extraversion						-0.604	5.068	0.001**
		Agreeableness						-0.530	-12.138	0.001**
		Openness						-0.276	-6.330	0.001**
		Conscientiousness						-0.239	-2.835	0.038*
4	Interpersonal understanding	Constant	0.69	0.476	0.464	40.7	0.001		1.49	0.138
		Neuroticism						-0.526	-10.374	0.001**
		Extraversion						1.137	21.678	0.001**
		Agreeableness						0.294	2.242	0.026*
		Openness						0.248	2.054	0.041*
		Conscientiousness						0.279	1.987	0.048*
5	Self esteem	Constant	0.669	0.448	0.436	36.4	0.001		6.603	0.001**
		Neuroticism						-0.426	-7.365	0.001**
		Extraversion						0.874	14.666	0.001**
		Agreeableness						0.337	8.312	0.001**
		Openness						0.158	4.426	0.001**
		Conscientiousness						0.618	4.426	0.001**
6	Autonomy	Constant	0.655	0.429	0.417	33.7	0.001		3.574	0.001**
		Neuroticism						-0.281	-2.335	0.02**
		Extraversion						0.317	2.37	0.019*
		Agreeableness						0.375	2.574	0.035*
		Openness						0.491	3.895	0.001**
		Conscientiousness						0.282	2.925	0.045*

*Indicates significance at the 0.05 level.

Findings reveal that personality traits significantly predict autonomy ($R=0.429$, $R^2=0.655$, $F=33.7$, $P=0.001$). Results showed that extraversion ($\beta=0.317$, $t=2.37$, $P=0.019$), agreeableness ($\beta=0.375$, $t=2.547$, $P=0.035$), conscientiousness ($\beta=0.282$, $t=2.925$, $P=0.045$), and openness to experience ($\beta=0.491$, $t=3.895$, $P=0.001$), most strongly and positively predicted autonomy whereas neuroticism ($\beta=-0.281$, $t=-2.335$, $P=0.02$), considerably and negatively predicted autonomy. The analyses showed that personality trait scores explained 42% of the total variance in autonomy (Table 3, model 6). Therefore, our findings can support the research hypotheses regarding which personality traits significantly predict professional skepticism subscales.

In order to evaluate examining the effect of the dimensions of big five personality traits on the characteristics of professional skepticism utilized path analysis (Fig.1). Each of these fit indices indicates that the hypothesized model provides a good fit to the data. (Table 4). Also, the model explained 54.7% of the total variation in professional skepticism by personality traits.

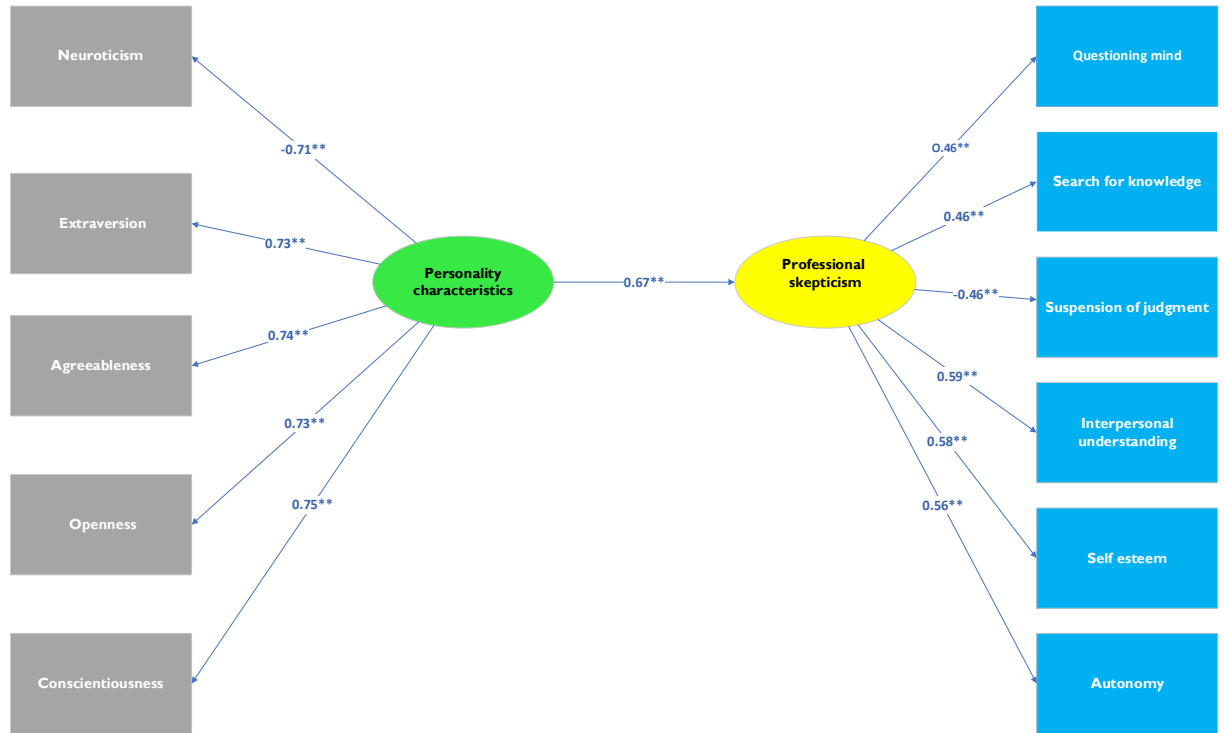


Figure 1. Path analysis diagram of the effect of the dimensions of big five personality traits on the characteristics of professional skepticism.

Table 4. Model fitting information

Fit Index	Chi-square value	(X2/df)	CFI	NFI	IFI	RMSEA	P-value
Value	0.001	4.887	0.900	0.886	0.901	0.160	0.227

Table 5 shows that dimensions of personality traits and professional skepticism directly impacted the total variable of personality traits and professional skepticism traits, respectively. Moreover, personality traits directly impacted professional skepticism ($\beta=0.67$, $P=0.001$). Thus, this study supported the research hypothesis regarding the direct effect of personality traits on professional skepticism.

Table 5. Estimation of direct effect coefficients

Variables	β	S. E
Direct effect of personality characteristics		
Neuroticism	-0.71**	0.14

Extraversion	0.72**	0.11
Agreeableness	0.74**	0.9
Openness	0.73**	0.12
Conscientiousness	0.75**	0.6
Direct effect of professional skepticism		
Search for knowledge	0.66**	0.11
Suspension of judgment	-0.66**	0.11
Self esteem	0.38**	0.63
Interpersonal understanding	0.49**	0.6
Autonomy	0.76**	0.10
Questioning mind	0.66**	0.33
Direct effect of personality characteristics on professional skepticism	0.67**	0.46

**Indicates significance at the 0.01 level.

*Indicates significance at the 0.05 level.

Discussion

The current research investigated the relationship between personality traits and professional skepticism in auditing partners using path analysis and multiple regression. Results showed that the Big Five personality traits are significant predictors of professional skepticism.

Hypothesis 1 (Table 3) indicates that personality traits significantly predict the questioning mind. Our findings confirmed the first hypothesis of the study. The European and American auditing standards indicate that the questioning mind is a paramount constituent feature of professional skepticism; therefore, auditors perform better by having a questioning mind. This finding is consistent with the results of research by Farag and Elias (2016) and Karahan (2022), indicating that students with positive personality traits will be more inclined to question and thus positively affect their work. The personality trait of agreeableness is one of the most crucial predictors of the questioning mind. Also, agreeableness is a valid predictor (Witt et al., 2002), as confirmed in our research.

Hypothesis 2 (Table 3) indicates that personality traits significantly predict the search for knowledge and confirm the second hypothesis of the research. This result is consistent with the findings of Farag and Elias (2016) and Karahan (2022). Fullerton and Dourtschi (2004) believe that skeptical auditors seek more information, and extraversion is a significant predictor of the search for knowledge.

Hypothesis 3 (Table 3) holds that personality traits significantly predict suspension of judgment. The findings confirm the third hypothesis of the study. Based on these results, extraversion is a negative and significant predictor and one of the most important predictors of suspension of judgment, while neuroticism is a positive and significant predictor of suspension of judgment. These findings agree with Farag and Elias (2016) and Karahan (2022).

In order to investigate Hypothesis 4 (Table 3), personality traits significantly predict interpersonal understanding. As a result of this study, the four hypotheses were

confirmed. This result is consistent with the finding by Farag and Elias (2016). Besides, in explaining the role of personality traits on interpersonal understanding, extraversion is one of the most important predictors of interpersonal understanding. Several studies that shown the effect of five-factor personality traits on job performance. The results of these studies indicate that Characteristics Five personality factors positively affect job performance (Barrick and Mount, 1991; Rothmann and Coetzer, 2003; Salgado, 1997; Seibert and Kraimer, 2001). The auditing career is no exception to this rule.

Hypothesis 5 (Table 3) shows that personality traits significantly predict self-esteem and confirm the fifth Hypothesis. Extraversion is one of the most important predictors of self-esteem. Individuals with more robust self-esteem have a more positive perception of themselves, affecting their performance (Tkach and Lyubomirsky, 2006). Therefore, its existence is an indispensable factor in professional skepticism (Bunge, 1991). This allows the auditor to appear independent while performing audit procedures (Ciolek, 2017). This finding agrees with Farag and Elias (2016) and Karahan (2022).

Hypothesis 6 (Table 3) indicates that personality traits significantly predict autonomy. This was confirmed by our finding, which is consistent with the results of Farag and Elias (2016) and Karahan (2022). In explaining the role of personality traits on autonomy, openness to experience is one of the most important predictors of autonomy. Bing and Lounsbury (2000) assert that openness to experience is a valid predictor, which can also be seen in our research.

As indicated by Hypothesis 7, personality traits significantly predict professional skepticism. Our findings confirm the seventh hypothesis. According to the coefficients of path analysis, the more positive personality traits in individuals, the more their professional skepticism increases and positively affects their performance in the audit profession. These findings are consistent with the results of research by Farag and Elias (2016) and Regbiyantari and Narsa (2021), and Karahan (2022). Also, professional skepticism among auditors positively affects their performance (Hurt et al., 2013).

Conclusion

This is the first study to examine the impact of personality traits on professional skepticism in auditing partners. The effect of these variables is explained in our findings. The limitations of this study are the small sample size and the use of questionnaires as the sole means of data collection. Another limitation is that the samples were only selected from male audit partners. Future research could benefit from the test MBTI more effectively as it is designed to identify the most suitable job for individuals. Further, it is expected to conduct studies on gender differences in auditing partners. Also, Researchers could use interviewing instead of questionnaires which will enable researchers to gain better insight and provide them with more accurate information about the subject at hand.

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Original Research

Peoples Income and Consumption Pattern during & before COVID-19 Pandemic: A Study in the Northern Areas of Bangladesh

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Abstract

The SARS COV2 pandemic hits the life and livelihoods of millions and consequently slows down the world economy. The pandemic hits hard the specific social groups due to travel restrictions/bans and other regulations that affect their income and consumption patterns. The goal of this paper is to find out whether the pandemic has any effect on consumption and income patterns among consumers in rural settings. To implement this study, structured questionnaires were sent to respondents and collect data from 180 samples living in rural areas of four different administrative districts in Bangladesh such as Rajshahi, Bogura, Naogaon, and Natore. Using paired sample T-test (parametric) and Wilcoxon signed ranked test (nonparametric) test found that pandemics had a significant effect on the pattern of consumption and income in the northern area of Bangladesh. While the Keynesian method of income determination shows that the MPC before the COVID-19 pandemic was 0.31 and during it was 0.37. This shows that consumers would like to consume at a higher level compared to them before the COVID-19 pandemic. Overall, the study revealed that though the pandemic significantly affect consumers' income to reduce, consumption levels inclines fuelled by the fear of panic buying during the pandemic. Government should have preparedness to provide essential goods during any natural disasters or pandemic-like events.

Keywords: Pandemics, COVID-19, Consumption habits, MPC, Northern Bangladesh.

JEL classification: D1, D11, D12

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Introduction

The global civilization confronted one of its greatest problems in historical remembrance at the commencement of the year 2020: a pandemic of widely identified coronavirus. This disease which produces a severe respiratory illness (COVID-19), expanded quickly over the planet, culminating in a worldwide catastrophe that compelled governments to take drastic steps to halt its proliferation (Liu et al., 2020). As a result, social distance remained a primary goal, resulting in the closing of schools, industries, offices, and markets, as well as border acceptance emergency markets and hospitals. So that this pandemic exacerbated the global supply disruptions (Ranney et al., 2020). However, in Bangladesh like in other countries, the manufacturing firms such as garments, agricultural goods, fast-moving consumer goods, and some other manufacturing industries were continuing their production to activate the wheel of the national economy (Better Work, 2020). However, due to (COVID-19), this is one of the worst times ever for all countries, and the world is facing serious difficulties.

The forced partial or complete lockdown of the nations is having a severe economic impact. In addition to the deaths caused by COVID-19, there have been closures of factories, a halt in production, essentially normal business operations, millions of job losses, and financial crises in several countries. Every economy, whether in wealthy, developing, or underdeveloped countries, is struggling to combat COVID-19. Every day, a large number of people get COVID-19, and this pandemic is to blame for thousands of daily fatalities. The main cause of this high mortality toll is COVID-19's untreatable medical condition. Currently, there is no known cure for COVID-19 patients that has been approved by science. The world economy has faced a substantial economic problem as a result of the COVID-19 epidemic. Governments have used social isolation and enacted lockdowns in order to stop the spread of COVID-19 in their respective nations. Governments incur expenses when they enforce lockdowns since no business is conducted.

There is proof from all across the world that pandemics and epidemics cause economic problems. The effects of diseases and pandemics on the global economy have also been assessed by a number of economists. For instance, Garret (2007) looks into how the 1918 influenza pandemic affected the US economy; Bloom and Canning (2006) look into the links between infectious disease epidemics and income around the world and how these links are impacted by shifting global conditions; Karlsson et al. (2013) look into the effects of the 1918 influenza pandemic on Sweden; Dixon et al. (2002) look into the effects of HIV AIDS on African economic development, and McKibbin and Sidore (2006) look into the effects of These studies show that pandemics and epidemics have an impact on the economy. In their study, Dixon et al. (2002) found that the HIV AIDS pandemic slowed Africa's growth rate by 2-4 percent a year.

Numerous scholars and economists have even forewarned the world about the financial effects of diseases and pandemics, such as Jonas (2013) and Fan et al. (2016). According to Fan et al. (2016), even a moderately severe pandemic might cause 2 million or more fatalities globally. The cost of fighting the pandemic influenza was estimated by the authors to be around 0.2-2 percent of world income, however on the low side.

Although they would not have endured as much suffering as was shown in the wake of the COVID-19 epidemic, it appears that governments have not learnt anything from earlier pandemics. According to estimates, COVID-19 will cost the world economy \$8.8 trillion in the 2020–2021 fiscal year. The World Economic Forum forecasts that in the fiscal year 2020–2021, global GDP growth will fall to about 2 percent, the lowest level since the 2008–2009 global financial crisis. The magnitude of the COVID-19-related economic catastrophe can be understood by considering that various nations are anticipated to see economic growth of between 5% and 10% in the fiscal year 2020–2021. This article's goal is to investigate how the COVID-19 outbreak has affected purchasing decisions and consumption patterns in northern Bangladesh. Numerous research on pandemics and epidemics that concentrate on their economic repercussions served as the inspiration for this study.

However, there hasn't been any significant research done to evaluate consumer attitudes during a pandemic. This feature of consumer behavior during an epidemic or pandemic was overlooked by the researchers. We are trying to close this research gap as a result. As follows is the organization of our research. The topic is introduced, given a brief synopsis in Section 1, and the article's basic structure is explained. In order to pinpoint the research gap, we review the pertinent literature in Section 2 of the paper. Our research aims are listed in Section 3. The research methodology utilized for the project is covered in detail in Section 4, along with the steps involved in data collecting. The data analysis and presentation are found in Section 5. The findings of the paper are further summarized in Section 5. The conclusion and findings are summarized in Section 6 and in section 7 recommendations for reaching markets during an epidemic or pandemic are included. The references used in the study are listed in Part 8. Section 9 adds an appendix.

Consumption Patterns before and during the COVID-19 Pandemic

Primary, secondary, and tertiary wants are satisfied in different ways. The most important condition is to be able to survive well the basic requirements that must be met. The three basic necessities are clothing, food, and shelter. Primary needs including those for education, health care, and leisure are supported by secondary needs. While tertiary demands are those that are produced in the context of lifestyle and status concerns. In general, the public's consuming behavior prior to the COVID-19 epidemic may be characterized as the ability of the impoverished to merely meet their most basic necessities. Primary needs will be addressed to the greatest extent possible through consumption habits, whereas secondary needs are occasionally unmet. The tertiary demands consumption pattern of the lower class is not satisfied. Primary needs will be given priority by the community in meeting its demands, followed by secondary and tertiary needs. Figure 1. displays the consumption patterns of the world and Bangladeshi citizens.

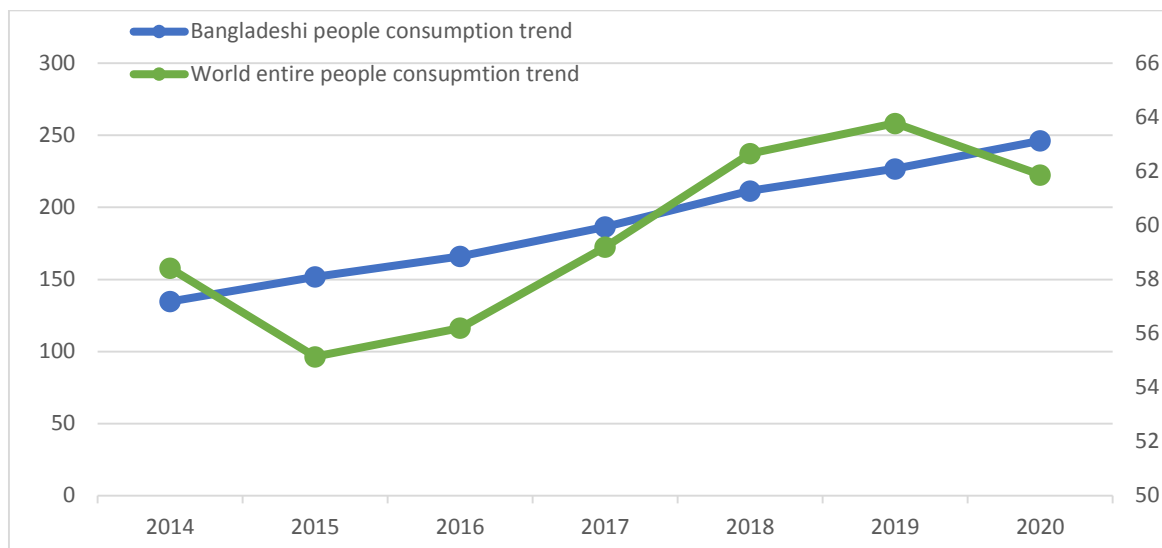


Figure 1: consumption pattern trend Source: World Bank

Literature review

As a direct result of the spreading of COVID-19, people are communicating differently, greeting one another differently, working differently, and purchasing various goods and services. Everything has undergone a substantial change. The use of community isolation and quarantine has resulted in a decline the COVID-19 cases; however, it is also causing people considerable distress. Due to plagues and diseases, economies throughout the world have suffered enormous losses. Jonas (2013) did research on the impact of pandemics on national development. The author concludes that the effects of a pandemic is so enormous that a sole severe pandemic can cost up to three trillion dollars. The author makes comparisons between the destruction produced by a pandemic and a natural disaster. The fact that a severe pandemic is recognized as one of the main global catastrophic threats Jonas (2013) demonstrates how concerned people are about the potential of a pandemic occurring. The author arrived to the conclusion that a pandemic bring agony, economic loss, and societal upheavals on a worldwide scale, but will have little effect on already destitute and fragile states.

Fan et al. (2016) determined the effects of a pandemic that must be incurred in order to combat the pandemic, in accordance with the findings of Jonas (2013). The authors arrived at the conclusion that pandemic costs are comparable to environment alteration charges. It suggests that the global cost of preventing and treating a pandemic would be equal to the worldwide cost of averting and handling climate change. Additionally, the scientists anticipated that the world would face a pandemic equivalent to the 1918 influenza epidemic. This is because the world has not learned from its past failures and has not shown any interest in preparing for a pandemic. This study concurs with the conclusions of Bloom and Canning (2006), who advised that the United States had failed to learn from previous pandemics and was on the verge of another calamity. This discovery is compatible with those discoveries. When expressed as a percentage of GDP, estimates place the worldwide mortality toll anywhere from 0.3% in high-income countries to 1.6% in low- and middle-income countries (Fan et al., 2016). In their study

of the monetary effects of infectious disease outbreaks, Sands et al. (2016) uncovered several risk factors that suggest a new pandemic is on the horizon. According to the findings of the authors, the underestimating of the threat that infectious disease crises provide to human lives and the livelihoods on which these people rely is the primary reason for less investment in infectious disease awareness and reaction. The authors concluded that infectious disease outbreaks had significant cost consequences. The annual effects of a pandemic influenza epidemic is similar to that of climate change, according to a report issued by the World Economic Forum in 2018. It is vital to stress that the majority of economic losses are often generated by reasonably anticipated consumer reactions, labour shortages, and cascading failures in both the economic and financial sectors, and not by the illness itself.

Orset (2018) investigates people's perceptions of house quarantine during a pandemic influenza outbreak, as well as the strategy's cost-effectiveness. According to the author, home confinement cannot be successfully applied if individuals refuse to cooperate freely. (Illustration :) Whether or whether a sick person must stay home depends on factors such as age, income, household spending, career, and contact with an infectious person, and access to medical care. According to the findings of the study, persons are less possible to fulfil with the rules of house confinement if they have a greater chance of becoming polluted or contaminating others. According to study by Baker et al. (2020), there is a negative association between the degree of social alienation and the amount of money spent, and pandemics do effect consumption arrays and, by extension, consumer behavior.

The research of Chen et al. (2020) investigates how the COVID-19 outbreak has affected Chinese consumption. The study obtained daily transaction data from 214 different cities. China's average consumption of offline goods and services decreased by 32% between the end of January and the beginning of April 2020, according to the poll's findings. In comparison to the previous year, spending on goods and services reduced by 33 percent and 34 percent, respectively. The industries durable damaged by the recession were those involving dining out, entertainment, and travel, which each experienced a 59 percent decline. The greatest decrease in consumption, up to 70 percent, was recorded in Wuhan, the place where COVID-19 initially debuted. According to the study's findings, there was a negative response from consumption to daily fluctuations in the severity of the pandemic, resulting in a 1,2% decrease in offline consumption in China in 2019.

During COVID-19 in France, Bounie et al. (2020) investigate the changes in customer behaviour from before to after the event. According to the findings of the study, when customers were surprised, they turned to online shopping, which mitigated the overall impact. Surico et al. (2020) analyze how people in the United Kingdom spend their money based on the financial transaction data of individuals. When the lockdown was initially enacted, individuals stocked up on necessities such as food, according to the findings of the study. In addition, they kept 15 percent more cash on hand than before the lockdown measures were introduced. This pattern remained until April, when it hit 20%. There have been considerable changes in the total amounts individuals spend on services, according to the findings of the poll. After the first week of March, consumer spending on apparel, footwear, accessories, children's books, and games decreased. The price of travel was significantly influenced, although the price of leisure activities declined in March and

remained lower through April. According to the findings of Chronopoulos et al. (2020), COVID-19 and community health initiatives adopted by the administration of the United Kingdom have a considerable impact on the quantity of money and types of items people in Great Britain spend their money on. The researchers noted that when COVID-19 was declared a pandemic on March 11, 2020, people in Britain spent more money on food, causing them to stock up on supplies. The data reveal that men, older individuals, and those with higher incomes spend much more money on all types of purchases than women, younger individuals, and those with lower incomes. According to Muellbauer (2020), a fall in household income will prompt individuals to cut their spending. The author argues that a sixteen percent decrease in household income will result in a twenty percent decrease in consumer spending. The author offers an explanation as to why this is occurring. This can be explained in part by the fact that fewer things are being purchased overall, which contributes to the negative shock. The second factor is that individuals are worried about their future earnings as a result of the historically high pace of jobless growth. Then, the drop in asset prices and a substantial reduction in the overall amount of available credit are further explanations (Muellbauer, 2020). Consumer spending and the U.S. economy appear to be in a considerably worse position than they were at any point during the global financial crisis of 2008–2009. (Muellbauer, 2020). According to research accompanied by IBM (2020) in April, the COVID-19 pandemic has a bigger influence on people's mobility, purchasing power, and ability to participate in activities. According to the results of the survey, the majority of respondents said that they would use public transportation less or not at all, which may raise the demand for private autos. However, due to the economic disaster caused by COVID-19, consumers will be incapable of making purchases. According to the findings of the study titled "The Impact of Epidemics and Pandemics," COVID-19 is fundamentally affecting the behaviour of US consumers, which will have long-term consequences for a range of businesses, including as retail, transportation, and travel. Accenture (2020) conducted a study that reached the same conclusion as IBM (2020): that consumers' priorities have moved to focus on their most basic needs. As a direct result, demand has increased for products in the vital categories of hygiene, cleaning, and staples, while demand has fallen for products in the non-essential categories. The outcomes of the study indicate that digital commerce is gaining popularity rapidly, and it is projected that this trend will continue after COVID-19. Customers place the most value on knowing exactly what they are getting, protecting their health and safety, supporting their local economy, and making the most of their shopping time, according to the conclusions of the study. McKinsey and Company (2020) did a study to estimate the long-term effects that COVID-19 will have on customers. Consumers who responded to the survey claimed that COVID-19 has affected not only their purchasing habits but also their everyday routines. Due to stagnant salaries, consumers are limiting their spending to necessities and other non-discretionary items and services. Customers are rapidly turning to online and digital solutions and depending on less traditional methods to obtain goods and services in person, according to the findings of the survey. Sheth (2020) examines how the COVID-19 epidemic changed human behaviour and identifies eight direct impacts. These include hoarding, improvising, and releasing pent-up desire, acceptance digital technology, blurring the barriers between work and home life, reuniting with friends and family, and discovering talent. According to the conclusions of the study, customers' routines will almost surely change, but they will not disappear entirely. Instead, they will return, allowing business owners to experiment with something unique. COVID has also considerably increased its

use of social media sites such as Facebook, Instagram, WhatsApp, Twitter, and Zoom, resulting in a substantial increase in the number of individuals discussing it. In order to appreciate how individuals think, technical innovation is required, according to the author. As a result of altering demographics, public policy, and technological advancements, the study determines that individuals are more likely to adopt new habits and less likely to abandon old ones. COVID-19 is related with a number of adverse consequences. This phenomena has had an effect on consumers and the way they purchase items, as well as the economy, society, ecology, and culture. For the purpose of determining the scope of these effects, research efforts have been made. Chakraborty and Maity (2020) investigate the global consequences of migration, society, and the environment of COVID-19 on in their study. According to the authors' predictions, the impact of COVID-19 on annual GDP growth will be about similar to a two-percentage-point monthly slowdown. Tourism has been hit the worst, losing between 50 and 70 percent of its earnings. COVID-19 has been shown to have a favorable impact on the environment. This is because the closing of enterprises, factories, and other similar institutions has resulted in a drop in trash emissions, which has been extremely helpful for global ecology. The recovery of the ecosystems has made great progress. Chakraborty and Maity's (2020) findings regarding the influence of COVID-19 on the natural world have been corroborated by a number of different research endeavors. Researchers Saeida et al. (2020) examined that when economic activity was halted during a pandemic, air value increased in several locations throughout the globe. Similar results were found by Zambrano-Monserrate et al (2020).

According to the findings of Sharma et al. (2020), COVID-19 has a positive effect on India's environment, notably in terms of the country's air quality. The study found that the O₃ content in the ozone layer grew by 17 percent while the SO₂ concentration remained the same. During the lockdown, the Air Quality Index (AQI) decreased by 44 percent in the north, 33 percent in the south, 29 percent in the east, 15 percent in the center region, and 32 percent in the west. This shows that air quality increased during the lockdown. Ali and Alharbi's (2020) research examines how COVID-19 spreads, how it is managed and controlled, how it is treated, and how it affects society. According to the study's conclusions, the stoppage of economic operations throughout the world has had a profoundly negative effect on the countries, with the travel and tourism industry being the most badly affected. The authors are concerned that fewer educational institutions will make it more challenging for students to acquire a decent education. Furthermore, scholars feel that a lack of high-quality education will result in major long-term losses for the world. At the conclusion of the report, the necessity of establishing specialized research centers and advancing science and technology is emphasized in order to better plan for and respond to future disasters similar to the ones that occurred here.

Economic impact of pandemics

Pandemics and epidemics can have an impact on the economy that reaches well beyond the borders of the nations where they begin. Things in the modern world, such as travel, commerce, etc., that facilitate the transmission of the disease frequently exacerbate these effects. As we are currently witnessing with COVID-19, epidemics and pandemics can also inhibit an economy from expanding by modifying people's expectations about the economy and discouraging investment and tourists. Numerous economists have

researched the potential adverse impacts of an epidemic or pandemic on the economy. For example, Dixon et al. (2002) evaluated the impact of the HIV/AIDS pandemic on Africa's economic development and found that it had a considerable influence. The epidemic affected people's desire to work and their productivity, which led to a reduction in exports from Africa and an increase in imports. Africa's annual economic growth rate decreased by 2-4 percent due to the pandemic's devastating effects. According to Bloom and Canning (2006), the emergence of SARS slowed the economies of the affected countries. They determined that foreign direct investment in Hong Kong decreased by 62% in just one quarter as a result of the SARS outbreak in China. As a result of having to shut down, sales at a number of enterprises dropped by more than 50 percent. The SARS pandemic cost the United States economy roughly \$11 billion (Bloom and Canning, 2006). The cost of fighting a pandemic was estimated by Fan et al. (2016). The scientists found that the cost of a pandemic is equivalent to that of climate change. Because battling a pandemic costs so much money, the same amount could be used to battle climate change. Because no lessons from the past have been learned and little preparation has been made for pandemics in general, the authors warned that a pandemic as devastating as the one that occurred in 1918 would soon strike the world. Pandemics and epidemics can have devastating consequences on the economy, as evidenced by the paragraphs above. With the use of COVID-19, it is now possible to observe the economic damage caused by this pandemic.

General Objectives of the Project

The main objective of the study is to assess the changing pattern of income and consumption before and during the COVID-19 pandemic in the Northern region of Bangladesh.

Specific Objectives of the Project

To attain the main objective following specific objectives are as follows:

1. To assess consumer attitudes towards consumption at the time of lockdown and before lockdown in the study areas according to their income.
2. To determine the effect of a pandemic on consumer behavior

Research methodology

Sampling Procedure

The study is descriptive in nature. However, from the objective perspective, both qualitative and quantitative approaches are employed. Data and necessary information will also be gathered from primary and secondary sources. To collect primary data a close-ended and open-ended questionnaire was hired to collect first-hand information. At first, we randomly select 4 districts from the Rajshahi division namely Rajshahi, Bogra, Natore, Naogaon then we will also randomly choose 45 households from each district. In addition, we have taken those samples as only businessmen, day laborers, ers, and farmer households and excludes govt. job and other job holder households because their income

remains constant during a pandemic, finally, 180 households have been chosen for collecting data regarding consumption patterns during the pandemic and also before the pandemic. Moreover, for secondary data, we choose the source of BB, BBS, WB, WHO, etc.

Methods of Data Analysis

As this research is based on qualitative and quantitative approaches, we utilize both parametric and non-parametric tests for assessing our objectives. We investigate income and consumption patterns during pandemics and before the pandemic by using primary data to test the root level situation or original consumption and income pattern of people. Furthermore, 1. To analyze the difference between income and consumption patterns before and during a pandemic we use paired sample tests as parametric tests and Wilcoxon Signed Rank Test non-parametric test. 2. Latter we test before and during the MPC level of the targeted consumer by the Keynesian consumption function model

$$\text{Consumption function : } C_t = \alpha + \beta_1 Y_t + u_t \quad 0 < \beta_1 < 1$$

The parameter β_1 is known as a marginal Propensity to Consume (MPC) formula = Change in Consumer spending / Change model.

Analysis of data and discussion of results

Table 1. Parametric test of Paired sample statistics

		Mean	N	Std. Deviation	Correlation	Paired Difference Mean	t	Sig.
Pair 1	MIBP	22900	180	14048	.73	9320	6.63	.04
	MIDP	13580	180	6256	(.05)			
Pair 2	MCBP	16048	180	9178	.62	1058	2.52	.01
	MCDP	14990	180	8606	(.03)			

A paired-samples t-test compares the average of two groups of people or cases that are the same or the average of the same group at two different times. The t-test is called a repeated measures t-test if the same group is tested again on the same measure. The average scores for People's Consumption Pattern during and before the COVID-19 Pandemic is compared with a paired samples t-test in Table: 1. the paired samples correlation shows that there is a strong link between the level of consumption before and during the pandemic. As the p-value is statistically significant, so we can conclude that the average income and consumption pattern of the people is changed before and during (covid-19) pandemic.

Table 2. Non-parametric test of Wilcoxon Matched Pairs Signed Rank Test

		N	Mean Rank	Sum of Ranks
MIDP - MIBP	Negative Ranks	54a	23.8	1047
	Positive Ranks	31b	17	34
	Ties	5c		
	Total	90		
MCDP-MCBP	Negative Ranks	49d	25.27	657
	Positive Ranks	34e	15.38	246
	Ties	7f		
	Total	90		
	MIDP - MIBP	CCDP-CCBP		
Z	-5.541 ^b	-2.580 ^b		
Asymp.Sig.(2-tailed)	0	0.03		

For the above problem the null and alternative hypotheses are spelled out below:

H_{null} : There will be no difference in People's Income and Consumption Patterns during & before COVID-19 Pandemic

H_{alt} : There will be a difference in People's Income and Consumption Pattern during & before COVID-19 Pandemic

For the purpose of determining whether or not there is a distinction between income and consumption pattern, a Wilcoxon matched-pairs signed rank testing is used. Results of that analysis indicated that there was a significant difference in income and Consumption patterns during & before COVID-19 Pandemic, in the table: 2, $z = -5.54$ and -2.58 , $p < .05$. These non-parametric test results also indicate that there is a significant difference between income and consumption pattern during and before the pandemic.

Keynesians consumption function and MPC (Marginal Propensity to consume) analysis,

As a result, various articles have been written about the consumption function. So many macroeconomic strategies rely on the ability to impact total economic demand without increasing government spending directly (Fama & French, 1993). John Maynard Keynes' 1936 General Theory of Employment, Interest, and Money is the most well-known (Keynes, 2006). The Marginal Propensity to Consume is the first and most crucial of Keynes' assumptions. Between zero and one dollar is an additional expenditure (Kinsey, 1983). According to his works on the "basic psychological law," men are prone to increase their spending in proportion to their income, but not by the same amount (Kimball, 1990). In other words, when someone obtains an extra dollar, they frequently spend a portion of it and save the remainder. This income component is known as marginal consumption propensity (MPC). A measure of the notion that an increase in disposable income (income after taxes and transfers) will lead to an increase in personal consumer spending (consumption) is the marginal propensity to consume (MPC), an empirical statistic (Carroll, Slacalek, & Tokuoka, 2014). To put it another way, if a family

has a marginal propensity to purchase of 0.65 and they acquire an extra dollar of disposable income, they will spend \$65 and put \$35 into savings. In mathematical notation, the marginal propensity to consume (MPC) function is defined as the disposable income derivative of the consumption (C) function (Y). $MPC = \Delta C / \Delta Y$ For any given shift in consumption (C), we may calculate its root cause (Y) as the percentage change in disposable income. A value between 0 and 1 represents the marginal propensity to spend, which is determined by dividing the percentage change in consumption by the percentage change in income. If the individual borrowed money to cover expenses in excess of their income, the MPC could surpass one. In a closed two-sector economy, one minus the MPC equals the marginal propensity to save, both of which are significant in determining the magnitude of the multiplier and are fundamental to Keynesian economics.

Table 3. MPC Results of before and after covid-19

Keynes Consumption Function		MPC	R ²	F	P	D-W	df
Model 1 Before Covid-19	$C = 8946.19 + 0.31Y$	.31	.78	13.96	.03	2.24	1.16
Model 2 During Covid-19	$C = 9930.9 + 0.37Y$	.37	.68	8.64	.05	1.89	2.21

Model 1, MPC of before pandemic

The aggregate private consumption function is represented here in its most basic form by this model. It investigates the relationship between aggregate disposable income (Y) in the past and consumer spending. In table 3, we find that the marginal propensity to consume is 0.31, which is a very significant value from a statistical perspective (P .03). The value of R² for the coefficient of determination is satisfactory at 0.78. This indicates that if disposable income increases by 1 million, then a total of 0.31 million takas will be spent on consumption provided that all other factors remain unchanged. The estimate provided by mpc appears to be too low. The values of the model's coefficient of determination (R²), standard error of the regression, F-statistic, and D-W statistic, as well as its model P value, demonstrate that the model possesses the appropriate statistical features.

Model 2, MPC of during pandemic

In this model, we have thought about how the way we use things now affects us. We find it interesting that the value of MPC went up by .37 during the time of the pandemic in the table: 3. though lack of income and other crises reduce up aggregate supply, people don't stop likely to spend money. So, we can say that, when there is a crisis and income shortfall, people don't want to save money; instead, they want to spend it and remain their consumer behaviour as before. As a result, their MPC goes up.

Impact of COVID-19 on consumption pattern

More than 90% of those who responded to the study overall claimed that COVID-19 had impacted their spending patterns. The majority of them, or 60%, believe that during

COVID-19, consumption and spending patterns have changed dramatically. 24 per cent of respondents, or almost a quarter, were unconcerned about changing their spending patterns. Seven per cent of the respondents overall claimed that COVID-19 had had no impact on their purchasing patterns. During COVID-19, 73 per cent of all respondents reported spending less, indicating that their spending patterns have changed. However, 27% of respondents said they were increasing their spending on COVID-19. 81 per cent of the respondents, or the majority, are spending money on necessities during COVID-19. A total of 11% of them spend money on personal care items, 4% on EMI repayment, 2% on entertainment, and the other 2% go out to eat. COVID-19 has also compelled customers to make online purchases.

Conclusion

The primary aim of the article was to evaluate changes in consumption patterns during and before to COVID-19, determine parallels and differences in consumer behaviour in a few selected regions, and recommend the most effective strategies for accessing markets through any forthcoming pandemic. Based on the arguments in the preceding section, we derive the following conclusion:

- Customers' habits shift when a pandemic hits. Our COVID-19 case study data shows this to be the case. Our research indicates that COVID-19 has made a sizable influence on buying habits in Bangladesh.

- COVID-19 has a major effect on how people in Bangladesh shop for and consume goods. The vast majority of COVID-19 shoppers concentrated simply on necessities. Customers only buy the essentials in the event of a pandemic. During an epidemic or pandemic, consumers tend to favour higher-quality goods and meals.

- Consumers' spending habits are significantly altered in the wake of pandemics like the recent COVID-19 outbreak. Among those who participated in our study, more than 70% said their spending habits had been negatively affected by COVID-19.

- Customers' first priority during pandemics is maintaining their own health. Whether used for education, entertainment, or social networking, internet platforms have a good shot at succeeding during an epidemic or pandemic. Additionally, customers are more likely to use electronic payment methods during an outbreak.

- Consumer behaviour in both rural and urban settings is similarly affected by epidemics and pandemics. However, consumers in metropolitan areas are more negatively affected by the closure of restaurants, movie theatres, and recreational facilities.

- People tend to retreat to their hometowns out of fear that the virus would spread there. Our research led us to find this behaviour. In addition, many people are eager to return to urban regions after COVID-19 in pursuit of employment.

- An extended effect on consumer behaviour from the COVID-19 epidemic is expected. The public is convinced that COVID-19 will permanently alter their discretionary spending patterns.

Recommendations

We advise marketers and policymakers to use the following strategies to reach customers during an epidemic or pandemic:

- According to our data, the majority of consumer expenditure is on basics such as food and prescription drugs. As a result, marketers should strive to create such business models.
- Several online channels are available during an outbreak. Businesses should make an effort to go digital and invest in online platforms during pandemic outbreaks. According to the findings, people like to live a healthy and fit lifestyle. Furthermore, it has been revealed that customers took immune boosters during the COVID-19 pandemic. Businesses should make an effort to incorporate products that boost immunity and support good health in their product assortment.
- According to authorities, people who lost their jobs due to a pandemic should try to find alternative employment.

Author Contributions

Mohammad Nazmus Sakib has made a substantial contribution to the concept or design the article; and analysis, interpretation of data for the article.

Abu Hurira helped to collect the data and involved in drafting the manuscript or revising it critically for important intellectual content.

Md Ariful Islam has given final approval of the version to be published and accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Appendix

Abbreviations

- BB = Bangladesh Bank
- BBS = Bangladesh bureau of statistics
- MPC = Marginal propensity to consume
- MIDP = Monthly income during Pandemic
- MIBP = Monthly income before pandemic
- MCDP = Monthly consumption during pandemic
- MCBP = Monthly consumption before pandemic
- WHO = world health organization
- WB = World Bank

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Original Research

Roots of Administrative Corruption in Public Sector of Developing Countries

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Abstract

What lessons does prior research on causes of corruption offer public administrators operating in, and researchers studying the dynamics of, public sectors of most governments developing societies? In this paper we summarize a voluminous body of prior economic, social and political science research that tells us about the roots of corruption in public sector of developing countries. Informing the analysis is a "review of reviews" of a sprawling research that examines six indicators: government size, oil revenue, democracy, quality of bureaucracy, rule of law, and human development; that are assumed to be major factors in increasing or decreasing the level of corruption in developing societies. We discern from this formidable body of research what is known about causes of corruption, what is left to know, and how useful the prior research could become panacea for encountering administrative corruption of developing countries. Finally, based on research findings, suggestions for future research are presented

Keywords: Administrative Corruption, government size, oil revenues, democracy, bureaucracy quality, rule of law, human development.

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Introduction

According to the Corruption Perception Index (CPI), over two-thirds of the 176 countries in the globe, fall below the midpoint of the scale of 0 (highly corrupt) to 100 (very clean). The global average score is a paltry 43, indicating endemic corruption in a country's public sector (Transparency Organization, 2016). Administrative corruption could be the outcome of mismanagement of a society's potential talents and resources that could result in socio-political failure and economic crisis in that society. Therefore, the fight against administrative corruption is an undeniable imperative for all governments. (Zadegan & Mohammad, 2004). In other words, administrative corruption is an obstacle for organizations to function effectively, and a main factor that ends up to removal of institutions from achieving their goals (Frisch, 1994; Igiebor, 2019). In fact, administrative corruption is like an infection that pollutes the body of the organization, its members one after another, and infects the spread of the corpuscular community (Kasasbeh, Mdanat, & Khasawneh, 2018). The corruption, particularly the political and administrative corruption has been discussed from different point of views. But, corruption literature, have dealt, more frequently, with the question of how to cure this social ills. Compared with the literature on the solution of this bureaucratic illness, there are less debates on the roots of administrative corruption and the context within which it will exist. Therefore, the main question of this study is "What are the roots of administrative corruption in public sector of developing countries?" If any of scholarly efforts on the subject is part of a puzzle, this study attempts to draw a general picture in order to combine different pieces of this puzzle. Therefore, this study aims at systematically reviewing recently published ISI articles on AC, to find out in what conditions administrative corruption increases and where it may be decreased?

Method

In this meta-analysis research we reviewed one hundred ISI articles that were published over a period of 1995 to 2022 in international journals. The databases searched included Scopus, Oxford, Cambridge, JSTOR, Springer, Science Direct, ProQuest, Elsevier, and Google Scholar. In addition to these known databases, the authors had access to a tool called Dialog Classic, which is a collection of many data-bases. The search included terms related to the administrative corruption (roots, causes, reasons, and effect factors). Theoretical sampling in sequential order was used to comparatively analyze the convergences and divergences, of the causes of corruption in the articles that provided an opportunity to select the articles in the next stage. In next stage we had access to articles containing roots and causes of corruption in public sector of developing countries. Then, by reviewing the selected articles we were able to extract the roots and causes of corruption from the texts, and identify the spectrum of opinions of scholars, their discussions and agreements and disagreements. It was at this point that we found the causes for corruption in developing countries, being measured by their frequency. These can be categorized into five factors: economic, political, bureaucratic, legal and social. In order to operationalize the five factors and set variables to be discussed in each concept, the authors received the views of the research committee's professors, and a number of experts from political science and economics departments of Science and Research Branch of Islamic Azad University. Summing up the comments in the second round of

panels of experts led to selection of six representative variables in the five categories. In the economic dimension, the size of government and oil revenues, in the political dimension, the democracy, in the bureaucratic dimension, the quality of bureaucracy, in the legal dimension, the rule of law, and ultimately in the social dimension, human development were identified as representing variables for each class.

Government Size & Corruption

Government size can be viewed as an important subject for study of the corruption, but, the causality and direction of these two construct may be two-sided. What are the logic and impacts of government size on corruption? There is no consensus among authors on the issue from theoretical aspect. The literature that has examined the relationship between these variables vary and represent different point of views.

Proposition 1: *The effect of government size on reducing corruption is dependent on the level of democracy.*

Kotera et al. study results of 82 countries (2012) found that an increase in government size can lead to a decrease in corruption if the democracy level is sufficiently high. Furthermore, their findings show that the greater the level of democracy, the more decrease in level of corruption. These results provide some important implications for policymakers seeking to perform government interventions without aggravating corruption. The focus of a study by Montinola & Jackman (2002) is about causal relationship between the size of government and corruption. According to their findings, public-sector size, by itself, does not foster corruption. They argue, the level of growth and political stability mediate this relationship.

In summary, the reviews findings, reveal that if democracy runs low, an increase in the size of government will increase the level of corruption. Conversely, there are studies that argue, increasing the size of government causes higher corruption in developing countries. In other words, the hypothesis is that, the larger the size of government and bureaucracy, the larger will be the number of bureaucrats, and the greater opportunities for them to be corrupt and demand bribes. The findings of several studies show that the overall size of the government budget relative to GDP is positively correlated with higher level of corruption ((Rose-Ackerman & Palifka, Corruption and government: Causes, consequences, and reform, 2016; Mauro, The effects of corruption on growth and public expenditure, 2017; Gillanders, 2014; Goel & Nelson, 2021; dela Rama, Lester, & Staples, 2022; Jetter, Agudelo, & Hassan, 2015; Philp, 2017; Gründler & Potrafke, 2019; Husted, 1999; Mauro, Corruption and growth, 1995) (LaPalombara, 1994; Scully, 1991). Given the fact that an increase in the size of government, causes corruption, it is possible to conclude that a smaller government is desirable if the objective is to control corruption. It follows that an increase in the size of government will temporarily raises administrative corruption. As, (O'Donnell, 2001) state that the lesser government involvement in the economy, will lead to lower level of the corruption.

Proposition 2: *An increase in government size reduces corruption if economic development level is high.*

When governments are in periods of economic downturns, providing adequate government services to citizen is unlikely. So, those citizens or customers who demand public services might be tempted to bribe public officials in order to seize more public services. This may happens in another way. The government may be forced to lessen employee salaries to reduce its payroll costs. Indeed, in conditions that economy is booming, evidence show that the larger the public sector in terms of government expenditures, the lower the extent of corruption. The discussion is that public-sector size itself does not foster corruption. It has to be emphasized that corruption declines with increasing economic development, as reflected in GDP per capita. GDP reflects a number of factors, of course, but we have emphasized its substantial correlation with average wages, both private and public. Along with their intrinsic interest, the results for per capita GDP thus speak at least indirectly to part of the claim made for an effect of government size on corruption. The higher wages in both the private and public sectors associated with increasing GDP will reduce the incentives for corruption. In other words, wages would seem to be the critical quantity, not the sheer size of the public sector itself.

It appears from our analysis that corruption increases in periods of economy downturns. According to the study of (Li'an & Jing, 2009) corruption increases at economy downturn. They have used a panel data at the provincial level during the period 1989—2004. Applying a fixed-effect model and IV estimation, they found that government size positively affects the occurrence of corruption, and the effect becomes larger for the increase in the size of the "core" government sector. They also identified the significant impacts of the size and structure of government expenditures on corruption. Also, (Arvate, Curi, Rocha, & Miessi Sanches, 2010) found that increasing the size of government causes higher corruption in developing countries. Given the fact, there is a consensus on promoting good governance, the policy recommendations are all related to strengthening governments capacity to formulate appropriate policies regarding expenditures, revenues and reducing the "room" for corruption.

Oil Revenues & Corruption

Over the past decades, "huge oil revenues" have been considered as a major source of corruption in oil-rich countries. In countries where the main part of government income is earned from oil revenues and GDP growth depends on oil production, oil revenue and corruption, as well as the society's political structure, transformation and social condition are fundamental variables for analyzing the corruption phenomenon. Let us see what literature tells us about the connection of resource rents and corruption in rentier countries?

Proposition 3: mechanisms through which resource rents affect corruption cannot be separated from political systems.

In a study, (Arezki & Brückner, 2011) examined the effect of the interaction between resource rents and democracy on corruption for a panel of 29 Sub-Saharan countries during the period from 1985 to 2007. They found that higher resource rents lead to more corruption and the effect is significantly stronger in less democratic countries. They support their argument by documenting that higher resource rents lead to more (less) government spending in less (more) democratic countries. Also, Shaxson's study

(Shaxson, 2007) that was based on nearly 15 years' research into oil and politics in sub-Saharan Africa, and included interviews with numerous key players, explores the dynamics of the resource curse theory. Shaxson's conclusion support the argument of development theorists who are in favor of political rather than economic development, in developing societies. Further, the study of (Ross, 2008) represents that oil wealth often wreaks havoc a country's political system. He blames political leaders of developing countries for being indifferent to the advice offered by development specialists and adds that they are too busy profiting from corruption and crushing their opponents.

Understanding the interplay between political systems and resource rents is a matter of key importance for the design of risk management strategies to tackle corruption. As the authors commented so far, it is not advisable to separate the issue of resource rents from political systems when studying the evolution of corruption following a resource bonanza. This is because less democratic countries are able to dispense pork-barrel spending to disguise redistribution and quell the masses (Arezki & Brückner, 2011)

Proposition 4: *If the quality of democratic institutions is relatively low, resource rents will increase corruption.*

In a cross national study of 39 countries in a period of 1997 to 2013, (Mahdavi, 2014) asserts that the political institutions employed by states to govern their petroleum wealth, are responsible for much of the variation that are seen in corrupt outcomes. He argues not only political institutions do not matter for corruption — a long-held view in political economy, but those accountable to watch corrupt behavior, are themselves involved in the matter. The separate literature on political corruption has similarly shown that rent-seeking is exacerbated by or borne out of so-called “bad” institutions (Krueger, 1974; Rose-Ackerman, The economics of corruption, 1975; Buchanan, Tollison, & Tullock, 1980; Rose & Peiffer, 2019). In general, regulatory NOCs may facilitate corruption because these firms are staffed with political appointments (as opposed to meritocratic appointments), who not only have the opportunity to solicit bribes from contract bidders but also have little incentive or even knowledge to pick the “best” bidder on the basis of technical skill. In other words, these types of managers are more prone to bribery and extortion given not only their political connectedness but also their capacity as gatekeepers of oil licenses and lucrative contracts. Research's results of (Bhattacharyya & Hodler, 2010) confirm that the relationship between resource rents and corruption depends on the quality of the democratic institutions. They use panel data for 124 countries covering the period 1980 to 2004. In their study, various alternative measures of natural resources, corruption and the quality of the democratic institutions, are examined. The findings imply that democratization might be a powerful tool to reduce corruption in resource-rich countries. Brunnschweiler's study re-examines the effects of natural resource abundance on corruption, considering the role of institutional quality. The empirically significant relationship between institutional quality and resource dependence reflects that countries with poor institutions are unlikely to develop non-primary production sectors to reduce their dependence on resource exports (Brunnschweiler, 2008).

The results of several studies show that the relationship between resource rents and corruption will depend on the quality of democratic institutions. Rentier states, politically

tend to become authoritarian (Hammond, 2011), prevent democratization and political participation. Obviously, in such this system, the quality of democratic institutions is relatively low, and separation of powers and independence of the judicial system is nonexistent.

Proposition 5: Government control over all aspects of the economy in resource-rich countries increases corruption opportunities.

(Arezki & Brückner, 2011) by using panel fixed effects regressions and a new measure of country specific oil rents that is driven by cross-country differences in geology, examine the effects of oil rents on corruption for a panel of 30 oil-exporting countries during the period 1992–2005. They found that an increase in oil rents significantly increases corruption. They support their argument by documenting there is a significant effect of oil rents on corruption in countries with a high share of state participation in oil production. Also (Bardhan, 2017) indicate that the role of OPEC on corruption is noteworthy, because the state control of all aspects of the dominant sector of an economy does in fact increase the opportunities for rent seeking and corruption. Freed of the political constraints associated with direct taxation, political leaders have every incentive to engage in the politics of patronage, an environment in which corruption flourishes.

As economists argue the rentier states by restricting economic freedom, create opportunity to maximize their involvement in the economy.

Proposition 6: In resource-rich and less democratic countries, political leaders, through mechanisms such as populist cost policy, convert natural resources to corruption in order to survive their political status.

(Andersen & Aslaksen, 2013), in a sample of more than 600 political leaders in up to 152 countries, found that allocation and distribution of government income through populist cost policy is a means for the maintenance of undemocratic regimes. The authoritarian governments, which gains their revenues through resource rents, do not set up an effective tax system or alternatively, do not have much incentives to let other economic sectors to grow. Hence, political leader's legitimacy rest on widespread occupation. There are studies that suggest, leaders in developing economies, in the absence of property rights (individual or communal), eliminate "open access" conditions to natural resources and incentives for investment and long-term management of the resources (Badeeb, Lean, & Clark, 2017; Barbier, 2010). Also, in a study (Torvik, 2002) argues that people in this conditions try to obtain quotas or entitlements for access to natural resources rather than focusing on direct production. Intense competition to capture economic rents creates ample opportunities for corruption and can motivate people to offer bribes or government officials to solicit bribes.

Democracy & Corruption

Generally speaking, institutionalist literature especially in empirical terms – has focused on political factors as the main state- related factors for explaining corruption. To start with, there are numerous cross country studies dealing with the impact of the type of political regime on corruption: are democratic states less corrupt than authoritarian

ones? Contrary to , (Harriss-White & White, 1996) there seems to be a significant relationship between democracy and corruption, though it is a non-linear one. This non-linearity has been defined as either a U-shaped (e.g (Bardhan, 2017)), a J-shaped (e.g., (Bäck & Hadenius, 2008)), or an S-shaped (e.g., (Sung, 2004)) relationship.

Proposition 7: Corruption is reduced by establishing democracy

(Paldam, 1999) finds that there is a negative relationship between corruption and the level of democracy. He adds that since there is a strong interaction (vice-versa) between democracy and pattern of transition, therefore the independent effect of democracy on corruption is uncertain. But, (Akçay, 2002) has mentioned that more democratic nations are less corrupt because of two reasons. First, democratic regimes possess effective governance system, rule of law, accountability and transparency, whereas undemocratic regimes do not. Second, democratic regimes embraces those leaders who have political will to address corruption, create the environment in which civil organization can deal with corruption, and support anticorruption activities. Similar argument is put forward by (Shleifer & Vishny, 1993) who say that countries with more political competition have stronger public pressure against corruption – through laws, democratic elections, and even independent press – and so, are more likely establish organizations that reduce rather than maximize corruption. Therefore, they conclude that democracy is negatively related with corruption.

Comparative politics, tell us about the impact of classical distinction between majoritarian and proportional representation (PR) systems over corruption. In the PR systems, with the existence of large voting districts, democracy has a positive effect in controlling corruption. In the majoritarian systems that characterized by the number of MPs elected in a single district, democracy has the same positive effect on reducing corruption. Despite the fact that, in the both systems the relationship between variables do not change much, the individual accountability of MPs in majoritarian is lower than PR system. Thus, it is likely that in the latter, the candidates be more prone to engage in corrupt activities (De Vries & Solaz, 2017; Klašnja, 2015; Esarey & Schwindt-Bayer, 2018)

The relationship between democracy and Corruption could be moderated by variables such as “independent media”. (Bardhan, 2017) but (Jetter, Agudelo, & Hassan, 2015) state that the relationship between independent media and democracy is not statistically significant. As (Klašnja, 2015) state, the main reason that political freedom reduces corruption is that it imposes transparency and creates a balance in the political system.

In addition, as democratization process goes on, political stability is more pervasive for governments to fight corruption, so it's not surprising that writers like (Jetter, Agudelo, & Hassan, 2015), (Rose-Ackerman, Corruption in international business, 2018) and (Leite & Weidmann, 1999) found that corruption increases in unstable politics. Thus, while some argue that with the increase of democracy, corruption decreases, other scholars believe that corruption will increase in the early stages of democracy, and will be decreased as the political stabilization goes on (Jetter, Agudelo, & Hassan, 2015)

Bureaucracy Quality & Corruption

A growing literature, mainly in economics and political science, has highlighted the relationship between the quality of bureaucracy and corruption in developing societies. The lack of "bureaucracy quality" plays an important role in creation and spread of corruption. On other hand, the higher the quality of bureaucracy, the more possibility for corruption to diminish (Bardhan, 2017; Van Rijckeghem & Beatrice S. , 1997). Scholars and policy-makers agree that factors like "good governance", "state capacity", and "quality of government" foster social and economic development. Also researchers have argued that in highly inefficient government institutions where the level of meritocracy is low, the likelihood of corrupt activities to increase is high. (e.g., (Hall & Jones, 1999; Acemoglu, Johnson, & Robinson, The colonial origins of comparative development: An empirical investigation, 2001; Acemoglu, Johnson, & Robinson, Reversal of fortune: Geography and institutions in the making of the modern world income distribution, 2002; Easterly & Levine, 2003; Rodrik, Subramanian, & Trebbi, 2004))

Proposition 8: The higher level of meritocratic recruitment the lesser level of corruption

(Rauch & Evans, 2000) and (Dahlström, Lapuente, & Teorell, 2012) show that some bureaucratic factors, i.e. professionalism and meritocratic recruitment which are statistically significant deterrent of corruption, reduce corrupt activities. Their argument goes on to state that even other political and administrative factors such as the years of democracy or the type of electoral system, as well as employees' competitive salaries, carrier stability or internal promotion, compared to meritocratic recruitment, do not have much significant impact on reduction of corruption.

They argue that one way to reduce corruption is separating interests of bureaucratic agents from those of their political principals. This policy prevents opportunistic actions such as accepting bribes or organizing kickbacks to take place. The elected officials and professional bureaucrats may engage in corrupt behavior, but this requires coordination of actors with different interests. The premise is that, weakening the ties between politicians and bureaucrats diminishes the possibility of their collusion and increases the chances for both groups to reveal corrupt actions taken by the other group. (Frankel, 2014) argue the possibility of separation of interests between these groups can be occurred as a result of different source of their accountability. Politicians are accountable to their constituencies and higher civil servants are accountable to their professional peers or to the public at large. (Alesina & Tabellini, 2008) conclude, the separation of interest might be limited to parliamentary systems where the carrier of professional civil servant become independent from the carrier of political incumbents.

Proposition 9: The low level wages of civil servant is a cause for corruption.

There is a classical premise in the literature on bureaucracy and corruption which assumes that public servants low incomes is a main cause for corruption. Traditionally, the authors who study public servants' wages and penalties for corrupt behavior, tend to use cost-benefit analysis. Within this framework they apply cost-benefit analysis in which economic incentives – carrots and sticks – might be set so that public servants are not

tempted to engage in corrupt behavior (Becker & Stigler, 1974). Although, it needs much efforts to conduct empirical investigation over the incentives of public servants, it is assumed that their incentives can be affected by the amount of their wage and the probability of detection and the penalty they may receive for corruption (Ninepence, 2020). The study of (Ninepence, 2020) presents the first empirical estimation of the effect of civil service payments on corruption. First, they showed that theory is ambiguous on the relationship between civil-service payment and corruption. Then, they examined the issue using a new data set on wages for low-income countries. Their findings based on a cross-country averages presented evidence of a significant relationship st between relative civil-service payments. Also, the study of (Herzfeld & Weiss, 2003) that measured employees' wage-to-GDP ratios, suggest that wage increases, significantly reduce corruption. The effect of wages on corruption has been also highlighted by Evans and Rauch (Evans & Rauch, 1999) . However, other studies show that this relationship is not always statistically significant (Kuntz, et al., 2015; Dimant & Tosato, 2018)

Rule of Law & Corruption

Despite the disagreement over the definition of the rule of law and indicators to measure this concept, most of the studies have raised the question of whether civil servants are law abiding and stand the norms governing their formal responsibilities. This again raises the question of whether a country could enjoy a higher level of rule of law and yet facing a widespread corruption?. (Mendonça & Fonseca, 2012) show that corruption is inherently related with rule of law. It seems that most of developing societies sustaining serious corruption problems, have a very weak rule of law and law enforcement system (Igiebor, 2019)

Proposition 10: *A higher level of rule of law is associated with a lower level of corruption.*

The idea that a weak rule of law implies a high level of corruption is supported by (Leff, 1964) and (Huntington, 1968). Also, the World Bank considers rule of law as an important dimension of good governance and the essential means for controlling corruption. In brief, in countries where a higher rule of law exist, it is ensured that no one is above the law and thus the corruption may decrease much. As Herzfeld & Weiss's study (Herzfeld & Weiss, 2003), indicate, an effective legal system has been viewed as a key component in reducing corruption (see also (Rose-Ackerman, Corruption in international business, 2018; Van Rijckeghem & Beatrice S. , 1997))

(Mendonça & Fonseca, 2012) poses the question as whether there is a causal link between corruption and rule of law. They argue that the low level of rule of law in developing societies is associated with high level of corruption. The discussion focuses on politician's behavior whose success in elections depends on large sums of money that is acquired through illegal granting of state contracts to their friendly business partners. More than a few layers of society are involved and are affected by this trail of money. In the first place, politicians misappropriate public funds; and in order to protect themselves they intervene in the judicial process. Because of perpetual lack of rule of law, citizens' liberties and rights are not protected. Corrupt politicians require political appointees in government organizations to grant procurement contracts facilitate cheap sales of state

land and assets to their personal businesses or their family or friends' companies. The recipients of the contract reward the influential politicians with a generous commission. This side payment serves as party/campaign finance or enrichment (sometimes as large as half the contract—up to millions of dollars). They deliberately avoid targeted reforms such as, independent, powerful anti-corruption agencies; supervisory bodies to enforce public wealth declarations; civil service reform; electoral law reform; public procurement supervision and transparency. While the media and civil society may uncover these activities, and investigations and prosecutions may follow, most of the people involved in the exposed illicit transactions never receive punishment. The cases of corruption get dropped, or resolve without punishment and due justification. Politicians and their business partners intervene in the judiciary process in order to avoid punishment. This endangers principles of rule of law, separation of powers and independence of judiciary.

Human Development & Corruption

Human development is defined as “expanding the choices people have to lead lives that they value” (Programme, 2001) . Extending human capabilities through human resource development; such as good health and nutrition, education and skill training are choices that can be expanded. According to the Human Development Index (HDI) released by the United Nations Development Program, human development includes three vital aspects of socioeconomic development: health, education and living standards. HDI is based on three indicators, all of which are equal in weight (United Nations Development Program, 2001):

- Longevity, as measured by the life expectancy (at birth) index;
- Educational attainment, as measured by an index evaluating a combination of adult literacy (two-thirds weight) and the combined gross primary, secondary, and tertiary enrolment ratio (one-third weight);
- Standard of living and access to resources, as measured by an index calculating real GDP per capita in terms of purchasing power parity (PPP).

Although literature links human development and corruption, the causal relationship between these variables remains unclear. While many researchers support the decisive role of corruption in preventing human development indexes to improve (Akhter, 2004; Gatti, 2004; Leys, 2017; Mauro, Corruption and growth, 1995), some recent studies support a Vis versa relationship between them. (Zhang, Cao, & Vaughn, 2009). It seems corruption and human development has a dialectic effect on each other, which means they influence and are influenced by each other thus form a vicious cycle. (Anand & Sen, Human development and economic sustainability, 2000; Prados de la Escosura, 2015) . It is argued that targeted efforts to strengthen human development are necessary to break this vicious cycle and facilitate the process of combating corruption. First of all the human development constructs encourage the importance of economic power to improve the quality of life (Anand & Sen, Human development index: Methodology and measurement, 1993; Anand & Sen, Human development and economic sustainability, 2000). Human development increases the willingness and ability of individuals to monitor the corrupt practices to happen and the motivation for corrupt behavior.

Proposition 11: *Increasing the level of human development reduces the level of corruption.*

According to the study of (Husted, 1999), in countries with higher GNP per capita, the level of corruption is lower. This argument is based on the fact that governments are restricted by private party opposition and the fact that the more resources are more likely to reduce the incentive to get involved in corrupt practices (Cheung & Chan, 2008; Husted, 1999). Second, in countries with higher levels of human development, people are more educated and capable of monitoring and evaluating public behavior. The analysis of data collected from Uganda showed that better education was associated with better knowledge of the corruption reporting process. This, in turn, led to a reduction in administrative corruption and improved public service quality (Hsiao, Vogt, & Quentin, 2019). Similarly, (Cheung & Chan, 2008) by examining the Gross Enrollment data in education and Corruption Perceptions Index data, found that, increasing in the number of literate people will lead to a decline in corruption. Ultimately, by definition, a higher level of human development creates an environment that provides equal access to opportunities for people to exercise their freedom and maximize their potential (Ul Haq, 1995). As a result, increase in human development encourages more people to collectively seek social justice and enhance moral standards (Zhang, Cao, & Vaughn, 2009; Sen, 1999). Within such an environment, corruption is likely to be restricted. To conclude the above literature, which shows the link between corruption and income, education and free will, researchers have proposed the following statements: It seems countries with longer life expectancies, higher education and literacy, adequate salary, and the ability of citizens to participate in communities, the level of corruption is less likely to increase.

Conclusion

This study was conducted to examine a broad range of prior economic, social and political researches that were published in accredited international journal during a period of 1995 to 2022 on the roots of corruption in the public sector of developing countries. It examined the six concepts that linking to and influencing the administrative corruption: government size, oil revenues, democracy, bureaucracy quality, rule of law and human development. The results showed that though each of these concepts as independent variables, have measured the level of corruption, the corruption has been influenced by mediating and moderating variables as well. Given that combating corruption is essential for investigating the quality of governance in developing societies, this paper attempted to present what the previous studies have told us about the roots and causes of corruption, and the context (political, economic and social) in which it may exist. It aimed at presenting the gaps in the literature and where researchers need to focus in their future researches on the topic. The paper may present some idea or possible plan (policy advice) for policy makers to strengthen the government's capacity, and promote the institutional quality and democracy to fight back corruptive practices in developing areas. This goal might be achieved through a strong political will and by such a means like restructuring the state bureaucracy, rule of law and human development.

As to the limitations of this research, we have to note that in order to extract the causes of corruption in developing countries, the literature could not place the importance and priority of the five concepts that have affected the level of corruption in developing

societies. Also, the reviewers had to deal with the international and local statistics and data available to them at the time of enquiry, so, in order to determine the appropriateness of the above-mentioned indicators they had to consult with several social science academicians and professionals. Obviously, the generalizability of the findings requires more comprehensive research. Therefore, we suggest that this study be carried out using a longitudinal method and other research strategies.

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Original Research

Potential Development of Mini-Scale Shrimp Aquaculture in Plastic Ponds in Pasuruan Regency, Indonesia

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Abstract

Vannamei shrimp farming on a mini-scale plastic pond ("busmetik") in Pasuruan Regency has been implemented since 2015. This study aims to analyze financial feasibility and potential for busmetik development in this region. The research was conducted in three sub-districts with a population of 120 farmers. Sample was determined by simple random sampling and 37 farmers were selected. Data collected through interviews, and analyzed by financial feasibility and SWOT. The results showed that busmetik vannamei shrimp farming in Pasuruan Regency was feasible to be developed based on investment criteria: R/C and B/C greater than one, short payback period, BEP price and production lower than real price and production, positive NPV, and IRR is higher than bank interest rate. Sensitivity analysis on the decline in production and prices by 20% resulted in the conclusion that this business is just feasible. Analysis of internal factors (IFE) and external factors (EFE) resulted in six strategies for developing vannamei shrimp farming business with busmetik technology. Those strategies were to classify product sizes based on quality; increase production volume with optimal land use; integrated production management; product differentiation; training program planning; and work with third parties for assistance. Government and investors can promote the business by supporting financing, providing integrated production management training in order to increase production and income of farmers.

Keywords: Business feasibility, vannamei shrimp, strategy, busmetik

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Introduction

Development of national marine and fisheries in the era of globalization aims to create a healthy, productive and creative society through strong fisheries based on local resources. Fisheries sector development is a priority because it is a main source of livelihood for people in coastal areas, especially fishermen and rural communities who work as fish cultivators, including shrimp. The sector is also a foreign exchange earner whose number is increasing from year to year. According to (Rumaijuk & Lubis, 2020), export potential of shrimp commodities was able to provide the country's foreign exchange from fishery products of more than 50%.

Increasing demand for exports illustrates improvement in development and business in the fisheries sector. However, export of this commodity must pay attention to domestic needs so as not to cause a negative trade balance (Pudjiastuti, 2014; Pudjiastuti et al., 2013; Pudjiastuti & Kembauw, 2018). It is a potential of the fisheries economy that must be developed, but remains in the blue economy corridor. The implication is that an economy that is focused on the marine and water sector must also emphasize balance between economic development and environment carrying capacity. It is hoped that this activity will not only affect the welfare of wider community, but also sustainable economic development (Ervianto, 2018; Saksono, 2013).

Vannamei shrimp cultivation benefits farmers based on the empirical studies that have been carried out in Lamongan Regency (Chusnul et al., 2010), Purworejo (Utomo et al., 2012), Pemalang (Pasaribu et al., 2017), Pekalongan (Untara et al., 2018), Serdang (Nainggolan et al., 2018), Parangtritis DIY (Khatimah, 2019), Kolaka (Kasmin et al., 2020). On the other hand, income of vannamei shrimp cultivation is higher than that of tiger shrimp (Tobing et al., 2021) and smallholder shrimp (Saragih et al., 2015). Government is just trying to increase capacity of vannamei shrimp ponds through various technologies, including cultivation of mini-scale plastic shrimp ponds (*busmetik = budidaya udang skala mini empang plastik*) that are environmentally sound (*ecoshrimp*). Several studies on the shrimp business feasibility had also been carried out by (Makalingga et al., 2018) in Purworejo Regency, (Ariadi et al., 2019) in low salinity cultivation systems, (Aprilia et al., 2020) in supra-intensive ponds, (Amsari et al., 2021) in cultivation through demonstration farming, (Amri & Haris, 2022) on various shrimp culture technologies, all of them stated that the aquaculture is financially feasible. However, no one had studied financial feasibility of busmetik technology.

Busmetik is a technology that has been the result of empirical studies since 2009 and is currently at the stage of accelerating adoption to the level of shrimp cultivators. This technique was developed because it has advantages: 1) easy to manage because the plot is not too wide ($\leq 1000 \text{ m}^2$), 2) operational costs incurred for one cycle are just affordable for middle to lower class cultivators, 3) soil quality is not a factor barriers in the application of technology because pond construction is coated with plastic (HDPE), 4) pest and disease control is easier so that it can reduce risk of disease attacks, because it applies biosecurity measures and probiotic applications, 5) maintains balance of the ecosystem through a growth of mangrove vegetation in the cultivated area which functions as a biofilter, 6) is very suitable for cultivation of *Litopenus vannamei* because

it can be reared in high density, above 100 shrimps/m³, 7) vannamei has faster growth, is more resistant to disease, and has a flexible market segment (Aisyah et al., 2022; Fatalattof et al., 2022; Suriawan et al., 2019).

Busmetik in Pasuruan Regency has continued to expand from 2016 to 2020. In 2016, this area had a pond of 4.06 ha, which increased in 2017 to 9.52 ha. In the following year (2018) those area decreased to 8.40 ha, and in 2019 it decreased by 1.63 ha. But in 2020, busmetik pond area would increase again to 15.41 ha. The development shows that busmetik vannamei shrimp is able to improve regional economy (Nardianto et al., 2019). The purpose of this study was to analyze the potential for busmetik vannamei shrimp development in Pasuruan Regency in order to support government policies so that aquaculture develops from year to year.

Methodology

We carried out this research in Pasuruan District, precisely in Kraton District, Rejoso District and Lekok District. Population in the three sub-districts was recorded at 120 vannamei shrimp farmers who apply busmetik system with an operational area of 400 m² per plot. Sample was randomly selected and consisted of 37 farmers. Data were collected through interviews with farmers using a questionnaire. After data was compiled, it was then tabulated and analyzed quantitatively with two approaches, i.e. feasibility study for busmetik business and its development strategy using SWOT analysis. Financial feasibility was carried out using following parameters: R/C, B/C, payback period, BEP (unit and price), NPV and IRR, and their sensitivity if prices and production fall by 20%.

1. Return Cost Ratio (R/C) according to (Anindita et al., 2015) is calculated by formula:

$$R/C = \frac{\text{Return}}{\text{Total cost}} \dots\dots\dots (1)$$

where: R/C > 1, it means that the business is feasible; R/C = 1, it means that the business is in break-even condition, and R/C < 1, it means that the business is not feasible.

2. Benefit Cost Ratio (B/C) is a comparison between total revenue and total cost, which shows the value of revenue obtained from each rupiah spent. A business is said to be feasible if this parameter ≥ 1. The formula used is:

$$B/C \text{ Ratio} = \sum_{t=1}^n \frac{(B_t - C_t)}{(1+IRR)^t} \dots\dots\dots (2)$$

where: B_t = gross profit of t-month; n = economic age; C_t = gross cost of t-month; t = 0, 1, 2, 3, ...

3. *Break Even point* (BEP), were classification into BEP price and BEP unit. They were calculated by formula:

$$BEP_{\text{price}} = \frac{FC}{P-VC} \dots\dots\dots (3)$$

$$BEP_{unit} = \frac{\text{Total cost}}{\text{Selling price}} \dots\dots\dots (4)$$

where: FC = fixed costs; P = selling price per unit; VC = variable cost per unit

4. *Payback Period* (PP) is the estimated payback period for the busmetik business investment which is determined by formula:

$$PP = \frac{\text{Initial investment}}{\text{Revenue}} \times \text{time period (month)} \dots\dots\dots (5)$$

Business is said to be feasible if payback period is less than or equal to business investment age.

5. *Net Present Value* (NPV) is the difference between present value of profits and costs, calculated by formula:

$$NPV = \sum_{t=1}^n \frac{B_t - C_t}{(1+i)^t} \dots\dots\dots (6)$$

Where: i = compound rate or interest rate (%). Criteria: $NPV > 0$, business is feasible; $NPV = 0$, business on breaks even point; $NPV < 0$, business is not feasible.

6. *Internal Rate of Return* (IRR) is the rate of return of busmetik business which shows the present value (NPV) equal to zero.

$$IRR = i_1 + (i_2 - i_1) \frac{NPV_1}{(NPV_1 - NPV_2)} \times 100\% \dots\dots\dots (7)$$

Where: i_1 = interest rate resulting in $NPV > 0$; i_2 = interest rate that generates $NPV < 0$; NPV_1 = NPV at interest rate i_1 ; NPV_2 = NPV at interest rate i_2 .

Busmetik development strategy was determined by a SWOT analysis that begins with identifying internal and external factors, assessing internal and external factors, evaluating internal factors (IFE) and external factors (EFE), determining position of current strategy, and formulating a new strategy to be implemented. IFE and EFE were done by determining rating, weight and score.

IFE stages include: (1) identifying internal factors, (2) giving weights from 0.0 (not important) to 1.0 (very important) for each factor. Weight indicates importance of each factor to the overall internal factor. Total number of weights must be 1.0, (3) giving a rating of 1 to 4 for each factor to indicate whether the factor is a major weakness (rating = 1), or a minor weakness (rating = 2), a minor strength (rating = 3), or major power (rating = 4), (4) multiply each factor weight by a rating to determine weighted average for each factor, (5) add up the weighted average of each factor to determine total weighted average. Average value is 2.5. A weighted average total below 2.5 represents internal weakness, while a total score above 2.5 indicates a strong internal position.

EFE stages include: (1) identifying external factors, (2) giving a weight of 0.0 (not important) to 1.0 (very important) for each factor. Weights indicate relative importance of the factor to business success in the industry. Sum of all weights must be 1.0, (3) giving

a rating of 1 to 4 for each external factor, where 4 = superior response, 3 = above average response, 2 = average response, 1 = bad response. Ratings are based on the effectiveness of company's strategy, while weights are based on industry, (4) multiply each factor weight by its rating to determine weighted value, (5) add up weighted of each factor to determine total weighted score. Highest weighted value is 4.0 and lowest weighted is 1.0. Total weighted average is 2.5. Total weighted score of 4.0 indicates that the business responds very well to the opportunities and threats that exist in its industry. Strategy is selected based on the position of these factors in a matrix consisting of four quadrants.

Results and Discussions

Overview of Pasuruan Regency

Territory of Pasuruan Regency with an area of 1,474,015 km² is located between 112°33'55" to 113°05'37" East Longitude and between 7°32'34" to 7°57'20" South Latitude. In the north, it is bordered by Pasuruan City, Madura Canal and Sidoarjo Regency. In the south, it is bordered by Malang Regency. In the west, it is bordered by Mojokerto Regency and Batu City. In the east, it is bordered by Probolinggo Regency. Geologically, Pasuruan Regency is very diverse, and there are 3 types of rocks including surface rocks, sedimentary rocks, and volcanic rocks of the young and old quarters.

Geographically, several sub-districts located at an altitude of 0-12.5 masl have a potential for developing fisheries and aquaculture businesses. Potential districts for the development of the business include: Gempol, Beji, Bangil, Rembang, Kraton, Pohjentrek, Gondangwetan, Rejoso, Winongan, Grati, Lekok, and Nguling sub-districts. Implementation of busmetik technology in Pasuruan Regency had continued to increase from 2016 to 2020. Lekok District, especially in Tambak Lekok Village, has an area of 9.52 ha of shrimp ponds with the technology. Rejoso District, especially in Rarangan Village and Patuguran Village had 4.64 ha. Kraton District had Gerongan Village and Pulokerto Village, that covering an area of 10.78 ha. Farmers with busmetik technology initially have a pond area of between 400 – 2,000 m² per plot. But, then they changed it to an area of 400 – 700 m² per plot because it was considered more efficient, the profit was greater, and technically controlling water quality was also easier.

Financial Feasibility of Busmetik Vannamei Shrimp

Vannamei shrimp cultivation carried out in plastic ponds with a plot size of 400 m² consisted of two production cycles in a year. In general, farmers have been cultivating vannamei shrimp for 4 years. Shrimp cultivation begins with operational land preparation, seed stocking and maintenance. Shrimp harvest is done two times per cycle, when it is 60 shrimps per kg which is sold for IDR 57,000 per kg and size 45 (45 shrimps per kg) with selling price of IDR 72,000. Selling price was assumed to be fixed with interest rate for small businesses is 7%. Busmetik financing comes from own capital. Feasibility analysis consists of several details about cash outflows and inflows.

Investment Cost

Investments in shrimp cultivation generally include equipment that must be prepared at the beginning of production. Equipment used are water wheels, water pumps, tarpaulins and generators and have an economic life of five years. Investment is calculated as depreciation which was using flat method over the business life. Detailed calculation of depreciation is presented in Table 1. Equipment depreciation was IDR 4,333,333 per year. Generator functions as a provider of electricity when farmers experience problems. Wheel serves as a means of delivering air and oxygen into the pond. Oxygen carried then dissolves into the water and becomes dissolved oxygen (Amri & Haris, 2022).

Table 1. Investment depreciation costs

Equipment	Selling price (IDR/unit)	Total	Value of equipment (IDR)	Economic age (year)	Depreciation (Rp)	Percentage (%)
Water wheel	5,800,000	2 unit	11.600.000	5	2.320.000	53
Water pump	4,500,000	1 unit	1.000.000	5	200.000	5
Tarpaulin	16,000	400 m	6.400.000	5	1.280.000	30
Generator	24,000,000	1 unit	2.666.667	5	533.333	12
Total			21.666.667		4.333.333	100

Operational Cost and Income of Busmetik

Operational costs are all funds spent in the production process (Witoko, et al., 2022). The costs include variable and fixed costs incurred during the production process. Every production activity would be faced with a problem of assigning costs to facilitate necessary production factors. Costs were all cash and non-cash expenditures for busmetik process in one year with two production cycles on a business scale of 400 m². Based on Table 2, it can be seen that operational costs are dominated by variable costs with 69.02%. The largest fixed costs were electricity and labor wages, while the largest variable costs are feed and seeds. It is also similar to the results of previous studies, although the technology used was different.

Revenue is total harvest in one year multiplied by selling price. Shrimp production results were divided into two categories, i.e. size 60 and size 45. Revenue and income of shrimp cultivation were presented in Table 3. It is clear that the business is profitable because total costs are much smaller than revenue. It is similar to the previous studies.

Table 2. Operational costs of the busmetik vannamei business per year per 400 m²

No.	Component	Price (IDR/unit)	Description	Cost per cycle (IDR)	Cost per year (IDR/400 m ²)
1	Fixed cost				
	Salary	3,200,000	1 year	1,600,000	3,200,000
	Tax	2,784	1 year	1,392	2,784
	Electricity	8,023,043	1 year	3,677,228	7,354,456
	Water	183,363	1 year	84,042	168,083
	Transportation	180,040	1 year	82,519	165,037
	Fuel oil	1,061,702	1 year	486,614	973,227
	Total fixed cost			5,931,795	11,863,587
2	Variable cost				
	Shrimps seed	48	44,445 shrimps	2,133,360	4,266,720
	Shrimps feed	14,600	643 Kg	9,387,800	18,775,600
	Probiotics	22,000	11 L	242,000	484,000
	Omya	8,500	106 Kg	901,000	1,802,000
	Mineral	23,000	24 Kg	552,000	1,104,000
	Total variable cost			13,216,160	26,432,320
3	Total cost (1+2)			19,541,627	38,295,907

Table 3. Revenue and income busmetik per year per 400 m²

No	Size (shrimps/kg)	Production (kg)	Price (IDR/kg)	Total (IDR)
1	60	328	57,000	18,696,000
2	45	702	72,000	50,544,000
Total Revenue				69,240,000
Total Cost				42,629,240
Total Income				26,610,760

Criteria of Busmetik Business Financial Feasibility

Based on the calculations of regarding investment costs, operational costs and shrimp business income, cash flow can be arranged which is feasibility analysis (Table 4). As previously explained, the analysis was carried out of one year and two cycles. Activities carried out every month: 1) land preparation, 2) stocking and maintenance, 3) maintenance, 4) maintenance and harvesting, 5) harvesting and area drying, 6) land preparation, 7) stocking and maintenance, 8) maintenance, 9) maintenance and harvesting, 10) harvesting and drying, 11) area drying, and 12) there were no activity.

Table 4. Cash flow for vannamei shrimp busmetik (thousand IDR/month/400m²)

No.	Descriptions	Month												
		0	1	2	3	4	5	6	7	8	9	10	11	12
I	In Flow													
	Revenue					9,348	252,720				9,348	252,720		
II	Out Flow													
A	Investment Cost													
1	Water wheel	2,320	193.33	193.33	193.33	193.33	193.33	193.33	193.33	193.33	193.33	193.33	193.33	193.33
2	Water pump	200	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67	16.67
3	Tarpaulin	1,280	106.67	106.67	106.67	106.67	106.67	106.67	106.67	106.67	106.67	106.67	106.67	106.67
4	Generator	533.33	44.44	44.44	44.44	44.44	44.44	44.44	44.44	44.44	44.44	44.44	44.44	44.44
B	Operational Cost													
1	Shrimps seed			2,133.36					2,133.36					
2	Shrimps feed			3,129.27	3,129.27	3,129.27			3,129.27	3,129.27	3,129.27			
3	Probiotics			80.67	80.67	80.67			80.67	80.67	80.67			
4	Omya			300.33	300.33	300.33			300.33	300.33	300.33			
5	Mineral			184.00	184.00	184.00			184.00	184.00	184.00			
6	Labor (salary)		266.67	266.67	266.67	266.67	266.67	266.67	266.67	266.67	266.67	266.67	266.67	266.67
7	Tax													2.78
8	Electricity		668.59	668.59	668.59	668.59	668.59	668.59	668.59	668.59	668.59	668.59	668.59	
9	Water		15.28	15.28	15.28	15.28	15.28	15.28	15.28	15.28	15.28	15.28	15.28	
10	Transportation		15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	
11	Fuel oil		88.48	88.48	88.48	88.48	88.48	88.48	88.48	88.48	88.48	88.48	88.48	
	Total Outflow (A+B)	4,333.33	1,415.12	7,242.75	5,109.39	5,109.39	1,415.12	1,415.12	7,242.75	5,109.39	5,109.39	1,415.12	1,415.12	630.56
III	Net Benefit (I-II)	-4,333.33	-1,415.12	-7,242.75	-5,109.39	4,238.61	251,304.88	-1,415.12	-7,242.75	-5,109.39	4,238.61	251,304.88	-1,415.12	-630.56

Costs in the financial feasibility were calculated on monthly basis. Farmers get revenue in each cycle in the 4th month through harvesting shrimp with a size of 60 shrimps per kg, and in the 5th month through harvesting shrimp with a larger size of 45 shrimps per kg. It also applies to the second cycle. Proceeds from the first harvest turned out to be able to cover all the costs. It is a manifestation of the business efficiency so that farmers continue to exist in this mini-scale business.

Feasibility is also proven by parameters (Table 5) that meet the existing criteria. R/C and net B/C that are greater than one indicate that each unit of money invested in this business will generate greater revenues and profits. BEP price is even lower than selling price of 60 shrimps per kg. Meanwhile, BEP unit is also much lower than the number of shrimp produced $(702 + 18696000/72000) = 962$ kg (equivalent to 45 shrimps per kg).

Table 5. Parameters of busmetik financial feasibility and its sensitivity

Parameters	Normal conditions	Price decrease 20%	Production decrease 20%
R/C	1.6		
BEP unit (kg)	753		
BEP price (IDR/kg)	47,142		
NPV (IDR)	24,940,641	11,274,508	11,682,880
IRR (%)	251.9	133.9	137.8
Net B/C	1.4	1.37	1.38
Payback period	4 months 5 days	4 months 8 days	4 months 8 days

$R/C > 1$, indicating that busmetik business is feasible to develop. It is similar with the results of research by (Ariadi et al., 2021) and (Sa'adah, 2019). Time required to return investment costs is relatively fast, namely 4 months and 5 days, even compared to the age of production cycle. A positive NPV indicates that income generated in the business exceeds operational costs. It shows that busmetik business with private capital at an interest rate of 7% is feasible, provided that for one year investment in shrimp business scale of 400 m² generates a profit of IDR 24,940,641. Return on capital in this business is relatively very high, i.e. 251.9% compared to the bank's interest rate of 7% per year. Based on the financial feasibility analysis criteria, busmetik business in Pasuruan Regency is feasible to be developed. Even if, shrimp production and prices drop by 20%, the business is feasible to develop yet. Feasibility of shrimp with similar technology does not yet exist, but it is in line with (Khatimah, 2019) on shrimp cultivation on sandy land and (Witoko et al., 2019) on vannamei shrimp cultivation in marine floating net cages.

Development Strategy of Busmetik Business

Evaluation of Internal and External Factors

Identification of internal factors (strengths-weaknesses) and external factors (opportunities-threats) were assessed based on the level of importance. These level were determined based on the results of interview (questionnaire) using a weighted value.

Criteria for assigning a level of importance are as follows: if a weighted value of 4 means very important, a weighted value of 3 means important, a weighted value of 2 means somewhat important and a weighted value of 1 means that it is not important. Assessment of internal factors and external factors of vannamei shrimp culture are presented in Table 6 and Table 7.

Identification results on the strength factor in Table 6 show that the range of farmers' choices is between important to very important. It revealed that for farmers, information on how to implemented busmetik is easier to manage and the yield of vannamei shrimp has good quality due to the availability of quality seeds. Weakness factor according to farmers has an important to very important value. On the other hand, quality of human resources is also a very important factor for farmers in continuity of busmetik business.

Table 6. Internal factors importance of the busmetik strategy

Symbol	Strengths	Level of importance
S1	Availability of quality seeds	very important
S2	Shrimp produced is high quality	very important
S3	Information about maintenance of busmetik is perfectly	important
S4	Easy in busmetik management	very important
Symbol	Weakness	Level of importance
W1	Limited capital owned	important
W2	Evaluation is carried out when harvest failure occurs	important
W3	Human resources quality that is not optimal	very important
W4	Limited land occupied	important

Table 7 shows that opportunity factor had an important and very important value for farmers. Market availability was a very important factor in continuity of the business. Likewise with threat factor, which had an important to very important value. Difficult terms for borrowing capital are a very important threat factor because it takes a relatively long time to disburse loans.

Table 7. External factors importance of the busmetik strategy

Symbol	Opportunity	Level of importance
O1	Market availability	very important
O2	Shrimp prices are relatively stable	important
O3	Market information is easy to get	important
Symbol	Threat	Level of importance
T1	Disease attacks that can cause harvest failure	important
T2	Increasingly difficult capital loan requirements	very important
T3	Competition of shrimp quality produced by other farmers	important
T4	Environmental pollution	important

Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE)

IFE and EFE matrices were arranged by giving a score of 1-4 on each factor according to the level of importance. Internal and external evaluations carried out through rating, weighting and scoring were presented in Table 8 and Table 9. Table 8 shows the results of IFE getting a score of 3.51, where strength factor received a score of 1.78 and weakness with a score of 1.72. The biggest strength of busmetik business lies in the availability of quality seeds, while the biggest weakness is limited capital. Table 9 shows that EFE get a score of 3.38, where the opportunity factor gets a score of 1.40 and the threat factor with a score of 1.97. The biggest opportunity for the busmetic business is availability, while the biggest threat factor lies in environmental pollution caused by the business in the form of waste. However, this last aspect has a solution, namely every farmer must have a waste control facility (WWTP).

Table 8. Matrices of Internal Factor Evaluation (IFE)

Symbol	Strength	Rating	Weight	Score
S1	Availability of quality seeds	3.8	0.17	0.64
S2	Shrimp produced is high quality	3.5	0.12	0.41
S3	Information about maintenance of busmetik is perfectly	3.1	0.10	0.32
S4	Easy in busmetik management	3.6	0.12	0.42
Total strength			0.50	1.78
Symbol	Weakness			
W1	Limited capital owned	3.4	0.15	0.50
W2	Evaluation is carried out when harvest failure occurs	3.2	0.12	0.37
W3	Human resources quality that is not optimal	3.7	0.13	0.49
W4	Limited land occupied	3.4	0.10	0.35
Total weakness			0.50	1.72
Total Internal			1.00	3.51

Table 9. Matrices of External Factor Evaluation (EFE)

Symbol	Opportunity	Rating	Weight	Score
O1	Market availability	3.7	0.16	0.58
O2	Shrimp prices are relatively stable	3.5	0.09	0.32
O3	Market information is easy to get	3.2	0.16	0.50
Total Opportunity			0.41	1.40
Symbol	Threat			
T1	Disease attacks that can cause harvest failure	3.1	0.18	0.56
T2	Increasingly difficult capital loan requirements	3.5	0.18	0.61
T3	Competition of shrimp quality produced by other farmers	3.1	0.05	0.16
T4	Environmental pollution	3.5	0.18	0.64
Total Threat			0.59	1.97
Total External			1.00	3.38

Based on the evaluation results, it is possible to predict the strategic position of busmetik vannamei. Strategic position of the business in the SWOT quadrant is

determined as follows: 1) X axis is determined by reducing strength factor score by the weakness factor score, which is $1.78 - 1.72 = 0.06$, 2) Y axis is determined by reducing opportunity factor score by the threat factor score, which is $1.40 - 1.97 = -0.57$. Mapping of values on the X-axis and Y-axis (coordinates) into the SWOT quadrant can be seen in Figure 1.

Figure 1 shows that busmetik business strategy is in the position of diversification strategy. Its position has an implication that implementation of busmetik technology had a greater opportunity than the threat. Opportunities available include market share available at relatively stable prices because market information for vannamei shrimp is easy to obtain. In addition to great opportunities, busmetik business had threats, such as disease, competition for quality of shrimp circulating in the market, to environmental pollution due to waste water and shrimp that have died during the rearing process. Therefore, to minimize threats, it is necessary to improve quality of human resources so that proper maintenance management based on vannamei shrimp rearing standards can be well controlled by farmers. Based on the SWOT analysis, there are 6 (six) alternative strategies in shrimp farming with busmetik technology: (1) classifying product size based on quality; (2) increase production volume with optimal land use; (3) integrated production management; (4) product differentiation; (5) training program planning; and (6) cooperate with third parties for assistance.

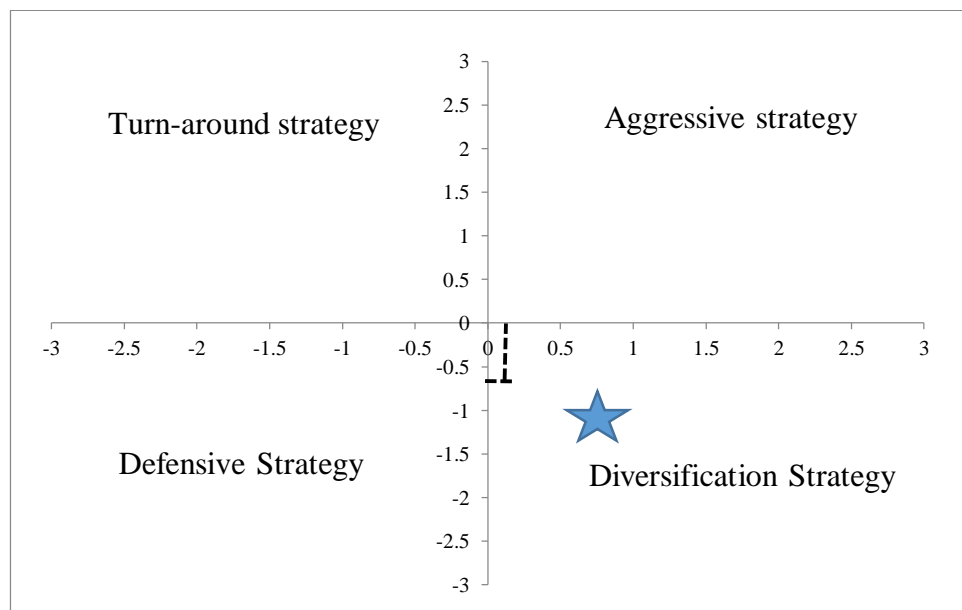


Figure 1. Matrix of SWOT quadrant of the busmetik strategy

Classification based on quality (size) is one step in maintaining and increasing price of vannamei shrimp. Shrimp marketed with similar size and quality, will have a high economic value compared to shrimp marketed with various qualities. Limited land owned is not an obstacle to increase income. One way is to optimize land use so that production volume increases by continuously rearing shrimp. It will create an integrated production management so that it can meet market demand both in terms of quantity and quality of vannamei shrimp.

Busmetik business continues to grow so as to bring in competitors with similar products and equal quality. One of the steps to overcome it is to differentiate shrimp products by increasing the types of shrimp that are cultivated. New type of shrimp must be able to meet market segment. To make it happen, it is necessary to present programs that are able to improve quality of human resources, such as training in shrimp rearing management to handling waste.

Conclusions

Busmetik vannamei shrimp farming in Pasuruan Regency is feasible to be developed based on investment criteria: R/C and B/C greater than one, short payback period, BEP price and production lower than real price and production, positive NPV, and higher IRR higher than the bank interest rate. Sensitivity analysis on the decline in production and prices by 20% resulted in the similar conclusion that the business is just feasible.

Strategy analysis using a SWOT approach shows that the relevant development position is diversification strategy. There are six strategies recommended for the development of busmetik vannamei shrimp farming business, namely 1) classifying product size based on quality; 2) increase production volume with optimal land use; 3) integrated production management; 4) product differentiation; 5) training program planning; and 6) cooperate with third parties for assistance.

Government can facilitate farmers through provision of loan funds considering receipt of indirect payments in cash, so that business will be sustainable. In the future, further research with focus on the business sustainability will be conduct because to be able to carry out this cultivation, farmers must pay attention to environmental conditions. WWTP must be made first.

Author Contributions

The first author is in charge of collecting and analyzing data, as well as compiling a draft manuscript. The second author is in charge of compiling tabulation results and data analysis, revising draft articles, adjusting templates, submitting and correspondence. The third author collects articles for reference.

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Original Research

The Prediction of Professional Skepticism Components Based on the Big Five Personality Traits of Auditing Partners

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Abstract

Professional skepticism is an integral part of successful auditing. The trait of professional skepticism has been identified in psychological research as an enduring personality trait. This study aimed to investigate the prediction of professional skepticism components based on the Big Five personality traits of auditing partners of the Iranian Association of Certified Public Accountants (IACPA). To that end, the participants consisted of 231 male auditing partners. Our research results suggest that personality traits, including extroversion, agreeableness, conscientiousness, and openness to experience, positively predict the professional skepticism components, including a search for knowledge, self-esteem, interpersonal understanding, autonomy, and a questioning mind. Neuroticism negatively predicts the professional skepticism components mentioned. Also, extroversion, agreeableness, conscientiousness, and openness to experience negatively predict suspension of judgment. Neuroticism positively predicts the suspension of judgment. These findings can aid audit firms in the recruitment procedure of auditors and assist accounting and auditing educators in guiding students in their career tracks.

Keywords: Auditing partners, big five personality traits, professional skepticism.

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Introduction

The complexity and uncertainty of economic conditions worldwide have sharpened the public expectation for more reliable and accurate financial statement information. Auditing is the only profession in the Netherlands that legally approves skepticism, treating it as a vital component of auditing (Quadackers, 2009; Yankova, 2015). The significance of this profession has increased more than before following financial scandals such as Enron and WorldCom in the United States, as well as Ahold and Parmalat in Europe (Sanusi et al., 2010).

The primary cause of many audit problems is not applying professional skepticism on the part of auditors (Beasley et al., 2001; Glover and Prawitt, 2014). As a result, auditors are invariably advised to maintain a desirable level of professional skepticism (Payne and Ramsay, 2005). This will enable them to identify any significant misstatements in the financial statements (Larimbi et al., 2013) and prevent many deficiencies in auditing (Glover and Prawitt, 2014; Hamshari et al., 2021). Auditors who characteristically display such an attitude of professional skepticism could have an extraordinary advantage for the auditing profession (Hussin et al., 2017; Hussin et al., 2019).

Research indicates that professional skepticism is a psychological construct that varies among individuals (Hurt, 2010). Therefore, depending on their different personality traits, auditors can employ various levels of professional skepticism (Nelson, 2009; Regbiyantari and Narsa, 2021). Accordingly, Personality traits affect auditors' behavior and ability to apply professional skepticism accurately in various situations (Crant, 2006; Glover and Prawitt, 2014; Samagaio and Felício, 2022).

Some studies addressed the factors affecting professional skepticism (Agarwalla et al., 2017; Andreas, 2016; Brazel et al., 2016; Persellin et al., 2019). Also, some sought to explain the role of personality traits on professional skepticism in accounting students (Farg and Elias, 2016; Karahan, 2022). But, so far auditing partners have not been investigated. So, the present study evaluates whether auditing partners' Big Five personality traits predict their professional skepticism. Our theoretical prediction is that the Big Five personality traits will predict the traits of professional skepticism in auditing partners. If such an effect is found, it will help audit firms to recruit the best candidates for audit jobs and highlight which employees may need additional training or oversight to ensure they are sufficiently skeptical. Also, it will help accounting and auditing educators to guide students better in making choices for a career path.

The contributions of the present research to the literature are as follows: First, it presents the extent of the trait of professional skepticism among auditing partners. Second, it shows which personality traits are related to auditing partners' professional skepticism.

The paper is structured as follows: This introduction is followed by a review of the relevant literature concerning professional skepticism and personality traits. This is followed by discussing the research method and the study's results. Finally, the outcome of our findings discusses as well as future research directions.

Literature review and hypothesis

Personality traits

Numerous studies show that personality is composed of five primary traits: neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A), and conscientiousness (C) (Cobb-Clark and Schurer, 2012; Gosling et al., 2003; John and Srivastava, 1999; McCrae and Costa, 2003; Van Kuijk, 2020). Research in psychology has shown the influence of personality characteristics on organizational behavior. (Farak and Elias, 2016). Neuroticism is how a person responds to stressful situations (Costa and McCrae, 2008; Horzum et al., 2017; Parlak and Sazkaya, 2018). Extraversion is associated with an individual's vitality and freshness (Kajonius and Mac Giolla, 2017; Van Dijk et al., 2017; Van Kuijk, 2020). Because, Extroverts often experience positive emotions and enjoy interacting with others (Milfont et al., 2015; Soto, 2018; Van Kuijk, 2020). Openness to experience reflects a person's intellectual curiosity, and high levels characterize people who enjoy the exploration process (McCrae and Costa, 1997; Mhlana, 2019; Van Dijk et al., 2017; Van Kuijk, 2020). Individuals with agreeable personalities tend to trust, be altruistic, and be more eager to help others (Costa and McCrae, 2008; Kvasova, 2015; Van Kuijk, 2020). Conscientiousness is an individual's natural tendency to be fair, accountable, and hardworking (Costa and McCrae, 1998; Khalid and Sekiguchi, 2019; Van Kuijk, 2020).

Professional skepticism and its measurement

The leading cause of most lawsuits against auditors is their failure to exercise professional skepticism (Messier et al., 2010; Juliana et al., 2021; Winantyadi and Waluyo, 2014). According to the US Public Company Accounting Oversight Board (PCAOB, 2021), the Audit Inspection Unit of the UK's Professional Oversight Board (Unit AI, 2010), and the Australian Securities and Investment Commission (Securities, 2011), the application of professional skepticism is essential in auditing (Doty, 2011). Therefore, auditors must maintain such an attitude by challenging information and evidence throughout the audit process (Noldera and Kadousb, 2018).

In fact, there are more likely more skeptical auditors to question and evaluate information before making decisions (Hurt et al., 2013). Auditors make better decisions when they have more accurate and convincing evidence. It has been established by Hurt et al. (2010) skeptical auditors systematically exhibit more different behaviors and act more independently as well (Bunge, 1991; Kurtz, 1992; Graham, 2019). Additionally, there are less likely to easily accept others' claims (Bunge, 1991; Graham, 2019). Such auditors can better detect inconsistencies in the evidence and claims of others (Kurtz, 1992; Graham, 2019).

By way of analysis of the relevant standards led Hurt (2010) to identify six behavioral characteristics associated with auditors' professional skepticism. These six characteristics are labeled: questioning mind, suspension of judgment, search for knowledge, interpersonal understanding, autonomy, and self-esteem. In the field of auditing, several academic papers Hurt's six-factor scale which measures auditor skepticism is supported. (Janssen et al., 2020; Popova, 2013; Quadackers et al., 2009).

In the US, the Audit Quality Center regards The Hurtt Professional Skepticism Scale as a credible measure in this domain. Additionally, academic and professional sources support the importance of these six factors presented (PCAOB, 2021).

1. Questioning mind: an auditor's questioning mind in professional skepticism plays a vital role, because finding whether evidence obtained indicates that significant distortion occurred due to fraud or not (AICPA, 2020; Dimitrova and Sorova, 2016).

2. Suspension of judgment: Auditors should avoid making decisions before gathering sufficient evidence (AICPA, 2016; Nickell, 2012).

3. Search for knowledge: Searching for knowledge reduces uncertainty by acquiring more information (Sorova and Dimitrova, 2016).

4. Interpersonal understanding: Interpersonal understanding indicates that the motivations and behaviors of individuals providing audit evidence can affect the quality of evidence; due to the fact that people may have different perceptions of an event. These different perceptions can lead to misinformation and misleading (Fullerton and Durtschi, 2004; Hussin and Iskandar, 2015).

5. Autonomy: Researchers in auditing regard autonomy as a fundamental feature of the auditing profession (Ciołek, 2017), as auditors need to be independent in their judgments and not influenced by the beliefs and opinions of others (Kurtz, 1992; Hussin and Iskandar, 2015).

6. Self-esteem: refers to one's attitude towards oneself (Boyle et al., 2016). Therefore, the higher an individual's self-esteem, the more independent their thought processes are when performing audit procedures (Kurtz, 1992), and having such an attitude makes the auditors act more independently (Ciołek, 2017).

Research hypotheses

Personality is one factor that can be used to determine a person's level of performance (Regbiyantari and Narsa, 2021). Auditing is a profession that requires different personality traits in different stages of auditing.

Farag and Elias (2016) and Karahan (2022) suggest that the Big Five personality traits predict six professional skepticism components: knowledge, self-esteem, interpersonal understanding, autonomy, suspension of judgment, and a questioning mind.

The Big five personality traits are expected to predict the questioning mind because previous research showed that the personality trait of agreeableness is positively associated with the questioning mind (Witt et al., 1991). Farag and Elias (2016) showed that accounting students with positive personality traits would be more inclined to question, thereby impacting positively on their work. Karahan (2022) showed that extraversion with a questioning mind had a significant and positive relationship. This relationship can be attributed to extroverts' stronger tendency to share their opinions with others, their proneness to seeking thrills, and skepticism in investigations. With these traits, extroverts perform better in their careers and also have more professional

skepticism (De Bruin and Rudnick, 2007; Farag and Elias, 2016; Watson and Clark, 1992; Wilmot et al., 2019).

H1. The Big Five personality traits predict a questioning mind.

The Big five personality traits are expected to predict the search for knowledge because previous research indicates that individuals with positive personality traits are more inclined to seek information and have more professional skepticism (Fullerton and Dourtschi, 2004; Farag and Elias (2016). Also, in complex and challenging conditions, individuals with high professional skepticism can easily control these conditions and overcome their skepticism by collecting enough evidence (Hurt, 2010; Linn et al., 1982). Accordingly, Conscientiousness, extraversion, and openness to experience contribute significantly to explaining the variable of the search for knowledge. Individuals with conscientiousness and openness to experience are curious and enthusiastic about discovering more, therefore, displaying higher skepticism (Karahana, 2022).

H2. The Big Five personality traits predict the search for knowledge.

The Big five personality traits are expected to predict the suspension of judgment because extraversion, conscientiousness, and openness to experience have an inverse and significant relationship with the suspension of judgment, while neuroticism has a significant positive relationship with it (Farag and Elias, 2016; Karahana, 2022). Individuals with personality traits of extraversion, conscientiousness, and openness to experience will continue to collect and objectively evaluate the evidence until their evidence satisfies them sufficiently to decide the integrity and accuracy of their financial statements (Karahana, 2022).

H3. The Big Five personality traits predict the suspension of judgment.

The Big five personality traits are expected to predict interpersonal understanding because previous research showed the Big five personality traits have efficacy on job performance. Therefore, this rule also applies to the auditing profession (Barrick and Mount, 1991; Rothmann and Coetzer, 2003; Salgado, 1997; Seibert and Kraimer, 2001). Extraversion and openness to experience significantly correlate with interpersonal understanding (Farag and Elias, 2016; Karahana, 2022).

H4. The Big Five personality traits predict interpersonal understanding.

The Big five personality traits are expected to predict self-esteem because personality traits with self-esteem have a significant relationship (Farag and Elias, 2016). Positive self-perception is associated with better performance among individuals with more self-esteem. (Tkach and Lyubomirsky, 2006; Barrick et al, 2001). Therefore, its existence is an indispensable factor in professional skepticism (Bunge, 1991) because in applying auditing procedures auditors appear more independent (Ciolek, 2017). Self-esteem is influenced significantly by personality traits such as conscientiousness and openness to experience (Karahana, 2022).

H5. The Big Five personality traits predict self-esteem.

The Big five personality traits are expected to predict autonomy because personality traits have a positive relationship with autonomy (Farag and Elias, 2016). The personality trait of openness to experience is an autonomy valid predictor as auditors who are greater freedom of choice are less likely to trust management's claims and it is unlikely to be influenced easily by management's claims (Bing and Lounsbury, 2000; Karahan, 2022).

H6. The Big Five personality traits predict the autonomous.

The Big five personality traits are expected to predict professional skepticism due to the significant correlations between them and professional skepticism components (Farag and Elias, 2016; Karahan, 2022). Pacini and Epstein (1999) believe extraversion positively correlates with experientiality and rationality. Oreg and Sverdlik (2014) state that extroverts can convince others more effectively which indicates their assertiveness. Linn et al. (1982) also believes that individuals with higher professional skepticism have more effective face-to-face communication skills with the employer, which can originate from their self-esteem. Individuals with agreeable personalities are usually self-sacrificing towards others or life events (Rothmann and Coetzer, 2003). Additionally, agreeable individuals maintain that dishonesty reduces the credibility of financial statements and has a negative effect on those using financial statements. Thus, these individuals apply a high degree of skepticism in auditing (Muntada, 2013; Farag and Elias, 2016). Similar to extraversion, Pacini and Epstein (1999) believe that rationality, experientiality, and agreeableness have a positive relationship. Conscientious individuals are hardworking and want to do their best, making them behave cautiously (Burch and Anderson, 2009). Professional skepticism is a crucial factor in the success of an auditing process (Steel, 2007). Individuals with neuroticism tendencies have less control over stress (Hough et al., 1990). Having stress prevents them from dealing with problems and displaying professional skepticism (Carver and Connor-Smith, 2010). People with high openness to experience are more curious, this characteristic leads them to seek out new ideas, and also have high skepticism (Farag and Elias, 2016; McCrae and Costa, 1997).

H7. The Big Five personality traits predict professional skepticism components.

Research method and statistical results

Participants

The statistical population of this research includes all male auditing partners working in audit firms under the membership of the Iranian Association of Certified Public Accountants (IACPA) in 2019 in Iran. Based on Cochran's Formula and by accepting an error of 5%, the required number of samples reached 300 people. In order to observe conservatism, 350 paper questionnaires were distributed among the community, of which 231 out of 300 returned questionnaires were usable.

In this study, personality traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience) were the predictor variables, and the criterion

variables were professional skepticism subscales (suspension of judgment, search for knowledge, self-esteem, interpersonal understanding, autonomy, and questioning mind). Data were analyzed using IBM SPSS Statistics 26 and IBM SPSS Amos 24 to calculate descriptive and inferential statistics (Pearson correlation coefficients, multiple linear regression, and path analysis).

Research instruments

Big Five personality characteristics

In order to measure the Big Five personality characteristics, we used the NEO Five-Factor Inventory (Costa and McCrae, 1992). It consists of 60 items (12 for each trait) answered with a Likert Scale ranging from 0 (absolutely disagree) to 4 (absolutely agree). Many studies have administered a valid Persian version of this questionnaire to Iranian samples: Faramarzi et al., 2013; Faramarzi and Salmalian, 2014. As reported in the Anisi study, Cronbach's alpha values for extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience were respectively .75, .75, .82, .84, and .74 (Anisi, 2012). In this study, Cronbach's alpha coefficients for neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness were .83, .82, .85, and .80 respectively.

Professional skepticism

The questionnaire developed by Hurtt (2010) was used to measure professional skepticism traits. It is a scale composed of 30 items that are scored on a six-point Likert scale from 1 (strongly disagree) to 6 (strongly agree). The questions are in the form of positive statements in twenty-two cases. The remaining eight questions are reversed statements. The total professional skepticism score ranges from 30 to 180, and higher scores reflect higher levels of professional skepticism. As reported in the Royale et al. study, Cronbach's alpha value for suspension of judgment, search for knowledge, self-esteem, interpersonal understanding, autonomy, and a questioning mind were respectively .59, .72, .60, .92, .59, and .78 (Royae et al., 2013). In this study, Cronbach's alpha coefficients were the suspension of judgment, search for knowledge, self-esteem, interpersonal understanding, autonomy, and questioning mind, respectively (.71, .52, .61, .63, .66, and .50).

Results

Table 1 shows the descriptive statistics (minimum, maximum, means, standard deviations, skewness, kurtosis) of the variables for the Big Five personality traits and the six components of professional skepticism.

Table 1. Descriptive statistics (N = 231)

Variable	Min	Max	Mean	SD	Skew	Kurt
Personality Traits	-	-	-	-	-	-
Extraversion	31	51	37.14	5.93	0.63	- 0.76
Agreeableness	28	55	37.43	5.90	0.112	- 0.55
Conscientiousness	29	53	37.51	5.47	0.66	- 0.56
Neuroticism	25	43	28.86	6.14	- 0.36	0.48
Openness to experience	26	55	38.01	6.62	0.65	- 0.70
Professional Skepticism Components	-	-	-	-	-	-
Search for knowledge	10	30	20.17	4.42	-0.58	-0.27
Suspension of judgment	7	29	19.70	4.61	-0.43	-0.11
Self-esteem	6	25	17	4.02	0.04	-0.626
Interpersonal understanding	4	25	16.07	4.30	-0.22	-0.374
Autonomy	7	31	20.32	4.92	-0.37	-0.402
Questioning mind	4	15	9.14	2.45	-0.09	-0.119

Table 2 shows the correlation results. There were positive and significant correlations between professional skepticism subscales (search for knowledge, self-esteem, interpersonal understanding, autonomy, and questioning mind) and personality traits (extraversion, agreeableness, conscientiousness, and openness to experience). Table 2 shows negative statistically significant correlations between suspension of judgment and personality traits (extraversion, agreeableness, conscientiousness, and openness to experience). There is a positive statistically significant correlation between suspension of judgment and neuroticism and a negative statistically significant correlation between neuroticism and several professional skepticism subscales (search for knowledge, self-esteem, interpersonal understanding, autonomy, and a questioning mind).

Table 2. Correlation matrix between personality traits and professional skepticism components

Variable	Search for knowledge	Suspension of judgment	Self-esteem	Interpersonal understanding	Autonomy	Questioning mind
Extraversion	0.37**	-0.71**	0.55**	0.58**	0.54**	0.55**
Agreeableness	0.57**	-0.58**	0.62**	0.66**	0.57**	0.51**
Conscientiousness	0.55**	0.59**	0.66**	0.66**	0.60**	0.52**
Neuroticism	-0.44**	0.69**	-0.56**	-0.60**	-0.59**	-0.50**
Openness	0.51**	-0.64**	0.58**	0.64**	0.62**	0.52**

**Indicates significance at the 0.01 level.

*Indicates significance at the 0.05 level.

Multiple regression was used to examine the predictive role of personality traits on professional skepticism and its subscales (see Table 3). Results show that each personality trait was predictive of the professional skepticism subscales.

According to the findings, personality traits significantly predict a questioning mind ($R=0.32$, $R^2=0.566$, $F=21.1$, $P=0.001$). Among the dimensions of personality, extraversion ($\beta=0.399$, $t=2.726$, $P=0.007$), agreeableness ($\beta=0.495$, $t=8.884$, $P=0.001$), conscientiousness ($\beta=0.363$, $t=6.451$, $P=0.001$), and openness to experience ($\beta=0.226$, $t=5.955$, $P=0.001$) were positive and meaningful predictors of questioning mind thus neuroticism ($\beta=0.188$, $t=-3.474$, $P=0.001$) was a negative and significant predictor of questioning mind. In other words, the analyses indicated that personality trait scores could explain 32% of the total variance in the questioning mind (Table 3, model 1).

The second model indicates that personality traits significantly predict the search for knowledge ($R=0.412$, $R^2=0.642$, $F=31.4$, $P=0.001$). Extraversion ($\beta=0.692$, $t=5.092$, $P=0.001$), agreeableness ($\beta=0.426$, $t=3.062$, $P=0.002$), conscientiousness ($\beta=0.423$, $t=2.848$, $P=0.005$), and openness to experience ($\beta=0.359$, $t=2.807$, $P=0.005$), among the dimensions of personality, were positive significant predictors of the search for knowledge, whereas neuroticism ($\beta=-0.467$, $t=-5.820$, $P=0.001$) was a negative and significant predictor. Thus, based on the analyses, personality trait scores can explain 41% of the total variance in the search for knowledge.

In the third model, findings indicate that a suspension of judgment is significantly predicted by personality traits ($R=0.116$, $R^2=0.34$, $F=54.4$, $P=0.001$). Extraversion ($\beta=-0.604$, $t=-5.068$, $P=0.001$), agreeableness ($\beta=-0.530$, $t=-12.138$, $P=0.001$), conscientiousness ($\beta=-0.239$, $t=-2.835$, $P=0.038$), and openness to experience ($\beta=-0.276$, $t=-6.330$, $P=0.001$) were significant and negative predictors of suspension of judgment, while neuroticism ($\beta=0.367$, $t=3.429$, $P=0.001$) was positive and significant. According to the findings of the analyses, personality traits explained 11% of the total variance in the suspension of judgment.

According to the study, personality traits predict interpersonal understanding significantly ($R=0.476$, $R^2=0.69$, $F=40.7$, $P=0.001$). Extraversion ($\beta=1.137$, $t=21.678$, $P=0.001$), agreeableness ($\beta=0.294$, $t=2.242$, $P=0.026$), conscientiousness ($\beta=0.279$, $t=1.987$, $P=0.048$), and openness to experience ($\beta=0.248$, $t=2.054$, $P=0.041$), among the dimensions of personality, were positive and meaningful predictors of an interpersonal understanding, whereas neuroticism ($\beta=-0.526$, $t=-10.347$, $P=0.001$) was a negative and significant predictor. Therefore, it appears that personality traits explain 47% of the total variance in interpersonal understanding (Table 3, Model 4).

The fifth model demonstrates that self-esteem is significantly predicted by personality traits ($R=0.448$, $R^2=0.669$, $F=36.4$, $P=0.001$). It was found that Indicators of extraversion ($\beta=0.874$, $t=14.666$, $P=0.001$), agreeableness ($\beta=0.337$, $t=8.312$, $P=0.001$), conscientiousness ($\beta=0.618$, $t=4.464$, $P=0.001$), and openness to experience ($\beta=0.158$, $t=4.426$, $P=0.001$) most significantly and positively predict self-esteem whereas neuroticism ($\beta=-0.426$, $t=-7.365$, $P=0.001$) significantly and negatively predicts self-esteem. Accordingly, it has been determined that personality trait scores can explain 44% of self-esteem variance. 2.547

Table 3. Results of multiple regression analysis between personality characteristics and professional skepticism

Model	Criterion Variable	Predictor Variables	R	R ²	Adjusted R ²	F	Sig.	β	t	Sig.
1	Questioning mind	Constant	0.566	0.32	0.305	21.1	0.001		61.33	0.001**
		Neuroticism						0.188	-3.474	0.001**
		Extraversion						0.399	2.726	0.001**
		Agreeableness						0.495	8.884	0.001**
		Openness						0.226	5.955	0.001**
		Conscientiousness						0.363	6.451	0.001**
2	Search for knowledge	Constant	0.642	0.412	0.399	31.4	0.001		2.36	0.019*
		Neuroticism						-0.467	-5.820	0.001**
		Extraversion						0.692	5.092	0.001**
		Agreeableness						0.426	062.3	0.002**
		Openness						0.359	2.807	0.005**
		Conscientiousness						0.423	2.848	0.005**
3	Suspension of judgment	Constant	0.34	0.116	0.096	54.4	0.001		5.279	0.001**
		Neuroticism						0.367	3.429	0.001**
		Extraversion						-0.604	5.068	0.001**
		Agreeableness						-0.530	-12.138	0.001**
		Openness						-0.276	-6.330	0.001**
		Conscientiousness						-0.239	-2.835	0.038*
4	Interpersonal understanding	Constant	0.69	0.476	0.464	40.7	0.001		1.49	0.138
		Neuroticism						-0.526	-10.374	0.001**
		Extraversion						1.137	21.678	0.001**
		Agreeableness						0.294	2.242	0.026*
		Openness						0.248	2.054	0.041*
		Conscientiousness						0.279	1.987	0.048*
5	Self esteem	Constant	0.669	0.448	0.436	36.4	0.001		6.603	0.001**
		Neuroticism						-0.426	-7.365	0.001**
		Extraversion						0.874	14.666	0.001**
		Agreeableness						0.337	8.312	0.001**
		Openness						0.158	4.426	0.001**
		Conscientiousness						0.618	4.426	0.001**
6	Autonomy	Constant	0.655	0.429	0.417	33.7	0.001		3.574	0.001**
		Neuroticism						-0.281	-2.335	0.02**
		Extraversion						0.317	2.37	0.019*
		Agreeableness						0.375	2.574	0.035*
		Openness						0.491	3.895	0.001**
		Conscientiousness						0.282	2.925	0.045*

**Indicates significance at the 0.01 level.

*Indicates significance at the 0.05 level.

Findings reveal that personality traits significantly predict autonomy ($R=0.429$, $R^2=0.655$, $F=33.7$, $P=0.001$). Results showed that extraversion ($\beta=0.317$, $t=2.37$, $P=0.019$), agreeableness ($\beta=0.375$, $t=2.547$, $P=0.035$), conscientiousness ($\beta=0.282$, $t=2.925$, $P=0.045$), and openness to experience ($\beta=0.491$, $t=3.895$, $P=0.001$), most strongly and positively predicted autonomy whereas neuroticism ($\beta=-0.281$, $t=-2.335$, $P=0.02$), considerably and negatively predicted autonomy. The analyses showed that personality

trait scores explained 42% of the total variance in autonomy (Table 3, model 6). Therefore, our findings can support the research hypotheses regarding which personality traits significantly predict professional skepticism subscales.

In order to evaluate examining the effect of the dimensions of big five personality traits on the characteristics of professional skepticism utilized path analysis (Fig.1). Each of these fit indices indicates that the hypothesized model provides a good fit to the data. (Table 4). Also, the model explained 54.7% of the total variation in professional skepticism by personality traits.

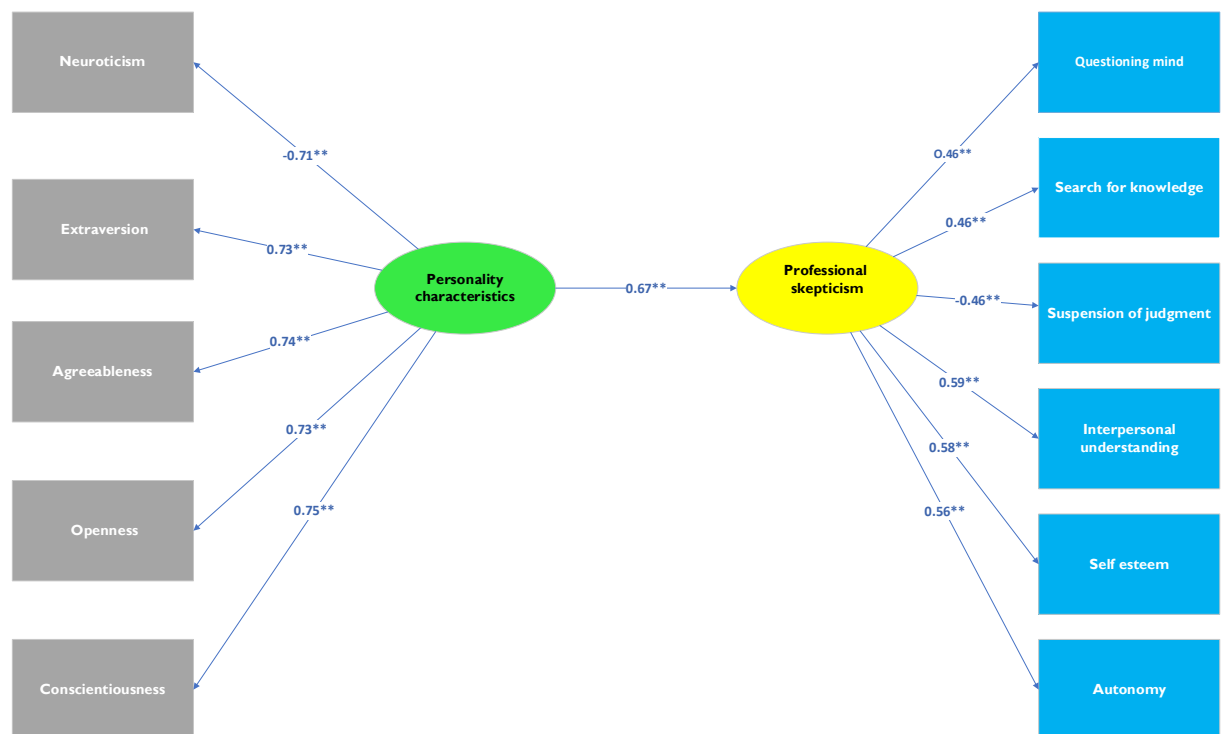


Figure 1. Path analysis diagram of the effect of the dimensions of big five personality traits on the characteristics of professional skepticism.

Table 4. Model fitting information

Fit Index	Chi-square value	(X2/df)	CFI	NFI	IFI	RMSEA	P-value
Value	0.001	4.887	0.900	0.886	0.901	0.160	0.227

Table 5 shows that dimensions of personality traits and professional skepticism directly impacted the total variable of personality traits and professional skepticism traits, respectively. Moreover, personality traits directly impacted professional skepticism ($\beta=0.67$, $P=0.001$). Thus, this study supported the research hypothesis regarding the direct effect of personality traits on professional skepticism.

Table 5. Estimation of direct effect coefficients

Variables	β	S. E
Direct effect of personality characteristics		
Neuroticism	-0.71**	0.14
Extraversion	0.72**	0.11
Agreeableness	0.74**	0.9
Openness	0.73**	0.12
Conscientiousness	0.75**	0.6
Direct effect of professional skepticism		
Search for knowledge	0.66**	0.11
Suspension of judgment	-0.66**	0.11
Self esteem	0.38**	0.63
Interpersonal understanding	0.49**	0.6
Autonomy	0.76**	0.10
Questioning mind	0.66**	0.33
Direct effect of personality characteristics on professional skepticism	0.67**	0.46

**Indicates significance at the 0.01 level.

*Indicates significance at the 0.05 level.

Discussion

The current research investigated the relationship between personality traits and professional skepticism in auditing partners using path analysis and multiple regression. Results showed that the Big Five personality traits are significant predictors of professional skepticism.

Hypothesis 1 (Table 3) indicates that personality traits significantly predict the questioning mind. Our findings confirmed the first hypothesis of the study. The European and American auditing standards indicate that the questioning mind is a paramount constituent feature of professional skepticism; therefore, auditors perform better by having a questioning mind. This finding is consistent with the results of research by Farag and Elias (2016) and Karahan (2022), indicating that students with positive personality traits will be more inclined to question and thus positively affect their work. The personality trait of agreeableness is one of the most crucial predictors of the questioning mind. Also, agreeableness is a valid predictor (Witt et al., 2002), as confirmed in our research.

Hypothesis 2 (Table 3) indicates that personality traits significantly predict the search for knowledge and confirm the second hypothesis of the research. This result is consistent with the findings of Farag and Elias (2016) and Karahan (2022). Fullerton and Dourtschi (2004) believe that skeptical auditors seek more information, and extraversion is a significant predictor of the search for knowledge.

Hypothesis 3 (Table 3) holds that personality traits significantly predict suspension of judgment. The findings confirm the third hypothesis of the study. Based on these results, extraversion is a negative and significant predictor and one of the most important predictors of suspension of judgment, while neuroticism is a positive and significant

predictor of suspension of judgment. These findings agree with Farag and Elias (2016) and Karahan (2022).

In order to investigate Hypothesis 4 (Table 3), personality traits significantly predict interpersonal understanding. As a result of this study, the four hypotheses were confirmed. This result is consistent with the finding by Farag and Elias (2016). Besides, in explaining the role of personality traits on interpersonal understanding, extraversion is one of the most important predictors of interpersonal understanding. Several studies that shown the effect of five-factor personality traits on job performance. The results of these studies indicate that Characteristics Five personality factors positively affect job performance (Barrick and Mount, 1991; Rothmann and Coetzer, 2003; Salgado, 1997; Seibert and Kraimer, 2001). The auditing career is no exception to this rule.

Hypothesis 5 (Table 3) shows that personality traits significantly predict self-esteem and confirm the fifth Hypothesis. Extraversion is one of the most important predictors of self-esteem. Individuals with more robust self-esteem have a more positive perception of themselves, affecting their performance (Tkach and Lyubomirsky, 2006). Therefore, its existence is an indispensable factor in professional skepticism (Bunge, 1991). This allows the auditor to appear independent while performing audit procedures (Ciolek, 2017). This finding agrees with Farag and Elias (2016) and Karahan (2022).

Hypothesis 6 (Table 3) indicates that personality traits significantly predict autonomy. This was confirmed by our finding, which is consistent with the results of Farag and Elias (2016) and Karahan (2022). In explaining the role of personality traits on autonomy, openness to experience is one of the most important predictors of autonomy. Bing and Lounsbury (2000) assert that openness to experience is a valid predictor, which can also be seen in our research.

As indicated by Hypothesis 7, personality traits significantly predict professional skepticism. Our findings confirm the seventh hypothesis. According to the coefficients of path analysis, the more positive personality traits in individuals, the more their professional skepticism increases and positively affects their performance in the audit profession. These findings are consistent with the results of research by Farag and Elias (2016) and Regbiyantari and Narsa (2021), and Karahan (2022). Also, professional skepticism among auditors positively affects their performance (Hurt et al., 2013).

Conclusion

This is the first study to examine the impact of personality traits on professional skepticism in auditing partners. The effect of these variables is explained in our findings. The limitations of this study are the small sample size and the use of questionnaires as the sole means of data collection. Another limitation is that the samples were only selected from male audit partners. Future research could benefit from the test MBTI more effectively as it is designed to identify the most suitable job for individuals. Further, it is expected to conduct studies on gender differences in auditing partners. Also, Researchers could use interviewing instead of questionnaires which will enable researchers to gain better insight and provide them with more accurate information about the subject at hand.

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Original Research

Peoples Income and Consumption Pattern during & before COVID-19 Pandemic: A Study in the Northern Areas of Bangladesh

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Abstract

The SARS COV2 pandemic hits the life and livelihoods of millions and consequently slows down the world economy. The pandemic hits hard the specific social groups due to travel restrictions/bans and other regulations that affect their income and consumption patterns. The goal of this paper is to find out whether the pandemic has any effect on consumption and income patterns among consumers in rural settings. To implement this study, structured questionnaires were sent to respondents and collect data from 180 samples living in rural areas of four different administrative districts in Bangladesh such as Rajshahi, Bogura, Naogaon, and Natore. Using paired sample T-test (parametric) and Wilcoxon signed ranked test (nonparametric) test found that pandemics had a significant effect on the pattern of consumption and income in the northern area of Bangladesh. While the Keynesian method of income determination shows that the MPC before the COVID-19 pandemic was 0.31 and during it was 0.37. This shows that consumers would like to consume at a higher level compared to them before the COVID-19 pandemic. Overall, the study revealed that though the pandemic significantly affect consumers' income to reduce, consumption levels inclines fuelled by the fear of panic buying during the pandemic. Government should have preparedness to provide essential goods during any natural disasters or pandemic-like events.

Keywords: Pandemics, COVID-19, Consumption habits, MPC, Northern Bangladesh.

JEL classification: D1, D11, D12

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Introduction

The global civilization confronted one of its greatest problems in historical remembrance at the commencement of the year 2020: a pandemic of widely identified coronavirus. This disease which produces a severe respiratory illness (COVID-19), expanded quickly over the planet, culminating in a worldwide catastrophe that compelled governments to take drastic steps to halt its proliferation (Liu et al., 2020). As a result, social distance remained a primary goal, resulting in the closing of schools, industries, offices, and markets, as well as border acceptance emergency markets and hospitals. So that this pandemic exacerbated the global supply disruptions (Ranney et al., 2020). However, in Bangladesh like in other countries, the manufacturing firms such as garments, agricultural goods, fast-moving consumer goods, and some other manufacturing industries were continuing their production to activate the wheel of the national economy (Better Work, 2020). However, due to (COVID-19), this is one of the worst times ever for all countries, and the world is facing serious difficulties.

The forced partial or complete lockdown of the nations is having a severe economic impact. In addition to the deaths caused by COVID-19, there have been closures of factories, a halt in production, essentially normal business operations, millions of job losses, and financial crises in several countries. Every economy, whether in wealthy, developing, or underdeveloped countries, is struggling to combat COVID-19. Every day, a large number of people get COVID-19, and this pandemic is to blame for thousands of daily fatalities. The main cause of this high mortality toll is COVID-19's untreatable medical condition. Currently, there is no known cure for COVID-19 patients that has been approved by science. The world economy has faced a substantial economic problem as a result of the COVID-19 epidemic. Governments have used social isolation and enacted lockdowns in order to stop the spread of COVID-19 in their respective nations. Governments incur expenses when they enforce lockdowns since no business is conducted.

There is proof from all across the world that pandemics and epidemics cause economic problems. The effects of diseases and pandemics on the global economy have also been assessed by a number of economists. For instance, Garret (2007) looks into how the 1918 influenza pandemic affected the US economy; Bloom and Canning (2006) look into the links between infectious disease epidemics and income around the world and how these links are impacted by shifting global conditions; Karlsson et al. (2013) look into the effects of the 1918 influenza pandemic on Sweden; Dixon et al. (2002) look into the effects of HIV AIDS on African economic development, and McKibbin and Sidore (2006) look into the effects of These studies show that pandemics and epidemics have an impact on the economy. In their study, Dixon et al. (2002) found that the HIV AIDS pandemic slowed Africa's growth rate by 2-4 percent a year.

Numerous scholars and economists have even forewarned the world about the financial effects of diseases and pandemics, such as Jonas (2013) and Fan et al. (2016). According to Fan et al. (2016), even a moderately severe pandemic might cause 2 million or more fatalities globally. The cost of fighting the pandemic influenza was estimated by the authors to be around 0.2-2 percent of world income, however on the low side.

Although they would not have endured as much suffering as was shown in the wake of the COVID-19 epidemic, it appears that governments have not learnt anything from earlier pandemics. According to estimates, COVID-19 will cost the world economy \$8.8 trillion in the 2020–2021 fiscal year. The World Economic Forum forecasts that in the fiscal year 2020–2021, global GDP growth will fall to about 2 percent, the lowest level since the 2008–2009 global financial crisis. The magnitude of the COVID-19-related economic catastrophe can be understood by considering that various nations are anticipated to see economic growth of between 5% and 10% in the fiscal year 2020–2021. This article's goal is to investigate how the COVID-19 outbreak has affected purchasing decisions and consumption patterns in northern Bangladesh. Numerous research on pandemics and epidemics that concentrate on their economic repercussions served as the inspiration for this study.

However, there hasn't been any significant research done to evaluate consumer attitudes during a pandemic. This feature of consumer behavior during an epidemic or pandemic was overlooked by the researchers. We are trying to close this research gap as a result. As follows is the organization of our research. The topic is introduced, given a brief synopsis in Section 1, and the article's basic structure is explained. In order to pinpoint the research gap, we review the pertinent literature in Section 2 of the paper. Our research aims are listed in Section 3. The research methodology utilized for the project is covered in detail in Section 4, along with the steps involved in data collecting. The data analysis and presentation are found in Section 5. The findings of the paper are further summarized in Section 5. The conclusion and findings are summarized in Section 6 and in section 7 recommendations for reaching markets during an epidemic or pandemic are included. The references used in the study are listed in Part 8. Section 9 adds an appendix.

Consumption Patterns before and during the COVID-19 Pandemic

Primary, secondary, and tertiary wants are satisfied in different ways. The most important condition is to be able to survive well the basic requirements that must be met. The three basic necessities are clothing, food, and shelter. Primary needs including those for education, health care, and leisure are supported by secondary needs. While tertiary demands are those that are produced in the context of lifestyle and status concerns. In general, the public's consuming behavior prior to the COVID-19 epidemic may be characterized as the ability of the impoverished to merely meet their most basic necessities. Primary needs will be addressed to the greatest extent possible through consumption habits, whereas secondary needs are occasionally unmet. The tertiary demands consumption pattern of the lower class is not satisfied. Primary needs will be given priority by the community in meeting its demands, followed by secondary and tertiary needs. Figure 1. displays the consumption patterns of the world and Bangladeshi citizens.

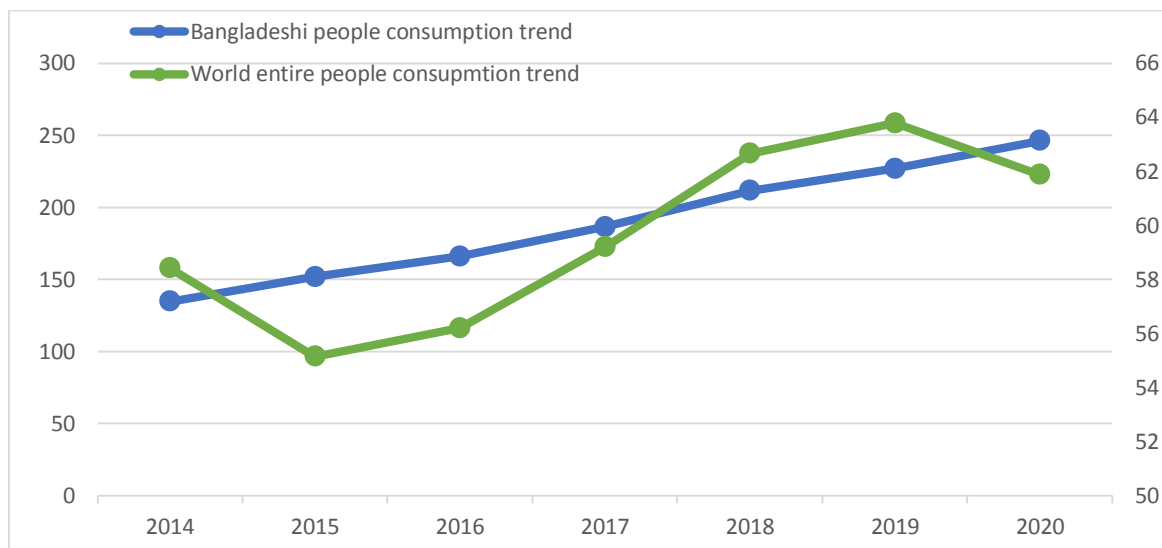


Figure 1: consumption pattern trend Source: World Bank

Literature review

As a direct result of the spreading of COVID-19, people are communicating differently, greeting one another differently, working differently, and purchasing various goods and services. Everything has undergone a substantial change. The use of community isolation and quarantine has resulted in a decline the COVID-19 cases; however, it is also causing people considerable distress. Due to plagues and diseases, economies throughout the world have suffered enormous losses. Jonas (2013) did research on the impact of pandemics on national development. The author concludes that the effects of a pandemic is so enormous that a sole severe pandemic can cost up to three trillion dollars. The author makes comparisons between the destruction produced by a pandemic and a natural disaster. The fact that a severe pandemic is recognized as one of the main global catastrophic threats Jonas (2013) demonstrates how concerned people are about the potential of a pandemic occurring. The author arrived to the conclusion that a pandemic bring agony, economic loss, and societal upheavals on a worldwide scale, but will have little effect on already destitute and fragile states.

Fan et al. (2016) determined the effects of a pandemic that must be incurred in order to combat the pandemic, in accordance with the findings of Jonas (2013). The authors arrived at the conclusion that pandemic costs are comparable to environment alteration charges. It suggests that the global cost of preventing and treating a pandemic would be equal to the worldwide cost of averting and handling climate change. Additionally, the scientists anticipated that the world would face a pandemic equivalent to the 1918 influenza epidemic. This is because the world has not learned from its past failures and has not shown any interest in preparing for a pandemic. This study concurs with the conclusions of Bloom and Canning (2006), who advised that the United States had failed to learn from previous pandemics and was on the verge of another calamity. This discovery is compatible with those discoveries. When expressed as a percentage of GDP, estimates place the worldwide mortality toll anywhere from 0.3% in high-income countries to 1.6% in low- and middle-income countries (Fan et al., 2016). In their study

of the monetary effects of infectious disease outbreaks, Sands et al. (2016) uncovered several risk factors that suggest a new pandemic is on the horizon. According to the findings of the authors, the underestimating of the threat that infectious disease crises provide to human lives and the livelihoods on which these people rely is the primary reason for less investment in infectious disease awareness and reaction. The authors concluded that infectious disease outbreaks had significant cost consequences. The annual effects of a pandemic influenza epidemic is similar to that of climate change, according to a report issued by the World Economic Forum in 2018. It is vital to stress that the majority of economic losses are often generated by reasonably anticipated consumer reactions, labour shortages, and cascading failures in both the economic and financial sectors, and not by the illness itself.

Orset (2018) investigates people's perceptions of house quarantine during a pandemic influenza outbreak, as well as the strategy's cost-effectiveness. According to the author, home confinement cannot be successfully applied if individuals refuse to cooperate freely. (Illustration :) Whether or whether a sick person must stay home depends on factors such as age, income, household spending, career, and contact with an infectious person, and access to medical care. According to the findings of the study, persons are less possible to fulfil with the rules of house confinement if they have a greater chance of becoming polluted or contaminating others. According to study by Baker et al. (2020), there is a negative association between the degree of social alienation and the amount of money spent, and pandemics do effect consumption arrays and, by extension, consumer behavior.

The research of Chen et al. (2020) investigates how the COVID-19 outbreak has affected Chinese consumption. The study obtained daily transaction data from 214 different cities. China's average consumption of offline goods and services decreased by 32% between the end of January and the beginning of April 2020, according to the poll's findings. In comparison to the previous year, spending on goods and services reduced by 33 percent and 34 percent, respectively. The industries durable damaged by the recession were those involving dining out, entertainment, and travel, which each experienced a 59 percent decline. The greatest decrease in consumption, up to 70 percent, was recorded in Wuhan, the place where COVID-19 initially debuted. According to the study's findings, there was a negative response from consumption to daily fluctuations in the severity of the pandemic, resulting in a 1,2% decrease in offline consumption in China in 2019.

During COVID-19 in France, Bounie et al. (2020) investigate the changes in customer behaviour from before to after the event. According to the findings of the study, when customers were surprised, they turned to online shopping, which mitigated the overall impact. Surico et al. (2020) analyze how people in the United Kingdom spend their money based on the financial transaction data of individuals. When the lockdown was initially enacted, individuals stocked up on necessities such as food, according to the findings of the study. In addition, they kept 15 percent more cash on hand than before the lockdown measures were introduced. This pattern remained until April, when it hit 20%. There have been considerable changes in the total amounts individuals spend on services, according to the findings of the poll. After the first week of March, consumer spending on apparel, footwear, accessories, children's books, and games decreased. The price of travel was significantly influenced, although the price of leisure activities declined in March and

remained lower through April. According to the findings of Chronopoulos et al. (2020), COVID-19 and community health initiatives adopted by the administration of the United Kingdom have a considerable impact on the quantity of money and types of items people in Great Britain spend their money on. The researchers noted that when COVID-19 was declared a pandemic on March 11, 2020, people in Britain spent more money on food, causing them to stock up on supplies. The data reveal that men, older individuals, and those with higher incomes spend much more money on all types of purchases than women, younger individuals, and those with lower incomes. According to Muellbauer (2020), a fall in household income will prompt individuals to cut their spending. The author argues that a sixteen percent decrease in household income will result in a twenty percent decrease in consumer spending. The author offers an explanation as to why this is occurring. This can be explained in part by the fact that fewer things are being purchased overall, which contributes to the negative shock. The second factor is that individuals are worried about their future earnings as a result of the historically high pace of jobless growth. Then, the drop in asset prices and a substantial reduction in the overall amount of available credit are further explanations (Muellbauer, 2020). Consumer spending and the U.S. economy appear to be in a considerably worse position than they were at any point during the global financial crisis of 2008–2009. (Muellbauer, 2020). According to research accompanied by IBM (2020) in April, the COVID-19 pandemic has a bigger influence on people's mobility, purchasing power, and ability to participate in activities. According to the results of the survey, the majority of respondents said that they would use public transportation less or not at all, which may raise the demand for private autos. However, due to the economic disaster caused by COVID-19, consumers will be incapable of making purchases. According to the findings of the study titled "The Impact of Epidemics and Pandemics," COVID-19 is fundamentally affecting the behaviour of US consumers, which will have long-term consequences for a range of businesses, including as retail, transportation, and travel. Accenture (2020) conducted a study that reached the same conclusion as IBM (2020): that consumers' priorities have moved to focus on their most basic needs. As a direct result, demand has increased for products in the vital categories of hygiene, cleaning, and staples, while demand has fallen for products in the non-essential categories. The outcomes of the study indicate that digital commerce is gaining popularity rapidly, and it is projected that this trend will continue after COVID-19. Customers place the most value on knowing exactly what they are getting, protecting their health and safety, supporting their local economy, and making the most of their shopping time, according to the conclusions of the study. McKinsey and Company (2020) did a study to estimate the long-term effects that COVID-19 will have on customers. Consumers who responded to the survey claimed that COVID-19 has affected not only their purchasing habits but also their everyday routines. Due to stagnant salaries, consumers are limiting their spending to necessities and other non-discretionary items and services. Customers are rapidly turning to online and digital solutions and depending on less traditional methods to obtain goods and services in person, according to the findings of the survey. Sheth (2020) examines how the COVID-19 epidemic changed human behaviour and identifies eight direct impacts. These include hoarding, improvising, and releasing pent-up desire, acceptance digital technology, blurring the barriers between work and home life, reuniting with friends and family, and discovering talent. According to the conclusions of the study, customers' routines will almost surely change, but they will not disappear entirely. Instead, they will return, allowing business owners to experiment with something unique. COVID has also considerably increased its

use of social media sites such as Facebook, Instagram, WhatsApp, Twitter, and Zoom, resulting in a substantial increase in the number of individuals discussing it. In order to appreciate how individuals think, technical innovation is required, according to the author. As a result of altering demographics, public policy, and technological advancements, the study determines that individuals are more likely to adopt new habits and less likely to abandon old ones. COVID-19 is related with a number of adverse consequences. This phenomena has had an effect on consumers and the way they purchase items, as well as the economy, society, ecology, and culture. For the purpose of determining the scope of these effects, research efforts have been made. Chakraborty and Maity (2020) investigate the global consequences of migration, society, and the environment of COVID-19 on in their study. According to the authors' predictions, the impact of COVID-19 on annual GDP growth will be about similar to a two-percentage-point monthly slowdown. Tourism has been hit the worst, losing between 50 and 70 percent of its earnings. COVID-19 has been shown to have a favorable impact on the environment. This is because the closing of enterprises, factories, and other similar institutions has resulted in a drop in trash emissions, which has been extremely helpful for global ecology. The recovery of the ecosystems has made great progress. Chakraborty and Maity's (2020) findings regarding the influence of COVID-19 on the natural world have been corroborated by a number of different research endeavors. Researchers Saeida et al. (2020) examined that when economic activity was halted during a pandemic, air value increased in several locations throughout the globe. Similar results were found by Zambrano-Monserrate et al (2020).

According to the findings of Sharma et al. (2020), COVID-19 has a positive effect on India's environment, notably in terms of the country's air quality. The study found that the O₃ content in the ozone layer grew by 17 percent while the SO₂ concentration remained the same. During the lockdown, the Air Quality Index (AQI) decreased by 44 percent in the north, 33 percent in the south, 29 percent in the east, 15 percent in the center region, and 32 percent in the west. This shows that air quality increased during the lockdown. Ali and Alharbi's (2020) research examines how COVID-19 spreads, how it is managed and controlled, how it is treated, and how it affects society. According to the study's conclusions, the stoppage of economic operations throughout the world has had a profoundly negative effect on the countries, with the travel and tourism industry being the most badly affected. The authors are concerned that fewer educational institutions will make it more challenging for students to acquire a decent education. Furthermore, scholars feel that a lack of high-quality education will result in major long-term losses for the world. At the conclusion of the report, the necessity of establishing specialized research centers and advancing science and technology is emphasized in order to better plan for and respond to future disasters similar to the ones that occurred here.

Economic impact of pandemics

Pandemics and epidemics can have an impact on the economy that reaches well beyond the borders of the nations where they begin. Things in the modern world, such as travel, commerce, etc., that facilitate the transmission of the disease frequently exacerbate these effects. As we are currently witnessing with COVID-19, epidemics and pandemics can also inhibit an economy from expanding by modifying people's expectations about the economy and discouraging investment and tourists. Numerous economists have

researched the potential adverse impacts of an epidemic or pandemic on the economy. For example, Dixon et al. (2002) evaluated the impact of the HIV/AIDS pandemic on Africa's economic development and found that it had a considerable influence. The epidemic affected people's desire to work and their productivity, which led to a reduction in exports from Africa and an increase in imports. Africa's annual economic growth rate decreased by 2-4 percent due to the pandemic's devastating effects. According to Bloom and Canning (2006), the emergence of SARS slowed the economies of the affected countries. They determined that foreign direct investment in Hong Kong decreased by 62% in just one quarter as a result of the SARS outbreak in China. As a result of having to shut down, sales at a number of enterprises dropped by more than 50 percent. The SARS pandemic cost the United States economy roughly \$11 billion (Bloom and Canning, 2006). The cost of fighting a pandemic was estimated by Fan et al. (2016). The scientists found that the cost of a pandemic is equivalent to that of climate change. Because battling a pandemic costs so much money, the same amount could be used to battle climate change. Because no lessons from the past have been learned and little preparation has been made for pandemics in general, the authors warned that a pandemic as devastating as the one that occurred in 1918 would soon strike the world. Pandemics and epidemics can have devastating consequences on the economy, as evidenced by the paragraphs above. With the use of COVID-19, it is now possible to observe the economic damage caused by this pandemic.

General Objectives of the Project

The main objective of the study is to assess the changing pattern of income and consumption before and during the COVID-19 pandemic in the Northern region of Bangladesh.

Specific Objectives of the Project

To attain the main objective following specific objectives are as follows:

1. To assess consumer attitudes towards consumption at the time of lockdown and before lockdown in the study areas according to their income.
2. To determine the effect of a pandemic on consumer behavior

Research methodology

Sampling Procedure

The study is descriptive in nature. However, from the objective perspective, both qualitative and quantitative approaches are employed. Data and necessary information will also be gathered from primary and secondary sources. To collect primary data a close-ended and open-ended questionnaire was hired to collect first-hand information. At first, we randomly select 4 districts from the Rajshahi division namely Rajshahi, Bogra, Natore, Naogaon then we will also randomly choose 45 households from each district. In addition, we have taken those samples as only businessmen, day laborers, ers, and farmer households and excludes govt. job and other job holder households because their income

remains constant during a pandemic, finally, 180 households have been chosen for collecting data regarding consumption patterns during the pandemic and also before the pandemic. Moreover, for secondary data, we choose the source of BB, BBS, WB, WHO, etc.

Methods of Data Analysis

As this research is based on qualitative and quantitative approaches, we utilize both parametric and non-parametric tests for assessing our objectives. We investigate income and consumption patterns during pandemics and before the pandemic by using primary data to test the root level situation or original consumption and income pattern of people. Furthermore, 1. To analyze the difference between income and consumption patterns before and during a pandemic we use paired sample tests as parametric tests and Wilcoxon Signed Rank Test non-parametric test. 2. Latter we test before and during the MPC level of the targeted consumer by the Keynesian consumption function model

$$\text{Consumption function : } C_t = \alpha + \beta_1 Y_t + u_t \quad 0 < \beta_1 < 1$$

The parameter β_1 is known as a marginal Propensity to Consume (MPC) formula = Change in Consumer spending / Change model.

Analysis of data and discussion of results

Table 1. Parametric test of Paired sample statistics

		Mean	N	Std. Deviation	Correlation	Paired Difference Mean	t	Sig.
Pair 1	MIBP	22900	180	14048	.73	9320	6.63	.04
	MIDP	13580	180	6256	(.05)			
Pair 2	MCBP	16048	180	9178	.62	1058	2.52	.01
	MCDP	14990	180	8606	(.03)			

A paired-samples t-test compares the average of two groups of people or cases that are the same or the average of the same group at two different times. The t-test is called a repeated measures t-test if the same group is tested again on the same measure. The average scores for People's Consumption Pattern during and before the COVID-19 Pandemic is compared with a paired samples t-test in Table: 1. the paired samples correlation shows that there is a strong link between the level of consumption before and during the pandemic. As the p-value is statistically significant, so we can conclude that the average income and consumption pattern of the people is changed before and during (covid-19) pandemic.

Table 2. Non-parametric test of Wilcoxon Matched Pairs Signed Rank Test

		N	Mean Rank	Sum of Ranks
MIDP - MIBP	Negative Ranks	54a	23.8	1047
	Positive Ranks	31b	17	34
	Ties	5c		
	Total	90		
MCDP-MCBP	Negative Ranks	49d	25.27	657
	Positive Ranks	34e	15.38	246
	Ties	7f		
	Total	90		
	MIDP - MIBP	CCDP-CCBP		
Z	-5.541 ^b	-2.580 ^b		
Asymp.Sig.(2-tailed)	0	0.03		

For the above problem the null and alternative hypotheses are spelled out below:

H_{null} : There will be no difference in People's Income and Consumption Patterns during & before COVID-19 Pandemic

H_{alt} : There will be a difference in People's Income and Consumption Pattern during & before COVID-19 Pandemic

For the purpose of determining whether or not there is a distinction between income and consumption pattern, a Wilcoxon matched-pairs signed rank testing is used. Results of that analysis indicated that there was a significant difference in income and Consumption patterns during & before COVID-19 Pandemic, in the table: 2, $z = -5.54$ and -2.58 , $p < .05$. These non-parametric test results also indicate that there is a significant difference between income and consumption pattern during and before the pandemic.

Keynesians consumption function and MPC (Marginal Propensity to consume) analysis,

As a result, various articles have been written about the consumption function. So many macroeconomic strategies rely on the ability to impact total economic demand without increasing government spending directly (Fama & French, 1993). John Maynard Keynes' 1936 General Theory of Employment, Interest, and Money is the most well-known (Keynes, 2006). The Marginal Propensity to Consume is the first and most crucial of Keynes' assumptions. Between zero and one dollar is an additional expenditure (Kinsey, 1983). According to his works on the "basic psychological law," men are prone to increase their spending in proportion to their income, but not by the same amount (Kimball, 1990). In other words, when someone obtains an extra dollar, they frequently spend a portion of it and save the remainder. This income component is known as marginal consumption propensity (MPC). A measure of the notion that an increase in disposable income (income after taxes and transfers) will lead to an increase in personal consumer spending (consumption) is the marginal propensity to consume (MPC), an empirical statistic (Carroll, Slacalek, & Tokuoka, 2014). To put it another way, if a family

has a marginal propensity to purchase of 0.65 and they acquire an extra dollar of disposable income, they will spend \$65 and put \$35 into savings. In mathematical notation, the marginal propensity to consume (MPC) function is defined as the disposable income derivative of the consumption (C) function (Y). $MPC = \Delta C / \Delta Y$ For any given shift in consumption (C), we may calculate its root cause (Y) as the percentage change in disposable income. A value between 0 and 1 represents the marginal propensity to spend, which is determined by dividing the percentage change in consumption by the percentage change in income. If the individual borrowed money to cover expenses in excess of their income, the MPC could surpass one. In a closed two-sector economy, one minus the MPC equals the marginal propensity to save, both of which are significant in determining the magnitude of the multiplier and are fundamental to Keynesian economics.

Table 3. MPC Results of before and after covid-19

Keynes Consumption Function		MPC	R ²	F	P	D-W	df
Model 1 Before Covid-19	$C = 8946.19 + 0.31Y$	.31	.78	13.96	.03	2.24	1.16
Model 2 During Covid-19	$C = 9930.9 + 0.37Y$	.37	.68	8.64	.05	1.89	2.21

Model 1, MPC of before pandemic

The aggregate private consumption function is represented here in its most basic form by this model. It investigates the relationship between aggregate disposable income (Y) in the past and consumer spending. In table 3, we find that the marginal propensity to consume is 0.31, which is a very significant value from a statistical perspective (P .03). The value of R² for the coefficient of determination is satisfactory at 0.78. This indicates that if disposable income increases by 1 million, then a total of 0.31 million takas will be spent on consumption provided that all other factors remain unchanged. The estimate provided by mpc appears to be too low. The values of the model's coefficient of determination (R²), standard error of the regression, F-statistic, and D-W statistic, as well as its model P value, demonstrate that the model possesses the appropriate statistical features.

Model 2, MPC of during pandemic

In this model, we have thought about how the way we use things now affects us. We find it interesting that the value of MPC went up by .37 during the time of the pandemic in the table: 3. though lack of income and other crises reduce up aggregate supply, people don't stop likely to spend money. So, we can say that, when there is a crisis and income shortfall, people don't want to save money; instead, they want to spend it and remain their consumer behaviour as before. As a result, their MPC goes up.

Impact of COVID-19 on consumption pattern

More than 90% of those who responded to the study overall claimed that COVID-19 had impacted their spending patterns. The majority of them, or 60%, believe that during

COVID-19, consumption and spending patterns have changed dramatically. 24 per cent of respondents, or almost a quarter, were unconcerned about changing their spending patterns. Seven per cent of the respondents overall claimed that COVID-19 had had no impact on their purchasing patterns. During COVID-19, 73 per cent of all respondents reported spending less, indicating that their spending patterns have changed. However, 27% of respondents said they were increasing their spending on COVID-19. 81 per cent of the respondents, or the majority, are spending money on necessities during COVID-19. A total of 11% of them spend money on personal care items, 4% on EMI repayment, 2% on entertainment, and the other 2% go out to eat. COVID-19 has also compelled customers to make online purchases.

Conclusion

The primary aim of the article was to evaluate changes in consumption patterns during and before to COVID-19, determine parallels and differences in consumer behaviour in a few selected regions, and recommend the most effective strategies for accessing markets through any forthcoming pandemic. Based on the arguments in the preceding section, we derive the following conclusion:

- Customers' habits shift when a pandemic hits. Our COVID-19 case study data shows this to be the case. Our research indicates that COVID-19 has made a sizable influence on buying habits in Bangladesh.

- COVID-19 has a major effect on how people in Bangladesh shop for and consume goods. The vast majority of COVID-19 shoppers concentrated simply on necessities. Customers only buy the essentials in the event of a pandemic. During an epidemic or pandemic, consumers tend to favour higher-quality goods and meals.

- Consumers' spending habits are significantly altered in the wake of pandemics like the recent COVID-19 outbreak. Among those who participated in our study, more than 70% said their spending habits had been negatively affected by COVID-19.

- Customers' first priority during pandemics is maintaining their own health. Whether used for education, entertainment, or social networking, internet platforms have a good shot at succeeding during an epidemic or pandemic. Additionally, customers are more likely to use electronic payment methods during an outbreak.

- Consumer behaviour in both rural and urban settings is similarly affected by epidemics and pandemics. However, consumers in metropolitan areas are more negatively affected by the closure of restaurants, movie theatres, and recreational facilities.

- People tend to retreat to their hometowns out of fear that the virus would spread there. Our research led us to find this behaviour. In addition, many people are eager to return to urban regions after COVID-19 in pursuit of employment.

- An extended effect on consumer behaviour from the COVID-19 epidemic is expected. The public is convinced that COVID-19 will permanently alter their discretionary spending patterns.

Recommendations

We advise marketers and policymakers to use the following strategies to reach customers during an epidemic or pandemic:

- According to our data, the majority of consumer expenditure is on basics such as food and prescription drugs. As a result, marketers should strive to create such business models.
- Several online channels are available during an outbreak. Businesses should make an effort to go digital and invest in online platforms during pandemic outbreaks. According to the findings, people like to live a healthy and fit lifestyle. Furthermore, it has been revealed that customers took immune boosters during the COVID-19 pandemic. Businesses should make an effort to incorporate products that boost immunity and support good health in their product assortment.
- According to authorities, people who lost their jobs due to a pandemic should try to find alternative employment.

Author Contributions

Mohammad Nazmus Sakib has made a substantial contribution to the concept or design the article; and analysis, interpretation of data for the article.

Abu Hurira helped to collect the data and involved in drafting the manuscript or revising it critically for important intellectual content.

Md Ariful Islam has given final approval of the version to be published and accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Appendix

Abbreviations

- BB = Bangladesh Bank
- BBS = Bangladesh bureau of statistics
- MPC = Marginal propensity to consume
- MIDP = Monthly income during Pandemic
- MIBP = Monthly income before pandemic
- MCDP = Monthly consumption during pandemic
- MCBP = Monthly consumption before pandemic
- WHO = world health organization
- WB = World Bank

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Original Research

Roots of Administrative Corruption in Public Sector of Developing Countries

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Abstract

What lessons does prior research on causes of corruption offer public administrators operating in, and researchers studying the dynamics of, public sectors of most governments developing societies? In this paper we summarize a voluminous body of prior economic, social and political science research that tells us about the roots of corruption in public sector of developing countries. Informing the analysis is a "review of reviews" of a sprawling research that examines six indicators: government size, oil revenue, democracy, quality of bureaucracy, rule of law, and human development; that are assumed to be major factors in increasing or decreasing the level of corruption in developing societies. We discern from this formidable body of research what is known about causes of corruption, what is left to know, and how useful the prior research could become panacea for encountering administrative corruption of developing countries. Finally, based on research findings, suggestions for future research are presented

Keywords: Administrative Corruption, government size, oil revenues, democracy, bureaucracy quality, rule of law, human development.

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Introduction

According to the Corruption Perception Index (CPI), over two-thirds of the 176 countries in the globe, fall below the midpoint of the scale of 0 (highly corrupt) to 100 (very clean). The global average score is a paltry 43, indicating endemic corruption in a country's public sector (Transparency Organization, 2016). Administrative corruption could be the outcome of mismanagement of a society's potential talents and resources that could result in socio-political failure and economic crisis in that society. Therefore, the fight against administrative corruption is an undeniable imperative for all governments. (Zadegan & Mohammad, 2004). In other words, administrative corruption is an obstacle for organizations to function effectively, and a main factor that ends up to removal of institutions from achieving their goals (Frisch, 1994; Igiebor, 2019). In fact, administrative corruption is like an infection that pollutes the body of the organization, its members one after another, and infects the spread of the corpuscular community (Kasasbeh, Mdanat, & Khasawneh, 2018). The corruption, particularly the political and administrative corruption has been discussed from different point of views. But, corruption literature, have dealt, more frequently, with the question of how to cure this social ills. Compared with the literature on the solution of this bureaucratic illness, there are less debates on the roots of administrative corruption and the context within which it will exist. Therefore, the main question of this study is "What are the roots of administrative corruption in public sector of developing countries?" If any of scholarly efforts on the subject is part of a puzzle, this study attempts to draw a general picture in order to combine different pieces of this puzzle. Therefore, this study aims at systematically reviewing recently published ISI articles on AC, to find out in what conditions administrative corruption increases and where it may be decreased?

Method

In this meta-analysis research we reviewed one hundred ISI articles that were published over a period of 1995 to 2022 in international journals. The databases searched included Scopus, Oxford, Cambridge, JSTOR, Springer, Science Direct, ProQuest, Elsevier, and Google Scholar. In addition to these known databases, the authors had access to a tool called Dialog Classic, which is a collection of many data-bases. The search included terms related to the administrative corruption (roots, causes, reasons, and effect factors). Theoretical sampling in sequential order was used to comparatively analyze the convergences and divergences, of the causes of corruption in the articles that provided an opportunity to select the articles in the next stage. In next stage we had access to articles containing roots and causes of corruption in public sector of developing countries. Then, by reviewing the selected articles we were able to extract the roots and causes of corruption from the texts, and identify the spectrum of opinions of scholars, their discussions and agreements and disagreements. It was at this point that we found the causes for corruption in developing countries, being measured by their frequency. These can be categorized into five factors: economic, political, bureaucratic, legal and social. In order to operationalize the five factors and set variables to be discussed in each concept, the authors received the views of the research committee's professors, and a number of experts from political science and economics departments of Science and Research Branch of Islamic Azad University. Summing up the comments in the second round of

panels of experts led to selection of six representative variables in the five categories. In the economic dimension, the size of government and oil revenues, in the political dimension, the democracy, in the bureaucratic dimension, the quality of bureaucracy, in the legal dimension, the rule of law, and ultimately in the social dimension, human development were identified as representing variables for each class.

Government Size & Corruption

Government size can be viewed as an important subject for study of the corruption, but, the causality and direction of these two construct may be two-sided. What are the logic and impacts of government size on corruption? There is no consensus among authors on the issue from theoretical aspect. The literature that has examined the relationship between these variables vary and represent different point of views.

Proposition 1: *The effect of government size on reducing corruption is dependent on the level of democracy.*

Kotera et al. study results of 82 countries (2012) found that an increase in government size can lead to a decrease in corruption if the democracy level is sufficiently high. Furthermore, their findings show that the greater the level of democracy, the more decrease in level of corruption. These results provide some important implications for policymakers seeking to perform government interventions without aggravating corruption. The focus of a study by Montinola & Jackman (2002) is about causal relationship between the size of government and corruption. According to their findings, public-sector size, by itself, does not foster corruption. They argue, the level of growth and political stability mediate this relationship.

In summary, the reviews findings, reveal that if democracy runs low, an increase in the size of government will increase the level of corruption. Conversely, there are studies that argue, increasing the size of government causes higher corruption in developing countries. In other words, the hypothesis is that, the larger the size of government and bureaucracy, the larger will be the number of bureaucrats, and the greater opportunities for them to be corrupt and demand bribes. The findings of several studies show that the overall size of the government budget relative to GDP is positively correlated with higher level of corruption ((Rose-Ackerman & Palifka, Corruption and government: Causes, consequences, and reform, 2016; Mauro, The effects of corruption on growth and public expenditure, 2017; Gillanders, 2014; Goel & Nelson, 2021; dela Rama, Lester, & Staples, 2022; Jetter, Agudelo, & Hassan, 2015; Philp, 2017; Gründler & Potrafke, 2019; Husted, 1999; Mauro, Corruption and growth, 1995) (LaPalombara, 1994; Scully, 1991). Given the fact that an increase in the size of government, causes corruption, it is possible to conclude that a smaller government is desirable if the objective is to control corruption. It follows that an increase in the size of government will temporarily raises administrative corruption. As, (O'Donnell, 2001) state that the lesser government involvement in the economy, will lead to lower level of the corruption.

Proposition 2: *An increase in government size reduces corruption if economic development level is high.*

When governments are in periods of economic downturns, providing adequate government services to citizen is unlikely. So, those citizens or customers who demand public services might be tempted to bribe public officials in order to seize more public services. This may happens in another way. The government may be forced to lessen employee salaries to reduce its payroll costs. Indeed, in conditions that economy is booming, evidence show that the larger the public sector in terms of government expenditures, the lower the extent of corruption. The discussion is that public-sector size itself does not foster corruption. It has to be emphasized that corruption declines with increasing economic development, as reflected in GDP per capita. GDP reflects a number of factors, of course, but we have emphasized its substantial correlation with average wages, both private and public. Along with their intrinsic interest, the results for per capita GDP thus speak at least indirectly to part of the claim made for an effect of government size on corruption. The higher wages in both the private and public sectors associated with increasing GDP will reduce the incentives for corruption. In other words, wages would seem to be the critical quantity, not the sheer size of the public sector itself.

It appears from our analysis that corruption increases in periods of economy downturns. According to the study of (Li'an & Jing, 2009) corruption increases at economy downturn. They have used a panel data at the provincial level during the period 1989—2004. Applying a fixed-effect model and IV estimation, they found that government size positively affects the occurrence of corruption, and the effect becomes larger for the increase in the size of the "core" government sector. They also identified the significant impacts of the size and structure of government expenditures on corruption. Also, (Arvate, Curi, Rocha, & Miessi Sanches, 2010) found that increasing the size of government causes higher corruption in developing countries. Given the fact, there is a consensus on promoting good governance, the policy recommendations are all related to strengthening governments capacity to formulate appropriate policies regarding expenditures, revenues and reducing the "room" for corruption.

Oil Revenues & Corruption

Over the past decades, "huge oil revenues" have been considered as a major source of corruption in oil-rich countries. In countries where the main part of government income is earned from oil revenues and GDP growth depends on oil production, oil revenue and corruption, as well as the society's political structure, transformation and social condition are fundamental variables for analyzing the corruption phenomenon. Let us see what literature tells us about the connection of resource rents and corruption in rentier countries?

Proposition 3: *mechanisms through which resource rents affect corruption cannot be separated from political systems.*

In a study, (Arezki & Brückner, 2011) examined the effect of the interaction between resource rents and democracy on corruption for a panel of 29 Sub-Saharan countries during the period from 1985 to 2007. They found that higher resource rents lead to more corruption and the effect is significantly stronger in less democratic countries. They support their argument by documenting that higher resource rents lead to more (less) government spending in less (more) democratic countries. Also, Shaxson's study

(Shaxson, 2007) that was based on nearly 15 years' research into oil and politics in sub-Saharan Africa, and included interviews with numerous key players, explores the dynamics of the resource curse theory. Shaxson's conclusion support the argument of development theorists who are in favor of political rather than economic development, in developing societies. Further, the study of (Ross, 2008) represents that oil wealth often wreaks havoc a country's political system. He blames political leaders of developing countries for being indifferent to the advice offered by development specialists and adds that they are too busy profiting from corruption and crushing their opponents.

Understanding the interplay between political systems and resource rents is a matter of key importance for the design of risk management strategies to tackle corruption. As the authors commented so far, it is not advisable to separate the issue of resource rents from political systems when studying the evolution of corruption following a resource bonanza. This is because less democratic countries are able to dispense pork-barrel spending to disguise redistribution and quell the masses (Arezki & Brückner, 2011)

Proposition 4: *If the quality of democratic institutions is relatively low, resource rents will increase corruption.*

In a cross national study of 39 countries in a period of 1997 to 2013, (Mahdavi, 2014) asserts that the political institutions employed by states to govern their petroleum wealth, are responsible for much of the variation that are seen in corrupt outcomes. He argues not only political institutions do not matter for corruption — a long-held view in political economy, but those accountable to watch corrupt behavior, are themselves involved in the matter. The separate literature on political corruption has similarly shown that rent-seeking is exacerbated by or borne out of so-called “bad” institutions (Krueger, 1974; Rose-Ackerman, The economics of corruption, 1975; Buchanan, Tollison, & Tullock, 1980; Rose & Peiffer, 2019). In general, regulatory NOCs may facilitate corruption because these firms are staffed with political appointments (as opposed to meritocratic appointments), who not only have the opportunity to solicit bribes from contract bidders but also have little incentive or even knowledge to pick the “best” bidder on the basis of technical skill. In other words, these types of managers are more prone to bribery and extortion given not only their political connectedness but also their capacity as gatekeepers of oil licenses and lucrative contracts. Research's results of (Bhattacharyya & Hodler, 2010) confirm that the relationship between resource rents and corruption depends on the quality of the democratic institutions. They use panel data for 124 countries covering the period 1980 to 2004. In their study, various alternative measures of natural resources, corruption and the quality of the democratic institutions, are examined. The findings imply that democratization might be a powerful tool to reduce corruption in resource-rich countries. Brunnschweiler's study re-examines the effects of natural resource abundance on corruption, considering the role of institutional quality. The empirically significant relationship between institutional quality and resource dependence reflects that countries with poor institutions are unlikely to develop non-primary production sectors to reduce their dependence on resource exports (Brunnschweiler, 2008).

The results of several studies show that the relationship between resource rents and corruption will depend on the quality of democratic institutions. Rentier states, politically

tend to become authoritarian (Hammond, 2011), prevent democratization and political participation. Obviously, in such this system, the quality of democratic institutions is relatively low, and separation of powers and independence of the judicial system is nonexistent.

Proposition 5: Government control over all aspects of the economy in resource-rich countries increases corruption opportunities.

(Arezki & Brückner, 2011) by using panel fixed effects regressions and a new measure of country specific oil rents that is driven by cross-country differences in geology, examine the effects of oil rents on corruption for a panel of 30 oil-exporting countries during the period 1992–2005. They found that an increase in oil rents significantly increases corruption. They support their argument by documenting there is a significant effect of oil rents on corruption in countries with a high share of state participation in oil production. Also (Bardhan, 2017) indicate that the role of OPEC on corruption is noteworthy, because the state control of all aspects of the dominant sector of an economy does in fact increase the opportunities for rent seeking and corruption. Freed of the political constraints associated with direct taxation, political leaders have every incentive to engage in the politics of patronage, an environment in which corruption flourishes.

As economists argue the rentier states by restricting economic freedom, create opportunity to maximize their involvement in the economy.

Proposition 6: In resource-rich and less democratic countries, political leaders, through mechanisms such as populist cost policy, convert natural resources to corruption in order to survive their political status.

(Andersen & Aslaksen, 2013), in a sample of more than 600 political leaders in up to 152 countries, found that allocation and distribution of government income through populist cost policy is a means for the maintenance of undemocratic regimes. The authoritarian governments, which gains their revenues through resource rents, do not set up an effective tax system or alternatively, do not have much incentives to let other economic sectors to grow. Hence, political leader's legitimacy rest on widespread occupation. There are studies that suggest, leaders in developing economies, in the absence of property rights (individual or communal), eliminate "open access" conditions to natural resources and incentives for investment and long-term management of the resources (Badeeb, Lean, & Clark, 2017; Barbier, 2010). Also, in a study (Torvik, 2002) argues that people in this conditions try to obtain quotas or entitlements for access to natural resources rather than focusing on direct production. Intense competition to capture economic rents creates ample opportunities for corruption and can motivate people to offer bribes or government officials to solicit bribes.

Democracy & Corruption

Generally speaking, institutionalist literature especially in empirical terms – has focused on political factors as the main state- related factors for explaining corruption. To start with, there are numerous cross country studies dealing with the impact of the type of political regime on corruption: are democratic states less corrupt than authoritarian

ones? Contrary to , (Harriss-White & White, 1996) there seems to be a significant relationship between democracy and corruption, though it is a non-linear one. This non-linearity has been defined as either a U-shaped (e.g (Bardhan, 2017)), a J-shaped (e.g., (Bäck & Hadenius, 2008)), or an S-shaped (e.g., (Sung, 2004)) relationship.

Proposition 7: Corruption is reduced by establishing democracy

(Paldam, 1999) finds that there is a negative relationship between corruption and the level of democracy. He adds that since there is a strong interaction (vice-versa) between democracy and pattern of transition, therefore the independent effect of democracy on corruption is uncertain. But, (Akçay, 2002) has mentioned that more democratic nations are less corrupt because of two reasons. First, democratic regimes possess effective governance system, rule of law, accountability and transparency, whereas undemocratic regimes do not. Second, democratic regimes embraces those leaders who have political will to address corruption, create the environment in which civil organization can deal with corruption, and support anticorruption activities. Similar argument is put forward by (Shleifer & Vishny, 1993) who say that countries with more political competition have stronger public pressure against corruption – through laws, democratic elections, and even independent press – and so, are more likely establish organizations that reduce rather than maximize corruption. Therefore, they conclude that democracy is negatively related with corruption.

Comparative politics, tell us about the impact of classical distinction between majoritarian and proportional representation (PR) systems over corruption. In the PR systems, with the existence of large voting districts, democracy has a positive effect in controlling corruption. In the majoritarian systems that characterized by the number of MPs elected in a single district, democracy has the same positive effect on reducing corruption. Despite the fact that, in the both systems the relationship between variables do not change much, the individual accountability of MPs in majoritarian is lower than PR system. Thus, it is likely that in the latter, the candidates be more prone to engage in corrupt activities (De Vries & Solaz, 2017; Klačnja, 2015; Esarey & Schwindt-Bayer, 2018)

The relationship between democracy and Corruption could be moderated by variables such as “independent media”. (Bardhan, 2017) but (Jetter, Agudelo, & Hassan, 2015) state that the relationship between independent media and democracy is not statistically significant. As (Klačnja, 2015) state, the main reason that political freedom reduces corruption is that it imposes transparency and creates a balance in the political system.

In addition, as democratization process goes on, political stability is more pervasive for governments to fight corruption, so it's not surprising that writers like (Jetter, Agudelo, & Hassan, 2015), (Rose-Ackerman, Corruption in international business, 2018) and (Leite & Weidmann, 1999) found that corruption increases in unstable politics. Thus, while some argue that with the increase of democracy, corruption decreases, other scholars believe that corruption will increase in the early stages of democracy, and will be decreased as the political stabilization goes on (Jetter, Agudelo, & Hassan, 2015)

Bureaucracy Quality & Corruption

A growing literature, mainly in economics and political science, has highlighted the relationship between the quality of bureaucracy and corruption in developing societies. The lack of "bureaucracy quality" plays an important role in creation and spread of corruption. On other hand, the higher the quality of bureaucracy, the more possibility for corruption to diminish (Bardhan, 2017; Van Rijckeghem & Beatrice S. , 1997). Scholars and policy-makers agree that factors like "good governance", "state capacity", and "quality of government" foster social and economic development. Also researchers have argued that in highly inefficient government institutions where the level of meritocracy is low, the likelihood of corrupt activities to increase is high. (e.g., (Hall & Jones, 1999; Acemoglu, Johnson, & Robinson, The colonial origins of comparative development: An empirical investigation, 2001; Acemoglu, Johnson, & Robinson, Reversal of fortune: Geography and institutions in the making of the modern world income distribution, 2002; Easterly & Levine, 2003; Rodrik, Subramanian, & Trebbi, 2004))

Proposition 8: The higher level of meritocratic recruitment the lesser level of corruption

(Rauch & Evans, 2000) and (Dahlström, Lapuente, & Teorell, 2012) show that some bureaucratic factors, i.e. professionalism and meritocratic recruitment which are statistically significant deterrent of corruption, reduce corrupt activities. Their argument goes on to state that even other political and administrative factors such as the years of democracy or the type of electoral system, as well as employees' competitive salaries, carrier stability or internal promotion, compared to meritocratic recruitment, do not have much significant impact on reduction of corruption.

They argue that one way to reduce corruption is separating interests of bureaucratic agents from those of their political principals. This policy prevents opportunistic actions such as accepting bribes or organizing kickbacks to take place. The elected officials and professional bureaucrats may engage in corrupt behavior, but this requires coordination of actors with different interests. The premise is that, weakening the ties between politicians and bureaucrats diminishes the possibility of their collusion and increases the chances for both groups to reveal corrupt actions taken by the other group. (Frankel, 2014) argue the possibility of separation of interests between these groups can be occurred as a result of different source of their accountability. Politicians are accountable to their constituencies and higher civil servants are accountable to their professional peers or to the public at large. (Alesina & Tabellini, 2008) conclude, the separation of interest might be limited to parliamentary systems where the carrier of professional civil servant become independent from the carrier of political incumbents.

Proposition 9: The low level wages of civil servant is a cause for corruption.

There is a classical premise in the literature on bureaucracy and corruption which assumes that public servants low incomes is a main cause for corruption. Traditionally, the authors who study public servants' wages and penalties for corrupt behavior, tend to use cost-benefit analysis. Within this framework they apply cost-benefit analysis in which economic incentives – carrots and sticks – might be set so that public servants are not

tempted to engage in corrupt behavior (Becker & Stigler, 1974). Although, it needs much efforts to conduct empirical investigation over the incentives of public servants, it is assumed that their incentives can be affected by the amount of their wage and the probability of detection and the penalty they may receive for corruption (Ninepence, 2020). The study of (Ninepence, 2020) presents the first empirical estimation of the effect of civil service payments on corruption. First, they showed that theory is ambiguous on the relationship between civil-service payment and corruption. Then, they examined the issue using a new data set on wages for low-income countries. Their findings based on a cross-country averages presented evidence of a significant relationship st between relative civil-service payments. Also, the study of (Herzfeld & Weiss, 2003) that measured employees' wage-to-GDP ratios, suggest that wage increases, significantly reduce corruption. The effect of wages on corruption has been also highlighted by Evans and Rauch (Evans & Rauch, 1999) . However, other studies show that this relationship is not always statistically significant (Kuntz, et al., 2015; Dimant & Tosato, 2018)

Rule of Law & Corruption

Despite the disagreement over the definition of the rule of law and indicators to measure this concept, most of the studies have raised the question of whether civil servants are law abiding and stand the norms governing their formal responsibilities. This again raises the question of whether a country could enjoy a higher level of rule of law and yet facing a widespread corruption?. (Mendonça & Fonseca, 2012) show that corruption is inherently related with rule of law. It seems that most of developing societies sustaining serious corruption problems, have a very weak rule of law and law enforcement system (Igiebor, 2019)

Proposition 10: *A higher level of rule of law is associated with a lower level of corruption.*

The idea that a weak rule of law implies a high level of corruption is supported by (Leff, 1964) and (Huntington, 1968). Also, the World Bank considers rule of law as an important dimension of good governance and the essential means for controlling corruption. In brief, in countries where a higher rule of law exist, it is ensured that no one is above the law and thus the corruption may decrease much. As Herzfeld & Weiss's study (Herzfeld & Weiss, 2003), indicate, an effective legal system has been viewed as a key component in reducing corruption (see also (Rose-Ackerman, Corruption in international business, 2018; Van Rijckeghem & Beatrice S. , 1997))

(Mendonça & Fonseca, 2012) poses the question as whether there is a causal link between corruption and rule of law. They argue that the low level of rule of law in developing societies is associated with high level of corruption. The discussion focuses on politician's behavior whose success in elections depends on large sums of money that is acquired through illegal granting of state contracts to their friendly business partners. More than a few layers of society are involved and are affected by this trail of money. In the first place, politicians misappropriate public funds; and in order to protect themselves they intervene in the judicial process. Because of perpetual lack of rule of law, citizens' liberties and rights are not protected. Corrupt politicians require political appointees in government organizations to grant procurement contracts facilitate cheap sales of state

land and assets to their personal businesses or their family or friends' companies. The recipients of the contract reward the influential politicians with a generous commission. This side payment serves as party/campaign finance or enrichment (sometimes as large as half the contract—up to millions of dollars). They deliberately avoid targeted reforms such as, independent, powerful anti-corruption agencies; supervisory bodies to enforce public wealth declarations; civil service reform; electoral law reform; public procurement supervision and transparency. While the media and civil society may uncover these activities, and investigations and prosecutions may follow, most of the people involved in the exposed illicit transactions never receive punishment. The cases of corruption get dropped, or resolve without punishment and due justification. Politicians and their business partners intervene in the judiciary process in order to avoid punishment. This endangers principles of rule of law, separation of powers and independence of judiciary.

Human Development & Corruption

Human development is defined as “expanding the choices people have to lead lives that they value” (Programme, 2001) . Extending human capabilities through human resource development; such as good health and nutrition, education and skill training are choices that can be expanded. According to the Human Development Index (HDI) released by the United Nations Development Program, human development includes three vital aspects of socioeconomic development: health, education and living standards. HDI is based on three indicators, all of which are equal in weight (United Nations Development Program, 2001):

- Longevity, as measured by the life expectancy (at birth) index;
- Educational attainment, as measured by an index evaluating a combination of adult literacy (two-thirds weight) and the combined gross primary, secondary, and tertiary enrolment ratio (one-third weight);
- Standard of living and access to resources, as measured by an index calculating real GDP per capita in terms of purchasing power parity (PPP).

Although literature links human development and corruption, the causal relationship between these variables remains unclear. While many researchers support the decisive role of corruption in preventing human development indexes to improve (Akhter, 2004; Gatti, 2004; Leys, 2017; Mauro, Corruption and growth, 1995), some recent studies support a Vis versa relationship between them. (Zhang, Cao, & Vaughn, 2009). It seems corruption and human development has a dialectic effect on each other, which means they influence and are influenced by each other thus form a vicious cycle. (Anand & Sen, Human development and economic sustainability, 2000; Prados de la Escosura, 2015) . It is argued that targeted efforts to strengthen human development are necessary to break this vicious cycle and facilitate the process of combating corruption. First of all the human development constructs encourage the importance of economic power to improve the quality of life (Anand & Sen, Human development index: Methodology and measurement, 1993; Anand & Sen, Human development and economic sustainability, 2000). Human development increases the willingness and ability of individuals to monitor the corrupt practices to happen and the motivation for corrupt behavior.

Proposition 11: *Increasing the level of human development reduces the level of corruption.*

According to the study of (Husted, 1999), in countries with higher GNP per capita, the level of corruption is lower. This argument is based on the fact that governments are restricted by private party opposition and the fact that the more resources are more likely to reduce the incentive to get involved in corrupt practices (Cheung & Chan, 2008; Husted, 1999). Second, in countries with higher levels of human development, people are more educated and capable of monitoring and evaluating public behavior. The analysis of data collected from Uganda showed that better education was associated with better knowledge of the corruption reporting process. This, in turn, led to a reduction in administrative corruption and improved public service quality (Hsiao, Vogt, & Quentin, 2019). Similarly, (Cheung & Chan, 2008) by examining the Gross Enrollment data in education and Corruption Perceptions Index data, found that, increasing in the number of literate people will lead to a decline in corruption. Ultimately, by definition, a higher level of human development creates an environment that provides equal access to opportunities for people to exercise their freedom and maximize their potential (Ul Haq, 1995). As a result, increase in human development encourages more people to collectively seek social justice and enhance moral standards (Zhang, Cao, & Vaughn, 2009; Sen, 1999). Within such an environment, corruption is likely to be restricted. To conclude the above literature, which shows the link between corruption and income, education and free will, researchers have proposed the following statements: It seems countries with longer life expectancies, higher education and literacy, adequate salary, and the ability of citizens to participate in communities, the level of corruption is less likely to increase.

Conclusion

This study was conducted to examine a broad range of prior economic, social and political researches that were published in accredited international journal during a period of 1995 to 2022 on the roots of corruption in the public sector of developing countries. It examined the six concepts that linking to and influencing the administrative corruption: government size, oil revenues, democracy, bureaucracy quality, rule of law and human development. The results showed that though each of these concepts as independent variables, have measured the level of corruption, the corruption has been influenced by mediating and moderating variables as well. Given that combating corruption is essential for investigating the quality of governance in developing societies, this paper attempted to present what the previous studies have told us about the roots and causes of corruption, and the context (political, economic and social) in which it may exist. It aimed at presenting the gaps in the literature and where researchers need to focus in their future researches on the topic. The paper may present some idea or possible plan (policy advice) for policy makers to strengthen the government's capacity, and promote the institutional quality and democracy to fight back corruptive practices in developing areas. This goal might be achieved through a strong political will and by such a means like restructuring the state bureaucracy, rule of law and human development.

As to the limitations of this research, we have to note that in order to extract the causes of corruption in developing countries, the literature could not place the importance and priority of the five concepts that have affected the level of corruption in developing

societies. Also, the reviewers had to deal with the international and local statistics and data available to them at the time of enquiry, so, in order to determine the appropriateness of the above-mentioned indicators they had to consult with several social science academicians and professionals. Obviously, the generalizability of the findings requires more comprehensive research. Therefore, we suggest that this study be carried out using a longitudinal method and other research strategies.

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