Chapter # 1.

1. INTRODUCTION:

Time Changes and organization needs to forecast there key factors before having an uncertain environment. Procurement Forecasting is also as essential as any other factor for an organization during a pandemic or in any uncertain environment. Other than pandemic or any uncertain situation organization need a consistent supply chain in all aspect in order to fulfill their production, manufacturing, services for having a constant supply in market. In today's business world, business needs quick decision for having less risk and stability in the business. Business need forecasting and planning for stability and future forecasting of the business.

Procurement is one of the main variable of the supply chain and forecasting procurement has a greater significance in a pandemic or uncertain environment. The current pandemic was a child when business leaders realize that these crises will leads to a bid uncertainty and more deep effect on the economy than initially expected. Not only minimizing the cost procurement team has always have heavy shoulders in reducing risk. In 2020 they did both in pandemic when logistics broke down due to lock down.

Organization when making their procurement strategy focus on cost cutting and supply base, but with few supplies and small inventories many organization fails during pandemic and ran out of stock and failed to meet customer demand. The current pandemic COVID-19 has been one of the most severe supply-chain disruption in recent history, and is likely to weaken many organizations and supply-chains globally. In an attempt to contain the spread of the virus, most governments around the world responded by implementing human containment measures, border closures, and quarantines with varying degrees. This global response has severely impacted the global supply-chain operations. While the extent and cost of this outbreak pandemic are still unrecognized, we

do know that global supply-chains that link the world to China and other manufacturing hubs would be seriously disturbed.

The impact of COVID-19 on different business sectors would vary due to the differences in demand and supply patterns. The Pharma industry of Pakistan was got seriously affected due to this pandemic. Their supply chain got heavily disruption and various Pharmaceutical fails to meet their customers demand. The researcher select the pharmaceutical sector of Pakistan which gets highly affected to meet their customer demand in the COVID 19 pandemic. In the current pandemic we saw that various Pharmaceutical products got out of supply which customers need urgently.

1.1.   Background of the Problem:

The study basically belongs to the pharmaceutical industry which also got highly disrupted in the last pandemic COVID-19. The COVID-19 virus outbreak generated multiple problem points for organizations and tasked them with a vital sustainability challenge. A pandemic disrupts preexisting supply and demand networks by causing damage to infrastructure of pharmaceutical sector of Pakistan. We saw that various Pharma and safety products produced by pharmaceuticals got supply damage and were short in the market. The other problem is the closing and shutdown as a result of lockdown create shortage of various items used in Pharma Sector. The logistics were also delayed due to not having transport on time as in complete lockdown situation. So there is serious circumstance faced by Pharma sector in the pandemic having a disruption in the supply chain management.

Still the leaders of the organizations are uncertain about the future impact of the virus on the organizational growth and supply chain management. The virus has a much more impact on procurement, heavy cost and overall supply chain management as expected in the beginning of the

pandemic when it was a child. The main raw material used in the manufacture of medicines is API (Active Pharmaceutical ingredient), which is mostly imported from China (around 80%). Wuhan is the chief hub of API manufacturing and China is the world's largest API producer. China is the first country which affected by this pandemic in very beginning and had closed all exports including this material when china was fighting with the unseen war. Normally in Pakistan the pharmaceuticals keep six month stock of this material having a good market and production size, but the small pharmaceuticals of Sindh closed down its production due to not having the stock.

Pakistani pharmaceutical industry is not the only facing the Raw material issues. The packaging material used by the Pharma sector like glass/ plastic bottles or the cardboard boxes are running short of supply since the glass, plastic and paper industries are shut down. Furthermore, Local items such as rubber used in the packaging or the stoppers have mostly been imported from China and thus running short too.

1.2.   Problem of Statement:

The COVID-19 Pandemic created manifold problems and points for Pharma Sector of Pakistan and engaged them with a vibrant sustainability challenges. The pandemic disrupts prior supply and demand grids by causing damage to infrastructure of pharmaceutical sector of Pakistan. The procurement and supply chain planning of the industry was not sufficient and fails to meet the demand of the medicines during the serious pandemic. The various Pharmaceuticals not having a big size and making very valuable products or by products were shut down due to running low in raw material stocks. So the pandemic badly affected economically as well as financially the Pharma Sector and the sector fails to produce the medicines when people badly affected by the pandemic.

1.3.   Purpose of the Study:

The study is conducted to know how significance is the forecasting and planning of the procurement and a stable supply chain management for the Pharma sector of Pakistan. The uncertain environment due to any reasons either this pandemic or any unforeseen will not give time to the organizations to make arrangements. Financially strong organizations can do their procurement forecasting and buy in bulk at low cost and can be stable in any uncertain and unforeseen, but how small and middle level Pharma companies not having finance can forecast their procurement and supply chain. That's the point the study raise for the Pharma sector that why procurement forecasting is essential to face any uncertain or pandemic. So Pharma sector needs to focus on the procurement forecasting and stable supply chain management and to increase their operational finance for procurement in advance. After this pandemic shock the small and middle level Pharma organization can understand how important is to invest in the advance procurement or a stable supply chain. So the purpose of the study is clear and study will help to understand the importance and significance of procurement forecasting and supply chain planning.

1.4.   Significance of the Study:

The study was conducted to enlighten the importance and significance of procurement forecasting and supply chain planning and investing in advance procurement for small and middle level Pharma companies. The study raise the issues faced by the Pharma sector due to the COVID-19 pandemic. The study conducted selecting the middle and small Pharma sector of Karachi faced the issues in the pandemic. The study has its own significance and importance for essentiality of procurement forecasting and planning to be save from any uncertain and unforeseen.

1.5.   Limitation of the Study:

The study is limited to the scope of procurement forecasting and supply chain planning in any uncertain environment. The study is limited to the small and middle level Pharma companies of Karachi. The survey is the primary means to study in data collection. The study was limited as respondents are willing to disclose information. It was limited as per respondent's ability to answer these questions. Due to time and cost constrains limited sample size is selected.

Chapter # 2

Literature Review:

Pharmaceuticals sector is one of the important sectors which support your hospitals and pharmacy and in this corona virus pandemic this Pharma sector has faced many problems like procurement, transportation and running low in stock. The main problems that the Pharma industries are facing is the availability of raw material that majority of our Pharma is importing from other countries. COVID-19 seems to have immersed whole economies like a massive giant. One and all is affected, if not physically then economically and financially. The industries of various sectors have started to enter a gloomy phase. The pharmaceutical companies too are badly affected.

Pakistan has around 759 units for manufacturing pharmaceutical products and meets almost 70% of the demand for finished medicines in the country (Pakistan Pharmaceutical Manufacturers Association, PPMA). Inclusive in this total are 25 multinationals, which together hold an equal share with domestic manufacturers in the Pakistani market. In Sindh there are approximately 183 firms (PPMA).

Despite the presence of all these firms, medicine shortages are common, many of them being lifesaving. Out of the approximately 70,000 registered drugs, Pakistan's pharmaceutical industry produces hardly 10,000. It should, therefore, not come as a surprise if a certain drug is found to be effective against Coronavirus, and it is found to be short in Pakistan.

2.1. Important of Forecasting and Planning in Procurement:

When it comes to forecasting and preparation, corporate leaders are like economists an meteorologists in many respects.We are adamant on what has happened in and to our organizatio n already, but we are not as good at predicting what lies ahead.

For most of us, however,   Our Company's future   is easily ranked as more critical than the past.

Which brings us to the issue of how our companies can forecast the future, both

in terms of what our deliberate acts can achieve as we execute plans and how critically we face

the thrown of the business environment.

Of course, precision in predicting and forecasting the future is unattainable and not necessary. As

in every business endeavor, we strive to execute

with a goal in mind and a vision and plan.There are many priorities in the field of forecasting and

 planning - some driven internally,Such as setting compensation models - and others driven by ex

ternal factors, such as investor expectations.

2.2. Hedging Inventory Risk in Supply Chain Management:

Pharmaceuticals firms should have a sophisticated hedging strategy for managing supply price

risks for a wide variety of Inventories used in their production line. Pharma organization needs a

strong hedging to mitigate inventory risk in any uncertain environment like COVID-19. Now the

organization needs to invest more in hedging inventory for a smooth production line in any

uncertain environment.

SIMON ELLIS, OCT 2020, said that As an industry, Pharma has been significantly affected by

COVID-19. Seventy percent of respondents felt that their supply chain was extremely vulnerable

to the continuing pandemic; they are already seeing widespread drug shortages, cost increases, and

significant degradation of delivery performance both from suppliers and to customers.

SIMON ELLIS, OCT 2020, said that the pharmaceutical supply chain is marked by generally poor

visibility, particularly from an end-to-end perspective, with efforts more aspirational than

actionable or achieved. Seventy eight percent of companies felt that having timely finished goods

visibility would dramatically reduce drug shortages, one of the top challenges for half of the survey respondents. Overall supply chain agility is limited, with 43% of the respondent companies saying that they lack the necessary agility and redundancy to survive major business disruptions. The traditional focus has been on inventory as the sole and low-risk form of agility.

Although much of the pharmaceutical supply chain debates have centeredon supply stability, disruptions in demand are equally uncertain and troublesome.   In the pandemic,   According   to   a survey the accuracy of the demand forecast has dramatically declined, with 63 percent of survey respondents stating they havelost confidence in their demand forecasts and 75 percent saying they are in reactive mode and continuously accelerating to meet demand.

It would be difficult to achieve complex supply and demand balancing and efficient supply chain planning with weakdemand forecasts and volatile supply without a network of linked partners exchanging data and working in real time.   In reality, analytics   are weak, primarily functionally, A situation that does not promote continuous end-to

End balanced planning and a responsive supply chain network, which is oriented, transactional, And fragmented and not comprehensive.

Now after this blast of COVID-19, the leaders should understand and make strategy to procure and how important to invest in supply chain and procure before the bad time. This is now 2021, and still we are not confident that where this pandemic lead to us. The second layer in British economy making them at high risk after the complete lock down again. The researchers are working that today's world and the coming world will not be so easy and there will be any unforeseen and uncertainty, so making production stable and forecasting demand, hedging inventory will be the essential and most important part of supply chain planning. So this pandemic addressed business to completely change their dimensions.

2.3. Resilient Planning:

The highly-infectious COVID-19 virus was declared a global pandemic by the World Health Organization on 11 March 2020 (**Armani et al. 2020**). Although its exact origins are unknown, the COVID-19 pandemic is believed to have emerged in Wuhan, China in December 2019. The severity of the virus differs between individuals, ranging from mild symptoms of fever, coughing, and shortness of breath to severe respiratory problems in critical cases. A notable number of cases have resulted in hospitalization and even death (**Zhou et al. 2020b**). On 3 March, it was estimated that the global mortality rate of COVID-19 was approximately 3.4% (**WHO 2020**). COVID-19 mortality has been more common in older adults and those with pre-existing health conditions (**Zhou et al. 2020a**). The operations of many organizations have been severely disrupted as the outbreak spread around the globe, impacting both supply and demand (**Ivanov 2020**). The unprecedented nature of the pandemic has meant that businesses had no prior planning and were exposed to significant risk. A survey conducted by Ernst & Young in 2019 found that of 500 senior board members globally, only 20% of the executives were confident that their companies were prepared to respond to a large adverse risk (**Ernst and Young 2020**). While most short- or medium-term impacts of COVID-19 can now be identified, the long-term impacts still remain uncertain. The pandemic has broken many global SCs (**Araz et al. 2020**), particularly for organizations with lean and globalized SC structures. In fact, it was reported that 94% of the Fortune 1000 companies have experienced COVID-19-driven SC disruptions (**Sherman 2020**).

As a result, organizations have been pushed to undergo significant work to re-design SCs, improve resilience, and reexamine relationships with suppliers in order to reduce systemic risks.

2.4. Multi Sourcing Strategies:

COVID-19 has revealed a new set of SCM risks for multinationals to consider. The lean SC, which relies on *Just-in-Time* and *zero inventory* management strategies, is overexposed to epidemic disruption. However, building agility is an expensive exercise and it would be impractical for firms to completely overhaul their SCs to manage 'black-swan' events such as the COVID-19 pandemic. This section thus explores a variety of strategies of varying costs that firms can employ to mitigate SC and demand disruption brought on by COVID-19 in both the short- and long-term.

Given the potential for outbreaks to disrupt input-sourcing, managers should consider adjusting the sourcing mix to better diversify risk. Dual-sourcing strategies, where both suppliers are located within close geographical proximity of one another, are exposed to greater lockdown disruptions. Similarly, firms with geographically diverse networks of suppliers are still exposed to SC disruption if a product relies on inputs from multiple suppliers as a single disruption can have a consequent ripple effect. Management must determine which of its products are particularly exposed to single-source dependencies or single location dependencies and look to build appropriate risk management strategies. In the short term, this could include reallocating inventory across regions or reducing dependence on products at risk of disruption. For example, ASOS, an online-only fast fashion company, worked with suppliers to shift production to suit the new demand for loungewear and activewear (**ASOS 2020**). In the medium-term firms can look to build 'buffers' to mitigate the *ripple effect* when a single supplier is compromised. This can be done in two main ways: (1) firms can create an *inventory buffer* or 'safety-stock' of essential components and products and, (2) firms can create a *time buffer* by delaying the production of goods where demand is unpredictable.

Conceptual Frame Work:

So after in-depth literature review it is found that, portfolio hedging, resilient planning and multi sourcing strategy are essential towards procurement forecasting and thus helpful in uncertain and unforeseen situations like COVID-19.

Developing a stable supply chain and on time procurement is not an easy task. It is a complex problem need in-depth thinking in organizations and organizations need to invest more in advance procurement. There is need to understand that how a stable supply chain in term of procurement, meeting customers demand in any pandemic can increase the organizational strength.

H1: Environmental uncertainty reduces by portfolio hedging leading towards procurement forecasting

H2: Environmental uncertainty reduces with resilient planning leading towards procurement forecasting.

H3: Environmental uncertainty reduces via multi sourcing strategy leading towards procurement forecasting

Diagrammatically the conceptual Frame Work is:
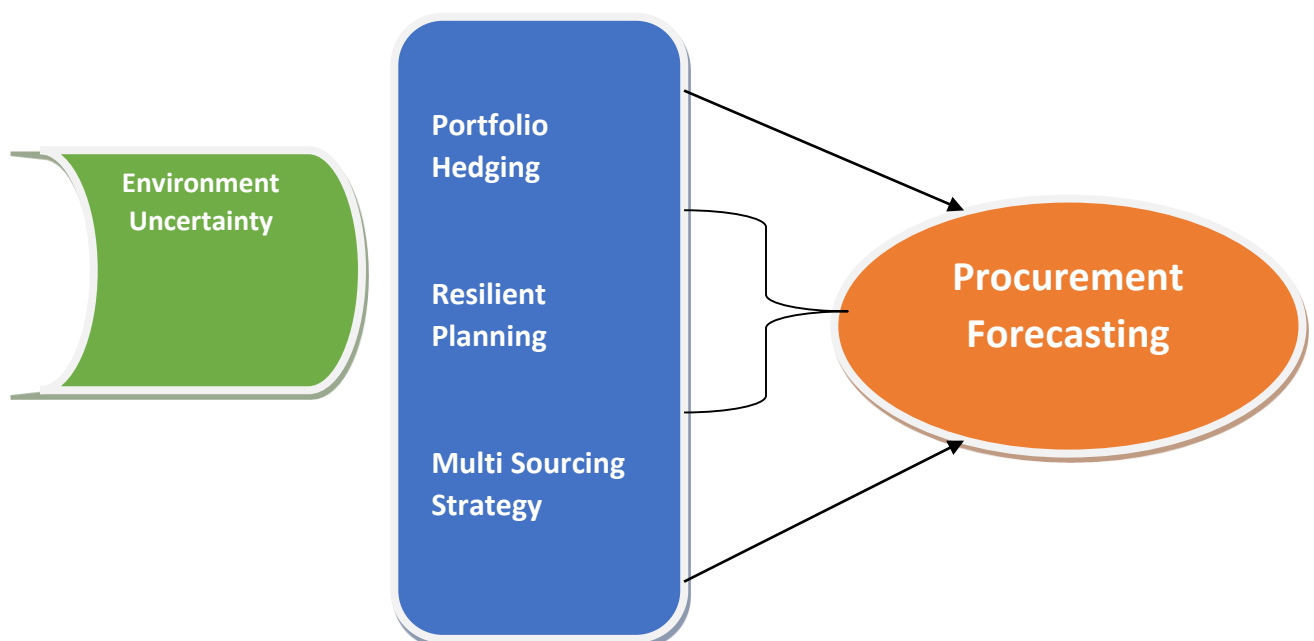
Chapter # 3:

3. Research Methodology.

3.1. Research Design.

The basis aim of this research is to discover the impact of pandemic (COVID-19) on the Pharma sector of Karachi. Since the study is quantitative therefore it mainly comprises of extensive primary sources of data. Data was collected from the employees of Pharma and their management.

For this purpose Senior Level managers, managers, Managers and Assistant managers were contacted from the selected Pharma. The stratified random sampling has been used. Observation, interviews, Articles and internet and questionnaire is used to collect the data from primary and secondary source of data. The data collected from different sources have been tested through different statistical tools like **Descriptive Statistics, correlation** *&* **regression** in order to explore the issues faced by Pharma under Pandemic.

3.2.Research Instruments:

The primary Research instrument is research questionnaire (Annexure 1); which is drafted on the basis of Likert scale, ranking and order. Questionnaire was asked from the employees of Pharma companies of Karachi and all the variables after an in-depth Literature review were included in the questionnaire for seeking the feedback from the respondents on the basis of Likert scale.

3.3. Sampling Methodology and Sample Size:

On Random Basis the researcher selected the three local Pharma from Karachi having Small and Middle size and operation. Questionnaire was asked form all levels senior managers to Assistant managers.

Sample Organizations:

- **Hilton Pharma**
- **Helix Pharma**
- **Indus Pharma**

Sample Respondents:

Stratified random sampling is used. Total sample size from three Pharma is 120. 30 respondents are from Hilton Pharma, 30 are from Helix Pharma and 60 are from Indus Pharma

Designations of Respondents	Hilton Pharma	Helix Pharma	Indus Pharma
Senior Managers	3	2	14
Managers/ Operational Staff	10	13	12
Assistant Managers & Others	17	15	34

3.4. Data Analysis Techniques:

Data were collected from the respondents and statistical analysis like descriptive statistics, correlation, regression, in which each variable has been planned, is done. The models are developed through dependent and independent variables using regression analysis to find the results of hypothesis. Complete statistical interpretation of the data is done. The researcher also used tables, graphs, bar charts, pie chart and other interpretational instrument for better explanation of results.

Chapter # 4

Results and Finding:

Reliability Test (Cronbach's Alpha):

120 questionnaire were asked from the employees of three pharmaceutical firms. Thus a reliability test needed here to check the reliability of the data. The researcher applied Cronbach's alpha as a reliability test through SPSS **(See Annexure 1).**

The result for Cronbach's alpha is as under:

Reliability Statistics

Cronbach's Alpha	N of Items
.945	19

Results: It should be noted that an alpha of **.8** is considered as good, here we get **.945** the value of Cronbach's alpha which is excellent as reliability statistics of our data.

Demographic Analysis through Cross Tabs:

The researcher used SPSS cross tab for the demographic analysis of the data. (See Annexure 2 for SPSS Output)

Organization & Gender

Organization * Gender Cross tabulation				
Count				
		Gender		Total
		Male	Female	
Organization	Helix	24	6	30
	Hilton	25	5	30
	Indus	52	8	60
Total		101	19	120

Out of 120 respondent 101 was male and 19 were females.

Organization & Designation:

Organization * Designation Cross tabulation					
Count					
		Designation			Total
		Senior Managers & GM	Managers and Operational Staff	Asst. Manager & Others	
Organization	Helix	2	13	15	30
	Hilton	3	10	17	30
	Indus	14	12	34	60
Total		19	35	66	120

Out of 120 respondents 19 are senior and general managers, 35 respondents belongs to manager

and operational staff and Assistant managers & others.

Organization & Respondent Experience:

Organization * Years In Org. Cross tabulation						
Count						
		Years In Org.				Total
		One Year	Two Years	Three Years	Four Years	
Organization	Helix	4	11	15	0	30
	Hilton	6	15	6	3	30
	Indus	20	10	30	0	60
Total		30	36	51	3	120

25% of the Respondent serves one year in the organization, 30% of the respondent are serving since last two years, 42% of the respondent are serving since three years and only 3% are served for four years.

H1: Environmental uncertainty reduces by portfolio hedging leading towards procurement forecasting:

The researcher developed the first hypothesis that Environmental uncertainty reduces by portfolio Hedging leading towards procurement forecasting. To analyze the hypothesis researcher developed a regression model with ANOVA through SPSS to reject or don't reject the null hypothesis.

Followings are the results generated:

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.501	.249		2.012	.047
PH	.737	.067	.712	11.011	.000

a. Dependent Variable: EU

The mathematical form of the regression model will be:

$$EU = α + β\ PH$$

$$EU = .249 + .712\ PH$$

The model show that the variable and constant are significant. Model is showing a significant relationship between Environmental uncertainty and Portfolio Hedging of Pharmaceuticals.

Mathematically if we increase the PH by 1 then EU will increase by .712 while other things remaining unchanged?

The model summary is here:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.712[a]	.507	.503	.81873

a. Predictors: (Constant), PH

The researcher found 71.2% positive correlation between Environmental Uncertainty and Portfolio

Hedging in model summary. Or we can say that 50.7% of environmental uncertainty is explained

by Portfolio Hedging.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	81.270	1	81.270	121.242	.000[a]
	Residual	79.097	118	.670		
	Total	160.367	119			

a. Predictors: (Constant), PH

b. Dependent Variable: EU

The F-Value of ANOVA is truly significant, therefore the overall model is good fit and

significant. (See annexure 3 for SPSS output).

Result: we don't reject out null hypothesis which means Environmental uncertainty reduces

by portfolio Hedging leading towards procurement forecasting.

H2: Environmental uncertainty reduces with resilient planning leading towards procurement forecasting.

Resilient planning is a reducer of environmental uncertainty leading towards procurement forecasting. The hypothesis need to be proved. The researcher applied here the Pearson correlation as a statistical tool in order to reject or don't reject the hypothesis.

Correlations

		EU	RP
EU	Pearson Correlation	1	.655**
	Sig. (2-tailed)		.000
	N	120	120
RP	Pearson Correlation	.655**	1
	Sig. (2-tailed)	.000	
	N	120	120

**. Correlation is significant at the 0.01 level (2-tailed).

At 1% level of alpha there is positive correlation of **65.5%** between environmental uncertainty and resilient planning. The correlation is statistically significant as sig. (2-tailed) value is .000 which is less than .05. The researcher also find coefficient of determination **42.9%**. This means that **42.9%** of environmental uncertainty is explained by resilient planning. (See Annexure 4 for SPSS Output)

Result: We don't reject our Hypothesis for Pakistan. It means resilient planning reduces environmental uncertainty leading towards procurement forecasting.

H3: Environmental uncertainty reduces via multi sourcing strategy leading towards procurement forecasting:

The researcher developed the third hypothesis that Environmental uncertainty reduces by multi sourcing strategy leading towards procurement forecasting. To analyze the hypothesis researcher developed a regression model with ANOVA through SPSS to reject or don't reject the null hypothesis.

Followings are the results generated:

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.721	.263		2.745	.007
	MSS1	.284	.087	.308	3.261	.001
	MSS2	.383	.087	.415	4.397	.000

a. Dependent Variable: EU

The mathematical form of the regression model will be:

$$EU = \alpha + \beta_1\,MSS1 + \beta_2\,MSS2$$

$$EU = .721 + .308\,MSS1 + .415\,MSS2$$

The model show that the variable and constant are significant. Model is showing a significant relationship between Environmental uncertainty and multi sourcing & successfulness.

Mathematically if we increase the MSS1 by 1 then EU will increase by .308 while other things remaining unchanged?

The model summary is here:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.663[a]	.440	.430	.87636

a. Predictors: (Constant), MSS2, MSS1

The researcher found 66.3% positive correlation between Environmental Uncertainty and multi sourcing in model summary. Or we can say that 44% of environmental uncertainty is explained by multi sourcing.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	70.511	2	35.255	45.905	.000[a]
	Residual	89.856	117	.768		
	Total	160.367	119			

a. Predictors: (Constant), MSS2, MSS1

b. Dependent Variable: EU

The F-Value of ANOVA is truly significant, therefore the overall model is good fit and significant. (See annexure 5 for SPSS output).

Result: we don't reject out null hypothesis which means Environmental uncertainty reduces by portfolio Multi sourcing strategy leading towards procurement forecasting.

Hypothesis Summary:

Hypothesis Summary					
Hypothesis Statement	Reject/Don't Reject	Statistical Tool Used	Results	Statistical Test Used	Significant
H1: Enviromental uncertainty reduces by portfolio hedging leading towards procurement forecasting.	Don't Reject	Regression	121.242 (.000 Sig.)	F-Test (ANOVA)	Yes
H2: Enviroment uncertainity reduces with resilient planning leading towards procurement forecasting.	Don't Reject	Pearson Correlation	65.5% (.000 Sig.)	P-Value (T-Distribution)	Yes
H3: Enviromental uncertainity reduces via multisourcing strategy leading towards procurement forecasing.	Don't Reject	Regression	45.905 (.000 Sig.)	F-Test (ANOVA)	Yes

The summary of the hypothesis is clear, and all the three hypothesis developed by the researcher are proved. They all are statistically significant. The summary represent that the researcher don't reject any of the three hypothesis.

Chapter # 5

5.0. Conclusion:

The research is based on environmental uncertainty and its impact on unstable procurement and supply chain planning. The study is conducted within Karachi and three local Pharma are selected as population. These are Hilton, Helix and Indus Pharma. The selected sample size is of 120 from these three Pharma. The researcher tried to cover all impact of environmental uncertainty and their response towards significance of procurement forecasting to have this research more authenticated.

The research did a proper literature review and goes through the observations and developed a conceptual frame work. This conceptual frame work includes the basic variables of procurement forecasting, which are portfolio hedging, resilient planning and multi sourcing strategy and seeing their impact on environmental uncertainty. On the basis of literature the researcher said that these variables have important impact to manage uncertainty and unforeseen situation like COVID-19.

The data was collected properly and complete results were driven by the research. The researcher concludes that there is difficult to manage uncertain environment and any unforeseen with having less intention on forecasting your procurement, and under large organizational interest and to meet any unforeseen like COVID-19. Organization when making their procurement strategy focus on cost cutting and supply base, but with few supplies and small inventories many organization fails during pandemic and ran out of stock and failed to meet customer demand. The researcher try to found the significance of advance procurement and a stable supply chain to meet customers demand and having stables prices of the produced product in the uncertain situations.

5.1. Recommendations:

- Search and go for quick wins by adopting advanced technology and practices which initiate high response towards the existing system and process to improve over all procurement stability.

- Ascertain and line up the essential competences and major weaknesses in the pandemic, such as time to time action and on spot accurate data sharing for end-to-end upstream and downstream visibility.

- Ascertain an arranged and synchronized business focus on portfolio hedging, resilient planning, and multi sourcing strategy to plan procurement and focus on meeting agreed customers demand.

- To get 2021 in order, discussions about processes, measures and budgets must be done now, so that teams can be proactive in their engagement models with the rest of the organization.

- Endeavor to be technological leaders by transforming your operations towards technological platforms which allow teams to be more automated and more data-driven and to get more done in less time.

References:

Achille, Antonio, and Daniel Zipser. 2020. McKinsey & Company. Retrieved from A Perspective for the Luxury-Goods Industry during—and after—Coronavirus. April 1. Available online: **https://www.mckinsey.com/industries/retail/our-insights/a-perspective-for-the-luxury-goods-industry-during-and-after-coronavirus#** (accessed on 18 June 2020).

Allwood, Julian M., Søren Ellebæk Laursen, C. Malvido De Rodríguez, and Nancy MP Bocken. 2006. Well dressed? In *The Present and Future Sustainability of Clothing and Textiles in the United Kingdom*. London: Institute for Manufacturing, University of Cambridge.

Alessandro, Ancarani, Carmela Di Mauro, Luciano Fratocchi, Guido Orzes, and Marco Sartor. 2015. Prior to reshoring: A duration analysis of foreign manufacturing ventures. *International Journal of Production Economics* 169: 141–55.

Anjum, A., Kashif, M. T., & Riaz, W. (2016). Supply Chain Integration and Operational Performance:Moderating role of Organizational Culture. *International Journal of Academic Research in Business and Social Sciences*, 644-657.

ASOS. 2020. Working with Our Suppliers during Covid-19: May 2020 Update. ASOS PLC. Available online: **https://www.asosplc.com/~/media/Files/A/Asos-V2/reports-and-presentations/working-with-our-suppliers-during-covid-19-May-2020-update.pdf** (accessed on 18 June 2020).

Baramichai, Manisra, Emory W. Zimmers, and Charalambos A. Marangos. 2007. Agile supply chain transformation matrix: An integrated tool for creating an agile enterprise. *Supply Chain Management* 12: 334–48.

BBC. 2020. Coronavirus pandemic: Tracking the global outbreak. *BBC News*, June 13. Available online: **https://www.bbc.com/news/world-51235105**(accessed on 18 June 2020).

Bevilacqua, Maurizio, Giacomo Goli, and Giulio Marcucci. 2019a. Supply Chain Resilience research trends: A literature overview. *IFAC PapersOnLine* 52: 2821–26.

Cabral, Izunildo, Antonio Grilo, and Virgílio Cruz-Machado. 2012. A decision-making model for Lean, Agile, Resilient and Green supply chain management. *International Journal of Production Research* 50: 4830–45.

Carvalho, Helena, Susana Duarte, and V. Cruz Machado. 2011. Lean, agile, resilient and green: Divergencies and synergies. *International Journal of Lean Six Sigma* 2: 151–79.

Dolgui, Alexandre, Dmitry Ivanov, and Boris Sokolov. 2018. Ripple effect in the supply chain: An analysis and recent literature. *International Journal of Production Research* 56: 414–30.

Ernst and Young. 2020. *Nearly 80% of Board Members Felt Unprepared for a Major Risk Even Like COVID-19: EY Survey*, April 20. [Press release]. Available online: **https://www.ey.com/en_us/news/2020/04/nearly-80-percent-of-board-members-felt-unprepared-for-a-major-risk-event-like-covid-19-ey-survey** (accessed on 18 June 2020).

Ivanov, Dmitry, and Ajay Das. 2020. Coronavirus (COVID-19/SARS-CoV-2) and supply chain resilience: A research note. *International Journal of Integrated Supply Management* 13: 90–102.

Ivanov, Dmitry, and Alexandre Dolgui. 2019. Low-Certainty-Need (LCN) Supply Chains: A new perspective in managing disruption risks and resilience. *International Journal of Production Research* 57: 5119–36.

Ivanov, Dmitry, and Alexandre Dolgui. 2020. Viability of intertwined supply networks: Extending the supply chain resilience angles towards survivability. A position paper motivated by COVID-19 outbreak. *International Journal of Production Research* 58: 2904–15.

Ivanov, Dmitry, Alexandre Dolgui, and Boris Sokolov. 2019. The impact of digital technology and Industry 4.0 on the ripple effect and supply chain risk analytics. *International Journal of Production Research* 57: 829–46.

Ivanov, Dmitry. 2018. Revealing interfaces of supply chain resilience and sustainability: A simulation study. *International Journal of Production Research* 56: 3507–23.

Ivanov, Dmitry. 2020. Predicting the impacts of epidemic outbreaks on global supply chains: A simulation-based analysis on the coronavirus outbreak (COVID-19/SARS-CoV-2) case. *Transportation Research Part E: Logistics and Transportation Review*, 136. Available online: **https://www.sciencedirect.com/science/article/pii/S1366554520304300** (accessed on 18 June 2020).

Rouse, M. (2019, November). *What is supply chain management (SCM) and why is it important?* Retrieved April 9, 2020, from Searcherp: https://searcherp.techtarget.com/definition/supply-chain-management-SCM

Simon Ellis (2020). Supply Chain Agility in the Pharmaceutical Industry, *Trace Link, IDC White paper.*

Sherman, Erik. 2020. *94% of the Fortune 1000 Are Seeing Coronavirus Supply Chain Disruptions: Report.* New York: Fortune.

WHO (World Health Organization). 2020. WHO Director-General's Opening Remarks at the Media Briefing on COVID-19 [Press Release]. Available online: **https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19** (accessed on 3 March 2020).

Zhou, Fei, Ting Yu, Ronghui Du, Guohui Fan, Ying Liu, Zhibo Liu, Jie Xiang, Yeming Wang, Bin Song, Xiaoying Gu, and et al. 2020a. Clinical Course and Risk Factors for Mortality of Adult Inpatients with COVID-19 in Wuhan, China: A Retrospective Cohort Study. Available online: **https://pubmed.ncbi.nlm.nih.gov/32171076/** (accessed on 18 June 2020).

Zhou, Min, Xinxin Zhang, and Jieming Qu. 2020b. Coronavirus disease 2019 (COVID-19): A clinical update. *Frontiers of Medicine* 14: 126–35.