

Analysis of Migration of Advertisement Business from Print Media to Electronic Media of Pakistan: A Time Series A.R.I.M.A Model Application for Forecasting Overall Print Industry's Advertisement Business Curtailment

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Abstract

Couple of decades back, it was generally acceptable that print media has secured future, newspapers and magazines have a good market and good readership in Pakistan. But by the end of 90's, when electronic media introduced and welcomed by peoples, print industry of Pakistan tends to decline and players of the industry was in shocked and started to take steps to survive in the market. Advertisers are curtailing their advertisement business from print media and allocating more budgets to advertiser in electronic media.

Purpose

The purpose of the study is to highlight the future trend and to forecast the future share of publishers in market's total advertisement business by using autoregressive integrated moving average (ARIMA) models.

Design/Methodology/Approach

This research is divided into two parts; in part one, data about the print media share in total advertisement business is collected from the head office of APNS. In part two is Box-Jenkins approach of ARIMA modeling was applied on the time series data to forecast.

In this study, framework of ARIMA includes the following steps: Data collection, identification of model and order, making data stationary, estimation of different orders of ARIMA models to find the best appropriate model by comparing their AIC and SIC values, diagnostic test of residuals for white noise and forecasting of in-sample and out sample data.

Findings

The traditional Box-Jenkins methodology was used to forecast the time series named ARIMA modeling. Initially the model which was identified was AR(1), by the spikes of the correlogram and used to build up the model. Correlogram of basic data series showed the existence of unit root in the series but on 1st level of difference, the data series became stationary. Augmented Dickey Fuller Unit Root test was applied to accept or reject the hypothesis of unit root, and on first differentiation the value of t was -4.83 which is significant and the null hypothesis of unit root existence was rejected and series considered as stationary.

ARIMA (2,1,3) was identified as the best appropriate model with lowest AIC and SIC value among 15 combinations of AR and MA which were estimated in this study.

$$Y_t = \alpha + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \theta_1 e_{t-1} + \theta_2 e_{t-2} + \theta_3 e_{t-3}$$

$$Y_t = -0.0798 - 0.1184Y_{t-1} + 0.1012Y_{t-2} - 1.5085e_{t-1} - 26.14e_{t-2} - 13.46e_{t-3}$$

Equation of ARIMA (2,1,3) shows that the today print media's advertisement revenue share is dependent on the two leg value of past year's share value and on the three leg values of past years error which is moving average.

The value of R^2 is 0.9988 which shows that the model is fit and the weight of auto regressive and moving average legs in total sum of square is around 99%.

Correlogram Q Statistics of residuals, shows that the residuals are white noise and model is pass the suggested diagnostic test.

The forecasting of 2013, which is in sample data shows the same result as per actual data so the prediction power of model is considered as reliable and appropriate. The future prediction which is out of sample prediction shows the 6 percent decline in the share of print media in advertisement revenue over the period of four years which is an alarming situation for the publishers. Readers are switching from printed stuff to online stuff and in Pakistan; people are more likely to watch television therefore advertisers of Pakistan are more interested to advertise in electronic media and they are curtailing their advertisement expense from print media and allocating more budget to electronic media.

Practical Implications

This study will help new comers in this industry of publishing in Pakistan to understand the advertisement

revenue trend and also to understand the ARIMA model application. It also helps the existing publishers to make vital decision regarding the revenue mix and to take any grand decision like diversification or merger etc.

Originality/Value

This study is unique; it is quantitative in nature. All the data in this paper is original and secondary data was collected from the head office of All Pakistan Newspaper Society which is the main governing body of print media in Pakistan. This study predicts about the future of the industry because the main factor of profitability of print media which is advertisement income is predicted.

1. INTRODUCTION

1.1 Definition

Print Media is a term which refers all the printed text and images in form of information, news or entertainment, it circulates the printed matter around the region, society, city, country. It contain a paper, printed out by anything from ink (etc.) mostly for the purpose to circulate in the market to generate revenue by selling advertisement

Print media contain Information and Entertainment both, it includes all sort of Newspapers, Magazines, Pamphlets, newsletters and all other printed publication on a sheet of paper and often folded to make handy.

Press is a term in Pakistan by which whole print media is known.

1.2 Types of Print Media

Print media contain all printed publications such as

Newspaper, Magazines, Booklet, Newsletter, Flyer, Brochure, Catalogues, Poster and banners and all other printed stuff like image or text on paper.

Mostly every medium of print media in market is operating for business purpose to make profit.

1.2.1 Newspaper

Initially, Newspaper was published in Germany and after that the concept of news spread via newspaper was adopted by whole world. Before Electronic Media, Newspaper was considered as the most important medium of mass communication. Main purpose of newspaper is to spread news around the country, in addition it also circulate information about public affair and event information, entertainment, cultural transmission and education etc. Opinion Builder is the term which is generally said for newspapers because it helps its audience to build opinion according to the news published in newspaper on national and international issues. Newspapers also include some sort of stories, articles and columns of human interest and cartoons for entertainment purpose.

Advertisement in Newspaper is something for which newspaper are running nowadays. After the arrival of Electronic media, when circulation of print media(newspaper) declining day by day, it's very difficult of cover all expenses only from circulation income so publishers are highly depend and focused on the advertisement income and space selling. In Pakistan there are some leading newspapers like Daily Jung, Daily Dawn, Daily Express etc. which charge high rates for advertisement in their newspaper, concept of high sale(circulation) and high advertisement rate are well followed in Pakistan. Recently the publishers of newspaper are also suffering from the curtailment of advertisement business in print media from the advertiser.

1.2.2 Magazines

Magazines, comes in boundaries of periodicals, they have variety of articles on different issues and scenarios, they have title page which shows the topic of the magazine. Magazines may be publish monthly, bi-monthly, fortnightly, weekly, quarterly, semiannually and annually. Mostly magazines in Pakistan are in A4 size and with four color printing. Magazines may be circulated in particular area, town, region, city or for whole country, some magazines are free and delivered at free of cost which contain only advertisement, they may b for some region or area.

Magazines in Pakistan have not very high sales but in their profitability there is a huge role played by advertisement income therefore the overall circulation of magazines is increasing. Urdu magazines have around 60 percent of total sale, after that English, Sindhi, Punjabi Balochi and Pashtu language magazine have the remaining market.

Purpose of magazines are not to spread news, it satisfy the need of information of their readers by providing stories(full story and episode wise) and articles on general topics or on politics, fashion, crime, cooking or personalities etc. Before the boom of electronic media in Pakistan, magazines are considered as the more entertaining source of print media among all categories because its contents.

Recently, when audience of magazine is shifting towards electronic media, attitude of females are declining more toward television mainly and they like to watch dramas more instead of reading stories.

In Pakistan like newspaper, magazines are also working for profit purpose and the publishers are focused on Advertisement business more instead of working on circulation of magazines, in result therefore there are lots of in comer in publishing industry started their magazines with low circulation and they are focused on advertisement business. But main problem face by the publisher is that the advertisers are more concern to

advertise his product on electronic media (mainly television in Pakistan).

1.2.3 Books

Books are the collection of printed papers with some informative and entertaining stuff, bound together. In starting, books are fail to become the medium of mass communication and it gather only the attention of elite class, but later it become the medium of mass communication. Books are considered as the one of the oldest form of printing and publishing.

In Pakistan's education policy Books plays a vital role, because in schools colleges and universities of Pakistan, the instruments of study are books.

Books are in printed hard copy form, therefore it provide permanent record of the script, peoples are maintaining the record of books, there are several libraries which are storing and protecting some precious books from decades.

In Pakistan, there are some categories of books publishing, whole book may be made by publisher, he may buy data from the writer and then he became the owner of that material and he have right to publish according to publisher's choice. Publisher may also publish book on royalty basis and have to give royalty on per copy sold to writer.

As per Google, there are around 130 million books are circulating in the whole world.

Some other less popular kinds of print media are:

1.2.4 Newsletters

These are the regular publication and contain few folded pages, In Pakistan, newsletter mostly used to aware the customers about the products and available brands, its readers and target audience are selective on the basis of area, block, town or city, it can be an effective and cheaper way to reach readers. In general newsletter may be published for information and entertainment purpose to their customers, audience, employees or members. Because the printing and making of newsletter is comparatively easy so there are numbers of newsletters which are publishing on regularly basis around the world.

1.2.5 Pamphlets

Pamphlets are a tool of marketing, and mostly use to aware the customers, but the circulation area of these pamphlets is limited because these pamphlets are distributed by hand. These pamphlets have local influence. These pamphlets are free of cost so the circulation of these pamphlets will not give any direct sales profit to company. Some companies may insert their pamphlets in daily newspapers and in magazines by making deal with the area agent(distributor).

Pamphlets are not entertaining, there are informative and use to aware the target audience.

1.3 History of Print Media in Pakistan

Muhammad Ali Jinnah, founder of Pakistan, also was the founder of "The Daily Dawn Newspaper". In Delhi, India on October 1941 Muhammad Ali Jinnah establish The Dawn as the voice of Muslims to promote the agenda of independent state. Nawa-i-waqt, another newspaper for Pakistan also launched before the independence with the agenda of Independent Pakistan in 1940, so Pakistani print media came in to existence before the independence of Pakistan in some sense and formed to raise the voice of Muslims and to promote the idea of Pakistan.

At the time of independence of Pakistan, most of the Muslims newspapers migrate and moved to Pakistan like daily Jung, Daily Dawn(starts from Karachi 1947), Anjam etc. some of the newspaper already existed in the boundaries of Pakistan at the time of Independence name like Nawa-I-Waqt and Pakistan times.

At the end of 80's, the total circulation of all dailies and periodicals is more than one thousand five hundred in Pakistan. "*Press Reference: Pakistan, Advamag, Inc., accessed 19 June 2011*"

Till 1997 the total number of magazines, newspapers and other printed material goes to four and a half thousand but towards 2003 it decreases suddenly to nine hundred, this is the era where electronic media spreading quickly. After that print media again gain its circulation and number of periodicals and newspaper in total and reached to twelve hundred in 2008. "*Newspapers and periodicals by language and province 1999 to 2008, Provincial Public Relation Departments, Federal Bureau of Statistics, Government of Pakistan, 27 April 2009*". New groups involved in printing materials and many more dailies and periodicals got declaration for of name and start publishing. In Pakistan, top rated magazines are owned by elite class from starting and many newspapers are owned by politically influenced owner and mostly are owned by private sector.

1.4 Print Media in Pakistan and role of All Pakistan News Paper Society

APNS, All Pakistan Newspaper Society is the governing body of print media in Pakistan and was establish in 1950. Mostly publications are the members of this society and from these members the executive members are selected to make prime decision regarding the whole Pakistan's print media society.

For first three years, APNS not received much attention and support by the publisher's and advertising agencies and could not successfully represent the welfares of the print industry but in 1953, when most of the

leading publication houses and publishing groups were located in Karachi, it was decided to create the head office of All Pakistan Newspaper Society in Karachi. Most of the publication houses welcome APNS and start to become member, after some time publishers from whole Pakistan become the member of this society, at present almost every newspaper and magazine is a member of this society. In 1971 APNS have only 41 member publications where today (2014), there are 402 members. International Newspaper society recognizes the existence of APNS in 2009 and APNS become the member of World Association of Newspapers.

Key purpose of APNS is to monitor, protect, promote and give the code of conduct to the rights and duties of these media groups. APNS actively and efficiently handle the problems of their member publishers. All Pakistan Newspaper Society divided print media into two parts, Dailies and Periodicals, and organize their different election to select the executive members. They also subdivided print media market province wise. Mostly all the advertising agencies are also the member of APNS, therefore the problem of miss commitment between the advertiser or publisher become minimum, because in such case APNS will take decision like imposing ban to particular client and other all publication member will not publish their advertisement, this is a very vital role played by All Pakistan Newspaper Society. APNS not only impose ban or handles the complaints of non-payment but it plays a role of a bridge between advertising agencies and publishers and between advertising agencies and advertisers to solve the dispute. Therefore their listed clients (advertisers) are not allowed to place their advertisement in any member publication without the permission of advertising agency.

Almost, every newspaper which publish regularly on daily basis comes in the category of Dailies and other interval publications are known as periodicals like magazines or digest which publish monthly or bi-monthly.

Print Media Society of Pakistan is captured by elite class of Pakistan and because of their diversified business like TV Channels they enjoyed good rate of benefits from advertisement business (because of package deals) as compare to such magazines which are owned by small group.

To promote and motivate the members and to attract the non-member publication APNS initiate the award function. In 1981 it starts the annual awards named The Advertising Award and in 1982 it starts The Journalist Awards. Some of the well-known awards are: business Performance Award, Best Product Launch Award, Best Visual Design, Best Column, Best Article, Best Feature, Best Photograph, Best Cartoon etc.

1.5 Advertisement Business and Role of Advertising Agencies in Pakistan

Advertising is considered as a tool of mass promotion of the business in which a, paid, single message, idea, product or service (for awareness and to make influence) can reach to large audience. Print media and electronic media is most powerful medium of marketing or advertising in nowadays days because it capture large number of peoples, readers, viewers and listeners. After the independence of Pakistan, there were few number of advertisers because of no or very low production and the media of Pakistan was limited, low number of magazines and newspaper were printed with low circulation and there were no visible electronic media. In 50's when business take place and production and selling products starts, many new advertising agencies starts and establish their business in different cities of Pakistan, in 80's and 90's there are sufficient numbers of agencies working and now these advertising agencies are recognized by whole world. PAA, Pakistan Advertising Association is the association and governing body of all advertising agencies of Pakistan. (August 2011, History of Advertising and Evolution in Pakistan Friday, <http://whizmasscomm.blogspot.com/2011/08/advertising-history-of-advertising-and.html>).

Two decades back, Print media was supposed to be a very effective media for advertising any brand, there were many newspaper and magazines which were very familiar among the peoples and there were only two television channels in Pakistan till 90's and television was the suck kind of thing which was lye in the category of expensive and luxury goods, therefore advertiser consider to advertise his brand in print media, in mid of 90's when electronic media gets boom and private sectors got licenses for TV channels then number of channels increases and there were a major shift of preferences and choices, people switch toward electronic media and the familiarity of print media decrease, at that time advertiser also tends more toward electronic media. Currently, television channels are charging heavy advertisement rates to advertise in their channel, so the big groups focused more to advertise their products in TV channels.

Advertising agency plays a third party role or a role of agent between advertisers and media. There are two prime functions of advertising agencies, first to release advertisement of client to media and other is to design or make video ad. Agencies have creative dept. to generate different ideas about product for advertisement. In Pakistan most of the agencies charges 15% commission on every release and deduct this amount from the rate for Ad. Some agencies are also working as buying houses. Creating, planning, advertise and promotion of the brand is the core function of Ad agency. Ad agency advises the client, where to advertise, they have very strong knowledge of circulation of different print mediums and TRP (television Rating Point) of different TV channels, Ad agencies makes an advertising plan for their clients to approve. Some of the well-known advertising agencies of Pakistan are, Group M (with business of Unilever Pakistan and top rating clients

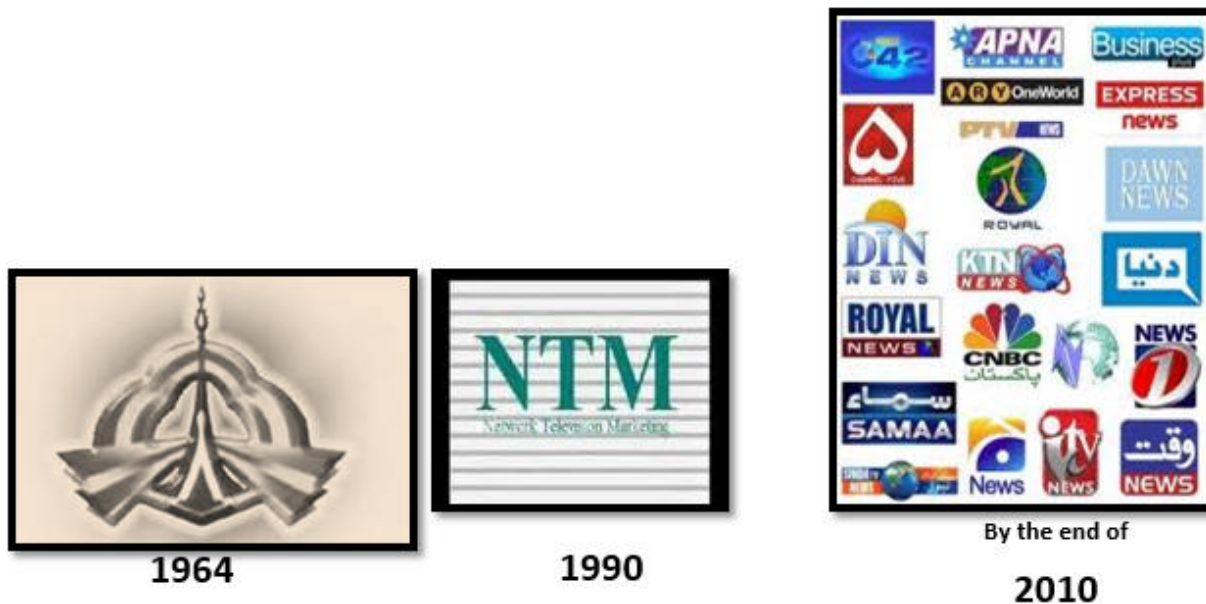
of Pakistan like Nestle and Pepsi), Brainchild Productions (main client is P&G and Reccit and Benkizire), Interflow Pakistan, Manhattan Group etc.(Top advertising agencies in Pakistan <http://www.primedia.pk/services/advertising.php>)

1.6 Electronic Media in Pakistan

PTV Pakistan Television network was the first state owned TV channel launched in Nov 1964, after 12 years PTV switched their transmission from black and white to color. In 1990 another TV channel introduce to the market named NTM and by the end of 2010 there are around eighty one local and around 50 channels were transmitting. A huge variety of programs are telecasting on these channels in around every language spoken in Pakistan specially Urdu which is the national language and in English as well.

PEMRA, Pakistan Electric Media Regulatory Authority introduce to govern the regulation of electronic media specially television. Main function of PEMRA is to formulate rules and regulations, code of conduct for media group and also for cables operators (*Electronic Media History & Challenges* <http://mass.pakgalaxy.com/electronic-media-history-challenges.html>).

Medialogic is an organization which was introduced in 2006 is the only overnight TV rating provider in Pakistan. Approx. all broadcaster and major advertisers are their client. Medialogic provide rating which shows the familiarity of the TV channel among the viewers and also shows the preferences of viewer. Advertiser also concern with this rating and always wants to advertise in such channel which have high viewership (*Salman Danish Naseer, CEO – Medialogic*).



News	Entertainment	Sports	Children	Music
Geo News ARY News Samaa Dunya TV Express News Waqf TV Dawn News News1 Metro One Business Plus Express 24/7 Aaj TV CNBC PTV News Din News Channel 5 Royal News KTN News APNA News Vash News Sindh News Khyber News City 42 Indus News	ARY Digital Hum TV Geo Ent Indus Vision A Plus* AKS * TV One PTV Home Alto Sohni Dharti* Dharti Vibe Koh-e-Noor* AXN ATV PTV National	Geo Super Tensports Fashion Style 360 Informational Value TV Health TV* Food Zaiqa* Masala ARY Zauq	Cartoon Net Nickelodeon Movies HBO Filmmax Filmazia Starlite Silver Screen Film World* Religious Madni ARY QTV Haq TV	Oxygene Aag Play ARY Music GKA Boom MTV Pakistan Oye K2 Regional Rohi TV KTN Punjab TV APNA Raavi Mehran Sindh TV PTV Bolan Waseb TV AVT Khyber Kook Kashish Awaz Sabz Baat

1.7 Significance of Print Media

Nobody can deny the significance of print media, it can change the culture, views, believes of the people.

Society adopt the agenda which was released by print media, we have great example of Nick Carter how US agent dominates on the Russian army in his series of novel and make the image of US superiority on the readers mind. Magazines have article like social topic, health related, women oriented, News, Teens, Business, Religious etc. can be very helpful and people are used to read and take guideline from them. This role of magazines is very important and hopefully will remain same.

1.8 Future of Print Media

Today Printing Material is not as important as Electronic material, circulation of magazines and newspapers is decreasing gradually, however the total or overall circulation is increasing due to new incomers of the market, well-set and familiar magazines and newspapers are losing their circulation. Electronic media, in high pace, is eating the share of print media from the market. Publishers are in great threat and therefore switching or diversifying their business or stating new way to sell their magazines. So after great consideration we can say that the print media may survive in future by electronic mean like, putting their magazine online and charge subscription charges. Printed media also have a life by support of advertisement income, but Advertisement income is also related with the circulation because advertiser always wants to go for such magazine, which have a high sales. In 21th Century, most of the peoples are using electronic media like online newspaper or blogs for information. Therefore the word “Press Is Dead”, often heard from many media groups around the world.

1.9 Problem Statement

“Advertisers are curtailing the business (advertising) percentage of print media and intend to advertise more in electronic media rather than print media”.

1.9.1 Explanation

From last 10 years print media community is facing financial losses in term of their turnover/circulation due to massive change in the attitude of the customer to give preference to electronic media over print media, so publishers are more concern about advertising income. Because of continuous increase in paper and printing prices, publishers are declining circulation of their publication (rather to increase price of their magazine and newspaper or reduce the quality) and focusing on advertisement Income to be in market or to survive in the market.

There is a huge diversion in the trend that people are more focusing on electronic media and the readership is declining day by day. For newspaper peoples are reading online each and every kind of news and now also in Pakistan every newspaper and lots of magazines are also available online. When we look closely our new generation, we will see that our new generation have no interest in reading books, magazines and newspapers this all because they have more interest in electronic stuff like surfing in net via computers and smart phones.

Advertiser in a person who gets his salary to promote business via advertising in different and best market prevailing medium, he wants his advertisement to be watched, listen and read by the target audience. Electronic media have a very vast viewership and it reached almost in every house of Pakistan. There is almost every kind of TV channels for every kind of person like for kids, teens, adults, female, sports, news, regional, national and international as well with large viewership. Companies and advertiser can easily approach their target audience, if the product of the company is female oriented e.g. like cooking oil, advertiser will go for ladies oriented channel like drama channels and family entertainment channel or if product is of child, like toffee or chocolate and biscuit, then advertiser may go for carton or kids channels. So advertisers are curtailing the percentage share of advertising in print media and allocating more budget to electronic media, as electronic media is more effective and powerful medium available to aware the target market about the product.

In country like Pakistan, general price level increases day by day, so the cost of production increases and publishers suffers because of variable costs (paper cost and printing expenses) which are directly associated with the circulation so at present, publishers are more concerning and depending more on advertisement business and advertiser, to best utilize the resources both market available and financial, are curtailing the percentage share of advertising in print media, in such condition publishers are in great future threat of financial losses and have to shut down their businesses in future if they don't adopt any other mean or related diversification.

1.10 Research Question

Will the share of advertisement business, in Future, sufficient to survive in market with low circulation for the publishers?

1.11 Research Objective

Main objective of this study is to highlight the trend of the advertiser of curtailment of the business from print media and focus more on electronic media, and the publishers are more concern with advertisement income rather to increase sale due to high variable charges. So ARIMA model forecasting of this decline in percentage

share of print media will allow to predict and analysis the trend of the advertising industry. In this technologic era, where print media is losing its value and readership day by day this study is very useful for the publisher who are entering in this field especially in their decision of revenue mix(circulation and advertisement income ratio).

1.12 Justifications

This study will help the existing publishers and new comers in the industry of publishing in Pakistan.

This study gauges and helps to understand the trend of advertisement income percentage decline for the print media via a time series analysis on curtailment of percentage, and also helps to take strategic future decision like diversification or to make corrective measures like to go online or to start any other mean of income.

Print industry, in whole world, is facing losses. Especially in Pakistan where literacy rate is very low and peoples have less interest in reading hard copies, publishers are facing losses only those media groups who are involved in other media or in electronic media activities and business are making profit, this study is suitable to some extend for those publishers who are working on breakeven or suffering losses to understand the trend and beware of future disaster of low percent of advertisement income.

1.13 Limitation

This study needs accurate data, true facts and figures to apply the time series ARIMA model on the advertisement business percentages which was curtailed by advertiser over the period of ten years and this data is not so easily available on internet. The Administrator of APNS Mr. Tanvir Ahmed ensures that he will provide the data of curtailment of Ad business for print for ten years of their member advertisers and advertisement agencies. But the limitation is that there are some agencies and advertisement clients are not the member of APNS because APNS have a policy that they offer membership to only those business who have minimum one year mature, therefore it represents about 90% of the industry and in this research, it is considered as whole.

Direct data collection from the advertisers or from publishers is almost impossible because they are in large numbers to approach and no advertiser or publisher will ever disclose their original amount of business because it's a business secret and mostly they don't disclose the original figure because of high rate of competition in the industry.

1.14 Scope

This study will take into account the percentage of advertisement business which was released by the advertiser to make forecasting on the basis of time series auto regression integrated moving average model to facilitate the publisher and give him a future perspective as per researcher of the advertisement business which plays a vital role in developing future strategy plan for the organization to continue its business and make some precautonal measures.

1.15 Assumptions

Most of the publications in Pakistan are owned by medium scale companies or by peoples of middle class, whose motive is to make profit, although there are also some publications which are owned by big groups or media groups who are also a part of electronic media with motive of their publicity od for welfare or for to be in market as publisher, in this research small medium groups are focused who have only published stuff to make profit. While talking about electronic media means that in this research, only television network considered as electronic media.

2. LITERATURE REVIEW

Andrew Lavalley, (2008), discuss about the report which was published by Audit Bureau Of Circulation, America that there is about 3.6 percent downfall in the circulation of five hundred and thirty four observed daily newspapers in six month duration till march 2008 which was much higher than previous decline which was 2.1 percent. He said that circulation of Sunday issues decline faster than regular publications and for the duration that decline was of 4.6 percent.

In his article he said that big ten newspapers are suffering from circulation decline, he mention some name and their circulation downfall for the period. He starts from very famous newspaper named The New York Times with the circulation decrease of around 3.9 percent and because of that they occurs loss of more than one million. In his article he quote the saying of the spokesperson of New York Times that "This was a decline that we planned and budgeted for". Later company takes corrective measures and cut back discounts and offers to increase profit.

In this study, main and important aspect is discussed, this is a problem which whole world is facing or publishers are facing, and publishers are in great stress, how to control profit. There is a simple solution and that is to maximize the advertising income or the income which can generate by space selling rather to cut discounts

or to cut any offer which can attract the reader or customer, because advertisement income is also correlated with circulation. Mostly advertisers are advertising their product through advertising agencies, these advertising agencies send proposal to these clients (advertiser) including the name of all most circulated magazine. Advertising agencies never refer those magazines or newspapers which have low or no circulation, so companies should have to adopt such policies to increase circulation.

Agostiono Manduchi & Robert Picard, (2009) In their research, focused on advertising revenue, he take advertising income as fixed revenue because of selected number of allocated pages to the seller the advertiser and circulation as variable. Cost is the main factor which plays a main role in deciding what should be the cost or price of that publication, there are some publications who have more cost than the price, in such case, publisher restrict his publication and intentionally decrease the circulation by printing less number of copies to save the cost of paper and printing and emphasis more on advertising income.

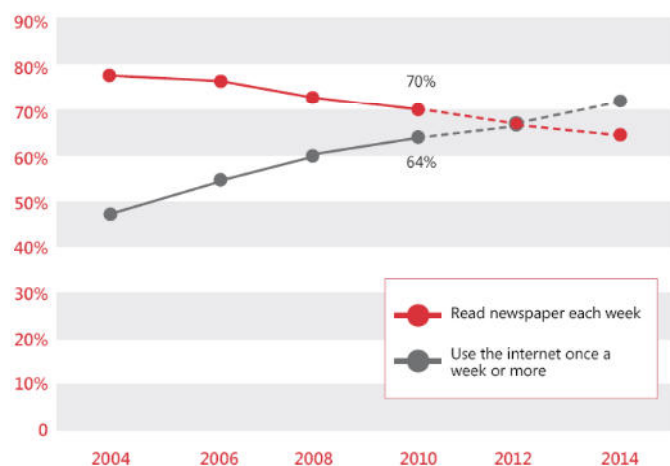
AMAS Ltd., (2010) conduct a detail research on how the digital media especially internet effect he advertising pattern of the advertisers internationally and in Ireland as well. Main theme of this study is that the print industry of whole world and Ireland, as well, is suffering a long term structural change, both the source of revenue, readers and advertisers, are less interested in printed stuff. Later in this research, AMAS limited discuss about the behavior and attitude of the Irish audience that around 77 percent of adults are now using internet and connected via computers and from smart devices, data regarding census in 2008 shows that around two third of the household are using internet. The influence and attractiveness of social web sites like Facebook make people to use internet more, average person of Ireland use internet around 13 hours a week, and usage of mobile device are heavier than he PCs.

Later in this research, the company discuss the change of advertising spend towards digital media, which is used to refer and for supportive document for our study. According to this research internet base advertising is taking a greater share of traditional media, and United States, United Kingdome and Nordic

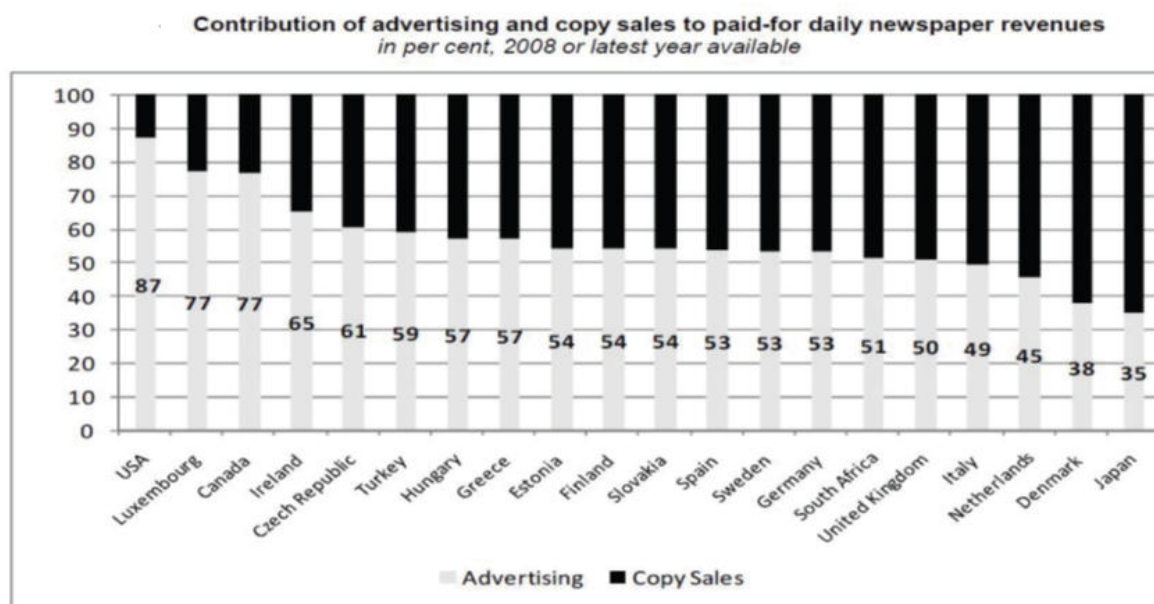
countries are at top. In 2009, the total spending in online advertising was of 22.7 billion dollar in United States.

In next phase of their research they discuss the effect of internet advertising on traditional publishers of different countries. In this figure, company shows graphically that in 2010, at the time of this research, the percentage of European users of newspaper are higher than the users of internet but in prediction, by the end of 2012, number of internet users will be increase as compare to newspaper readers.

Main threat, which was discussed in this research, for the publishers, is the decreasing circulation and revenues, change of audience and advertisers preferences and choices,



drifting media habits of youngsters and increasing competition as low sales publications are introducing and cutting the remaining market prevailing advertising revenue.



Source: OECD calculations based on data from The World Association of Newspapers (WAN).

This picture shows the revenue pattern of the publishing industries of different countries, in which the Publisher of USA were at top in emphasizing on advertisement income and around eighty seven percent of their revenue was generated by advertisement income, overview of this chart provides the researcher, the idea about the global industry. Japan got the lowest dependency on advertisement income and around sixty five percent they are earning from the circulation or sales of copies. This also because of high literacy rate and the maintain attitude of the customer towards reading.

Further in this report author discuss the decline in the overall decline in advertisement income for the publishers of USA from 2004 to 2009. In 2004 the total advertisement expenditure via print industry by the advertisers was 46,703 million dollars but by the end of 2009, advertisers curtail their expense to 24,821 million dollars, these figures are also played a supportive document for this study to build up the mind of researcher. According to this report, the reason identified by OECD, for this structural change in the advertising pattern is that the print industry is losing its appeal to the readers in term of old media, and by introduction of new media in the market with high attractiveness and the influence of this new media on new generation is too high which force publisher to think about the profitability in future.

PWC, in this report (Outlook for Newspaper Publishing in the Digital Age, Moving into Multiple Business Models) mention that due to rise in broadband penetration and use of new electronic devices, the traditional print media is suffering from decline and recession, readers are increasingly moving from print media to electronic media and this change is massive. In their study they observed the position of print publishers and advertisers as they adopt the strategies and profitable measures in the era of digital revolution. In this study they come to the conclusion that the print media publishers are now mainly focused on cost reduction strategy and many publishers are now involve in multiple business platforms and now adopting the new technologies to earn profit by electronic mean.

Key supporting findings of their study are:

- Advertiser goes for that published product, which have large number of reader.
- Publisher should adopt multiple business platforms and offer different advertising packages to the advertisers, because this decline to the industry is likely to continue for next few years.
- Television expected to remain on top in the list of most attractive media for both consumers and advertisers.
- Recently, the advertisers have more concern in advertising via mobile devices

7: Global advertising expenditure by medium



Source: PricewaterhouseCoopers newspaper advertiser survey

Advertisers and media buyers have numbers of varieties of mediums to advertise their product and to interact with the customers, in the picture above, from 2008 to 2011 only the print media and newspaper industry suffers the most they got negative figure in the growth scale, which mean they lose the advertisement income around 2.3% and advertisers are more concern about other media to advertise except print media.

Caitlin Moldway, (2012), discussed, in his report that the Publishing business has fought with an assortment of financial difficulties in recent years. Readers are supporting computerized choices, giving preferences to online media over printed materials. Further he discuss about the decline in revenue for the print industry of United Nation, according to his report print industry's revenue was decline on average of 6.2% in the five year to 2012 and expected to fall about two percent next year(predicted in year 2012) which was about seventy six billion loss.

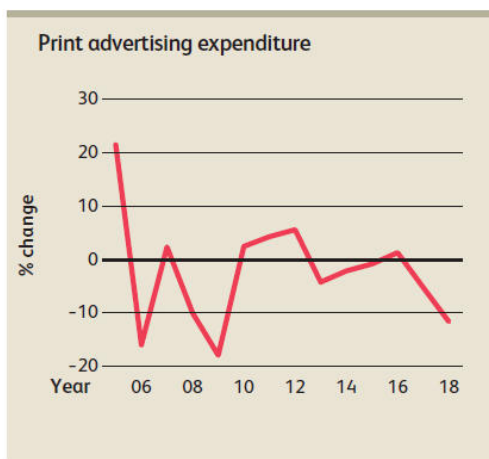
According to him the Publishing industry is anticipated to proceed with its decrease in the five years to 2017, average per year predicted revenue decline was around 1.8 percent. Electronic items, substitute and online media continues to take over the share of print media both in customers and advertisers. In order to cover up such losses, the tradition publisher should diversify their business into cross media activities.

In his report he said that the print advertising revenue includes all space selling and printing of publishers advertisement in the newspaper or magazine and the allocation of publishers budget is inclines more towards advertising in online media, by watching this the traditional publishers are decreasing their products quality in term of page output, which is also one of the factors of decline in the demand of printed materials.

In this figure, he took advertising revenue as Print advertising expenditure on vertical axis and percentage change in revenue on horizontal scale. This chart shows that a sudden decline in 2006 was faced by the industry and after that trend of the industry is diminishing and from 2010 to 2012 there is a positive trend and advertising revenue increased but after that again the attitude of the line shown continuous decline in the trend and predictions for future were also not in the favor of publishers, as advertisers are focused to advertise more in electronic or online media. As the use of digital media and social media increases and people's preferences are shifting, the advertisers are campaigning more in digital media rather than print media which is supposed to be a slower and ignored medium to transfer any idea or message. Further he discussed about the diversification in the industry, the facility of keeping and uploading books and printed stuff on internet helps a bit to the publisher to earn some subscription revenue and search engines like Google got attraction of reader and make them

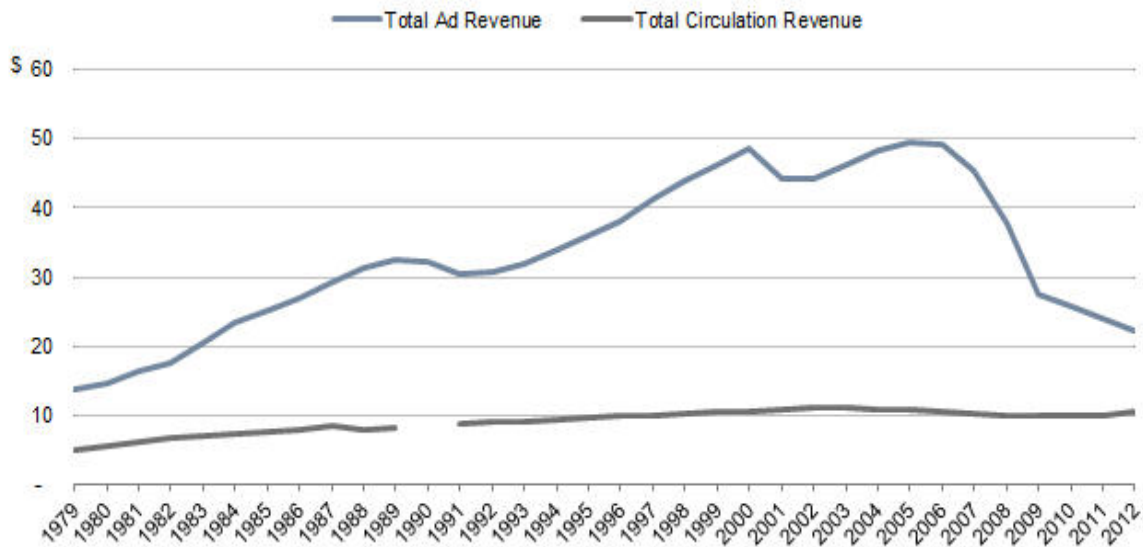
switch to online readers.

This report used as a supporting document for this study and some points of author are identical with the theme of this study and quite supportive in making strong concept about the international market.



Ad Revenue Decline Continues to Slow Down

In Billions of Dollars



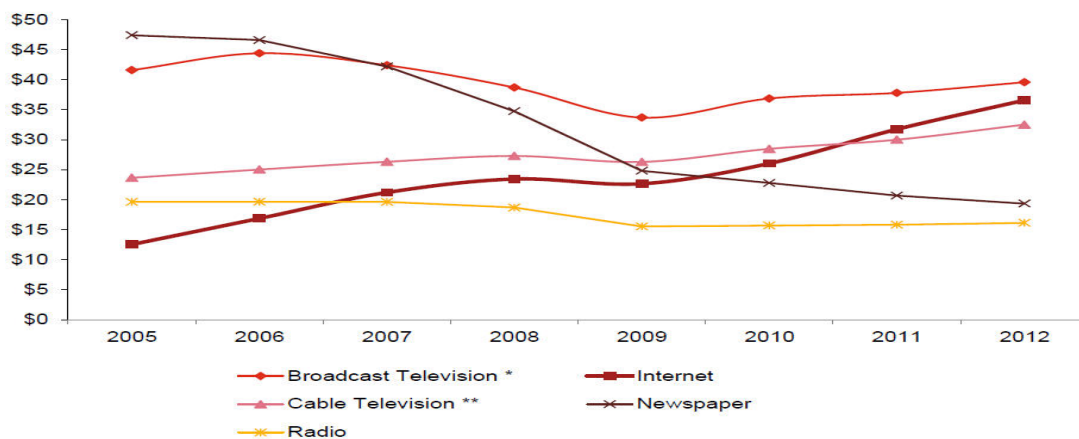
Source: Newspaper Association of America
 Note: No circulation revenue data available for 1990.

PEW RESEARCH CENTER
 2013 STATE OF THE NEWS MEDIA

This chart shows the long term trend of the circulation and advertisement revenue for the print industry of the United States, this chart shows that there is a sudden downfall in the advertisement income for the publishers from 2007 to onwards. There is a gradually increase in the trend of industry’s advertisement revenue from 1980 to 2006. Later in this report they mention that although there is overall increase in the circulation and in circulation income but the individual circulation of majority of the publication was decreased in 21th century, this circulation income increased due to increase in the number of new comers in the industry, accordingly many publishers started the strategy of low sale high price.

An another report was presented by Interactive Advertising Bureau (IAB) in April 2013, on the basis of a survey report which was conducted by PwC regarding the share of advertisement income of different media mediums from 2005 to 2012, in this report the author discuss the changes in the advertisement revenue share of the different media.

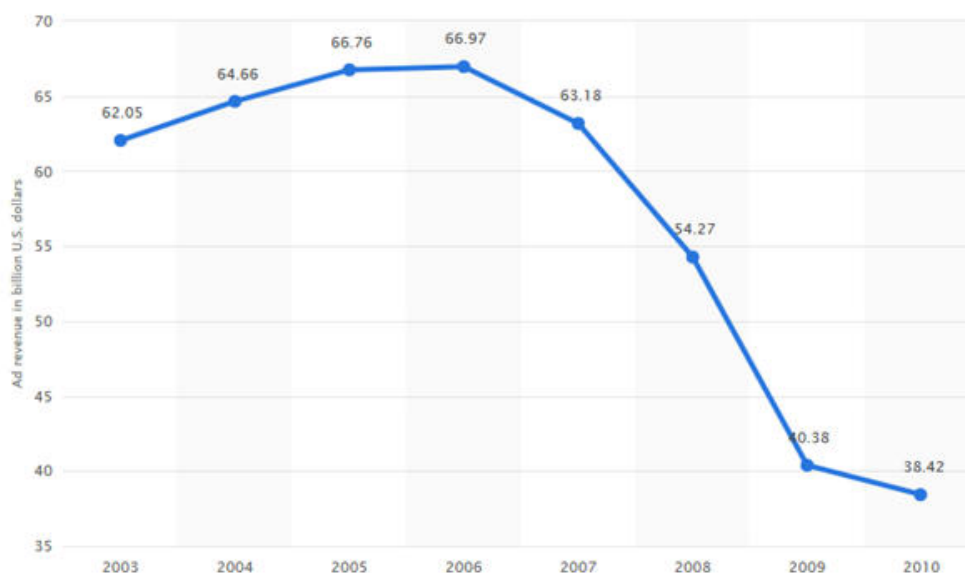
Advertising revenue market share by media, 2005-2012 (\$ billions)



* Broadcast Television take into account Syndicated and Spot TV advertising income.
 ** Cable Television consists of Nationwide and Resident Cable Network’s advertising income.
 Sources: IAB Internet Advertising Revenue Report; PwC

Author, in this report, shows that in United States, except print media all other mediums increase their advertisement income. Radio, which is also considered as one of the oldest form of media, according to this report Radio managed to maintain its advertising income over the period of eight years. Print is the only industry which suffers most during this period in term of its advertisement business and in gaining advertisers attraction, the downfall of total advertisement income increased year by year. In this report author mainly discussed about the increasing advertisement revenue of online internet, in 2009, internet websites proprietors enjoys the double digit growth rate in their advertisement revenue and by the end of 2012, internet's share in advertisement income is the highest among all kinds of media.

Total advertising revenue of U.S. print media* from 2003 to 2010 (in billion U.S. dollars)



Source: <http://www.statista.com/statistics/183860/us-print-media-advertising-revenue-since-2003/>

Above picture is only to discuss the sudden downfall in advertising revenue of the United States print industry from the year 2007 to 2010 which is around 25 billion dollars. This was the time when electronic devices were capturing market and time by time people become habitual of these devices and some scholars considered these electronic devices as necessities not as luxuries.

From year 2003 to 2007 print industry of United States, somehow manage to maintain their advertisement revenue but from 2007 they suffers decline in the profit due to decline in advertisement income so therefore publishers adopted the cost cutting strategies to remain in the market and they entered into the multiple business models by adopting some electronic mean to be in the market.

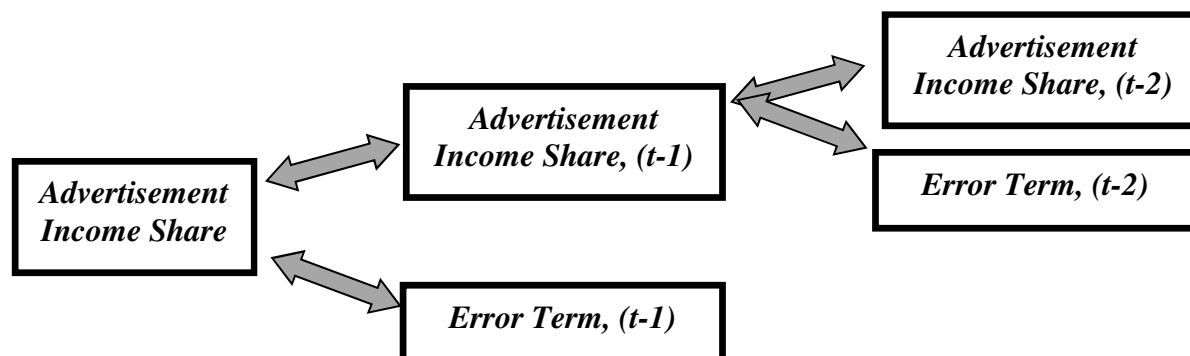
3. CONCEPTUAL FRAMEWORK

Theoretical framework of the study will help us to spot and understand the flow of the study and we can easily draw the general framework for data analysis of the research.

This framework is a foundation for the parameters or boundaries of a study.

3.1 Times Series Variable:

Print Media Advertisement Income Share is the only variable for this study.



3.2 Explanation of Conceptual Framework

The Conceptual framework of the study consists of single variables named “Print Media Advertisement Revenue Share”. In this study, ARIMA model technique will be conducted on this variable. ARIMA model consists of two elements one is Auto Regression and another is Moving Average.

Auto Regression, which is denoted by AR, based on the Law that the present value of the considered variable is affected or depends on last year’s value of that variable.

And on the other hand, Moving Average, which is denoted by MA, based on the Law that the present value of the considered variable is depends on the last year’s error value of that variable.

Trend of the share of advertisement income for the print media is declining and the advertisers are curtailing their advertising expense from print media and allocating on other media, ARIMA model is to forecast the trend.

4. RESEARCH METHODOLOGY

4.1 Hypothesis

H(A): Data series have unit root

This hypothesis is about to check the stationarity of the data series.

4.2 Research Design and Data Collection

This research is on quantitative data, secondary data is collected from the main office of APNS, which was taken from the Gallup website(in Pakistan Data from Gallup.com is considered as authentic and the main data collecting advertising agencies like Group M, Synergy Advertisers and APNA use this data for their statics test regarding the media industry). This data is about share of print media or publishers in the overall advertisement budget of the media industry.

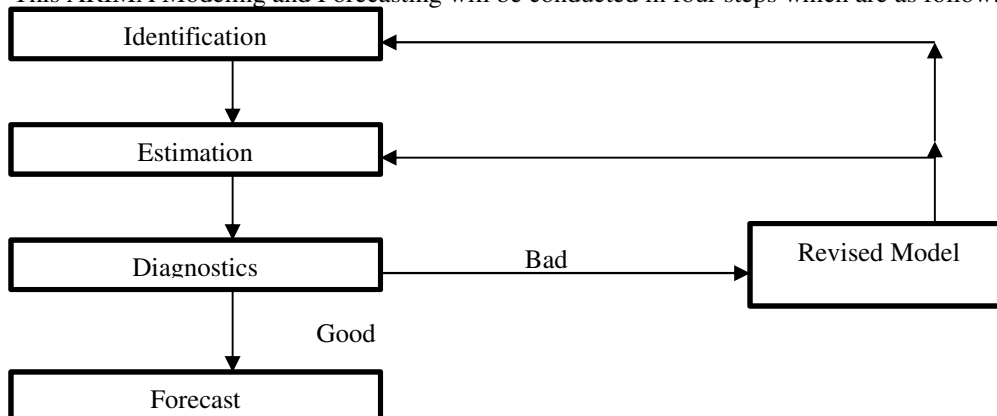
4.3 Procedure and Model Methodology:

As discussed earlier, there is only one variable in this study which is secondary data and collected from the main office of APNS, Mr. Tanvir Ahmed who is working as Chief Administrator, provided the data. They basically maintained their database from the data provided by Gallup Pakistan and considered this data source as authentic medium of data providers in reference to Print and Electronic media.

After data collection, ARIMA modeling technique was applied for Modeling and Forecasting.

The data for the variable “Advertisement Income Share for Print Media” have been collected for the period of 2003 to 2014, and then forecast for next following year would be carried out.

This ARIMA Modeling and Forecasting will be conducted in four steps which are as follow:



A fit estimated model is parsimonious, model data series should be stationarity, residuals of the model should be White Noise, should has good out of sample forecast and adjusted R square should be relatively high. Mostly parsimonious model may not have the best fit or out-of-sample forecasts, Abdus Salam, (2007).

4.3.1 Identification and Stationarity Process

Box-Jenkins (1976) methodology would be applied in initial phase of model identification. Using graphs, statistics, ACF’s (Autocorrelation Function) and PACF’s (Partial Autocorrelation Function) analysis etc. to identify the model initially, however this may not be the main model for the study but it is necessary to start with up for momentum. The spikes of ACF and PACF in diagrammatic representation of the data in correlogram, shows the model specification and number of legs in Auto Regressive and Moving Average, basically it identify the order of the model.

Non stationary data is volatile and cannot be used to make model or to forecast, it gives the spurious

result. In first phase of this study after identification of order of the model, the very next thing is to make data series stationary which means that the data should have constant mean, constant variance and constant auto covariance. Correlogram also shows the stationarity of the series but in this study the unit root test will be conducted to check the stationarity in the series. Data series, in this study has only 10 observations and for this number of observation, the Augmented Dickey Fuller test is suggested, if the series is non-stationary, first have to take logarithm of the series then again check the data, if data contain unit root then have to take 1st level differentiation and then 2nd differentiation. Mostly data series become stationary at 1st level differentiation. In Augmented Dickey Fuller test hypothesis has been created.

- H0: series contains a unit root
- H1: series is stationary.

The null hypothesis of an Augmented Dickey Fuller is rejected if the test statistic is more negative than the critical value.

4.3.2 Estimation

Least square method via E-views software would be applied to determine the coefficients. Different combination of AR and MA would be estimate to find out the best appropriate model. Criteria to find best appropriate model is to consider AIC (Akaike Information Criteria) and SIC (Schwarz Information Criteria) values, the model which contain lesser AIC and SIC value would be consider as best fitted model and then goes under various diagnostics tests.

4.3.3 Diagnostics

After model building and choosing process, the selected model should pass some adequacy and competency measures. A Residual test would be conducted which is based on flaw that the residual of the selected model should be White Noise. Therefore ACFs and PACFs spikes of Correlogram Q Statistics of residual would be observed for significance, if there no significant spike then the selected model is White Noise and ready to use for forecasting. And if there are spikes which are significant then the model is not adequate and then the study will starts again from the first step of ARIMA model identification.

4.3.4 Forecast

Finally, the diagnosed model would be used to forecast the out of sample forecast which mean that the data for this study is provided from 2003 to 2013 and this study will forecast the possible prediction of print media advertisement's share form the year 2013 to 2017.

4.4 Population

There are around 400 member publication in APNS, APNS is a governing body for print media and have solid code of conduct for advertising agencies. Target audience for this study are the client of these listed agencies because their budget and media business sharing was maintained by advertising agencies. There are some of the big advertising agencies and buying houses, who are maintain the data base for record or stational purpose like Group M, Synergy Advertisers and Orient Advertising. Records of these transactions are also maintained in the APNS House because it's the governing body and data for this study is collected from APNS House Karachi.

4.5 Time Series Variable

Advertising Income share is the only variable of this study.

4.5.1 Advertising Income Share

Advertisement Income is income generate by the sale of space in magazine or to print any advertiser's creative artwork for their product in their publications. This advertisement may be issues by advertising agencies or direct from the client. In Pakistan, Advertisement agencies take fifteen percent as their commission of the advertisement rate and rest 85% is for the publisher. It is very fruitful for the publisher to print as many as advertisement in their magazine because the creative of that advertisement is designed by advertisement agency and it make good looking layout of the magazine, but publisher should not forget circulation because advertiser only wants to advertise in those magazine which have high sales. From last ten years advertisers are not interested to publish their add and not allocating budget for print media, the massive switch of the audience from print media to electronic media, make advertiser to advertise in electronic media and advertisers are now curtailing the budget of print media and assigning more amount on television. Advertisement income for the publisher is the variable for this study, and mainly focused on percentage share of this advertisement income for print media to analyze the trend and make model application.

4.6 Equation for the research

$$Y_t = \alpha + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \theta_1 e_{t-1} + \theta_2 e_{t-2} + \theta_3 e_{t-3}$$

$$Y_t = -0.0798 - 0.1184 Y_{t-1} + 0.1012 Y_{t-2} - 1.5085 e_{t-1} - 26.14 e_{t-2} - 13.46 e_{t-3}$$

Where,

Y = Advertisement share for print media

e = Error term

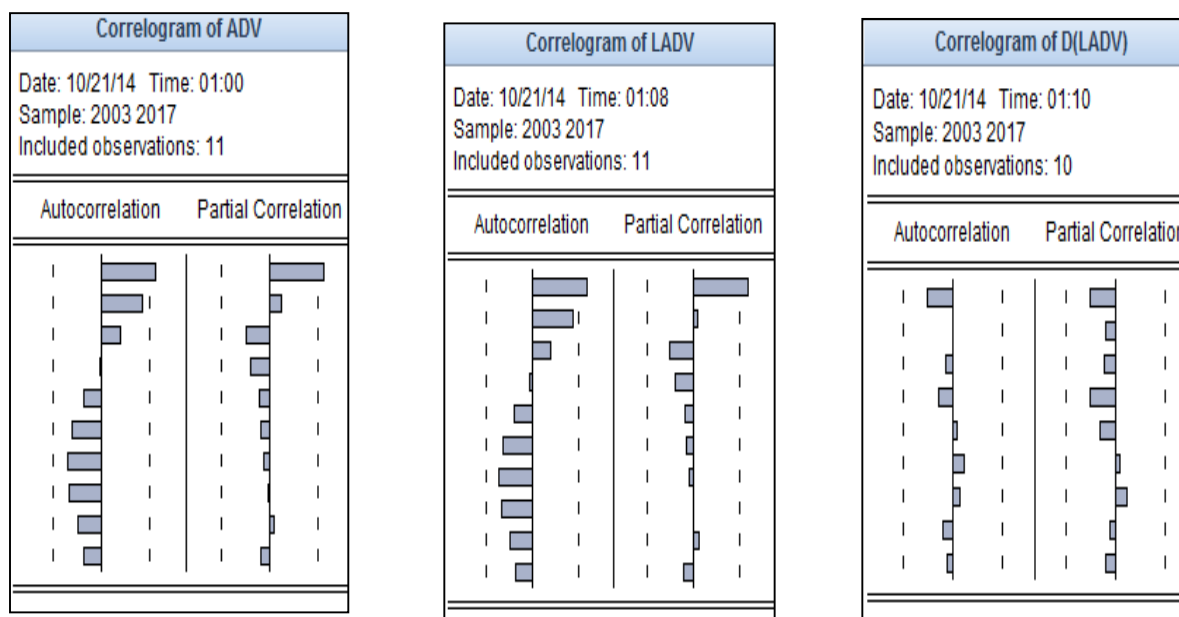
Φ and θ are the respective slopes,
 α is the intercept and μ is the error.

4.7 Data Analysis Technique

An ARIMA model technique was applied to forecast the uni-variate time series. E-views and Microsoft Excel software were employed for this purpose.

5. DATA ANALYSIS/FINDINGS

5.1 Identification and Model Building



Taking ADV as a share of Print Media in overall market's advertisement revenue of Pakistan from 2003 to 2013, in percentage.

To examine the properties of the data, Correlogram is one the tool suggested in Box-Jenkins methodology. It is useful in two sense, first to identify the order of the series and by the and by plotting the correlogram ARMA (1,0,0) is identified initially although its only to make the model start.

Secondly correlogram also provides helps to check the stationarity at different levels like on log and on differentiated series. In Correlogram of raw series named ADV and in correlogram of LADV which is the logarithm of the series shows that the series is not stationary, but after taking first differentiation, series become stationary. This can be judge by the length of the spikes of correlogram, if the spikes are significant and lengthy them the cut point then its means that the series is not stationary and have to take corrective measures. But the suggested technique to analysis the stationarity of the data Unit Root test in Box-Jenkins methodology.

5.1.1 Testing For Stationarity: The Unit Root Test

Augmented Dickey-Fuller Unit Root Test on LADV		
Null Hypothesis: LADV has a unit root		
Exogenous: Constant		
Lag Length: 0 (Automatic - based on SIC, maxlag=1)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.243560	0.6101
Test critical values:	1% level	-4.297073
	5% level	-3.212696
	10% level	-2.747676
*Mackinnon (1996) one-sided p-values.		
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 10		

Augmented Dickey-Fuller Unit Root Test on D(LADV)		
Null Hypothesis: D(LADV) has a unit root		
Exogenous: Constant		
Lag Length: 0 (Automatic - based on SIC, maxlag=1)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.843284	0.0058
Test critical values:	1% level	-4.420595
	5% level	-3.259808
	10% level	-2.771129
*Mackinnon (1996) one-sided p-values.		
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 9		

Before identification of a suitable ARMA model, data series should be checked for stationarity because a non-stationary data is volatile and will give spurious or false result and forecasting.

Above figures shows the Augmented Dickey Fuller Unit Root test for the logarithm and data series on first differentiation. Unit root test of differentiated series shows the data stationary. There are two ways to accept or reject hypothesis of unit root, first one to consider t-value, if the t-value of the test is lesser then the critical

value of t, then the null hypothesis will reject. And other way to compare the p-value of the test with the significance levels, usually null hypothesis rejects when the p-value is less than or equal to a specified significance level, often 0.05 (5%), or 0.01 (1%) and even 0.1 (10%).

H0: series contains a unit root.

H1: series is stationary.

D(LADV) is the first differentiated log series. Unit root test of D(LADV) shows the t-value of -4.843, which is significant on every level of significance and the null hypothesis of series contain unit root will be rejected and series considered as stationary on first differentiation.

5.2 Estimation

After making the data stationery, the observed model will be estimated by simple least square method which was ARIMA (1.0.0). Then different combination of AR and MA would be estimate to find out the best appropriate model by comparing their AIC (Akaike Information Criteria) and SIC (Schwarz Information Criteria) values and the best model will send for re-estimation to determine the coefficient and for residual diagnostic test.

5.2.1 Developing Models

S.no	Model Specifications	AIC Values	SIC Values
1	AR(1)	-2.65776	-2.61394
2	AR(2)	-2.70127	-2.67148
3	AR(3)	-2.67449	-2.70539
4	MA(1)	-2.67149	-2.61097
5	MA(2)	-2.47174	-2.38097
6	MA(3)	-3.52802	-3.40699
7	ARIMA(1,1,1)	-3.51049	-3.44475
8	ARIMA(2,1,1)	-3.34798	-3.30826
9	ARIMA(3,1,1)	-5.83627	-5.87491
10	ARIMA(1,1,2)	-5.0957	-5.00805
11	ARIMA(2,1,2)	-8.6963	-8.64665
12	ARIMA(3,1,2)	-8.04054	-8.08691
13	ARIMA(1,1,3)	-4.11331	-4.00374
14	ARIMA(2,1,3)	-8.70624	-8.64666
15	ARIMA(3,1,3)	-6.18046	-6.23455

This figure shows the AIC (Akaike Information Criteria) and SICs (Schwarz Information Criteria) value of different combination of ARIMA model. In these fifteen combinations, the combination number fourteen, ARIMA (2,1,3), is best the appropriate model because of having smallest AIC and SIC values.

5.2.2 The Best Model

The best appropriate model is given as:

$$Y_t = \alpha + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \theta_1 e_{t-1} + \theta_2 e_{t-2} + \theta_3 e_{t-3}$$















$$Y_t = -0.0798 - 0.1184Y_{t-1} + 0.1012Y_{t-2} - 1.5085e_{t-1} - 26.14e_{t-2} - 13.46e_{t-3}$$

5.2.3 Re-Estimation

Dependent Variable: D(LOG(ADV))					
Method: Least Squares					
Date: 10/20/14 Time: 05:59					
Sample (adjusted): 2006 2013					
Included observations: 8 after adjustments					
Convergence not achieved after 500 iterations					
WARNING: Singular covariance - coefficients are not unique					
MA Backcast: OFF (Roots of MA process too large)					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	-0.079794	NA	NA	NA	
AR(1)	-0.118400	NA	NA	NA	
AR(2)	0.101204	NA	NA	NA	
MA(1)	-1.508466	NA	NA	NA	
MA(2)	-26.13975	NA	NA	NA	
MA(3)	-13.45871	NA	NA	NA	
R-squared	0.998835	Mean dependent var	-0.071565		
Adjusted R-squared	0.995923	S.D. dependent var	0.046066		
S.E. of regression	0.002941	Akaike info criterion	-8.706240		
Sum squared resid	1.73E-05	Schwarz criterion	-8.646659		
Log likelihood	40.82496	Hannan-Quinn criter.	-9.108091		
F-statistic	343.0134	Durbin-Watson stat	1.668787		
Prob(F-statistic)	0.002909				
Inverted AR Roots	.26	-.38			
Inverted MA Roots	6.13	-.54	-4.08		
Estimated MA process is noninvertible					

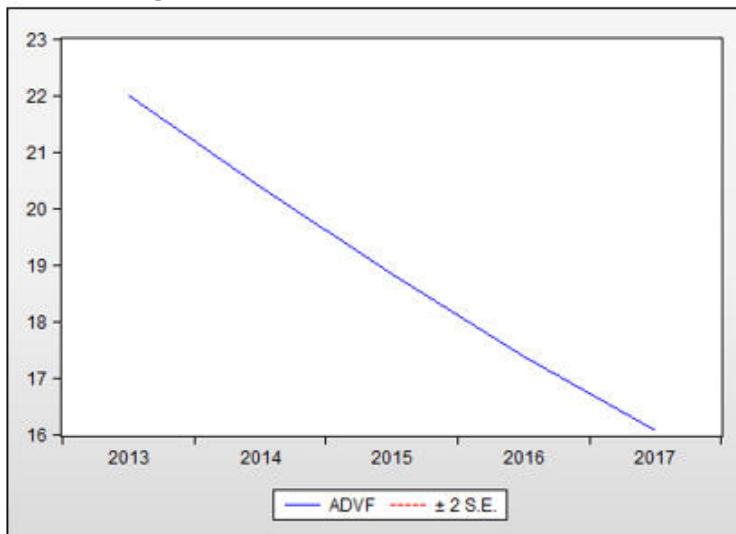
The above figure is the estimation of the best appropriate model which is ARIMA (2,1,3). Its means, it has AR (2) and MA (3) with first level of integration. This figure also shows the main static results of the model like coefficients, R², Adjusted R², sum of square of residuals and F-statistics etc.

5.3 Model Diagnostics

Correlogram of Residuals						
Date: 10/20/14 Time: 06:04						
Sample: 2006 2013						
Included observations: 8						
Q-statistic probabilities adjusted for 5 ARMA term(s)						
Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	0.119	0.119	0.1631	
		2	-0.401	-0.421	2.3086	
		3	-0.422	-0.375	5.1605	
		4	0.091	-0.004	5.3255	
		5	0.087	-0.309	5.5261	
		6	0.042	-0.134	5.5960	0.018
		7	-0.016	-0.093	5.6153	0.060

After the estimation of the selected model, the third step is to diagnose the residual for white noise. Above figure shows the Correlogram Q Statistics of residuals, since there are no significant spikes of ACFs and PACFs, it means that the residuals of this selected ARIMA model are white noise and this model can be used for forecasting.

5.4 Forecasting

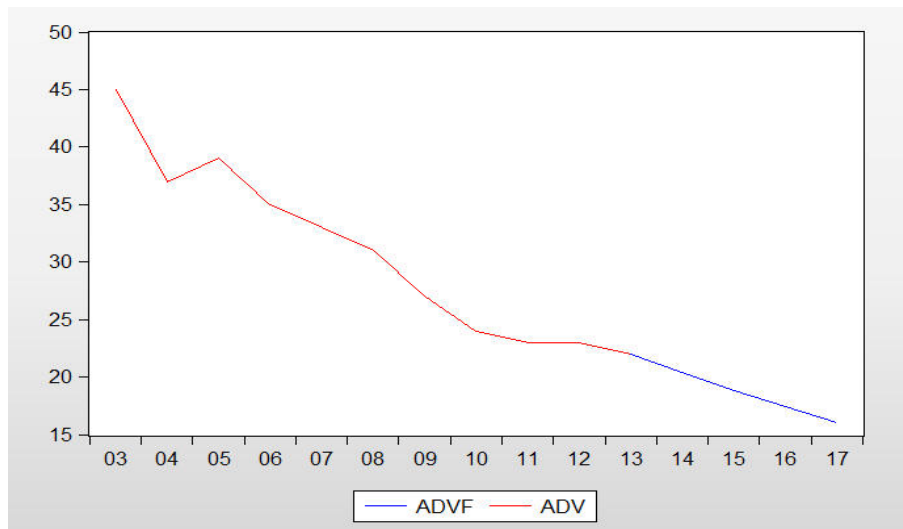


Forecast: ADVF
 Actual: ADV
 Forecast sample: 2013 2017
 Included observations: 1
 Root Mean Squared Error 0.002033
 Mean Absolute Error 0.002033
 Mean Abs. Percent Error 0.009243

The above chart shows the out of the sample forecast for the print media advertisement share from 2013 to 2017. To check the accuracy of the

forecast, 2013's data which is already given also forecasted.

Years	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Forecasted Values	45	37	39	35	33	31	27	24	23	23	21.998	20.375	18.831	17.391	16.058



ARIMA model forecast followed the decline trend of the advertisement share of print media. Actual data of 2013 is 22 percent and the forecasted is 21.99% which is around same and therefore this prediction is considered as valid. From 2013 to 2017, predicted share we decline around 6 percent. In this chart red line is representing the actual data till 2012 and from 2013 to 2017 which is forecasted, is represented by blue line and donated

by ADVF.

6. DISCUSSION ON RESULTS AND CONCLUSION

This study is divided into four major data analysis parts and results of the data are quite up to the mark and predictable.

The traditional Box-Jenkins methodology was used to forecast the time series named ARIMA modeling. In initial phases of identification and estimation, first thing which was done was to identify the order of the ARIMA model. Initially the model which was identified was AR(1), by the spikes of the correlogram and used to build up the model.

Secondly correlogram was also used to check the stationarity at different levels like on log and on differentiated series. Correlogram of basic data series showed the existence of unit root in the series but on 1st level of difference, the data series became stationary. Augmented Dickey Fuller Unit Root test was applied to accept or reject the hypothesis of unit root, and on first differentiation the value of t was -4.83 which is significant and the null hypothesis of unit root existence was rejected and series considered as stationary.

Then 15 different combination of AR and MA estimated to find out the best appropriate model by comparing their AIC (Akaike Information Criteria) and SIC (Schwarz Information Criteria) values and the model ARIMA (2,1,3) was selected as the best fitted model, because it have the lowest value of AIC and SIC.

$$Y_t = \alpha + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \theta_1 e_{t-1} + \theta_2 e_{t-2} + \theta_3 e_{t-3}$$

Equation of ARIMA (2,1,3) shows that the today print media's advertisement revenue share is dependent on the two leg value of past year's share value and on the three leg values of past years error which is moving average.

The value of R^2 is 0.9988 which shows that the model is fit and the weight of auto regressive and moving average legs in total sum of square is around 99%.

In the third step of diagnostic the residual for white noise, after the estimation of the selected model, the Correlogram Q Statistics of residuals showed that the residuals are white noise and the model is adequate to pass the criteria of appropriate model for forecast, this is judge by the movement of spikes of ACF and PACF.

To check the accuracy and predictability power of the forecast model, 2013's data which is already given also forecasted which is already inside the sample, to compare the magnitude of difference between actual and forecasted of 2013. Actual data of 2013 is 22 percent and the forecasted is 21.99% which shows the highly perfection of the forecasted model and out of the sample prediction is considered as appropriate, adequate and reliable.

From 2013 to 2017, predicted data showed that the share of print media in advertisement revenue will tends to decrease over the period of next five years by 6 percent, and by the end of 2017, the advertisement share will be 16.06 percent which is an alarming situation for the publishers, because as the trend of the market readership changed and people are switching from hard copies to soft copies and like to read stuff online, the circulation income have no charm in future for the publishers and advertisers are also tends to advertise in the publication which have high circulation and in electronic media so this curtailment of advertisement business from print media seems to be continue.

7. RECOMMENDATIONS

Owners and publishers should adopt Defensive Strategies like Mergers with big groups, or use Diversify Strategy.

Owners should put their data and soft copy on their publications online to increase the readership of their product.

Publishers should take some sale promotions to increase their sales volume and also should adopt the strategy of cost cutting by using low gramage of paper and finding cheaper source of printing.

Publishers also should have to play on low margin or low profit margin to promote sale, because sales and advertisement revenue are the two element of profit, but advertisement income is seems to be decline over the time as forecasted.

In Pakistan this crises will increase further, so they should adopt such a policy which will give them support in future like some of the newspaper of Pakistan, also start their TV channels but this require huge budget and this recommendation is for big groups only.

Note: These all recommendations are as Managing Editor because by profession researcher is also working as Managing Editor of a magazine.

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TERMS AND THEIR MEANING

Electronic Media, Considering mainly Television Networks

APNS, All Pakistan Newspaper Society

PEMRA, Pakistan Electric Media Regulatory Authority

PTV, Pakistan Television Network

PAA, Pakistan Advertising Association

M.A., Moving Average

OECD, Organization for Economic Co-operation and Development

IAB, Interactive Advertising Bureau

PwC, PricewaterhouseCoopers

AIC, Akaike Information Criteria

SIC, Schwarz Information Criteria

ACF, Autocorrelation function

PACF, Partial Autocorrelation function

ADF, Augmented Dickey Fuller

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