International Review of Business and Economics

Subscription: $50 per year for 2 issues. Individual issues can be requested for $30. Please email or mail your request with your name and address to the appropriate address listed below.

By mail: **Prof. Kishore Kulkarni,** Department of Economics, Campus Box 77, Metropolitan State University of Denver, PO Box 173362, Denver, CO 80217-3362 USA.
E-mail: kishorekulkarni25@gmail.com.

IRBE respects academic freedom but carefully monitors academic integrity of the authors. Papers submitted to IRBE should be completed with independent and original research, free of any plagiarism, and should not have been submitted to any other publication outlet including online publications. Violation of this requirement may result in IRBE informing authors' employer/manager or any other deci-sion making authority to take further legal or punitive action.

International Review of Business and Economics

EDITORS

EDITORIAL ADVISORY BOARD

Table of Contents

BUSINESS & ECONOMICS JOURNAL

INTERNATIONAL REVIEW OF BUSINESS AND ECONOMICS

WWW.IRBEJOURNAL.COM Chief Editor: Kishore G. Kulkarni, Co-Editors: Amitabh Dutta and Rajeev Sooreea ISSN: 2474-5146

May 31, 2020. Editor's Note:

Given the unprecedented crisis Corona virus has caused this year, the journal publication has become a challenging venture. Recently, however, to help IRBE do some smooth functioning, Society of Indian Academics in America (SIAA) (see www.siaaus.org) has offered tremendous support. They have not only invited me to be the new Vice President of the Society, but have also promised to do a nice sponsorship for the journal. That by itself, still does not solve all our problems. This year submission rate for IRBE has gone down as authors of quality papers are getting more choices to publish in other journal outlets.

IRBE is pleased to see some positive developments. Dr. Rajeev Sooreea Associate Dean, College of Business, at Dominican University in California has accepted to be Associate Editor, and our conference in Surat, Gujarat, India in December 2019, was a grand success. The Auro University that served as the local host offered tremendous facilities. Eminent speakers were gathered from all corners of India, USA, and Australia who presented high quality work.

I would like to move in the next gear by opening more opportunities of publication in IRBE. Please invite your colleagues to submit paper for our future issues. With your help we need to make the journal world popular. Please send me your comments at my e-mail kulkarnk@msudenver.edu

Kishore G. Kulkarni, Ph.D.,
Distinguished Professor of Economics, Chief Editor, International Review of Business and Economics, (www.irbejournal.com)
Campus Box 77, P. O. Box 173362, College of Business, Metropolitan State University of Denver, Denver, CO 80217-3362. Phone: 001-720-244-3663.
Personal website: www.kulkarnibooks.com Published papers available at www.researchgate.net
Sixth Edition: "Principles of Macro-Monetary Economics" Kendall Hunt Publishing Company, (2019)

https://view.publitas.com/kendall-hunt-publishing/macro-monetary/page/4-5

International Student Mobility: Recent developments and prognosis with special reference to India.

Anand Kulkarni, Victoria University, Australia. Email anand.kulkarni1@vu.edu.au[1]

Abstract

This paper examines global student mobility. It finds that student mobility has been on the rise rapidly in the last five years, mostly of a global nature, rather than intra-regional, especially in the case of Indian students. Students are highly aspirational and seek an edge in the labour market through specialist studies and post study work rights, and are focussed on obtaining a strong return on educational investment. Universities around the world increasingly seek to cater to these aspirations. Beyond the traditionally dominant inbound countries, a number of others, including especially in Asia, are becoming hubs of international student activity both as senders and receivers. Australia is becoming an increasingly key location for students, especially in recent times for Asian students. From a strategic standpoint, it will be important to maintain freedom of movement for students to benefit individuals and host and home countries.

Key words: student mobility, India, student aspirations, home country, host country.

Introduction

This paper is in six key sections. Section one examines the recent trend and global outlook for student mobility, followed by a regional and country perspective, and also looks at the growing movement of students from emerging Asia. The second section examines the growing segmentation of students by discipline and level of study. Section three considers the key influencing factors for student decision making. The fourth section builds on section three by examining recent trends in the mobility of Indian students abroad, their motivations, including in reference to key markets of the US and Australia. Section four also canvasses student mobility into India as India attempts to reform and upgrade its own higher education scene. Section five looks at some strategic implications, especially in relation to India. Section six provides some concluding remarks.

Section One: Students everywhere

Global student mobility continues to accelerate (Institute for International Education 2018)[2]. The benefits for students are profound, including enhanced skills and experience, potential employment prospects, nurturing and consolidating ties and networks for personal, commercial and cultural reasons. For host countries is the possibility of skilled labour through student attraction, addressing economic and labour market needs. Home countries can benefit from advanced skills on the return of students, or at least have access to a vibrant diaspora (including trade and investment ties, cultural links, ideas and knowledge connection) should students not return. A review of short term international student mobility indicated, among other things, key outcomes in terms of enhanced cultural awareness, language skills, cross-cultural communications skills, cultural adaptability and inter cultural competence or the ability to cope with life in another culture (Roy et al 2019). In cold, hard terms the direct and indirect economic impact of international students has been estimated at $57bUS for the US, $25.5bUS for the UK, and almost $20bUS for Australia, with Germany and France

[1] The views expressed in this paper are the author's alone.

[2] Note this paper was prepared prior to the outbreak of the coronavirus, which is impacting and likely to further impact on student mobility to and from China for the forseeable future.

over $14USb and Canada over $11bUS. The total global direct and indirect economic impact of Indian students is estimated at almost $18bUS with the corresponding impact of Chinese students at $51bUS (Choudaha 2019). The main beneficiaries of Indian and Chinese student mobility have been the US, UK, Canada and Australia.

The short period between 2013 and 2017 reveals immense growth globally in student movement from 4,230,955.1 to 5,309,240.4. Some estimates have overall growth of international enrolment rising by 51% between 2015 and 2030 or some 2.3 million students (Choudaha 2019). According to Choudaha (2019) there are, and have been, "three waves" of international student mobility: the period ***2001- 2008*** defined by terrorist attacks of 9/11 leading to student demand shifts from the US to Australia, Canada and the UK, the emergence of world class universities in Asia and the growth in intra- European student mobility; the period ***2008-2016*** characterised by the impacts of the Global Financial Crisis, more pro-activity in the US in regard to student attraction and retention, the continued rise in Asian institutions in terms of rankings, and as regional hubs, the growth of China's middle class, Indian students desire for post-graduate studies, as well as tightening of post work study rights in UK and Australia amid concerns about students using study as a vehicle for permanent residency; and the period ***2016 and beyond*** aligned with growing inward looking sentiment on the part of Governments in US and UK especially, concerns in Canada and Australia about over-reliance on a few countries and therefore issues of sustainability of growth, as well as political and economic uncertainty in Europe, and the emergence of lower-middle income countries such as India, Nigeria and Vietnam in driving demand. Based on a range of economic, social and demographic factors, the British Council estimates (British Council 2018) that outbound student mobility growth will slow between 2015 and 2027, due in some part to slower growth in China's tertiary age population (offset though by increase in gross enrolment ratio which means China will still be a dominant player in outbound student mobility), but also noting expected growth in outbound student mobility from other key markets, especially India, Pakistan, Nigeria and Bangladesh, associated with favourable demographics, and strong economic growth, for example. Various parts of the world, including Germany, countries in Eastern Europe, Brazil, South Korea, Malaysia, Singapore and HongKong, are expected to experience declines in outbound students, in large measure because of declines in tertiary age populations (British Council 2018).

Regional mobility

We turn to the regional implications and effects of student mobility. Our findings, drawing on UNESCO data, are that the student mobility is focused on well- known global destinations and that intra-regional flows are not becoming especially dominant save for a few areas. For example, for outbound students we find that the share of students from South and West Asia to other places in South and West Asia[3] has grown slightly from 5.6 to 5.9%, as it has for central and Eastern Europe, while for North America and Western Europe it has declined as it has for Latin America (UNESCO Institute for Statistics 2019). Data for other regions intra-regionally is not available. In an inbound sense, intra-regional movement has increased in the Arab States, and for South and West Asia and Latin American, but declined for all other regions. Thus, it appears that students are quite prepared to travel far and wide when deciding where to study, rather than being bound by proximity, familiarity, and possibly cultural connections. A bold globally oriented cohort is evident.

If we examine the changing numbers and market share inbound for key countries around the world, then it is the case that the old favourites stand out. In 2017, eight countries accounted for more than 50% of students by destination. These are Australia, Germany, Japan, Russia, UK, US and Canada and

[3] See Appendix One for country composition in regions.

China. While there is talk of a significant downturn in the U.S market share of international students, in fact the US has slightly increased its share of international students between 2013 and 2017 from 18.5% to 18.6%. This however is masking changes in the intervening years. The US share, for example, was more than 19% in 2016 and close to this in 2015, rising from 18.7% in 2014 (UNESCO Institute for Statistics 2019). In reality, the biggest shift and decline in the period between 2013 and 2017 was to the UK which lost 1.6% in global market share, associated in large measure due to restrictions on post study work rights, and possibly in the latter period with Brexit uncertainty. The winners in share terms have been student diversion to Australia, and to a lesser extent Germany, China and interestingly Turkey, noting the rapid growth in China. All countries have experienced growth in raw numbers. In share terms, there has been some re-alignment in that high income countries have lost some share to the upper-middle and middle income countries[4], in part reflecting the "China effect".

Others point though more explicitly to the "Trump factor" and that growth rate of international students in 2017 in the U.S was half that of the previous year, which was the lowest increase in US numbers over the previous 7 years, noting although that the US still is a number one destination for international students (M.M Advisory 2018). A survey of more than 500 US Institutions (Baer 2018) examining new enrollments of international students in Fall 2018 compared to Fall 2017 found that 49% of institutions experienced a drop, 44% an increase and 7% indicated stability. The top four reasons for the drop off in order of importance are: visa application processes or visa delays/denials; social and political environment in the US; enrolling in another country's institutions; cost of tuition/fees and financial assistance issues. Other key reasons include feeling unwelcome in the US, inability to secure a job there after studies and, physical safety (e.g gun violence, civil unrest) (Baer 2018). A number of these reasons were also prevalent in previous years.

[4] As at July 2019, according to the World Bank, low income countries are those with GNI per capita of current $US 1025 or less in 2018, lower middle countries are between $ US 1026 and $ US 3995, upper middle income between $ US 3996 and $ US 12375, and high income countries greater than $US 12,376

Table 1 inbound student flows (market share in brackets): Main destinations

	2013 numbers of inbound students	2017 numbers of inbound students	Inbound mobility ratio 2013	Inbound mobility ratio 2017	GDP per capita latest year PPP constant 2011 International $	Ranked Institutions per capita latest year (population 15-64 years)	Global Innovation Rankings 2019 (out of 129 countries)	World Happiness Ranking 2019 (out of 156 countries)
Australia	249, 868 (5.9)	381,202 (7.2)	-	21.48	45,439	2.1	22	11
China	96,409 (2.3)	157,108 (2.95)	0.28	0.40	16,187	0.08	14	93
Germany	196,619 (4.6)	258,873 (4.9)	7.07	8.37	45,959	1.6	9	17
India	34,419 (0.8)	46,703 (0.9)	0.12	0.13	6,899	0.06	52	140
Ireland	12,861 (0.3)	19,983 (0.4)	6.45	8.88	70,855	2.8	12	16
Japan	135,803 (3.2)	164,338 (3.1)	3.52	4.27	39,294	1.4	15	58
Malaysia	99,648 (2.2)(2014)	100,765 (1.9)	8.83	8.07	28,176	0.6	35	80
Netherlands	68,943 (1.6)	96,289 (1.8)	10.23	11.0	49,787	1.2	4	5
NZ	41,352 (0.97)	52,678.5 (0.99)	16.12	19.61	36,354	2.5	25	8
Poland	27,767 (0.7)	63,925 (1.2)	1.46	4.12	28,752	0.5	39	40
ROK	55,536 (1.3)	70796 (1.3)	1.66	2.26	36,777	0.8	11	54
Russian Federation	213,347 (2014) (4.7)	250,658 (4.7)	3.05	4.26	24,791	0.5	46	68
Saudi Arabia	62,143 (1.5)	78,344 (1.5)	4.58	4.66	48,996	0.3	68	28
Spain	56,361 (1.3)	64,927 (1.2)	2.86	3.23	35,056	2.5	29	30
South Africa	42,351 (1.0)	45,334 (0.9)	4.09	4.06	12,145	0.3	63	106
Sweden	25,437 (0.6)	28,747 (0.5)	5.83	6.74	47,194	1.9	2	7
Turkey	54,387 (1.3)	108,076 (2.0)	1.09	1.5	25,287	0.6	49	79
Ukraine	49,686 (1.2)	52,768 (0.99)	2.25	3.07	7907	0.2	47	133
UAE	59,227 (1.4)	64,447 (1.2)	44.63	33.60	66,616	0.5	36	21
UK	416,693 (9.8)	435,734 (8.2)	17.46	17.92	40,158	2.3	5	15
US	784,427 (18.5)	984,897 (18.6)	3.93	5.18	55,681	0.8	3	19
Belgium	48,748 (1.2)	44,978 (0.9)	9.98	8.54	43,218	1.1	23	18
Canada	151,244 (3.6)	209,979 (3.95)	9.72	12.92	44,070	1.2	17	0
Lower-middle income	222,551.3 (5.3)	266,152 (5.0)	0.39	0.41				
Middle	1,024,157.5 (24.2)	1,364,986.3 (25.7)	0.73	0.84				
Upper Middle	801,606.2 (18.9)	1,098,834.3 (20.7)	0.96	1.13				
High	3,148,615.7 (74.4)	3,886,512.1 (73.2)	5.75	7.17				
World	4,230,955.1	5,309,240.4	2.11	2.38				

Source: UNESCO Institute for Statistics 2019, Global Innovation Index 2019, World Bank 2019, World Happiness Report 2019, Times Higher Education 2020

Table 2 Outbound Student Flows (market share of total outbound students in brackets): Main Sources

	2013 outbound students	2017 outbound students	Outbound student mobility ratio 2013	Outbound student mobility ratio 2017	GDP per capita latest year, PPP constant 2011 International $	Ranked Institutions per capita latest year (population 15-64 years)	Global Innovation Ranking 2019(out of 129 countries)	World Happiness Ranking 2019 (out of 156 countries)
Bangladesh	37,235 (0.9)	57,675 (1.1)	2.57 (2014)	2.09	3,879	0.009	116	125
Brazil	39,560 (0.9)	58841 (1.1)	0.52	0.69	14,283	0.3	66	32
China	719,357 (17.0)	928,090 (17.5)	2.11	2.10	16,187	0.08	14	93
France	76,654 (1.8)	89,379 (1.7)	3.28	3.53	39,556	0.9	16	24
Germany	120,510 (2.8)	122,195 (2.3)	4.33	3.95	45,959	1.6	9	17
India	190,636(4.5)	332,033 (6.3)	0.68	0.99	6,899	0.06	52	140
Iran	49,493 (1.2)	52,521 (0.98)	1.13	1.21 (2016)	19,098	0.7	61	117
Italy	50,290 (1.2)	74,268 (1.4)	2.69	4.04	35,739	1.7	30	36
Kazakhstan	54,172 (1.3)	84,681 (1.6)	6.93	13.51	24,738	0.2	79	60
Malaysia	59,826 (1.4)	63,253 (1.2)	5.36	13.51	28,176	0.6	35	80
Morocco	40,322 (0.95)	51,164 (0.96)	5.70	5.07	7,509	0.2	74	89
Nepal	32,168 (0.8)	64,054 (1.2)	6.74	17.26	2,724	0.06	109	100
Nigeria	63,904 (1.5)	85,251 (1.6)	-	-	5,316	0.04	114	85
Pakistan	40,338 (0.95)	53,023 (0.99)	2.11	2.73	4,928	0.1	105	67
Korea	113,857 (2.7)	105,399 (1.98)	3.41	3.36	36,777	0.8	11	54
Russia Federation	51,462 (1.2)	56,659 (1.1)	0.68	0.96	24,791	0.5	46	68
Saudi Arabia	74,981 (1.8)	84,310 (1.6)	5.53	5.02	48,996	0.3	68	28
Syria	25,084 (0.6)	53,612 (1.0)	3.80	6.70 (2016)	-	-	-	149
Ukraine	45,259 (1.1)	77,639 (1.5)	1.93	4.66	7,907	0.2	47	133
US	75,645 (1.8)	86,566 (1.6)	0.38	0.46	55,681	0.8	3	19
Vietnam	55,979 (1.3)	94,622 (1.8)	2.49	3.58 (2016)	6,609	0.04	42	94

Source: UNESCO Institute for Statistics 2019, Global Innovation Index 2019, World Bank 2019, World Happiness Report 2019, Times Higher Education 2020

Country mobility

Tables 1 and 2 highlight the top 20 or so inbound and outbound student countries (ie receiving and sending) where the top 20 relate to 2017 data[5]. Apart from the dominant sender countries e.g China, India and dominant receiving countries e.g US, UK, Canada and Australia, are a group of countries that we describe as hybrids, who are significant receivers and senders. These 9 countries are China, Germany, India, Malaysia, Republic of Korea, Russian Federation, Saudi Arabia, Ukraine and the US. Several important and interesting trends and features can be observed. Firstly, is that the hybrid group is mixed by way of development levels, as measured by GDP per capita, ranging from $7907 in Ukraine to $55,681 in the U.S. Second, that the most number of these hybrid countries are in Asia, suggesting that the Asian region is becoming a hub for multi-flows of students. The inbound importance of Asian countries stems from their investments in, and growing sophistication of their higher education base, offering of English language courses, rising development levels and their welcoming and indeed facilitative policy stances to inward student mobility. The hybrids also continue their traditional outward student mobility in the context of seeking alternative experiences, premium education abroad, access to global labour markets, and rising disposable incomes.

Dominant inbound mobility

It is also the case that dominant inbound countries are characterized by the following features:

- highest living standards (although not totally conclusive given the prominence of India, China, Ukraine, Turkey and South Africa)
- the strongest distribution of ranked institutions per capita as a quality indicator
- strength in overall innovation (apart from just education systems), as reflected in the latest Global Innovation Index, including the broader development and diffusion of research, knowledge and technology, which in turn, arguably, could be associated with stronger job and entrepreneurial opportunities for skilled graduates in innovation and knowledge intensive fields, and commercialization of knowledge from research.

Further, there is some association between inbound mobility and higher degrees of happiness amongst host countries, as measured by the World Happiness Index. However, this is not totally conclusive, as reflected in the strength of inbound student mobility and low happiness in for example, South Africa, Ukraine, India, China and Malaysia. Thus, it would appear that in some cases there are specific regional factors influencing the inward mobility of countries e.g. other African countries studying in South Africa, rather than general factors such as innovation, happiness and level of economic development as host factors. There seems, on balance, a stronger association between inbound mobility and global innovation rankings than in relation to happiness.

A number of Asian countries are undertaking significant policy developments, allied with initiatives of Higher Education Institutions, focused on inward student mobility. For example, Philippines is becoming more popular for English language programs, Japan is increasingly recruiting within Asia, China is a leading nation for hosting international branch campuses, and Taiwan's Ministry of

[5] The section pertaining to Tables 1-3 for student mobility draw on UNESCO Institute for Statistics (UIS) data. According to UNESCO and OECD international students are those who have crossed a national or territorial border for the purpose of education and are now enrolled outside their country of origin. These data do not include short term study experiences or exchanges.

Education plans to more than double the inward student intake over a two year period to 2019 (Studyportals 2017). The importance of Asia as study destination is underscored also by its later internationalization process, meaning it has significant capacity compared to Europe which has reached maximum capacity. One "game changer "is the growth in English language offerings, particularly the case in Malaysia, China, Taiwan and Hong Kong (Studyportals 2017).

Outbound student mobility

Outbound student mobility is dominated by China and India (although not so pronounced when considering outbound mobility ratio which measures outbound students relative to domestic tertiary base), and to a lesser extent Vietnam, Korea, Saudi Arabia, and interestingly the US (which highlights in general its global reach). As is to be expected, in general terms, outward mobility is associated with lower levels of GDP per capita, and the lower reaches of happiness. Students are moving to countries by and large which have a higher number of ranked institutions relative to population, to countries which are better off economically and have higher living standards (which in turn is associated with their capacity to offer high quality education and broader facilities) and (with some exceptions) to happier countries than their own, as reflected in the fact that countries which are major senders are also those that are at the lower reaches of happiness. However, what is not so clear cut is any association between outbound mobility and Global Innovation. It is not always the case that students are moving in droves from lower innovation nations. It may possibly be that education and training are de-linked from the broad innovation capabilities of a home nation, including in the minds of students.

Table 3, drawn from UNESCO Institute for Statistics (2019), shows the outbound mobility of some emerging nations from Asia, which is of growing importance, even though a number of these are not yet in the top 20 outward sending nations in absolute terms. Growth in student flows is associated with rising income levels and aspiration, and welcoming host country policies Even in the relatively short time frame that we have data for, what we see is the rapid growth from Vietnam, Philippines, Nepal, Bangladesh, and of course India and China is pronounced. In a number of these countries, growth is coming from a low base admittedly. Further, and interestingly, overall growth in outbound mobility exceeds growth in the movement of goods and services for a number of these nations. Thus, it is the people movement via students, that appears to be the principal driver of global and regional engagement when compared with trade. The gap between student flows and trade flows is particularly apparent for India, Nepal, Bangladesh and Bhutan (in the latter two countries trade has declined). Of interest also is that most outbound students from Asia are not just going to the traditional destinations in Oceania, US and Europe, but also to "non- traditional" locations such as Saudi Arabia, Thailand, and Egypt. There are to be sure, in some of these cases, very specific historical ties and close geographic proximity. Of note also is that India is emerging as a destination for international students, which we consider later in this paper.

Table 3 Outbound student flows Asia

	2013 outbound students	**2017 outbound students**	**% change in outward student mobility**	**Main countries 2017**	**Change in trade 2013-2017**
Vietnam	55,979	94,662	69.1%	Australia, France, Germany, Japan, U.S, UK	73.7%
Thailand	26,103	32,119	23.0%	Australia, Egypt, Japan, UK, US	5.2%
Sri Lanka	16,042	20,735	29.3%	Australia, India, Japan, Malaysia, US,	30.4%

	2013 outbound students	2017 outbound students	% change in outward student mobility	Main countries 2017	Change in trade 2013-2017
Phillipines	11,721	17,197	46.7%	Australia, US, Canada, UK, NZ	71.4%
Pakistan	40,338	53,023	31.4%	Australia, Malaysia, Saudi Arabia, UK, US	18.6%
Nepal	32,168	64,054	99.1%	Us, UK, India, Australia, Japan	66.6%
Bangladesh	37,235	57,675	54.9%	US, Malaysia, Canada, Australia, UK, Germany	-0.5%
Bhutan	3,677	4,393	19.5%	India, Thailand, Australia, US, Sri Lanka	-0.3%
Myannmar	7,418	8,965	20.9%	Us, Thailand, Japan, Australia, UK	NA
Lao	4,822	5,064	5.0%	Vietnam, Thailand, Australia, Japan, ROK	26%
Indonesia	39,448	47,574	20.6%	US, Australia, Malaysia, UK, Japan	3.5%
India	190,636	332,033	74.2%	See Table below	11.3%
China					NA
Cambodia	4,449	5,928	14.8%	Thailand, Australia, France, US, Japan	34.4%

Source: UNESCO Institute for Statistics 2019, World Bank 2019

Section Two: A nuanced view of student mobility

This section highlights the growing specialisation and differentiation of student mobility, as students increasingly seek higher value study options.

Table 4 Mobile students as a share of all students (%): Select OECD countries

	2013			2014			2015			2016		
	Bachelor	Masters	Ph.D	Bachelor	Masters	PhD	Bachelor	Masters	PHd	Bach	Masters	PhD
Australia	14	38	33	13	40	34	13	43	34	14	46	34
Canada	8	14	27	8	11	29	10	14	30	10	18	32
Belgium	8	16	38	8	20	37	9	18	42	9	20	44
France	8	13	40	7	13	40	7	13	40	7	13	40
Germany	4	12	7	4	12	7	5	13	9	5	13	9
UK	13	36	41	14	37	42	14	37	43	14	36	43
US	3	8	32	3	9	35	4	9	38	4	10	40

Source: OECD 2019

Table 4, drawing on OECD data (OECD 2019), demonstrates over time, the share of mobile students in total students, by level of study in selected major host OECD nations. What is observed is consistency over time, and that students seek out post graduate studies, especially Ph.D's in overseas markets. Thus, students are looking for a specialist orientation in their studies, to seek an edge in the labour market via value added courses and offerings. To the extent that overseas work permits are allowed, then specialist training can also be considered an entrée into residency and higher value jobs. For example in Australia, post graduate courses allow for longer post study work rights compared to undergraduates.

Student mobility by level and field

If we drill down further and look at mobile students as a share of all students by level and field based on OECD data (OECD 2019), we observe the following (Tables 5, 6, 7):

- Generally the share of international students is higher for post graduate compared to under graduate, as already seen
- Doctorates in the US are dominated by international students in engineering and construction and ICT, which one would surmise is the "Indian and Chinese" effect
- Engineering post graduate is the dominant occurrence across all countries, but to a lesser extent in Germany
- With the exception of the UK and the US, arts and social sciences is less pronounced in other countries. This may be a reflection of the traditional strengths of the US and UK in liberal arts courses, and in the case of the UK, design specialties. Much focus is on knowledge intensive science and engineering based courses, areas of continued and likely enhanced growth
- Also of interest is the popularity among overseas students of business, law and administration courses reflecting both the potentially lower cost of a number of these courses, and their popularity as a springboard to entrepreneurship and related ventures

Table 5: Mobile students as a share of all students in selected OECD countries %: Bachelors 2016

	Education	Arts and Humanities	Social sciences, journalism and information	Business Admin and Law	Natural Sciences, Maths Statistics	ICT	Eng, Manufac, Construction	Agriculture, fisheries, forestry Vet	Health and Welfare	Services
Australia	2.7	8.3	6.5	25.8	11.3	28.2	22	11.9	8.8	8.6
Canada	1.4	9.4	9.9	13.9	11.8	17.7	15.1	12.1	2.1	1.9
France	3.6	8.3	7.5	8.2	7.4	13.8	11	5.1	1.8	2.5
Germany	1.4	6.6	5.1	4.1	4.5	6.4	6.5	2.0	3.4	2.3
UK	1.6	10.1	14.4	26.2	9.5	13.3	24.7	11.7	7.8	-
US	0.7	3.0	3.9	6.4	4.4	4.7	9.3	8.2	1.5	1.9

Source: OECD 2019

Table 6: Mobile students as a share of all students in selected OECD countries %: Masters 2016

	Education	Arts and Humanities	Social sciences, journalism and information	Business Admin and Law	Natural Sciences, Maths Statistics	ICT	Eng, Manufac, Construction	Agriculture, fisheries, forestry Vet	Health and Welfare	Services
Australia	11.9	31.5	21.3	61.6	41	81.5	63.2	35.3	18.1	31
Canada	5.7	12.9	14.8	17.2	21	38.7	41.9	21	8.9	4.0
France	4.7	21.8	21.7	14.5	21.3	28.6	15.2	2.9	5.8	10.8
Germany	3.0	13.9	14.4	11	8.4	22.6	25	17.7	9.5	7.0
UK	9.6	42.4	40.1	60.1	29.9	50.4	51	25.9	12.8	-
US	2.5	13.2	9.0	12.6	17.3	38.2	34.5	0.9	5.9	2.2

Source: OECD 2019

Table 7: Mobile students as a share of all students selected OECD countries % Doctoral 2016

	Education	Arts and Humanities	Social sciences, journalism and information	Business Admin and Law	Natural Sciences, Maths Statistics	ICT	Eng, Manufac, Construction	Agriculture, fisheries, forestry Vet	Health and Welfare	Services
Australia	22.8	18	21.4	35.9	40.8	54.3	51.8	48.4	23.9	31.1
Canada	13.1	21.2	17.5	27.4	38.6	46.5	53.5	47.5	20.7	7.7
France	29.6	39.7	39.6	39.4	36.7	53.2	49.7	-	25.2	24.8
Germany	8.4	8.6	10.7	5.7	9.1	11.4	14	8.5	6.0	8.0

	Education	Arts and Humanities	Social sciences, journalism and information	Business Admin and Law	Natural Sciences, Maths Statistics	ICT	Eng, Manufac, Construction	Agriculture, fisheries, forestry Vet	Health and Welfare	Services
UK	31.1	37.6	46.3	57	37.6	58.2	60.2	44.1	32.9	-
US	6.1	26.4	28	25.3	53.1	80.3	85.3	74.2	22.8	23.4

Source: OECD 2019

Aspirations

That students have different aspirations, expectations, financial capacity, labour market attachment and personal traits is exemplified by Choudaha, Ororsz and Chang (2012) in segmenting international students who wish to study in the US. According to the authors there are four types of prospective students: Explorers (most interested in the personal experiences and who plan to attend a second tier institution and generally have low academic preparedness and high financial resources); High Fliers (academically well prepared and who have financial means, and usually look to study in high reputation institutions); Strugglers (limited financial resources and relatively low academic preparedness and often need additional preparation for overseas study); and Strivers (those employed either part time or full time during the application process, who have high academic preparedness and seek financial aid and wish to study in top tier institutions). According to the research, some 46% of Indian respondents to a survey were strivers, followed by 27% who are strugglers, 14% high fliers and explorers 13%. By contrast, the corresponding numbers for China are 19%, 21%, 32% and 28%. In short, prospective Chinese students are better academically prepared and have less financial concerns and constraints than Indian counterparts. In fact, India has the highest percentage of explorers compared to Chinese, Korean and the average of all countries prospective students to the US.

Just as one sees segmentation by students, so to must Institutions move with the times. In an environment in which global competition for students is strong and growing, Universities are, and will need to, define and re-define their basis of advantage, around niche research focus, student experience centric institutions, industry focused ones and digital hubs, allied with strategic responses around what the best approach is to innovating new programs, delivering existing programs in innovative fashion, both onshore and offshore, and English versus non English language programs (Choudaha and Rest 2018).

Section Three: The Student View

Increasingly, students are viewed by institutions as customers or core stakeholders, whose expectations need to be understood, addressed and met. Institutions and indeed nations are much more acutely aware of student sentiment particularly among the globally mobile students who actively choose which countries and institutions to study in. As such, consumer satisfaction survey data is important to understand. A recent global survey of student satisfaction, encompassing both domestic and international students, revealed a number of important features. Overall, students are very satisfied with their study experience, more so for post graduate students, older students, and international students compared to domestic students. In addition, less teacher-student engagement is also a barrier for domestic students undertaking bachelor's courses because of larger class sizes and demands of higher studies when compared to secondary studies. (Studyportals 2019). Older students and those undertaking post graduate studies have greater career and study clarity, and life and study experience which might account for their greater satisfaction compared to undergraduate and younger cohorts. The greater satisfaction of international students might be linked with studying in locations which are of better living standards, having higher quality institutions with greater resourcing and facilities, and strongerr reputation than those institutions in their home country.

The following table drawn from Study Portals (2019), with author modifications, outlines student satisfaction in various locations, in comparison with global averages. “Above” refers to above global averages, “below” to below global averages and the remaining category is “at average” global standards.

Table 8: Student ratings of study markets

	Overall Rating	**Teacher-student interaction**	**Admission process**	**Career development**	**Student diversity**	**Quality of student life**
UK	Above	Above	Above	Above	Above	Above
Ireland	Above	Above	Above	Above	Above	Below
Belgium	Above	Below	Below	Below	Below	Above
Netherlands	Below	Below	Below	Below	Below	At global average
Austria	above	below	below	above	above	above
Switzerland	above	above	above	above	above	above
Germany	below	below	below	below	below	below
US	Above	Above	Above	Above	Above	Above
Canada	Above	Above	Above	Above	Above	Above
Cyprus	below	above	above	below	above	below
Israel	below	below	below	below	below	below
Turkey	below	above	above	above	below	below
Lebanon	below	above	above	above	above	above
Iran	below	below	below	below	below	below
UAE	below	above	below	below	below	below
Egypt	below	below	below	below	below	below
Jordan	below	below	below	below	below	below
Iceland	above	above	above	above	above	above
Denmark	above	above	above	above	above	above
Norway	above	above	above	above	above	above
Sweden	above	above	above	above	above	above
Finland	above	above	above	above	above	above
Estonia	above	above	above	above	above	above
Latvia	Below	above	above	above	Below	Below
Lithuania	above	above	above	above	Below	Above
Australia	Above	Above	Above	Above	Above	Above
New Zealand	Below	Above	Below	Below	Above	Below
Spain	Below	Below	At global average	Above	Below	Above
Portugal	Portugal	Above	Above	Above	Above	At global average
Italy	Below	Below	Below	Above	Below	Above
France	Below	Below	Below	Above	Above	Below
Malta	Below	Below	Below	Above	Below	Below
HongKong	Above average	Above	Above	Above	Below	Below
Indonesia	Above average	Above	Above	Above	Above	Above
Philippines	Above average	Above	Above	Above	Above	Above
Taiwan	Above average	Above	Above	Above	Above	Above
Malaysia	At global average	Above	Above	Above	Above	Above

	Overall Rating	**Teacher-student interaction**	**Admission process**	**Career development**	**Student diversity**	**Quality of student life**
South Korea	Below global average	Above	Above	Above	Below	Above
China	At global average	Below	At average	Below	Above	Above
Singapore	Below average	At global average	Above	Above	Above	Above
Japan	Below average	Above	Above	Above	Above	Above
Mexico	Above	Above	Above	Above	Above	Above
Brazil	Above	Above	Above	Above	Above	Above

Source: Study Portals 2019 with author modification

This table of satisfaction drivers which incorporates both domestic and international students, shows that the U.S, UK, Canada, Iceland, Denmark, Norway, Finland, Sweden, Estonia, Australia, Mexico and Brazil, are considered above global average in all dimensions. Many of these are traditional destinations for international students. Nordic and Scandinavian countries, if not dominant in world terms, have a reputation for high quality education. Results for countries such as Iceland, Mexico and Brazil, are somewhat surprising since they are not known for being hubs of international student activity. It may be that they are highly satisfactory largely for domestic students, which account for these ratings. Also surprising given the volume of international students, and its low or non -existent tuition fees is Germany which obtained below average results. A key reason includes the absence of strong teacher-student interface (Studyportals 2019). In the Asian domain, a number are above global average on all or a number of metrics suggesting the rise of Asian institutional strength.

The data on the drivers of international higher education mobility and associated “push” and “pull” factors highlights the importance of employment goals in student intentions, including post study work rights, but also from a host country perspective, the balance between education and migration. A number of countries now have significant programs in place to promote post study work rights of various length, and different periods depending on level of study (Berquist et al **2**019). In the US optional practical training is included in the student statistics as it requires the approval of the host institution, and thus become part of the student journey. The importance of employment post study is seen by the sharp decline of UK enrolment following the abolition of post study work rights in 2012.

Australia is also a good case in point of the interface between study and work. The explosion of vocational education and training (VET) in the latter part of last decade was fueled in large measure by the desire and intention to obtain permanent residency (Hall 2019). Accordingly, the policy was tightened to break the nexus between education and migration, and enrollments declined dramatically. Following further policy re-alignment including new visa arrangements, enrolment again picked up. The new policy arrangements allowed for two streams of temporary work visa after graduation (and more flexibility of work while studying), centred around addressing occupations in demand with a visa for 18 months after study completion, and a longer term working visa for 2-4 years with even longer periods for higher levels of qualification, and willingness to re-locate to regional areas (Berquist et al 2019). In Australia, five countries have accounted for 70% of such temporary visas: India, China, Nepal, Pakistan and Vietnam. Not coincidentally, India and China have dominated enrolment growth (Hall 2019). Surveys conducted in Australia reveal that temporary work visa following graduation does not confer a competitive advantage in the labour market in

Australia, in terms of employability as such (but does act as a pathway to permanent residency), but its benefits lie more in networking, english language skill development, building professional contacts and gaining some work experience, which can assist eventually with employment outcomes (Tran, Rahim, Tan 2019).

Section Four: Indian Student Mobility

What then of Indian student mobility? Indian outward student mobility is driving significant growth in international student mobility. According to UNESCO statistics, Indian outward mobility has grown from 190,636 students in 2013 to 332,033 by 2017, a growth of 74% in just four short years and a rise in its share of outbound global mobility from 4.5% to 6.3% (UNESCO Institute of Statistics 2019).

In 2017, just three markets, US, UK and Australia, accounted for close to three quarters of India's international student outflow. However, there has been some re-alignment in the share of Indian students abroad going to Australia and Canada, at the expense of the UK and US (although US is still the dominant host for Indian students by a considerable margin). Thus, although the overall US market for all nationalities has not shifted much in share terms (in fact has marginally increased as we saw), *it has declined markedly for Indian students.*

What is apparent from table 9 is that in the eyes of Indian students, a number of countries are becoming increasingly attractive (for more than 1000 Indian students in any one year). Despite being relatively small when compared to the traditional destinations of UK, US, Australia and Canada, the share of Indian students going to these other countries e.g NZ has increased, and even where the share might have declined the raw numbers have grown, with the one exception of the UAE which has declined in share terms and raw numbers. Some other insights can be noted. Indian students do not have a significant presence in Asia, except in Malaysia, suggesting that intra-Asian mobility is not a significant factor in Indian outward mobility. Second, Eastern Europe has loomed as an important destination for Indian students, arguably reflecting these countries commitment to high quality education and the strength of India's general political and other ties with these nations. Also what is apparent is the importance of certain Middle Eastern nations as destinations. Favourable work arrangements could be one element of this.

Table 9: Indian student mobility and destination

	2013 outward	**2017 outward**	**2013 share of outward Indian mobility**	**2017 share of outward Indian mobility**
Italy	999	2,887	0.5%	0.9%
Kyrgyzstan	1,137	4,745	0.6%	1.4%
Malaysia	1,765 (2014)	2,263	0.9%	0.7%
Netherlands	873	1,933	0.5%	0.6%
New Zealand	6,844	12,552.4	3.6%	3.8%
Poland	223	2,084	0.1%	0.6%
Russia	2630 (approx. share as data is 2014)	6544	1.4%	1.97%
Sweden	1,069	1,840	0.6%	0.6%
Ukraine	2,627	5,885	1.4%	1.8%

	2013 outward	**2017 outward**	**2013 share of outward Indian mobility**	**2017 share of outward Indian mobility**
UAE	8,247	7,395	4.3%	2.2%
Kazakhstan	205	2,425	0.1%	0.7%
Ireland	536	1,621	0.3%	0.5%
Georgia	911	2,433	0.5%	0.7%
France	1,828	2,823	0.95%	0.9%
Saudi Arabia	1,573	2,020	0.8%	0.6%
Australia	16,150	51,976	8.5%	15.7%
Canada	13,626	32,616	7.1%	9.8%
France	1,828	2,823	0.95%	0.9%
Germany	5,645	13,387	2.96%	4.0%
Italy	999	2,887	0.5%	0.9%
UK	22,155	16,421	11.6%	4.9%
US	92,596.8	142,618.2	48.6%	42.95%

Criteria more than 1000 students in any of the one years.

Source: UNESCO Institute for Statistics 2019, Author Calculations

Determinants of Indian choice

What determines choice of location and institution abroad for study by Indians? Quantitatively this is as follows:

Table 10: Determinants of Indian students' choice

Tuition Fees	47%
Career Support at University	41%
Teaching Quality	41%
University reputation amongst academics	37%
Student experience	23%
University research quality	23%
University reputation amongst employers	23%
Location of University	18%
Social life	10%
Diversity of students and staff	6%
Cost of living	30%
Post study work rights	23%
Ease of getting a visa to study	11%
Safety	9%
Ease of getting a visa to work	5%

Source: QS Intelligence Unit 2019 (a), adapted by author

In qualitative terms, the following are the key "push" and "pull" factors that drive Indian students to study offshore and in particular institutions and locations (QS Intelligence Unit Reports). These are summarized as below

Table 11: Push and pull motivations for Indian students

Employability, particularly STEM
High competition for places for post graduate in STEM in India, and for jobs
Lack of industry and practical orientation to programs in India
Cutting edge research and facilities abroad
Availability of professors and their reputation offshore
Greater academic freedom abroad in choice of research
Personalised learning
Flexibility of study in overseas countries, including ability to switch subjects, undertake multi-disciplinary studies and to study courses not available in India
Cross disciplinary collaboration in research
Glass ceilings on careers in India for females and increasing ageism
Broader orientation in overseas universities, including mentoring, career guidance, internships, work experience options
Post study work rights in countries abroad and part time work options while studying
Prominent alumni of overseas institutions
Importance of new perspectives, overseas networks, cultural experiences, meeting new people from different backgrounds
Importance of family ties in a foreign location to minimize cost
Importance of subject as opposed to overall rankings

Source: QS Intelligence Unit 2016, QS Intelligence Uniy 2018 (a, b), QS Intelligence Unit 2019 (a,b,c,d) author modifications

Tables 10 and 11 indicate that Indian students take a wider, strategic and multifaceted approach when deciding when and where to study, in institutions and locations. While cost is clearly important, there are broader issues including academic quality, career prospects and seeking the best that overseas research and scholarship offers. In addition, most students prioritise the reputation of the study market over the location per se. Access to leading edge academics, facilities, and the reputation of the institution is pivotal, although broader locational attributes cannot be discounted. Further, students make calculations on overall return from educational investment rather than just purely narrower cost considerations alone, where the return on investment encompasses job prospects and post study work rights, value for money, salary, reputation and quality of institutions and visa rules (QS Intelligence Unit 2019 (a)).

The importance of high quality education for India students is underscored by examining and comparing data for Indian students in the UK and the prevalence of ranked institutions. Table 12, based on author calculation drawn from Times Higher Education data, shows that more than 50% of Indian students in the UK studied in UK institutions ranked in the top 1000 approximately in the world, with the greater proportion studying in the top 200 Institutions.

Table 12 Indian students and University Rankings

Rank of Institutions (Times Higher Education 2018)	**% Indian Students in the UK 2017 by ranked institution**
1-100	12.9%
101-200	11.2%
201-300	1%
301-400	3.4%
401-500	4.4%

Rank of Institutions (Times Higher Education 2018)	% Indian Students in the UK 2017 by ranked institution
501-600	4.5%
601-800	15.3%
800+	1.1%

Source : Times Higher Education 2018, Higher Education Statistics Agency 2019, Author Calculations

A recent study (Cturtle 2019) of completed student experiences of Asians from India, China and other Asian countries, who studied in Australia, Canada, NZ, UK, US and Europe revealed important insights: the importance of alumni in providing the most reliable sources of pre-departure information; that career is the dominant motivation for studying abroad; and that almost three quarters of these graduates obtained a job within 3 months of graduation, longer for post-graduation; and most international students of Canada return back to Canada. Interestingly, the study finds that Indian students are least happy with their return on investment from international investment and are more likely to take up internships (alongside Vietnamese and Singaporeans) than other country students. This once again demonstrates the highly demanding nature of Indian students when undertaking international education, and their strong career orientation.

Indian and Chinese students in the U.S

Tables 13, 14 and 15, drawing on Open Doors data (USA Institute of International Education 2019) demonstrate the importance and impact of Indian and Chinese students in the US. As can be seen, both Indian and Chinese students account for significant proportions of international students in the US, in the case of China, almost one-third, and India, almost one-fifth. India's share has improved significantly over the five year period. Correspondingly, India and China's share of total enrolment in the U.S education system has increased over the five year period. The sharp divide between the profile of Indian students in the US compared to China can be seen in the much higher share of post-graduate and Online Practical Training (OPT) in India's international student mix compared to China (although volumes are higher from China) . By contrast, China has a much higher share of undergraduate in its study mix. It should be noted that India's post graduate share most recently has declined (although OPT has increased). Overall, the Indian experience demonstrates the importance of seeking out of higher value, specialist training which could lead to a labour market "edge" as exemplified by post graduate and OPT data. Also, and arguably, OPT is a pathway to potential migration. The preference for post graduate over undergraduate could also be associated with affordability issues in the sense that Indian students may be saving up through some work at home, before venturing overseas to undertake further studies.

Table 13: Indian and Chinese share of total international students in US

	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
India share of international students	11.8%	11.6%	13.6%	15.9%	17.3%	17.9%
China share of international students	28.7%	30.97%	31.2%	31.5%	32.5%	33.2%
India	96,754	102,673	132,888	165,918	186,267	196,271

	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
numbers						
China numbers	235,597	274,439	304,040	328,547	350,755	363341
Total International student numbers	819,644	886,052	974,926	1,043,839	1,078,822	1,094,792
Total student enrollment	21,253,000	21,216,000	20,300,000	20,264,000	20,185,000	19,831,000
India share of overall enrollment in US	0.5%	0.5%	0.7%	0.8%	0.9%	1.0%
China share of overall enrollment in US	1.1%	1.3%	1.5%	1.6%	1.7%	1.8%
International share of total enrollment	3.9%	4.2%	4.8%	5.2%	5.3%	5.5%

Source: Institute of International Education 2019 and Author calculations

Table 14: Indian share of international enrollments in US by level of study (raw numbers in brackets)

	Undergraduate	Graduate	Non-degree	OPT
2012/2013	13.2% (12,740)	56.4% (54,607)	1.6% (1,576)	28.85 (27,831)
2013/2014	12.3% (12,677)	59.5% (61,058)	1.2% (1,242)	27.0% (27,696)
2014/2015	12.4% (16521)	64% (85,055)	1.4% (1,924)	22.1% (29,388)
2015/2016	11.6% (19,302)	61.4% (101,850)	1.5% (2,438)	25.5% (42,328)
2016/2017	11.8% (21,977)	56.3% (104,899)	1.2% (2,259)	30.7% (57,132)
2017/2018	11.9% (23,346)	48.7% (95,651)	0.95% (1,884)	38.4% (75,390)

Source: Institute of International Education 2019 and Author calculations

Table 15: Chinese share of international enrollments in the US by level of study (raw numbers in brackets)

	Undergraduate	Graduate	Non-degree	OPT
2012/2013	39.8% (93,789)	43.9% (103,505)	6.1% (14,335)	10.2%(23,968)
2013/2014	40.3% (110,550)	42.2% (115,727)	5.4% (14,761)	12.2% (33,401)
2014/2015	40.96% (124,552	39.6% (120,331)	5.3% (16,043)	14.2% (43,114)
2015/2016	41.3% (135,629)	37.5% (123,250)	5.3% (17,475)	15.9% (52,193)
2016/2017	40.7% (142,851)	36.6% (128,320)	5.6% (19,749)	17.1% (59,835)
2017/2018	40.9% (148,593)	36% (130,843)	5.0% (18,225)	18.1% (65,680)

Source: Institute of International Education 2019 and Author calculations

Indian Students in Australia

The comparison of Indian and Chinese students in Australia over the last few years is shown in the tables below based on Department of Education data (Australian Government 2019). Tables 16 and 17[6] compare Indian and Chinese students by type of course, rather than level or field of study. It shows higher growth in higher education for Indian students compared to China, but Chinese growth has been stronger in all other categories. In raw numbers, Indian students are far less than in China, except in the vocational sector. There was an "explosion" of enrolment from India in vocational education in the latter part of the last decade, as a pathway to permanent residency, and also to address key skills shortages. It may also reflect the possibility that Australia does not attract the most academically orientated students from India. It should be noted that things are changing with India's share of international higher enrolments rising from 12.9% to 18% in just three years, at the expense of vocational enrolment. Both China and India's share of the total international market in Australia has grown in recent years. By comparison with China the school market is under-developed for India.

Table 16: Indian students in Australia: numbers and share of international students in Australia (in brackets)[7]

	2015	**2016**	**2017**	**2018**	**% change**
Higher Education	35,137 (12.9%)	44,324 (14.5%)	54,040 (15.5%)	72,050 (18.0%)	105.1
Vocational Education and Training	28,629 (17.0%)	27,298 (14.97%)	27,258 (12.6%)	29,784 (12.2%)	4.0
Schools	224 (1.1%)	218 (0.9%)	230 (0.9%)	269 (1.0%)	20.1
Elicos	7,593 (5.3%)	5,616 (3.7%)	5,062 (3.3%)	5,687 (3.6%)	-25.1
Non Award	398 (1.1%)	335 (0.8%)	376 (0.8%)	502 (1.0%)	26.1
Total India	71,981 (11.2%)	77,791 (11.0%)	86,966 (10.9%)	108,292 (12.4%)	24.5
Total all nations	642,231	709,330	796,130	876,399	

Source: Australian Government 2019

Table 17 Chinese students in Australia: numbers and share of international students in Australia (in brackets)[8]

	2015	**2016**	**2017**	**2018**	
HE	96,766 (35.6%)	112,511 (36.8%)	133,548 (38.2%)	152,712 (38.3%)	57.8

[6] This data is onshore international students. Note that students engaged in two different courses, for example, will have enrolments counted twice.

[7] Elicos is English Language Intensive Courses for Overseas Students

[8] Elicos is English Language Intensive Courses for Overseas Students

VET	13,291 (7.9%)	13,776 (7.4%)	18,475 (8.5%)	22,341 (9.1%)	68.1
Schools	10,265 (50%)	12,044 (51.8%)	13,494 (52.6%)	13,662 (50.97%)	33.1
Elicos	38,498 (26.7%)	41,894 (27.9%)	45,589 (29.4%)	47,762 (30.5%)	24.1
Non Award	10,858 (28.9%)	15,478 (35.1%)	19,575 (39.2%)	19,419 (38.9%)	78.8
Total China	169,678 (26.4%)	195,703 (27.6%)	230,681 (28.97%)	255,896 (29.2%)	50.8
Total all nations	642,231	709,330	796,130	876,399	

Source: Australian Government 2019

It should also be noted that these developments need to be seen in the context of growing enrolments in Australia generally, including especially from Asia (Australian Government 2019). For example, overall student growth in HE has been very significant, albeit from a low base in many cases, between 2015 and 2018, from Bangladesh (32.6%), Bhutan (150.8%), Cambodia (89.2%), Indonesia (16.7%), Nepal (135.9%), Pakistan (26.6%), Philippines (8.3%), Singapore (57.3%), Sri Lanka (88.1%) and Vietnam (24.1%). All nationalities have grown in Higher Education by 46.9% for Australia. Similarly large growth has been observed from these locations in vocational education.

Transnational Education

Beyond international movement of students is the growing provision of offshore education, or trans national education, through establishment of campuses abroad, partnerships, and other agreements. The growing importance of offshore education is due to prospects of servicing wider markets, having access to industrial and research hubs abroad, the welcoming attitude of governments abroad, cost factors for students, and as a means of obviating constraining immigration policies and rules in the country that supplies the education. While data is limited, some evidence is instructive. Data for Australia offshore provision (Australian Government 2017 (a)) indicates that there has been growth (with some perturbations along the way), with the share of the total international provision of education accounted for by offshore rising from 24.2% in 2011 to 27.2% in 2017. Thus, offshore provision now accounts for more than a quarter of international education provision. In 2017, there were 6,735 Indian enrollments in offshore education provided by Australian Institutions, making India the fifth largest offshore enrolment behind Singapore (26,965), China (22,834), Malaysia (19,916) and Vietnam (6,816) (Australian Government 2017 (b)).

A variation on this is the growth in international study experiences abroad, which comprise faculty led and other study tours, internships, classes at a host university, exchange programs, summer programs and research related experiences. For Australian students, Europe dominated these study experiences comprising around 30% of such experiences, followed by North East Asia (19.9%), South East Asia (16.8%) and Northern America (14.7%). South Asia does not as yet loom large in this provision and uptake of such experiences, accounting for only 6% of international study experiences, of which India dominates, accounting for 3.6%. In North East Asia China predominates accounting for 11.2% (Australian Government 2017 (c). One would expect that India as a destination for study experiences would increase over time, as India becomes more of a destination for study more generally, and as it partners with overseas countries in their provision of offshore education, as well as the more liberalized approach to international education by the Indian Government.

India as a host

Table 18 shows growth in students in India drawn from UNESCO data (UNESCO Institute for Statistics 2019) It should be noted that the main sources and most growth have come from neighbours in South Asia (dominated by Nepal), Africa and the Middle East. Most of the students in India are therefore from less developed and nearby countries, reflecting affordability factors in large measure. It should also be noted that most of the students tend to be male, in undergraduate rather than post graduate courses, and concentrated in one State, Karnataka (Government of India 2018). Thus, to be a powerhouse, India needs to be able to attract students from a wider source, including from prominent global knowledge hubs, and be able to offer more variety in programs and courses and have a broader spatial distribution of international students within India. In the 2017 Project Atlas report, India was considered an emerging destination for students (Institute of International Education 2017). To be fair the recent Indian Draft Education Policy has made inward student mobility in India a priority (Government of India 2019).

Table 18 International Students in India (main sources)

	2013	**2017**
Congo	588	511
Ethiopia	274	723
Kenya	435	530
Nigeria	661	2086
Somalia	96	492
Sudan	1,649	2,073
Canada	325	836
US	849	1,118
Afghanistan	2,330	4,378
Bahrain	155	435
Bangladesh	774	1,526
Bhutan	2,362	2,253
Iran	2,109	1,459
Iraq	1747	813
Malaysia	1,874	1,638
Nepal	6,983	10,494
Sri Lanka	991	1,269
UAE	805	1,217
Yemen	529	1,341
Australia	75	359

Source UNESCO Institute for Statistics 2019

Section Five Strategic Implications

Overall, subject to the vagaries of international policy stances, including possible further shifts to an inward, protectionist mindset, the outlook for growing outbound mobility of India students is likely to continue. This is enhanced by India's growing economy, rise of its aspirational middle class, the growing reach of English speaking programs around the world, and favorable demographics, as

indicated previously. It will be essential for India to retain and enlarge its connection to its influential diaspora as a source of new ideas, remittances, commercial, trade and other cultural links, which in turn could further stimulate inward and student mobility, in a positively reinforcing cycle.

It is also likely that India will itself become a destination for students, although noting the severe imbalance between incoming and outgoing students (Wadhwa 2018). However, a number of points need to be made. Firstly, in our view, India will need to be attractive to other sources of students from more developed nations to capitalize on leading edge research, and promote access to global research and knowledge hubs. At present India is seen as a lower cost option for the developing world. Second, India will need to improve its competitive environment as a destination. Although improving, India only has 4 cities out of 120 (and ranked in the lower reaches) in QS Best student cities (QS Best Cities 2019).Third, India should continue to improve its overall quality, transparency, reputation and governance of its education system. Of promise is the recent Draft Education Policy in India. The policy call for, among other things: two way international staff and student mobility; collaborative research; process improvements to ease student access to study in India and to work; and offering unique Indian courses. The policy builds on previous efforts to increase inward student mobility. This is on top of proposed reforms to improve accountability, transparency and governance in the sector (Government of India 2019, Kulkarni 2019). India's rise in the global university rankings is also a positive sign.

In terms of a more detailed strategic response we argue that India could utilize short term study experiences in the country as a "taster" for longer term study options, and also to canvass more job oriented, internship programs, which in turn will require significant investment in career guidance, mentorship and labour market access arrangements. Further, innovative program offerings (and modes of delivery) which identify, showcase and offer programs based on India's traditional and emerging strength areas (e.g grass roots innovation, traditional medicine) and their nexus could be further deployed. India could also continue to liberalise and free up the sector to expose it to more international competition, including through autonomous branch campus activity, noting the need for safeguards around quality and probity. Importantly also will be flexibility in study options including the growth of dual degrees, collaborative education arrangements, flexible "fly in fly out" study options, and capitalizing on the expansion of Indian institutions outward to bring further alignment with global student expectations.

Globally, it will be important for countries to resist the inward looking sentiment that appears to be on the rise, in order to reap the benefits of student mobility to address skills needs, bring personal connections and potential to bear, enrich diversity, become influential diaspora and facilitate the multi-country flow of ideas, knowhow, technology, expertise, and collaboration, central to knowledge economies. Ensuring also that females can participate in and benefit from global mobility will also be important, as student mobility for the most part is male dominated.

Section Six: Concluding Remarks

Students are on the move, more globally than intra- regionally, as our observations find. Asia is becoming a hub for higher education mobility. Students are motivated by a variety of things, with career and career support looming large, and the desire to obtain an edge in the labour market, through post-graduate studies, especially for Indian students. There are different segments of students for universities to cater to and to derive a competitive advantage.

The U.S is still the number one destination for Chinese and Indian students, although there is some evidence that an inward looking sentiment is affecting the willingness of students to move there. The UK lost market share, through its closing off post study work rights some years ago. This is now being revised. Australia, Canada and other nations have been beneficiaries of this "student diversion".

Growth in student mobility globally, but to Australia especially, has been pronounced. Australia has one of the highest rates of internationalization of the higher education system in the world, open to all from all parts of the world, including especially Asia.

India has been sending students in large numbers although as a share of total enrollment it is not especially high. To fully capitalize on the global flow of ideas, research, collaborations and knowhow, India will need to further open up its education and training system to students especially those from advanced research hubs. To be sure and fair, the latest draft education policy in India, is flagging such a more significant role for India in inward student mobility. Further reform though is needed.

APPENDIX ONE: Description of Regions

Arab States	Central and Eastern Europe	Central Asia	East Asia and the Pacific	Latin America and the Caribbean	North America and Western Europe	South and West Asia	Sub-Saharan Africa
Algeria	Albania	Armenia	Australia	Anguilla	Andorra	Afghanistan	Angola
Bahrain	Belarus	Azerbaijan	Brunei Darussalam	Antigua and Barbuda	Austria	Bangladesh	Benin
Djibouti	Bosnia and Herzegovina	Georgia	Cambodia	Argentina	Belgium	Bhutan	Botswana
Egypt	Bulgaria	Kazakhstan	China	Aruba	Canada	India	Burkina Faso
Iraq	Croatia	Kyrgyzstan	China, Hong Kong Special Administrative Region	Bahamas	Cyprus	Iran (Islamic Republic of)	Burundi
Jordan	Czechia	Mongolia	China, Macao Special Administrative Region	Barbados	Denmark	Maldives	Cabo Verde
Kuwait	Estonia	Tajikistan	Cook Islands	Belize	Faeroe Islands	Nepal	Cameroon
Lebanon	Hungary	Turkmenistan	Democratic People's Republic of Korea	Bermuda	Finland	Pakistan	Central African Republic
Libya	Latvia	Uzbekistan	Fiji	Bolivia (Plurinational State of)	France	Sri Lanka	Chad
Mauritania	Lithuania		Indonesia	Brazil	Germany		Comoros
Morocco	Montenegro		Japan	British Virgin Islands	Gibraltar		Congo
Oman	North Macedonia		Kiribati	Cayman Islands	Greece		Côte d'Ivoire
Palestine	Poland		Lao People's Democratic Republic	Chile	Greenland		Democratic Republic of the Congo
Qatar	Republic of Moldova		Malaysia	Colombia	Holy See		Equatorial Guinea
Saudi Arabia	Romania		Marshall Islands	Costa Rica	Iceland		Eritrea

Arab States	Central and Eastern Europe	Central Asia	East Asia and the Pacific	Latin America and the Caribbean	North America and Western Europe	South and West Asia	Sub-Saharan Africa
Sudan	Russian Federation		Micronesia (Federated States of)	Cuba	Ireland		Eswatini
Sudan (pre-secession)	Serbia		Myanmar	Curaçao	Israel		Ethiopia
Syrian Arab Republic	Slovakia		Nauru	Dominica	Italy		Gabon
Tunisia	Slovenia		New Zealand	Dominican Republic	Liechtenstein		Gambia
United Arab Emirates	Turkey		Niue	Ecuador	Luxembourg		Ghana
Yemen	Ukraine		Palau	El Salvador	Malta		Guinea
			Papua New Guinea	Grenada	Monaco		Guinea-Bissau
			Philippines	Guatemala	Netherlands		Kenya
			Republic of Korea	Guyana	Norway		Lesotho
			Samoa	Haiti	Portugal		Liberia
			Singapore	Honduras	San Marino		Madagascar
			Solomon Islands	Jamaica	Spain		Malawi
			Thailand	Mexico	Sweden		Mali
			Timor-Leste	Montserrat	Switzerland		Mauritius
			Tokelau	Nicaragua	United Kingdom of Great Britain and Northern Ireland		Mozambique
			Tonga	Panama	United States of America		Namibia
			Tuvalu	Paraguay			Niger
			Vanuatu	Peru			Nigeria
			Viet Nam	Puerto Rico			Rwanda
				Saint Kitts and Nevis			Sao Tome and Principe
				Saint Lucia			Senegal

Arab States	Central and Eastern Europe	Central Asia	East Asia and the Pacific	Latin America and the Caribbean	North America and Western Europe	South and West Asia	Sub-Saharan Africa
				Saint Vincent and the Grenadines			Seychelles
				Sint Maarten (Dutch part)			Sierra Leone
				Suriname			Somalia
				Trinidad and Tobago			South Africa
				Turks and Caicos Islands			South Sudan
				Uruguay			Togo
				Venezuela (Bolivarian Republic of)			Uganda
							United Republic of Tanzania
							Zambia
							Zimbabwe

Source: UNESCO Institute for Statistics 2019

BIBLIOGRAPHY

Australian Government Department of Education 2017 (a) Commencing and All Overseas Students by State, Higher Education Institution and Onshore/Offshore Status[(a)], Full Year 2017 https://docs.education.gov.au/node/51346 accessed 15/10/2019.

Australian Government 2017 (b) Department of Education Delivery of Australian higher education courses offshore 2017 Excel File Accessed 22/9/2019.

Australian Government Department of Education 2017 (c) Australian students studying overseas https://internationaleducation.gov.au/research/australianstudentsoverseas/pages/australians-students-overseas.aspx accessed 20/9/2019.

Australian Government 2019 Department of Education International Student Enrolment Basic Pivot Table 2015-2018 https://internationaleducation.gov.au/research/International-Student-Data/Pages/InternationalStudentData2018.aspx accessed 31/10/2019.

Baer J 2018 Fall International Student Enrolment Hot Topics Survey, Institute of International Education Center for Academic Mobility Research and Impact.

Berquist B, Hall R, Morris-Lange S, Shields H, Stern V, Tran L 2019 "Introduction" in Global Perspectives On International Student Employability: International Education Association of Australia.

British Council Education 2018 International Student Mobility to 2027: Local Investment, Global Outcomes.

Choudaha R, Orosz, K, Chang L 2012 Not All International Students Are the Same WES Research

Choudaha R, Van Rest E 2018 Envisioning Pathways to 2030: Megatrends Shaping the Future of Global Higher Education and International Student Mobility: Studyportals

Choudaha R 2019 Beyond $300 Billion: The Global Impact of International Students: Studyportals.

Cornell University, INSEAD, and WIPO (2019); The Global Innovation Index 2019: Creating Healthy Lives—The Future of Medical Innovation, Ithaca, Fontainebleau, and Geneva.

Cturtle 2019 Exploring International Student Employment Outcomes and Satisfaction Global Comparison.

Government of India Ministry of Human Resource Development 2018 All India Survey of Higher Education (AISHE) 2017-2018.

Government of India Ministry of Human Resource Development 2019 Draft National Education Policy.

Hall R "Australia's Work Rights Policy Settings" 2019 in Berquist B, Hall R, Morris-Lange S, Shields H, Stern V, Tran L Global Perspectives On International Student Employability International Education Association of Australia

Helliwell, J., Layard, R., & Sachs, J. (2019). World Happiness Report 2019, New York: Sustainable Development Solutions Network.

Higher Education Statistics Agency (HESA) UK 2019 https://www.hesa.ac.uk/data-and-analysis/students/where-from accessed 25/9/2019

Institute of International Education The Power of International Education Project Atlas 2017 https://www.iie.org/en/Research-and-Insights/Project-Atlas/Explore-Data/Infographics/2017-Project-Atlas-Infographics Accessed 25/11/2019

Institute of International Education 2018 Center for Academic Mobility Research and Impact A World on the Move

Institute of International Education Open Doors 2019 https://www.iie.org/Research-and-Insights/Open-Doors/Data/International-Students/Places-of-Origin accessed 21/9/2019.

Kulkarni A 2019 India's draft national education policy 2019: what are the implications for international education?https://www.ieaa.org.au/blog/indias-draft-national-education-policy-2019.

M.M .Advisory 2018 Indian Students Mobility Report.

OECD 2019 share of international students enrolled by level of education and field https://stats.oecd.org/viewhtml.aspx?datasetcode=EAG_ENRL_MOBILES_FIELDS&lang=en accessed 26/9/2019

QS Intelligence Unit 2016 What Matters to International Students? Focus On India.

QS Intelligence Unit 2018 (a) Indian Applicants: Ambition, Competition and fight for Employment 2018.

QS Intelligence Unit 2018 (b) Indian Applicants: Focus on STEM Subjects and Academic Freedom 2018.

QS Intelligence Unit 2019 (a) Indian Applicants: How Does Cost Influence Destination Choices?

QS Intelligence Unit 2019 (b) Indian Applicants: How Does Reputation Influence Destination Choices?

QS Intelligence Unit 2019 (c) Indian Applicants: How Do Visas Influence Destination Choices?

QS Intelligence Unit 2019 (d) Indian Applicants: How Do Indian Students Use Rankings?

QS Best Student Cities 2019 https://www.topuniversities.com/city-rankings/2019 accessed 25/11/2019.

Roy A, Newman A, Ellenberger T and Pyman A 2019 Outcomes of international mobility programs: a systematic review and agenda for future research Studies in Higher Education 44:9, 163001640, DOI: 10.1080/03075079.2018.1458222.

Studyportals 2017 Asia Rising The State of International Education.

Studyportals 2019 Student Satisfaction A 2019 Global Overview.

Times Higher Education 2018 World University Rankings 2018 (for UK) https://www.timeshighereducation.com/world-university-rankings/2018/world-ranking#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/stats accessed 10/10 2019.

Times Higher Education 2020 https://www.timeshighereducation.com/world-university-rankings/2020/world-ranking#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/stats accessed 13/11/2019

Tran L, Rahimi M, Tan G 2019 Temporary Graduatification: Impacts of Post-Study Work Rights Policy in Australia Research for Educational Impact Deakin University.

UNESCO Institute for Statistics (UIS) 2019 International Student Mobility in Tertiary Education Statistics http://data.uis.unesco.org/ accessed 13/10/2019, 6/11/2019 and 8/11/2019

Wadhwa R 2018 Imbalanced Student Mobility in India: A Serious Concern, International Higher Education pages 19-20.

World Bank Indicators 2019 https://data.worldbank.org/indicator accessed 13/11/2019.

Group-affiliated Firms and audit fees: Evidence from India

Mohinder Parkash
Professor of Accounting
Department of Accounting & Finance
School of Business Administration
Oakland University
275 Varner Drive
Rochester, MI 48309, USA
Email: parkash@oakland.edu
Phone: (+1248) 370-4361

Rajeev Singhal*
Professor of Finance
Department of Accounting & Finance
School of Business Administration
Oakland University
275 Varner Drive
Rochester, MI 48309, USA
Email: Singhal@oakland.edu
Phone: (+1248) 370-3288

Yun (Ellen) Zhu
Associate Professor of Finance
Department of Accounting & Finance
School of Business Administration
Oakland University
275 Varner Drive
Rochester, MI 48309, USA
Email: zhu2@oakland.edu
Phone: (+1248) 370-328

JEL Code: M42
Keywords: Agency Conflicts, Audit Fees, Group-Affiliated firms

***Author for correspondence**

ABSTRACT

This study analyzes the role of auditors and affiliation to a business group in corporate governance of firms by examining the audit fees charged to group-affiliated and independent firms. Agency problems in firms may be mitigated by the monitoring provided by controlling investors of firms affiliated to business groups. On the other hand, concentrated ownership may also result in higher agency costs because of inefficient profit distributions, tunneling, and complicated ownership structures. Audit fees are determined by the effort expended and the risks faced by auditors. We examine the relationship between audit fees and Group-affiliation for Indian firms. We find that the audit fees paid to BigN auditors are lower for Group-affiliated firms than non-Group-affiliated firms, but audit fees paid to non-BigN auditors are significantly higher for Group-affiliated and non-Group-affiliated firms, consistent with the idea that BigN auditors recognize the role of Group-affiliation in mitigating the agency conflicts.

affiliated firms have incentive to use high quality auditors to mitigate conflicts with minority shareholders. We follow Fan and Wong [2004] who point out that "Big 5 firms have international reputations and are generally perceived to be more independent than local auditors" to define auditor quality.

To examine the role of auditors, we use a sample of exchange listed Indian firms between 2001 and 2018 to examine the fees paid to auditors for provision of audit services. Group-affiliation may affect the audit fees paid to BigN and non-BigN auditors. BigN auditors have their reputation to protect and are more likely to exert effort to minimize misstatements. Simultaneously, the effective monitoring by controlling stockholders of Group-affiliated firms can reduce the risk of misstatement of financial reporting. Khanna and Palepu [2000] report higher performance of Group-affiliated firms in India. Gopalan et al. [2007] report significantly lower probability of bankruptcy of Group-affiliated firms than stand-alone firms by the financial support extended within group-affiliated firms. Prior research has also uncovered a risk-sharing phenomenon among group firms (Khanna and Yafeh [2005]). These characteristics of Group-affiliated firms should imply lower effort and audit risk for auditors. On the other hand, Johl et al. [2016] appeal to the extant literature and argue that group affiliation may have negative consequences for the members. For example, George and Kabir [2008] find inefficient profit redistribution as an explanation of underperformance of Group-affiliated and group discount relative to firms not affiliated to any group in India. Bertrand et al. [2002] show that controlling shareholders tunnel resources away from minority investors in business groups in India. Claessens et al. [2006] argue that in general, the complicated ownership structures and linkages between group members may lead to greater agency costs. As a

result of the negative effects of Group-affiliation, audit effort and risk may be higher for auditors leading to higher audit fees.

Whether BigN and non-BigN auditors recognize the contrasting features of Group-affiliation and weigh them appropriately to charge audit fees remains an empirical question. Our results indicate that BigN firms' audit fees for Group-affiliated firms are lower than those for non-Group-affiliated firms but audit fees charged by non-BigN firms are significantly higher for Group-affiliated firms. This evidence is consistent with Khan et al. [2015] for Bangladesh family firms, and Ho and Kang [2013] for US family firms but opposite to the results reported by Fan and Wong [2005] for eight emerging economies and Fang et al. [2017] for China. Our results imply that contrary to BigN auditors, the non-BigN firms do not perceive the advantages of Group-affiliation in reducing the audit effort and risk.

India provides an appropriate context to undertake the study of business groups because although the Indian business groups have been compared to Japanese Keiretsus and Korea Chaebols, there are important differences. Khanna and Palepu [2000] argue that unlike in Japan, there is no group-specific bank to coordinate group activities in India. It is the common board members and family members who perform the coordination role among group members. Bae et al. [2002] state that while the Indian business groups form pyramidal ownership structures, the Korean business groups are defined more accurately by cross-holdings of shares. Therefore, given these differences and the sparse research on issues related to business groups in India when compared with much larger body of research for other major Asian economies, the examination is warranted. Khanna and Palepu [2000] also lists advantages of India as an experimental

setting by referring to the presence of large number of business groups, the availability of quality data for individual members of a group, the restriction of membership of a firm to only one group, and the use of well-established accounting standards similar to those followed in advanced economies for preparation of accounts.

Besides examining a different experimental setting, the current study contributes to the extant literature on Group-affiliation firms in a large emerging market in several other ways. Further, this study also adds to the empirical evidence in auditing literature that Group-affiliated Indian firms have lower audit fees when they select BigN audit firms than non-Group-affiliated firms indicating lower audit effort and risk of Group-affiliated firms assessed by quality BigN auditors. Therefore, the current study extends the results presented Ho and Kang [2013], Fan and Wong [2005], Johl et al. [2016], and Fang et al. [2016] related to audit fees for business groups. The study also helps provide answer to the empirical research issue that while smaller investors are vulnerable to expropriation, they still invest in firms controlled by an entity. The current study contributes to this line of research by reporting that lower audit fees is an indication of a non-controlling investor's faith in transparency of financial reporting and in expecting decisions fair for them.

The remainder of the paper presents the literature review and hypotheses in Section 2, Section 3 presents the Data and Methodology used to test the stated hypotheses, and the empirical results are presented and discussed in Section 4. Section 5 concludes.

2. LITERATURE REVIEW AND HYPOTHESES

An effective corporate governance structure protects investors by reducing the agency problem associated with the separation of management and control. There are several

components which form the corporate governance structure in an economy. The board of directors, an active takeover market, judicial systems, and institutional investors are the traditional ways by which the agency problems can be alleviated. Auditors also play an important role in the corporate governance structure of an economy since reputed auditors are likely to conduct an effective audit to safeguard their image.

Jensen and Meckling [1976] argue that the relationship between shareholders and managers of a firm fits the definition of a pure agency relationship. Therefore, the problems that occur because of the separation of ownership and management are also agency problems (Type I). It is reasonable to expect that the distance between the interests of the manager and outside stockholders determines the magnitude of Type I agency problems. Therefore, increased managerial ownership should be inversely related to the Type I agency problem.

Anderson and Reeb [2003] argue that family ownership can reduce Type I agency problem. They state that, founding families hold equity ownership and board seats in nearly one-third of the Fortune 500 firms in the US. These families hold poorly diversified portfolios and often control the corporations. Consequently, to protect the value of their shareholdings, a family has a strong incentive to monitor the performance of the company it controls. In addition, Chen et al. [2010] report that in the US family owners impose stricter discipline on managers. Consistent with the idea that self-interested large stockholders monitor their companies' management, Villalonga and Amit [2006] provide evidence that family management reduces and can even eliminate the agency conflict with managers.

Simunic [1980] posits that audit fees are an increasing function of the level of audit effort and audit risk faced by an auditor. Bell et al. [2001] document that audit fees are higher when business risk is increased because of higher number of audit hours for risky audits. Bedard and Johnstone [2004] document that auditors plan increased effort and billing rates for clients with earnings manipulation risk and that the positive relationships between earnings manipulation risk and both effort and billing rates are greater for clients that also have heightened corporate governance risk.

Increased ownership concentration reduces the Type I agency problem but exacerbates the Type II agency problem. Therefore, depending on whether the Type I or the Type II agency conflict dominates, the auditors may evaluate the level of effort required for the audit and assess the associated risk in determining the fees charged for audit services. Therefore, the pricing of higher quality audit services should depend on the magnitude of real and perceived agency problems.

Empirically, Ho and Kang [2013] report that US family firms among S&P 1500 pay lower audit fees and the difference is even more significant for firms in which the family owner is the largest stockholder. Fan and Wong [2005] find that for their sample of eight East Asian economies those firms likely to experience the conflict of interest due to their concentrated ownership structures are more likely to use the services of Big-5 auditors and that the Big-5 auditors taken into account the potential agency conflicts in making their audit fee decisions.

Group-affiliation may affect the audit fees paid to BigN and non-BigN auditors. Simultaneously, the effective monitoring by controlling stockholders of Group-affiliated firms can reduce the risk of misstatement of financial reporting. Further, if Group-

affiliated firms have elevated performance there is lower probability of manipulating earnings and financial statements. In addition, if Group-affiliated firms are provided financial support by other firms in the group, there would be lower chances of bankruptcy and liquidation, and smaller audit risk. Several papers provide support for this assertion. For examples, Khanna and Palepu [2000] report higher performance of Group-affiliated firms in India. Gopalan et al. [2007] find significantly lower probability of bankruptcy of Group-affiliated firms when compared with stand-alone firms because of the financial support extended by other Group-affiliated firms. Khanna and Yafeh [2005] provide evidence for risk-sharing phenomenon among group firms. These characteristics of Group-affiliated firms should imply lower effort and audit risk for auditors. However, Johl et al. [2016] argue that group affiliation may have negative consequences for the members. For example, George and Kabir [2008] find inefficient profit redistribution the explanation of underperformance of Group-affiliated and group discount relative to firms not affiliated to any groups in India. Bertrand et al. [2002] show that controlling shareholders tunnel resources away from minority investors in business groups in India. Claessens et al. [2006] argue that in general, the complicated ownership structures and linkages between group members may lead to greater agency costs. As a result of the negative effects of Group-affiliation, audit effort and risk may be higher for auditors and lead to higher audit fees.

Whether BigN and non-BigN auditors recognize these features equally and charge differential audit fees remains an empirical question. The above discussion leads to our third hypothesis:

Hypothesis: A Group-affiliated firm pays lower (higher) audit fees when a BigN auditor is selected.

3. DATA AND METHODOLOGY

Prowess, a database of Indian firms, maintained by the Center for Monitoring Indian Economy Pvt. Ltd. (CMIE) is our main source of the information required to conduct our analyses.[2] This database has been used in many recent papers examining issues relevant to India. Indian firms are required to disclose all fees paid to the auditors for providing an audit of the firm's accounts and for certain nonaudit services. These data are disclosed in financial statements prepared by firms. We also require financial data, information about whether a firm is affiliated to a business group, and the stock market data for our sample firms. These data items are extracted from the CMIE database. Our sample period extends from 2001 through 2018 and includes all firms for which the required auditor fee, financial, and market data are available. After the data restrictions, we have 35,347 firm-years.

Author
Comment: ?

Author
Comment: ?

We propose the following audit fees model to test our hypotheses:

Author
Comment: ?

$$LNAUDIT = \alpha_0 + \alpha_1 GROUP + \alpha_2 ATURN + \alpha_3 CURR + \alpha_4 QUICK + \alpha_5 IMR + \alpha_6 LNNAF + \alpha_7 LNTA + \alpha_8 ROA + \alpha_9 RET + \alpha_{10} VAR + \alpha_{11} LEV + \alpha_{12} MB + \alpha_{13} FOROPS + \alpha_{14} INITIAL + \alpha_{15} SPECIAL + \alpha_{16} LOSS + \alpha_{17} CEOCHR + \alpha_{18} NUMMEET + \alpha_{19} INSTIT + Industry\ Controls + Year\ Controls + \varepsilon$$

In the above equations, the control variables represent corporate governance (*INSTIT*, *NUMMEET*, *CEOCHR*), complexity of operations and audit effort (*ATURN*, *CURR*, *QUICK*, *SPECIAL*, *FOROPS*), size (*LNTA*), risk (*VAR*, *LEV*), performance (*ROA*, *RET*, *MB*, *LOSS*), and the characteristics of the auditor (*BIGN, INITIAL*). Extant literature has

identified these variables (Simunic [1984]; Parkash and Venable [1993]; Palmrose [1996]; Craswell and Francis [1999]; DeFond et al. [2002]; Whisenant et al. [2003]; Clatworthy et al. [2009]; Ho and Kang [2013]; Johl et al. [2016]). We define the variables we use in our analyses in the notes section.[3] We also include the predicted signs of our control variables based on prior research in the tables.

To address the problem of simultaneity in a firms' choice of auditor and audit fees and to address any potential bias in OLS estimates because of self-selection, we employ the Heckman two-stage method (Heckman [1979]; Ho and Kang [2013]). We follow Ho and Kang [2013] and model auditor choice in the first stage. Then we employ the Ordinary Least Square (OLS) regressions to estimate fee models for BigN and non-BigN separately in the second stage.[4] Since there may be several observations for a firm in our sample, it is possible that our results are affected by the correlations that exist across observations for each firm. In order to avoid the issue of independence, we cluster our standard errors by firms.[5]

4. RESULTS

Our sample period extends from 2001 through 2018 and the final sample contains 35,347 firm-years, of which about fifty-five percent are not affiliated to any business group. Table 1 contains the auditor choice and audit fees for our sample by group affiliation and industry. In Table 1, Panel A, the firm-years for BigN and non-BigN auditors are presented. Out of the 7,225 firm-years with BigN auditors, 4,277 (59%) are for the firms affiliated to business groups, greater than 2,948 (41%) non-Group-affiliated firm-years. Mean, and median audit fees (Table 1, Panel B) are significantly higher for Group-affiliated firms than for firms that are not affiliated to any business groups. In

Panel C of Table 1, we present the industry distribution of our sample firms. The audit fees vary substantially by industry for our sample firms and there is concentration of firms in the *CHEMICAL* industry, while firms in *MINING, ELECTRICAL,* and, *DIVERSIFIED* industries have relatively far fewer firms. The Electricity industry has the highest mean audit fees whereas the Textile industry has the lowest.

Table 1: Auditor and audit fees by auditor type and group-affiliation

Panel A: Auditor Type

	All Firms N	Group-affiliated Firms N	Non-Group-affiliated Firms N
BigN Auditor	7,225	4,277	2,948
Non-BigN Auditor	28,122	11,504	16,618
All Firms	35,347	15,781	19,566

Panel B: Group-affiliation (Actual fees in Indian Rupees)

		Audit Fees	
	N	**Mean**	**Median**
Group-affiliated Firms	15,781	48,384	15,900
Non-Group-affiliated Firms	19,566	21,166†	6,600†
All Firms	35,347	33,318	9,800

†**Denotes significant differences between Group-affiliated and Non-Group-affiliated firms at 1% level.**

Panel C: Audit fees by industry (Actual fees in Indian Rupees)

		Audit Fees	
Industry	**N**	**Mean**	**Median**
AGRICULTURE	3,685	30,305	9,800
TEXTILE	3,130	16,195	6,600
CHEMICAL	5,631	28,623	9,100
CONSUMER GOODS	1,203	39,270	12,300
CONSTRUCTION	3,386	44,614	15,900
METAL	2,550	35,002	9,100
MANUFACTURING	3,081	32,474	11,100
TRANSPORTATION	2,294	50,305	19,800
MINING	313	34,694	13,300
ELECTRICAL	268	93,625	33,700
TRADING	2,868	16,547	4,600
SERVICES	2,558	39,680	7,900

INFORMATION TECHNOLOGY	3,839	39,788	9,000
DIVERSIFIED	541	24,911	10,500
All Firms	35,347	33,318	9,800

Table 2 includes the summary statistics for our sample categorized on the basis of whether a firm is affiliated to a group. We also test for significant differences in our model variables between the Group-affiliated and non-Group-affiliated subgroups. The mean (median) audit fees (*LNAUDIT*) for Group-affiliated firms is statistically higher than the mean (median) audit fees for non-Group-affiliated firms. The mean (median) size (*LNTA*) of Group-affiliated firms is also statistically higher than the mean (median) size of non-Group-affiliated firms, which could be a reason for the audit fees differential. The mean (median) non-audit fee (*LNNAF*) for Group-affiliated firms is statistically higher than the mean (median) audit fees for non-Group-affiliated firms. Twenty seven percent of the Group-affiliated firms have hired BigN audit firms whereas only 15% of the non-Group-affiliated firms have hired BigN audit firms and the difference is significant. While the Group-affiliated firms have significantly higher median special items than non-Group-affiliated firms, the mean and median asset turnover, current and quick ratios, investment opportunities are significantly higher for non-Group-affiliated firms.

Table 2: Descriptive sample statistics

	Non-Group-affiliated Firms			**Group-affiliated Firms**		
Variable	**N**	**Mean**	**Median**	**N**	**Mean**	**Median**
LNAUDIT	19,566	8.99	8.79	15,781	9.74†	9.67†
LNNAF	19,566	4.45	7.24	15,781	6.71†	8.39†
ATURN	19,566	0.95	0.86	15,781	0.86†	0.77†
CURR	19,566	1.65	0.95	15,781	1.19†	0.21†
QUICK	19,566	1.25	0.49	15,781	0.91†	0.12†

LNTA	19,566	21.2	21.05	15,781	22.29†	22.16†
ROA	19,566	0.03	0.03	15,781	0.03	0.03
RET	19,566	0.3	0.05	15,781	0.34	0.07†
VAR*100	19,566	0.21	0.14	15,781	0.18	0.11†
SPECIAL*100	19,566	0.72	0.03	15,781	0.72	0.07†
LEV	19,566	0.16	0.01	15,781	0.15	0.00†
MB	19,566	1.05	0.68	15,781	0.98†	0.64†
NUMMEET	19,566	1.81	1.79	15,781	1.95†	2.08†
INSTIT	19,566	6.12	1.01	15,781	10.76†	6.23†
BIGN	19,566	0.15		15,781	0.27†	
INITIAL	19,566	0.27		15,781	0.19†	
FOROPS	19,566	0.6		15,781	0.66†	
LOSS	19,566	0.34		15,781	0.35†	
CEOCHR	19,566	0.34		15,781	0.26†	

†Denotes significant differences between Group-affiliated and Non-Group-affiliated firms at 1% level.

In Table 3, we examine sample correlations of audit fees with the exogenous variables in our models. The Group-affiliation variable (*GROUP*) has significant correlation with *LNAUDIT*. On the univariate basis most of our model variables, except special items are significantly correlated with audit fees.

Table 3: Correlations with audit fees

Variable	CORRELATION
LNNAF	0.63***
BIGN	0.54***
ATURN	-0.03***
CURR	-0.05***
QUICK	-0.04***
LNTA	0.80***
ROA	0.09***
RET	-0.02***
VAR	-0.05***
LEV	-0.03***
MB	0.15***

INITIAL	0.03***
FOROPS	0.20***
SPECIAL	-0.01
LOSS	-0.17***
CEOCHR	-0.03***
NUMMEET	0.50***
INSTIT	0.52***

***Denotes significant differences at 1% level.**

Table 4 presents the audit fees regression results using the Heckman 2-stage to test our hypothesis that Group-affiliated firms pay lower audit fees when BigN auditors are selected. The first two columns of the table include the regression results for firms employing BigN audit firms and the last two columns of the table contain the results with those sample firms using non-BigN audit firms. The *R*-squares of the regressions are high indicating that our models explain most of the variation in the audit fees. The coefficient of *GROUP* for BIGN firms is negative at the 1% significance level, indicating that Group-affiliated firms pay lower audit fees than non-Group affiliated firms when BigN auditors are selected. This suggests that BigN auditors recognize that group-affiliation provides a way to ameliorate the agency problems between dominant and minority shareholders. Larger firms and firms with larger turnover, size, number of board meetings and foreign operations, special items, and CEO being the chairperson of the board tend to pay higher audit fees. In the next two columns, we observe that the co-efficient of the variable of interest, *GROUP*, is positive at 5% significance level indicating that non-BigN auditors do not value the increased monitoring because of Group-affiliation. Higher turnover ratio, nonaudit fees, firm size, foreign operations, presence of special items, incurring negative net income in the previous two fiscal years, CEO being the chairperson of the board, number of board meetings, and institutional ownership are

associated with higher audit fees, but higher current ratios and returns, and new auditors lead to lower audit fees for firms which choose non-BigN auditors.

Author
Comment: ?

TABLE 4: Audit Fees Model

		BIGN=1		BIGN=0	
Variable	**Prediction**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
INTERCEPT	+/-	2.985	0.02**	2.519	0.00***
GROUP	?	-0.159	0.00***	0.065	0.02**
ATURN	+	0.145	0.00***	0.045	0.00***
CURR	-	-0.026	0.57	-0.001	0.06*
QUICK	-	0.023	0.61	0.001	0.22
IMR	+	-2.311	0.00***	-1.774	0.00***
LNNAF	+	0.014	0.00***	0.049	0.00***
LNTA	+	0.387	0.00***	0.325	0.00***
ROA	-	-0.158	0.02**	-0.038	0.02**
RET	-	-0.012	0.13	-0.001	0.76
VAR	+	-0.258	0.00***	0.206	0.13
LEV	+	0.173	0.14	-0.006	0.55
MB	+	-0.015	0.20	0.006	0.29
FOROPS	+	0.200	0.00***	0.152	0.00***
INITIAL	?	-0.043	0.09*	-0.052	0.00***
SPECIAL	+	0.446	0.01***	0.138	0.00***
LOSS	+	0.020	0.56	0.041	0.02**
CEOCHR	+	0.179	0.01***	0.063	0.01***
NUMMEET	+	0.111	0.01***	0.171	0.00***
INSTIT	+	-0.004	0.07*	0.005	0.00***
INDUSTRY		**CONTROLLED**		**CONTROLLED**	
YEAR		**CONTROLLED**		**CONTROLLED**	
NOBS		**7,225**		**28,122**	
R2		0.72		0.67	

***, **, * **Significant at the 1%, 5%, and 10% level respectively.**

In Table 2, we document differences between firms that are group-affiliated and not for several of our variables. It is possible that our results showing differences in audit fees for group-affiliated and independent firms are driven by these underlying differences. To mitigate the possibility, we use the propensity score matching (PSM) technique. To implement the PSM, we first run a logistic regression on firm characteristics to estimate

the probability of belonging to a business group. We then match a group-affiliated firm with an independent firm using the propensity scores. The results for the PSM samples are provided in Table 5. The results are qualitatively similar to those reported in Table 4 and support our assertion that BigN auditors take into account the ameliorating effect of group-affiliation with respect to the dominant and minority stockholders.

Table 5: Audit Fees Model using Propensity Score Matching

	BIGN=1		**BIGN=0**	
Variable	**Coefficient**	**p-value**	**Coefficient**	**p-value**
INTERCEPT	2.581	0.01***	1.573	0.00***
GROUP	-0.070	0.09*	0.112	0.00***
ATURN	0.129	0.00***	0.065	0.00***
CURR	-0.033	0.47	-0.002	0.00***
QUICK	0.031	0.50	0.002	0.00***
IMR	-2.059	0.00***	-1.307	0.00***
LNNAF	0.015	0.00***	0.049	0.00***
LNTA	0.397	0.00***	0.349	0.00***
ROA	-0.091	0.20	-0.035	0.05**
RET	-0.018	0.03**	-0.003	0.45
VAR	-0.267	0.00***	0.112	0.31
LEV	0.228	0.03**	-0.011	0.30
MB	-0.015	0.16	0.010	0.08*
FOROPS	0.177	0.00***	0.185	0.00***
INITIAL	-0.021	0.40	-0.052	0.01***
SPECIAL	0.537	0.02**	0.134	0.02**
LOSS	0.006	0.87	0.033	0.10*
CEOCHR	0.145	0.03**	0.029	0.35
NUMMEET	0.096	0.02**	0.179	0.00***
INSTIT	-0.002	0.26	0.005	0.00***
INDUSTRY	**CONTROLLED**		**CONTROLLED**	
YEAR	**CONTROLLED**		**CONTROLLED**	
NOBS	5,184		19,642	
R2	0.69		0.64	

***, **, * **Significant at the 1%, 5%, and 10% level respectively.**

5. CONCLUSION

Financial economists have long argued that the separation of ownership and control gives rise to Type I agency problems and the control differential between dominant and minority shareholder leads to Type II agency problems. Traditional means of corporate governance are generally found to be weaker in emerging markets. Auditors help alleviate the agency conflicts by creditable attestation of the financial statements of a corporation. Literature also suggests that affiliation to a business group also reduces agency conflicts by providing another mechanism to monitor a firm's managers. We provide evidence that the increased monitoring and reduced audit risk due to membership in a business group results in lower audit fees. Our research provides insights into the determinants of audit fees for an increasingly important political jurisdiction and provides insights into the link between monitoring and audit fees charged by.

Given the relationships among Group-affiliation and lower audit fees in India, future research may investigate other group characteristics like number of firms in the group, size of firms in the group, and industry concentration to explore the audit fee differential.

NOTES

1. In India and other emerging markets, family owned firms and firms affiliated to groups share similarities in their ownership structure. For examples, Khanna and Palepu (2000) observe that Indian Group-affiliated firms are usually owned and controlled by a family to a significant degree. Khanna and Rivkin (2001) observe that group-affiliated firms have concentrated ownership of one or more families with strong ties and Fan and Wong (2005) find that the phenomenon has become a prominent feature of publically listed firms in the emerging markets. Therefore, the arguments in the literature for family-controlled firms also apply to group-controlled firms in the Indian context.

2. http://www.cmie.com/

3. ***GROUP***	An indicator variable equal to 1 if the firm belongs to a business group; 0 otherwise.
BIGN	An indicator variable equal to 1 if the auditing firm is an affiliate of Deloitte, Pricewaterhouse Coopers, Ernst & Young, KPMG, or Arthur Andersen ; 0 otherwise.
LNTA	The natural log of total assets.
LNAUDIT	The natural log of audit fees in Indian rupee.
LNNAF	The natural log of non-audit fee in Indian rupee.
ATURN	The asset turnover ratio.
CURR	The current ratio.
QUICK	The quick ratio.
ROA	Return on assets defined as net income divided by total assets.
RET	The annual raw return over the previous fiscal year.
VAR	The variance of residuals from the market model over the previous fiscal year.
LEV	Total debt to total assets.
MB	The market to book ratio computed as the market value of equity plus book value of debt divided by total assets.
SPECIAL	Defined as the absolute value of special items scaled by total assets, where special items include provisions, write-offs, expenses related to discontinued operations, and items related to merger & acquisitions activities.
INSTIT	Institutional ownership.
NUMMEET	The natural log of the number of board meetings.
CEOCHR	An indicator variable equal to 1 if the CEO is also the chairperson of the board; 0 otherwise.
LOSS	An indicator variable equal to 1 if the firm incurred negative net income in the previous two fiscal years; 0 otherwise.
FOROPS	An indicator variable equal to 1 if the firm had income from foreign sources; 0 otherwise.
INITIAL	An indicator variable equal to 1 if the auditor engagement was less than two fiscals ago; 0 otherwise.

4. For comparison, we also ran our regressions using single-stage OLS and obtain similar results.

5. We are thankful to a reviewer for pointing out the problem of independence when using multiple observations for a firm.

References

Anderson, R., C., and D. M. Reeb. (2003). Founding-Family Ownership and Firm Performance: Evidence from the S&P 500. *Journal of Finance*, 58, 1301-1328.

Bae, K., J. Kang, and J. Kim. (2002). Tunneling or Value Added? Evidence from Mergers by Korean Business Groups. *Journal of Finance*, 57, 2695-2740.

Basu, D., and K. Sen. (2015). Financial decisions by business groups in India: Is it "fair and square"? *Journal of Contemporary Accounting & Economics*, 2015, 121-137.

Besley, T., and R. Burgess. (2004). Can Labor Regulation Hinder Economic Performance? Evidence from India. *The Quarterly Journal of Economics*, 119, 91–134.

Bedard, J., C., and K. M. Johnstone. (2004). Earnings Manipulation Risk, Corporate Governance Risk, and Auditors' Planning and Pricing Decisions. *Accounting Review*, 79, 277-304.

Bell, T., B., W. R. Landsman, and D. A. Shackelford. (2001). Auditors' perceived business risk and audit fees: Analysis and evidence. *Journal of Accounting Research*, 39, 35–43.

Bertrand, M., P. Mehta, and S. Mullainathan. (2002). Ferreting out tunneling: an application to Indian business groups. *Quarterly Journal of Economics*, 117, 121-148.

Chakrabarti, R., W. Megginson, and P. Yadav. (2008), Corporate Governance in India. *Journal of Applied Corporate Finance*, 20, 59–72.

Chen, S., X. Chen, Q. Cheng, and T. Shevlin. (2010). Are family firms more tax aggressive than non-family firms? *Journal of Financial Economics*, 95, 41-61.

Claessens, S., S. Djankov, J. P. H. Fan, and L. Lang. (2000). The separation of ownership and control in East Asian Corporations. *Journal of Financial Economics*, 58, 81-112.

Claessens, S., S. Djankov, J. P. H. Fan, and L. Lang. (2002). Disentangling the Incentive and Entrenchment Effects of Large Shareholdings. *Journal of Finance*, 57, 2741-2771.

Claessens, S., J. P. H. Fan, and L. Lang. (2006).The benefits and costs of group affiliation: Evidence from East Asia. *Emerging Markets Review*, 7, 1-26.

Clatworthy, M., G. Makepeace, and M.Peel. (2009). Selection bias and the Big Four premium: New evidence using Heckman and matching models. *Accounting and Business Research*, 39, 139–166.

Coase, R., H. (1937). The Nature of the Firm. *Economica*, 4, 386-405.

Craswell, A., and J. Francis. (1999). Pricing of initial audit engagements. *Accounting Review*, 74, 201-216.

DeFond, M, K. Raghunandan, and K. Subramanyam. (2002). Do nonaudit services fees impair auditor independence? Evidence from going concern audit opinions. *Journal of Accounting Research*, 40, 4, 1247-1274.

Fan, J., P., H., and T. J. Wong. (2005). Do external auditors perform a corporate governance role in emerging markets? Evidence from East Asia. *Journal of Accounting Research*, 43, 35-72.

Ferris, S., P., K. A. Kim, and P. Kitsabunnarat. (2003). The costs (and benefits?) of diversified business groups: The case of Korean chaebols. *Journal of Banking & Finance*, 27, 251–273.

George, R., and R. Kabir. (2008). Business groups and profit redistribution: A boon or bane for firms? *Journal of Business Research*, 61, 1004-1014.

Ghosh, S. (2007). External Auditing, Managerial Monitoring and Firm Valuation: An Empirical Analysis for India. *International Journal of Auditing*, 11, 1–15.

Gopalan, R., V. Nanda, and A. Seru. (2007). Affiliated firms and financial support: Evidence from Indian business groups. *Journal of Financial Economics*, 86, 759-795.

Heckman, J., T. (1979). Sample selection bias as a specification error, *Econometrica*, 47, 153-161.

Ho, J., L., and F. Kang. (2013). Auditor Choice and Audit Fees in Family Firms: Evidence from the S&P 1500. Auditing: A Journal of Practice & Theory, 32, 71–93.

Jensen, M., and W. H. Meckling. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 4, 305-360.

Johl, S., K., A. Khan, N. Subramaniam, and M. Muttakin. (2016). Business Group Affiliation, Board Quality and Audit Pricing Behavior: Evidence from Indian Companies. *International Journal of Auditing*, 20, 133-148.

Khan, A., M. B. Muttakin, and J. Siddiqui. (2015). Audit fees, auditor choice and stakeholder influence: Evidence from a family-firm dominated economy. *The British Accounting Review*, 47, 304-320.

Khanna, T., and K. Palepu. (1999). Emerging market business groups, foreign investors, and corporate governance. *NBER Working Paper Series*. Working paper 6955. http://www.nber.org/papers/w6955.

Khanna, T., and K. Palepu. (2000). Is group affiliation profitable in emerging markets? An analysis of diversified Indian business groups. *Journal of Finance*, 55, 867-891.

Khanna, T., and J. W. Rivkin. (2001). Estimating the performance effects of business groups in emerging markets. *Strategic Management Journal*, 22, 45-74.

Khanna, T. and Y. Yafeh. (2005). Business Groups and Risk Sharing around the World. *Journal of Business*, 78, 301-340.

Kim, J. and C. H. Yi. (2006). Ownership Structure, Business Group Affiliation, Listing Status, and Earnings Management: Evidence from Korea. *Contemporary Accounting Research*, 23, 427–464.

La Porta, R., F. Lopez-De-Silanes, and A. Shleifer. (1999), Corporate Ownership Around the World. *The Journal of Finance*, 54, 471–517.

Manos, R., V. Murinde, and G. Christopher. (2012). Dividend policy and business groups: Evidence from Indian firms. *International Review of Economics & Finance*, 21, 42-56.

Narayanaswamy, R., K. Raghunandan, and D. V. Rama (2012). Corporate Governance in the Indian Context. *Accounting Horizons*, 26, 583-599.

Palmrose, Z-V. (1996). The effect of non-audit services on the pricing of audit services: Further evidence. *Journal of Accounting Research*, 24, 405-411.

Parkash, M., and C. Venable. (1993). Auditee incentives for auditor independence: The case of nonaudit services. *Accounting Review*, 68, 1, 113-133.

Rajagopalan, N., and Y. Zhang. (2008). Corporate governance reforms in China and India: Challenges and opportunities. *Business Horizons*, 51, 55-64.

Shleifer, A., and R. Vishny. (1997). A Survey of Corporate Governance. *Journal of Finance,* 52, 737–83.

Simunic, D. A. (1980). The pricing of audit services: Theory and evidence. *Journal of Accounting Research*, 18, 161-190.

Simunic, D.A. (1984). Auditing, consulting, and auditor independence. *Journal of Accounting Research*, 22, 679-702.

Villalonga, B., and R. Amit. (2006). How do family ownership, control, and management affect firm value? *Journal of Financial Economics*, 80, 385-417.

Whisenant, S., S. Sankaraguruswamy, and K. Raghunandan. (2003). Evidence on the joint determination of audit and non-audit fees. *Journal of Accounting Research*, 4, 721-744.

ROLE OF TECHNOLOGY IN ECONOMIC DEVELOPMENT: WITH SPECIAL REFERENCE TO INDIA

Kishore G. Kulkarni, Ph.D.,
Distinguished Professor of Economics, Chief Editor, International Review of Business and Economics, (www.irbejournal.com)
Campus Box 77, P. O. Box 173362, College of Business, Metropolitan State University of Denver, Denver, CO 80217-3362.
Personal website: www.kulkarnibooks.com
Published papers available at www.researchgate.net

Paper to be presented in Federation of Business Disciplines (FBD) meeting in San Antonio, TX in March 2010

ROLE OF TECHNOLOGY IN ECONOMIC DEVELOPMENT: WITH SPECIAL REFERENCE TO INDIA

Introduction:

Traditional models (presented before 1980s) which claimed to explain the reasons and process of economic growth had rarely considered improvement in quality of technology (or innovation) as the main reason for economic growth. Most of the traditional models such as Harrod-Domar, Lewis etc focused on Capital (K) as the famous factor of production that individually suffered from the diminishing marginal productivity. In fact, the famous Neo-classical model of economic growth (Solow version) assumed that both traditional factors of production such as Labor (L) and Capital (K) go through decreasing returns to scale, which means by just applying more capital, or more labor alone, the economies would experience slower rather than higher rate of growth. Therefore in that model we thought the growth is basically coming from "outside factors" such as increased international trade, lower taxation or reduced regulation. This assertion also promoted the argument that growth is "exogenous" rather than "endogenous". The whole picture of endogenous growth was further drastically changed when Paul Romer (Nobel Prize winner of 2018) arrived on the horizon in 1990s to promote the argument that technological change as against mere Capital (K) can in fact be the prime driver of economic growth. This paper will analyze the traditional arguments of growth and compare them with what Paul Romer's contribution is to the growth dilemma. The present

paper is structured as follows: Section 1 surveys the neoclassical model that claims that growth is exogenous and Section 2 is used to make the main point that innovation, technological growth and entrepreneurship all contribute to economy in a serious way and the growth can be endogenous too. Section 3 points out the main features of this argument as applied to India's case in a limited sense of the term.

Section 1: Traditional Neoclassical Model of Economic Growth

In 1970s and 1980s a group of economists, called Neoclassical Economists, led by Nobel Prize winning Robert Solow started arguing that economic growth is better achieved by external factors such as freer international trade, fewer regulations, less administrative controls, lower taxation and fewer bottlenecks to the free markets. Focusing on their argument of open trade, in general, this was termed as the argument that believes economic growth is exogenous (caused by outside factors, rather than inside factors such as government interference in growth process, traditional growth contributors such as labor (L) and capital (K) and the aggressive policies). One of the main questions is why would they argue something like that?

In Paul Romer's words:

- We can share discoveries with others.
- There are incomprehensibly many discoveries yet to be found.

The economic jargon for this first point is the "non-rivalry of knowledge;" the jargon from math and computer science for the second point is "combinatorial explosion."

I've been pleasantly surprised about how well this article seems to have served its dual purpose. Non-economists have said that it helped them understand why unlimited growth is possible in a world with finite resources. Professional colleagues have been intrigued by the discussion of combinatorial explosion and its interaction with non-rivalry. Specialists and non-specialists have both latched onto the concept it points to of a meta-idea: an idea about how better to discover ideas. (see Romer (2018)).

Coming back to the Neoclassical model of growth and to summarize what was the main contribution of Solow led Neo-classical model of economic growth consider the following: If production GDP (Y) is based on the Cobb-Douglas Production function then the famous equation is as follows:

$$Y = A.\ K^{j}.\ L^{1-j}.\ e^{t} \qquad \text{......(1)}$$

Where Y = GDP the growth indicator or total production

K = capital stock; notice that an increase in K will create more capital applied to the production process

L = Labor stock of the country; also notice that an increase in L will create more labor employed in the production process

A = constant inputs employed such as land

e = other inputs which give an exogenous shock to the production process including the freer international trade, lower taxes, lower regulation etc (popularly called Solow Residual)

j = degree of increase in output when higher employment of K is done. (Same applied to 1-j which is the degree of increase in GDP when higher labor is employed) The design of Cobb-Douglas production function requires that $0 < j < 1$.

Recognize now that increase in capital stock alone (K) will increase GDP, but ever so slowly. This is because j is smaller than one and increase in K will have diminishing returns as very nicely explained by the law of diminishing marginal returns. Since (1 – j) is smaller than one, same law of diminishing marginal returns will apply to labor employment as well. Therefore individually when K and L are employed in higher amounts, the diminishing returns will warrant us that increase in GDP will be slower and slower. Moreover, when both K and L are increased simultaneously, the increase in GDP has an equi-proportionate increase. This is the case of constant returns to scale. Therefore the conclusion is that the traditional factors of production K and L have the diminishing marginal returns when applied individually, and have the constant returns to scale when applied together. So, the best growth that K and L can bring about is the increase in their proportion (say for example, 2% increase in K and L simultaneously will increase GDP by only 2%)

Then the question of high growth can be solved not by traditional factors of production such as K and L but by non-traditional factors such as freer markets, lower regulation, lower taxes, less government interference etc. Therefore the growth was considered to be exogenous and “e” in our equation 1 is popularly termed as “Solow Residual”. Now add to the above argument the

contribution made by Paul Romer, who pointed out that one of the other things that can make growth possible is the infusion of technology and innovation. Other issues ensued too. Consider for an example, an attempt to give credibility to third factor of production (In the Equation 1 above) namely, human capital (H), Greg Mankiew, David Romer and David Weil (1992) argued that the value of j can be even smaller if contributions of other factors of production are recognized. For example, with third factor of production j can be 1/3. In any case, the traditional neoclassical model with two or three factors of production assumes a closed economy, and more importantly same level of technology.

Section 2: The "Idea of Ideas" and the Innovation as the Factor of Production

In Romer's model as discussed before, the technological change or innovation becomes the key factor of production. Increase in the application of innovating techniques can lead to increasing marginal productivity. In fact infusion of one idea in an equipment can pave a way for another idea and it keeps on building itself further. Consider the computers or the i-phones. There has been tremendous improvement in these equipment as more and more is being invented to aid its performance. Thus, new ideas can feed on themselves and the marginal productivity keeps on increasing. Chad Jones recently explained the idea of ideas very nicely as follows:

Here is the key insight: ideas – designs or blueprints for doing or making something – are different from nearly every other good in that they are *non-rival.* Standard goods in classical economics are rivalous – as more people drive on a highway or require the skills of a particular surgeon or use water for irrigation, there's less of those goods to go around. This rivalry

underlies the scarcity that is at the heart of most of economics and gives rise to the Fundamental Welfare Theorems of Economics.

Ideas, in contrast, are non-rival – as more and more people use the Pythagorean theorem or the Java programming language or even the design of the latest iPhone, there is not less and less of the idea to go around. Ideas are not depleted by use, and it is technologically feasible for any number of people to use an idea simultaneously once it has been invented. (see Jones 2018)

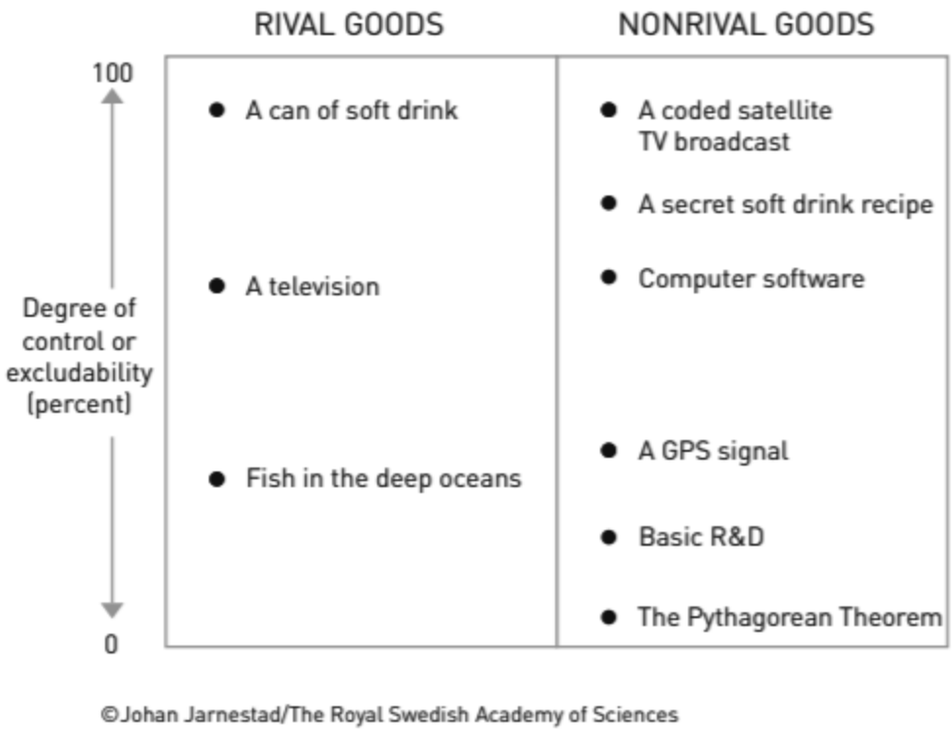
Or, better yet, see the following excerpt from Nobel lecture about the examples of non-rival nature of things:

A key insight was to develop the economics of ideas based on their non-rivalrous nature. In particular, an idea (or blueprint) can be utilized by many economic agents at once without impeding the possibility of potentially unbounded additional users. This endows ideas with a natural property to generate aggregate non decreasing returns to scale (constant rather than increasing to obtain balanced growth). At the same time, Romer noted that the non-rivalrous character of ideas would render investments for their creation unprofitable unless ideas are partially excludable, so that there is scope to regulate access by potential users.

For example, you could use encrypting technology or limited access platforms to charge user fees. Also, rules introduced by governments could limit imitation that left inventors unrewarded. Indeed, the function of intellectual property right (IPR) protections, such as patents, is to provide inventors with incentives to innovate and propel technological change.

Indeed, by exploring the determinants of incentives for economic agents to conduct R&D and generally make productivity-enhancing investments, one could study the role of institutional rules and policies in shaping the trajectory of productivity improvement that ultimately determines long-run prosperity as well as development through catch-up growth. Researchers have relied on the insights from EGT to study the impact of public policy and political economy factors shaping up how societies prosper or stagnate based on the nature of their institutions.

Romer's work opened up the possibility of more encompassing approaches, including cross-fertilization of ideas between fields, to the study of catch-up growth and international development. This research has included the study of why poverty traps can emerge, how growth take-offs happen, what determines whether a country's growth trajectory converges or diverges relative to other economies, how are "convergence clubs" shaped, and so on. Not all of these phenomena can be characterized in the context of traditional neoclassical or exogenous growth models relying solely on analysis of markets or economic policies. (See Maurice Kugler, Berkeley Economics, October 17, 2018)



The above table is useful to make the difference between rival goods and non-rival goods. Clearly, the goods on the right side have increasing marginal returns as higher application of these can increase the output on a continuous basis. In the next section we shall discuss how these ideas were useful to explain some of the technological revolution in India especially in 1990s to 2010s.

India's Experience of Technology Growth in Recent Times

In case of India, the impetus given by growth in technology in 1980s and 1990s has helped the economy grow very fast but that pace of infusion of more technological innovation has not continued with the same speed as before. Nonetheless the tremendous economic growth fueled by newly found love for freer international trade and technological change has made miracle in Indian economy. As D. Arun Kumar puts it "As a result of these sustained efforts through various funding schemes, significant progress has been made in certain technology sectors, particularly in strategic industries such as space sciences, nuclear technology, defense technology, aviation and information technology. India's defense research laboratories have successfully developed light combat aircraft, ballistic missiles, satellite communications and several other technologies of strategic importance. Looking at some of the examples mentioned above we notice that, most of these developments are in highly specialized and niche areas, with long gestation periods and far removed from scope for immediate application for direct public domain, but have been internationally acclaimed. These fields are highly capital intensive and depend on continuous government support. Another important development has been that of Information Technology (IT hereafter) and IT enabled services sectors in India, recognized globally as highly competitive sectors. The IT-ITES industry has two major components: IT Services and business process outsourcing (BPO). The growth in the service

sector in India has been led by the IT-ITES sector, contributing substantially to the increase in Gross Domestic Product (GDP), employment, and exports. The sector has increased its contribution to India's GDP from 1.2% in Financial Year 1998 to 7.1% in Financial Year 2011". (See D. Arun Kumar in the reference list)

"However, one of the unwanted side effects of the technological growth is that too much growth in technology distributes the newly created income unequally. In the recent years, rising income inequality and jobless growth have been subjects of discussion and debate. A February 2018 New World Wealth report ('Global Wealth Migration Review', goo.gl/R9x5qX) claimed that India is the second-most 'unequal' country in the world, with millionaires controlling 54% of the wealth. In Japan, the most equal country, millionaires control only 22% of national wealth. India's average national income is $1,800 (about Rs 132,300) a year. However, 80% of Indians earn less than the average. Only 6% Indians earn more than Rs 240,000 a year. To get into the top 1% bracket, one needs to make just over $20,000 (Rs 1,469,600) a year. And this top 1% is generating 73% of the wealth." (see Banik in the Reference List)

With a widening income inequality, it may not be possible to sustain growth that India is witnessing at present. So what can be done? First of all, one needs to understand that the real culprit of unequal income is not the growth in technology. The real culprits are the lagging other sectors that do not grow as fast as the advancing technology sector. Therefore more reforms are needed for creating higher entrepreneurship, making more innovation, educational progress, designing efficient legal system and labor laws, high morale in productive activities and improved social attitudes leading to the total factor productivity. Real sustainable growth

is a result of these characteristics of an economy. Therefore all segments of India need to pay attention to achieving higher growth in these aspects for a long period ahead. Unfortunately, right now it does not look like the policy makers of the economy in general are making progress in that direction. In fact, some policy steps such as de-monetization and newly adopted Goods and Services Tax (GST) have proven to be badly implemented policy steps that have not shown very many positive effects

Thus India's future, just like future of any aspiring economy is dictated by how much growth the technology makes via innovation and entrepreneurship, and how much growth all sectors contribute. With the given complex nature of Indian polity and society, this is supposed to be a big challenge, unless all involved sectors as well as individuals show tremendous understanding of the problem and willingness to dissolve their differences whether the disagreements are economic, political or religious. Economic growth on a long-term basis is a serious (albeit grand) achievement which does not come along without contributions by even a small part of this complex economic machine. Despite the efforts of policy makers, big challenges have big, complex solutions. In the year 2020 however, it appears that politicians are bogged down more by the other things than economic. For example the Citizenship Amendment Act (CAA) and construction of Ram temple and similar issue have taken a priority over the urgently needed economic changes. The start of general election year has made political issues of greater importance than the economic restructure. Thus when economic reforms are needed in labor laws, stronger infra-structure in terms of roads and transportation, legal system revamping, labor laws revision policy makers are in a mood to address more political issues. This may not lead to another round of economic miracle, in fact this make even lead to slower economic

growth. Only future would tell if the private sector responds favorably or not to lead another round of economic expansion for the Indian economy.

Bibliography and References:

1) Banik, Nilanjan, "Times of India and Economic Times Article", October 22, 2018. //economictimes.indiatimes.com/articleshow/66307882.cms?from=mdr&utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst.

   Berkeley Economics, 2018

2) D. Arun Kumar, 147.153.169.153 on Wed, 11 Dec 2019 20:45:26 UTC
   All use subject to https://about.jstor.org/terms

3) Jones, Chad, "New ideas about new ideas: Paul Romer, Nobel laureate"
   VOX, CEPR Policy Portal, Stanford University, 12 October 2018

4) Mankiew, Greg, Romer, David and Weil, David, "Empirics of Economic Growth", Quarterly Journal of Economics, pp. 407-438, 1992.

5) Romer, Paul M. "The Origins of Endogenous Growth", Journal of Economic Perspectives, Volume 8, Number 1, Winter 1994, pp. 3-22.

6) Romer, Paul M (1986), 'Increasing Returns and Long-Run Growth', *Journal of Political Economy* 94: 1002-37.

7) Romer, Paul M (1990), 'Endogenous Technological Change', *Journal of Political Economy* 98(5): S71-102.

8) Solow, Robert M (1956), 'A Contribution to the Theory of Economic Growth', *Quarterly Journal of Economics* 70(1): 65-94.

Study of Consumer Perception about Organic Food Labels

POORNIMA TAPAS, Ph.D. *.,Professor and Faculty in-charge Executive Programmes, Symbiosis Institute of Business Management, Symbiosis International (Deemed University) Lavale , Pune 412115. Email-*

KOMAL DESAI, *PH.D Research scholar, Symbiosis International (Deemed University) Lavale, Pune 412115.Email-komaldesai635@yahoo.com*

ABSTRACT

One of the fundamental human rights include the right to healthy, affordable and sustainable food. Following the increase in environmental concerns, people especially in urban areas are looking for healthier, sustainable lifestyle alternatives. While the increase in demand for organic food might seem like an up-market fad, for most consumers of organic foods, the market place offers dilemma. There is an almost lack of information about what do organic labels signify, how to interpret these and which organic food actually deliver safety. This paper is a pilot study to understand consumer perception about organic food labels. The study is carried out on sample respondents belonging to different regions of Maharashtra State, India. Results obtained from this study will be used for a bigger study in this regard. It seems to be in line with the consumer behaviour model presented by Kotler and Keller (2012). Consumers' psychological characteristics influences the way they perceive organic labels. The study focuses only on the fact that, how perception about labels of organic food products, as a standalone factor, influences buying decision of consumers, irrespective of changes in other factors. We consider how personal, cultural and social factors influence integration of label's meaning for consumers.

KEYWORDS - *Consumer behaviour, Organic food, Organic labels.*

INTRODUCTION

Lack of effective labelling is one of the major concern of consumers. The national consumer (NCC) recognised an enormous sum of keen conservational buyers who could discover, neither the items nor the precise data to direct their conduct (NCC 1996). In such cases, flawed information enforces would be moral customers to settle on decisions. In this context, Kamalakannan, S., & Mani, D. R. (2012) expressed that morals are required for constant development and welfare of economics structure. The belief of a moral customer efficiently supporting the culture to move into sustainability is naturally fetched into query, given that commercialisation will lead to non-sustainability. Increased consumerism can harm the ecosystem and its ability to sustain future generations (Worldwatch Institute, 2015).

The fundamental question which needs an answer is, what if the clear information of sustainable certifications is available at point of sale? Will it influence them? As per Hamza and Dalmarco (2012) the level of knowledge even among conscious consumers is low.

What meaning consumers assume of organic certification labels? This article tries to evaluate the certification issue related to organic food products.

The Indian organic program is exhibited after the International Federation of Organic Agriculture Movements (IFOAM), Basic Standards for Organic Production and Processing, and the Codex Alimentarius Guidelines and the EU Regulation 2092/91. In India, Organic foods are regulated by Food Safety and Standards (Organic Foods) Regulations, 2017 notified under the provisions of the Act. It recognizes two systems of certification i.e. Participatory Guarantee System (PGS) implemented by Ministry of Agriculture and Farmers Welfare and National Programme for Organic Production (NPOP) implemented by Ministry of Commerce and Industry.

Related Theory and Literature-

Sustainable consumption - As per Annunziata, Mariani and Vecchio (2019), bigger need for knowledge of food which we consume daily has been observed due to concern of society for food production and consumption effect created on environment and involuntarily negative imprint of individual food choices on sustainability.

With rise in demand for sustainable food products, producers have now adopted certifications, labels, food claims and other information tools for differentiation of their goods. Sustainability characteristics of food products are credible features and so the

producers and suppliers need means to link to customers, and buyers need ways to recognise the preferred qualities (Sirieix et al., 2013). Manufacturer offers the guarantee of products matching the given quality standard by testing it and providing it with a certification marks which are also referred as mark of assurance. While buying the products, consumers can make better choices through creating awareness and knowledge labels certification, Dharni, K., & Gupta, K. (2015)

The purpose of organic labels is to deliver appropriate evidence about certain products and to update the consumers about its production and environmental impact (Drexler et al, 2018). When Consumers starts believing in such labels, they are willing to pay a higher price (Bruce & Laroiya, 2007). Eco labels promote sustainable consumption (Horne, 2009). Companies use certifications and organic labelling for various reasons. Fuerst & Mcallister claim that organic (eco) labelling helps companies to increase their competitive position and growth of market share. Labels are valuable tools for marketers to help them communicate efforts to consumers and create consciousness of environmental manufacture and a constructive ecological impression on nature (Bougherara & Combris, 2009).

International Regulations- The US Department of Agriculture (USDA) website asserts that "organic food is produced without using most conventional pesticides; fertilizers made with synthetic ingredients or sewage sludge; bioengineering; or ionizing radiation" (USDA, 2006).The ISO Norm 14024 ("environmental labels and declarations") was launched in 1999 as a complement to the ISO Norm 14000, aiming at regulating the principles, practices and the key features related to the environmental labels, according to the Global Eco labelling Network (GEN, 2004).

This Norm distinguishes the green labels in three different categories, namely: (a) Type I: sustainable labels obtained from an assessment based on multiple criteria, carried out by a third party; (b) Type II: self-declared environmental appeal; (c) Type III: labels in which it is required studies of life cycle assessment (LCA), still being drawn up by ISO (GEN, 2004)

As per Maimon (1994), many companies take this chance to distinguish themselves through the ecological appeal. This way they advance their own communication on products variances short of the endorsement of a third institution (Type II certification). Due to failing in liability to public, such type of self-regulation are dejected (Hartlieb and Jones (2009)

The GEN, non-governmental institution made with the aim to improve, encourage and develop the use of green labels on products and services, advocates the certification of ISO

type I, stating that a "green label" is awarded by an impartial third party to products that meet the environ-mental criteria established in the market (Global Eco labelling Network – GEN, 2004).

Indian Regulations – Food Safety and Standards Authority of India (FSSAI) has the command to control manufacturing, distribute, sell or import "organic foods" as per the requirements laid under Section 22 of the Food Safety Standards Act, 2006.

The small original producer whose annual turnover is less than 12 lakhs per annum and whose organic food is directly sold to end consumer, are exempted from the need of verification of compliance.

Food products can be labelled as 'Organic 'under two systems as follows-

a) Under National Programme for Organic Production (NPOP) system:

- In case of single ingredient product where all requirements have been met as per the specified standards can be labelled as 'Organic'.
- In case of multi ingredient product where minimum 95% of ingredients are of certified origin, can be labelled as 'Certified Organic'.

b) Under Participatory Guarantee System (PGS-India) system:

- In case of single ingredient product where all requirements have been met, may be labelled as 'PGS- Organic'.
- In case of multi ingredient product where minimum 95% of ingredients are organic, it may be labelled as 'PGS- Organic'.

The consumer shall look for Food Safety and Standard Authority of India's organic logo (Jaivik Bharat) and FSSAI Logo License number. In addition, the label may carry India Organic Logo (NPOP certified) or PGS-India Organic Logo (PGS-India certified), according to whichever system it is certified under.

Consumer behaviour for organic food products- Organic certification logos target the end buyer (Jahn et al., 2005). From a marketing viewpoint, the diversity of different organic logos in the market leads to confusion and doubts and raises the question whether consumers prefer products with certain organic certification logos over others. (Janssen, M., & Hamm, U. 2012). Also it is of interest how customer inclinations are impacted by customer insights and state of mind about labelling systems of organic foods

The theoretical framework of consumer behaviour is used for study of organic certification labelling. Blackwell, Miniard, and Engel (2000), defined consumer behaviour as "the physical and mental activities involved in buying, consuming and using products and services, including the decision making processes preceding and following such actions". **"**It is the study of how individuals, groups and organisations select, buy, use and dispose of goods, services, ideas, or experiences to satisfy their needs and wants "(Kotler and Keller, 2006).

Consumer behaviour model used in this research is presented by Kotler and Keller (2012), it includes various steps of studying the stimuli to consumption, whose interpretation is influenced by personal, social and cultural characteristics of individual. It also includes individual perception, memory and psychological aspects and motivation theories. All this together impact entire buying decision process. With reference to this model it is examined that how labels are used in relation to information search process, comparison with substitutes and in making final buying decision. As in India, it is mandatory to have "label" on organic food products, we can't examine certification issue as conclusive factor for buying. Here we are considering how personal, cultural and social factors influence integration of label's meaning for consumers.

For consumers to make a choice through better replacements offered via promotional activities for buying food products, its robustness has become a progressively significant aspect (Huang & lu, 2016).Along with taste and price of food products, consciousness of wellbeing also plays a major role while making buying decisions (Johansen et al., 2011)

Food superiority, labels, package and its price are the factors consumers take into consideration before buying any food products (Mohd Daud et al., 2011).

The past studies on the significance of food labels to the buyer's shows uncertainty in the results. There are acceptable number of studies (Johansen et al., 2011; Djekic and Smigic, 2016; Ali and Kapoor, 2009; Singla, 2011; Vemula et al., 2014; Saha et al., 2013) which have considered buyers awareness, utilisation, most looked for data, textual style and arrangement of labels, and determined the significance of labels for the buyers. Few researches have revealed the lack of trustworthiness of labels. As per Grunert et al. (2001), some labels of food products have botched to assure buyers, their quality due to unawareness of such labels or their awful understanding .Likewise, an examination pointing at assessing buyer's impression of labelled foods indicated that these items have accomplished agreeable

outcomes as far as announced inclination, however not as far as actual purchases (Chrysochou and Giraud, 2007)

As per Kumar and Kapoor (2015) India, which is growing global player in food marketplace, there are moderately less studies which considers impact and use of labels of food products on buyers buying choice, this article focuses on same.

RESEARCH OBJECTIVES -

- To check the awareness of consumers about organic food labels.
- To study the perception of consumers and to segment them as per the meaning they draw for organic food labels.
- To study the factors (within organic labels attributes) that motivate consumers to buy organic food products.

IMPORTANCE AND SCOPE OF STUDY

This study will help marketers to understand how 'attributes of Organic food label' influence the perception of individuals, and whether they play any role in consumers' buying decision. Scope of the study is limited to 'labels' and their role. Other drivers of buying decision are not studied alongside.

METHODS AND DATA ANALYSIS

As mentioned earlier, since this is a pilot study, it is conducted on a smaller sample size (189) drawn from major cities of Maharashtra state (India). Sample composition was of male, female population across different age groups. Single Transversal Survey was used which involves collecting data only once (Malhotra, 2006). Structured questionnaire was used as research instrument, which included 12 attributes found from literature (Conner & Christy, 2004). Refer Figure1, given below.

A descriptive analysis was performed first, followed by a cluster analysis, to segment the consumers according their buying behaviour. This was based on the meaning they draw from the labels. The SPSS software was used for data analysis.

RESULTS

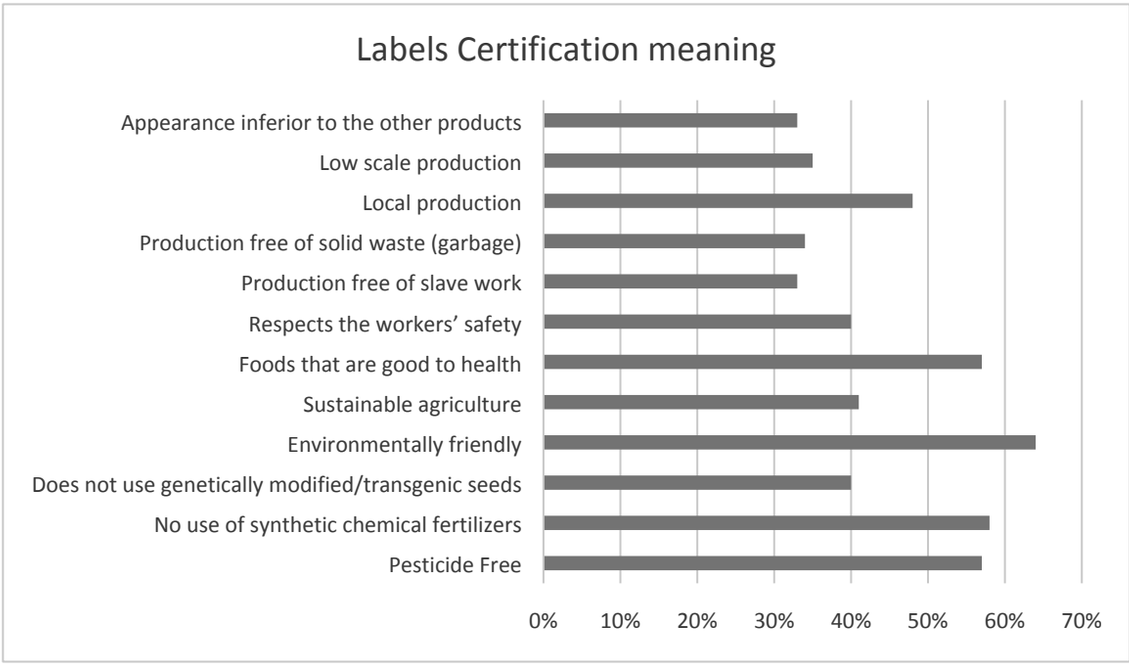


Fig no 1- Labels certification meaning.

Sample characteristics – The sample consisted of males (57%), females (43%). They were in the age group 18-39 years. Their schooling levels were higher, as 46% hold a Post Graduate Degree. With regard to the buying habits in general, the respondents purchase from supermarkets (39%), with a frequency of once a month (54%). Considering the buying of organic products, 26% buy them regularly, 38% have not bought even once.

Descriptive analysis- Most of the respondents were aware about certified organic labels. However, the study indicated that the respondents' familiarity with respect to specific label such as "Jaivik Bharat", "India Organic logo" or "PGS India Organic logo "was low.

Though the sample respondents were familiar with the label "environmentally friendly" the most, their awareness about the other labels such as "no use of synthetic chemical fertiliser", "pesticide free" and "food that are good to health" was relatively low. Moreover, the labels such as "production free of slave work" and "appearance inferior to other products" were less known to them. As far as their motivation to buy organic products were concerned, labels

such as “it is healthier”, “it is natural”, “it is chemical free” and “it has rich nutrients” were the drivers making them buy these products.

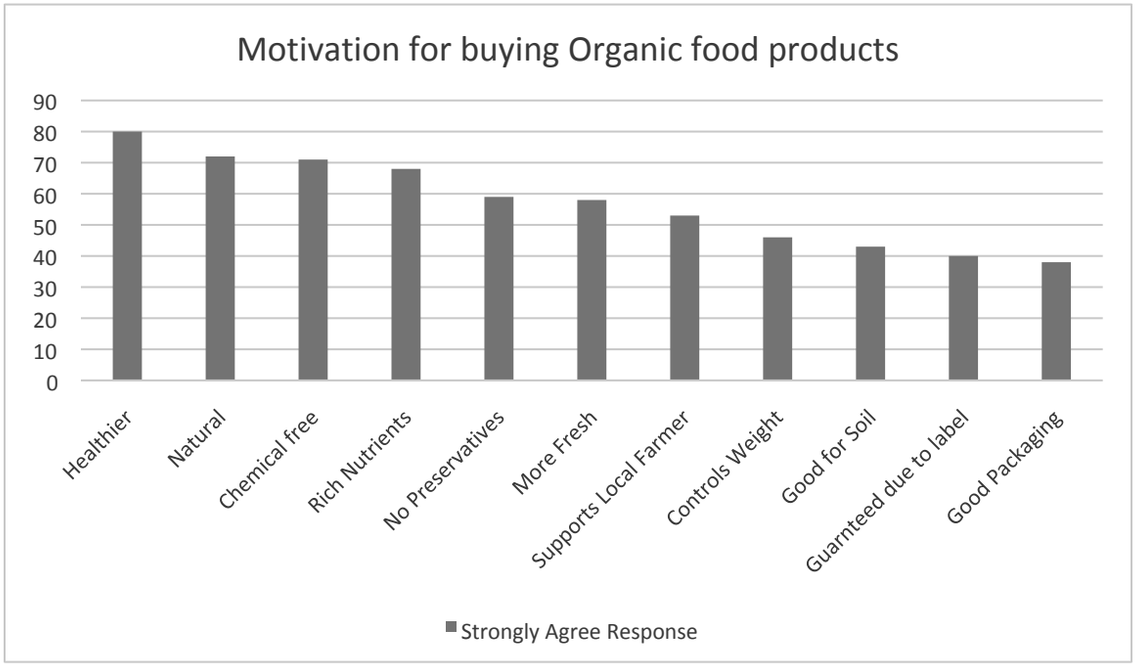


Fig 2- Motivation for buying organic food products.

Cluster analysis- This was carried out in the second stage after descriptive analysis, for the purpose of segmenting the consumers based on their buying behaviour.

Two prominent clusters were found- Cluster 1, with 59% of consumers and Cluster 2, with 41% of consumers

Cluster Distribution

		N	% of Combined	% of Total
Cluster	1	69	59.0%	36.5%
	2	48	41.0%	25.4%
	Combined	117	100.0%	61.9%
Excluded Cases		72		38.1%
Total		189		100.0%

Fig 3 – Cluster Distribution

Cluster 1 consisting majority of young population between 18 to 29 years of age, having a Post Graduate Degree, some of them were just married young couples. These respondents have bought Organic products ‘only once’. These respondents failed to notice the labels

Appearance of product did not have any influence on their buying decision. Taste also was not a decisive factor for buying organic products. They have rarely read any of the labels before buying. They were also found to be neutral about the "weight control" aspect of these organic products.

Cluster 2 consisted of population belonging to the age group 30 to 39 years, having a family with 2 children. Most of them with a Graduate Degree. These respondents were regular buyer of Organic products and they had noticed the labels like "Production free of slave work" and "Production free of Solid waste". They seem to have got influenced by appearance and taste of the products while buying Organic product. These respondents often read the labels before buying. The perception that Organic food products help in "weight control" was one of the major motivational factors for their buying decision.

DISCUSSION AND CONCLUSION

The prime objective of this study was to determine the significance of organic certification labels to the consumer. The primary analysis pointed out zero waste, environmentally friendly aspect of the products as the prominent meaning of the labels. However, cluster analysis revealed the need for deeper analysis of the subject. Different consumer profiles may have different perception about the labels of organic food products.

As per Kotler and Keller (2012) Consumer behaviour framework (p172), it is mentioned that, consumer characteristics play an important role in influencing consumer decision. It includes various psychological factors like perception, motivation and demographic characteristics as gender and age. Kotler and Keller describe "perceptions are a process through which someone select, organize and interpret information received, as a means of creating a meaningful image of the world" (2012, p. 174).

This study was to understand what kind of image is created in the minds of the consumers, when they come across organic labels. The study found that different groups of consumers have different perceptions of organic labels. Psychological characteristics found to have influence on the buying behaviour.

Findings from cluster analysis can help marketers of organic products to position their products as per the target segments. They can also base their marketing strategies for promoting their products in different markets accordingly. Labelling agencies can also take

cognizance of this aspect. Lot of awareness and promotion is required to be done. They know about very few labels from the range of available organic labels.

REFERNCES

1) *Agricultural & Processed Food Products Export Development Authority (APEDA). (n.d.). Organic products. Retrieved from http://apeda.gov.in/apedawebsite/organic/PresentStatus.htm*
2) *Ali, J. and Kapoor, S. (2009), "Understanding consumers' perspective on food labelling in India", International Journal of Consumer Studies, Vol. 33 No. 6, pp. 724-734.*
3) *Annunziata, A., Mariani, A., & Vecchio, R. (2019). Effectiveness of sustainability labels in guiding food choices: Analysis of visibility and understanding among young adults. Sustainable Production and Consumption, 17, 108-115.*
4) *Bougherara, D., & Combris, P. (2009). Eco-labelled food products: What are consumers paying for? European Review of Agricultural Economics, 36 (3), 321–341. doi:10.1093/erae/jbp023*
5) *Bruce, C., & Laroiya, A. (2007). The production of eco-labels. Environmental & Resource Economics, 36, 275–293. doi:10.1007/s10640-006-9028-9*
6) *Conner, D., & Christy, R. (2004). The organic label: How to reconcile itsmeaning with consumer preferences. Journal of Food Distribution, 35(1),40–43.*
7) *Dharni, K., & Gupta, K. (2015). Exploring antecedents of healthy food choices: an Indian experience. International Journal of Consumer Studies, 39(2), 101-108.*
8) *Djekic, I. and Smigic, N. (2016), "Food labels – status and consumers' attitude on the Serbian food market", Nutrition & Food Science, Vol. 46 No. 2, pp. 204-216.*
9) *Drexler, D., Fiala, J., Havlíčková, A., Potůčková, A., & Souček, M. (2018). The effect of organic food labels on consumer attention. Journal of food products marketing, 24(4), 441-455.*
10) *Fuerst, F., & McAllister, P. (2011). Eco-labeling in commercial office markets: Do LEED and Energy Star offices obtain multiple premiums? Ecological economics, 70, 1220-1230. doi: 10.1016/j.ecolecon.2011.01.026*

11) *Gourmelon, G. (2015). Global plastic production rises, recycling lags—new worldwatch Institute analysis explores trends in global plastic consumption and recycling. Worldwatch Institute.*

12) *Grunert, K.G., Juhl, H.J. and Poulsen, C.S. (2001), "Perception de la qualite en alimentaire et role de labels (Food quality perception and labels role)", Revue Francaise du Marketing, Vols 183-184 Nos 3-4, pp. 181-196.*

13) *Hamza, K., & Dalmarco, D. (2012). Sustainable certifications and their relevance for conscious consumption and business. GATHER Magazine Of Management Accounting And Sustainability, 2 (2), 1-20.*

14) *Hartlieb, S., & Jones, B. (2009). Humanising business through ethical labelling:Progress and paradoxes in the UK. Journal of Business Ethics, 88(3),583–600.*

15) *Horne, R. E. (2009). Limits to labels: The role of eco-labels in the assessment of product sustainability and routes to sustainable consumption. International Journal of Consumer Studies, 33, 175–182. doi:10.1111/ijc.2009.33.issue-2*

16) *Hrysochou, P. and Giraud, G. (2007), "Is designation of origin an important cue driving consumer loyalty behavior? Evidence from scanner data on dry-cured ham", ANZMAC Conference, University of Otago, Dunedin.*

17) *Huang, L. and Lu, J. (2016), "The impact of package color and the nutrition content labels on the perception of food healthiness and purchase intention", Journal of Food Products Marketing, Vol. 22 No. 2, pp. 191-218.*

18) *Jahn, G., Schramm, M. and Spiller, A. (2005). The reliability of certification: Quality labels as a consumer policy tool. Journal of Consumer Policy 28(1):53-73.*

19) *Janssen, M., & Hamm, U. (2012). Product labelling in the market for organic food: Consumer preferences and willingness-to-pay for different organic certification logos. Food quality and preference, 25(1), 9-22.*

20) *Javik bharat.Retrieved from https://jaivikbharat.fssai.gov.in/index.php*

21) *Johansen, S.B., Naes, T. and Hersleth, M. (2011), "Motivation for choice and healthiness perception of calorie-reduced dairy products – a cross cultural study", Appetite, Vol. 56 No. 1, pp. 15-24.*

22) *Kamalakannan, S., & Mani, D. R. (2012). A Study on Ethics of Consumerism in India. Journal Impact Factor, 3(3), 169-174.*

23) *Kapoor, S. and Kumar, N. (2015), "Fruits and vegetables consumers' behavior: implications for organized retailers in emerging markets", Journal of International Food and Agribusiness Marketing, Vol. 27 No. 3, pp. 203-227.*

24) *Kotler, P. (2000) Marketing Management, 10th Edition, Prentice Hall, Upper Saddle River: New Jersey*

25) *Kotler, P., & Keller, K. L. (2012). Marketing Management, 1th Edition, Prentice Hall, Upper Saddle River: New Jersey*

26) *Krishijagran. Retrived from https://krishijagran.com/agripedia/how-to-get-india-organic-certification/*

27) *Maimon, D. (1994). Eco-strategy in Brazilian companies: reality or discourse?. Journal of Business Administration, 34 (4), 119-130.*

28) *Malhotra, N.K. and Birks, D. (2006) Marketing Research: An Applied Approach. 3rd Edition, Prentice Hall, Upper Saddle River.*

29) *Mohd Daud, N., Ramli, L., Jemahdi, N. and Husna Razalli, R. (2011), "Examining critical success factors of consumers' attitude towards nutritional labelling of SMEs products in Malaysia", Australian Journal of Basic and Applied Science, Vol. 5 No. 8, pp. 944-950.*

30) *Network, G. E. (2004). Global Ecolabelling Network (GEN) information paper: introduction to ecolabelling. Ottawa, Canada: Global Ecolabelling Network.*

31) *Saha, S., Vemula, S.R., Mendu, V.V.R. and Gavaravarapu, M. (2013), "Knowledge and practices of using food label information among adolescent attending schools in Kolkata, India", Journal of Nutrition Education and Behavior, Vol. 45 No. 6, pp. 773-779.*

32) *Singla, M. (2010), "Usage and understanding of food and nutritional labels among Indian consumers", British Food Journal, Vol. 112 No. 1, pp. 83-92.*

33) *Sirieix, L., Delanchy, M., Remaud, H., Zepeda, L., & Gurviez, P. (2013). Consumers' perceptions of individual and combined sustainable food labels: a UK pilot investigation. International Journal of Consumer Studies, 37(2), 143-151.*

34) *USDA Food and Nutrient Database for Dietary Studies, 2.0. 2006. Beltsville, MD: Agricultural Research Service, Food Surveys Research Group.*

35) *Vemula, S.R., Gavaraavarapu, S.M., Mendu, V.V.R., Mathur, P. and Avula, L. (2014), "Use of food label information by urban consumers in India – a study among supermarket shoppers", Public Health Nutrition, Vol. 17 No. 9, pp. 2104-2114.*

VOLATILITY TRANSMISSION AMONG NIGERIA, SOME SELECTED AFRICAN AND WORLD EQUITY MARKETS

IDOLOR, Eseoghene Joseph *ACE*, *MAMN*[*]
Ph.D Management University of Nigeria (UNN),
Ph.D Finance University of Benin (Uniben)
Department of Banking and Finance
Faculty of Management Sciences
University of Benin, Nigeria.
E-Mail: eseoghene.idolor@uniben.edu
greatidolor@gmail.com

Keywords: Volatility, Transmission, Equity, Markets, Nigeria, Africa, World
JEL Classification code: G15, C32, C51, C52, G10

ABSTRACT

I examine the extent of volatility transmission, spill-over and contagion among Nigeria, some selected African and world equity markets. Empirical findings indicate the presence of volatility transmission and spill-over among the Nigerian and world equity markets. However, for the Nigerian and African markets, the results show that there is volatility transmission, but no evidence of volatility spill-over. The results were not statistically significant enough to prove the existence of volatility contagion among all the African markets, arising from the recent global financial crisis.

I. INTRODUCTION

This paper examines the extent of volatility transmission, spill-over and contagion among Nigeria, some selected African and world equity markets. It examines five major regional African and four major world equity markets that cut across Asia, Europe and North America. Using daily and weekly stock market index data from December 2004 to December 2013, the study applied the multivariate BEKK approach, which enables easy analysis of volatility transmission, spill-over and contagion effect from world equity markets to the regional African and then to the Nigerian market. Univariate GARCH (I, I) analysis was also applied with the aim of explaining the second moments of stock price behaviour in the sampled stock markets with particular emphasis on the Nigerian stock market.

The deepening level of globalisation in international trade and finance, fostered by advances in information and communication technologies, financial innovation and the deregulation of capital markets worldwide, have intensified interdependencies and linkages between national and major international financial markets. The continuous financial opening has meant that stock market traders and speculators in a given capital market are much likely to incorporate into their investment and divestment decisions, not only relevant information generated domestically within the national economies where they are domiciled, but also information generated in other foreign markets. This has resulted in rapid inter-market information transmission, greater financial integration as well as volatility transmission, spill-over and contagion effect among the world's numerous capital markets (Idolor (2014), Mabvuto (2011), and Koch and Koch, (1991)).

Volatility transmission among financial markets exist because of real economic and financial ties between world economies in our contemporary period that is characterised by rapidly increasing levels of globalisation among developed and emerging economies. As a result of the existence of such ties, new information arising from one country affects not only local stock market returns and volatility, but also the stock market returns and volatility of financial assets traded on the floor of other bourses (stock markets). The new information arising from such markets may be absorbed immediately by other markets, or with a lag, depending on the presence and number of informed investors, information asymmetry, existence of feed-back

traders, herding behaviour, market frictions and market microstructure changes. The magnitude and speed of volatility transmission provides valuable insight into the nature and swiftness of dissemination of such new information among countries. The size of its effect naturally reflects how global investors feel about news, as well as their appraisal of its impact on asset prices across markets (Kaminsky and Reinhart (2002)).

In this paper, volatility transmission is used to refer to the means, medium or channel through which financial shocks move across borders. In order to travel across borders, information needs transmission channels. In the short run, asset price changes in equity markets are the primary channel or medium of transmission of financial shocks across borders. Owing to the dependence of numerous developed and emerging markets alike on common bank creditors and cross market portfolio re-balancing by investment funds, financial markets and institutions have been shown to act as a major tool for cross-border shock transmission (Kodres and Pritsker (2002), and Calvo (2004), Todorov (2012)). With the increasing level of financial market interdependency and correlations among world financial markets, volatility transmission is now currently used interchangeably with financial spill-over and contagion in much of the empirical literature (Idolor (2014), Mabvuto (2011), and Todorov (2012)). Empirical results testing the concept, in its very weak form are often used to indicate a clear case of volatility transmission, in its semi strong form, it indicates a spill-over, while in its strongest form when the correlations are very significant due to turbulence or crisis in international financial markets, or correlations that cannot be explained by economic fundamentals, the results will indicate a contagion (Mabvuto (2011), Park and Song (2000), Bekaert, Havey and Ng (2005), and Boyson, Stahel and Stulz (2010)).

Indeed, in the last two decades we have seen how different financial crisis that originated from particular regions or countries have extended geographically to other regions with far reaching and pervasive impact on national economies. This has in no small measure significantly led to research by academics on the nature of interrelationship among different stock markets. As long as international markets are becoming more and more integrated, information generated in one stock market can without any doubt, affect other stock markets. To this end, financial instability has become an important issue for the reason that financial crises such as bank collapses or stock market crashes may directly influence a country's economic well-being

(Todorov (2012)). The implication of this is that, if a stock market is integrated with another country's stock market, domestic financial stability would greatly depend on the financial stability of another country.[1] Such interdependencies would highlight the vulnerability of a domestic economy to negative external shocks. By implication, the converse would be true for positive external shocks as well. Ng (2000) highlights another crucial point why understanding market interdependencies through volatility transmission, spill-over and contagion effect is critical, most especially, in the evaluation of regulatory proposals to restrict international capital flows. Such a restrictive policy would perhaps be a mitigating factor to the vulnerability and instability that may arise due to deepened financial integration. Consequently, turbulence in financial markets has led to numerous calls for reforming the whole global financial system with the aim of improving its stability (see Beirne, et al. (2009), Rogoff (1999), Eichengreen (1999), Bob-Osaze (2007), and Mabvuto (2011)).

The study fills an important gap in the extant literature. This is because a thorough understanding of the structure, drivers and transmission mechanisms among stock markets, and the volatility arising from within these inter-market linkages have crucial implications for domestic and foreign stock markets. From the investor's perspective, knowledge of the manner and the extent to which different financial markets are interrelated is significantly crucial for the determination of efficient international hedging decisions so as to minimise the adverse effect of uncertainty on the expected returns on investments. Furthermore, an understanding of the manner in which international markets are interrelated facilitates the identification of diversification opportunities for individual investors and international portfolio management firms.

Moreover, in an international context, modern portfolio theory suggests that when there is a drastic increase in the level of volatility transmission, spill-over and contagion as a result of strong linkages among capital markets, investors have to spread away their non-systematic risk in their portfolio by investing in more isolated markets so as to minimise the likelihood of suffering large losses (Idolor (2014), Mabvuto (2011),and Belke and Polleit (2009)). Therefore a thorough understanding of the manner and extent to which financial markets are linked would give invaluable insights for the evaluation of policy proposals aimed at not only maximising economic gains from stock market linkages, but also cushioning the adverse effects of shocks to

the economy that would naturally emanate from increased financial globalisation. This is indeed of prime importance to the relatively very weak frontier capital markets in Africa.

II. BACKGROUND AND HYPOTHESES

A. The Setting

For some inexplicable reasons, very little has been written on volatility transmission, spill-over and contagion among African capital markets in-spite of the rapid growth in the number of stock exchanges in the continent over the last fifty years, when the number rose from only two to over seventeen. Yet, capital markets are key drivers of economic growth and development (Idolor (2014), and Bob-Osaze (2011)). To date, there still is a difficulty in ascertaining the level of volatility transmission, spill-over and contagion among Nigeria and other regional African and developed world equity markets. Previous research have centred more on exploring the nature and extent of transmission and spill-over among the mature and more developed emerging markets with little or no emphasis on African stock markets. A few notable studies in this regards include those of Christiansen (2007), In (2007), Cifarelli and Paladino (2005), Koutmos and Booth (1995), Koch and Koch (1991), and Eun and Shim (1989). The scenario has led to a paucity of reliable academic research aimed at assessing and quantifying the extent to which regional African stock market volatility is affected by idiosyncratic shocks or risk originating locally, regionally and globally; thereby, making it relatively difficult to make inferences about the magnitude of the interdependence of regional African markets, with their foreign or global counterparts. The situation is made even more cumbersome by the mere fact that most African bourses, except for a few major regional bourses, do not keep or make publicly available, up to date records of their past historical stock market prices and indexes dating back earlier than 2009.

In addition, most studies, from the few conducted in relation to African markets, that have examined the level of regional and global interdependence of regional African stock markets, have mainly emphasised the linkages in terms of return co-movements with little or no interest in the trends, in the returns generating process, the volatility transmission process or spill-over of

regional African markets and their foreign counterparts. Also, none of these studies have jointly examined them explicitly with Nigeria as the focal point of emphasis. In addition, most of the past studies fail to jointly examine the relative importance of regional and global factors, in volatility transmission of the Nigerian (and indeed African) stock market by quantifying the magnitude and proportion of the volatility driven by regional and global factors, and whether these proportions or factors have remained stable over time. Furthermore, many of the previous research have applied mainly univariate GARCH models or at best Bivariate GARCH models, which focuses either on a single market or just two markets rather than multivariate GARCH models which gives more robust - although complex- treatment to issues dwelling on volatility transmission and spill-over among numerous international bourses. Some notable studies in this regard include those by Alhassan (2006), Humavindu and Floros (2006), Pretorious and De Beer (2004), and Piesse and Hearn (2002).

To date the level of volatility transmission, spill-over and contagion among Nigeria and other regional African and world equity markets still continue to pose a major challenge to stakeholders in the literature, as African markets seem to be exposed to the vagaries of idiosyncratic shocks emanating from foreign mature world equity markets. In addition, there is a lack of policy tools and framework for measuring and insulating African economies from such external negative shocks. African markets also seem unable to capitalise from positive economic shocks emanating from global markets which could as well also lead to economic prosperity if well utilised. Analysts have attempted to use univariate GARCH modelling as well as fundamental and technical approaches; and more tools are being evolved in the literature to deal with this very important aspect of the stock market. All the attempts are to see if stock market speculators can beat the market and reap a windfall from a sound knowledge of how price changing information is transmitted from one stock market to another. Some of these analytical tools have had some limited successes in terms of long-term prediction of volatility transmission and spill-over among equity markets. To this end, the multivariate modelling approach to studying the level of risk, volatility transmission, spill-over, and contagion among markets has attracted the interest of latter day analysts; and has been adjudged a possible tool of the future in both developed and emerging economies. The use of the multivariate BEKK model for instance has received a new impetus and is currently at the front burners of volatility analysis in the literature (see Engle and Kroner (1995), Mabvuto (2011), and Idolor (2014)).

African financial markets have also changed greatly over the last decade as a result of capital market reforms, master plans and market microstructure changes that have been implemented over the years. Some of the reforms have led to an increase in the number of new issues as well as improved levels of market capitalization. The depth and breadth of African markets have also been enlarged over the years. Furthermore, numerous investors, both local and foreign, are now indicating more serious interest in the market as it grows. There is therefore a need for more robust analytical tool leverage to sustain these efforts at improving the growth of African bourses (Eriki and Idolor (2010)).

The great majority of the theoretical and empirical works relating to stock market volatility spill-over and transmission mechanism has so far been predominantly centred on exploring the nature and extent of spill-over among the mature and more developed emerging markets. While many of these studies have provided empirical evidence supporting the existence of significant volatility transmission and spill-over among capital markets worldwide, with special reference to African markets, there seems to be a few dissenters, who hold the opinion that African markets do not constitute an effective means of transmission mechanism or spill-over from shocks originating from mature financial markets. This school of thought suggests that such markets are segmented and largely driven by local fundamentals rather than volatilities originating from mature foreign or equally emerging and frontier stock markets. Some of the previous studies in this regard includes Christiansen (2007), Koch and Koch (1991), and Eun and Shim (1989). Theory has clearly made some progress in the subject. At least in Africa, we now recognise and understand the importance of stock market linkages on the level of capital market development of a country; and how it could serve as a catalyst for effective volatility transmission and spill-over from one stock market to another. However, very little is known about its empirical relevance to developing African countries like Nigeria and indeed the other African frontier stock markets studied. Empirical work has unearthed some stylized facts on the importance or implications of volatility transmission for emerging and mature stock markets, but this evidence is largely based on foreign and highly advanced and civilised European and Asian economies; and it is not at all clear how these facts relate to different economic models of other poor developing countries in Africa.

Without testing the robustness of these research findings outside the natural environment in which they were uncovered, it is hard to determine whether these empirical regularities are merely spurious correlations, let alone whether they support one theory or another (Rajan and Zingales (1995)). This study attempts to start filling this gap in our knowledge. The motive for this current effort therefore is to upgrade the current corpus of knowledge regarding emerging and frontier African capital markets, with the Nigerian market as a special focal point of interest.

B. Hypotheses and Testable Propositions

I investigate the level of volatility transmission among Nigeria, some selected African and world equity markets. As a frame of reference, the following four hypotheses, stated in the null form are posed:

H_{01}: Information driven shocks emanating from any of the sampled stock markets do not significantly set up an increase in the volatility inherent in the Nigerian stock market.

H_{02}: Volatility in Nigerian stock market returns does not significantly lead to volatility in other African and mature world equity markets.

H_{03}: The correlations between asset returns in the sampled stock markets are not significantly higher during periods of higher volatility which are often associated with a financial crisis.

H_{04}: There is no significant volatility contagion effect among Nigeria and other African stock markets; arising from the recent global financial crisis.

C. Study Significance

As mentioned in the previous sections, very few empirical studies have been conducted within or outside Nigeria to determine the extent to which Nigeria's stock market is integrated with other regional African and global equity markets. Apart from adding to the very scant empirical literature on the interdependences and level of volatility transmission, spill-over and contagion among Nigeria, other regional African or global counterparts; the study contributes to previous body of research in terms of both the main issues and the manner in which they are

addressed. For instance it is an improvement on the univariate and bivariate volatility transmission models adopted by Mabvuto (2011) and Todorov (2012), which was applied to a set of mature, emerging and African frontier stock markets. The multivariate BEKK model adopted in the study also is in line with the general framework adopted by Beirne et al. (2009) and, as an extension, Bekaert and Harvey (1997) since both regional and global influences are shown to exert volatility transmission, spill-over and contagion effects on a domestic market.

First, of the studies that examine regional and global interdependences of the Nigerian equity market, none in the literature, to the best knowledge of the researcher, examines it explicitly with Nigeria as the focal point, as intended in this study. Methodologically, most of the past research fail to jointly examine the relative importance of regional and global factors in volatility transmission to Nigeria's equity market by quantifying the magnitude and proportion of the volatility driven by regional and global factors and whether the volatility level have remained stable over time. In this respect, a notable novelty of our research is that in contrast to previous research, the study attempts to link in some measure the information content of international equity prices to time-variations in the global and regional markets and their integration so as to establish, beyond speculative doubt, some possible factors that drive the volatility transmission processes both at the regional African and global level. This is of fundamental importance for policy formulation within and outside the African clime. Also our focus on the equity market is not arbitrary. It is motivated by our view point that the stock market is the aspect of the financial market that is most likely to be readily affected by external shocks originating outside national boundaries, in comparison to the money market that is a priori expected to be much more responsive to domestic monetary policy conditions.

Second, the exposure of African frontier equity markets to external financial risk emanating from foreign emerging or mature equity markets is a matter of substantial concern for international investors. African markets are often considered very risky. That however might not stem from the markets not being fundamentally sound; it might just be that investors do not know much about them. This study may provide financiers with further information about potential investment and portfolio diversification opportunities in the focal African emerging and frontier markets. Direct investment, project risk evaluation, cost of capital calculation, asset

pricing and allocation, in addition to the development of risk hedging techniques can potentially benefit from this study as well.

Third, policy makers, at least in Africa, may take advantage of the findings of the study, since understanding inter-market connections could provide for more informed decisions, improve macroeconomic management, as well as improve their ability to promptly time, predict, and evaluate susceptibility of their country to shocks from abroad. Improved assessment of the nature and origin of a fundamental financial shock and possible subsequent economic downturn may facilitate the adaptation of more appropriate anti-crisis techniques and thus alleviate, or at least shorten, the suffering of the African economies most affected by the deterioration of financial or economic conditions.

Exploration of potential inter-market linkages may also aid academics within and outside the African clime, in shedding more light on the outcome of market liberalization on capital flows and mobility. Enhanced awareness of market co-movement may expand their understanding of the significance of the structure and potential effects of free cash flows as well as any subsequent restrictions. In addition, the study may assist academics in forecasting and evaluating the reaction of international financial markets to global and local shocks, as well as in achieving deeper understanding of the shock transmission mechanisms and contagion effects. These can help in providing answers to the nagging question of how quickly, or how badly, the selected African markets were affected by the recent global economic downturn; and may even provide some insights about future financial and macroeconomic policy course of action. No doubt it is quite a tasking assignment given the paucity of information and difficulty of accessing reliable data concerning African markets. But the author is not daunted by such obstacles, only challenged. As noted in Bob-Osaze (2007, 2011) and Idolor (2014), if Africa is to develop and join the rest of the world in uplifting the standard of living of its citizenry, it must let others know its problems. The capital market is probably one of the key places to begin. It is therefore hoped that this study aid in attracting more interest in the field through an appreciable number of quality books and related studies. Besides, the findings of this study will lay foundation for other academia and research students in African Tertiary institutions to carry-out further research related to this study, with particular emphasis on achieving a global research outlook rather than just laying emphasis on their indigenous local market or economy alone. This I believe, mutatis

mutandis will be in line with the modern mantra of thinking globally while acting locally. The findings of this study, may also serve as very useful springboard for related studies in Nigeria and some other less developed countries (LDCs) or added experience for some others outside the African continent.

III. METHODOLOGY

A. Model Specification, Procedure and Issues

The general framework that allows for three sources of unexpected returns, namely: a purely domestic shock, a regional African shock, and a global shock from the mature equity markets is devised for the current study. The general framework follows that of Beirne, et al. (2009), and, as an extension, Bekaert and Harvey (1997) since both regional and global influences are shown to exert volatility transmission spill-over and contagion effects on a domestic market. For instance it is an improvement on the univariate and bivariate volatility transmission models adopted by Mabvuto (2011) and Todorov (2012); which was applied to a fewer number of mature, emerging and African frontier stock markets, with fewer parameters estimated in comparison to the current study. In this study I utilize two separate models to describe the behaviour of returns in the markets. First, I utilize univariate *GARCH* (*1,1*) model to specify market returns as a function of own past values for the selected stock markets with particular emphasis on the Nigerian stock market; second, I specify a multivariate model that accounts for the impact of volatility transmission, spill-over and contagion among Nigeria, regional African and world equity markets.

B. The Univariate GARCH

Univariate GARCH models facilitates the parameterization of the conditional variance, to model the unobservable second moments and allows the conditional variance to depend on the elements of the information set in an autoregressive manner (Gujarati, 2005). For the conditional variance equation, two variants of the GARCH (1, 1) model that incorporates the leverage effects in the market are specified. First, the EGARCH, developed by Nelson (1991), and second, the GJR or Threshold ARCH (named after Glostern, Jagannathan and Runkle). The EGARCH and

GJR or Threshold ARCH models are part of the basic GARCH (1, 1) model. Another name for GARCH (1, 1) is the ARCH and GARCH lag length. It is possible to also use GARCH (p, q) to represent it. In addition, when the leverage term is incorporated into it, it is written as GARCH (p, q, r). The mean equation, conditional variance equations for the model and sufficient conditions for applying the model are shown in equations 1, 2, 3 and 4 respectively.

$$r_t = c_t + \in_t \tag{1}$$

r_t = Stock Return

c_t = Constant term in the model (or equation)

ϵ_t = Error term

GARCH (*1, 1*) = Indicates one period autoregressive lag and one period Heteroskedasticity lag.

EGARCH = Exponential *GARCH*

EGARCH is used in combination with *GARCH* (*1, 1*) because it incorporates the leverage effect. Leverage effect is essential since I also want to measure asymmetric behaviour which shows how volatility responds to price changing information or movement in the market. In *GARCH* (*1,1*) as previously indicated, naturally have incorporated into it the mean term, *ARCH* term and the *GARCH* term. However, since I am also using *EGARCH*, I have in addition to the *ARCH* and *GARCH* term; the Leverage term. The Leverage term which measures the leverage effect is the last term in equation (2). The leverage effects modelled in the framework allows for the prediction of asymmetric behaviour of stock volatility in terms of downward or upward movements. The specification of the conditional variance for *EGARCH* is:

$$\log\left(\sigma_t^2\right) = \log\omega + \log\sum_{i-1}^{q}\beta_i\left(\sigma_{t-1}^2\right) + \log\sum_{i=1}^{p}\alpha\left|\frac{\in_{t-i}}{\sigma_{t-i}}\right| + \sum_{i=1}^{r}\gamma_i\frac{\in_{t-i}}{\sigma_{t-i}} \tag{2}$$

For equation (2), positive and negative values of ϵ_t have different impacts on volatility and these can be captured by the leverage effect which is tested by the hypothesis that a priori γ_i is < 0.

The a priori expectation therefore states that γ_i is < 0

If γ_i is > 0 = It means volatility responds to price changing information positively.

If γ_i is < 0 = It means volatility responds negatively to price changing information

If γ_i is = 0 It means volatility does not respond in any direction to price changing news or information, and thus indicate that leverage effect is zero

w = mean term in equation (2), and is the first term in equation (2).

β_i = coefficient of the *ARCH* term

α_i = coefficient of the *GARCH* term

γ_i = Coefficient of the leverage term

q, p and r = Lag terms of the equation

σ_t^2 = GJR or Threshold ARCH conditional variance equation

ϵ_{t-1} = Error term of one lag.

$$\log \sigma_t^2 = \log \omega + \log \sum_{i-1}^{q} \beta_i \left(\sigma_{t-1}^2\right) + \log \sum_{i=1}^{p} \alpha_i \in_{t-1}^2 + \log \sum_{i=1}^{r} \gamma_i \in_{t-1}^2 d_{t-i} \quad (3)$$

w = Mean term in equation (3), and is the first term in equation (3)

β_i = Coefficient of the ARCH term

α_i = Coefficient

of the GARCH term

γ_i = Coefficient of the leverage term

q, p and r = Lag terms of the equation

σ_t^2 = EGARCH conditional variance equation

ϵ_{t-1} = Error term of one lag

d_{t-i} = Dummy variable which captures reaction to both good and bad news (and is either 1 or 0).

Good news is captured as 0 while bad news is captured as 1. They have different effects on the conditional variance. For instance, good news here has an impact of α, while bad news has an impact of (α +γ). The a priori expectation is that $\gamma > 0$; a priori if $\gamma > 0$ it means that the *leverage effect* exists and vice versa. If $\gamma > 0$, the news impact is asymmetric indicating that the market is more volatile when there is bad or negative news. Furthermore as can be observed in equation (3), if d_t , the dummy is zero then it means it affects the *GARCH* term in the equation (the third term in equation 3), and thereby impact on α_i. As a result it is often assumed or hoped by researchers that γ_i (Gamma) is > 0 or positive. This is in line with the assumption that the market becomes more volatile with bad news than with good news. *GJR* or Threshold *ARCH* is a *GARCH* variant that includes leverage terms for modelling asymmetric volatility clustering (Nelson (1991), and Idolor (2014)). This is done by introducing a dummy variable which eventually is used to help know the effect of good news and bad news in the market.

$$\in_t \left| \digamma_{t-1} \right. \qquad N\left(0, \sigma_t^2\right) \tag{4}$$

Equation (4) is an econometric terminology which states that the error term is normally distributed with zero mean and with a constant variance as indicated in the general assumptions of ordinary least square (OLS). In addition it is worthy of note that the determination of the nature of news whether negative or positive (in the EGARCH model), and whether good or bad (in the GJR or Threshold ARCH) in the two conditional variance equations adopted in the study is generated by the system itself. The researcher therefore is not required to determine how the nature of the news and information is to be captured by the dummy variables. For instance such information once imputed is determined automatically from the data set by the statistical analysis software package (in this case Eviews) once the model is specified as we have done in the study. If the squared values of the error term are negative it is classified as Good News and if they are positive it is classified as bad news for the GJR or Threshold ARCH. In addition, if the squared values of the error term are negative it is classified as being indicative of volatility responding negatively to price changing information; and if the squared values of the error term are positive it is indicative of volatility responding positively to price changing information in the EGARCH model.

C. The Multivariate GARCH

The multivariate GARCH model facilitates the estimation of volatility transmission, spill-over and contagion across the sampled stock markets, as the model incorporates both the estimation of variances and co-variances. Here only the variance and covariance matrix is assumed to be dependent on the information set. Multivariate models were specifically developed to handle issues related to volatility transmission across markets or financial instruments, as the model goes beyond the estimation of variances to the estimation of co-variances as well (Engle and Kroner (1995)). If the conditional variance and covariance (H_t) is allowed to be measurable with respect to I_{t-1} (information set), then the multivariate *GARCH* model can be applied to volatility a

analysis. The mean equation, conditional variance-covariance equations for the model in both its compact and broad form as well as sufficient conditions for applying it is shown in equations 5, 6, 7 and 8 respectively.

$$r_t = \Omega + \beta r_{t-1} + u_t \qquad (5)$$

r_t = Vector of stock returns for Nigeria, regional African and world equity markets

Ω = Ohm is a vector of constants (α_1, α_2, α_3) for the three sets of markets being studied

r_{t-1} = The corresponding vector of lagged returns

β = Coefficient of the vector of lagged returns

u_t = The residual vector for the three sets of markets being studied.

Since three sets of markets are involved in the analysis, a tri-variate *GARCH* framework is devised for the mean return equation. Thus, in equation (5), r_t is a vector of stock returns for the Nigerian market, regional markets and the world equity markets, while r_{t-1} is the corresponding vector of lagged returns; and the residual vector $u_t = (\in_{1t}, \in_{2t}, \in_{3t})$ where $\in_{it}$ represents the error term for a particular market. *Ω* is used because it is a vector showing the intercepts of the whole set of markets and not just an element of one single market.

For the study I propose a *BEKK* **(***1, 1, 1***)** model to estimate the conditional covariance matrix for the three-level stock indices and to conclude about the volatility dynamics among the sampled markets. *BEKK* **(***1,1,1***)** simply means I have one autoregressive lag, one heteroskedasticity lag and one covariance lag. The term autoregressive means that current values of a variable is dependent upon the past values of the variable, while the term heteroskedasticity means non constant variance or changing variance over time. Since my goal is to determine the extent of stock market volatility transmission, spill-over and contagion for three sets of markets, I utilize a diagonal *BEKK* model. Despite its reduced generality when compared to other multivariate models, the *BEKK* model is able to clarify the dynamics on conditional variances and covariances (see Engle and Kroner (1995), Idolor (2014)). This in other words means the

BEKK model framework can do all that the other multivariate transmission models can do, and, even more in a more specific and precise manner. In this instance the modelling of the dynamics of volatility transmission, spill-over and contagion across assets and markets. Following the mean equation in equation (5), the variance covariance of the standard *BEKK*(*1,1,1*) model is defined as shown in equation (6)

$$H_t = C_0^{*'} C_0^* + A_{11}^{*'} \in_{t-1} \in_{t-1}^{'} A_{11}^* + G_{11}^{*'} H_{t-1} G_{11}^{'} \quad (6)$$

C = Indicates an n×n lower triangular matrix of constants.

A_{11} = Indicates an n×n parameter of the matrices that measures the effects of idiosyncratic shocks or news on the conditional co-variances.

G_{11} = Indicates an n×n parameter of the matrices that shows the degree of volatility persistence, that is how the volatility is self-generated over time, among the markets.

H_t = Indicates the variance covariance matrix to be estimated by the *BEKK* model, and is the more general or compact form of the *BEKK* model.

C is an n×n lower triangular matrix of constants while A_{11} and G_{11} are n×n parameter matrices with A_{11} measuring the effects of idiosyncratic shocks or "news" on the conditional covariances and G_{11} showing the degree of volatility persistence or how volatility is self-generated over time among the markets. The first term in equation (6) represents the matrix of constants which shows how volatility moves from Nigeria to regional, regional to Nigeria, Nigeria to world, world to Nigeria, as well as Nigeria to regional and world equity markets and vice-versa. The second term in equation (6) represents the effects of shocks on the conditional variances. In this instance I am interested in the effect of shocks from the international markets on Nigeria and other regional African markets and vice versa. In addition, the third term in equation (6) indicates the level of volatility persistence, that is, how volatility feeds on itself over time.

Since my goal is to determine the intensity of transmission of volatility from one market to the other, the diagonal representation of the *BEKK* model, where the matrices A_{11} and G_{11} are assumed to be diagonal, is adopted. Making use of diagonal *BEKK* helps ensure that the results obtained are reliable. The diagonal *BEKK* ensures that H_t is positive definite which means; it should have or possess a determinant. The diagonal *BEKK* representation, has been shown to be a particularly convenient representation for estimation of volatility among assets and for analysis of simultaneous equations systems. Engle and Kroner (1995) have also shown that under simple and straightforward conditions, the parameters in the *BEKK* model with $K = 1$, are already identified, so the problem of identification of the simultaneous equations are avoided. Within the diagonal framework and following Beirne et al. (2009), the parameters of the autoregressive term (for the various stock markets) in equation (5) are $\beta = (\beta_{11}, \beta_{12}, \beta_{13} \mid 0, \beta_{22}, \beta_{23} \mid 0, 0, \beta_{33})$. This allows for the transmission and spill-over effect of returns from mature markets to regional and Nigerian markets, and from regional markets to the Nigerian market. In line with this system of causality in variance, the *BEKK* model adopted for this study, slightly modifies the fully diagonal structure and imposes three zero restrictions on each of the parameter matrices A_{11} and G_{11}. The complete set for the conditional variance covariance for the *BEKK* is thus expressed as shown in equation (7).

$$H_t = \begin{bmatrix} a_{11} & 0 & 0 \\ a_{21} & a_{22} & 0 \\ a_{31} & a_{32} & a_{33} \end{bmatrix}' \begin{bmatrix} \in^2_{1,t-1} & \in_{1,t-1}\in_{2,t-1} & \in_{1,t-1}\in_{3,t-1} \\ \in_{2,t-1}\in_{1,t-1} & \in^2_{2,t-1} & \in_{2,t-1}\in_{3,t-1} \\ \in_{3,t-1}\in_{1,t-1} & \in_{3,t-1}\in_{2,t-1} & \in^2_{3,t-1} \end{bmatrix} \begin{bmatrix} a_{11} & 0 & 0 \\ a_{21} & a_{22} & 0 \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$$
$$+ \begin{bmatrix} g_{11} & 0 & 0 \\ g_{21} & g_{22} & 0 \\ g_{31} & g_{32} & g_{33} \end{bmatrix}' H_{t-1} + \begin{bmatrix} g_{11} & 0 & 0 \\ g_{21} & g_{22} & 0 \\ g_{31} & g_{32} & g_{33} \end{bmatrix} \quad (7)$$

$\epsilon^2_{1,t-1}$ = Nigerian stock market variance

$\epsilon^2_{2,t-1}$ = Regional African Stock Market Variance

$\epsilon^2_{3,t-1}$ = World stock market variance

H_t = Indicates the variance covariance matrix to be estimated by the *BEKK* model, and is the more robust representation form of the *BEKK* model

a_{11} = Volatility from Nigeria to Nigeria stock market.

a_{21} = Volatility from Regional African markets to Nigeria stock market.

a_{22} = Volatility from Regional African markets to other Regional markets.

a_{31} = Volatility from World stock markets to the Nigerian stock market.

a_{32} = Volatility from World stock markets to Regional African stock markets.

a_{33} = Volatility from World to other mature World stock markets.

g_{11} = Volatility persistence from Nigeria to Nigeria stock market.

g_{21} = Volatility persistence from Regional African markets to the Nigeria stock market.

g_{22} = Volatility persistence from Regional African markets to other Regional markets.

g_{31} = Volatility persistence from World stock markets to the Nigerian stock market.

g_{32} = Volatility persistence from World stock markets to Regional African stock markets.

g_{33} = Volatility persistence from World to other mature World stock markets.

The framework in equation (7) still guarantees positive definiteness of the parameters of the variance covariance matrices in the model. This simply means that the matrices are identified and have a determinant (see Engle and Kroner (1995)). Equation (6) is the compact form of equation (7). Since I am modelling three sets of markets within my model, I have a *3*3* diagonal square matrices. If the set of markets had been two I would have used a *2*2* diagonal matrices. The size of the matrices increases as the markets or variables are expanded. The diagonal *BEKK* model structure is a kind of structure where only the principal diagonal (typical in diagonal matrices) elements in the model are estimated as shown in equation (7). Since the interest is on volatility transmission, spill-over and contagion as it moves from one market to another, the diagonals, representing the modelled sets of markets, thus show the movement from one diagonal to another in the matrices. Restated somewhat differently, it shows the movement from

one market to another. The fact that fewer generalisations and specific required coefficients are estimated makes it to be widely utilized in the empirical literature for studies of this nature. The a priori signs for the multivariate BEKK model could be either positive or negative, as the intention is to determine if there is a change at all among the parameters of the model and not particularly on the direction of the change. The second term in equation (7) represents the variances while, the leading square diagonals in the second term represents the *GARCH* effect. The last two terms represents the level of volatility persistence.

$$\in_t \ |\Omega_{t-1} \ \tilde{} \ N\left(0, \sigma_t^2\right) \tag{8}$$

Equation (8) is an econometric terminology which states that the error term is normally distributed with zero mean and with a constant variance as indicated in the general assumptions of ordinary least square (OLS). Furthermore, as stated in the previous sections of the study, Contagion indicates turbulence in the markets and hence is often captured in the empirical literature by simply adding a dummy variable to equation (7) when computing. The level of correlation in returns due to idiosyncratic shocks is usually measured using the contagion framework (see Bekaert, Havey and Ng (2005), Corporale, Spitis and Spagnolo (2006), Baele (2007), and Idolor (2014)). For the current study I define volatility transmission, spill-over and contagion as the spread of market disturbances from one market to another either weakly or strongly. For the study, if the disturbance is weak or in its semi strong form, it indicates a case of volatility transmission and spill-over respectively, but if the disturbance is significantly very strong, it indicates a contagion. I am therefore interested in the intensity of transmission of volatility among the sampled stock markets during episodes of turbulence in the global financial market. The structural changes in stock returns in the Nigerian and African (regional) markets arising from volatility contagion is captured by including a dummy *(D)* in equation (6). The dummy takes a value of *1* during periods of turbulence and a value of *0* prior to and after the selected turbulence period. My focus in the study is on the global economic crises of 2008/2009 as the turbulence period.

IV. DATA

A. Sample Selection Procedure

The data utilized in the study are the daily and weekly price indices for nine markets, namely, Nigeria, Ghana, Kenya, Republic of South Africa (RSA), Egypt, China, United Kingdom (UK), United States of America and Japan. The data span ranges from December 2004 to December 2013; a time frame of nine years. The only restriction made in selecting the time frame is that data on stock market index must have been available for the entire period covered; this is particularly very important in the case of African frontier[1] markets that only very recently began to officially compute their stock market indexes. The period was also considered because it guaranteed adequate collection of data and reliability of result as well. Moreover the period also covered some major stock market meltdown and also coincides with the recent global financial crisis (meltdown) where shocks from one market could possibly be transmitted or spill-over to other mature, emerging or frontier equity markets. While the focal point is on the Nigerian bourse, the analysis is extended to a selected number of other African frontier, emerging as well as mature world equity markets for more robust comparison purposes. In order to analyse the volatility linkages among Nigeria and other regional, frontier, emerging and mature global equity markets, I exercise due diligence in the choice of countries to include in the study. The mature markets in the study include the United States of America (USA), United Kingdom (UK) and Japan. These markets are not arbitrarily selected- in addition to the magnitude of Nigeria's trade linkages with these markets; they are among the world's largest stock markets and numerous previous empirical research in the literature have underscored their relative predominance in global financial asset pricing and volatility transmission to other emerging and frontier markets. In addition, the use of these markets is not unique to the current study as Ng (2000) and Christiansen (2007) have provided similar basic arguments for the use of some of these markets in volatility transmission, spill-overs and contagion related studies. USA for instance is undeniably the largest market in the world and the empirical literature is full of studies that the market is dominant in the global transmission of volatility in any possible instance of a crisis or value meltdown. The empirical literature also seem to suggest also a significant level of dominance for UK and Japan as well. The regional African frontier markets of interest in the study include Nigeria, Ghana and Kenya, while the emerging markets include China, South Africa and

[1]A frontier market is an economic term which was coined by International Finance Corporation's Farida Khambata in 1992. It is commonly used to describe a subset of emerging markets (EMs) worldwide. (Todorov (2012), and Idolor (2014)).

Egypt. A complete list of the classification of markets into frontier, emerging and mature equity markets is available in MSCI BARRA Index official website.

My selection of some of the regional emerging and frontier African markets is not arbitrary, but governed by several factors. In view of the recent effort that have been put forward by numerous African regional economic blocks, stock market practitioners and the academia in general, on the need to foster greater economic cooperation and integration of African bourses (see Bob-Osaze (2011), or Idolor (2014)) . I strongly believe that the existence of strong political, economic and bilateral trade linkages may induce stock markets in these regional emerging and frontier African markets to respond to information unique to these regions in Africa (east, west, north and south). The stock markets were also included because the markets, are among Africa's largest equity markets. China a strong and emerging Asian stock market was included principally in the light of the recent growing influence of China in both African and global trade. Also today China is portrayed as being among the world's largest economies. China was also included as the only emerging market outside the African continent not only for its dominance as one of the fastest growing emerging capital markets in the world but also in view of the size and importance of its bilateral trade links with the major economies in Africa. It is perceived that the level of volatility transmission among Nigeria, regional African and world equity markets may not be adequately captured if the Chinese market was omitted from the sample.

One important point that warrants attention relates to the frequency of the data used in the study. Weekly data is preferred to daily data for several reasons. First and foremost, any study of information transmission among financial markets can only be valid if it takes into account the existence of non-synchronous trading among markets in its assumptions (Idolor (2014)). Immediately apparent to a researcher studying such markets, is the fact that there exist perfectly and partially non-overlapping trading periods amongst all the markets. African markets such as Nigeria, Egypt, Kenya and Ghana for instance tend to close much earlier than the Republic of South Africa (RSA), with the effect that any important developments (regionally or globally) that occur after these markets close are likely to be incorporated into the Republic of South Africa (RSA) stock market returns on that day, while only being incorporated (with a lag) on the

subsequent day in the other four markets (Mavbuto (2012)). This failure to share the same information at the same time has critical implications for the study at hand. Within the adopted analytical framework, the effect of using daily (non-synchronous close-to-close) data, shown in the empirical literature, is that it could potentially possibly distort my inferences by inducing spurious dependencies amongst the different equity market returns and volatility shocks that cannot be distinguished from information driven volatility spill-over's. This possibility to date is still highly contentious in much of the empirical literature as conflicting results have emerged as to which method is more reliable (Ng (2000), Christiansen (2007); Mabvuto (2011), Todorov (2012), and Idolor (2014)).

Therefore to partially offset this problem of which procedure produces more reliable result, whether daily or weekly data streams, I deviate from other related studies by using a combination of both daily and weekly return series in the analysis for effective comparison purpose. The advantage of weekly data is that distortions related to homogeneous non-trading, for instance due to country specific holidays, and the day-of-the-week calendar anomaly are avoided; while daily data streams have the advantage of stock prices instantaneously reflecting any new regional or global material information, positive or negative, that emanates from the business and political climes of the indigenous country or other foreign countries. This advantage has often been cited as being a real test of the level of market efficiency inherent in any stock market; and the empirical literature does suggest its relevance in attaining true 'price discovery' or intrinsic worth of financial assets. Therefore, in view of the above issues and the objectives of the current study, my choice of using both daily and weekly data is justifiable for comparison purposes in the final analysis. If the same or similar results are obtained then it is logical to report only one conveniently in order not to make the study unwieldy.

It is imperative to acknowledge that this is not the only way to deal with the problem of non-synchronous trading times/hours. As observed by Ng (2000), previous studies for instance those of Eun and Shim (1989) and Karolyi and Stulz, (1996) suggest that high frequency daily data, intraday open-to-close and close-to-open data, may be more desirable for studying international correlations and spill-over's. These data are very much unavailable for most African bourses, and international groups like Morgan Stanley Composite Index (MSCI) and Standard and Poor's. Also, many African bourses only very recently began to officially compute

and store their official stock market indexes, on stock returns, in their websites, archives and official bulletins. Kenya for example only started computing her all share index in 1998; yet the market is one of the major regional markets within the African continent and indeed the largest stock market in east Africa. This scenario has in no small way posed a major constraint in the choice of the African bourses to include in the study. Furthermore, intraday daily data are not available for most of the African countries that currently have officially recognised bourses. Moreover, I doubt that such high frequency data would be practical in view of the relative illiquidity of most African stock markets over the full time frame covered or length of the study, especially in the period prior to 2003. Other approaches involve the use of two-day rolling average returns based on each market's aggregate stock market index (see Forbes and Rigobon, (2002), Mabvuto (2011), or Idolor 2014).

As previously stated, the main variable of importance in this study is the returns on stocks from three sets of market. The markets include Nigeria, selected regional African and world equity markets. For the study the stock market index data for the selected stock markets proxy via the daily and weekly MSCI BARRA Index (Morgan Stanley Composite Index) is analysed from December 2004 to December 2013; a time frame of nine years. The only restriction made in selecting the time frame is that data on stock market index must have been available for the entire period covered; this is particularly very important in the case of African frontier markets that only very recently began to officially compute their stock market index. Moreover, the period also covered some major stock market crashes/value meltdown and also coincides with the much mentioned recent global financial crisis where shocks from one market could possibly be transmitted or spill-over to other equity markets. While the focal point is on the Nigerian bourse, the analysis is extended to a selected number of other African and world equity markets for more robust comparison purposes. Daily and weekly data is employed since it ensures inclusive dynamic movements in the stock markets and provides greater insight on cross-market interactions.

B. Test for Time Series Properties

The stationarity property of each of the time series variable is investigated through the Augmented Dickey Fuller (ADF) test for the unit root and Philip-Perron procedure. Test for time series properties of a data set involves a test for autocorrelation, and unit root. Generally, unit root test involves the test of stationarity for variables used in time series analysis. The importance of stationarity of time series borders on the fact that for a non-stationary time series it is not possible to generalize to other time periods apart from the present period. This makes forecasting based on such time series to be of little practical value. Moreover, the relationships being estimated in this study are long run relationships. If the data collected on the variable of interest are not stationary and I go ahead to use it to estimate the relationship of interest the results will be considered as spurious and not representative of the true relationship. Moreover, testing for time series properties of the data is an important goal in itself since its results will constitute a part of the descriptive statistics which enables one to see the true behaviour of the time series data with respect to time.

C. Diagnostic Test

The study also test for heteroscedasticity using the Langrangian Multiplier (*LM*) *ARCH* test and Quartile charts that indicates the pattern of the time series; which can be used to infer on the possible existence of heteroskedasticity of the variables. If there is heteroskedasticity in the time series, it gives a sufficient condition to proceed to use the *ARCH* and *GARCH* univariate and multivariate models for the analysis.

V. RESULTS

A. Stock Market Returns Pattern and Movement

The initial set of analysis in this study is to investigate the pattern, movement and other properties of stock market returns for each of the markets in the selected sample. In Figure Ia and Ib, the trend in stock market returns for all the nine markets are shown for both daily and weekly

outcomes. The effect of the global financial crises that began in 2008 is clearly seen in the charts where a sharp drop is shown for the 2008 period. This effect however seems to have been more felt in the Nigerian market. Indeed, the Nigerian market does not appear to have recovered extensively from the shock up till 2013 as the market index is still relatively low in comparison to the prevailing values before the global financial crisis. For China the stock market returns seems to exhibit similar patterns of price movement to that of Nigeria. An interesting aspect of the trend is that none of the other African market demonstrated similar movement or patterns with that of Nigeria. Indeed, the South African and Egyptian markets have grown relatively steady since the drop that occurred during the crises. The Kenyan and Ghanaian markets experienced troughs (drop in the wave pattern) for brief periods after 2008 but have both been on a rapidly growing path in recent years. These wide divergences in the price indexes have implications for the African stock markets in terms of the level of market linkages and integration within the African continent. The U.S., U.K. and Japanese markets show very similar stock market returns movements during the period of analysis. The charts for the weekly stock return indexes are quite similar to those of the daily indexes although they appear smoother. They also report similar divergent stock returns movement patterns vis-à-vis the Nigerian stock market and other African markets. In general the possibility of the African markets being segmented and not fully integrated with the world equity markets can be gleaned from Figure 1a and 1b respectively.

The African markets are seen to have recovered strongly from the previous downturn in prices during the 2008/2009 financial crisis period. Even the Republic of South Africa and Egyptian markets that are priory assumed to be more integrated with the advanced world equity markets than other African markets seem to have recovered fully and are in the upward path. However, the Nigerian market is seen to be following the same path and trend as the world equity markets which is yet to fully rebound from the crisis period as far as the period of my analysis is concerned. This pictorial result however may not be fully indicative of the Nigerian market being fully integrated with the world equity markets but may rather be as a result of a chance occurrence in the domestic Nigerian financial market that coincided with the global financial crisis period. For instance, the Central Bank of Nigeria on August 14th, 2009 removed the chief executive officers (along with other top management staff and executive directors of five (5) highly rated conventional/universal deposit money banks in the country; for offences and

unethical practices ranging from falsification of accounting statements, embezzlement and the granting of loans and other credit facilities to customers and business partners/clients (way above their capital base and regulatory obligor limits) without any form of collateral security; which made them technically insolvent. The bank CEOs were also accused of doing little or nothing to recover the loans granted and also of hurriedly presenting such delinquent and toxic assets/loans as bad debts in their accounting statements and books (Omachonu (2009)).

Furthermore, on September 16th 2009, while addressing capital market regulators and active market participants in the Nigerian Stock Exchange trading floor (in Lagos State Nigeria), the Central Bank of Nigeria Governor stated that "the problem with the five banks, whose top executives were removed, is a clear case of a lack of liquidity, lack of capital and a lack of sound corporate governance…" practices (STV (2009)). Shortly, after, an additional three CEOs were removed for similar offences after a careful and thorough scrutiny of their accounting and financial statements by the CBN; bringing the number of affected banks to eight (8) out of the total twenty four (24) deposit money banks operating in the country at that time. It is therefore intuitively appealing that some domestic Nigerian factors may have led to the continuous low level of the market which makes it display similar characteristics like that of the advanced world equity markets despite the low level of integration of the Nigerian market with that of the advanced world equity markets.

In addition, the daily and weekly stock returns series for the sample period are reported in Figures 2a and 2b. The returns in the Nigerian stock market clearly show the case of volatility clustering as is the case with the other stock markets. Apparently, large price changes in these markets are followed by still larger changes in stock prices, causing persistence in stock market volatility as soon as one is generated. This has caused thickening of the returns series for certain periods in the reported markets. Volatility clustering is also noted for the weekly series where price changes of similar directions appear to follow each other. This clustering is seen to have been heightened for these markets during the global financial crises period, thereby suggesting that volatility persistence is strengthened during periods of crises in the sampled markets

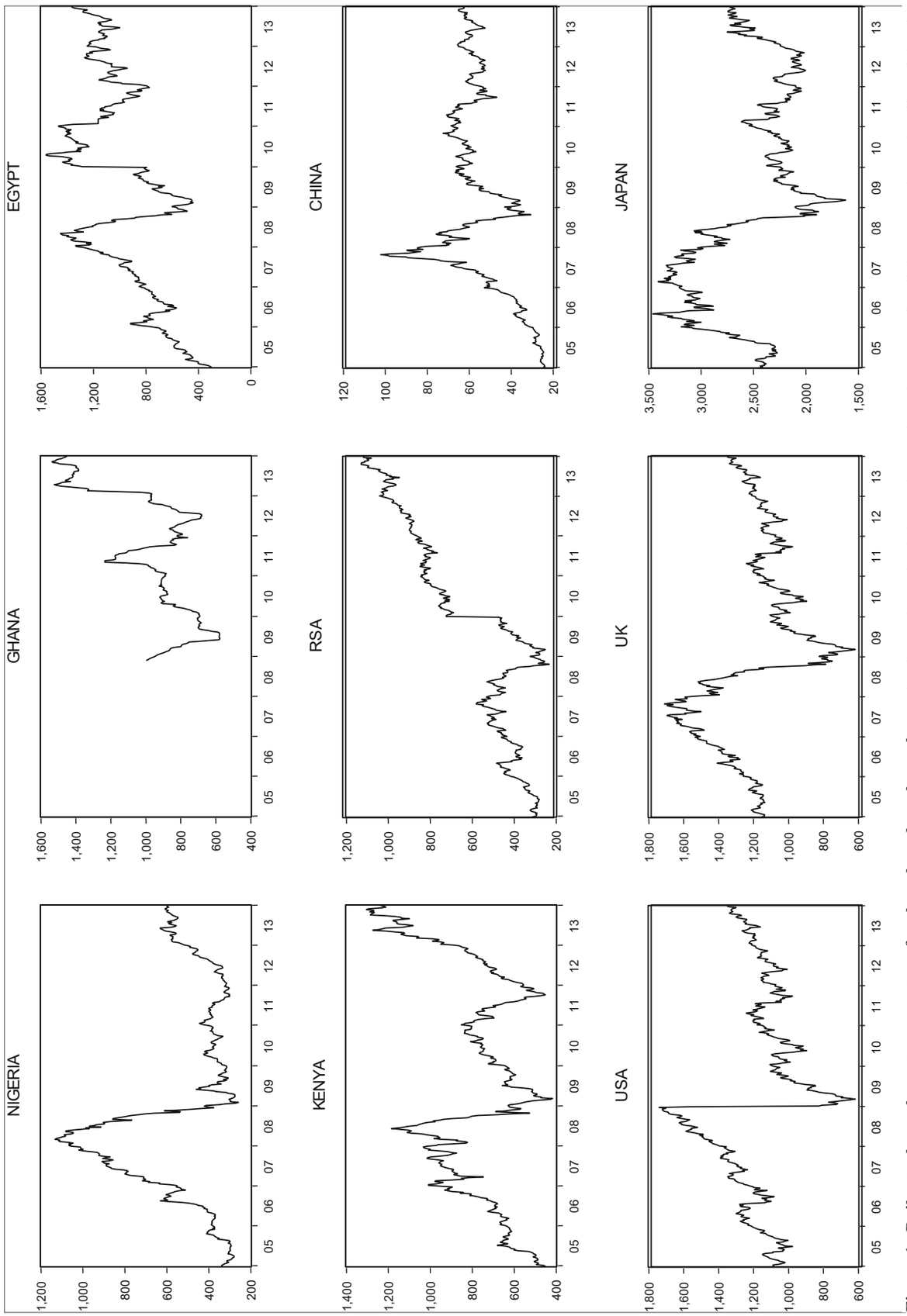


Figure 1a.Daily stock market returns pattern for the selected stock markets. This figure shows the daily trend in stock market returns for all the nine markets. The effect of the global financial crises that began in 2008 is clearly seen in the charts where a sharp drop is shown for the 2008 period. This effect however seems to have been more felt in the Nigerian market. Indeed, the Nigerian market does not appear to have recovered extensively from the shock up till 2013 as the market index is shown to be relatively low in comparison to the prevailing values before the global financial crisis

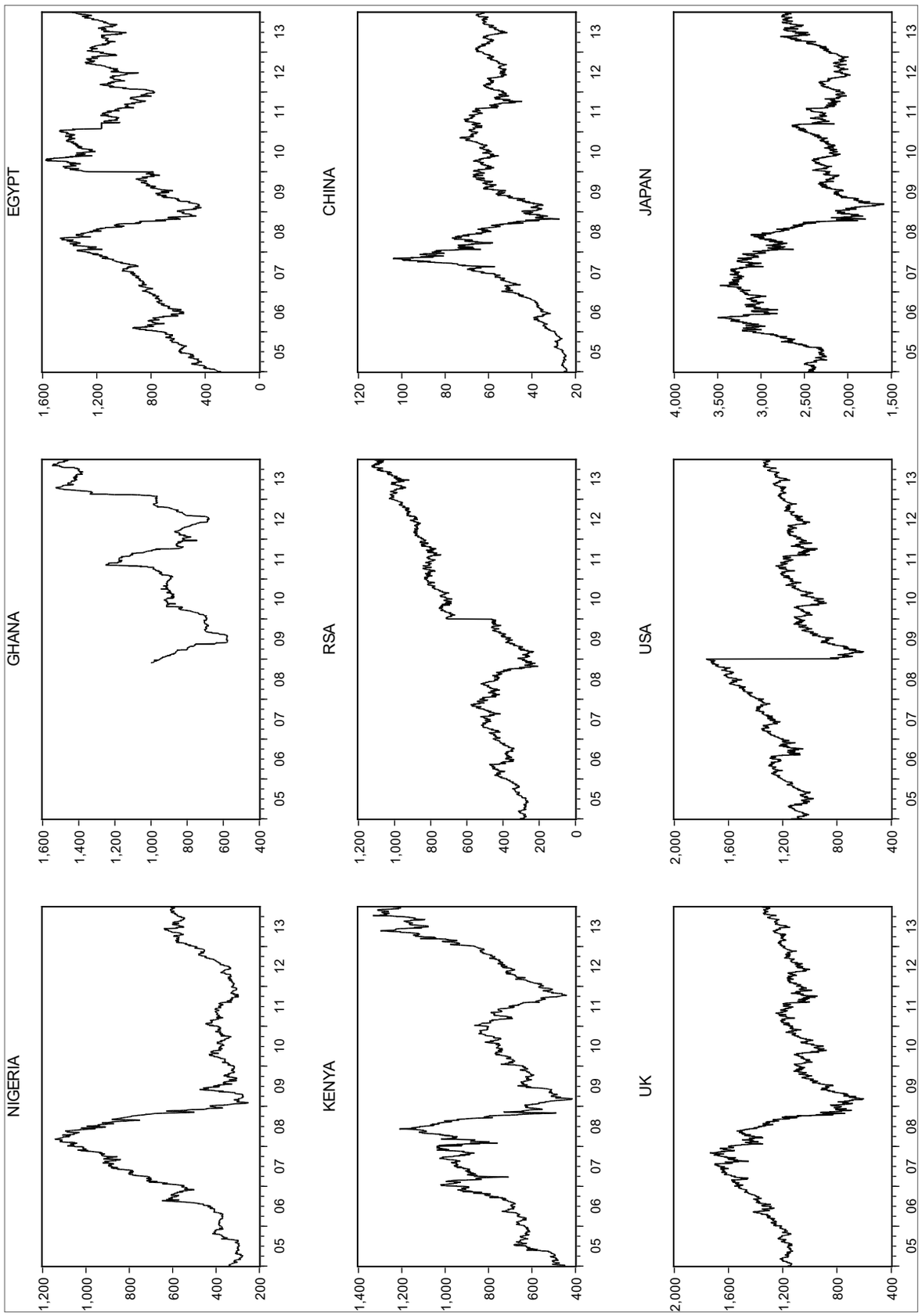


Figure 1b. Weekly stock market returns pattern for the selected stock markets. This figure shows the weekly trend in stock market returns for all the nine markets. The effect of the global financial crises that began in 2008 is clearly seen in the charts where a sharp drop is shown for the 2008 period. This effect however seems to have been more felt in the Nigerian market. Indeed, the Nigerian market does not appear to have recovered extensively from the shock up till 2013 as the market index is shown to be relatively low in comparison to the prevailing values before the global financial crisis

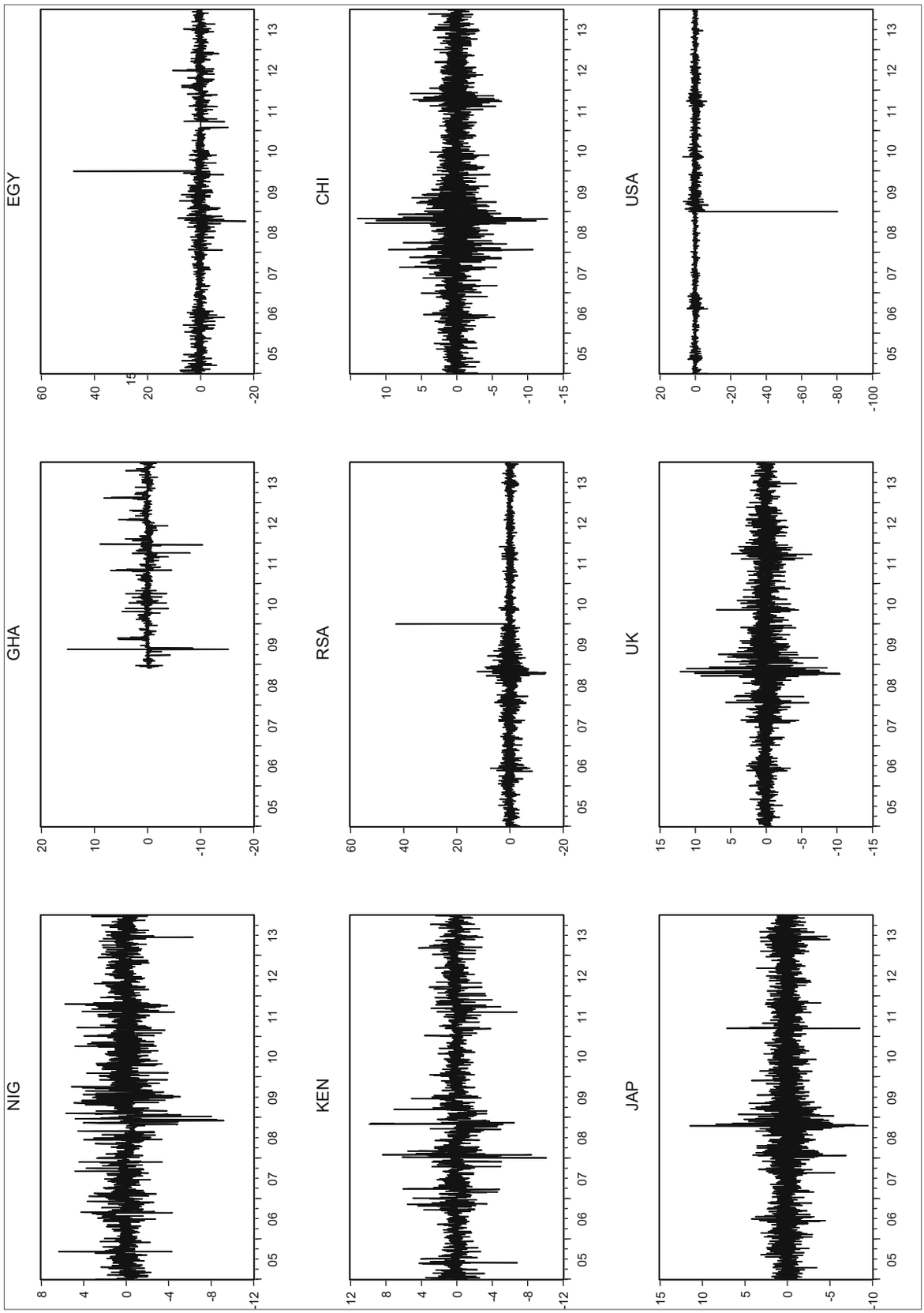


Figure 2a. Daily stock returns series for the selected stock markets. This figure shows the daily stock returns series for the sample period. The returns in the Nigerian stock market clearly show the case of volatility clustering as is the case with the other stock markets. Apparently, large price changes in these markets are followed by still larger changes in stock prices, causing persistence in stock market volatility as soon as one is generated.

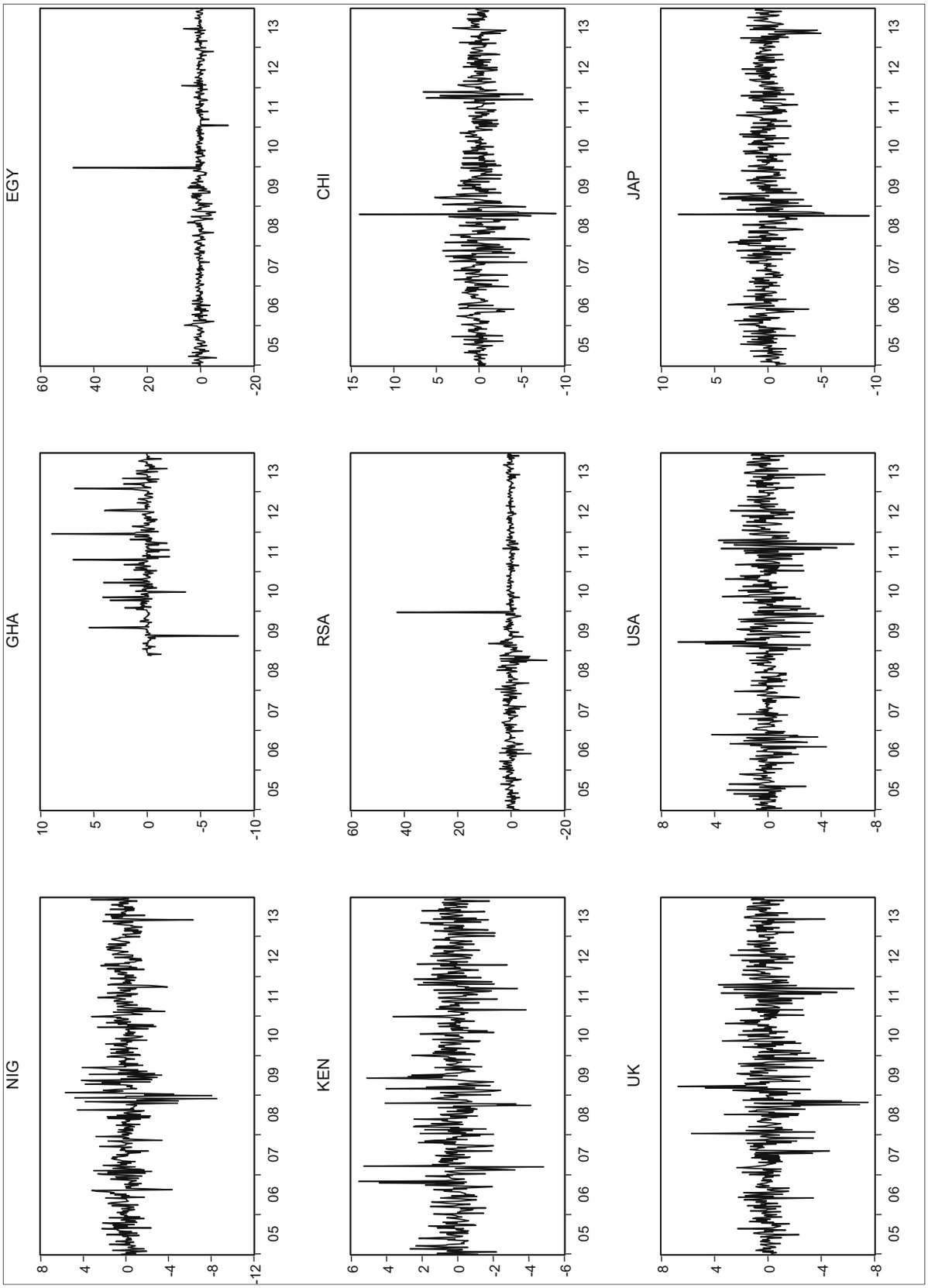


Figure 2b. Weekly stock returns series for the selected stock markets. This figure shows the weekly stock returns series for the sample period. The returns in the Nigerian stock market clearly show the case of volatility clustering as is the case with the other stock markets. Apparently, large price changes in these markets are followed by still larger changes in stock prices, causing persistence in stock market volatility as soon as one is generated.

B. Descriptive Statistics

The summary statistics for the series in the sample for each of the markets is shown in Table Ia and Ib respectively. The average returns for the African market is 0.18 for the weekly returns and 0.06 for the daily returns. These values are higher than those of the world market which have mean return of 0.04 for the weekly and 0.01 for the daily returns. This result indicates that the African markets, being essentially comprised of frontier and emerging markets seems to be more profitable than the developed foreign markets perhaps due to the high volatility inherent in them. Included among the statistics is the Jarque-Bera (J-B) statistic, which may be used to test normality. In particular, the hypothesis of normality is rejected for each of the markets for both daily and weekly return series by applying the Chi-Square distribution test. Further evidence on the nature of deviations from normality may be gleaned from the sample skewness and kurtosis measures. While skewness of each series is always very close to zero (except for Egypt and south Africa), the kurtosis is very large, ranging from 6.52 for the Kenyan market to 194.1 for the African regional market in the weekly series. The kurtoses for the daily returns series are even larger (see Table Ib). The large kurtosis value, indicative of the existence of leptokurtoses, gives strong evidence that extremes are more substantial than would be expected from a normal random variable. In addition, the Ljung-Box portmanteau Q-statistic autocorrelations tests of six lags reject the null hypothesis of no autocorrelation in the standardized residuals in only one case for daily (and none for weekly), and the null hypothesis of no autocorrelation in the standardized squared residuals in four cases for the weekly and daily series.

Table Ia Descriptive Statistics for Weekly Returns

	Chi	***Egy***	***Jap***	***Ken***	***Nig***	***RSA***	***UK***	***USA***	***Gha***	***Africa***	***World***
Mean	0.02	0.25	0.08	0.13	-0.02	0.16	0.01	0.05	0.16	0.18	0.04
Maximum	14.04	47.84	8.42	5.57	5.68	42.87	6.75	6.75	8.95	30.40	5.74
Minimum	-9.04	-10.45	-9.51	-4.84	-8.54	-13.57	-7.51	-6.46	-8.57	-6.38	-5.37
Std. Dev.	1.86	2.76	1.53	1.19	1.49	2.74	1.52	1.37	1.31	1.74	1.17
Skewness	0.40	10.76	-0.43	0.30	-0.74	7.70	-0.72	-0.26	1.61	10.89	-0.36
Kurtosis	11.65	190.06	8.34	6.52	8.36	128.93	7.15	6.14	23.19	194.13	7.80
J-B	1478.327	694333.2	573.63	249.51	605.62	315207	377.10	198.19	4649.06	724653.60	460.93
Q(6)	10.48	2.401	14.71	1.986	2.461	5.248	4.273	1.677	1.153	5.416	6.533
$Q^2(6)$	117.7	0.033	162.5	24.71	150.5	0.053	67.19	62.31	1.031	0.012	7.907

This table presents summary statistics for daily returns of the sampled markets for the period of study.

Table Ib: Descriptive Statistics for Daily Returns

	CHI	***EGY***	***JAP***	***KEN***	***NIG***	***RSA***	***UK***	***USA***	***GHA***	***Africa***	***World***
Mean	0.04	0.07	0.00	0.04	0.02	0.06	0.01	0.01	0.03	0.06	0.01
Maximum	14.04	47.84	11.47	9.90	6.35	42.87	12.16	7.02	15.08	30.40	6.29
Minimum	-12.84	-17.14	-9.51	-10.11	-9.20	-13.57	-10.43	-80.46	-15.26	-7.80	-19.76
Std. Dev.	1.88	2.06	1.44	1.32	1.39	2.00	1.54	2.10	1.27	1.24	1.18
Skewness	-0.02	4.76	-0.19	0.16	-0.22	3.88	-0.11	-23.92	-1.12	5.70	-2.23
Kurtosis	9.98	128.77	8.48	12.86	6.68	96.43	12.09	915.15	59.46	155.42	39.57
J-B	4754.3	1554465	2952.5	9499.7	1342.3	858770.5	8075.14	81518939	176694.2	2283487	132692.6
Q(6)	9.369	5.371	20.45	11.60	5.661	13.91	40.46	6.166	90.79	45.43	27.26
$Q^2(6)$	1221.4	0.279	951.5	740.6	352.3	2.265	1099.1	0.009	369.5	0.053	1.505

This table presents summary statistics for weekly returns of the sampled markets for the period of study

One way of further examining the distribution of the residuals in stock return is to plot the quantiles chart. The quantiles in this study are plotted using the Quantile-Quantile (Q-Q) theoretic plot and are shown in Figure 3a and 3b for daily and weekly stock market returns series respectively. If the residuals are normally distributed, the points in the QQ-plots should lie alongside a straight line. The plots for the daily and weekly returns indicate that basically, both large negative and positive shocks are driving the departure from normality in each of the markets. As shown in the charts, both the upper and lower tails in the plots deviate extensively from the straight lines. Apparently, very large shocks, whether positive or negative tend to degenerate into a series of deviations from long run patterns in the markets. Note that I have modified the QQ-plot slightly by setting identical axes to facilitate comparison with the diagonal line.

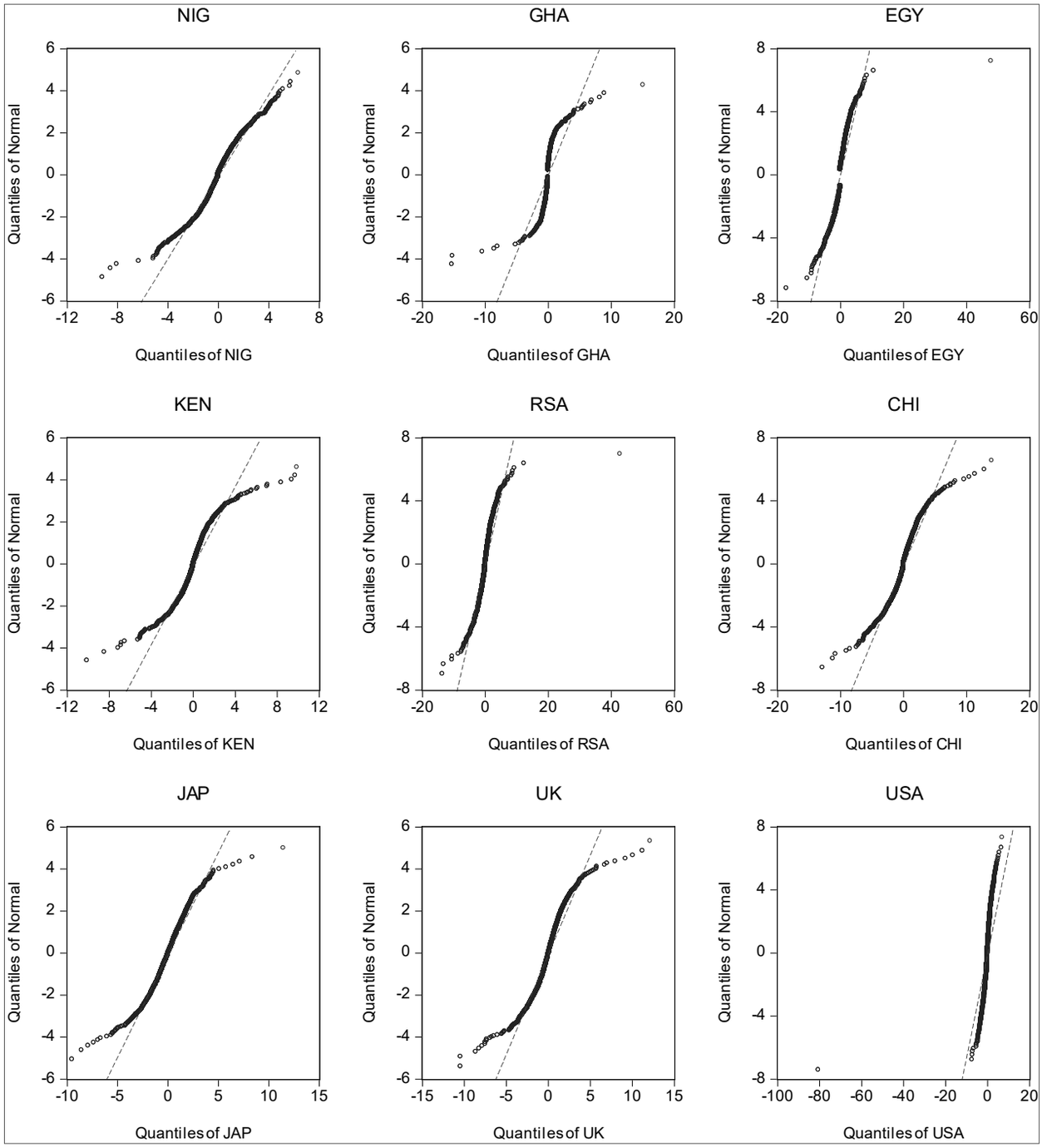


Figure 3a. Quantile plots for daily stock returns. The plots for the daily stock returns indicate that basically, both large negative and positive shocks are driving the departure from normality in each of the markets. As shown in the charts, both the upper and lower tails in the plots deviate extensively from the straight lines. Apparently, very large shocks, whether positive or negative tend to degenerate into a series of deviations from long run patterns in the market**s.**

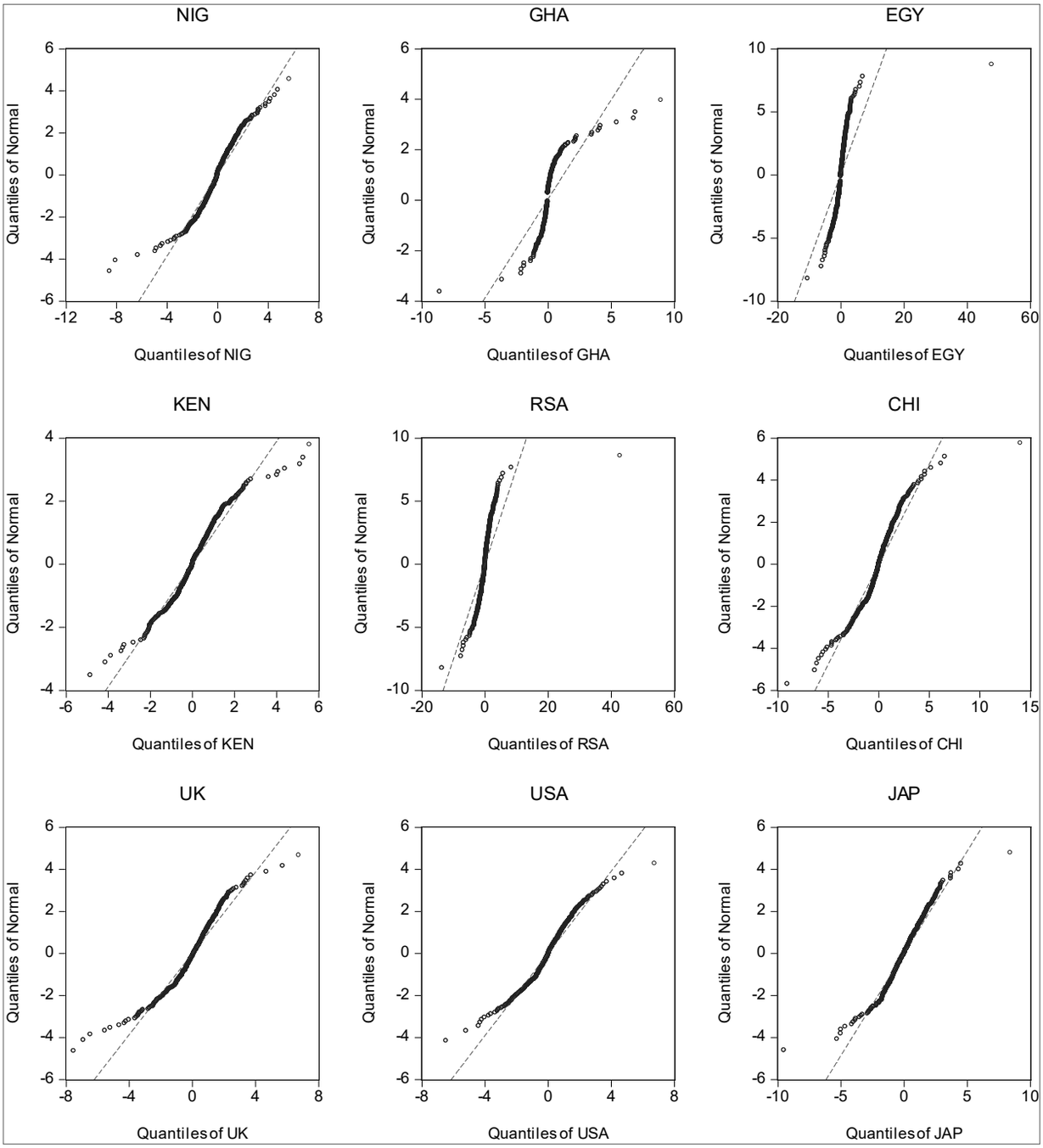


Figure 3b. Quantile plots for weekly stock returns. The plots for the weekly returns indicate that basically, both large negative and positive shocks are driving the departure from normality in each of the markets. As shown in the charts, both the upper and lower tails in the plots deviate extensively from the straight lines. Apparently, very large shocks, whether positive or negative tend to degenerate into a series of deviations from long run patterns in the market

To further examine the background behavioural patterns in the return series, correlation analysis is conducted on the data. The correlation matrices for the weekly and daily return series are reported in Tables IIa and IIb. All the correlation statistic values are positive, indicating that the market returns for the sampled markets tend to essentially move in the same direction over time. These outcomes suggest the existence of some form of preliminary linkages among these markets in terms of returns series. The correlation values for the Nigerian market and other markets are particularly low. For instance, the correlation with African markets is 0.071 for both the weekly and daily returns and 0.038 (for the weekly returns) and 0.58 (for the daily returns) in the case of the world markets. Compared with the other African markets, correlation with the regional markets (for instance Egypt and South Africa), the relationship between the Nigerian market and that of the African regional market is not quite impressive.

Table IIa: Unconditional Correlations Matrix for Weekly Returns

	KEN	*NIG*	*EGY*	*RSA*	*USA*	*UK*	*CHI*	*JAP*	*World*
NIG	0.013								
EGY	0.033	0.046							
RSA	0.047	0.084	0.681						
USA	0.026	0.060	0.061	0.218					
UK	0.068	0.011	0.139	0.507	0.629				
CHI	0.155	0.042	0.196	0.362	0.214	0.428			
JAP	0.048	0.000	0.138	0.261	0.166	0.388	0.582		
World	0.107	0.038	0.186	0.457	0.636	0.805	0.789	0.732	
Africa	0.269	0.071	0.892	0.894	0.152	0.355	0.328	0.221	0.362

This table provides the background behavioural patterns in the return series. The correlation matrices for the weekly return series are reported. All the correlation statistic values are positive, indicating that the market returns for the sampled markets tend to essentially move in the same direction over time. These outcomes suggest the existence of some form of preliminary linkages among these markets in terms of returns series.

Table IIb: Unconditional Correlations Matrix for Daily Returns

	NIG	*KEN*	*EGY*	*RSA*	*USA*	*UK*	*CHI*	*JAP*	*Africa*
KEN	0.034								
EGY	0.064	0.109							
RSA	0.043	0.058	0.369						
USA	0.034	0.022	0.036	0.162					
UK	0.020	0.093	0.145	0.624	0.354				
CHI	0.055	0.111	0.236	0.444	0.120	0.429			
JAP	0.047	0.067	0.181	0.271	0.060	0.236	0.499		
Africa	0.071	0.445	0.789	0.760	0.114	0.447	0.408	0.268	
World	0.058	0.105	0.213	0.536	0.629	0.727	0.744	0.608	0.441

This table provides the background behavioural patterns in the return series. The correlation matrices for the daily return series are reported. All the correlation statistic values are positive, indicating that the market returns for the sampled markets tend to essentially move in the same direction over time. These outcomes suggest the existence of some form of preliminary linkages among these markets in terms of returns series.

C. Tests for Time Series Properties

As part of the preliminary analysis, time series properties of the series in terms of stationarity and heteroskedasticity was also tested for. In the result shown in Table III, all the series are integrated of order zero and are stationary in levels form both for the daily and weekly series. This suggests time-invariant movement in the return series over time. For the ARCH test, the Langragian Multiplier test indicates the absence of ARCH terms for the weekly series for African, World and UK stock market returns and for the daily series of African, World and U.S. stock market returns.

Table I11: Unit root and ARCH-LM Tests

	Nigeria	***Africa***	***World***	***US***	***China***	***UK***	***Japan***
Panel A: Unit Root tests for Weekly stock market returns							
ADF	I[0]	I[0]	I[0]	I[0]	I[0]	I[0]	I[0]
PP	I[0]	I[0]	I[0]	I[0]	I[0]	I[0]	I[0]
Panel B: ARCH-LM test for weekly stock market returns							
	13.51**	0.004	0.038	3.908*	65.85**	1.404	15.73**
Panel C: Unit Root tests for daily stock market returns							
ADF	I[0]	I[0]	I[0]	I[0]	I[0]	I[0]	I[0]
PP	I[0]	I[0]	I[0]	I[0]	I[0]	I[0]	I[0]
Panel D: ARCH-LM test for daily stock market returns							
	214.8	0.005*	0.261*	0.001*	163.4	86.75	113.2

This table presents the Unit Root tests and ARCH-LM tests for both the weekly and daily stock market returns for the markets under study. All the series are integrated of order zero and are stationary in levels form both for the daily and weekly series. This suggests time-invariant movement in the return series over time. Two stars (**) denote statistical significance at the 1% level and one star (*) denotes statistical significance at the 5% level.

D. Univariate Analysis Results

The univariate analysis provides the background on examining the pattern of first moment variations in stock returns. As mentioned in the previous section, the EGARCH and the GJR (Threshold) modelling framework are employed in conducting the univariate analysis. The results of the estimated EGARCH and Threshold ARCH results which were specified in section II of the study, are presented in Table IVa and IVb respectively. The

constant term in the mean equations is significant and positive at 5 percent level of significance for most of the daily series, indicating a general tendency for variability in the returns series. The mean term (ω), in the variance equation results for all the markets, for both daily and weekly data series, is significant at the 5 percent level. This shows that

generally, the position of stock returns at any given period has strong effects on the pattern of volatility in each respective market. Only two of the stock index series exhibited positive mean terms; most of the series have negative mean terms. This indicates that stronger or better returns position in the market tends to reduce volatility amplitudes in the market. If the returns are well positioned, the tendency for volatility generation or persistence is significantly reduced.

The leverage effect (γ) in the output is significant at the 5 percent level of significance for all the markets and stock index series except Nigeria, and also have the correct negative sign in each market. Thus, there appears to be strong asymmetric effect in stock prices; as there seems to be existence of leverage effect in future prices during the sample period. Bad news tends to generate information asymmetry in the markets and could be said to be more destabilising than good news since γ is significantly different from zero. Apparently, arbitrary news generated from outside the system creates distortions in the pattern of return movements in the markets. This result generally suggests that the markets could be susceptible to unfavourable investor reactions due to news from foreign markets. In the case of the Nigerian market, the leverage effect is absent and the market cannot be said to possess asymmetry effects and the market returns tend to remain relatively unchanged irrespective of the nature of news in the system.

The alpha (α) parameter represents the "ARCH" effect and shows the effect of volatility from previous periods. The coefficient of this term is mostly positive and significant for the markets at 1 percent level of significance. This shows the tendency of stock prices gaining an upward slide at any given shock in the markets. The beta parameter (β) measures the persistence in conditional volatility irrespective of anything happening in the market (Alexander and Lazer (2004)). The β term is positive and relatively large (close to 1.0) for most of the market and stock returns series. This shows that volatility in stock market returns takes longer time to wear off following a crisis in the stock markets. This outcome was also implied in the mean equation. The result suggests the presence of volatility persistence in the markets where deep changes in the stock market returns series tend to feed on themselves to generate more volatility over

time. Thus, long term measures must be put in place when addressing short term arbitrary shocks in stock prices in Nigeria and the other sampled stock markets.

The results of the GJR model are similar to those of the EGARCH result as shown in Table IVb. The Nigerian stock market once again exhibits the absence of leverage effect, which is rather surprising considering the pattern of value meltdown experienced in the stock market during the 2008 financial crisis. The γ term represents a deeper effect for the GJR model. It demonstrates the response of conditional volatility in the markets to bad news or good news reaching or emanating from the markets. Only the U.S. daily return series has zero response to news in the market. Moreover, the responses to news in the African markets are generally higher than the world markets. The results also shows that bad news have stronger impacts on stock market returns volatility than good news in the markets as shown by the high values of $\alpha + \gamma$ in Table IVa and IVb respectively.

Table IVa: Univariate EGARCH Results

Variable	***Nigeria***		***Africa***		***Advanced***		***US***		***China***		***UK***		***Japan***	
	Daily	*Weekly*	*Daily*	*Weekly*	*Daily*	*Weekly*	*Daily*	*Weekly*	*Daily*	*Weekly*	*Daily*	*Weekly*	*Daily*	*Weekly*
Constant	0.06*	0.033	0.09**	0.29**	0.04*	0.04	-0.01	0.02	0.07*	-0.05	0.01	-0.01	-0.002	0.17**
ω	-0.27**	-0.185**	-0.06**	1.19**	-0.06**	-0.09**	1.49**	-0.16**	-0.1**	-0.16**	-0.08**	-0.06**	-0.11**	-0.19**
α	0.41**	0.350**	0.1**	-0.55**	0.08**	0.14**	-0.34**	0.26**	0.15**	0.29**	0.11**	0.11**	0.16**	0.29**
γ	-0.01	-0.023	-0.07**	-0.39**	-0.06**	-0.12**	-0.24**	-0.12**	-0.05**	-0.06*	-0.1**	-0.11**	-0.09**	-0.09**
$\alpha + \gamma$	0.4	0.327	-0.07	-0.94	0.02	0.02	-0.58	0.14	0.1	0.23	0.01	0	0.07	0.2
β	0.89**	0.883**	0.99**	0.06	0.99**	0.96**	0.01	0.93**	0.99**	0.95**	0.99**	0.97**	0.97**	0.93**

This table shows the daily and weekly univariate analysis results and background on the pattern of first moment variations in stock returns. EGARCH and the GJR (or Threshold) modelling framework is employed in conducting the analysis. The constant term in the mean equations is significant and positive at 5 percent level of significance for many of the daily series, indicating a general tendency for variability in the returns series. The mean term (ω), in the variance equation results for all the markets, for both daily and weekly data series, is significant at the 1 percent level. This shows that generally, the position of stock returns at any given period has strong effects on the pattern of volatility in each respective market. Two stars (**) denote statistical significance at the 1% level and one star (*) denotes statistical significance at the 5% level.

Table IVb: Threshold GARCH Results

	Nigeria		Africa		World		US		China		UK		Japan	
	Daily	*Weekly*	*Daily*	*Weekly*	*Daily*	*Weekly*	*Daily*	*Weekly*	*Daily*	*Weekly*	*Daily*	*Weekly*	*Daily*	*Weekly*
C	0.03	0.036	0.06	0.17	0.03	0.04	-0.02	0.03	0.05	-0.05	0.02	0.02	0.01	0.16*
Return(-1)	0.32**	-0.047	0.27**	0.04*	0.1**	0.01	-0.04**	-0.04	0.05*	0.00	-0.04*	-0.04	-0.11**	-0.03
ω	0.12**	0.375**	0.34**	0.38**	0.01**	0.06**	0.01**	0.12**	0.04**	0.13**	0.02**	0.09**	0.06**	0.15*
α	0.19**	0.233**	0.23**	-0.004**	0.01	0.01	-0.02**	0.04*	0.04**	0.09*	0.01	0.02	0.02*	0.08
γ	-0.01	0.036	1.49**	-0.04**	0.06**	0.14**	0.02**	0.21**	0.08**	0.09*	0.12**	0.15**	0.12**	0.14**
$\alpha + \gamma$	0.18	0.269	1.72	-0.044	0.07	0.15	0	0.25	0.12	0.18	0.13	0.17	0.14	0.22
β	0.75**	0.579**	0.27**	0.92**	0.96**	0.87**	1.0**	0.79**	0.91**	0.83**	0.92**	0.86**	0.88**	0.78**

This table presents the results of the GJR model. The results are quite similar to those of the EGARCH result in Table IVa. The Nigerian stock market exhibits the absence of leverage effect, which is rather surprising considering the pattern of value meltdown experienced in the stock market during the 2008 financial crisis. The γ term represents a deeper effect for the GJR model. It demonstrates the response of conditional volatility in the markets to bad news or good news reaching or emanating from the markets. Moreover, the responses to news in the African markets are generally higher than the world markets. The results also shows that bad news have stronger impacts on stock market returns volatility than good news in the markets as shown by the high values of $\alpha + \gamma$. Two stars (**) denote statistical significance at the 1% level and one star (*) denotes statistical significance at the 5% level.

E. Multivariate Analysis Results

The results of the estimated multivariate GARCH model using the BEKK procedure is reported in Table Va. As mentioned in section II, volatility transmission from one market to another is measured by considering the second moments of stock returns for the markets. The BEKK estimates report both the within-market volatility and between market volatility in the case of Nigeria and other African markets. In the result, the world equity markets are proxy by an aggregate of four leading markets in the world as well as the individual markets from some of the leading world equity markets. Due to high similarity in the results obtained from both the daily and weekly stock market returns series, only the results for the daily returns series are reported in this section.

In the results, the first column in Table Va shows the markets to which volatility in Nigerian stock market returns respond to. For instance, the first cell shows response of returns volatility in the Nigerian market to African and world volatility. In the African and world markets results, a_{11} is not significant; indicating that news of volatility within the African market may not be a very potent factor in generating volatility extensively. The g_{11} coefficient is however very significant (at 1 percent level) and positive which implies the existence of volatility persistence in the Nigerian markets.

In terms of transmission from the African regional markets to the Nigerian market (a_{12}), the coefficient is not significant while that of volatility persistence (g_{12}) passes the significance test. This result shows that volatility transmission from the African markets do not necessarily generate volatility in the Nigerian market, rather, it only fuels the persistence of volatility in the Nigerian market. In the same vein, the results indicate that volatility in the Nigerian market does not transmit volatility directly into the other African market; rather it is the persistence of volatility that is transmitted into the regional markets. For the transmission of volatility from world equity markets to Nigeria, a_{13} also fails the significance test while g_{13} passes the test at the 1 percent level. This is similar to the African market results and shows

that volatility transmission from the world markets to Nigeria is more related to persistence of volatility in the Nigerian market. It is also noted in the results that the g_{ij} coefficients are very high and close to one in most cases. This suggests that transfer of persistence of volatility from the regional and world markets to the Nigerian market is very deep and profound.

Volatility transmission among the world market, and the Nigerian market; as well as among African and Nigerian market, reports significant a_{11} coefficients. These suggests that the proportion of volatility in the Nigerian market that is attributable to internal forces or changes in market fundamentals tends to increase also when the influences of the world and regional markets on the Nigerian market is reduced. Volatility transmission is also high for both the Nigerian and African markets. Indeed a_{12} is significant for the African market result which indicates more accurately that Nigerian market tends to generate volatility in the regional African markets. The volatility persistence transmission coefficient is however small for the African market (0.426), but high for the world market result. Apparently, the persistence transfer is more pronounced through the world equity markets than the African regional markets.

Surprisingly, the world equity market volatility transfer results using individual foreign markets as proxy shows that the Chinese market performed better in the estimation. This result indicates that volatility transmission from China to Nigeria may be more effective and persistent than the other world equity markets used in the study. Therefore, the proportion of volatility attributable to the influences from the Chinese market may be higher than the other markets. For the results on the transmission of volatility among the world equity markets; and the African regional markets, shown in Table Vb, similar outcomes to that of Nigeria is found. The results show that volatility transmission from world to African markets is more related to persistence than to generation of the volatility. This shows that internal market mechanisms could be more responsible for volatility generation in the African market than the foreign markets.

Table Va: Parameter Estimates for Variance-Covariance Equations in the BEKK Model (Nigerian Market)

Market	a_{11}	g_{11}	a_{12}	g_{12}	a_{13}	a_{13d}	$a_{13}+a_{13d}$	g_{13}	g_{13d}	$a_{13}+g_{13d}$	a_{12d}	$a_{12}+a_{12d}$	g_{12d}	$g_{12}+g_{12d}$
World and Africa	*0.0007*	*0.928***	*0.0006*	*0.928***	*0.005*	*0.034*	*0.038*	*0.773***	*0.002*	*0.775*	-	-	-	-
World alone	*0.001***	*0.956***	*0.016*	*0.809***	-	-	-	-	-	-	*0.004*	*0.02*	*0.019***	*.828***
Africa alone	*0.127***	*0.259***	*0.164***	*0.426***	-	-	-	-	-	-	*0.242*	*0.406*	*0.016***	*0.432*
USA	*0.0005*	*0.595*	*0.003*	*0.635***	-	-	-	-	-	-	*-8.5E-6*	*0.595*	*-0.001*	*0.636***
China	*0.016***	*0.923***	*0.06***	*0.794***	-	-	-	-	-	-	*0.086***	*0.146*	*0.027*	*0.821*
UK	*0.0002*	*0.926*	*-0.007*	*0.795***	-	-	-	-	-	-	*0.01*	*0.003*	*0.123***	*0.915*
Japan	*0.002*	*0.887***	*-0.021*	*0.776*	-	-	-	-	-	-	*0.146***	*0.125*	*0.019*	*0.795*

This table presents the results of the estimated multivariate GARCH model using the BEKK procedure. Volatility from one market to another is measured by considering the second momentsof stock returns for the markets. The BEKK estimate report both the within market volatility and between market volatility in the case of Nigeria and the other market. Two stars (**) indicates significance at 1 percent level and one star (*) indicates significance at 5 percent level.

Table **Vb: Parameter Estimates for Variance-Covariance Equations in the BEKK Model (African Market)**

Market	a_{11}	g_{11}	a_{12}	g_{12}
World and Africa	*0.0007*	*0.928***	*0.004*	*0.773***
Nigerian	*0.127***	*0.259***	*0.164***	*0.426***

This table presents the parameter estimates for variance-covariance equations in the BEKK model. The results show that volatility transmission from world to African markets is more related to persistence than to generation of the volatility. Two stars (**) denote statistical significance at the 1% level and one star (*) denotes statistical significance at the 5% level.

Further to the BEKK estimates shown in Table Va and Vb, the Wald coefficient test to examine volatility transmission indicators among the various markets in the analysis, was conducted. The Wald test, which is approximately distributed in the Chi-Square format, is shown in Table VI. A closer examination of the results shows that the hypothesis of volatility transmission between pairs of markets and among the three market series cannot be rejected. The first three columns show these volatility transmission tests for the estimated coefficients. None of the markets fails the Chi-Square test of significance and this clearly proves transmission of volatility among the markets. I then extend the test of volatility among the markets to show whether contagion may be demonstrated in the results and behavioural patterns of volatility among the markets. The last three columns in Table VI report the Wald coefficient tests for contagion. Except for China which just passes the significance test at the 5 percent level, the results in the BEKK model clearly indicates the nonexistence of contagion among the Nigerian, regional African and world equity markets. These results show that the presence of contagion effect on the Nigerian market arising from the 2008 financial crisis cannot be proven in this study.

F. Hypotheses Tests

Hypothesis I

From the coefficients of volatility transfer in the BEKK results of Table VIa and VIb, all the coefficients are majorly positive and mostly significant at either 1 or 5 percent level of significance; especially in terms of volatility transfer from the world and regional African stock markets to the Nigerian stock market. So the null hypothesis is rejected, and the alternative hypothesis that information driven shocks emanating from the sampled stock markets tend to increase the inherent volatility in the Nigerian stock market, is accepted. This outcome can be considered as an indication of the existence of volatility transmission from the African and world equity markets to the Nigerian market.

Table VI: Wald Test of Restrictions

	$a_{12} = a_{13} = a_{23} = g_{12} = g_{13} = g_{23} = 0$ *Volatility Transmission Among World, Regional African and Nigerian markets*	$a_{13} = g_{13} = 0$ *Volatility Transmission Among World Market and Nigerian Market*	$a_{12} = g_{12} = 0$ *Volatility Transmission Among individual External Markets and Nigeria*	$a_{12d} = a_{13d} = a_{23d} = g_{12d} = g_{13d} = g_{23d} = 0$ *Contagion Among World, African and Nigerian Markets*	$a_{13d} = g_{13d} = 0$ *Contagion Among World and Nigerian Markets*	$a_{12d} = g_{12d} = 0$ *Contagion Among African and Nigerian Markets*
World and Africa	70517.3**	6.36*	-	4.58	4.01	-
World alone	-	-	784179**	-	-	5.31
Africa alone	-	-	594**	-	-	0.52
USA	-	-	508.4**	-	-	0.516
China	-	-	588.9**	-	-	7.13*
UK	-	-	419.4**	-	-	1.33
Japan	-	-	634.2**	-	-	0.735

This table shows the Wald coefficient test to examine volatility transmission indicators among the various markets in the analysis. The Wald test, a test of robustness, is approximately distributed in the Chi-Square format. An extension of the Wald test is targeted at testing for volatility among the markets to show whether contagion may be demonstrated in the results, as well as; provide information on the behavioural patterns of volatility among the markets. Two stars (**) denote statistical significance at the 1% level and one star (*) denotes statistical significance at the 5% level.

Note: $a_{12} = a_{13} = a_{23} = g_{12} = g_{13} = g_{23} = 0$; $a_{13} = g_{13} = 0$; $a_{12} = g_{12} = 0$; $a_{12d} = a_{13d} = a_{23d} = g_{12d} = g_{13d} = g_{23d} = 0$; $a_{13d} = g_{13d} = 0$; $a_{12d} = g_{12d} = 0$ represents the three zero constraints imposed on the Diagonal BEKK (1, 1, 1) model parameters, which are for the current study, no longer relevant in the determination of volatility transmission, spill-over and contagion among the sampled stock markets.

Hypothesis II

The result of the BEKK model and the Wald coefficient test in Tables Va, Vb and VI indicates that transmission of volatility from the Nigerian market to both world and African markets, in very weak form exist. However, the pattern of volatility transmission is that of persistence. It is when volatility persists in the Nigerian stock market, that it is transmitted to the other markets. In particular however, the transmission of volatility from the Nigerian to the African market is rather very weak.

Hypothesis III and IV

For hypotheses III and IV, I consider the conditional correlations among the three sets of markets in the analysis with respect to the financial crises period which marked a period of higher volatility in international equity markets. Table VII show the F statistic test that examines the shift in the conditional correlations among the markets arising from the periods of higher volatility. The results show that a significant shift occurred in the conditional correlations of the variances of stock returns among Nigeria and all the other markets except that of the African region. This result indicates that higher volatility in the world markets when aggregated or considered individually causes a significant structural break and a change in the pattern of conditional correlations among the Nigerian market and the world market, but does not cause any significant change for the conditional correlations among the Nigerian and African markets. This is indicative of the existence of volatility spill-over among the Nigerian and world equity markets. The insignificant change in the conditional correlations is further buttressed by the average conditional correlation table for crises and non-crises periods in Table VIII.

Table VII: Test of conditional correlation shifts among markets during the 2008 financial crises

Conditional Correlation	F-value	Probability
World and Africa	299.816	.000
World and Nigeria	71.668	.000
Africa and Nigeria	.000	.996
U.S.A and Nigeria	85.914	.000
China and Nigeria	103.527	.000
U.K. and Nigeria	444.032	.000
Japan and Nigeria	147.146	.000

This table shows the F statistic test that examines the shift in the conditional correlations among the markets arising from the periods of higher volatility. The results show that a significant shift occurred in the conditional correlations of the variances of stock return

Table VIII: Conditional correlations (crises and non-crises period)

	World	***Africa***	***USA***	***China***	***Japan***	***UK***
Non-crises	0.081	0.103	0.038	0.092	0.053	0.057
Crises	0.064	0.103	0.023	0.047	0.034	0.033

This table presents the average conditional correlations for the sampled markets. The result shows that the conditional correlations among the Nigerian market and that of other African markets did not change with respect to the crisis period.

Table VIII, shows the average conditional correlations for the sampled markets. The conditional correlations among the Nigerian market and that of other African markets did not change with respect to the crisis period. The value, though relatively high (0.103 or 10.3 percent), remains unchanged for the two periods. For the other markets, conditional correlations were affected for the period of the crisis. This result has implications also for contagion effect.

In the case of the African market, the null hypothesis cannot be rejected since the shift effect is insignificant for the conditional correlations. This result invariably implies that essentially, integration among the African regional markets is quite weak and may not be profound enough to guarantee volatility spill-over among the markets. However among the Nigerian and world equity markets, the alternative hypothesis that the correlations between asset returns are significantly higher during periods of higher volatility which are often associated with a financial crisis, is accepted. Contagion effect which occurs in crises periods was captured with a dummy variable in the BEKK model. The results also clearly reject the hypothesis of contagion among the Nigerian, regional African and world equity markets. Hence, the hypothesis that here is no significant volatility contagion effect among Nigeria and other African stock markets; arising from the recent global financial crisis is accepted.

VI. IMPLICATIONS AND CONCLUSIONS

This paper examines the extent of volatility transmission, spill-over and contagion among Nigeria, some selected African and world equity markets. The results show the existence of volatility transmission among the sampled markets and non existence of spill-over effect particularly among the African markets. In addition the findings did not confirm the existence of volatility contagion among the African markets arising from the recent global financial crisis. One possible explanation of this occurrence is that African markets are yet to be fully integrated both regionally in Africa and globally as volatility in these stock markets are much more as a result of local market fundamentals than as a result of global shocks due to changes in global financial market fundamentals.

The findings of this study have important implications for policy and portfolio diversification. First, the existence of some form of volatility linkages among Nigeria, regional African and world equity markets could be an indication that as the markets get more integrated, there may be a gradual decline in the potential benefits from international

equity diversification among the markets. Second, the fact that volatility from the world equity markets are quickly transmitted into the Nigerian and African stock markets should be of concern for policy makers as volatility affects financial stability. Volatility transmission from the world stock markets to the African markets could be harmful during periods of financial crises. If such harmful volatility is transmitted into the African stock markets, it could, in turn, be transmitted into other domestic markets like the money market and foreign exchange markets, which could in turn threaten the stability of the domestic financial system as a whole. Therefore, there is a need for policy makers to keep a watchful eye on the behaviour of volatility, especially in other African and major world equity markets in order to prevent or at best curtail negative investors sentiment that often plague frontier and emerging markets during periods of financial crises. While it is often difficult to prevent incidences of volatility transmission, spill-over and contagion, one way of minimising its effect is to ensure that there is a stable domestic macroeconomic and political environment.

Another way of mitigating the adverse effects of volatility transmission, spill-over and contagion is for African economies to diversify and be less dependent on natural resources, in its crude form, as a major source of national income. A diversified economy often is characterised by a more robust and stable financial system that is capable of mitigating the effects of negative external shocks while at the same time able to capitalise on any positive external shocks emanating from foreign markets. Although, this study has focused on one financial market (the stock market), it is important to note that other financial markets, such as the money, and foreign exchange markets, also offer potentials for diversification and are also important for financial stability. Thus, I recommend that similar studies be undertaken for these financial markets so as to complement the current study in the quest for ways to improve financial stability and investment strategies in African markets.

This study examined the extent of volatility transmission, spill-over and contagion among Nigeria, some selected African and world equity markets. It examined five major regional African and four major world equity markets that cut across Asia, Europe and North

America. The results showed that there was volatility transmission among the sampled markets and that there was no spill-over effect particularly among the African markets. In addition the findings did not confirm the existence of volatility contagion among the African markets arising from the recent global financial crisis. One possible explanation of this occurrence is that African markets are yet to be fully integrated both regionally in Africa and globally as volatility in these stock markets are much more as a result of local market fundamentals than as a result of global shocks due to changes in global financial market fundamentals. The findings of this study have important implications for policy and portfolio diversification. Firstly, the existence of some form of volatility linkages among Nigeria, regional African and world equity markets could be an indication that as the markets get more integrated, there may be a gradual decline in the potential benefits from international equity diversification among the markets. Secondly, the fact that volatility from the world equity markets are quickly transmitted into the Nigerian and African stock markets should be of concern for policy makers as volatility affects financial stability. Volatility transmission from the world stock markets to the African markets could be harmful during periods of financial crises. If such harmful volatility is transmitted into the African stock markets, it could, in turn, be transmitted into other domestic markets like the money market and foreign exchange markets, which could in turn threaten the stability of the domestic financial system as a whole. Therefore, there is a need for policy makers to keep a watchful eye on the behaviour of volatility, especially in other African and major world equity markets in order to prevent or at best curtail negative investors sentiment that often plague frontier and emerging markets during periods of financial crises. While it is often difficult to prevent incidences of volatility transmission, spill-over and contagion, one way of minimising its effect is to ensure that there is a stable domestic macroeconomic and political environment.

REFERENCES

Alexander Carol, and Emese Lazer, 2004, The equity index skew, market crashes and asymmetric normal mixture GARCH, ICMA Centre Discussion paper no 2004-13, Reading University.

Alhassan, Abdulsalam, 2006, Prospects for international portfolio diversification: Linkages between the Ghanaian equity market and the world's major markets, *The African Finance Journal* 8, 1-13.

Baele, Lieven, 2007, Volatility spillover effects in European equity markets, *Journal of Financial and Quantitative Analysis* 40, 373-401.

Beirne, John, Guglielmo M. Caporale, Marianne Schulze-Ghattas, and Nicola Spagnolo, 2009, Volatility spillovers and contagion from mature to emerging stock markets, Working paper Series no. 1113, European Central Bank.

Bekaert, Geert, and Campbell R. Harvey, 1997, Emerging equity market volatility, *Journal of Financial Economics* 43, 29-77.

Bekaert, Geert, Campbell R. Harvey, and Angela Ng, 2005, Market integration and contagion, *Journal of Business* 78, 39-69.

Belke, Ansgar, and Thorsten Polleit, 2009, *Monetary Economics in Globalised Financial Markets* (Springer-Verlag, Berlin-Heidelberg).

Bob-Osaze, Esosa, 2007, *Capital Markets: African and Global* (The Book House Company, Lagos).

Bob-Osaze, Esosa, 2011, The specificities of value melt-down in the Nigerian Stock Exchange 2008-2010: Some Parallax snaps, Security and Exchange Commission (SEC) professorial endowed lecture Series no. 1, University of Benin.

Calvo, Guillermo A., 2004, *Contagion in Emerging Markets: When Wall Street is a Carrier* (International Economic Association (IEA) Book Series, Palgrave Macmillan, London).

Caporale, Guglielmo M., Nikitas Pittis, and Nicola Spagnolo, 2006, Volatility transmission and financial crisis, *Journal of Economics and Finance* 30, 376-390.

Christiansen, Charlotte, 2007, Volatility-Spillover effects in European bond markets, *European Financial Management* 13, 923-948.

Cifarelli, Giulio, and Paladino Giovanna, 2005, Volatility linkages across three major equity markets: A financial arbitrage approach. *Journal of International Money & Finance* 24, 413-439.

Dean, James W., 2009, *Paradoxes of the global financial meltdown*, 5th ARTNeT Capacity Building Workshop for Trade Research Bangkok, June.

Eichengreen, Barry, 1999, *Towards a New International Financial Architecture: A Practical Post-Asia Agenda* (Institute for International Economics, Washington D.C.).

Engle, Robert, and Kenneth F. Kroner, 1995, Multivariate simultaneous generalized ARCH. *Econometric Theory* 11, 122-150.

Eriki, Peter O., and Eseoghene J. Idolor, 2010, The Behaviour of stock prices in the Nigerian capital market: A Markovian analysis, *Indian Journal of Economics and Business* 9, 675 – 694.

Eun, Cheol S., and Sangdal Shim, 1989, International transmission of stock market movements, *Journal of Financial & Quantitative Analysis* 24, 241-256.

Forbes, Kristin J., and Roberto Rigobon, 2002, No contagion, only interdependence: Measuring stock market comovements, *The Journal of Finance,* 57, 2223-2261.

Gujarati, Damodar N., 2005, *Basic Econometrics* (Tata McGraw-Hill, New Delhi).

Humavindu, Michael, and Christos Floros, 2006, Integration and volatility spillovers in African equity markets: evidence from Namibia and South Africa, *African Finance Journal* 8, 31-501.

Idolor, Eseoghene J., 2014, Volatility transmission among Nigeria, some selected African and world equity markets, Unpublished Doctoral Dissertation, University of Benin.

In, Francis, 2007, Volatility spill-overs across international swap markets: The US, Japan, and the UK, *Journal of International Money and Finance* 26, 329-341.

Kaminsky, Graciela L., and Carmen M. Reinhart, 2002, Financial markets in times of stress. *Journal of Development Economics* 69, 451-470.

Karolyi, G. Andrew, and Rene M. Stulz, 1996, Why do markets move together? An investigation of US.–Japan stock return comovements, *Journal of Finance* 51, 951-986.

Koch, Paul D., and Timothy W. Koch, 1991, Evolution in dynamic linkages across daily national stock indexes, *Journal of International Money and Finance* 10, 231-251.

Kodres, Laura E., and Mathew Pritsker, 2002, A Rational expectations model of financial contagion, *Journal of Finance* 57, 769-799.

Koutmos, Gregory, and Geoffrey G. Booth, 1995, Asymmetric volatility transmission in international stock markets, *Journal of International Money and Finance* 14, 747-762.

Mabvuto, Mumba, 2011, Analysis of volatility spillover effects between the South African, regional and world equity markets, Unpublished Master's Thesis, Rhodes University.

Nelson, Daniel B., 1991, Conditional heteroskedasticity in asset returns: A new approach, *Econometrica* 59, 347–370.

Ng, Angela, 2000, Volatility spillover effects from Japan and the U.S. to the Pacific-Basin, *Journal of International Money and Finance* 19, 207-233.

Nicole, Boyson M., Christof W. Stahel, and Rene M. Stulz, 2010, Hedge fund contagion and liquidity shocks, *The Journal of Finance* 65, 1789 – 1816.

Omachonu, John, 2009, How Over-ambition and Weak Regulation Wrecked Banks, *Business Day* 8, 1-4.

Piesse, Jenifer, and Hearn Bruce, 2002, Equity markets integration versus segmentation in the three dominant markets of the Southern African customs union: Cointegration and causality tests, *Applied Economics* 34, 1711-1722.

Pretorius, Anmar, and Jesse De Beer, 2004, Contagion in Africa: South Africa and a troubled neighbour, Zimbabwe. *Economic Modelling* 21, 703-717.

Rajan, Raghuram G., and Luigi Zingales, 1995, What do we know about capital structure? Some evidence from international data, *The Journal of Finance* 50, 1421 – 1460.

Rogoff, Kenneth, 1999, International institutions for reducing global financial instability, *Journal of Economic Perspective*s 13, 21-42.

Silver Bird News, 2009, *Central Bank Governor's address to active market participants in the Nigerian Stock Exchange*, September 16.

Todorov, Galin K., 2012, A study of stock market linkages between the US and frontier markets, Unpublished Doctoral Dissertation, Florida International University.

LEVERAGING ECONOMIC GROWTH: A SWOT ANALYSIS

Sudhanva V. Char

Adjunct Professor, Biostatistics
Life University
Marietta, GA 30060

schar@life.edu

JEL Classification: B1-B3, O2, Q5

LEVERAGING ECONOMIC GROWTH: A SWOT ANALYSIS

ABSTRACT

India accounted for 30 percent or more of World GDP a little over a thousand years ago, a level no other country has attained anytime in history. Then came China's rise, and the pillages and plunders of invaders who literally raided India. The European colonizers came soon thereafter, continuing the loot of India more systematically. Today China has made up for lost growth and has emerged as the second largest economy in the world. India, under a democratic political framework with some devious and corrupt political actors, is struggling to make progress. The last five years has witnessed much nationalistic fervor and generated new hopes of capturing the ancient and historic economic aura and governance, and making more swift progress plausible despite COVID-19. This SWOT analysis, lists and discusses factors that encourage entertaining hopes of rapid growth. It also highlights constraints shackling even modest progress. Inspiring leadership can help realize the inner economic tiger that could enable a 10-12% annual growth for at least next ten years.

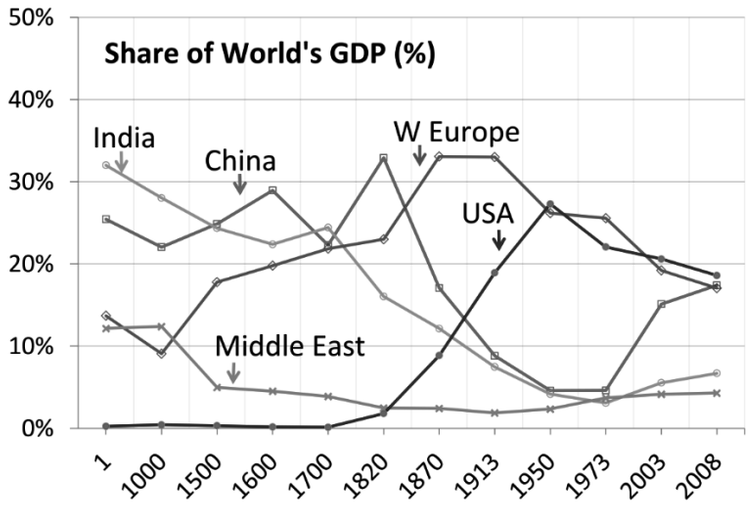
Key Words: World GDP Share, Indian Economic Growth, COVID-19

JEL Classification: B1-B3, O2, Q5

INDINA ECONOMY: THE MILLENNIAL PERSPECTIVE

Indian economy will be at least *Numero Tres* in terms of size of nominal Gross Domestic Product (GDP) right in our own generation if India continues to thrive as a fast growing nation state. And thereafter, if communist China and capitalist-oriented mixed economy of USA are not up to their boast, India will be *Numero Uno* like in fact it was, before the invasions and pillages of the past 1000 years. Past economic growth is meticulously tracked of by Nobel laureate economist Angus Maddison in his *magnum opus "The World Economy: A Millennial Perspective."* (Development Center, OECD 2001.) This paper looks at some ground realities that counsel us to regard such a prodigious exhilarating economic future about India's GDP with a heavy dose of skepticism. Also it looks at factors that encourage us **not** to dismiss such a majestic scenario as sheer naïveté because profound change is taking place in recent years giving even critics a glimpse of India's potentials.

Fig. 1 Maddison Retrospective and Perspective on India



Source: *Angus Maddison 2001*

JEL Classification: B1-B3, O2, Q5

India's emergence as a world power is plausible because a) the nation has been one such in the past and b) growing the economy swiftly is well within its capabilities. What is noteworthy in Fig.1 is India's position as *Numero Uno* accounting for 30% of world GDP up until 1500 AD, and as *Numero Secundus* accounting for 25% till 1700. Thereafter invasions and colonialism dragged India's share down to 5% in 1973. Other historical factors and colonialism pulled down China's likewise (after 1870) down to the same level. Like China, India too is waking up to its true capability and potential after a long recuperation period. Nationalist self-esteem has again been welling up, egging on the populace to go for rapid economic growth at least till the basic needs like drinking water, food, clothing and shelter, health and wellness, education and a decent standard of living are reached to all citizens. Fig.2, again from Maddison, projects GDP growth till 2030 and shows a convergence of the GDPs of USA, China and W. Europe in 2008. W. Europe's share in world GDP starts to go down after 1950. This is mainly the European Union which is a group of countries and not a single sovereign state. That would leave India in the third position albeit at an unimpressive zig-zaging GDP growth touching $10 T, which is double the envisaged $5 T for 2024-25. Of course, in terms of purchasing power parity (PPP), India is already there, ranking third after USA and China. From $5T to get to $10T, effective 2025, the growth rate would have to be about 12 to 14%, which is within capabilities if all growth factors coalesce. India's economic future is riding on the materialization of swift growth. Ill-advisedly, all factors, in particular political cohesion for growth, are not coalescing and not leveraging the nationalistic zeal for rapid progress.

12% Growth

Fig. 3 projects what could emerge if Indian economy were to grow from now on at a steady fast clip as per the compounding Rule of 72. In the milieu that India finds itself today with a relatively slow 4.5% growth in the third quarter of 2019 some nay-sayer will say, all bets for economic growth are off. However, matter of fact, both framing and confirmation bias need to be avoided. What would be somewhat confounding about future growth are disagreements with not even a

modicum of consensus on how to attain rapid inclusive growth. Some economists have still to accept that social wellbeing is more important than economic wellbeing, even as one targets total wellbeing. This makes one feel it is sheer naiveté to think of achieving the 12% rate imperatively needed to attain the targeted GDP and provide jobs to the unemployed millions in the working age population. And besides GDP there is also the intriguing prospect of not going by herd instinct and settling instead for Gross Domestic Happiness (GDH) after the $5 T GDP stage, pulling India out of the GDP rat race.

Wrangling for power, Tammany Hall politics, and obstruction of progressive economic policies, could only beget a subdued default rate of growth like now. Even this would be uncertain given the angst (or good cheer as of now) about oil prices, water shortage, global warming and cognitive dissonance about diminishing carbon foot print, tit-for-tat tariff build up, world trade problems, and frightening population growth and more recently COVID-19 logjam. In such a dystopian scenario, the 2018-36 growth blueprint for India's GDP is a humdrum hyperbole.

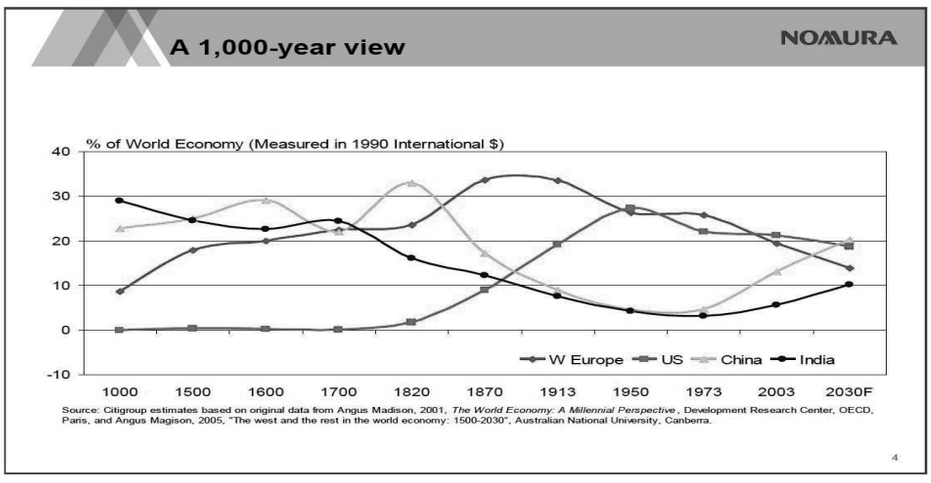
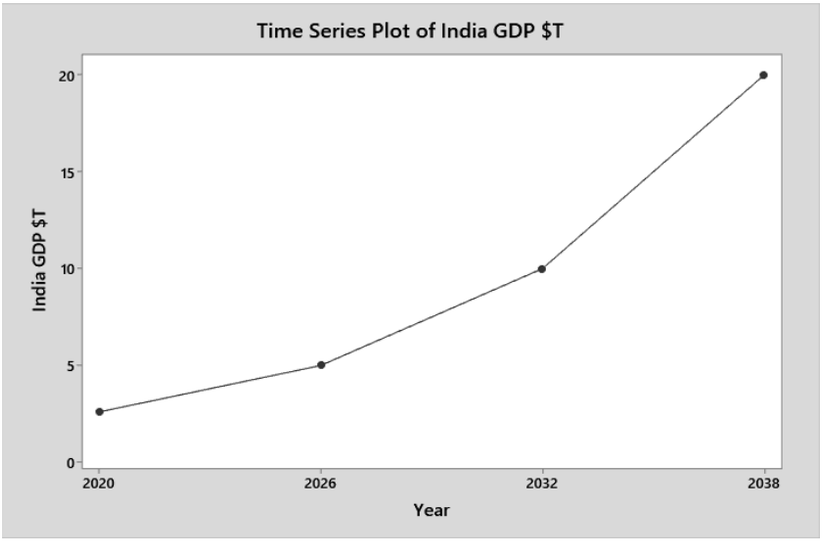


Fig. 2 Maddison-Nomura 1000-2030 Projections for Four Economies

Fig.3: India's GDP Doubling thrice during 2018-36 as per Rule of 72 Projections, in Tn. $



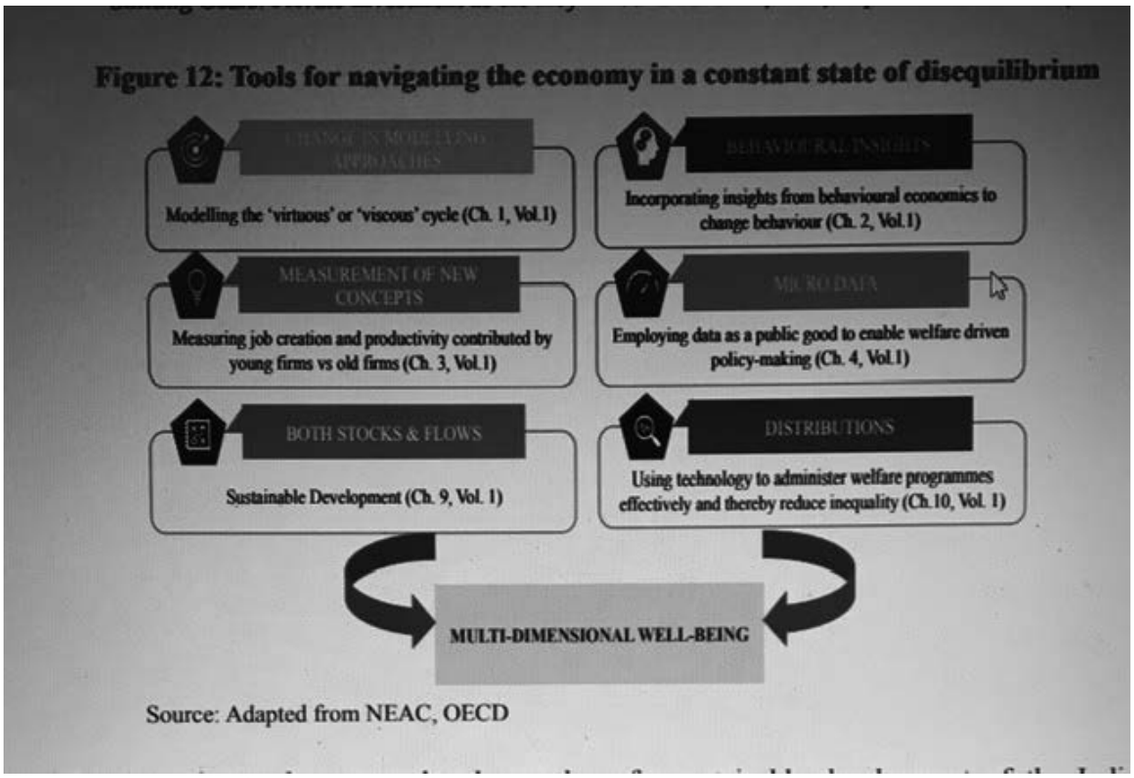
Source: *Rule of 72 Projections assuming a 12% Growth Rate*

'Blue Sky Thinking'

There is a diversity of views about the economy. Some of them congeal with what we know and some contradict. This paper has the limited objective of coming up with a narrative that entertains all views about strengths, weaknesses, opportunities and threats (SWOT), and then come up with a *Tertium Quid*. It is an unenviable task as far as Indian economy is concerned, at times making you feel you are gazing down an economic rabbit hole. The reader is warned that the list of SWOT items may appear disconnected as one goes from one item to another, but they nevertheless fit into the SWOT outlook. For uncommitted economists, labels like leftist, rightist and such others are mere meaningless stickers, and wisdom lies in going for best practices and policies, regardless who propounded them: Milton Friedman, John Maynard Keynes, Karl Marx, Minoo Masani or Mahalanobis. This fully resonates with the unfettered thinking or 'blue sky thinking' adumbrated in the Economic Survey 2018-19, in the matter of an appropriate economic model to achieve the $5-T GDP target by 2024-25 (Fig.4 below.) The Survey rightly emphasizes

the real need to contextualize economic theories to Indian setting. K. Subramanian's diagram below from the *Economic Survey 2018-19* delineates sharply the Blue Sky Thinking in strategizing for economic action for the $5T goal in the context of a constant state of disequilibrium. This is original and unfettered ism-free rational approach, and laudable. It spells out the inputs into such thinking. It offers the right framework for navigating the socioeconomic uncertain world: willingness to recalibrate policies and strategy according to changing facts, borrowing as much as feasible from behavioral economics, measuring job creation and productivity of new and old firms, use of micro-level data as much as macroeconomic data, and deploying technology for delivering welfare.

Fig. 4 Proposed Model for Navigating Indian Economy in Disequilibrium



Source: *Government of India, Ministry of Finance, Economic Survey 2018-19, p.13*

Goldilocks Era

"Animal spirits" as termed by John Maynard Keynes has been unleashed in Indian economy since 2014 and it seems like a Goldilocks era of it. There is no better time to leverage these spirits to drive Indian economy full throttle for high-trajectory all-inclusive growth. The vast conviction and exuberance pervading the Union Government, the consumer public, as well as business, have been generating an investment surge. The Union Government has been into massive capital-formation in highways, ports, airports, railways, defense and ordnance industries, health care, power generation, rural electrification, river linking and cleaning and many others. This is in step and style with the fact that gross capital formation as a proportion of GDP is always high, at 40% around economic take off. In the economic armory of the government there are social behavioral change projects too, such as "Beti Bachav, Beti Padhav", Swatch Bharat cleanliness awareness and promotion, better tax compliance, fast switch to digital payments, minimal cash use and so forth. Some of these measures are rooted in the conviction that socio-economic capital formation, as much as physical asset build-up, is key to rapid growth. In some of these endeavors there is Public and Private sector Partnership (PPP). For the near term while an 8% growth rate is sensible, over the longer haul, a 10 or 12 % rate of GDP growth is feasible and essential to provide the escape velocity from the gradualist rates of the past for takeoff into self-sustaining growth. This is doable, if there is agreement about such an aspiration. Forgoing this perfect opportunity for rapid progress means forfeiting it for good because such are the current auguries for growth over the long haul, the animal spirits in particular. Short term predicaments should not cloud creative thinking about medium and long term opportunities and risks.

This paper tries to assemble facts that could help India emerge as a super-economic power accounting for 20-25 of world GDP, like it was before colonialism emaciated Indian economy. It also attempts a strategic SWOT road map. But the SWOT list covers crucial issues and facts, and not all. The current Indian Government has a large mandate acquired in the 2019 Parliamentary elections to take a good shot at rapid growth to attain a GDP of $5 Trillion by 2024-25, becoming the fifth largest economy in the world, ensuring an equitable distribution of growth opportunities.

JEL Classification: B1-B3, O2, Q5

India has been worse than desperate and even frantic for freedom from the corrupt governments in New Delhi and more so in state capitals, feasting on permit-license raj. Big time corruption seems to have gone away at least in the Union administration. The perception is that in state governments corruption is widespread. The political mandate is an imperative either to achieve goals or else, lose the 2024 elections. There is thus a Damocles sword hanging over the government, pressuring it to lunge towards the $5T GDP goal. This is a huge helpful economic factor. In the SWOT analysis that follows, Strengths do have a flip side and they are dealt with in the Weakness side. The same goes for Opportunities and Threats. A SWOT matrix template is avoided in view of the nature of an economic SWOT analysis.

And before all that, as this paper goes to press, a new adverse issue in the form the Corona Virus (COVID 19) has raised its Medusa-like head, threatening the health of the nation, or more or less, even the planet's entire human population. This challenge will cost much in terms of considerable additional funds on medical infrastructure and supplies, medical services and more. Such costs would include loss of GDP growth, unemployment and other socioeconomic upheavals, depending upon how intense the virus outbreak is, how many get infected and how long its spell is on the world and Indian economy. There are positives too. As a nation that is leading the global fight against the Corona virus and has successfully imposed a lockdown to contain the virus spread with good prospects of flattening the COVID-19 curve even before it peaks, stable India may attract new capital from companies that are pulling out of China, and from nations that are otherwise beat-up by the disease. They may include companies like Amazon, Apple, Google, Facebook, IBM, Microsoft and others who already have considerable presence in India. More on this under Strengths and Weaknesses.

A. STRENGTHS

1. **Less Dependence on World Markets**

JEL Classification: B1-B3, O2, Q5

India will soon be a $3.0T economy and soon thereafter in 2024-25 a $5 T economy, assuming there are no new challenges other than COVID-19. In terms of PPP Indian GDP has been for some time the third largest in the world. Till recently it was the only large economy with the fastest rate of growth: 8%, surpassing turbo-charged China's. Unlike China, India has a low dependency ratio on world markets. This could be a big plus factor, 60 % of GDP being produced for domestic consumer consumption. Currently under the Prime Minister's Rs. 20 Lakh Crore Atmanirbhar Bharat Abhiyan (ABA) anti-COVID economic package, aimed at aiding those persons and businesses affected by social distancing and lockdown, it is proposed to spend roughly an amount approximating to 10 percent of GDP. This is the stimulous bundle of campaigns to salvage business and assist the common man. Government is pressuring business and consumers to promote, Make in India, Brand India and revive the *swadeshi* spirit and boost resilience. There could be however some loss of economies of scale and opportunities to cut costs. On a side note, this fact also explains the conflict that onion exports of 2.1 million/per year (worth ₹500 million) pose for price stability at home. Less dependence on world markets for full capacity utilization means that the Government cannot blame the external market downturn too much for the slump in domestic growth rates. The Government has reconciled itself to an 8% per annum growth in GDP into the future going by the performance of the economy in recent years (Fig. 4). It assumes a 0.7% annual increase in productivity, INR Rs. 75 per dollar, 4% inflation, a GDP of Rs. 375 lakh crores in March 2025.[1] The Government is playing conservatively safe till returns from five-year old investments start flowing in.

By way of stimulating economies, there is going to additional spending running into trillions of dollars by several countries especially America and Europe, leave alone India. India should be able to substitute itself in supply chains likely to be snapped in the aftermath of COVID-19. Liquidity should not be a problem. Central banks everywhere have been pressured by circumstances to take to quantitaitve easing, making credit cheap, and otherwise welcoming borrowers without severe lending caveats.

JEL Classification: B1-B3, O2, Q5

2 Services Sector is Key

Services account for over 61.5% of India's GDP, a share that belonged to the agricultural sector not long ago. The composition of GDP is, Services or tertiary sector with a GDP share of 61.5%, Manufacturing 23.1% and the Farm sector 15.4%. Services sector, together with the gig economy of personal contracts has emerged as the largest contributor to GDP. This is the same pattern that emerged in USA, China, Germany, Japan, UK, Russia, or most other developed countries as economic advance got into stride. The strength and advantage here is capital-output ratios are relatively low, compared to the manufacturing sector, demanding much less of capital so frantically needed in other key areas such as technical education, social welfare and other sectors, leave alone capital goods and business sectors.

3 Poverty is Down

Poverty reduction is no more a slogan and there is solid proof of millions of countrymen receiving incomes larger than existence wage ($1.90/per day). Several government initiatives have crossed the hurdles of delivering benefits over the last mile. Besides The Pradhan Mantri Jan Dhan Yojana (PMJDY) poverty alleviation has supplied more than 5 crore low priced cooking gas (LPG) cylinders (over 3 years). It is into supply of drinking water, sanitation (toilets) virtually all over India, Ayushman Bharat health care for the indigent covering about 500 million persons, the PM Kisan Sanman depositing Rs. 6000 directly into every farmer family's account, and their like. The PMJDY direct deposit of Rs. 3000 on average per annum in the personal accounts of about 371 million indigent persons is a classic example in poverty amelioration. The bank accounts come with a RuPay Debit card with an overdraft eligibility of Rs. 10,000 and Rs. 2 lakh accident insurance. The Yojana cuts out intermediaries and their *haftha*, and helps with direct 100 percent benefit transfers. More crucially it has brought about financial inclusion to 28.5% of the people at the bottom of the economic pyramid who were out of it despite years of striving to do it. According to the UN Development Report 2019, 640 million Indians were in "Multidimensional"

JEL Classification: B1-B3, O2, Q5

poverty in 2005-6 and this went down to 365.55 million 2016-17, a reduction of 254.45 million. A communist country could pull perhaps more people out of poverty in a shorter time, but one wishes the term "multidimensional" included freedoms as we know them here, not just drinking water, nutrition, electricity, quality education and other material comforts. According to the World Data Lab poverty rate in India has come down from 14.4% in rural areas and 9.5% in urban areas in 2012 to 4.3% and 3.8 % in the rural and urban areas respectively in 2018. Thus there is a steep fall in the poverty rate and the number of extreme poor with incomes of less than $1.9 per day is estimated at 50 million. Much of this poverty reduction has been put through the triad of (JAM) Jan Dhan bank accounts, Aadhar biometric IDs, and Mobile cell phones in the current milieu of a digital revolution. According to the National Payments Corporation of India, transactions via the Unified Payments Interface (UPI), the country's flagship payments platform, grew by 25 per cent and crossed Rs 1 trillion in value in December 2018. However, at just 154 loans per 1000 persons it would appear that there is considerable scope for augmenting consumption and standards of living of the poor. Such augmentation could provide the key to catalyzing the economy to a tipping point for poverty removal. It would have to start with development of a credit reporting system to enable banks to lend. In this matter India is much behind developed nations although digital identity meets personal credit information needs to some extent. The foundation for the gig economy is laid thus.

4. Inequality

Inequality as reflected in the Gini coefficient has decreased as per World Bank data from 0.45 in 2004-5 to 0.339 in 2009. It is possible it has gone up again thanks to uncontrolled growth of black economy till the demonetization of the rupee in 2016, and other measures to curb tax evasion. Black money is generated continuously and is a perpetual flow in this respect. Like Simon Kuznets would say, market economy first lets income and wealth inequality increase, and then it reduces it. There is merit in saying: let the goose that lays the golden egg continue to do so, without expecting it to lay more than one at a time. The current government's policies such as the triad of Jandhan

accounts, direct deposits into them and the mobile digital revolution are instruments for poverty reduction.

5. Economic and Social Behavioral Change

Behavioral economics (BE) lets go the diehard idea of the economy as a machine to tinker with, and instead highlights standards of government-public behavior that get things done. Behavioral change is being witnessed in tax compliance, enforcement of compliance behavior, nationalistic fervor with a can-do spirit, public awareness of recent past and of national ground realities. There have been profound cultural and political changes, with corruption confined only to State government departments with high contacts with the public such as construction and real estate, judiciary, police, licensing, permit issuing offices. The erstwhile corruption culture still pervades only in certain states with political parties proficient in such culture.

There is more interdisciplinary activity in the psychology-economics interface. There is somewhat visible success in changing economic behavior. It has moved away from taking advantage opportunistically to one of more accountability and identification with the larger national causes of rapid socio-economic advance. As an example tax compliance has improved considerably, the number of tax payers has more than doubled in recent years that coincide with Rupee demonetization, GST and changes in Insolvency-Bankruptcy Code. Strange as it may seem, this is in keeping with Abhijit Banerjee‘s theories of herd behavior, rumor mongering and rational behavior of economic agents charged with a revived and energized nationalism under a new political set up.[2]

Goods and Services Tax (GST) launched in July 2017 is a classic example of successful behavioral economics-based reform. It ended the tyranny of India’s indirect tax architecture. 1300 different goods and 500 services were put under five buckets for the GST rate ranging from 0 % for basic essentials like milk to 28% for luxuries. There is pressure to go the Singaporean or Canadian GST way with just one tax rate instead of the five rates now. In India 17 different tax-

upon-tax cascading taxes such as excise, customs, sales tax, service tax, octroi and so forth were fused into one GST. It saved on an average some 20% of conveyance time by ending the waiting time by trucks at state borders during which time they had to contend with harassment by Octroi staff and traffic police. This was a powerful incentive for compliance and thousands of untaxed companies started complying willingly.[3] Such agreement with tax law is of critical importance in India where the tax to GDP ratio is as low as 17% compared to 34% in European (OECD) countries.

BE makes evident what motivates people to change behavior: not fear, but factors like monitoring progress being made, instant rewards for compliance and social inducements. Trepidation caused by fear prompts inaction. Social incentives include mirroring behavior and the consequences of compliance and otherwise. In Britain in order to incentivate people to pay up taxes on time, the British tax authority publicized that 90 percent of people pay tax on time. With this information about an overwhelming majority of tax payers paying their dues on time, those that were delaying payments acted swiftly to join the herd, resulting in an increase in tax revenues of 5.6 billion pounds in a recent year. It certainly pays to use the BE card to make plans actionable.

6. Oil Prices are Lying Low

Transport costs will be lower than before on account of the precipitate fall in oil prices in the absence of demand, depressed by COVID-19. Lower oil prices will serve the automobile industry well by increasing the demand for vehicles fueled by gas. There may be a temporary harsher setback in sales for electric vehicles for the same reason. Overall, low oil prices will serve to reduce development costs by reducing import costs sizably, by augmenting foreign exchange reserves even while strengthening the rupee vis-à-vis the dollar, Euro, Sterling and other hard currencies. It may even incentivize investment in building large storage facilities for creating strategic oil reserves when prices are low.

B. WEAKNESSES

1. COVID 19

/A quick back-of-the-envelope computation of plausible losses due to the COVID 19 downturn

Table 1: Estimated COVID 19 Loss in GDP during 2020

Country	GDP 2019 in $ Billion	Avg. Weekly Loss in $ Billion	Number of Weeks Economy Down	COVID19 caused GDP Loss ($ Billion)
1. USA	21,439.45	412	7	2884
2. China	14,143.16	272	7	1904
3. Japan	5154.153	99	7	693
4.German	3863.344	74	6	444
5. India	2,935.270	56	7	392
6. UK	2,743.586	52	7	364
7. France	2,707.704	52	7	364
8. Italy	1,988.636	38	7	266
9. Brazil	1,847.020	36	6	216
10. Canada	1,730.914	33	7	231
World*	87,265.226	1678	6	10,068

*a) World GDP Average slowdown presumed at 6 weeks
b) Total Loss not aggregate of 10 countries,
Weeks shut down are mere estimates
Source: Computed by author from GDP Data in: IMF.org, World Economic Outlook, October 2019

in economies would start with the annual GDP of any country, and then the computation of average per week GDP, and estimate how many weeks economies are held down by the for example, the steel or automobile industries with heavy linkages with the rest of the economy. In the absence of accurate data of individual sectoral closures and the latest output data, it is expedient to resort to the formula below for a ballpark educated guess of the loss due to the pandemic. The simple formula would be as follows:

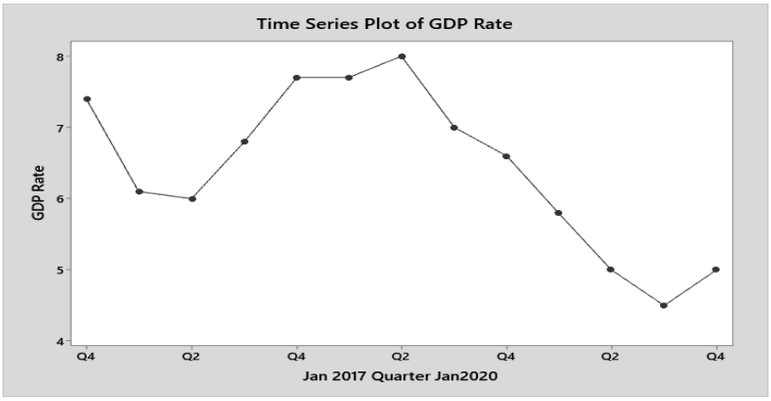
$$\textbf{GDP Loss due to COVID 19} = (GDP_{y19} \div 52) * W_d$$

where, GDP_{Y19} is the nominal GDP for the year 2019 and W_d is the number of weeks the economy is held down or slowed down by the Corona Virus, and 52, the weeks in the year.

The fall in Indian GDP in the current calendar year, using the formula above, for illustrative purposes, assuming 7-week lockdown and $56 billion GDP per week, is $392 billion or about 14 % of GDP. China's is likely to be about $2.0 trillion and USA's about $2.9 Trillion. Longer the

lockdown, larger too the GDP loss. By speeding up recovery one can reduce this loss. Job losses will definitely be disproportional to GDP declines. There are no easy tradeoffs between minimizing mortality due to COVID through lockdowns, and minimizing GDP loss by lifting lockdowns. India's current GDP is approaching $3 Trillion. India's population is 134 crores. About 50% of it or about 67 crores of people, is the working age population (WAP) in the age group of 16 years and 64 years, excluding those still in schools and colleges, housewives and those not seeking jobs. It may not also include those in jails or being incarcerated. Labor Force Participation rate – LFPR is about 50 percent of WAP according to the National Sample Survey office (NSSO) data. Thus, 50 percent of 67 crores or 33.5 crores is the LFPR. We are definitely not pressing into service this huge working age population that can yield a population dividend on which the country is banking on, for leapfrogging in an economic context. National infrastructure projects in construction, transport sector, linking rivers and many others need speedy execution. Other countries faced with a similar situation are known to disturb peace in (international) border areas and divert people's attention from life and death unemployment.

Fig.5 Slow Down in GDP Rates of Growth Jan 2017 – Jan 2020



Source: *S. Char Based on World Bank qtly. GDP data. Apogee is end II Q.2018 and nadir is III Q.2019. See Fig. 6 at the end.*

2 2020 Recession

The slowdown from July 2018 (Q2) as in Figs 5 and 6 cannot be classified as a recession, GDP did not contract, but its growth rate did. Also it is trending up. It is followed by declines in

employment. There is need to realize that the main causes for this slow down are actually two elephants in the room: dearth of abundant unaccounted cash drained out of economy after notebandi and secondly fear caused by stricter enforcement of law, followed by less or nil inclination for cash transactions that intend to avoid GST and personal income taxes. A cache of resources in the large informal economy lies beyond the pale of tax authority. Purchases of big ticket items including housing is not happening. This vicious cycle or loop is completed by less demand, less investment, less borrowing and less lending. CMIE estimates that the share of investment as % of GDP is down from 30.71% in 2004-5 to 28.78% in 2019-20. In 2018-19 projects worth Rs. 20.74 T were dropped by mostly private firms. It is about Rs. 8 T in the first 6 months of 2019-20. New investment could break this vicious cycle provided such investment is in microeconomic businesses that are most affected. The government is also wanting to disinvest from banks and public sector units in which much capital has been sunk. It would also be economically wise to avoid sunk-cost bias such as continuing to fund subsidies to even well-off sections and reallocate resources for projects.

Table 2. Observed and Expected Counts for Global Rates

Glob Rate	Poisson Probability	Observed Count	Expected Count	Contribution to Chi-Square
<=2	0.310440	20	24.5248	0.83481
3	0.213953	16	16.9023	0.04816
4	0.190255	22	15.0302	3.23207
>=5	0.285352	21	22.5428	0.10559

|Chi-Square Test

Null hypothesis	H_0: Data follow a Poisson distribution
Alternative hypothesis	H_1: Data do not follow a Poisson distribution

DF	Chi-Square	P-Value
2	4.22063	0.121

The slowdown in India's GDP is not a unique phenomenon, but a trend the world over. A goodness-of-fit chi-square test of global rates gave this author a chi-square value of 4.221 (P-Value 0.121). This confirmed that they seemed to follow an unpredictable Poisson pattern which

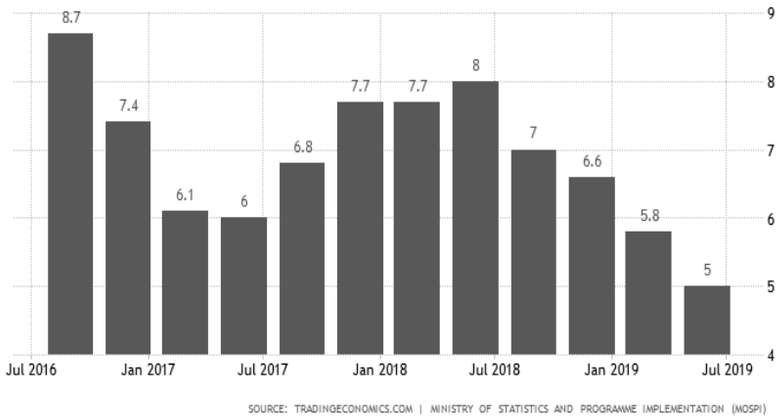
could perhaps be explained by the uncertainty in the global economy. T-test comparisons of observed and expected values of Indian growth rates gave a paired test T-value of 438.14 (P-Value 0.000) which could be interpreted to mean that there is enough evidence to reject the equality of the two GDP growth rates, with expectations of high rates driving the narrative to some extent, and so deceiving.

GDP growth rate has come down from a high of 8+ percent in quarter beginning July 2018 (Figs. 5 and 6) to about 5 - 6 % in Quarter ending Jan 2020 causing some alarm about sales of real estate, cars, jewelry, refrigerators, smart phones, and other big-ticket items which had seen better days before the assault on unaccounted money and the burst of asset bubbles. Even during festive seasons like Diwali the purchases have been down and minimal, except for gold, 30 tons of which was sold in a single day during the 2019 *Dhanteras* festival.[4] The price was Rs.38,275/10 grams. That is some Rs.11840 crores of gold sales in a day! What conclusions can we draw about demand, MPC, savings, and foot loose fancy-free (unaccounted?) cash? However, the fall in sales of some items is precipitous, leading to layoffs, paycuts, lower earnings, and related negatives. Two consecutive declines in quarterly GDP is enough to call it a recession. Unemployment is at a record 45-year high.

Worrisome question: Is the Marginal Propensity of Consumption (MPC) going down and is savings again on the upswing? This is not the case. Between 2012 and 2018 the household savings rate has come down from 23.6% to 17.2%. Total savings rate was 30% in 2018, down from 35% in 2012. Savings of private corporations was a constant 10 to 12%, public corporations 4%, Government's -2 to 0%. There is thus a confirmation of the fall in incomes however transitional it could be,

JEL Classification: B1-B3, O2, Q5

FIG. 6 GDP GROWTH RATES



inevitably causing a significant slowdown of the economy. Where will resources for massive investments in all sectors come from? Interest rates are at a nine year low. The economy is being stimulated and borrowings will happen in a substantial manner probably even before the lockdown due to COVID-19 is lifted.

3. Global Warming

The bleak predictions of global warming due to man-made activities and catastrophic- events was dramatized by Greta Thunberg of Sweden where carbon footprints are taken so seriously that there is a 115 Euro charge per ton of CO_2. Everyone is talking about it, but not doing much to avoid a catastrophic scenario, like the Corona Virus in the health area, and time is running out. In the Euro region itself there is a move to levy a 10 Euro/per ton tax and is being opposed by business. Time is running out for taking coordinated action to reduce smoke pollution, to adopt alternative technologies, and reduce carbon footprints every which way. There is commitment to move towards carbon-neutral investments by 2050 by a group of world's largest asset-owners responsible for directing investments of over $2T USD. The International Development Finance Fund is raising $1T by 2025 for green energy funding in 20 least developed countries. In the midst of this, some countries like USA and Brazil are going back on the Paris Agreement.

Asset managers of assets totaling $34 T, in a survival mode thanks to floods and other disasters threatening their assets, are asking for urgent action: a) Let the price of carbon reflect the cost of carbon (damage) to the world climate. 2) Phase out fuel subsidies and c) Phase out thermal coal worldwide. It is necessary to repeat the remarkable success that attended upon ozone depletion, resulting in restoring the ozone layer by replacing chlorofluorocarbons (CFCs) by hydrofluorocarbons (HFCs) and again by HFC substitutes friendlier to the environment. Trifecta of factors call for urgent actionable items to reduce warming: a) natural disasters, b) dramatically lower costs of power production from wind and solar, and c) commitment to fill the vacuum left by turning back on the Paris accord. Gore's *Inconvenient Truth*, and the suggestions of the Intergovernmental Panel on Climate Change (IPCC) won Nobel Peace prizes in 2006. If not addressed, 3^0 Celsius global heating will happen by end of the century, whereas IPCC stated that temp rise above 1.5^0 is enough to cause significant and irreversible damage to ecosystem that supports human existence.

Between 2006-2015 Greenland ice shields alone lost ice mass at an average rate of 278 billion tons per year. It was 155 billion tons in the case of arctic ice sheet. Glaciers like in the Himalayas are losing 220 billion tons of ice every year. Glacier funerals are being observed in the European Alps. Since 1902 IPCC says Global Mean Sea level has gone up by 16 CM, the rate of increase doubling in the last ten years.

In 2018 China reduced CO_2 emissions per unit of GDP (emission intensity) by 45.8% from the 2005 level and increased the share of non-fossil fuels in primary energy consumption by 14.3%. India too has done well, achieving a 21% reduction in emission intensity as early as 2014, thereby achieving its pre-2020 voluntary target. Despite the recent controversy about Brazil letting the natural rain-forests burn down, it achieved a 58% emission reduction in a business-as-usual scenario set for it by NAMAs (Nationally Appropriate Mitigation Actions), overreaching its target of 36-39% reduction by 2020. Delhi's notoriety as the most polluted city defies the

JEL Classification: B1-B3, O2, Q5

reduction achievements. Earth Overshoot Day indicating on which day more resources were used than the earth can generate, was July 29, 2019.

If planet earth's population reaches 10.9 billion 2050 according to the UN Population Fund from 7.63 billion now, one shudders to think of the consequences. Mahatma Gandhi (this is his 150th birthday year) said more than a 100 years ago: "The earth, the air, the land and the water are not an inheritance from our forefathers, but on loan from our children. So we have to hand over to them at least at it was handed over to us." This is easier done with much less population, than with more. He also said: "The earth provides enough to satisfy every man's need, but not every man's greed." Enormous responsibilities rest on all individuals. No one is exempt from minimizing carbon footprints. Meetings and sessions need to be conducted on Zoom or skype with web cameras. Air flights burn aviation fuel. Global warming is messing up with the regular schedule of rainfall and in recent years there is excess rainfall, flooding many cities. Mumbai had more rain than ever before in the past 65 years. Due to the precarious water supply and increasing population, quality of living standards are likely to come down drastically by 2050 for about 70 million people, per projections of the World Bank. 45% reduction in emissions is needed by 2030 to limit warming by the end of the century to 1.5^0 Celsius. Every country's future is tied up with everyone else's. As noted above, glaciers and ice in the sturdy Himalayas are melting and threatening large water volumes in the near future and dwindling water volumes in the mid and long-term. Without alternative sources such as sea water desalination, rain harvesting and so on, not just economic, but all-round advance would be severely impacted. Rising seas could also drown out cities, not just damage them.

Irony is Marathwada with serious water shortage, has a boom in sugar cane, a crop that is very thirsty for water. Market decisions about crops to be grown are made on noneconomic considerations. Sugar factories get numerous tax subsidies including for electricity and for fertilizers. Loans to sugar farmers have been written off by banks. Sugar business received $880

million in export subsidies. According to the World Resources Institute three-fourths of irrigated sugar cane production takes place in areas under "extremely high water stress." Will politics stop interfering with prudent socio-economic life-death decision-making?

4. Employee Retrenchment

Unemployment figures show that as per CMIE estimates it is 8.5 percent in October 2019 as compared to 7.2 percent in September 2019. At 8.5 % it is the highest since August 2016. 10 to 12 Million of young persons join the workforce every year. Also firms are letting go workers in large numbers due to automation, which is welcome in its boost to productivity, but not so welcome in retrenching workers. Role of AI can be scary if not prepared for it, but utilitarian if one is fully organized and primed for it. Also there is the paradox of acute shortage of plumbers, electricians, truck drivers, brick-layers, IT savvy programmers, and numerous other technicians trained as per needs of automobiles, trucks, earth-moving equipment, accountants and others. Rigid labor laws at times could also come in the way of winding up business.

5. Sustainable Model of Development

On a side note, growth for growth sake is the pattern for cancer cells. Growth could have a greater purpose. Economic growth is meaningless unless the common man is adequate with regard to not just the basics of life, but also health care and education. The basics have not been procured for them, wretchedly enough for the past 6-7 decades. And the truth is, India is losing out on even uncontaminated air and dirt-free drinking water for all. A state of affairs like this hardly offers options other than earmarking as much resources as needed for basics including clean air, unpolluted drinking water, hygienic toilets and quality education. Beyond that, India needs discussion about the pattern or model of economic development India to opt for, whether it should be as materialistic as in the West or China, or it should blaze a new trail in terms of Gross National Happiness or Wellness, not very unlike Bhutan's.[5] Critical to this discussion is the fact that India does not entertain geopolitical or economic or cultural hegemony, other than forceful defense of its borders against inane bellicose neighbors who have more to gain teaming up with

India than by warring. India has no designs for a Belt and Road Initiative because it is redundant for the country's goals. Unpretentiousness saves India trillions of dollars yielding a higher marginal return internally. It is not a question of moral vs. materialistic development, but one of looking into the costs thereof, trading off one for the other.

6. Gross National Happiness (GNH > GDP)!

New thinking in development economics is what is called for, fully accounting for wellbeing of current and future generations and sustainable development. Economist Partha Dasgupta supported it.[6] Also needed is a critical look at what are needed and how much, without further exacerbating global warming. If the consensus is that after ensuring the basics of a wholesome life, which is anyway a long way off, India's growth should be less materialistic, more services oriented, more environmentally-friendly, shifting from fossil fuels to renewables and so forth, that would once again be a game changer not just for India but all others coming from behind. There is the classic trade-off between present consumption and greater future well-being for the coming generations, one being set off against the other. Is it moral, for this generation to burden the future generations with adverse aspects of global warming, and perhaps drive them out to colonize Mars?

Repeatedly it is mentioned that there is only one earth and it cannot support conspicuous consumption. It cannot sustain advanced country living standards for all peoples in developing and poor countries because of space and resource constraints.[7] Technology may avert Malthusian famines and tragedy including global warming, and help solve persistent issues through innovations over the long haul. Densely populated countries cannot however resort to escapism. Like Keynes said, in the long run we are all dead. In the meantime rationally, there may be serious struggles for air, water, energy, education services, food, health services, living space and other basics. Quality of life is already way down in many developed and developing countries including India and China, dragging down life expectancy. America and other countries have the problem of plenty, waste and endemic ennui in life leading to pointlessness, mindless gun

proliferation and violence, opioid overdosing, and other forms of suicide which too have been dragging American life expectancy down. So what is the nucleus between scarcities and gluts? How do you avoid overindulgence? Hegemonic America, China, Russia and such others are driven by their Military-Industrial Complex that keeps boosting their military budget which, following Say's Law, does trigger wars.[8] India has been different, formidably defending the nation from Marxist fundamentalists on one side and religious fanatics on the other, and yet, keeping a tab on defense expenditures. Beating swords into plowshares would free enormous resources for mankind's progress.

C. OPPORTUNITIES

1. Citizen Engagement

Greater involvement of overseas citizens of Indian origin in India's growth and inflow of foreign currency are possible with unicorn firms sprouting all over especially in businesses like e-commerce, online education, cyber security and cloud services. The disinvestment in countries like China and others pummelled by COVID-19, is likely to find business openings in India. There is going to be monetary easing and pump-priming even at the risk of higher than 4% inflation and bigger budget deficits. The objective is stimulation of demand by depositing purchasing power in the hands of people.

2. Network Link Rivers

Linking rivers, rain-harvesting and water bodies offer opportunities to ensure round-the-year water supply even in deserts.

3. Farm Tax

Possible openings to tax agricultural incomes are likely. Subsidies to agriculture are in hundreds of crores. This is true of agriculture anywhere in the world. European Union spends $65 billion in annual farm subsidies. This farm patronage system has led to mafia-style grabbing of land to harvest the subsidies. In India, the truth about sugar mills and sugarcane fields has been known

for 5-6 decades. There is political mafia-style grab of these farm assets. It is time to introduce farm taxes at least to partially offset the government deficits. Marathwada is accutely short of water, but earmarks much of scarce water to sugar cane not subsistence crops.

4. **Research in STEM areas**

Enormous research possibilities exist in STEM areas. The utilization of digital systems will sky rocket as more and business and governments transition from manual to online virtual techniques.In many organizations during the COVID exigency over 90 percent are working from their homes. That could become the new normal if the telecommunicatios infrastructure gets up to speed. There could be shortage of technically qualified persons to meet the demand.

5. **New Supply Chain Alignments**

Larger export possibilities could materialise especially in drugs and chemicals, somewhat boosted by the disdain about China's rigorous export efforts and trade wars. In the post-COVID-19 years, China may lose some American market. There could be post-Brexit opportunities and worries too. How well-prepared Indian business is to bag opportunities will be tested out soon.

6. **Spread of Indiana**

There is increasing world-wide acceptance of Indian living styles such as vegetarianism, yoga, ayurveda, especially in the post-COVID-19 period, and even Sanskrit. There could be openings for all: both people of Indian origin and others that master these disciplines. However, some of them are overcrowded areas of business endeavors.

D. THREATS

1. **Tariff Wars**

Tariff Wars have begun such as between USA and China and there could be a loss of America as a huge consumer unless India plays the cards smart.

2. **Global Warming**

JEL Classification: B1-B3, O2, Q5

Global Warming due to man-made activities and catasrophic events could slow growth. This has been dealth with at some length earlier under Weaknesses.

3. **Adverse External Relations**

Unhelpful attitude of neighbors like Pakistan in regard to using terrorist activity as a proxy war and forming a common market for sharing resources and augmenting alround prosperity could divert resources to defense.

4. **Immigration from Poor Neighbors**

Osmosis works against India, India being more well-to-do in real terms. Because of larger opportunities for personal growth and thanks to porous borders, imigrants from Bangladesh, Nepal, and possibly other countries slip into India and change demographics in places like Assam, changing the socio-economic and cultural dimensions of the area. There is much tension too.

5. Innovative Fiscal and Monetary Policy

In the area of innovative fiscal and monetary policy, somehow India is always tentative. The November 2016 Rupee Demonetization was an intelligent measure, though half-heartedly prepared and implemented. But together with other measures such as GST and the Insolvency and Bankruptcy Code (IBC) changes, tax compliance has been transformed from that of a corrupt third world counntry to that of a strictly-enforced and competent tax system, boosting the number of tax payers more than 200 percent. Another obsessive phobia is about debt as percent of GDP. The 10% spending for Atmanirbhar Bharat Abhiyan is a bold breakthrough from fiscal and monetary tradition.There is healthy concern about non-performing assets of banks, on an average of about 15 percent of total lending. In Switzerland, banks have lent to households and private corporations even upto 250 percent of GDP, by sharply cutting interest rates, unlike the European Union which is too slow to bring about such decreases in interest rates even in the face of strong recessive trends.

6. Millstone Around neck: Labor and Land Laws

JEL Classification: B1-B3, O2, Q5

Laws governing land and labor have been stuck in the mud of socio-economic milieu of more than hundred years, oblivious to ground realities of the 21st century. They have come in the way of rapid progress by miring issues in the situation prevailing a long ago, and in the process curtailing much enthusiasm of entrepreneurs from abroad wanting to bring their business to India. This could be one of the leading causes why businesses planning to migrate from China do not feel the gusto to make the items in India, using relatively much lower costs of production in India and cater to the Indian and foreign markets like they did in the past while deciding about investing in China. Reforming such labor and land laws, together with expediting decisions about environmental clearances could result in dramatically larger investments.

TERTIUM QUID: DISCOVERY OF INNER TIGER

The wellbeing of the nation becomes an overriding thought and most people without vested interests accept that. In India too this fact, together with a modicum of nationalism, explains the vast revulsion for 'business as usual' and the energetic backing for measures such as Demonetization, GST, Bankruptcy Code, Swatch Bharat, promotion of indigenous medicine including yoga. The Government has been constantly tapping into this wellspring of antipathy for 'business as usual' and support for progressive good causes.

The bottomline is that there is no stark choice or trade off between social welfare and private enterprise. It is a false choice. One can have a business friendly environment as well as social equality, if the trade off is well done. Switzerland has thus emerged as the richest country in the world with no truck with any ism, rightist or leftist, but going for pragmatist polices for booms and recessions. There is scientific confirmation that pursuit of selfish interests will not help beyond a limited extent. Ayn Randian pursuit of self-interest without being guided by broad social and national interests will jeopardize all interests just as most non-cooperative outcomes do in a game theoretic environment.[9]

The animal spirits economic story of the country needs to be sustained if its enormous potential is to be achieved. The exuberance that was mentioned at the outset is amply validated by the

perceptible transformation of the Indian economy. Although a great deal more needs to be done for promoting distributive justice, prosperity is getting shared through direct benefit (last-mile delivery) transfers and productive jobs for the millions. An all-inclusive economy is emerging. This journey hopefully continues so that tempestuous times maybe avoided. Administrations could be empowered to help India emerge as a booming economic power. Citizen engagement and transparency bring about quality leaders.[10] Belatedly people are rediscovering that India is an economic tiger. It is only rational to expect citizens to let the tiger keep leaping to attain pre-colonial eminence.

END NOTES

[1] GOI *Economic Survey 2018-19,* page 4 footnote

[2]Banerjee A. 1992, *A Simple Model of Herd Behavior, Quarterly Journal of Economics, Vol. CVII August 1992 Issue 3, p.798*

[3]Char S. 2018 Demonetization: It's a Success*, International Journal of Business and Economics*, Vol.2, No.2, accessible at ,https://static1.squarespace.com/static/575f50868259b52cea334ff2/t/5bd5c65c15fcc0f8b76f186f/1540736606457/G_2016+Rupee+Demonetization.pdf

[4] Indian Bullion and Jewelers' Association (Oct. 26, 2019) *livemint.com/market/commodities/30-tonnes-gold-sold-on-dhanteras-exceeds-traders-expectations-ibja-11572111478738.html* accessed 12/01/2019

[5] While further research is definitely called for to discern what people want, at least some economically well-off communities must be aspiring for more wellness and happiness rather than more materials and services. Bhutan's switch to GNH is narrated at: https://www.grossnationalhappiness.com/

[6] Dasgupta, Partha (2004) Human Wellbeing and Natural Environment, Chapter 9.1 Sustainable Development, Oxford University Press, P.139

[7]Fox, Sean and Dyson, Tim, Part II, Is Population Growth Good or Bad for Economic Growth? Available at https://www.theigc.org/blog/part-2-is-population-growth-good-or-bad-for-economic-development/

[8]Roland, Alex 2009 The Military Industrial Complex: Lobby and Trope." In J. Bcevich Andrew's The Long War: A New History of US National Security Policy Since World War II. Columbia U. Press, Pp.340-57

[9] Dixit, Avinash (2018) World Trade – USA = ?, forum/765/world-trade-usa

[10] World Bank Group (2016) Making Politics Work for Development, Evidence of the Impact of Transparency Ibid., Pp.171-206

JEL Classification: B1-B3, O2, Q5