Academic Entrepreneurship in Petroleum Rentier States

by

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Submitted in partial fulfilment of the requirements for the award of the degree of Doctor of Philosophy in STRATEGY, ENTERPRISE AND INNOVATION of the University of Portsmouth

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<tr>
<td>ASUU</td>
<td>Academic Staff of Nigerian Universities</td>
</tr>
<tr>
<td>CONUASS</td>
<td>Consolidated University Academic Salary structure</td>
</tr>
<tr>
<td>DG</td>
<td>Director General</td>
</tr>
<tr>
<td>ECN</td>
<td>Energy Commission of Nigeria</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FIIRO</td>
<td>Federal Institute for Industrial Research</td>
</tr>
<tr>
<td>FMS&amp;T</td>
<td>Federal Ministry of Science and Technology</td>
</tr>
<tr>
<td>GBP</td>
<td>Great Britain Pounds</td>
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<tr>
<td>GCE</td>
<td>General Certificate in Education</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GNP</td>
<td>Gross National Product</td>
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<tr>
<td>IPTTO</td>
<td>Intellectual Property Technology Transfer Office</td>
</tr>
<tr>
<td>NABDA</td>
<td>National Biotechnology Development Agency</td>
</tr>
<tr>
<td>NACETEM</td>
<td>National Centre for Technology Management</td>
</tr>
<tr>
<td>NARICT</td>
<td>National Research Institute for Chemical Technology</td>
</tr>
<tr>
<td>NARSDA</td>
<td>National Space Research &amp; Development Agency</td>
</tr>
<tr>
<td>NASENI</td>
<td>National Agency for Science and Engineering Infrastructure</td>
</tr>
<tr>
<td>NBBRI</td>
<td>Nigerian Building and Road Research Institute</td>
</tr>
<tr>
<td>NBRRRI</td>
<td>Nigerian Building and Road Research Institute</td>
</tr>
<tr>
<td>NBS</td>
<td>Nigerian National Bureau of Statistics</td>
</tr>
<tr>
<td>NBTI</td>
<td>National Board for Technology Incubation</td>
</tr>
<tr>
<td>NERDC</td>
<td>Nigeria Educational Research and Development Council</td>
</tr>
<tr>
<td>NGN</td>
<td>Nigerian Naira</td>
</tr>
<tr>
<td>NILEST</td>
<td>National Institute of Leather Science and Technology</td>
</tr>
<tr>
<td>NIRP</td>
<td>Nigeria Industrial Revolution Plan</td>
</tr>
<tr>
<td>NIRP</td>
<td>Nigeria Industrial Revolution Plan</td>
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<tr>
<td>NIRP</td>
<td>Nigeria Industrial Revolution Plan</td>
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<tr>
<td>Acronym</td>
<td>Full Name</td>
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<td>------------------------------------------------</td>
</tr>
<tr>
<td>NISLT</td>
<td>Nigerian Institute of Science Laboratory Technology</td>
</tr>
<tr>
<td>NITR</td>
<td>Nigerian Institute for Trypanosomiasis and Onchocerciasis</td>
</tr>
<tr>
<td>NNMDA</td>
<td>Nigerian Natural Medicine Development Agency</td>
</tr>
<tr>
<td>NOTAP</td>
<td>National office for Technology Acquisition and Promotion</td>
</tr>
<tr>
<td>NUC</td>
<td>National Universities Commission</td>
</tr>
<tr>
<td>OPEC</td>
<td>Organisation of Petroleum Exporting Countries</td>
</tr>
<tr>
<td>PRODA</td>
<td>Project Development Agency</td>
</tr>
<tr>
<td>PSCI</td>
<td>Presidential Standing Committee on Inventions and Innovations</td>
</tr>
<tr>
<td>PTF</td>
<td>Petroleum Trust Fund</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>RMAFC</td>
<td>Revenue Mobilisation Allocation and Fiscal Commission</td>
</tr>
<tr>
<td>RMRDC</td>
<td>Raw Materials Research and Development Council</td>
</tr>
<tr>
<td>S&amp;T</td>
<td>Science and Technology</td>
</tr>
<tr>
<td>SAANU</td>
<td>Senior Staff Association of Nigerian Universities</td>
</tr>
<tr>
<td>SCI</td>
<td>Science Citation index</td>
</tr>
<tr>
<td>SHESTCO</td>
<td>Sheda Science and Technology Complex</td>
</tr>
<tr>
<td>SSCI</td>
<td>Social Sciences Citation Index</td>
</tr>
<tr>
<td>TAA</td>
<td>Technology Acquisition and Assessment</td>
</tr>
<tr>
<td>TETFUND</td>
<td>Tertiary Education Trust Fund</td>
</tr>
<tr>
<td>TIC</td>
<td>Technology Incubation Centre</td>
</tr>
<tr>
<td>UEC</td>
<td>University of Portsmouth Ethics Committee</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
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Acknowledgements

Things are never as they are said. Perhaps it is the reason I studied ‘underlying mechanisms’. I have completed a PhD in underlying mechanisms, yet still don’t understand why things are not what they are called. I was told a PhD is too hard, I found it ‘easy’. I was told a PhD is not fun, I found it a day at a playground. I was told it is too expensive, well, I paid for it. I was told it takes three years, it took four! I was told it is a lonely walk, but I was never without company.

I counted the number of meetings I had with Zoe, the number of events I was invited to by Zoe, the number of emails I got from Zoe, the number of notes I got from Zoe, the number of jokes I shared with Zoe, and I wondered how I will describe this a ‘lonely walk’. Thank you a million times Dr. Zoe Dann, on your shoulder I stood all through this walk, walk in the jungle; and what a shoulder!

Dr. Vijay Vyas never disappointed. Zoe never stopped advising “Vijay is a guru. He will have an answer”, and Vijay always did. Thank you very much Vijay, I am ever grateful. Many thanks to Dr. Andreas Hoecht whose devil’s advocacy deepened my thoughts and furthered my exploration, sad I couldn’t tap further from that well of knowledge. With you all I cannot I rightly qualify this a lonely walk.

I still can’t explain it. I heard the world is full of wickedness, yet I saw very kind people through this walk. I recall that evening I went to discuss a PhD with my mentor John Daly. Five minutes discussion and John asked “so how do I come in?” “Help me meet Dr. Zoe Dann”. “Her office is only next door” John said. Two minutes later we were with Zoe, next day it was me and Zoe, business school and ‘entrepreneurial motivation’, and Zoe could pronounce my name. Thank you John.

I was told it would take two months to consider my application, but things never go as they are said, it took ten days. Another two weeks Zoe was urging me “Chidubem time to park that motivation bus by the wayside, entrepreneurship has moved on”; I did. By Summer I was singing ‘Theory of Practice’, today I finished the song. I started off swiftly, and it was thought I would do it in two years, but things are never as we think them; it took four! I was told major reviews were horror, the horror task fell upon Dr. Alan Tait, but it was no horror, Alan became a friend and mentor! Alan never stopped asking “How is it going Chidubem?” Thank you Alan. It was not lonely.

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It is sad Mum, that you are not here to remind me that “the world is not a bed of roses”, but I am sure you are now where beds are full of roses. I miss you much, I still lock myself up sometimes to weep. When I close my eyes, I hear your comforting words “Nnaa don’t take this life too serious”. Mum you can see from this text that even a PhD, I am not taking serious. Dad, it is sad you are not here to see how that journey turned out. I got confident when you declared you trust me to survive even in a lonely desert. You promised we will talk about it, but things are not as they are said, you left, so we can’t talk about it now; how sad. Thank you for everything you did for me, we shall meet, we shall talk about it, and we shall part no more.

Many thanks to Dr. Chidube and Chidimma Nwankwo, my brother from another mum, name-sake, and standing together since 1978. Very many thanks to Otunba Tunde Salami, a friend, true and reliable. The whole world partakes in a PhD, silently everyone joins the contemplations; otherwise what explains those many puzzles and jigsaws of a PhD suddenly resolving themselves at merely being stared at? I found the ‘underlying mechanism’ to be that everyone contributes a piece of their brains. To you all who helped, hoped to help, and who wish they helped; I am most grateful. Your company ensured this was never a lonely walk, and I am forever thankful.

My supervisor asked me once “Do you take the respondents’ statements as the truth?” “Well, yes”, I answered, “but I am more interested in their underlying meanings”. Asked again now I will answer- “no, I don’t; things are never as they are said”. Finally and above all, I was told there was no God, for sure I say “there is God”, a supreme God who cares. I was told he would punish the earth, no, he won’t; things are not as we say. He will not destroy, he will heal and bless the earth. Thank you O God, flourish us, flourish the earth, beautiful works of your hands- Amen.
Abstract

This thesis discusses Academic Entrepreneurship within a prism of the Triple Helix model of innovation. It unravels how the socio-economic and political institutional logics of petroleum rentier states influence commercialization of findings of academic research in oil-rich regions. The thesis argues for a sociological approach to the study of entrepreneurship. Conceptualizing Academic Entrepreneurship as a social game, and the three members of the Triple Helix as players, it unravels the mechanisms of the relations within the Triple Helix as it plays out in oil-rich rentier regions. It focuses on the resource-rich West-African state of Nigeria as case. Using data from multiple sources, it unearths the various plays and combats; conflicts and tensions, struggles and negotiations, disagreements and agreements, between the three members of the Triple Helix.

The central theme of the thesis is that the structural powers that condition academic entrepreneurship are governed by interdependencies between agency and context-specific socio-politico-economic institutional logics. This is in line with, yet goes beyond the prevalent claim that institutions impose rules that constitute constraints and enablers of agency. The thesis argues that agential actions are not mere rules-compliance, rather are outcomes of strategic and pragmatic calculations, emergent from agents' internalized externalities, and contingent upon agential held convictions about what works best within given institutional dynamics.

Grounded on Bourdieu's sociology, and underpinned by Critical Realist philosophy, this thesis develops and offers a new conceptual framework applicable in entrepreneurship, organizational, and regional development research. Its findings highlight points of divergence of the key players in innovation and entrepreneurship, and offers policy-makers insights into what works, what doesn't work and what may never work regarding entrepreneurship and innovation policy. It brings to the fore, the criticality of context-specific institutional considerations in entrepreneurship and innovation policy-making.

Keywords: Academic Entrepreneurship, Agency, Bourdieu, Framework, Habitus Institutions, Nigeria, Practice, Rentier State, Social Space, Sociology.
Declaration:

Whilst registered as a candidate for the above degree, I have not been registered for any other research award. The results and conclusions embodied in this thesis are the work of the named candidate and have not been submitted for any other academic award.

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Chapter 1  
Introduction and Research Setting

Academic Entrepreneurship in a Rentier State

1.0  Introduction

Academic Entrepreneurship can be conceptualized as the commercialization of findings of research (Goldstein, 2010; Wood, 2011). It results in start-ups (Nelson, 2014), and bringing to market of innovative products (Stayton & Mangematin, 2016). It is recognized as a key instrument for stimulating economic and social growth (Feldman & Kelley, 2006; Mueller, 2006; Shane, 2004) and has capacity to enhance national income (Audretsch, 2007). Natural resource-rich rentier states differ from production states in that the states’ income derives prevalently from external rents from export of natural resources (Beblawi & Luciani, 1987), while production states derive national income from the taxation of domestic economic activities (Luciani, 1990).

Both natural resources and entrepreneurship contribute to national wealth. While natural resources (such as petroleum) are non-renewable, entrepreneurship, in contrast is sustainable. In his 2000 Lisbon Proclamation, the (former) European Commission President declared that “there is mounting evidence that the key to economic growth and productivity improvements lies in the entrepreneurial capacity of an economy” (Prodi, 2002). More recently worldwide, there has been a revival in the acknowledgment of entrepreneurship as a vital means of achieving economic (Acs & Szerb, 2007; Audretsch, 2006; Carree & Thurik, 2010) and social (Bahmani, Galindo, & Méndez, 2012; Shapero & Sokol, 2009) development.
Policy-makers consider entrepreneurship a facilitator of economic (Audretsch, 2006) and social (Baldwin, 2009) growth, catalyst for productivity (Erken, Donselaar, & Thurik, 2009) and panacea for unemployment (Audretsch & Thurik, 1998). Broadly defined, academic entrepreneurship is the “the transformation of knowledge into products, processes, and organizations” (Mueller, 2006).

The role of universities in the society has evolved over the years from traditional knowledge creation for dissemination (Enders, 2005; Hargreaves, 1999) to include knowledge creation for commercialization (Baldini, Grimaldi, & Sobrero, 2006; Perkmann et.al., 2013). Commercialization of findings of university research has grown since the 1980s, especially with the coming into force of the Bayle-Dole act (Mowery, Nelson, Sampat, & Ziedonis, 2001) in the United States about the same period.

Knowledge-based entrepreneurship is emerging as an alternative engine of economic growth (Etzkowitz, 2003c) alongside the triumvirate traditionally acknowledged sources of wealth: land, labour and capital. Especially in developed countries, and gradually in developing countries; university and industry, hitherto separate and distinct, are developing collaborative relationships, mostly through the support and initiatives of government. Clusters of new organisations emerging from, or associated with universities and research centres are gradually taking over the positions of multi-national firms as the 'big players' of many economies world over (Huggins & Johnston, 2009).

Universities have assumed the greater portion of the responsibility for the creation of knowledge through research (Bonaccorsi, 2007; Gunasekara, 2006). It is dominant argument in literature that Universities bring highly skilled labour
as well as advanced research and knowledge into an economic system (Boulton & Lucas, 2011). The triple helix model (Etzkowitz, 2008; Etzkowitz & Leydesdorff, 2002; Leydesdorff & Meyer, 2003) stresses the importance of the interaction between the private sector, government and universities in this process.

Studies about the knowledge creation process in universities, the mode of its transmission into industry, barriers, and the enablers of the process are popular. A search of the EBSCO database for articles with “academic entrepreneurship” (and its synonyms) within their title published between 2000 and 2016 returned 3,339 articles. This research joins the league of research including Grimaldi, Kenney, Siegel, & Wright (2011), Walsh & Huang (2014) amongst others, whose focus was placed on exploring and understanding knowledge creation in Universities and its translation into commercial values. It also joins the few of these studies such as Grimaldi, Kenney, Siegel, & Wright (2011) earlier mentioned, and Davey, Rossano, & van der Sijde (2016), who, in line with the argument of Welter (2011) for entrepreneurial studies, emphasise the importance of highlighting, and bringing into account, the impact of contextual characteristics and institutional dynamics on knowledge creation and commercialization. This study stands out the more, as it further unravels the negotiations, conflicts, tensions and power relations within the triple helix relationship between Universities, Industry, and Government. It uncovers and highlights how the presence of economic rents from petroleum within rentier contexts influence this relationship.
1.1 Academic Entrepreneurship

1.1.1 Definition

There is no general definition for Academic Entrepreneurship. Prevalent practice is for researchers to adopt a context-specific working definition as is the case in the general field of entrepreneurship (Cunningham & Lischeron, 1991), and recommended by Gartner (1990) (see section 2.1.1). This thesis investigates rentierism, a socio-economic construct that shapes institutional outlook of natural resource-rich regions. The thesis takes a sociological view of entrepreneurship, and in line with Kuechle (2011) conceptualizes entrepreneurship as a ‘game’. Scharle (2002) defines ‘gaming’ as:

“...activity involving more than one participant, where... the moves of the participants correspond to a pattern of complementary roles, the participants (either individuals or groups) have specific goals and driving strategies, the moves are motivated by the outcome of the game and by the pay-offs.”

This thesis, from its sociological standpoint towards the study of entrepreneurship defines Academic Entrepreneurship as:

“a Social Game where opportunities from utilizing findings of academic research are discovered, evaluated, and exploited through actions of individuals who aim at advancing their social positions though the pursuit of the various forms of capital availed by the commercialization of findings of research”.

Following this definition, academic entrepreneurs are defined as:
“individuals who partake in, or support the utilization of outcomes of academic research to advance their social positions through the recognition, evaluation, and exploitation of opportunities it presents”.

1.1.2 The Purpose of this Study

Welter (2011) previously cited argued for the contextualization of entrepreneurship research. Common approaches to contextualizing academic entrepreneurship research include the application of the structuration and institution-based frameworks (e.g. Acs, Desai, & Hessels, 2008; North, 1990); these lines of enquiry focus on formal institutions. It is however the informal institutions (traditions, beliefs, social norms, expectations, etc.) that underpin social order and pivot the interaction between entrepreneurs, formal institutions and the society (Coyne & Leeson, 2004; Garland, 2001, p. 6). It is therefore insufficient to consider formal institutions in isolation of the informal institutions that underpin them. Uncovering the interactions and underlying mechanisms that underpin them is achievable through multi-level perspectives that take into account both the formal and informal institutions. Such multi-level perspective has powers to uncover how formal and informal institutions interrelate to shape academic entrepreneurship; this is one gap this thesis fills.

To effectively fill this gap, this work recognizes that institutions emerge from pre-existing social and economic orders (Bathelt, 2002; Bathelt & Taylor, 2004; Göll & Thio, 2008; Henrekson & Sanandaji, 2010), hence the study identifies a socio-economic construct ‘rentierism’, that heavily influences the institutional logics of natural resource-rich states (Bulte, Damania, & Deacon, 2005; Chaudhry, 1997), aiming to unravel the impact of its (rentier) structures on the emergence of
academic entrepreneurship. Natural resources and knowledge-based entrepreneurship complement, and may substitute for each other in their contribution to national wealth (Falkinger & Grossmann, 2005; Mpeqa & Kuckertz, 2015). It therefore interesting to understand how the two relate.

1.2 The Study Background

This study uses Nigeria as a case to investigate the dynamics of academic entrepreneurship in a rentier state. Nigeria is situated on the West African coast, it has a landmass of 923,768 square kilometres and a population of 173 million (World_Bank, 2016), thus accounting for about 47% of Africa’s population. This makes Nigeria Africa’s largest democracy. Nigeria’s democracy operates the American-style presidential system, with a federal government headed by a president at the centre, and governors heading each of the 36 federating states.

The Nigeria’s Gross Domestic Product (GDP) at market prices stands at USD568,508,262,377.80 as at 2014 with an annual growth of 6.3% (World Bank, 2016). The Gross National Income (GNI) per capita is USD5,710.00 while the average life expectancy at birth is 52.4 years (World_Bank, 2016). Nigeria is Africa’s largest oil producer and world’s seventh (OPEC, 2016). Between 2003 and 2006, the Nigerian economy grew at average of 7.3% (Kasekende et.al. 2007), attributable to the corresponding increase in the world oil prices during the period. Following the decline in the world oil prices since 2014, Nigeria’s oil and gas GDP has declined by about 1.3% which has been a major socio-economic challenge for the country because oil accounts for about 90% of its export and 75% of its budgetary revenues (NBS, 2014).
In terms of industrial performance, the contribution of the Manufacturing Value Added (MVA) to the GDP is only 5.6% (UNCTAD, 2015); this is low in comparison with the global approximated average of 16%. Also, just over 1.8% of Nigeria’s export is machinery, while the rate of importation of such technology is over 38.0% (UNCTAD, 2015). The Global Innovation Index report (Dutta & Lanvin, 2014) scored Nigeria 0.1%, and ranked her 108th out of 141 countries compared, in terms of net high-tech exports.

1.2.1 The Nigerian Educational System and R&D Outputs

The total number of approved universities in Nigeria stands at one hundred and twenty seven (127) including 41 funded by the federal government, 25 state government-funded, and 61 privately-funded universities as at September 2015 (NUC, 2015). Research and development is carried out by the universities under the funding and supervision of the Ministry of Education. Twenty-six (26) other independent research institutes carry out sector-specific research (NBS, 2014).

The Nigerian universities, and all the federal institutions involved in research receive their funding from the Federal Government of Nigeria. About 1 percent of the Nigerian budget is set aside for research (Experton & Fevre, 2010, p. 55). This is only 1/6th of the UNESCO’s recommendation of at least 6% of a given country’s Gross National Product (Sayed & Ahmed, 2015). The Gross Domestic Expenditure on Research & Development (GERD) as a percentage of GDP for Nigeria stands at 0.21%, which totals NGN45,852,600.00 (GBP240,604.65 or USD363,577.69)¹ (UNdata, 2015). This makes Nigeria the 80th in the world in

¹ 1 GBP = 299.198 NGN. Source http://www.xe.com, Mid-market currency rates: 2015-12-05
terms of investment in research and development, a far cry from 1% GERD/GDP ratio recommended for African and other developing countries (UNESCO, 2010).

Despite the number of universities, the Nigerian educational system is not marked by a corresponding creative or technological outputs. Nigeria for example between 1962 and 2012 obtained only 42 utility patents. In terms of high R&D intensity products, in 2012 the country exported only £55,219,773.64 (3% of the manufactured exports) worth of products with high R&D intensity, and received in royalty and licence fee payments £165,499,272.90 (World-Bank, 2012).

A number of initiatives have however been taken by the Federal Government of Nigeria to accelerate development in science and technology. The Federal Ministry of Science and Technology for instance created the Raw Materials Research and Development council (RMRDC) with the mandate of identifying and profiling commercializable outcomes of research and development, for the developing local raw materials, while the National Office for Technology Acquisition and Promotion (NOTAP) was established to create awareness and to sensitize entrepreneurs on the usefulness of patents as a means of creating and developing small and medium scale enterprises. A few other agencies have been created by the government (see section 5.1.2.1) including the Presidential Committee on Invention and Innovation created in 2006 to galvanize all these efforts.

1.2.2 Oil Production, Socio-economic Changes and Rentierism

Crude oil in commercial quantity was discovered in Nigeria in 1956. Since then, production volumes have annually increased to become the backbone of the Nigerian economy (Basedau & Lay, 2009; Mahdavy, 1970; Sala-i-Martin &
Subramanian, 2003). Nigeria is the world’s seventh largest oil exporter (OPEC, 2016), the Organization of the Petroleum Exporting Countries (OPEC) reports Nigeria as its most populous member, and that crude oil export accounts for over 90% of the total national export (OPEC, 2016). In other words, oil exports dominates the Nigerian economy when either measured as a percentage of total national exports, or as a percentage of overall government revenue; this affirms Nigeria’s status as a classic rentier state, in line with rentier state literature (eg. Mahdavy, 1970; Al-Hegelan & Palmer, 1985; Beblawi & Luciani, 2016) that defines a rentier state as any state that receives a substantial portion of its income in the form of external rents.

Looking at a wider context, the effects of external rents from the export of petroleum on national institutions are well documented in African, Middle Eastern, South-American, Asian and European oil-rich states. Although rentierism is less prevalent in Europe, the rentier status of Russia is evident, despite being widely contested in Literature (Arilla, 2005; Freinkman & Plekhanov, 2009; Oomes & Kalcheva, 2007). The definition of a rentier state adopted for this study, when considering the contribution of oil rents to Russia’s exports, national revenue and budget implicates Russia a rentier state. As of 2012 for example, petroleum exploration and export accounted for 16% of Russia’s GDP, 52% of its annual budget, and over 70% of its total exports (IBP, 2013). Algieri (2011) and Oomes & Kalcheva (2007) find that oil wealth in Russia has produced relative de-industrialisation, contraction in non-oil exports, and real wage growth; a trend consistently associated with African, Asian, Middle-Eastern and South-American rentiers.
For Nigeria, reports (Ikelegbe, 2006; Ross, 2012) show that since oil discovery in 1956, external rents from its export has reshaped the country’s economic and social topography. Mogues, et.al., (2008) identify that the discovery of oil in Nigeria directly disrupted other productive sectors of the economy. They found that since oil discovery “agricultural products which used to be the backbone of the Nigerian economy, and which constituted approximately 80 percent of total national exports in 1960, had by 1976 declined to only 4 percent” (p.35). Nigerian government consistently acknowledges the 1970's as the period of ‘Oil Boom’ (Freund, 1978). Apart from its impact on the Nigerian economy, the period of ‘oil boom’ remains a defining one in the Nigerian history. It was a period marked by political unrests, escalation of high profile corruption, including the infamous ‘Halliburton scandal’ (Donovan, 2008), electoral fraud, violence, coups and counter-coups that eventually culminated in a civil war.

Post-civil war, oil continued to influence Nigeria’s socio-economic and political landscape. The rise in Nigeria’s oil incomes resulted in the weakening of the country’s social institutions (Otaha, 2012), with the elites who have access to the oil rents living above the law, and government and large organisations constantly ignoring court orders yet avoiding its consequences (Ibekwe, 2016). From an economic point of view, Nigeria’s real income per capita from 1970 to 1999 fell from USD264 to USD250 (Ross, 2003), and from a political point of view, oil income became a source of strife and conflicts in Nigeria (Watts, 2004), with the Niger-Delta, the heartland of the Nigeria’s petroleum deposits, becoming “virtually ungovernable” (p.51).
Above cited instances are in line with several strands of literature that illustrate how natural resources (especially oil) influence the socio-economic and political topography of oil-rich countries. Literature is laden with studies of how income from oil shapes the government (Basedau & Lay, 2009), economy (Mahdavy, 1970), politics (Okruhlik, 1999), and even behaviour (Herb, 2005) in these environments. The Dutch disease thesis (Corden, 1984; Corden & Neary, 1982; Rajan & Subramanian, 2011) for instance, blames resource wealth for the comparatively slow economic growth in resource-rich countries while Collier & Hoefler, (2005) link mineral wealth with violent conflicts. Ross, (2001) found oil wealth a hindrance to democracy and a fuel for authoritarianism. Harford & Klein, (2005) cited resource wealth as the determinant of institutions in resource-rich countries, while Karl, (1997) argues that oil booms cause destabilization of governance structures and weakening of national capacities. Yates (1996) holds a widely cited opinion that “the conditioning factor of economic stagnation and political authoritarianism in oil-dependent states is the corrosive effect of external rents (from oil)”. This work contextualizes academic entrepreneurship within a rentier setting and therefore further strengthens the rentier state literature by adding to it, knowledge as regards the influence of rentier structures on academic entrepreneurship.

1.2.3 Politics of Governance and Wealth Distribution in Nigeria

For a study focused on investigating academic entrepreneurship, it is essential to bring into account, the political context within which the phenomenon is being studied. More so because the underlying interaction between the political and social systems of co-habiting communities are constituents of the fundamental social dynamics that shape activities within it (including both research and its
commercialization). Politics and governance form part of the mechanisms for the
generation and distribution of economic and social resources (Rich, 1989; Ali,
2013) especially within a rentier state setting. The existence of geo-political
boundaries in the form of regions, and the presence of different languages,
dialects, religion, and social class across Nigeria makes the contentious issue of
resource sharing and allocation complex, intense and volatile. The struggle for a
share in the State’s political and economic power is the most contested among
the various groups within the Nigerian project.

Equitable distribution of ‘national wealth’ formed part of the indigenisation
strategies of the anti-colonial independence campaigners (Diamond, 1988), and
has remained part of the government rhetoric in modern day Nigerian politics
(Usman, 2015). To reflect the multiplicity of the country, the principle of “federal
coloracter” (Kendhammer, 2014) was invented to ensure that Nigeria’s ethno-
regional diversity is recognized and reflected in federal employment,
appointments and resource allocation. Government and government policies,
wealth distribution, and social governance is accordingly based on identity, and
ethnic championship; an arrangement that legitimizes corrupt, clientelist and
neo-patrimonial structures, and elitist behaviour (Joseph, 1987); Joseph (1987)
described this arrangement as prebendal politics. (Prebendalism is further
discussed in section 1.2.6.)

The field of Research, Innovation, and Entrepreneurship is not exempt from the
‘federal character’ principle (Kendhammer, 2014). ‘Equitable distribution’ is
expected to be brought into consideration both in the allocation of academic
entrepreneurial resources such as research funding, government expenditure on
commercialization, and in the appointment and distribution of roles in both research and its commercialization. While knowledge of the field, educational qualification and experience are given very basic consideration in the appointment of commercialization personnel, as the case in all other aspects of Nigeria’s national life, equitable representation of the various geo-political divisions that make up the country in the field is considered more critical (Jinadu, 1985).

1.2.4 Colonialism, Political Governance, Early Industry and Trade

The rentier state of Nigeria is characterised by poor management of natural resources, especially petroleum. Political instability and prebendalism (Joseph, 1983) are often blamed for the mismanagement (Lewis, 1996). Prebendalism describes:

“the sense of entitlement that many people in Nigeria feel they have to the revenues of the Nigerian state. Elected officials, government workers, and members of the ethnic and religious groups to which they belong feel they have a right to a share of government revenues” (Kopstein, Lichbach, & Hanson, 2014 p.521).

Prebendalism and resource mismanagement may possibly also exist in Nigerian Universities, and in the management of research, and in its commercialization. No study however has been conducted that tested prebendalism within the context of universities, although Williams (1998) acknowledge that “intellectual factions (ie. academics) tended to serve regional, sectional, or secessionist agendas, (and) whenever they coalesce at the centre, it was to facilitate a destructive prebendalist ethos” (p.296). Similarly Willott (2014) investigated one
Nigerian University and concluded that factionalism, which he defined as "competition for resources between structurally and functionally similar groups" is at the centre of the careers of academics in Nigerian universities. He found that personal connections, ethnicity, political ideology and beliefs, rather than 'formal competence' determines career success of academics in Nigeria.

Nigeria's democracy post-independence is punctuated by the incursion of military into politics. Out of Nigeria's fifty-six years of independence, military government has been in place for twenty-nine, while civilian democracy has ruled for twenty seven-years. Military governments in Nigeria are bolstered by extreme corruption, high-handedness, oppression, prebendalism, favouritism, and clientelism (Lenning & Brightman, 2009). Military incursion into politics, political instability, and resource mismanagement in Nigeria coincided with the discovery of petroleum in commercial quantities.

1.2.5 Pre/ Post-Colonial Commerce and Enterprise in Nigeria

Before the arrival of European explorers, the Nok culture (Essien, 2011) in the central region of Nigeria showed evidence of technological advancement with iron smelting technology, and trading routes connecting the Sahara (in the North of Nigeria) with the Middle-East and Europe. Portuguese, French, and Dutch traders and merchants established trades across the region (Aldrich, 1996). With the defeat of Napoleon in 1815, the British merchants dominated trading in the region (Wesseling, 2013), and eventually expanded the British trade and Colonial Empire down the south of Sahara, the expanded areas (North to South) eventually became the modern day Nigeria.
In 1861, the British Colonialists took control of Lagos, which later became Nigeria’s commercial and political capital, and in 1900 the entire region (current Nigeria) was placed under British rule with the Royal Niger Company established by the British government to oversee trading along the Niger (River) route (Newbury, 1978). The British government structured Nigeria into the Northern and Southern protectorates, and in 1914 amalgamated the two into one entity, thereby finalising the foundation of Nigeria, to be made up of the Northern Region and Southern Regions. The colonial boundaries, split along ethnic lines drew together mutually hostile groups, the foundation of Nigeria’s notoriously skewed political geography and ideologies that fragmented Nigeria into a multiplicity of centrally funded, subnational entities that translated into anchor points for individual and sectional arrogation of power and wealth by the elite.

The amalgamated Nigeria is most distinctly divided between a prevalently Christian South, and Muslim North. In the Northern region, the British administrators ran the government through Muslim Emirates, a system described as "indirect rule" (Geary, 2013) while British administrative official, directly governed the Southern Region (direct rule) (ibid). In 1939, Nigeria was further restructured and demarcated along economic lines of Northern, Eastern, and Western provinces. In economic terms, the North produced groundnut in commercial quantities, the East produced palm oil, while the West produced cocoa, all in commercial quantities (Freund, 1978). Rubber, coffee, and tin were also traded; these formed the bedrock of Nigeria early economy prior to the discovery of oil in 1956. In 1957, Eastern and Western regions were granted self-government, Northern Nigeria followed in 1959, and following the end of World War II, alongside several other European colonies across Africa, Nigeria
demanded independence from Britain. In response, Britain restructured Nigeria as a federal state with a (weak) central government and (more powerful) governments for each of the three regions (Falola & Heaton, 2008). Subsequently the major ethnic groups (Hausa-Fulani, Igbo, and Yoruba) formed political parties that controlled each region, further highlighting the polarised ethnic differences rather than a cohesive nation that Nigeria became.

1.2.6 Prebendalism, Ethnic and Religious Politics

The multiple ethnicities that make up Nigeria, and the political divisions set up by the colonial government and their consolidation by subsequent Nigerian governments and post-independence constitutions formed the basis for ethnocentric clientelist, rent-seeking, and corrupt prebendal structures pervading the Nigerian socio-economic system; a political system that is overwhelmed by ethno-religious sub-national solidarity and competitive mistrust (Joseph, 2013). Competitive politics implies that politicians make recourse to their sectional, religious or ethnic identities (p.43), since every Nigerian owes some loyalty to their indigenous community, origin, or ethnic identity. Politics, governance, decision-making, allocation of resources take into account the Nigerian ethno-territorial and religious diversity as a major guiding rationale in determining distribution of resources. These exist as a vicious struggle over the acquisition and distribution of social, economic, and political positions, management positions in government-owned enterprise, and in the award of government contracts. According to Joseph (1983), the various ethnic divisions in Nigeria are the basic clusters in the patron-client relationships that shape the prebendal competition for the appropriation of the offices of the state (pp. 58-64). The main function of the Nigerian state is thus distribution or allocation of revenue; and
political positions are structured to be reflective of the federal character of the Nigerian state.

The implication is that in Nigeria, distribution of responsibilities, and allocation of resources for research and its commercialization is expected to take into consideration, the maintenance of the ‘federal character’ of the Nigerian state. Such principle may dampen pure economic competition that is capable of engendering innovation and entrepreneurship. When the state apparatus has become avenues for wealth distribution among the multiple ethnic nationalities, entrepreneurial effort is more likely to be directed towards manipulating the ethnic identity symbols as to to capture state institutions, and control the state apparatus for the distribution of the social, economic, and political resources. As Opeyemi (2015) argues, prebendels find in ethnic institutions, means of access to sources of power, wealth and prestige. Once accessed, they determine the means of production, and make the rules for the acquisition, distribution, and consumption of national wealth. They control the state power and apparatus of governance, which are manipulated for personal advancement and gain (Joseph, 1987); these may have implication for the commercialization of findings of research, since the government is a key player in the triple helix of innovation (Etzkowitz, 2008). This study will unravel the social dynamics of the relationship between these socio-economic and political structures and academic entrepreneurship.

1.3 Research Questions and Research Objectives

This thesis takes a sociological perspective, and focuses on developing a sociological understanding of the action of agents. In contrast with realist studies
Academic Entrepreneurship in Petroleum Rentier States

(such as Arora, Haynie, & Laurence, 2013; Chell, 2013; Clarysse, et.al., 2011; Jones & Casulli, 2014) whose focus was placed on observing and measuring the personal attributes and behaviours of individuals and how these determine entrepreneurial tendencies, and others like Alvarez, Barney, & Anderson (2013), Dimo, (2011), Tang, and Kacmar, & Busenitz (2012) that focused on concrete opportunities and how they are discovered; this current study is not limited to identifying and analysing concrete structures. It however, acknowledges that it is not possible to study underlying structures and mechanisms without reference to the concrete structures they are produced from, they produce, or with which they relate (Brown, 2013). In line with the foregoing, the main questions that this research answers are:

1. What is the state of academic entrepreneurship in the rentier state of Nigeria?
2. Who are the key player groups in the commercialization of findings of research in a rentier state?
3. How does the presence of rents from petroleum influence dispositions and actions of the key players in the commercialization of finding of research?
4. What is the underlying sociological mechanism that govern academic entrepreneurship in a petroleum rentier state?

To adequately address these questions, this research sets the following objectives:

1. Develop a picture of the state of academic entrepreneurship in Nigeria.
2. Develop a multi-level sociological research framework applicable in the study of entrepreneurship that takes into account, individual, organisational, and contextual factors that influence entrepreneurship.
3. Identify the key player groups, their perception of expectations, roles, and responsibilities of their positions within the social order of a rentier state.
4. Identify how the perception of the agents of their positions informs their agential actions.

5. Relate contextual characteristics of a rentier state, with agential apprehensions and actions to illustrate sociologically, the underlying mechanism of how the presence of rents from oil influences academic entrepreneurship.

6. Enhance the body of knowledge as regards methodology, and contextualization of entrepreneurship research.

This research accepts that entrepreneurship involves human agency (Shane, Locke, & Collins, 2003) and is embedded within complex social systems (Aldrich & Zimmer, 1986), and argues that although entrepreneurship brings about strong economic outcomes (Acs, et.al., 2008; Carree & Thurik, 2010; Wennekers & Thurik, 1999), alongside social ones (Acs, Boardman, & McNeely, 2013; Shaker A Zahra & Wright, 2015), it remains a social phenomenon (Acs, et.al., 2013; Aldrich & Zimmer, 1986). The study therefore argues for, and emphasises approaching entrepreneurship study from a sociological perspective.

1.4 The Research Approach

This study takes a critical realist stance. Critical realism posits that reality exists independent of human knowledge of it (Archer, Bhaskar, Collier, Lawson, & Norrie, 2013), yet human perspectives of reality are shaped by, and are dependent on human knowledge and experience (Bhaskar, 2008). Academic entrepreneurship and the underlying mechanisms of its reality therefore exist whether discovered or not, but how academic entrepreneurs (agents) and the society apprehend academic entrepreneurship is socially constructed (Zilber,
2013) and hence depends on the mental modes (O'Connor, 1998) of individuals and groups.

This research therefore develops a multi-layered framework that conceptualizes individuals as producing and reproducing social practices following specific, contingent, complex, dynamic logics (Chudzikowski & Mayrhofer, 2011). It enquires how institutional logics, and the mental models of individuals, and their modes of relating govern the production and reproduction of action.

The multi-layered framework developed for this study captures the elements of rentierism within the Nigerian social environment, and develops an understanding of its underlying influence on agents, and how these produce and govern academic entrepreneurship. It conceptualizes the Nigerian rentier environment as a field, encompassing other sub-divisions (subfields) within which academic entrepreneurship occurs. Such conceptualization of academic entrepreneurship provides opportunity for events and interactions at all the three levels of analysis (individual, organisation, and national) to be captured and drawn into the analysis. The multi-layered framework also permits the schemata of perception and thinking of the agents, as well as the social, economic and cultural endowments available within a rentier environment at all the three levels of analysis, and how they impact on academic entrepreneurship to be taken into account.

It has previously been identified in the literature review (Chapter 2) of this work that multi-level perspective in the study of academic entrepreneurship is rare. A multi-level investigation of entrepreneurship presented in this work is therefore another of its major contributions. Bourdieu (1977)’s Theory of Practice provided
the skeleton for the multi-layered framework developed in this research that emphasises the structural properties of the context of action and the interplay of forces at play at the various levels of the analysis. Bourdieusean perspective allows for a simultaneous exploration of individual, organisational, and regional/environmental factors, and the multiple connections that govern the relation between the three levels of analysis to be accounted for.

While sociological approaches to the study of entrepreneurship is gaining momentum, and several theoretical frameworks are being advanced that may guide the sociological perspective of entrepreneurship, there exists no solid guidance that is based on the sociology of entrepreneurship that provides a methodological framework for entrepreneurship study. This gap in methodology is another of the major vacuums that this study fills. This study develops a methodological framework based on Bourdieu’s theory of practice that may guide conceptualization, collection and analysis of data. The new framework is applicable in entrepreneurship, organization, and management research; this is discussed further in ‘Chapter 3’.

1.5 Chapter Summary/ Structure of the thesis

This thesis is structured into ten chapters following a logical order. Chapter one is the introductory chapter and presents general discussions about entrepreneurship research. It sheds light on the background of the research and presents the research questions and objectives, while summarizing the approach to the study. Chapter two reviews existing literature, and discusses the themes and methodologies of earlier research on academic entrepreneurship, while identifying the gaps in the literature and how this research fills the gaps.
Chapter three presents the research framework, illustrating how the framework for the collection and analysis of data was developed and how it would answer the research questions and fill the gaps identified in Chapter two. Chapter four is the methodology chapter. It covers relevant philosophies of knowledge and how critical realism suits this study. It also discusses how data for this study is collected and analysed.
Table 1.1. The logic of the arrangement of the thesis

- Chapter 1  Introduction
- Chapter 2  Literature Review
- Chapter 3  Conceptual Framework
- Chapter 4  Methodology
- Chapter 5  Presentation of Data
- Chapter 6  Analysis of Data
- Chapter 7  Homology and Oppositions in the Fields
- Chapter 8  Homologous Practices in the Fields
- Chapter 9  Academic Entrepreneurship in a Rentier State
- Chapter 10  Conclusion
Chapters 5 – 10 discusses findings of the research. In Chapter five, the data collected in the study are presented. Data presentation has three aspects: 1. qualitative/ descriptive data, 2. quantitative data, and 3. interview data. Descriptive and quantitative data provides a snapshot of the state of academic entrepreneurship in Nigeria, the quantitative data illustrate the forms of capital (resources) held by the agents (or individuals), while the interview data in the form of narratives of the agents is embedded within the series of discussions presented in chapters 6 – 10.

Analysis of data starts in Chapter six. This chapter is the starting point of the analytical application of Bourdieu's relational perspective. It starts with the construction of the Nigerian Social Space, and the positioning of the academic entrepreneurs within the social space. The various fields, divisions or groups that manifest in the data are identified and discussed in this chapter. Chapter seven identifies and discusses the properties of the various groups/ fields of practice within the social space. This chapter discusses in particular the agential group dispositions (or ‘habitus’ in Bourdieusean terms) that influence choices of actions within the various groups. Chapter eight discusses the actions and practices specific to the various groups. Chapter nine discusses how the identified groups, their characteristics, dispositions and actions interrelate to produce academic entrepreneurship. Finally Chapter ten summarises the findings of the research and makes recommendations.
Chapter 2  Literature Review

Academic Entrepreneurship in a Rentier State

2.0  Introduction

This chapter illustrates the trend of research in academic entrepreneurship, highlighting findings, and how they have been investigated. It identifies extant research both in academic entrepreneurship and in rentier state literature that inform this study. The chapter begins with a review of the various conceptualization of academic entrepreneurship, then identifies the critical matters regarding previous research in general entrepreneurship, then narrows to extant academic entrepreneurship literature. The chapter provides support to the design of the current research, highlighting the shortcomings identified in earlier research, closing gaps found, and demarking the contribution of this work. It identifies and elaborates the gaps this current research intends to fill, and how it would contribute to the body of knowledge regarding academic entrepreneurship. Finally, this chapter lays the conceptual foundation upon which this research is built.

2.1  Academic Entrepreneurship

2.1.1  Definition

The result of the lack of consensus in definition (see 1.1.1), and accepted practice of adopting a contextual working definition and use of the term Academic Entrepreneurship (Cunningham & Lischeron, 1991; Gartner, 1990) is a proliferation of wide-ranging definitions, each apparently guided by the discipline of the author, the research questions being answered, and the variables of each work. Survey of the literature show the use of the terms: ‘university-based start-
up’ (Ensley & Hmieleski, 2005), ‘industry-science links’ (Debackere & Veugelers, 2005), ‘knowledge commercialization’ (Goldfarb & Henrekson, 2003), ‘academic (or university) spinout’ (O'Shea, Allen, Chevalier, & Roche, 2005; Vohora, Wright, & Lockett, 2004), ‘spin-off’ (Lawton Smith & Ho, 2006; Müller, 2010), ‘university-industry relations’ (Azagra-Caro, Archontakis, Gutiérrez-Gracia, & Fernández-de-Lucio, 2006; Tijssen, 2006), ‘academic (or university, or faculty) patenting’ (Crespi, D'Este, Fontana, & Geuna, 2011; Geuna & Nesta, 2006), ‘technology (or knowledge) transfer’ (Shane, 2002; Siegel, et.al., 2003), ‘university licensing’ (Conti & Gaule, 2011; Dechenaux, Thursby, & Thursby, 2011), research-derived entrepreneurship (Kenney & Patton, 2011) synonymously with academic entrepreneurship.

The definition of Academic Entrepreneurship developed for this research is similar to Shane & Venkataraman (2000)’s definition of the general field of study of entrepreneurship. Shane & Venkataraman (2000) defines the field as “the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited” (p.218). The field consequently “involves the study of sources of opportunities; the processes of discovery, evaluation, and exploitation of opportunities; and the set of individuals who discover, evaluate, and exploit them” (ibid). This current study, being of a sociological viewpoint defines academic entrepreneurship as a social game (see section 1.1.1):

A social game “where opportunities from utilizing findings of academic research are discovered, evaluated, and exploited through actions of individuals who aim
at advancing their social positions though the pursuit of the various forms of capital availed by the commercialization of findings of research”.

Going further it defines academic entrepreneurs as:

“...individuals who partake in, or support the utilization of outcomes of academic research to advance their social positions through the discovery, evaluation, and exploitation of opportunities it presents”.

This study is not alone in conceptualizing entrepreneurship as a game. Although mostly only passively, several previous studies acknowledges entrepreneurship as ‘game’, including Zahra & Schulte (1994), Kleindl (1999), Brozik & Zapalska (2006), Kuechle, (2013), and Morgan, et.al, (2015). Conceptualizing academic entrepreneurship as a game, this study acknowledges and highlights that every game has a context, or an arena of its play, and rules guiding its play. Players devise their game strategies knowing the rules of the game, knowing what is at stake, what is permitted and what is not; anticipating, yet uncertain about possible outcomes (gain or loss, reward or rebuke) of choices made, actions taken, or not taken during the play. This study provides an account of academic entrepreneurship 'game play', gaining analytical support from Bourdieu (1977)'s theory of practice that highlights position-takings, tensions, conflicts, negotiations, agreements and disagreements between various stakeholders in the field of academic entrepreneurship.
2.1.2 Perspectives in Academic Entrepreneurship Research

2.1.2.1 Personality-Based Perspectives

Researchers attempt to understand and explain the emergence of academic entrepreneurship from three major perspectives: the individual (Edler, Fier, & Grimpe, 2011; Haeussler & Colyvas, 2011; Jain, George, & Maltarich, 2009), the process (Bekkers & Bodas Freitas, 2008; Nicolaou & Birley, 2003; Wood, 2009), and the context (Grimaldi, Kenney, Siegel, & Wright, 2011; Inzelt, 2004; Kenney & Patton, 2011). Personality-based perspectives focus on the characteristics of the individual entrepreneurs (Clarysse, Tartari, & Salter, 2011; Haeussler & Colyvas, 2011; Mosey & Wright, 2007), while group-based perspectives focus on the characteristics and composition of the entrepreneurial team (Ensley & Hmieleski, 2005; O'Shea, et.al., 2005) as well as the impact of the actors’ social capital in terms of network ties (Mosey & Wright, 2007; Murray, 2004; Owen-Smith & Powell, 2003; Walter, Auer, & Ritter, 2006). Researchers with focus on the individual investigate the personality traits of the academics (Clarysse, et.al., 2011; Haeussler & Colyvas, 2011), main argument being that some academics are better predisposed to commercialize their research findings as a result of their personality and/ or some psychological characteristics, or due to possession of scarce knowledge that help them create, identify and capitalize on opportunities offered by academic research.

Jain, et.al. (2009) for instance attempted to offer insights into the socio-psychological processes underlying scientist involvement in commercialization activity, and concluded that scientists invoke rationales for involvement that are congruent with their academic role identity, and hence during commercialization
will consistently take active steps to preserve their academic role identity. Similarly Haeussler & Colyvas (2011) researched German and UK life scientists, testing the influence of the attributes of individuals including age, gender, qualification and experience, as well as reputation and personal value systems on their engagement in commercial activities (consulting, patenting, and founding). The study came to the conclusion that those characteristics that reflect professional security, advantage and productivity are strong predictors of entrepreneurial behaviour, and that the strength of the reputation-related importance that academics place on scientific achievement over that they place on commercial achievements influences the academics’ rate and likelihood of commercialization. The individual-based perspectives in literature also cite individual motivation (Dechenaux, et.al., 2011; Lam, 2011) as a major determinant of entrepreneurial behaviour with focus on how incentives and procedures are structured by universities (or firms) to encourage academics to commercialize outcomes of their research.

While it is reasonable to argue for personality and individual traits as the predictor of (entrepreneurial) behaviour, personality-based entrepreneurial models has not generated consistent empirical evidence of its claims (Chell, 1985), and similar approaches applied in other fields of leadership studies have been disappointing in yielding consistent results (Fleenor, 2006). Entrepreneurial motivation-based personality studies, although useful in explaining the paradox of higher rates of entrepreneurial activity in developing countries compared to developed countries (Acs, Z., 2006) has not been successful in predicting or explaining entrepreneurial behaviours (Shane, Locke, & Collins, (2003).
2.1.2.2 Procedural Perspectives

Procedure-based studies address the courses of action that transform research outputs into economic value, with most effort focused on understanding what influences the speed of the process (Müller, 2010), what the stages of the processes are (Etzkowitz, 2003b; Vohora, et.al., 2004), the modes or typologies of research commercialization (Bodas Freitas, Geuna, & Rossi, 2013; Hong, 2008; Landry, Saihi, Amara, & Ouimet, 2010; Nicolaou & Birley, 2003; Shane, 2002), or determinants of success (or failure) of the process (Knockaert, Ucbasaran, Wright, & Clarysse, 2011; Lawton Smith & Ho, 2006; Wennberg, Wiklund, & Wright, 2011; Wood, 2009).

Müller (2010) performed a duration analysis to investigate the length and cause of lag between a founder leaving of the academia and the establishment of a firm. The study found that longer time-lag is caused by the necessity for the assemblage of complementary skills, either by acquisition by the founder or by searching for suitable team members, and that new ventures are established faster if it was a high-level technology transfer, if the founders have access to university infrastructure, or if they receive informal support from former colleagues. Vohora, et.al. (2004) in their work investigated the phases in the development of university spinout companies, identifying the most important elements and the iterative aspects of the development process, as well as the 'critical junctures' which were identified as: opportunity recognition, entrepreneurial commitment, credibility and sustainability.

These studies highlighted above took a look at different aspects of academic entrepreneurship process in isolation of the contextual environment within which
the process takes place. Such reductionist views may be of grand implication on the research outcomes and conclusions since economic action does not occur in a vacuum (Elfring & Hulsink, 2003; Mayer & Kenney, 2004). Although procedure-based approaches are useful from managerial perspective, as they provide normative guidance, entrepreneurship would be better understood if the contextual environment within which it occurs is taken into consideration.

2.1.2.3 Context-Based Approaches

Literature shows that more recent works are beginning to bring into account the impact of contextual factors surrounding both the individual and the process of academic entrepreneurship. Welter (2011) discussed challenges and has proffered a way forward for the contextualization of entrepreneurship studies.

Three levels of analysis emerge in this regard: individual, organizational, and national levels. Individual levels of analysis are mostly concerned with the influence of the academics’ network ties (Mosey & Wright, 2007; Owen-Smith & Powell, 2003), while organizational level studies focus on the impact of university level factors such as research intensity and faculty office, and the transfer office quality, size and structure (Conti & Gaule, 2011; Hewitt-Dundas, 2012; Powers & McDougall, 2005; Van Looy et.al., 2011), reward system (Chapple, Lockett, Siegel, & Wright, 2005; Debackere & Veugelers, 2005; Siegel, et.al., 2003) and availability of human and financial resources (Allen, Link, & Rosenbaum, 2007; O'Shea, et.al., 2005). Van Looy, et.al. (2011) investigated the influence of university size, presence of disciplines, as well as the local R&D intensity on the universities’ ‘entrepreneurial performance’ and concluded that there is a strong positive relationship between the scientific productivity of the universities and
their entrepreneurial performance. Interestingly the study made a suggestion for a complementary research that would investigate separately the impact of national or regional innovation systems/ characteristics.
Fig. 2.1 Perspectives in academic entrepreneurship research
Similarly, national level contextualized studies focus on how national policy (Jacob, Lundqvist, & Hellsmark, 2003; Patzelt & Shepherd, 2009) and national innovation systems (Inzelt, 2004) stimulate or hinder academic entrepreneurship, with a number of references made to the influence of the Bayh-Dole Act (Grimaldi, et.al., 2011; Sampat, 2006; Shane, 2004) in the USA. A major similarity in all these studies is the tendency for researchers while justifying their choices of levels of analyses to treat these levels of analyses exclusively. Clarysse, et.al. (2011) in their work for instance compared side-by-side, the impact of individual attributes on academic entrepreneurship with the impact of the social environment, while Van Looy, et.al. (2011) investigated university-level factors and recommended the study of national-level factors as a separate future study. However, entrepreneurship involves multiple agents who influence each other and operate within hierarchical structures that interact with each other at the various levels to generate patterns of behaviours socially constructed as entrepreneurship (Mole & Mole, 2010; Sarason, Dean, & Dillard, 2006). Thus, for any research into the emergence of academic entrepreneurship to be credible and reliable, approach must be from a multi-level (Aldrich & Martinez, 2005; Davidsson & Wiklund, 2001; Groen, 2005) and holistic perspective that takes into consideration simultaneously, the individual, organizational and national level factors in its design, data collection and analysis. Such multi-level perspective is lacking in academic entrepreneurship research and is a gap this work intends to fill.

2.1.2.4  Contextualization in Academic Entrepreneurship Research

Contextualized research has become popular in the study of academic entrepreneurship. 53% of the studies included in the review of literature for this
study either made attempts to capture the influence of the environmental contexts within which entrepreneurial action occurs while investigating other factors, or focused squarely on the impact of contextual factors on the entrepreneur or the entrepreneurial process. Clarysse, et.al. (2011) for instance in their work, made a comparison of the impact of attributes of the individual on academic entrepreneurship with the impact of the social environment, while Fini, et.al. (2011) analyzed the extent to which university-level support mechanisms and local context support mechanisms complement or substitute for each other in fostering the creation of academic spin-offs.

Contextualization has become fundamental in general entrepreneurship research (Davidsson & Honig, 2003; McKeever, Jack, & Anderson, 2012; Steyaert & Katz, 2004; Zahra, 2007); and has been assimilated into academic entrepreneurship research. Impact of academic entrepreneurship on the society, especially its influence on universities’ performance of traditional academic work (Looy, Ranga, Callaert, Debackere, & Zimmermann, 2004; Welsh, Glenna, Lacy, & Biscotti, 2008) and contribution to the economy (Audretsch, Bönte, & Keilbach, 2008; Bramwell & Wolfe, 2008; Mueller, 2006) constitute the main focus of several studies. But a larger majority is concerned with the impact of established structures such as legal frameworks (Sampat, 2006; Shane, 2004), policies (Inzelt, 2004; Jacob, et.al., 2003; Patzelt & Shepherd, 2009) and intellectual property regimes (Geuna & Rossi, 2011; Kenney & Patton, 2011) on academic entrepreneurship. Shane (2004) examined the effect of one U.S. public policy initiative - the Bayh-Dole Act in the United States on university patenting, while Patzelt & Shepherd (2009) analyzed how and why entrepreneurs perceive the
usefulness of policy programs aimed at facilitating the development of academic ventures.

2.1.3 Critique of Previous Studies and Current Gaps

Contextual conditions shape institutions (Przeworski, 2004), thus institutions only reflect and maintain the effects of the conditions that shape them. Rentierism is one of such conditions that shape institutions, but the majority of research in entrepreneurship fail to identify and bring into analysis the influence of specific contextual conditions that shape the institutions they study. Shane (2004) is commended for identifying, and specifically focusing on the Bayh-Dole Act and its influence on academic entrepreneurship in the United States. However, the majority of other previous studies (Chapple, Lockett, Siegel, & Wright, 2005; Jacob, et.al., 2003) that focused on regions, specify the location of the context they study, seemingly assuming that geographical location is the instigator of the institutional outlooks of the regions they study. This study argues that mere geography is not sufficient in shaping institutions and behaviour, and that the findings of these previous studies that focused on geography would be more robust and would produce more valid results if the various specific contextual conditions that shape the geographies studied were identified, specified, and built into the analyses.

This study supports the argument of Beblawi & Luciani (2016), that it is the conditioning effects of the external rents from oil that underpins the prevailing institutional outlook of oil-dependent states. Formal institutions (Acs, et.al., 2008; North, 1990) as well as informal ones (Karlsson & Acs, 2002; Williamson, 2009) shape behaviours (Caselli & Cunningham, 2009), choices (Bates, 2008),
preferences (Smith, 2004), opportunities (Weyland, 2009), etc., and how they are interpreted in rentier states. These institutions pivot the relation between entrepreneurs and their social environment (Coyne & Leeson, 2004; Garland, 2001). It is therefore deficient to study regions in exclusion of their contextual institutional dynamics, more so to consider institutions in isolation of the social conditions that underpin them.

Excluding the contextual institutional dynamics that shape the contexts they examined weakened these previous studies identified in the review of literature of this current study. This study addresses this weakness. It therefore gains strength over the previous studies by identifying the rentier apparatus of petroleum-rich societies as an underpinning socio-economic condition that shape their institutions. Building into analysis, an account of the underpinning socio-economic determinant of the situation and behaviours that govern entrepreneurship within the context studied is thus another gap that this research fills.

Also as highlighted in section 2.1.2, previous studies on academic entrepreneurship approach their analyses from the perspective of the individual, the organisation, or from regional contexts. These studies focus on specific aspects of academic entrepreneurship seemingly on the assumption that these aspects operate independently. However diverse aspects of a complex phenomenon such as entrepreneurship (Minniti, 2004) relate through dynamic relations between its various elements working together to produce the phenomenon as observed (Alexander, Van Loggerenberg, Lotriet, & Phahlamohlaka, 2010; Damanpour & Gopalakrishnan, 1998; Santoro &
Academic Entrepreneurship in Petroleum Rentier States

Chakrabarti, 2002). Focusing only one aspect, Van de Ven & Poole (1995) argues “invariably offers only a partial account of a complex phenomenon. Moreover, the juxtaposition of different theoretical perspectives brings into focus contrasting worldviews of social change and development. Working out the relationships between such seemingly divergent views provides opportunities to develop new theory that has stronger and broader explanatory power than the initial perspectives” (p.511). This study agrees and proposes an integrative framework that builds the different perspectives into one, as to enable, and bring about a “broader explanatory power" that single perspectives cannot offer.

The current study argues that entrepreneurship being a complex phenomenon (Minniti, 2004), must be studied holistically, with methodological effort concentrated on integrating as many aspects of its reality as is possible. Such multi-level integrative perspective of academic entrepreneurship (as highlighted in Section 2.1.2) is lacking in academic entrepreneurship research; this is a gap this work intends to fill.

To close this gap, this research takes a multi-level sociological approach using Bourdieu’s sociological theories underpinned by a critical realist perspective to study academic entrepreneurship within the context of a rentier state. The aim is to unravel the complex underlying relational mechanism between the rentier apparatus of oil-rich countries and the commercialization of findings of research in these countries.

2.2 Bourdieu in the study of Academic Entrepreneurship

Several studies have been conducted in the field of entrepreneurship that adopted Bourdieu’s relational sociology as their research framework and /or lens.
Lewis & Cassels (2014) applied Bourdieu's concept of capital, to study rural entrepreneurship, introducing the new concept of 'spiritual capital' to explain what it termed Biodynamics - a form of "organic production with spiritual underpinnings", introducing a new form of capital that traditional conceptualizations and interpretations of capital fails to capture. Studying Ethnic Entrepreneurship, Vershinina, Barrett, & Meyer (2011) applied the Bourdieusean concepts of social, cultural and economic capital as its lens to explore how the differential sources and volumes of capital available to UK-based Polish entrepreneurs is employed and converted into entrepreneurial values.

Spiegel (2013) applied Bourdieu's framework to relate culture with everyday entrepreneurial practice to explain how different entrepreneurial cultures emerge within regions, and how these influence the local entrepreneurship process and the heterogeneous geography of entrepreneurship observable in the modern economy. Lehner (2014) studied crowdfunding of social entrepreneurial ventures using Bourdieu's forms of capital to investigate 36 social entrepreneurial ventures in terms of entrepreneurs' opportunity recognition, formation and exploitation. Thomson (2008) combined Bourdieu’s concepts of habitus and symbolic violence with Giddens (1984) structuration theory to study and theorize the social processes of opportunity recognition by Canadian entrepreneurs. Battilana (2006) relied on Bourdieu’s concept of fields, to argue how individuals’ social position is critical in understanding how they are enabled as institutional entrepreneurs despite opposing institutional pressures.

The works of Jones (2008, 2014, 2015) are mostly biased towards Bourdieu’s sociology, and all reflect her ‘Gendering of Entrepreneurship’ thesis (Jones,
2011), a very strong thesis anchored on Bourdieu's theory of practice. Jones’ (2011) thesis highlights the choices, positions and struggles of staff and students within higher education, and how they respond to institutionally-framed policies and “historically masculinised discourses” in their teaching and learning practices. Jones’ thesis provides insight to this research, especially on the importance of highlighting the context of the study, and the strength the study could gain by utilizing multiple sources of data.

While Jones’ (2011) thesis adopted Bourdieu’s theory of practice as its framework, collection and analysis of data could have been more strongly grounded on Bourdieu’s sociology. Application of Bourdieu’s theory of practice necessitates that data collection be guided by Bourdieu’s relational model, with focus on obtaining data that uncovers the field of practice being studied, habitus of the agents within the field, the forms of capital they hold, and how these shape their practice. These fundamental building blocks of Bourdieu’s sociology were soundly discussed by Jones (2011), but only occasionally mentioned in the analytical sections. This current study furthers the approach adopted by Jones (2011) by developing a new research framework based on Bourdieu’s theory of practice that ensures that data collection and analysis addresses sufficiently, all aspects of Bourdieu’s relational equation, ensuring that the richness, and the full potentials of Bourdieu’s sociology are embedded and integrated through the entire length and breadth of the research, from conceptualization, data collection, analysis and discussion. Developing such a framework is one of the key aims of this research; a critical contribution to the study of entrepreneurship that this thesis makes.
One of the most robust application of Bourdieu's relational approach to the study of entrepreneurship is the work of Karataş-Özkan & Chell (2015). Drawing on empirical data from 52 practitioners, the study applied a Bourdieuusean approach to study the gendered and multi-layered nature of engagement of women academics in innovation and enterprise. The study conceptualized the University as a field, and innovation and enterprise discipline as a wider field within which entrepreneurship occurs. It thus brought into its analyses how the field, dominated by males presents “stark options” to women by shaping their (women) habitus through “science enterprise experience”. The strength of Karataş-Özkan & Chell (2015)’s work is highlighted in its focus on illuminating the underlying structures, and the mechanisms of governance that regulates and perpetuates power relations within academic environments through the accumulation of capital; and its uncovering of the male-oriented symbolic violence of language and domination within the field, that leaves women with options of either “playing by the institutional rules, or opting out”. Although strongly grounded, the work of Karataş-Özkan & Chell (2015) could have gained even more strength if the power distances between the players are illustrated since this is the basis of the power relations and tensions between both individual 'players' and groups in the field. This current study thus extends further, the strengths of the work of Karataş-Özkan & Chell (2015) by starting its analysis with development of the social space of academic entrepreneurship that illustrates spatially, the power distances between individual academic entrepreneurs, and the various groups within the field of academic entrepreneurship, and how this underlies their practice.
Several other writers (Tatli, et al., 2014; Forson, Özbilgin, Ozturk, & Tatli, 2014; Karatas-Ozkan, et al. (2014) have argued for, and advocated the strength of adopting a Bourdieusean perspective to the study of entrepreneurship. This study strongly aligns with this argument, and furthers this call by developing a research framework that could guide its operationalization.

2.3 Rentierism

Nigeria is recognised as a rentier state (Adogamhe, 2011; Mähler, 2010; Yates, 1996). This study uses Nigeria as a case study to investigate the dynamics of academic entrepreneurship in a rentier state.

Several strands of literature have emerged on how natural resources (especially oil) influence the socio-economic and political topography of oil-rich countries. These include studies of how the rentier apparatus shapes the government, economy, politics, and even behaviour in these environments. The Dutch disease thesis (Corden, 1984; Corden & Neary, 1982; Rajan & Subramanian, 2011) for instance blames resource wealth for the comparatively slow economic growth in resource-rich countries, while Collier & Hoeffler (2005) link mineral wealth with violent conflicts. Ross (2001) found oil wealth a hindrance to democracy and a fuel for authoritarianism, Harford & Klein (2005) cited resource wealth as the determinant of institutions in resource-rich countries, while Karl (1997) contends that oil booms caused a destabilization of governance structures and weakening of national capacities.

Yates (1996) posit that “the conditioning factor of economic stagnation and political authoritarianism in oil-dependent states is the corrosive effect of external rent”. This work investigates academic entrepreneurship within a rentier setting
and will therefore further strengthen the rentier state literature by adding to what is known as regards the influence of rentier structures on knowledge-based entrepreneurship.

This study takes a critical realist stance which posits that reality exists independent of humans. It acknowledges entrepreneurship to involve human agency (Shane, et.al., 2003), embedded within complex social systems (Aldrich & Zimmer, 1986), yet shaped by human knowledge, experience and apprehension of its reality (Bhaskar, 2008). This study develops a multi-layered framework which conceptualizes that agents produce and reproduce social practices within a social space following complex and dynamic logics (Chudzikowski & Mayrhofer, 2011). The proposed multi-layered perspective captures the impact of rentierism on the intuitional dynamics of a rentier state as it relates to the commercialization of research, taking into account the perceptions, dispositions and apprehensions that agents have of their positions, of rents from oil and of academic entrepreneurship. The study focuses on the relations between these different levels of analysis (individual, organisational and geo-regional contexts), and their mechanism of governance of academic entrepreneurship.

2.4 Summary

Academic entrepreneurship has been studied from different perspectives. The different trends of research in academic entrepreneurship were discussed in this chapter, with highlights on what has been investigated, and the various approaches adopted in studying them. In this chapter the conceptual and methodological gaps existing in literature regarding the study of academic
entrepreneurship were identified and highlighted. Also in the chapter, argument was made for a sociological approach to the study of academic entrepreneurship. The chapter discussed the need and appropriateness for a multi-level integrative approach that builds into its analysis individual, organisational, and national level situational and contextual factors that impact on academic entrepreneurship, and laid the foundation for the conceptualization of the framework upon which this research was built. The conceptualizations follow in the next chapter.
Chapter 3 Conceptual Framework

Researching Entrepreneurship within a Context

3.0 Introduction

In this chapter, the framework for this research work is discussed. The chapter highlights how insights gained from literature review guided the methodological decisions of this research. It illustrates how concepts found in existing academic entrepreneurship literature can be classified under the dualism of agency and structure, and argues in favour of a framework that transcends the agency-structure divide. This chapter argues for a synthesis of Bhaskar’s critical realism (Bhaskar, 2008) and Bourdieu’s sociology (Bourdieu, 1977), and discusses how such synthesis strengthens the robustness of the method applied for this research. The model guiding this research and its application are conceptualized, and the steps followed in executing this research are presented and discussed. This chapter prepares the ground for the philosophical and methodological considerations that follow in the next chapter.

3.1 Implication of the Findings of Literature Search

Several of the approaches for the general study of entrepreneurship, discussed in the literature review section of this thesis (see section 2.1.2) have been of limited success in the study of entrepreneurship. Neck & Greene (2011) for example found personality or trait based approaches incapable of explaining the differential entrepreneurial tendencies found in agents that possess identical attributes. Similarly, Low & McMillan (1988), as well as Gartner (1989) disagrees on the possibility of relating entrepreneurship to specific personality traits and urged for personality-based approaches to be expunged from entrepreneurship
research (Rauch & Frese, 2007). Although repudiated, some of these approaches may become more useful when they are considered, not in isolation of the other perspectives that constitute the wholeness of the reality of entrepreneurship. For this study therefore, the implication of this viewpoint is the development of a conceptual lens that considers the complex nature of entrepreneurship; this is discussed in the next section.

3.2 Rationalizing the Conceptual Lenses

Entrepreneurship is indeed a complex phenomenon, it is essential therefore that it be studied holistically (Fuller, Warren, & Welter, 2008; Van Gelderen & Masurel, 2012), with integrative consideration granted every aspects of its reality. The conceptual framework of this current study aims at a holistic account of academic entrepreneurship that transcends several levels of analysis identified in literature. It seeks an approach to explore academic entrepreneurship that can unify the existing perspectives of academic entrepreneurship in current literature (discussed in section 2.1.2). As illustrated, the major streams identified in the literature review are focused on three distinct units of analysis: Individual level factors, Organisational (University and entrepreneurial firms), and regional level factors (context) including situational institutions and policy.

The stance of earlier research posit that individuals produce and reproduce social practices within a set of organisational and regional contexts following complex and dynamic logics (Chudzikowski & Mayrhofer, 2011). This current research is similarly oriented, but takes a sociological perspective of academic entrepreneurship, conceptualizing it as practice (Drucker, 1985).
Developing the research framework for this study began with a search for an appropriate theoretical lens that accounts for ‘practice’ (defined as practical activities of agents (Giddens, 2013); see section 3.4), with consideration given to the personal characteristics and situational circumstances of agents, while simultaneously accounting for the socio-economic and political conditions that impact on their choices and action and how these interrelate to give rise to, and/or condition academic entrepreneurship.

Bourdieu’s theory of practice (Bourdieu, 1977) suited the sociological perspective of this thesis as a research lens. Bourdieu’s theory offered this research an opportunity to simultaneously account for the internal and external situation of individuals that condition their preferences and action. This capability set Bourdieu’s sociological theory apart from other perspectives considered in this research for the study of entrepreneurship at a multi-level.

Other research lens considered for this study include: Giddens Structuration theory (Giddens, 1984), the Institutional theory (DiMaggio, 1988), Engestrom’s Activity theory (Engestrom, 2000), Wittgenstein Practice theory (Bloor, 2001), and Bhaskar’s Critical Realist approach (Bhaskar, 2008). Giddens’ structuration theory, Bhaskar’s critical realism and Bourdieu’s sociological theories were given strongest considerations for adoption in this research. For a study aiming at uncovering at a multi-level, the relationship between agency and the institutional structures of its emergence, Gidden’s (1984) structuration theory, although offering a multilevel platform, shows strong inclination towards the rational choice of agents (See Section 3.2.1), while Bhaskar’s critical realism, although acknowledging existence of non-empirical aspects of reality, offers no appropriate
methodological tool for apprehending that which it acknowledges. To gain from the strengths of the two while limiting their intrinsic weaknesses, the philosophy of critical realism that acknowledges that reality is not entirely empirical, is strengthened with Bourdieu’s sociology that offers within its concepts of capital, habitus, and social space, methodological tools for apprehending the non-empirical aspects of the phenomenon of academic entrepreneurship.

3.2.1 Giddens Structuration Theory

Giddens’ structuration theory appealed to this research especially in consideration of the central importance of Giddens’ concepts of agency, structure and structuration to entrepreneurship studies. More so, its notion of social structure has the power to explain how internal and external structures enable and/ or constrain agential action, and extents to which agents and their actions can go.

For a study focused on the influence of rentier structures on the action of agents, Giddens’ structuration theory offers a platform for an integration of agency and structure; how the agency of academic entrepreneurs within a rentier state, work together with the socio-economic structures of a rentier state to shape academic entrepreneurship. Giddens’ structuration theory offered a platform for the much sought-after transcendence of agency and structure dualism, offering a conciliatory bridge across the divides of individualism and structuralism, voluntarism and determinism; the common dualisms that meddle and encumber entrepreneurship research.

To Giddens’ structuration theory, it is the participation of individuals in the multiple social systems existent within nations, within industries, within organisations, etc. that underwrite the potentiality for human agency. Individuals
constantly struggle between the demands of the social systems of their existence (eg. polity, work, home, school, family, etc.), and it is the interactions between these and the agents, that keep the social systems in existence, produce opportunities, and shape the choices and the reactions of individuals to the systems and what they produce. Agency is therefore interpreted as the ability, knowledge, skill and capacity to make choices about what practices to accept or reject, and ability react to the system and whatever it produces. Research in academic entrepreneurship framed on Giddens’ structuration theory therefore has facility to expose how the interaction between agents and these social systems create academic entrepreneurial opportunities, shape choices and influence the reaction of individuals in different situations and gauge the outcomes they produce.

Structuration theory however lost its appeal to this study by its fallacious inclination towards the rational choice notion. Giddens’ theory strongly acknowledges human potential. It stands and upholds the notion that agents possess high consciousness of their choices and actions. To Giddens, agents have perfect understanding of the social systems, and consciously and reasonably articulate the motives that lead and inform their choice of actions, rightness or wrongness of these choices being immaterial (Giddens, 1984). Hence in a rentier state, academic entrepreneurial agency is a matter of knowledge, skill and will of individuals, enhanced by the available resources, in particular, the rents from oil which shapes the rules; rules which the agents, perfectly knowledgeable and aware of, rationally accept, follow, or reject. For a research as this, effort therefore is towards identifying the rules, how they come into being, how, and under what conditions the agents obey or reject them. But the stance of this
study opposes the total accountability of human choice by rationality of agency. Agents are rational, and strive to make rational decisions, but within the agents’ unconsciousness are also rules that result from previous experience and mode of apprehension of their socio-economic conditions. These, despite agents’ unconsciousness of them, guide their actions and choices; this point of disagreement was the reason Giddens’ structuration theory as research lens did not completely suit this research, although some aspects of its agency/structure notion was retained.

3.2.2 Bhaskar’s Critical Realism

Critical realism is both a philosophical stance and a method (Reed, 2009). Based on Bhaskar’s (1978) original writings, critical realism stresses the importance of the underlying mechanisms that produce action, shape agency and govern a phenomenon. Its fundamental conceptual elements include: objects, events and mechanisms. ‘Objects’ are items that cause or have the capacity to instigate the occurrence of ‘events’; put more appropriately, objects are anything that possesses causal or generative powers (Archer, et.al., 2013). As would naturally be expected for this study, oil wealth is a classic example of an object since it possesses causal powers that can instigate action. Social and material structures such as technology transfer offices, social relationships, networks, intellectual property, government, law and legal structures, rewards, etc. all constitute objects for a critical realist academic entrepreneurship study. ‘Events’ on the other hand are historical occurrences which may or may not be empirically visible. For this study, events may include new discoveries, patent applications, start-ups, spin outs, commercialization programmes, funding regimes, etc. ‘Mechanism’ refers to the nature of the interaction between objects that give rise
to the events. The unique and distinguishing feature of critical realism is the stratification of reality into three domains: the real, the actual and the empirical, corresponding to the three realms: mechanisms, events, and experiences respectively.

Critical realism as framework suits this research on the ground that academic entrepreneurship is a social phenomenon, with its evidences in structures, events, patterns, artefacts, etc. that are identifiable, observable and measurable. However these structures, events, patterns, artefacts, etc. that human enquiry identifies, observes and measures arise out of the observable and unobservable objects, structures and sub-structures (Danemark, et.al., 2002). Critical realism therefore requires that account be given of the impact, not only of the various visible social and concrete structures that may enable and/or constrain agency, but also the subjective knowledge and apprehension of agents within a given context, and the mechanism of how these interact to give rise to, or constrain entrepreneurship. Appreciation of reality as stratified as held in critical realism, for an entrepreneurship study, enables detailed and deeply articulated explanation of the phenomenon of entrepreneurship within a given context in terms of not only the material structures, but also the actors’ objective and subjective perceptions, apprehensions and interpretations. In particular for this study, it enables an understanding of the rentier objective structures, as well as subjective structures and structural factors that may exist not in material forms, but in the forms of subjective knowledge, apprehensions, and perceptions of agents operating within the rentier apparatus, as well as an understanding of the mechanisms of the interaction between these objects and subjects that materialize to give rise to the observed outcomes and shapes the situations of
academic entrepreneurship within a petroleum rentier state. Such a deeply articulated understanding is sought in this study.

Critical realism as a philosophical stance suits this study, however there are methodological weaknesses. Critical realism as a method presents a difficulty in its implementation, which this study found very messy. Messy in the sense that although it acknowledges that the reality of academic entrepreneurship is beyond all that could be empirically identified, if fails to offer any tool, or mechanism for objectivising these subjective and non-empirical aspects of reality which it acknowledges, except by a way of retroduction (Danermark, et.al., 2002; Downward & Mearman, 2007; Easton, 2010). This study accepts retroduction as a valid and suitable tool for bringing to fore, the underlying mechanisms that cannot be materially apprehended. But the study is in search of opportunities to also bring to material account, the non-empirical, subjective aspects of the phenomenon of academic entrepreneurship. Bourdieu’s Sociological theories with its concepts of capital, field and habitus offered this opportunity. Hence this study sought a synthesis of Critical realism and Bourdieu’s sociology, to simultaneously bring to account, the subjective and objective aspects of academic entrepreneurship.

3.2.3 Bourdieu’s Sociological theories

Bourdieu's sociological theories as an analytical framework for this work was intended as a mediator of the tension between objectivism and subjectivism. Bourdieu’s theories enable an exploration of a subject within the objective structures of its manifestation by granting a transcendence between the various levels of analysis to reconcile and harmonize external social structures with
subjective experience of individuals, thus opening up avenues for logical illustration of the emergence of a social phenomenon. Bourdieu’s approach is relational in that it conceptualizes the human ‘society’ as an assemblage of ‘relations’ (Bourdieu & Wacquant, 1992), which Bourdieu explained is differentiated from mere ‘interactions’ between individuals. According to Bourdieu, “What exist in the social world are relations – not interactions between agents or intersubjective ties between individuals, but objective relations which exist ‘independently of individual consciousness and will’” (Bourdieu & Wacquant, 1992, p. 97). Bourdieu termed his philosophical stance “structural constructivism”, and in some texts referred to it as “constructive structuralism”, as to highlight its two-way dialectic between structuralism and constructivism; between objectivism and subjectivism. It is this transcendence that appealed to this study.

This thesis is founded on the stance of Bourdieu’s sociology that choices and preferences of social agents in diverse domains of practice (eg. sports, music, politics, food, etc.) have their basis on their dispositions and social positions (Bourdieu, 1998a). Social position in Bourdieusean terms is defined by the volume and configuration of economic resources held by an agent (Bourdieu, 1998a), while disposition which Bourdieu refers to as ‘habitus’ (see section 3.12) is a product of the objective conditions which an agent encountered and/or encounters. In this way Bourdieu developed a framework that theorizes about, and inculcates objective contextual social structures into the subjective, mental experience of agents.
The major distinguishing feature that presented additional benefit to this study, giving Bourdieu’s theories preference over Giddens’ structuration theory as its research lens, is its concept of habitus (Bourdieu, 1977). Bourdieu’s habitus stands as a mediator between human agency and structure. Habitus is an embodiment within agents, of the structural constraints and enablers existing in their environment that provides them with personally configured rules. Rules that are as dynamic over time as their environment; a configuration that Bourdieu termed “structuring structures” (Bourdieu, 1977, p. 72). Unlike Giddens’ structuration theory that perceives agential action as outcomes of agents’ conscious rationality, Bourdieu’s sociology perceives action as products of unconscious dispositions that shape agents’ conscious and unconscious judgement. The concept of habitus provides for this research, a tool for building the unconscious dispositions of agents into its analytical framework, the fundamental reason Bourdieu’s sociological theories gained preference in this study over Giddens’s structuration theory.

3.2.4 Bourdieu and Critical Realism- The Empirical Domain

This study strengthened Bourdieu’s sociological theories as its framework with Bhaskar’s critical realism. Although Archer (2010) disagrees, this thesis, in line with Potter (2000) and Elder-Vass, (2007) argues that Bourdieu’s sociology is in consonance with Bhaskar’s critical realism. The Bourdieusean concept of field for example captures the material properties of the agents’ contextual setting, other agents within the environment, their actions and practices, while the concept of capital represents the various resources available to the agents. All these Bourdieusean concepts belong to the empirical domain of critical realism as the materially apprehensible aspects of the reality of academic entrepreneurship.
Within the empirical domain of critical realism this study therefore strove to identify and measure the material resources available to the agents, as forms and configuration of the various forms of capital they hold. The study also strove to capture within the empirical domain, the physical properties of the various fields of academic entrepreneurship. The “actual” domain of critical realism is the domain of events, action and their outcomes. Within this domain, this research sought to capture the actions of the agents and the events they give rise to. This is further discussed under section 3.2.5 below.

3.2.5 Domains of the Actual, Events and Process of Retroduction

The actual domain of critical realism for this research deals with the actions of the agents and the events their actions give rise to. The stance of critical realism is that some aspects of the reality within the actual domain are materially apprehensible while others may not be (Bhaskar, 1978). Events often do not occur in isolation, sequences of events could lead to an outcome. While some of the events can be seen and measured, others may not be. To provide a valid logical account of reality, it is therefore essential to also account for the hidden events. An apple can be observed falling downwards but the force driving it downwards cannot be observed. Yet science hypothesizes that the apple is not on the move on its own. Science can make the connections, but must find valid and logical technique for accounting for the connections. To account for the non-empirical aspects of the phenomenon, critical realism introduces the process of retroduction which involves working backwards to identify ‘buried’ objects, structures and events from potentialities inherent in ‘visible’ objects, structures and events.
3.2.6 Domain of the Real, Retroduction and Bourdieu’s Habitus

The domain of the real is the domain of the underlying mechanisms. Aspects of reality within this domain cannot be materially apprehended, but can be identified through observing the effects they produce such as opinions, actions, behaviours, events, etc. (via retroduction). Retroduction in this study is focused on the Bourdieu’s concept of habitus. Habitus is the materially inapprehensible dispositional aspects of agency that capacitate potentialities for action. Habitus acts as internalized rules of the game, enabling or constraining agents, based on its (ie. habitus) internal logic and its relation with the agent’s external world. Habitus thus provides an opportunity for objectivising and bringing to the fore, the internal disposition of agents. Actions of agents are materially identifiable, the events they produce or their outcomes are also identifiable, but the investigative powers that produce them are not empirically identifiable; habitus thus offers an avenue for gaining access to the instigators of action through the identifiable objects and events that produce them, and/ or that they produce.

3.3 Research Conceptual Base

The summary central theme of this research is identification of the structural powers (or determinants) that produce/ influence academic entrepreneurship, and the dynamics of their interaction with the contextual characteristics or forces existent in a rentier environment. As a result, academic entrepreneurship occupies the centre of the research model (fig. 3.1).
The various themes identified in the review of literature that inform academic entrepreneurship provide detached views of the phenomenon of academic entrepreneurship. This study stakes a holistic view of the phenomenon using Bourdieu’s sociological lens strengthened with critical realism to develop a worldview that unifies the different perspectives of the phenomenon of academic entrepreneurship given in extant literature.
Fig. 3.2 Determinants of academic entrepreneurship from literature.

Fig. 3.2 illustrates the various perspectives to the study of academic entrepreneurship in extant literature. The various studies that approached academic entrepreneurship from these perspectives produced different findings. Although these views of previous studies were valid, they provided detached views of the phenomenon. This study strengthens their views and findings, by integrating the various perspectives using the Bourdieu's sociological framework, deploying its various relational concepts as the unifiers.
The Bourdieusean concepts of capital, field, habitus and practice serve as mediators in this research by offering opportunity and serving as tools for integrating the various entrepreneurship research perspectives into one conceptual framework. These entrepreneurial research concepts and perspectives, and their Bourdieusean equivalents are highlighted in table 3.1.
<table>
<thead>
<tr>
<th>1</th>
<th>Financial resources, education, knowledge, skill,</th>
<th>Forms of Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Regional, organisational, local environment/ context</td>
<td>Fields and sub-fields</td>
</tr>
<tr>
<td>3</td>
<td>Personality, cognition,</td>
<td>Habitus</td>
</tr>
<tr>
<td>4</td>
<td>Behaviour, action</td>
<td>Practice</td>
</tr>
</tbody>
</table>

Table 3.1. Entrepreneurial perspectives and their Bourdieusean equivalents

3.4 Developing the Research Model

Habitus gives rise to action, and series of action give rise to practice. Action “is the event caused by an agent’s impulse” (Pinxton, 1991, p. 121), “a product of class dispositions intersecting with the dynamics and structures of particular fields” (Swartz, 2012, p. 121). It occurs “when habitus encounters those competitive arenas called fields, and action reflects the structure of that encounter.” (ibid). This study investigates academic entrepreneurship as practice, practice is defined as the “ongoing mix of human activities that make up the richness of everyday social life” (Hyde, Ryan, & Woodside, 2012, p. 429), or “ongoing series of practical activities” (Giddens, 2013, p. 81). Since academic entrepreneurship consist of several fields, Academic entrepreneurship practice consist of series of actions in several fields.
Relationally stated:

\[ \text{AE Practice} = \text{Actions}_{f1} + \text{Actions}_{f2} + \text{Actions}_{f3} + \ldots + \text{Actions}_{fn} \quad \ldots \text{eqn 1} \]

*Where: \( \text{AE} = \text{Academic Entrepreneurship}, f1 = \text{Field 1}, f2 = \text{Field 2}, fn = \text{Field n}.\)*

*Bourdieu’s theory of practice gives the equation of practice as:*

\[ \text{Practice} = \left[ (\text{capital}) (\text{habitus}) \right] + \text{field} \quad \text{(Bourdieu, 1984, p. 101)} \quad \ldots \text{eqn 2} \]

*Therefore:*

\[
\text{Academic Entrepreneurship Practice} = \\
\left[ (\text{capital}) (\text{habitus}) \right]_{f1} + \text{field properties}_{f1} \\
+ \left[ (\text{capital}) (\text{habitus}) \right]_{f2} + \text{field properties}_{f2} \\
+ \left[ (\text{capital}) (\text{habitus}) \right]_{f3} + \text{field properties}_{f3} \\
+ \ldots \\
+ \left[ (\text{capital}) (\text{habitus}) \right]_{fn} + \text{field properties}_{fn} \quad \ldots \text{eqn 3}
\]

To study academic entrepreneurship therefore, the research effort in this work focused on the various agential actions in the relevant fields that constitute the practice of academic entrepreneurship. Since action and practice result from the capital held by the agents, their habitus and the properties of the fields of their action, this research focuses on data that sheds light on these aspects of Bourdieu’s equation of practice as it relates to academic entrepreneurship in Nigeria.
Bourdieu typically starts off his research with a snapshot or "photograph" (Grenfell, 2004, p. 119) of the phenomenon he studies; the rest of the research focuses effort on explaining how the situation of the ‘photograph’ came to be. In line with Bourdieu’s ‘snapshot’ approach, the initial data this research collects is data that provides a snapshot, or ‘picture’ of the present state of affairs of academic entrepreneurship in the Nigerian rentier state. Once understood, the rest of the research and data focuses on understanding the social dynamics that produced the state of affairs identified.

3.5 Constructing the Research Objects

Bourdieu designates the core aspect, or "the summon of the art" (Grenfell, 2011, p. 200) of any sociological research to be the construction of it’s ‘objects’, or the ‘objectivation’ of the study, which involves engaging very high “theoretical stakes by means of very precise and often mundane empirical objects for the study” (ibid). For this study ‘constructing the research objects’ entails reconceptualising and representing the objects of the study in relational terms (Bourdieu, 1983) and expressing them in a unified language, assigning contextual meanings and nomenclature to the various objects of the research to form a coherent unit. ‘Construction’ involves scrutinizing, redefining, and expressing the objects of the research in the terms and language of its field of study. To achieve this, Bourdieu suggests a translation of “abstract problems into thoroughly practical scientific operations” (Bourdieu & Wacquant, 1992, p. 221), figuring out its ‘inside’ and ‘outside’ and choosing a method with which to approach it (Jones, Silver, & Massanari, 2006).
Bourdieu recommends that ‘construction of the research object’ is a process that needs to be applied continuously throughout any research, but must particularly be addressed during the conceptual stage. This section of this report revisits academic entrepreneurship as it is defined in this study, and expresses it and its components and context in a Bourdieu-sean language. To do this, the triple helix relationship (Etzkowitz, 2008) between the academic field, government and industry, within the rentier state of Nigeria is brought to the fore. This section conceptualizes the critical realist objects and artefacts, which includes the context of the research, agents, resources, etc.

### 3.6 Agents as Objects of Study in Bourdieu-sean Terms

The richness of Bourdieu’s sociology is embodied within his relational concepts of social space, fields, capital, practice, and habitus that represent the resources available to the agents, inter-agential relations and agents’ ‘relation’ and action within the structures existent in their social environment. There are three distinct players in the field of academic entrepreneurship: government, academia, and industry. These three players are identified and are discussed in Etzkowitz’s (2008) triple helix model. According to Etzkowitz “The growth of new firms from academic research and the location of science-based industry adjacent to universities is a manifestation of triple helix relations in knowledge-based societies” (p.7). Academic entrepreneurship results when “university, industry, and government enter into a reciprocal relationship with each other in which each attempts to enhance the performance of the other” (p. 8). To this study that conceptualizes entrepreneurship as a game, agents representing the three fields identified in the triple helix model are in game-like (Bourdieu, 1977) relationships.
with each other within the field of academic entrepreneurship. The focus of this research is thus on unravelling, understanding and illustrating the position takings (Bourdieu, 1996b), homologies (Bourdieu, 1985), oppositions (Bourdieu, 1990b), dialogues, tensions and struggles (Bourdieu, 1990a) between the three players, and their relations with the wider rentier social structures present in the Nigerian context of their practice.

3.7 The Concept of Social Space

The Bourdieusean social space is a theoretical multi-dimensional representation of the social world of individuals and the differential distribution of the resources (forms of capital) available in their ‘world’. Bourdieu’s concept of the social space arose out of his quest to break from what he termed “economism” (Bourdieu, 1985, p. 723) that constrains the social field (of human relations) to solely the economics and relations of economic production. Although Bourdieu acknowledges the multiplicity of factors that classify and differentiate agents within any given society, he argues for the primacy of economic and cultural factors (Bourdieu, 1984); highlighting that it is the combined effect of the two that yields the strongest powers in differentiating any given society (Bourdieu, 1989). The major determinant of agents’ position in the society, or within their social environment according to Bourdieu is the combined volume and configuration of cultural and economic capitals they possess. This according to Bourdieu is also the major determinant as well as indicator of the dispositions, choices, preferences, behaviour and action of agents in various fields (Bourdieu, 1984).
The social space is constructed by plotting the overall volume of economic and cultural resources agents wield against the proportion of either to the other. Economic capital is made up of monetary income and other material assets held by agents; economic capital “for Bourdieu, entails all income, savings, and assets that have a monetary value, defined in terms of that value” (Hancock & Garner, 2009, p. 179). In this work, the economic capital of the agents is measured in terms of their level of monetary income.

On the other hand cultural capital includes cultural and demographic elements such as formal education, training and work experience, in particular those that are relevant to the occupation of the agent being studied (Healy, Kirton, & Noon, 2010). It also includes customs, manners, tastes, dispositions, perceptions and ways of appreciating the world (Hancock & Garner, 2009). Bourdieu (1986) identified three major manifestations of cultural capital: the embodied state such as lasting mind dispositions, the objectified state such as cultural goods (including pictures, paintings, tools, archival objects, etc.), and the institutionalized state, such as educational qualifications. In this study, number of years actively spent by agents in pursuit formal education is used as the measure of their cultural capital.

The combined volume and configuration of both forms of capital (economic and cultural) are used to construct a theoretical representation of the social space. While the vertical axis (see fig. 3.4) measures and represents the overall volume of capital wielded by the agents, the horizontal axis measures and represents the proportion of the two forms of capital wielded by the agents. Moving from bottom to the top on the constructed space increases the overall volume of capital, while
moving from left to right increases the proportion of economic capital while diminishing the proportion of cultural capital. Moving from right to left reverses this change. In this way agents with the highest volume of capital appear at the upper portion of the space. If the volume of capital held by an agent consist of more cultural than economic, the position of the agent shifts to the left hand side of the space. Similarly, the agents move to the upper right hand side if they possess high volume of capital with a higher proportion of economic capital (see Fig. 4.4). Thus the most important factor in positioning an agent on the social space is the agent’s overall volume of capital which determines the position of the agent along the vertical axis, irrespective of the composition of the capital held. The second most important determinant of the agents’ location is then the “fundamental opposition” (Bourdieu, 1984, p. 176) between the two forms of capital (economic and cultural), represented by the proportional mix of the two.
Fig. 3.4 The French social space of taste, culture, and politics

(Source: Bourdieu, 1984)
The most significant feature of a constructed social space is the proximity between the agents in the space,

"the basis of the very notion of space, that is, a set of distinct and coexisting positions which are exterior to one another and which are defined in relation to one another through relations of proximity, vicinity, or distance, as well as through order relations, such as above, below, and between..." (Bourdieu, 1996a, p. 11).

The closer two agents are to each other on the social space, the more they have in common, agents close to each other on the social space tend to have similar characteristics, such as interest in similar sports, similar career choices, similar taste of music, food, etc.

In Distinction (Bourdieu, 1977), the social space included a third dimension-the evolution of the volume and composition of capital over time. Bourdieu successfully illustrated how individuals and groups deployed 'strategies' to accumulate, conserve, and convert various forms of capital in line with their peculiar circumstances. Bourdieu illustrated how ‘fields’ are shaped as a result of differentiation in the social space, with agents possessing approximate volumes and composition of capital constituting different distinct fields such as the field of academic entrepreneurship by occupying proximate positions on the social space. The agents in each ‘field’ make choice of strategies, and follow particular trajectories that are reflections of their dispositions that form the “class habitus” (Bourdieu, 2004b, p. 115) of their particular field. Choices of strategy made by
the agents are geared towards enhancing their position in a particular field, or society at large, and stem from the habitus they have developed over time.

“The ability to select the correct trajectory to follow or the most profitable field in which to invest was less a matter of free choice than of strategy, that almost intuitive ‘practical mastery’ of the social field which formed part of the bourgeois habitus” (Lane, 2000, p. 153).

3.8 The Forms of Capital

Bourdieu’s concept of capital, or ‘forms of capital’ was intended to extend analysis beyond “interests which capitalism has produced” (Bourdieu, 1977, p. 177) and to bring into the analysis of social relations “what economism does only partially, and to extend economic calculation to all the goods, material and symbolic, without distinction, that present themselves as rare and worthy of being sought after in a particular social formation” (p.178). Bourdieu defined capital as “accumulated labour (in its materialised form or its “incorporated,” embodied form), which, when appropriated on a private, i.e., exclusive, basis by agents or groups of agents, enables them to appropriate social energy in the form of reified or living labour.” (Bourdieu, 1986, p. 241) Capital in Bourdieusean terms spans economic and material assets, and other assets that exist in embodied forms, providing routes for appropriation of social power. In contrast with classic one-directional Marxian models that focus on concrete economic assets to provide an account of the society, the Bourdieusean model builds sociological assets into the analysis of the assets held by individuals. Capital equates to power (Stewart, 2012), but not just ‘economic power’. Although economic power remains dominant in Bourdiuesean analysis of power, Bourdieu (1986) insists that
economic capital needs to be complemented with other forms of agential holdings that manifest in social, cultural and symbolic forms in order to produce a complete analysis of power relations that exist between social groups in the society.

According to Bourdieu:

“capital can present itself in three fundamental guises: as economic capital, which is immediately and directly convertible into money and may be institutionalized in the forms of property rights; as cultural capital, which is convertible, on certain conditions, into economic capital and may be institutionalized in the forms of educational qualifications; and as social capital, made up of social obligations (‘connections’), which is convertible, in certain conditions, into economic capital and may be institutionalized in the forms of a title of nobility” (Bourdieu, 1986, p. 82).

Economic capital consist of income and assets ascribable to an agent, “all income, savings, and assets that have a monetary value, defined in terms of that value” (Hancock & Garner, 2009, p. 179). In this work, the economic capital of the agents is measured in terms of salaried income. Survey data provided information about the incomes of the agents in the fields of academic entrepreneurship. Government documents and company annual reports and accounts also contain information about the levels of remuneration of some agents operating within these organisations. These estimates of the incomes of the agents were used to triangulate the self-reported data supplied by the agents.

On the other hand, cultural capital includes cultural and demographic components such as formal education, training and work experience; in particular those that are relevant to the occupation of the agents being studied (Healy,
Kirton, & Noon, 2010). It also includes customs, manners, tastes, dispositions, perceptions and ways of appreciating the world (Hancock & Garner, 2009). Bourdieu (1986) identified three major manifestations of cultural capital: the embodied state such as lasting mind dispositions, the objectified state such as cultural goods (including pictures, paintings, tools, archival objects, etc.), and the institutionalized state, such as educational qualifications.

This study is focused on the “class habitus” of the three agential groups in the field of academic entrepreneurship in the rentier state of Nigeria and how their habitus is conditioned by the rentier status of the Nigerian state, how the habitus thus shaped influences their ‘choices of strategy’ within academic entrepreneurship ‘field of struggle’; and how their choice of strategy in turn shapes academic entrepreneurship in the Nigerian rentier state. To achieve this, the rentier social space is mapped out using the data obtained from the surveys. The volume of capital held by an agent is calculated using their individual incomes, while their cultural capital is estimated using the number of years spent in education. Once represented on the social space, the various fields of practice becomes identifiable as clusters of agents, or “clouds of individuals” (Lebaron, 2009) occupying proximate vicinity within the social space. The social space thus congregates agents possessing approximately identical volumes and configuration of capital within proximate vicinities.

3.9 The Fields of Practice of Academic Entrepreneurship

Bourdieu often uses the terms ‘social space’ and ‘fields’ interchangeably. Swartz (2012) for example states “the conceptual terminology of field and social space often interweave in Bourdieu’s account without clear distinction” (p.132). This
stems from the relationship between the two concepts. Fields are sub-elements of a social space, this relationship would account for instances in this work where the two terms appear to be used interchangeably; a practice that is often times found in Bourdieu’s work.

Each field of practice is a positional demarcation of the social space, within each field belongs agents who possess approximately identical volumes and configuration of capital, sharing not only commonalities in forms and configuration of capital held, but also commonalities in “interests which are generic to the field itself” (Pels, 2002, p. 242), as well as “schemas of perception, thought and action which tend to reproduce practices in conformity with the field” (Gheciu, 2005, p. 85).

Academic entrepreneurship consists of three subfields: the academic field, the Industry field and the field of government, in line with the triple helix model. The agents in each of these fields deploy various strategies aimed at either maintaining or enhancing their positions, not only in their fields, but in the larger field of struggles.
Fig. 3.5 Social space, fields of practice, and the field of power
(Source: Swartz, 2012, p. 139)

This study aims to understand the configuration and structure of the three fields that make up the larger field of academic entrepreneurship with a view towards understanding the ‘class habitus’ of each field, and the form of strategies adopted in each field within a rentier state apparatus. An understanding of these would lead to further understanding of the mechanism of emergence of academic entrepreneurship within a rentier state.

While agents in each of the fields struggle for power and dominance within their particular fields, they also collectively strive for group dominance within the larger field of academic entrepreneurship. It is this individual and collective striving for dominance of the space by the agents within the three fields that give structure to the phenomenon of academic entrepreneurship. The (imaginary) ‘arena’ within which the power struggles between the various fields of practice (academia,
industry and government) occurs is termed by Bourdieu as the ‘field of power’ (Bourdieu, 1989, 1998b); also referred to in some texts as the ‘field of struggle’ (Bourdieu, 1993), or in more recent works as fields of play (Bourdieu, 1993).

### 3.10 The Rentier Field of Power

The ‘field of power’ in contrast with the field of practice has “a more abstract character” (Hilgers & Mangez, 2014, p. 185). It is “a field of power relations- a social arena in which actors claim and draw on expertise and moral authority to gain influence and pursue career, organizational and national interests” (Shiffman, 2015. P.497). Because it is “subject to contingency and is, moreover, capable of functioning in accordance with logics that are specific to it” (Hilgers & Mangez, 2014, p. 12), the actors deploy various ‘field strategies’, making use of the various forms of capital at their disposal to advance their interests, positions and preferences so as to:

1. get ahead and remain active and relevant within their particular field, as well as
2. achieve, and/ or maintain the dominance of the field of practice they belong to over the other fields of practice co-habiting the overall field of power.

The significance of ‘field of power’ in this research is thus that it depicts the arena of struggle, agreements, disagreements and tensions between academia, the industry, and the government for dominance in the field of academic entrepreneurship and the larger rentier society. This research aims at gaining an understanding of the strategies deployed by the agents in each field (academia, industry, and government) as well as how the choices of the strategies are made;
and how the various fields and their strategies relate to condition academic entrepreneurship within the rentier state of Nigeria. This is achieved by making use of data on the volumes and configuration of capital held by the agents in conjunction with data on the habitus of the agents. The habitus of the agents are divulged from observed behaviour and oral disclosure of the agents. For this research this is in the form of oral and written speeches, declarations and publications of agents about themselves as well as narratives and personal accounts of their knowledge, beliefs, experiences, etc., given in interviews. Intensive desk research is conducted in various electronic databases, including University websites, research depositories, newspaper publications, blog sites, and other medial sites. This is confirmed and strengthened using primary data from semi-structured interviews. Data from these sources serve to draw on and unpack the habitus of the agents as the disclosed in their various accounts and narratives.

3.11 Structural Homology

Bourdieu’s concept of homology argues that the same underlying principles that structure the society into groups, classes, fields, etc. based on volume and configuration of capital held by individuals also reproduces similar structural equivalences even in unrelated fields. Certain properties existent in different fields, or certain preferences of individuals in proximate spaces within the social space are in a “one-to-one correspondence” (Coulangeon & Lemel, 2009, p. 47). Homology in Bourdieusean terms thus leads to possibility that a structure identified in one field can be mapped onto another structural manifestation in another field. For example high level of education, research interests, publication,
etc. are homologous with the academic field, likewise are other specific dispositions and preferences. Bourdieu in Distinction (1984) explains that “spaces defined by preferences in food, clothing, or cosmetics are organised according to the same fundamental structure, that of the social space determined by the volume and composition of capital” (p.208). Thus tastes in the culinary field are linked to the socio-economic positions of individuals. The bourgeoisie for instance is linked to strong tastes and rich desserts; while the French population that are within professional fields were found homologous within the space of delicate and lean foods. Individuals in the artistic fields were linked with exotic tastes, while the tastes of manual and blue-collar workers mapped on to salty, fatty, long simmered dishes.

Fig. 3.6 Bourdieu’s food space (1984)  
(Illustrating homology between social position and culinary taste).
Bourdieu (1986) found in the field of consumption of works of art, “the social characteristics of the audiences of the different Parisian theatres (age, profession, residence, frequency of attendance, preferred ticket price, etc.),” to be “perfectly congruent (with) characteristics of the authors performed (age, social origin, residence, lifestyle, etc.) and of the plays or the theatrical enterprises themselves” (p.161). Similarly while examining the distinctive forms of power (political, intellectual, bureaucratic, and economic) through which societies are governed, Bourdieu (1998b) identifies a structural homology between the location and attendance of French elite schools and relative residential locations of French occupational groups. Location of elite schools are homologous with residential structure of the occupational groups occupying dominant positions in the French social space.

In other words, the dispositions, choices, actions, practices, etc. are all of the same ‘embryonic’ origin as the socio-economic structures that determine the positions of the agents within the social space. This study therefore sought to identify homologies related to the social positions of the academic entrepreneurs within a rentier state and the system of dispositions of the agents, choices they make, actions they take and their various practices within each of the three fundamental fields of the practice of academic entrepreneurship. Possibilities are that the dispositions, choices, actions, practices, etc. are all of the same ‘embryonic’ origin as the socio-economic structures that determine the positions of the agents within the social space; this possibility is in line with Bourdieu’s concept of structural homology which holds that structures identified in one field can be mapped onto another entirely different field. The socio-economic configuration of agents within the rentier apparatus could be mapped to their
dispositions, actions, strategies, practices, etc. because the practices and the strategies deployed by agents in the three fields stem from the same developmental origin as the structural divisions that shape the Nigerian rentier space. This study therefore beamed its searchlight on dispositions, practices, strategies, actions, etc. that are homologous with the various fields within the Nigerian rentier space, aiming to identify the fundamental practices across the fields of practice of academic entrepreneurship.

### 3.12 Agential Habitus

Every agent possesses a system of disposition emergent from their past history, present situation, and future expectations. For Bourdieu, an agent’s position within the social space produces specific modes of thinking about the world, of interpreting the world, and of behaving in the world; Bourdieu termed these specific modes of apprehending the world as ‘habitus’ (Bourdieu, 1977; Bourdieu, 2005a). Bourdieu considers habitus a reflection or reproduction of the hierarchical social structures and positions existent within the social space. The concept of habitus is crucial in any Bourdieusean analysis of the society because it is through the same mechanisms that mental dispositions (habitus) reproduce ‘images’ of the existing social world that the ‘rules of the game’ within the fields of power are also reproduced (Bourdieu, 2005b). ‘Rules of the game’ in Bourdieusean terms refer to what is ‘right’ or ‘wrong’, ‘acceptable’ or ‘not acceptable’, taken for granted, etc. Rules of the game also defines what forms of capital is considered essential, as well as the accepted values and ‘exchange rate’ of each capital. The implication is that decisions or choices, including choice of field strategies deployed by an agent must be in conformance with the constraints and conditions
characterising the agent’s existence, histories, and personal trajectories (Bourdieu, 2000), since these are the conditioners of the agent’s habitus.

Bourdieu introduced the concept of habitus to overcome what he termed the dual "complementary fallacies" (Bourdieu, 2000, p. 138), which refers to the claims that agential action is determined by the enablement or constraint from external influences on one hand, or by rational, free-willed, conscious decisions of agents on the other. In contrast, Bourdieu argues that it is the habitus, which is alive in the being of the agents, conditioned “by past experiences. The systems of schemes of perception, appreciation and action enable them to perform acts of practical knowledge, based on the identification and recognition of conditional, conventional stimuli to which they are predisposed to reach; and, without any explicit definition of ends or rational calculation of means, to generate appropriate and endlessly renewed strategies, but within the limits of the structural constraints of which they are the product and which define them” (p.138).

Bourdieu distinguishes two aspects of habitus: primary habitus and secondary habitus. Primary habitus develop alongside individuals during early childhood development as part of human upbringing, a product of family pedagogic work. Family socialization and inculturation is related to the social position in the social space of the parents (or family) and emerges from the parents’ own habitus, or dispositions, modes of thinking, modes of feeling or judgements about behaviour and action; these externalities of the parents are thus internalized as their children’s own habitus (Walther, 2014) which are durable as they are “embodied history, internalized as second nature and so forgotten as history” (Bourdieu, 1990b, p. 334). Family or family circumstances is therefore crucial in the
formation of primary habitus, and the habitus thus formed becomes the base upon which subsequent (secondary) habitus develops (Bourdieu & Passeron, 1977, p. 42).

Secondary habitus builds upon the primary habitus and develops out of life experiences, learning and social interactions of the individual. It interacts “in a more intensive way with other forces in the field such as capitals or other agents’ positions” (Pym, Shlesinger, & Jettmarova, 2006, p. 136). Education and socialization are crucial in the formation of secondary habitus, the type of school attended, peer and social groups, television and media, etc. that an individual encounters during their life trajectory, and the social fields they traverse and get involved in, all contribute to the formation of the secondary habitus. Secondary habitus however must exist in ‘dialogue’ with the primary habitus for the formation of the habitus of every individual. Hence the habitus of every agent is the sum of the internalization of the social environment that begins at early childhood and throughout an individual’s life trajectory. While the primary aspect of the habitus is more durable, the secondary aspect of the habitus is more prone to modification and change, most often due to shifts in the balance of power within a field. Changes in the habitus of agents accounts for the changes in field strategies that in turn accounts for the transformations of a field over time. Changes in habitus and the corresponding transformations of the field are beyond the scope of this research.

The concept of habitus from a Bourdieusean perspective is important in understanding the choice of strategies and practices agents make within a rentier state since the generative schemas of the habitus, which gives rise to agential
choices and practices is applicable and transferable within and across several fields of practice (Wigg-Stevenson, 2014). The habitus produces the same unified set of dispositions across different fields of endeavour for all agents in proximate positions within the space. All agents belonging to the same ‘cloud’ possess similar dispositions that lead to similar choices and practices in different fields. The understanding of the disposition of each cloud in one field such as career therefore makes it possible to understand their disposition towards, and within the field of academic entrepreneurship since individuals with similar habitus will make similar choices of career, and adopt similar field strategies. While Bourdieu used taste to identify ‘classes’ in distinction, this study used career choice as marker of distinction, since it is the same schemas of thought that lead individuals to make choices about becoming academics, becoming industrialists, or joining the government that informs their choices and strategies within these various fields.

This research studied the habitus of agents within the field of academia, within the field of industry, and within the field of government/ politics, sought to understand their habitus; how the individual habitus of the agents, and their collective habitus (Jawitz, 2009) informed their choices of action, generated action, or governed their practices. Habitus cannot be directly observed (Reay, David, & Ball, 2005, p. 25), so has to be interpretively apprehended. In distinction, Bourdieu (1984) used preferences and practices that cluster in each ‘cloud of individuals’ in the social space to identify the class habitus that underlie these practices. To gain an understanding of the habitus of the agents in this research, the method of narrative inquiry was adopted. Secondary data was obtained through document analysis of materials obtained through an intensive
desk research. This involved examination of texts from statements made by agents, general interviews granted to the media or other individuals, public broadcasts, publications, news reports, company annual reports, etc. that hold statements made by government officials, industrialists, or academics. This was strengthened with primary data obtained in the form of narratives of the agents of their knowledge and experience through semi-structured interviews. This opened up a gateway to the mind dispositions of the agents; dispositions conditioned by the presence of rents from oil within the Nigerian rentier social space. This helped an understanding of how the 'rentier dispositions' of the agents influenced their choices, decisions, and actions. In this way access was gained to the "schemas of thoughts" of the agents (Gheciu, 2005, p. 85), the

Fig. 3.7 Space of lifestyles illustrating homologous practices
(Source: Bourdieu, 1977 p.129)
“generative principles” of their judgements (Bourdieu, 1977), and their “system of classification” (p.170) of their actions and practices; these represent the habitus of the agents.

3.13 Field Oppositions

The spatial division structured by the high and low divide between the differential volumes of capital held by agents within the social space results in “similar structural oppositions between the dominant and the dominated, or powerful and the powerless...” (Hsing & Lee, 2009, p. 163). Bourdieu illustrates homology as “structures of opposition in various fields that correspond with structures of opposition in the class structure” (Swartz, 2012, p. 130). For example there is an opposition “between male and female, and all the homologous oppositions between high and low, wet and dry, east and west, etc.” (Bourdieu, 1990a, p. 113). “Working mothers are opposed both to so-called non-working mothers, who stay at home, and to working fathers” (Balkin, 2002, p. 257). It is essential to emphasise that the oppositions are rather systems of perceptions within the habitus of the agents. This provides an explanation for instance, to the high crave for luxury goods in rentier states by agents who perceive themselves as rich, and luxury goods as symbols of wealth, in opposition to the ‘poor’ who identify themselves with, and consume ‘ordinary’ goods; foreign and luxury products thus become symbols of class. Similarly individuals in dominant positions within the social space consume luxury goods, and producers create expensive goods targeted at the dominant group. The disposition or habitus of agents apprehend items, practices, actions within their fields rather in terms of these durable
oppositions between posh and dowdy, rich and poor, high and low, winner and loser, dominant and dominated, right and wrong, worthy and unworthy, etc.

In distinction (Bourdieu, 1984), Bourdieu discusses opposition between tastes that are ‘rare’ and those that are ‘vulgar’, apprehended as ‘distinguished and common’, with rare practices designated as distinguished and homologous with agents high in overall capital volumes. The rare/ distinguished tastes are opposed to ‘vulgar’ tastes, identified as easy and common, and attributed to individuals with lower overall capital volumes. This study therefore seeks not only identification of structural homologies within and between the fields of academic entrepreneurship, but also the system of durable oppositions associated with the different proximate agential groups and the dynamic relations between choices, actions, and practices of the agents within and between fields.

3.14 Dominance, Dominant Group and Domination

The dominant group possesses the highest overall volume of capital, alongside a configuration of capital that places them at the top right-hand side of the social space. The dominant group in any given society defines and controls the social hierarchy (Bourdieu, 2004a). Being in control and recognised as so, the other subordinate groups existing in the social space strive individually and collectively to move into the dominant position, and in the struggle unconsciously ‘copy’ the symbols with which the dominant groups symbolise their dominance such as big cars, mansions, exotic holidays, etc.

The dominant group maintain their position through various strategies such as control of state institutions, violence such as police brutality, prison, or by symbolic violence (see Section 9.2.2) which comes in various forms, including
legitimation of corrupt practices, buy-offs, philanthropy, language, etc. These strategies and behaviours though not consciously produced, reflect the structure of society embodied as habitus within individuals as (Collyer, 2015) explains, “subordinate groups consent to the norms in social relations espoused by the dominant group” because of the power of the dominant to ‘coerce’ the subordinate groups to integrate the dominant world view as the norm (p.196). ‘Coercion’ includes the use of violence, since according to (Hall, 2014) “elites can establish control over rents and secure access to them using coercive violence” (p.186). In Bourdieusian terms however, violence is more often symbolic.

3.15 The Research Process

The research process follows a Bourdieusean framework underpinned by critical realism philosophy. It therefore entails gathering data about concrete objective structures of the phenomenon of academic entrepreneurship, gathering data about subjective knowledge and mental experience and disposition of academic entrepreneurship agents, identifying and positioning the agents and the resources held by and available to them as the various forms of capital, identifying the dispositions and or habitus of the agents, and finally using logic and retroductive processes to illustrate the dynamism of the relations between the various forms of capital, the dispositions of the agents, the field; and how these relate to produce the series of events and outcomes that working together, are recognised as ‘practice’.

The final part of the analysis- ‘mapping the relations’ involves recognising the observed aspects of the reality of academic entrepreneurship, retroducing to illuminate the unobservable aspects and logically demonstrating order in the
data, existing theory and observed state of affairs to produce a credible and irrefutable description of the mechanism of the emergence and sustenance of academic entrepreneurship within a rentier apparatus. The model developed for this research possesses an explanatory power to deal with not only the current state of affairs of academic entrepreneurship, but also a historical dimension that can explain the changes in the dynamism and outcomes of the phenomenon of academic entrepreneurship over time; such historical dimension however is not of interest to this current study.

3.16 Summary

In this section of this report, the framework that guided this research work was discussed. The section discussed how extant literature was used to guide the considerations made while deciding how this research would proceed. The chapter summarised the theoretical lenses considered as research lens and discussed how the decision to employ the Bourdieu’s sociological theories was made. Using Bourdieu, the conceptual framework for this research was developed in this chapter, and the discussion illustrated how Bourdieu’s sociology as the framework gained further strength and robustness by being underpinned by critical realism. The various stages recommended in literature for Bourdieu-based research were expanded and how the stages for this research emerged from it were discussed. The procedure for this research was described as a six-stage three phase process involving collection of data, analysis of data, and validation. This section of the report sets the scene for the next chapter, which discusses in full, the methodological principles and considerations made for this research.
Chapter 4 Methodology

Research Philosophy, Method, and Ethics

4.0 Introduction

The purpose of this chapter is to relate the underpinning philosophy, methodology, the design of the method for the data collection and analysis of the data for this study. While it is not intended in this section to enter into full discussions about philosophies of knowledge, the chapter provides an overview of relevant philosophies of knowledge in order to situate the philosophical stance of the study. The discussion considers philosophy of knowledge and its implications to the study of entrepreneurship, as suggested by Archer “the nature of what exists cannot be unrelated to how it is studied” (1985, p. 16). How critical realism most suits this study as its underpinning philosophy is illustrated, and how Bourdieu’s sociological theories serves as its analytical framework is discussed.

4.1 Ontology and Epistemology

4.1.1 Ontology

Ontology is the “theory of being” (Palmer & Dunford, 1996); it is a scholar’s statement of belief, assumption or position regarding the nature of existence (reality, being, becoming, etc.). The human sense is limited in its capacity to directly experience or acquire definite knowledge of what the world is like (Serres, 2008) hence, only aspects of reality are apprehensible to the human senses.

The position of this study is that reality cannot be limited to that which is observable; this stance is at par with positivism which dismisses that as non-
existent, aspects of reality that are not observable. Acknowledging human limitation encourages research effort towards building analytical tools and methods that may have the powers to unravel those aspects of reality that may not be observable. It opens opportunity for assumption of positions in order to support data and develop deeper knowledge about the nature of the world.

Two dualist positions—idealism and realism underlie the ontology of knowledge. While idealism perceives reality as a product of human cognisance and construction, realism perceives it as an externality to, and independent of human knowledge. For an idealist, the whole concept of academic entrepreneurship is a product of human mental construction. Organisations, agency, opportunities, etc. are all made up and exist within the minds of individuals, and outside of human mental models these ‘concepts’ have no existence. Hence research design or research as a whole consist entirely of accessing the mental models of individuals. On the contrast for a realist, academic entrepreneurship consist of concrete human actions and inactions, behaviours, desires, concrete barriers, resources, etc., and their existence is established by identifying, observing, enumerating, recording, etc. as to understand their properties and the way they are manifest in the world. The dualist ontological positions of realism and idealism are discussed in fuller details in section 4.2 of this report.

For this study, reality consist of observable and unobservable entities and mechanisms, and the purpose of research is to observe the observables, and design means of access or understanding of the unobservables. Reality, to this study exists independent of human knowledge or apprehension of it, yet it is apprehensible but only imperfectly and probabilistically through observations.
Academic Entrepreneurship in Petroleum Rentier States

(Guba & Lincoln, 1994); this is the position of this study. This study is therefore set to make observation of the reality of academic entrepreneurship, yet with an acknowledgement that all observations made are imperfect, probabilistic and generated knowledge only tentative. Observation being limited, knowledge shall not be limited to observation. Systematic and logical methods are applicable as to complement that which is observed. This is the critical realist stance, it is the stance of this study and it is further discussed in section 4.2.3 of this report.

4.1.2 Epistemology

While ontology relates to the “theory of being” epistemology refers to the “theory of knowledge” (White, 2001, p. 12). It refers to the position of the researcher (or observer) relative to knowledge about reality (or being, existence, etc.), “beliefs about the way in which knowledge is construed” (Cavaye, 1996, p. 232). For an entrepreneurship researcher epistemology deals with questions about what could be known and how the knowledge could be accessed regarding human actions and behaviour, structures, start-ups, processes, social relations, etc. that constitute entrepreneurship. In other words, it is the logic and mechanism of understanding the phenomenon being studied (entrepreneurship) and a judgement of the standard that is, or could be applied in determining the validity of claims the researcher makes regarding the position, behaviour, situation, understanding, meanings, actions or inactions of agents, organisations and the society that impact on or give rise to entrepreneurship. Epistemology deals with how knowledge is built up and made sense of, where the researcher or observer stands in relation to the knowledge being built up, and the place of the researcher’s own understandings, meanings, perspectives, standards, etc.
It is not possible for the researcher to remove self from the research because “as researchers, our choice of research topic is shaped by our own academic backgrounds and trajectories” (Grenfell & Lebaron, 2014, p. 23). As far as this study is concerned, the researcher is a member of the community being researched, the researcher is also an observer, a data collecting ‘instrument’, and a tool for its analysis. For a critical realist study, the role of the researcher in establishment of knowledge is dual: searching for, identifying and recording identifiable objects and subjects that reality is made up of, and deploying logical means to apprehend the unidentifiable aspects of reality using retroductive (Downward & Mearman, 2007) processes. Being an observer of the phenomenon under study, the researcher is often urged (Etherington, 2004) to keep the research work impersonal, and that the process is approached objectively from a distance with a “don’t-be-involved” stance while avoiding the “contamination” (p.19) that subjectivity may bring. But how can the dance be separated from the dancer (Yolanda Sarason, Dillard, & Dean, 2010)?

4.1.2.1 Reflexivity

While this study agrees that it is crucial that the researcher remains a neutral and non-interfering ‘judge’, it argues that personal bias, prejudice; preconceptions and predispositions not only come in the way, but are essential tools for analysis. To deny the researcher’s own dispositions and contributions to the research is to repudiate reflexivity. Reflexivity has been argued as the cornerstone of social intellectual enterprise (Bourdieu & Wacquant, 1992; Etherington, 2004) and key to the production of distinctive and scientific knowledge of the social world especially when contextualization is emphasised as is the case in this research.
Bourdieu in his work considers the researcher's self-awareness of their positions (of power) in the field of research, and in the society at large as a research instrument, and an important condition for sound social science, because “The Personal is Social” (Bourdieu & Wacquant, 1992, p. 202). Bourdieu asserts as follows:

“I have never ceased taking myself as an object, not in a narcissistic sense but as one representative of a category. ... I can be objectivized like anybody else, and like anybody else, I have the taste and preferences, the likes and the dislikes that correspond roughly to my position in social space. I am socially classified and I know precisely what position I occupy in social classifications” (p.203).

Writing on Bourdieu, Speller (2011) states “When Bourdieu studied his native region... he was simultaneously analysing the society and culture of which he was a product, and to which he owed his own system of dispositions, thoughts, and perceptions (i.e., habitus)” (p.43). With regards to the researcher’s position in the research process Bourdieu calls for reflexivity as tool that would lend a hand to the researcher in gaining control over the structures of thought and action internalized in the researcher through the experience of belonging to an intellectual field, a position which if ignored could lead to errors and biases in the design and analysis (Bourdieu, 1992).

Similarly Sayer argues that “the conditions and social relations of the production of knowledge influence its content. Knowledge is also largely—though not exclusively—linguistic, and the nature of language and the way we communicate are not incidental to what is known and communicated” (1992, p. 6).
The argument is that in this current work, the researcher remains a part and a member of the social world within which the researcher, and others within it have individual idiosyncratic apprehensions of their individual worlds, and peculiar understandings of their collective world. The researcher makes observations, conducts analysis and draws conclusions in this research therefore from a personal “point of view” (Bourdieu, 1989, p. 18) in the world with focused attention on understanding how the ‘world’ (of academic entrepreneurship) itself is structured, and apprehending what others within the context of the research make of their personal and collective world. To do so, the researcher deploys established knowledge, methods, and personal experience to gain a deeper and more meaningful understanding of the reality of the objects and subjects of this study. In other words, the researcher assumes a position of an unremoved member (of the context being researched), yet a distant observer of the phenomenon being studied, an ‘instrument’ for collection of data for the study and a ‘tool’ for its analysis and production of knowledge. This is the epistemological stance of this research.

4.2. Research Philosophy

Critical realism is the philosophical stance of this research, with an argument that research produces a complete picture of a phenomenon when it not only identifies, observes, measures, and explains observable aspects of reality, but when it also includes in the analysis, aspects of the reality that are not apprehensible to human senses. Thus the critical realist stance taken by this research is a middle position between realism and idealism.
For a better understanding of the implication of the critical realist stance of this research, philosophies of knowledge (ontology and epistemology) are viewed, not as discrete, bounded philosophical stances, rather as a continuum of philosophical positions. This is because the various philosophies of knowledge somewhat overlap one another (Eflin, Glennan, & Reisch, 1999; Newman & Benz, 1998). In the next two sections (4.2.1 & 4.2.2) of this report, realism and idealism as philosophies of knowledge are discussed so as to situate the critical realist stance of this work within the various philosophies of knowledge.

4.2.1 Realism

The different philosophies of knowledge are positioned along a continuum (Newman & Benz, 1998) (see Table 4.1). On one extreme of the continuum is realism which conceives reality as sets of objective, concrete structures that can be identified, observed, measured, etc., and on the other extreme is idealism which conceives reality as subjective, and totally an outcome of human mental processes. The strictest form of realism –naive realism has its roots in the Humerian (Strawson, 2014) positivist perspectives of the 18th century whose fundamental doctrine is the claim “that our ordinary perception of physical objects is direct, unmediated by awareness of subjective entities, and that, in normal perceptual conditions, these objects have the properties they appear to have” (Dretske, 1995, p. 339). Thus scientific enquiry is only meaningful only when its elements are empirically and objectively identifiable and measurable. Any knowledge claims or scientific enquiry that are not grounded in objectively observed and measured data is therefore to realists meaningless and of no scientific value (Ackroyd & Fleetwood, 2000; Fleetwood, 2014; Mingers, 2014); in other words, what is seen is what is existent.
Realism for years occupied a dominant position in entrepreneurship research (Alvarez, Barney, McBride, & Wuebker, 2014). These include studies that focus on the individual as the unit of analysis, with attempts at observing and measuring the personal attributes and behaviours of the individual and how this determines entrepreneurial tendencies (Arora, Haynie, & Laurence, 2013; Chell, 2013; Clarysse, et al., 2011; Jones & Casulli, 2014). Others include studies that view entrepreneurship as the process of discovery and creation of opportunities (Alvarez, Barney, & Anderson, 2013; Dimov, 2011; Tang, Kacmar, & Busenitz, 2012), amongst others.

What the realist perspective implies for an academic entrepreneurship study is that academic entrepreneurship manifests in concrete forms that can be identified, observed, measured, etc. The number of patents emerging from research conducted at a particular university, the number of academic entrepreneurs, preferences and behaviours, expenditure, etc. are all aspects of academic entrepreneurship that could be objectively observed, identified and measured. Causal relationships or the generation of regular principles can also be identified and possibly expressed in quantitative terms or models. Models and mathematical expressions can then be developed to allow for the prediction of entrepreneurial outcomes, or even control of such. Such prediction and control of outcomes is often the focus of realist studies in entrepreneurship.

For this study however, the reality of academic entrepreneurship goes beyond concrete, measurable entities and variables. Some aspects of what constitutes, or mechanisms that govern academic entrepreneurship are often neither observable nor measurable. The understanding or apprehension a person has
about an object (for example, a patent) influences their behaviour towards it (Bourdieu, Passeron, de Saint Martin, & Teese, 1996). But it is not possible to directly measure apprehension, mindset, disposition, etc. (Rijst, 2009). This study therefore takes a philosophical position that recognizes the criticality of concrete evidence, yet without denying the significance of the non-concrete and idealist aspects of reality.

4.2.2 Idealism

On the opposite end of the ontological spectrum lies idealism, with transcendental idealism as its extreme form. Transcendental idealism has its foundations in the Kantian metaphysical thesis (Friedman, 1992) which claims that reality consists of “super sensible, non-spatio-temporal entities, and that the physical objects as we know only SEEM to exist” (Allais, 2004, p. 655) (capitalization for emphasis is mine). Reality therefore is nothing more than human mental conjugation. The implication of an idealist stance for a study such as this is a shift of the focus of research towards gaining access to the mental models of individuals and understanding the modes and processes of human mental conjugation of reality. To idealists, the role of a researcher is therefore to “grasp thoughts” (Schim, 1996, p. 355), and these “thoughts exist independently of thinking” (ibid) just as physical objects exist independently of our physical grasp of them.

Milder forms of idealism include social constructivism which emphasises social relations in understanding reality, holding reality as socially (or collectively) constructed entity that neither resides nor is found in the mental faculties of an individual human, rather within a community. It “is born between people collectively searching for truth, in the process of their dialogic interaction”
(Emerson & Bakhtin, 1984, p. 110). In other words, the world or reality is collectively constructed by a ‘community’ which assigns a common meaning to their world. Hence instead of seeking to “grasp thoughts” (Schirn, 1996, p. 355) of individuals, research strives to deconstruct (Howells, 2013) the shared meanings and understandings constructed and shared by a community, since it is their shared meanings and understanding that constitute their reality. From an ontological point of view or logic, different communities depending on their peculiar characteristics and dispositions may assign different meanings to the same phenomenon. This line of thinking is the basis of the multiplicity of reality (Peek, 2010) as claimed by relativists who maintain that there are multiple realities and therefore accept multiple interpretations of same reality (Andrews, 2012).

While realist studies are focused on generating law-like relationships between entities, social constructivist studies have their focus on interpreting the meanings individuals or communities assign to their world (Creswell, 2007).
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**Table 4.1. The continuum of ontological and epistemological positions.**

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<th>Realism</th>
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Within the scope of this work, the reality of academic entrepreneurship goes beyond the mental modes of the agents. Although the significance of mental modes cannot be over-stressed, it must be acknowledged that mental modes of agents within any given context is conditioned by its contextual circumstances or environmental attributes. This work therefore attempts to account for the concrete aspects of academic entrepreneurship that together with the idealized forms govern the emergence of academic entrepreneurship. Taking into account objective and subjective aspects of the reality of academic entrepreneurship as is the case in this study implies taking a stand at the mid-line between realism and idealism; this is the position of critical realism.

4.2.3 Critical Realism

Critical realism, the philosophical stance of this study occupies a middle position between realism and idealism. As a philosophy of knowledge it acknowledges both realism and idealism to extents thus providing “an alternative to both hopes of a law-finding science of society modelled on natural science methodology and the anti-naturalist or interpretivist reductions of social science to the interpretation of meaning” (Sayer, 2000, p. 3). Based on the original writings of Bhaskar (1978), critical realism accepts that aspects of reality are apprehensible to human senses and could be observed and empirically measured, yet some aspects of the world do exist beyond empirical perception and measurement; or human knowledge or otherwise of them (Archer, et.al., 2013). This argument is in the line of depth realism (Harré, 1996) whose position is that there is much more to our world and reality than meets the eye, that there is much more to the world than we observe and experience, because beneath the reality that science
observes is a deeper level of reality that instigates and controls the observed events.

In contrast to empirical realism, critical realism is of the belief that the laws and patterns observed result from underlying ‘invisible ‘mechanisms, and should therefore not be taken independent of these mechanisms. It accepts and stresses the need for empirical evidence, yet abhors the epistemically fallacious stance of empirical realism (Bhaskar, 2008) that reduces reality to human sense, experience or knowledge. Reality to critical realists is stratified and mind-independent (Krauss, 2005) consisting of underlying structures and mechanisms whose generative powers determine what things get to occur and how they occur (Archer, et.al., 2013). It thus refutes the power of research to generalize about reality based on observed or experimented outcomes on the grounds that reality is transient and dynamic (Lawson, 1999); that the events that research observes do not emerge from concrete structures, rather from complex structures and mechanisms that are in a contingent relationships with one another (Tsoukas, & Chia, 2011). Critical realism thus emphasises the understanding of the underlying mechanisms that produce the events that science observes as the onus of research rather than the events themselves.

Sayer (1992) discussed the 8 key assumptions of critical realism as follows:

“1. The world exists independently of our knowledge of it.

2. Our knowledge of the world is fallible and theory-laden. Concepts of truth and falsity fail to provide a coherent view of the relationship between knowledge and its object. Nevertheless knowledge is not immune to empirical check and its
effectiveness in informing and explaining successful material practice is not mere accident.

3. Knowledge develops neither wholly continuously, as the steady accumulation of facts within a stable conceptual framework, nor discontinuously, through simultaneous and universal changes in concepts.

4. There is necessity in the world; objects—whether natural or social—necessarily have particular powers or ways of acting and particular susceptibilities.

5. The world is differentiated and stratified, consisting not only of events, but objects, including structures, which have powers and liabilities capable of generating events. These structures may be present even where, as in the social world and much of the natural world, they do not generate regular patterns of events.

6. Social phenomena such as actions, texts and institutions are concept dependent. We not only have to explain their production and material effects but to understand, read or interpret what they mean. Although they have to be interpreted by starting from the researcher's own frames of meaning, by and large they exist regardless of researchers' interpretation of them. A qualified version of 1 therefore applies to the social world. In view of 4–6, the methods of social science and natural science have both differences and similarities.

7. Science or the production of any kind of knowledge is a social practice. For better or worse (not just worse) the conditions and social relations of the production of knowledge influence its content. Knowledge is also largely—though
not exclusively—linguistic, and the nature of language and the way we communicate are not incidental to what is known and communicated. Awareness of these relationships is vital in evaluating knowledge.

8. Social science must be critical of its object. In order to be able to explain and understand social phenomena we have to evaluate them critically” (p5).

In contrast with social constructivism that is concerned with unravelling how knowledge is constructed within the mental models of agents (O’Connor, 1998), and empirical realism that is focused on observing patterns of events, the critical realist ontological and epistemological stance of this study directs interest and research energy on observable objects and events, yet focuses effort on understanding and illustrating the underlying mechanisms that produce them.

Critical realism as the philosophical stance of this research is premised on the ground that entrepreneurship is a social phenomenon (Thornton, Ribeiro-Soriano, & Urbano, 2011; Wickham, 2006, p. 15) which is evidenced in material and ideal structures, events, patterns, artefacts, etc. that are identifiable, observable and measurable. However these structures, events, patterns, artefacts, etc. that human enquiry identifies, observes and measures stem from relations between the observable as well as unobservable objects, structures and sub-structures (Danermark, et.al., 2002). In particular, critical realism supports that account be given of the impact, not only of the social and concrete structures that may enable as well as constrain agency, but also the subjective knowledge and apprehension of agents within a given context, and the mechanism of how these relate in order to give rise to, enable, or constrain entrepreneurship.

Appreciation of reality as stratified as held in critical realism for an
entrepreneurship study enables detailed and deeply articulated explanation of
the phenomenon of entrepreneurship within a given context. That is in terms of,
not only the material structures, but also the actors’ objective and subjective
perceptions, apprehensions and interpretations. In particular for this study, it
would enable an understanding of the rentier objective structures, as well as
subjective structures and structural factors that may exist not only in material
forms but in forms of subjective knowledge and perceptions of agents operating
within a rentier apparatus, as well as an understanding of the mechanisms of the
relations between these objects and subjects that materialize to give rise to the
observed outcomes and determine the existent situations of academic
entrepreneurship within the rentier state of Nigeria. Such deeply articulated
understanding of the relations and mechanisms is the aim of this study.

4.2.4 The Stratified Ontology of Critical Realism

Critical Realism stratifies reality into three ontological depths: The empirical, the
actual, and the real. The empirical domain consist of sensory objects, objects that
are seen, felt, heard, observed, perceived, etc.; if it is not experienced then it
doesn't belong to the empirical. The actual domain is the domain of events, but
events do not occur out of nothing, they are instigated. The real domain hence
consists of the generative forces that trigger the events that manifest in the
domain of the actual, for example agents’ apprehension of government funding
programme may be beyond empirical grasp, yet has the power to generate
action, or condition how an agent responds when such funding programmes
come to life.
Fig. 4.1. Structure of the domains of critical realism
(source: Mingers & Wouldcocks (2004))

As illustrated in fig. 4.1 above, the three domains of critical realism are not mutually exclusive. While the domain of the real is a set comprising of all three levels: mechanisms, events and experiences; the domain of the actual is a subset that consists of both events and experiences. The empirical domain is a subset of the previous two consisting of only experienced aspects of reality.

A critical realist study involves identification of the elements of critical realism and developing an understanding of their mode of relating. For this study, data collection involves identification, observation, measurement, etc. of empirical objects that relate to the phenomenon being studied (empirical domain), identification, observation, measurement, etc. of events and outcomes that relate to the phenomenon being studied (actual domain), and using evidence of objects and events that they produce alongside logic (retroduction) to apprehend unobservable objects, events, and the underlying mechanisms that produce
them. Thus design for collection of data for this study involves strategies for gaining access to evidence and facts that relate to the commercialization of research in Nigeria. Accessing documents and information held by relevant individuals and organisations, and scrutiny of publicly available reports and news reports that relate to commercialization of research. Inductive processes such as interviews are then applied to gain access to the ideal forms such as the mental modes and dispositions of individuals that relate with academic entrepreneurship. Bourdieu’s sociological theory is then applied to as a framework that transcends these two realms (material and ideal) of the reality of academic entrepreneurship.

4.3 Bourdieu’s Sociology as Research Framework

This work adopts Bourdieu's sociological theories as its analytical framework. Intended to serve as a mediator of the tension between idealism and realism (section 4.2.1 & 4.2.2), Bourdieu’s theories enable an exploration of a phenomenon within the objective structures of its manifestation by granting a transcendence between the various levels of analysis to reconcile and harmonize external social structures with subjective experience of individuals. Bourdieu’s approach is relational in that it conceptualizes the human ‘society’ as an assemblage of 'relations' which Bourdieu differentiated from mere 'interactions' between individuals. “What exist in the social world are relations - not interactions between agents or intersubjective ties between individuals, but objective relations which exist independently of individual consciousness and will” (Bourdieu & Wacquant, 1992, p. 97). Bourdieu termed his philosophical stance ‘structural constructivism’, and in some texts referred to it as ‘constructive structuralism’ so as to highlight its two-way dialectic between structuralism and
constructivism. The philosophical claim of Bourdieu is in line with critical realism and as such forms suitable analytical framework for this critical realist study.

### 4.3.1 Bourdieu’s Constructivist Structuralism and Critical Realism

Bourdieu’s philosophical claim (structural constructivism) is a matter of nomenclature because the philosophical stance of his works is in agreement with the critical realist argument. Bourdieu writes

> “Interactions, which bring immediate gratification to those with empiricist dispositions -they can be observed, recorded, filmed, in sum, they are tangible, one can ‘reach out and touch them’-mask the structures that are realized in them. This is one of those cases where the visible, that which is immediately given, hides the invisible which determines it. One thus forgets that the truth of any interaction is never entirely to be found within the interaction as it avails itself for observation” (Bourdieu, 1989, p. 16).

This in agreement with the critical realist ontological stance that reality goes beyond what can be empirically observed (Carlsson, Acs, Audretsch, & Braunerhjelm, 2008). Further, explaining his philosophical stance (constructivist structuralism) in Bourdieu (1989) he writes:

> “I mean that there exist, within the social world itself and not only within symbolic systems (language, myths, etc.), objective structures independent of the consciousness and will of agents, which are capable of guiding and constraining their practices or their representations. By constructivism, I mean that there is a twofold social genesis, on the one hand of the schemes of perception, thought and action which are constitutive of what I call habitus, and on the other hand of social structures” (p.14).
The correspondence of the Bourdieu’s constructivist structuralism with critical realism is the reason Bourdieu’s sociological theories were adopted as the methodological framework for this critical realist study.

Bourdieu’s sociology has its foundation on his thesis that choices and preferences of social agents in diverse domains of practice including sports, music, politics, food, etc. have their basis on their dispositions and social positions. Social position in Bourdieusian terms is defined by the volume and configuration of economic resources held by an agent (Bourdieu, 1998a), while disposition which Bourdieu refers to as ‘habitus’ is a product of the objective conditions which an agent encountered and/or encounters. In this way Bourdieu developed a framework that theorizes about and inculcates objective contextual social structures into the subjective, mental experience of agents.

The Bourdieusian approach entails gathering empirical data about concrete objective structures and data about subjective knowledge and mental experience of individuals. While the concrete data related to the economic and cultural resources available to the agents guide the spatial positioning of the agents in the social space, habitus representing the disposition of individuals helps to objectify the agents’ dispositions and apprehension of the structures within their environment. Thus the Bourdieusian forms of capital (Bourdieu, 1986), including cultural, social, symbolic etc. are applied to represent the resources available to the agents, and the other Bourdeausian concepts such as social space, fields, practice, struggles, symbolic violence are applied to reveal the dynamics of the power relations between agents and their social environment.
Bourdieu’s framework emphasises agential positioning, disposition and social embodiment as the heart of social research. While resources held by, or available to the agents are conceived as objects within the empirical domain of critical realism, practice and outcomes are captured as events in the actual domain while dispositions and social embodiment representing the apprehension of the agents lie in the real domain of critical realism. Hence the research process in this work involves identifying resources held by agents and positioning the agents according the capital hey hold, identifying the dispositions and embodiments or habitus of the agents, and using the retroductive process to illustrate the dynamism or relation between the various forms of capital and the dispositions of the agents, and how these produce events and outcomes that are recognised as academic entrepreneurship practice. Analysis therefore involves identifying and representing the observable aspects of the reality of academic entrepreneurship, and illumination of the unobservable aspects of the social relations that the reality of academic entrepreneurship is made of, and logically demonstrating order in the data to produce a credible and irrefutable explanation of the mechanism of emergence of academic entrepreneurship.

4.4 The Research Process

Grenfell & Lebaron (2014) suggests two phases of the research and three stages of analysis for Bourdieu-based research work. The recommended two phases of the research are:

1. Data Collection, and
2. Data Analysis
Little attention was given to the data collection phase by Grenfell & Lebaron (2014). Focused on the analysis of data, their proposed analytical procedure is structured as a 3-stage processes of:

1. Construction of the research object
2. Field analysis and
3. Participant Objectivation

The stage two of the three-stage data analysis phase (Field Analysis) is a further three-stage procedure involving:

1. Analysis of the fields within the larger field of power
2. Mapping out the structure of relations between the agential positions within the fields
3. Analysis of the agential systems of dispositions (habitus).

For this research, the two-phase-three-stage process was expanded to generate a three-phase-seven-stage process that includes the collection of data as shown in figure 4.2.
<table>
<thead>
<tr>
<th>Phase</th>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
<td>Descriptive Data</td>
<td>Gathering qualitative and quantitative data that illustrates the state of the phenomenon of academic entrepreneurship in a rentier state.</td>
</tr>
<tr>
<td>Collection</td>
<td>Quantitative Data</td>
<td>Gathering quantitative data, in particular data on the forms, volumes and configurations of capital held by the agents under investigation.</td>
</tr>
<tr>
<td>Data</td>
<td>Construction of the Social space</td>
<td>This is the first stage of the analysis of the data, and involves using the data obtained in the previous stage to spatially position the individuals according to the volumes and configurations of capital they hold.</td>
</tr>
<tr>
<td>Analysis</td>
<td>Separating and identifying the various fields within the field of power</td>
<td>Once the social space has been constructed, the distinct fields within the phenomenon being studied are identified at this stage. The features that characterize each of these fields are also identified and laid out.</td>
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<tr>
<td></td>
<td>Identifying homologies in the fields</td>
<td>This stage focuses on identifying the various objects, events, dispositions, tendencies, etc. that are specific to the each of the identified fields. These are then mapped onto the respective fields.</td>
</tr>
<tr>
<td></td>
<td>Relating the various events to actions, habitus and properties of the field</td>
<td>This is the relational stage. This stage focuses on using the process of retroduction and logic to relate the various objects, events, dispositions, etc. identified in the earlier stage.</td>
</tr>
<tr>
<td></td>
<td>Validation</td>
<td>At this stage existing theory and literature are applied to confirm and validate findings.</td>
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*Table 4.2 The three-phase, seven-stage research process*
4.5 Data Sources and Collection Techniques

4.5.1 Secondary Data Collection

In this section, the strategy for the collection of data for this study is described. Section 3.4 of this report explains that Bourdieu, on whose sociological theories the framework for this study is based starts off researching a phenomenon with a snapshot or “photograph” (Grenfell, 2004, p. 119) of the phenomenon. This is also in line with the recommendation of Danermark, et.al., (2002) that critical realist studies start with building up rich descriptive pictures of the phenomenon being studied. The purpose of the secondary data for this study is to build a picture of academic entrepreneurship in the rentier state of Nigeria. The required data is obtained from desk research (McCormack & Hill, 1997). The desk research in this study involved looking at data available from various databases for traces of academic entrepreneurship, in particular documents and databases of the various arms of the Nigerian government, those of academic/research institutions, and information in various reports including news journals, government publications, online portals, etc. that report on the commercialization of research outputs.

4.5.2 Approach to Gathering Secondary Data

The first phase of the data collection for this study focused on the empirical artefacts of academic entrepreneurship in the rentier state of Nigeria by asking questions related to its existence in the context of the study – Nigeria. This stage answers a two-fold question:
Does academic entrepreneurship exist in Nigeria?

What is the state of academic entrepreneurship in Nigeria?

To ensure that this question is answered adequately, the entire Nigerian state is taken as the starting point, it is then systematically broken down into smaller units, made up of various potential sources of data. The most likely sources to yield the relevant data are then selected and the rest eliminated. A criterion is set for inclusion (or exclusion) as a potential source of relevant data.

This research is focused on the commercialization of the outputs of research conducted at both publicly and privately-funded universities and research institutes in Nigeria, individual privately conducted, or non-supervised individual research is excluded. In summary, this research investigates commercialization of outputs of publicly funded research.

4.5.2.1 Identifying Sources of Desk Data

This study followed a structured approach (Russ-Eft & Preskill, 2009) to ensure that the sources of data can paint a true picture phenomenon of academic entrepreneurship as it is. Structured approach also “ensures that more of the information gathered is relevant to the purpose and the key questions” (p.225), it ensures no relevant data source is excluded, and that researcher bias does not mitigate against the richness of the picture painted of the phenomenon.

For this study, the structured approach guides the decision about where to seek data by taking a very broad view of the context of the study, breaking the context down into units of data sources, locating most potential sources of traces of the phenomenon, narrowing down data search to these specific units, and excluding
the irrelevant others. The included units are expanded and detailed data search within the relevant units are conducted.

4.5.2.2 Desk Data Sources

The Nigerian government through its various agencies funds and oversees education and research in public universities in Nigeria (Akomolafe, 2009; Bloom, Canning, & Chan, 2006). Since it is the government that funds research in Nigeria, it is logical to start the data search from government sources. The structured process starts by studying the structure of the Nigerian government to determine which arm of the government the traces of academic entrepreneurship is more likely to be found, or to put more directly, which arm of the government is responsible for academic entrepreneurship.

Since research in Nigeria are under the funding and regulation of the Federal Government of Nigeria, the process starts by identifying the various arms of the Federal Government of Nigeria, decomposing and studying each arm with the aim of identifying its responsibility, with the ultimate aim of identifying the arms or units responsible for the commercialization of research in Nigeria. Every arm of the government identified is further broken down into its sub-units, and the sub-units further investigated. The process continues until the smallest units within which academic entrepreneurship is clearly identifiable are identified. Criteria for inclusion (or exclusion) of any unit for further analysis is the mention of academic entrepreneurship (and its synonyms by definition) in the mission, vision, mandate of the unit.
Fig. 4.2 Model for selection of sources of data

(Shaded boxes indicate where criteria is met)

Starting from the first tier of the Nigerian government, the activities of each identified unit is studied. Units that do not meet the inclusion criteria are excluded, and those that meet the criteria are further studied and again broken down into its constituent departments. The roles/ functions of each department are studied and are either included or excluded based on the criteria set. By this approach all relevant government units and sub-units responsible for academic entrepreneurship are identified. Their structures, activities and programmes are also identified and studied; these provided leads and justification for further search for data from databases such as the World Bank, UNESCO, United Nations, etc.
The data obtained from the desk research answers the question regarding the existence (or otherwise) of academic entrepreneurship in Nigeria, and provides a picture of the phenomenon as it is in Nigeria. It also identifies some academic entrepreneurship in Nigeria. The data also informs the decision about which institutions to study in further details, and guides the selection of participants in the interviews. While the desk survey provides lead to possible participants in the interview stage, the final selection of interview participants are guided by the critical case selection criteria described in section 4.5.4.1.

4.5.3 Primary Data Collection

Bourdieu is known to make use of “field-based research methodologies and focuses on statistical patterns of relationships gleaned largely from participant observation, document analysis, interview, and multivariate statistical techniques.” (Kwasny & Truex, 2013, p.290). In this work, consideration was given to using ethnographic approach to obtain its data, but the high cost of conducting an ethnographic research in Nigeria (from the UK) was the hindrance. The initial data for this research was from secondary sources gathered through document analysis by examining of texts from press releases, statements, broadcasts, publications, periodic reports, news reports, company annual reports, government gazettes, website data, etc., that contain evidence of concrete structures of academic entrepreneurship, and statements made by academic entrepreneurs and other relevant stakeholders in the commercialization of outcomes of research. The primary data consist of two types: survey data and interview data. Survey data for this study was obtained through self-reported survey. This process generated demographic data about academic entrepreneurs, in particular their incomes, experience, and years spent in formal
education. The survey data was useful in positioning the agents in the social space.

The main primary data is interview data. Semi-structured interview was administered as part of the data collection process for this research. Twenty-one interviews were scheduled for this research, but due to initial low response rate, and high cost of the interviews in Nigeria only thirteen interviews were conducted. The initial interviews was limited to academics involved in research and its commercialization within universities. After initial analysis of data the emerging themes necessitated the widening of the study population to include government officials who facilitate the commercialization of research and industrialists who make use of findings of research in their business. Initial decision was to include seven government officials and seven industrialist and reduce the number of academics in the sample to seven. However extreme limitation in terms of time and finances allowed only one government official and two industrialists to be eventually included in the study. This development is one of the biggest limitations of this research. Government officials being public officials, regular practice in government being release of information and opinion to the public. Secondary data (from publications, speeches, government reports, etc.) was therefore used to strengthen the primary data. These sources provided further accounts of the practices, dispositions, apprehensions and opinions of the agents regarding academic entrepreneurship. It also served to triangulate the primary sources. The semi-structure interviews provided a platform for the academic entrepreneurs to recount their knowledge and understanding, and relive their practices, and experiences as it relates to academic entrepreneurship.
4.5.4 Sampling Technique

To determine an accurate representative sample of the study population it is essential to have a knowledge of the overall size of the study population (Israel, 1992; Ritchie, Lewis, & Elam, 2014), but there is no data available on the number of academic entrepreneurs in Nigeria (see section 5.1.1). The lack of data on the size of the study population makes the use of a representative sample size unreliable, and this may mitigate against the validity of the outcome if the sampling does not represent the population. Neergaard (2007) recommends “snowball or chain sampling for circumventing the problem since in these forms of sampling it is not necessary to know the exact population size up front” (p.255). Snowballing technique is chosen for this study.

The snowballing procedure

The outcome of the process described in section 4.5.3 includes a list of academic entrepreneurs identified from the desk research. Fifty-two (52) ‘academic entrepreneurs’ were identified, this forms a good starting point for the selection process in this research. However owing to the method from which the list emerged, it is not possible to identify strong cases. Decision therefore was made about who to include in this study and who to exclude from the study using critical case selection criteria as recommended by Flyvbjerg (2006).

Flyvbjerg discussed and recommended five strategies for selecting cases, one of his recommendations is the critical case selection strategy whose aim is to select few cases that are likely to more than others under consideration, strongly represent and inform the phenomenon being studied. Flyvbjerg explains that information obtained using critical case criteria can allow for strong logical
deductions because the cases selected can validly be taken as a representative of other cases not selected.

To narrow sample size and ensure that the strongest cases are included, an inclusion criteria was set which includes that those selected must have:

1. completed an academic research that was published,
2. self-considered at least, one finding their research commercializable, and
3. made a move towards commercializing at least, one finding of their research.

These three criteria reduced the samples obtained from the desk survey from 52 to 4. The interview data collection for this study started with a sample size of 4. Snowball sampling technique was then applied to further expand the sample size. Applying the snowballing technique raised the total number participants qualified to participate to seventeen, the selection criteria was applied and four participants were rejected. The total number of participants initially included to be interviewed was therefore thirteen.

4.5.4.1 Sample Size

The aim of this research is to use few strong cases to unravel and explain the underlying mechanisms that govern academic entrepreneurship in petroleum rentier states. Large samples are associated with the realist tradition which this study does not agree with, few strong and deeply studied cases enriches this study better than high number of cases as argued by Crouch & McKenzie (2006).

Crouch & McKenzie define ‘small’ as “often less than 20” (p.492) and argues that "small number of cases will facilitate the researcher's close association with the respondents, and enhance the validity of fine-grained, in-depth inquiry" (p.483).
Dreher (1994) argues case for small samples in research where deep meanings are important. She argues that small samples offer advantages over large samples because it provides an opportunity for repeated contacts with the respondents, and allows for greater involvement of the investigator; this she argues enhances the validity and reliability of the findings (p.286).

In order to ensure that adequate data was collected from the small sample, for interviews the specific sample size was not set advance, but decision was made for twenty-one participants for basic socio-demographic survey, and a range between three (3) and twenty-one (21) distributed across at least three Nigerian universities for in-depth interviews. In making this decision consideration was given to the limited resources available for this research. To strengthen the data and enhance validity, the actual number of interviews was determined by the data saturation point technique (Bowen, 2008).

4.5.4.2 Data Saturation Point

The data saturation point is the point when any further interviews conducted yields no new information (Bowen, 2008; Eisenhardt, 1989). For this research the interviews are conducted and thematic analysis preliminarily performed on the data. Emergent themes are recorded and the next set of interviews are conducted. New themes from the next interview data are compared with the previous and the next interview is conducted. The procedure continues until the theoretical saturation point in data is reached. For this research, nine interviews were completed before the theoretical saturation point was reached. The initial actual sample size was therefore nine.
Final full analysis of the data began after the collection of the last interview was completed and transcribed. However full analysis of the data implicated agents in government departments, and agents in industrial organisations, highlighting the need to obtain data from the perspectives of government officials and industrialists who also have roles to play in the commercialization of findings of research. This finding that academic entrepreneurs do not operate only in academia is one of the contributions of this research; it necessitated the expansion of the definition of ‘academic entrepreneurship’ to accommodate agents who may not be academic researchers, but their participation in the commercialization of findings of research necessitates their definition as academic entrepreneurs. The definition of ‘academic entrepreneurship’ and ‘academic entrepreneur’ finally adopted for this study is stated in section 1.11 of this report.

Time and cost constraints limited the number of additional participants that could be added to the study. Three additional participants were identified and included in this study: one government agent and two industry agents. The total final interview sample size used for this study is therefore twelve.

4.5.5. Simple Survey

The second stage of the analysis of data for this research involves classifying the participants using demographic information (see section 6.1). A survey was necessary to supplement the data obtained from interviews so as to build a balanced social space (see chapter 6) that accurately represents the structure of the three fields of academic entrepreneurship identified (universities, government, and industry). Seven participants each from each of the three fields
were required; this increased the total number of participants in this study to 21. A simple questionnaire (*Appendix viii*) was used to obtain the additional data.

### 4.7 Data Analysis

The analysis of data for this research followed five distinct stages:

- **Construction of the social space,**
- **Identifying the various fields and sub-fields within the social space,**
- **Identifying homologies in the various space,**
- **Relating events, to actions, habitus, and properties of the field; and**
- **Validation.**

#### 4.7.1 Stage 1: Constructing the Social Space

Construction of the social space is the starting point of the Bourdieusean analysis of data in this research. The outcome of this stage is a spatial positioning of agents according to the volumes and types (configuration) of capital they hold. Two forms of capital determine the positioning of agents on the social space: economic capital and cultural capital. Typically economic capital includes all forms of income and wealth accruable to an agent including income from employment, inheritance, ownership of property, etc., while cultural capital encompasses education, knowledge, job skills, social skills, social networks, etc. gained during a person's lifetime (see section 3.8). For this study, cultural capital is represented by the cultural skills acquired by the agents through formal education. This is measured by the number of years spent by the agents acquiring formal education; this data is self-reported by the agents in this study.
The simplified approach adopted by Bourdieu (1984) in Distinction in mapping the French space of social positions (fig. 4.3), was adopted in the construction of the Nigerian social space for this research. Bourdieu’s approach is described as ‘simplified’ here because it does not include “all the indicators of economic, cultural and social wealth” (Bourdieu, 1984 p.127). Bourdieu states:

“*In the absence of a survey (perhaps impossible to carry out in practice) that would provide, with respect to the same representative sample, all the indicators of economic, cultural and social wealth and its evolution which are needed in order to construct and adequate representation of social space, a simplified model of that space has been constructed, based on information acquired through earlier research...”* (ibid).

This study does not include “all the indicators of economic, cultural and social wealth”. Economic capital and cultural capital are represented using one indicator for each- income and education respectively. Decision to use only these indicators were mainly for cost reasons, owing to the limited fund available for this research.
Bourdieu’s model described by himself as ‘simplified’ includes three dimensions:

1. The volume of capital held by agents,
2. the configuration of the capital held, and
3. a historical dimension that illustrates the social trajectory of the agents over time.

The historical dimension illustrates social mobility. The social mobility of the agents is not part of the analysis of this study, the historical dimension is hence excluded from the social space constructed in this research. Focus is placed on understanding how the volume and configuration of capital held by the agents locate them on the Nigerian social space. The overall volume of capital for each individual agent is the total economic and cultural capital held by the individual agent. In this study, the agents’ incomes are used to estimate the volume of their
economic capital, while their level of educational capital acquired, measured by the number of years spent in formal education is used to estimate their cultural capital.

The economic capital held by the agents is measured in monetary terms. The overall capital held by an agent is sum of the economic and cultural capital the agent holds. Cultural capital for this study is expressed in number of years, in order to combine cultural with economic capital, it is necessary to convert every agent’s volume of cultural capital (number of years of education) into its economic equivalents. This is achieved by quantifying each year of education achieved by the agents in monetary terms. Each year of education is monetised by taking the corresponding increase in salary that could potentially be earned per additional year of education acquired. Web data obtained from online job advertisement was used to estimate this.

The total overall capital held by an agent is determined by:

\[
\text{Total overall capital} = \text{Total economic capital} + \text{Total cultural capital}.
\]

The configuration of capital held by the agent is the ratio of one form of capital to the other:

\[
\text{Configuration of capital} = \frac{\text{Total economic capital}}{\text{Total cultural capital}}.
\]

To construct the social space these values are plotted to scale on a graph (see fig. 6.1). For each agent, the total overall capital is plotted on the vertical axis (increases in overall volume is from bottom to top) against the configuration of capital on the horizontal axis (with cultural capital increasing from the right to
the left; increase in cultural capital results in corresponding decrease in economic
capital and vice-versa). A simplified explanatory model is shown (fig. 4.4)

![Explanatory model of construction of the social space](image)

**Fig. 4.4 Explanatory model of construction of the social space**

In the explanatory model above (Fig. 4.4), all three agents (A, B, and C) have
individual total capital ranging from -£500 to £500. An agent with total capital of
-£500 is in debt. The total capital is made up of cultural and economic
components, the horizontal axis is used to show the contribution of each
component to this total. The vertical axis in the explanatory social space above
shows Agent ‘A’ has total overall capital of £480. The horizontal axis shows that
this total is in the proportion of 10:90 (ie. 10% cultural capital and 90% economic
capital, or in absolute terms, £432 economic capital and £48.00 cultural capital).
Agent ‘B’ has total overall capital of £260, this total volume places the agent below Agent ‘A’ on the vertical axis. The location of Agent ‘B’ at the mid-point of the horizontal axis implies equal proportion (50:50) of cultural capital and economic capital. The absolute value of Agent ‘B’s capital can thus be calculated as cultural capital 50% of £260 (£130.00), and also £130 economic capital. Similarly Agent ‘C’ has a total capital volume of £180, made up of cultural £144 capital and £36 economic capital.

This convention is applied to position every agent on the social space. The social space constructed for this research is presented as fig. 6.2, and discussed in section 6.1.1 of this report

4.7.2 Stage 2: Identifying the Various Fields Within the Field

The social space constructed in Stage 1 results in clustering of agents who possess identical volumes and configuration of capital within the social space. The clusters are homologous groups, but they are not necessarily real groups (Grenfell, 2014), only related in the space because they share similar configuration of capital that bestow on them similar characteristics such as dispositions, preferences, interests, etc. More recent Bourdieu practitioners term the clusters “clouds of individuals”(Robson & Sanders, 2009, p. 19) which relates to the pattern of the plots on the social space (see fig. 6.2).

The different ‘clouds of individuals’ on the space represent different fields. Movement along the horizontal axis is a movement between fields, while a movement along the vertical axis is a movement between ‘classes’. The dominant group in the social space occupies uppermost right-hand corner of the space, while the dominated group occupies the lower left-hand corner of the space. The
implication is that the dominant group in any society possesses the highest overall volume of capital, and that this capital comprises mostly the economic form. This, Bourdieu explains is because the economic capital is the dominant capital (Bourdieu, 1986, p. 85) by the virtue of it being the easiest to convert to the other forms (Swartz, 2012, p. 80).

Within the groups, sub-groups can also potentially be identified, structured as sub-groups on the same principles of volume and configuration of capitals. For example, in the government field the various ministries can further be identified, and in the academic field the various disciplines can further be identified. Such deeper detailed accuracy is achieved by collecting richer data sets. It is not intended in this research to identify the sub-groups within the fields of academic entrepreneurship due to cost implications, and time constraints in gathering the required profound and more specific data.

4.7.3 Stage 3: Identifying Homologies in the Fields

The stage three of the analysis of data in this research involves identifying what Bourdieu terms ‘structural homology’ (Bourdieu, 1985). This stage focuses on identifying and mapping onto the identified fields, the various objects, events, dispositions, tendencies, etc. that are specific to the fields. The principle behind homology is that it is the same underlying principles that structure the agents into groups or various fields identified based on volume and configuration of capital they hold, that reproduces structural equivalences such as behaviour, choices, taste, preferences, interests, in other different fields that are not necessarily related (Grenfell & Hardy, 2007, p. 55). This stage of data analysis is therefore concerned with identifying those structures that are homologous with
the various groups identified in the previous stage of the data analysis, in particular the various mental structures defined as ‘habitus’; a system or categories of perception and thought (Grenfell & Hardy, 2007, p. 109). Homology in Bourdieusean terms leads to possibility that a structure identified in a field can be mapped onto another related or unrelated manifestation. For example dislike for reading novels although unrelated to research may be found homologous with researchers; classical music is not related to education, but preference for classical music may be found common, or homologous with the highly educated, etc. This stage of data analysis focuses on identifying homologous dispositions (habitus) within the various groups, mind dispositions that may give rise to the various actions and events within the various groups also identified at this stage of data analysis.

4.7.4 Stage 4: Relating Field, Events, Actions, Habitus

Stage four of the data analysis process is equivalent to the critical realist process of retroduction (Danermark, et.al., 2002; Easton, 2010). It involves analysing actions and events and relating them to the underlying instigating powers that reasonably and logically could have produced them. (Easton, 2010) described the process as “moving backwards”, and then states “...and that is what the process involves. It asks “what must be true in order to make this event possible?”” (p.123). Mingers (2006) describes the process as “the postulation of a hypothetical mechanism(s) or structure(s) that, if they existed, would generate the observed phenomenon. The structure could be physical, social or psychological, conceptual and may well not be directly observable except in terms of its effects” (p.23). At this stage, the various events in the fields and actions of the agents are related to the habitus and the properties of the fields. The
mechanisms of their relationship are also logically identified. Identifying this underlying mechanism that shape practices and outcomes is the major crux of this research.

4.7.5 Stage 5: Validation

Stage five may stand on its own as a separate stage, or linked with stage four. It is the confirmatory stage where the various relations and mechanisms identified in stage 4 are confirmed with real pattern of events, findings of previous research existent in literature, or existing theory. For a critical realist study, it is not possible to access or observe the underlying mechanism to verify if the findings are true. Hence the purpose of this stage is to validate the reproduced outcome rather than to verify them as argued by (Raitt, 1974), “we do not ask if it is true, only if it works- we validate and not verify” (p.835). For a critical realist study, the findings remains valid without any concrete evidence to back the findings up, unless, or until there comes into being, a more robust and better validated alternative explanation (Archer, Collier, & Porpora, 2013).

4.8 Research Validity

The validation stage is also linked to the overall validity of the research in terms of method, collection of data, and its analysis. The design validity of this study is achieved by selecting a methodology and framework that is in agreement with the units of analysis of the study. In this study, the underpinning research philosophy, the guiding framework, and interpretive method were synthesised from the literature. In this way, robustness was achieved in the conceptualization of the objects of research. Applying a Bourdieusean framework, the units of analysis of the study were expressed as their corresponding Bourdieusean
equivalents. The contexts of the study at different analytical levels correspond to Bourdieu’s concepts of fields and subfields, personality traits and agential motivation corresponds to Bourdieu’s concepts of habitus, while resources correspond to the various forms of capital.

In terms of analytical validity, Bourdieu’s relational sociology (Beasley-Murray et.al., 2000) provided a dynamic framework that allows for the dynamism between subjects and objects, and the relationships between them to be brought into the analysis. Inferential validity is achieved at the stage 5 (section 4.6.4) of the data analysis stage, by relating the empirical data and findings with existing knowledge, events and theory.

4.9 Ethical Considerations

This study is a case-based study focused on the rentier state of Nigeria with the aim of:

- Developing a picture of the state of academic entrepreneurship in Nigeria, and
- Understanding how the presence of rents from petroleum influence the commercialization of research output, in particular it focuses on the underlying mechanisms that govern academic entrepreneurship in a petroleum rentier state.

Because the research process involved collection of primary data from human subjects through interviews, this study as requirement complied fully and worked under the strict advisory and supervisory guidelines of the University of Portsmouth Ethics Committee (UEC) who provided a framework that guided collection, and use of data for this research. The UEC framework ensured that
appropriate consideration was given to ethical issues relating to the main activities of the data gathering and use in this research, and ensured that professional practice was followed in all decision-making on all ethical matters related to this research.

The University of Portsmouth Ethics Committee conducted an ethical review of this study focusing on six key principles of ethical research that the University of Portsmouth upholds including that:

- Research was designed, reviewed and undertaken in a manner that ensured integrity, quality and transparency;
- The researcher was clear, and all participants fully informed regarding the purpose, methods and intended possible uses of this research, what their role and participation in the research entailed, as well as any possible risks involved and how they would be mitigated.
- That any confidential information supplied by research participants or any participating or collaborating external agency was fairly and confidentially treated, and that the anonymity of respondents were maintained.
- That all participation in the research was voluntary and was free from any form of coercion or inducement.
- That likelihood of harm to the research participants was reduced to barest possible minimum in all instances.
- That the independence of the research was clear and maintained, and that any conflicts of interest or partiality are made explicit.

To achieve these, the study discussed with University of Portsmouth Ethics Committee on how important primary data was, and how collection of primary
data would contribute to the achievement of the objectives of the research project. It was considered that this study is a multi-level critical realist study with focus on understanding how the three levels of the individual, the organisation and national level material and ideal structures interact to produce or influence academic entrepreneurship. It was therefore argued, how essential it was to supplement the secondary data (which was obtained from documents available from various sources including repositories of government departments and those available on websites of government departments, agencies and organisations involved in the commercialization of research outcomes) with primary data so as to also gain access to the ideal structures of academic entrepreneurship. Primary data was found crucial for gaining access to the mental modes of individuals/ agents in particular their apprehension of the presence of the rents from oil, and how this influences their mind-sets, actions or inactions. The primary data for the study was proposed to be in the form of narratives of the agents which would be accessed through interviews.

The University of Portsmouth Ethics Committee also examined the survey population which included academics, who either by working independently or in collaboration with their universities or departments commercialize the outcomes of their research. It also included individuals who facilitate the commercialization process, in particular, those operating within their Universities’ Intellectual Property Technology Transfer Office (IPTTO), and those operating within the National Office for Technology Acquisition and Promotion (NOTAP).

The University of Portsmouth Ethics Committee also considered the size of the sample for the study and how the sample size was arrived at. Because the
purpose of the study was not to achieve constant conjunctions through statistical
inference, rather in using few strong cases to unravel the underlying mechanisms
that govern academic entrepreneurship in the rentier state of Nigeria, the size of
the study sample was put at 22. This consisted of 21 academic entrepreneurs
drawn, seven (7) each from three academic institutions in Nigeria and one from
the National Office for Technology Acquisition and Promotion (NOTAP). The
strategy for selecting the three universities is described under ‘paragraph 8’
below. Other Academic Entrepreneurs operating independently, identified
through the secondary data, not listed in the NOTAP’s ‘Compendium of Research
Results and Inventions’ may be included in the sample if their story shows
significant deviancy from those identified through the NOTAP Compendium. In
such situations the information oriented selection criteria would be applied in
deciding the further cases to be included.

University of Portsmouth Ethics Committee also considered how the respondents
would be selected and recruited to ensure that ethical issues were given adequate
consideration. The Committee scrutinized the recruitment strategy which
included that participants were to be identified and selected by looking at the
Nigerian government’s ‘Compendium of Research Results and Inventions’, which
it maintains at the National Office for Technology Acquisition and Promotion
(NOTAP). NOTAP in partnership with Nigerian universities and research institutes
collate details of research results and inventions. The compendium kept
information about researchers, their fields of expertise, and the current stage of
their commercialization projects. Access to the database is available to members
of the public on request. This Committee considered how this study intended to
make use of the compendium for identifying the academic entrepreneurs for the research.

Selection for inclusion in the study was based on size of the project, determined by the financial value of each project. The top twenty projects were included in the study. The Academic Entrepreneurs who own the projects and their universities were identified and their contacts obtained from the compendium.

Contact was made with the identified academic entrepreneurs either by phone or email with an introduction of the research, its purpose and the reason they were contacted. The invitation included an information sheet with more elaborate details of the research and what was expected of the participants and a consent form. Academics who wished to participate affirmed their decision by replying with a confirmation of their acceptance of the terms of the research, completing and signing the consent form that was attached. This procedure was considered ethical by the Ethics Committee.

University of Portsmouth Ethics Committee scrutinized the steps proposed in this study that would ensure that the requirements of informed consent were met for those taking part in the research. The steps included that the participants were provided with information sheet, and a consent form, and they gave their consent by signing the consent form, confirming their acceptance of the terms of the research including consent to be interviewed, for their voice to be recorded, and for the data generated to be stored, used for the research and published.

The University of Portsmouth Ethics Committee approved that consent was deemed to have been obtained once a participant signs and returns the consent form. The University of Portsmouth Ethics Committee were informed that this
process of informed consent would be completed before any data was collected, and that it was open to the participants to withdraw their participation before and during data collection. The University of Portsmouth Ethics Committee were also informed that the interviews would be digitally recorded and notes would be taken during the interviews, and that consent would be again dictated and verbally confirmed by the participants at the start of every interview, and that this would be captured at the start of each recording. If consent was not reconfirmed by the participant at this point, it would be deemed to have been withdrawn and the interview would not proceed. If the participant was happy to continue with the interview but has not consented to their voice being recorded, the interview would proceed, with the researcher only taking notes. It was also left open for the participants to withdraw their participation at any time during data collection. If they did, their data would be used up to the point of their withdrawal. Withdrawal was to be in writing to the researcher with a statement of an intention to withdraw participation, it was also left open for a participant to withdraw orally before or during an interview. The University of Portsmouth Ethics Committee considered this process and decided that it was ethical.

The University of Portsmouth Ethics Committee demanded an explanation of how data would be collected from each of the sample groups, and accepted the proposal that data would be qualitative, in the forms of discourses, narratives and opinions of the participants, elicited through semi-structured interviews, which would be digitally recorded except where consent was not given for such recordings. It was also proposed that participants may also provide other forms of documentary materials they may have. Although these would not be solicited,
they would be accepted if the participants provide them. The University of Portsmouth Ethics Committee approved this proposal.

The University of Portsmouth Ethics Committee demanded to know how data would be stored and what would happen to the data at the end of the research, and it was proposed that all audio recorded data would be transcribed verbatim and recordings held alongside the transcripts as a document on a pass-word protected CD. The University of Portsmouth Ethics Committee expressed concern on the security of the data and recommended that the audio recordings and the transcripts be held on the University of Portsmouth secure N: drive alongside all notes and other documentary evidence obtained from the participants, the recommendation was accepted. Therefore all audio recordings, transcripts, notes, and materials provided by the participants were password-protected and securely stored on the University of Portsmouth N: drive during the research process. At the end of the research (expected to be February 2016), all data would be archived and retained and their retention would be in line with the University of Portsmouth Research Data Management Policy which requires that research data must be retained for (10) years counting from whichever is the latest of:

- completion of the research,
- publication date of any findings emerging from the data,
- date of last request of the research data by a third party.

At the end of whichever of the above was applicable, the retention of the data would be reviewed, and the outcome of the review would determine if the data would continue to be retained, and for how long they would be further retained,
or if the data would be destroyed. The University of Portsmouth Ethics Committee considered this proposal as ethical and it was approved.

The University of Portsmouth Ethics Committee demanded what measures this study would take to prevent unauthorised persons gaining access to the data, and especially to data that may be attributed to identifiable individuals. It was proposed in this research that the data would only be held by the researcher and later shared with members of the research team, and at all times, the recording equipment and the computer onto which the data would be transferred to would be password protected. Recordings would be deleted from the recording equipment once they were transferred to a secure University computer. At the completion of the research, all data would continue to be securely protected and held on a University computer until destroyed as described above. The University of Portsmouth Ethics Committee gave an approval of this procedure.

The University of Portsmouth Ethics Committee also demanded to know what steps this research intended to take to as to safeguard the anonymity of the respondents. It was proposed that the participants’ identities would be kept anonymous throughout. Participants would be assigned identification numbers which would be used only for the purpose of helping the researcher to identify and classify data. In all other places, including when quotes were used they were not to be linked or traceable to any participant. In situations when it was impossible for a participant’s identity to be firmly kept anonymous (for example when their case was so distinct that it was possible for their story or statement to be attributable to them), the possibility of their being identified would be discussed with the participant. In this situation it was open for the participant to
continue notwithstanding, withdraw their participation, or grant consent to be expressly named. The University of Portsmouth Ethics Committee considered this procedure ethical, and an approval was granted.

The University of Portsmouth Ethics Committee demanded to know what the possible risks (physical or other, including reputational) to respondents that may result from taking part in this research were. This study identified that there was a possibility of that the reputation of participant or that of their institution might be affected as a result of their being investigated. The participants might highlight negative aspects of their work, their institutions, or their departments. It was proposed that for individual participants, respondent anonymity earlier discussed would be strictly followed to ensure that their data were not traceable to them, and for institutions, the data, and the report would be made available to the institutions to peruse before being published. It was also proposed that in situations where the institution expresses concern, the data would be anonymized before being used/published, and in extreme situations, the aspects of data/report where concern were expressed would be removed from the report. This proposal was approved by the University of Portsmouth Ethics Committee.

The University of Portsmouth Ethics Committee further demanded to know if there were any risks (physical or other, including reputational) to the researcher or to the University of Portsmouth that may result from conducting this research. This study identified and reported that because this research focuses on the rentier state of Nigeria, and the interviews would be conducted in Nigeria, there was a constantly updated warning on www.gov.uk about travelling to Nigeria. It
was proposed that the warning and advice on the government website would be followed both in timing the visits and in selecting sections of the country to visit. Reasonable care would be taken not to visit the volatile areas of Nigeria, if it was critical to obtain data from such areas, recourse may be made to telephone interviews. Besides the warning, no major specific risk was anticipated, but the researcher would be equipped with a mobile communication device dedicated for the research for the purpose of keeping in constant communication with local contacts in Nigeria and with the University.

The University of Portsmouth Ethics Committee recommended further that two local persons be nominated in Nigeria. The researcher and the local persons would have a list of emergency contacts to contact should any adverse situation arise. Both persons would be given a schedule of the interviews including venue, date and time. At least one of the local persons would be contacted on the day of any interview and advised of the start and likely finish time; same person would again be contacted at the end of the interview to confirm there were no concerns. If contact was not established after two hours of scheduled finish time, the local person would initiate contact with appropriate local emergency contact. The recommendation of the University of Portsmouth Ethics Committee was adopted and was implemented.

The University of Portsmouth Ethics Committee asked if any data would be obtained from a company or other organisation, and were informed that information would possibly be obtained from:

- NOTAP, an agency of the Nigerian government responsible for the commercialisation of research outcomes.
● Technology transfer offices of select Nigerian Universities
● University departments where the academic entrepreneurs belong, and
● Organisations that are spin-outs of Nigerian universities.

The University of Portsmouth Ethics Committee demanded to be informed what steps were in place to ensure that the requirements of informed consent were met for these organisations, and how confidentiality would be assured for the organisations, such that unauthorised persons would not access their data. This study proposed that contacts would be made with only members of these organisations that were in the position to deal with issues of consent. Details of the research and the type of data being sought and how they would be used would be communicated to these individuals. Details of the procedures in place for safeguarding information including the University policy on confidentiality would be communicated and maintained throughout. The members of the organisation would sign the consent form confirming that they gave their consent.

The University of Portsmouth Ethics Committee asked if these organisations have their own ethics procedures relating and demanded that the University of Portsmouth would require written evidence from the organisation that they approved this research to go ahead. In line with this recommendation, enquiries were made to the organisations requesting information about compliance to their ethics procedures. Compliance requirements for the organisations were requested using the ‘Letter for Approval from Organisation’, but no such ethical approvals were required.
The University of Portsmouth Ethics Committee demanded to know if this research involved vulnerable groups (e.g. children), sensitive topics, access to respondents via ‘gatekeepers’, use of deception, access to confidential personal data, psychological stress, anxiety etc, or intrusive interventions. None of these applied to this research; however it was proposed that care would be taken to ensure that only persons authorised to perform the required actions by the virtue of their positions in their organisations were contacted. In situations where it was not clear if the individuals were authorised to take the required actions, clarification would be sought from the heads of their departments. The University of Portsmouth Ethics Committee were satisfied with this procedure.

After a careful consideration of these processes intended to ensure ethical practice in this research by the University of Portsmouth Ethics Committee, this research was given a clean bill of health regarding the strict ethical policy of the University of Portsmouth. It was recommended by the University of Portsmouth Ethics Committee considered that this research could go ahead. This information was conveyed in an email dated 12 May 2015 (Appendix ‘ii’)

4.10 Chapter Summary

The purpose of this study is to understand the dynamism of the relationship between the rentier structures in Nigeria and academic entrepreneurial action. In this chapter, the design of the method following Bourdieu's 'relational analysis' framework which posits that the choices and practices of agents stems from the agents' relative positions in the social space (Bourdieu, 1977) was presented.

Further, the underpinning philosophy, methodology and the design of the method for the collection and analysis of the data for this study were discussed. The
discussion covered relevant philosophies of knowledge and situated the study in its critical realist philosophical position discussing its implication to the study. It illustrated how critical realism most suits this study and how it is in agreement with Bourdieu’s sociological theories which form the analytical framework for the study.

The Bourdieu’s concepts of field, habitus, and practice were built into a framework that allows an understanding of the interplay between the rentier structures in Nigeria and the practices of the academic entrepreneurs. This is based on Bourdieu’s thesis that individuals who occupy proximate positions in any given social context possess identical mind dispositions (habitus), and that the habitus is the conditioner of their practice.

This chapter discussed how understanding the habitus of the three academic entrepreneurial agential groups will help understand their practice and how these work together to explain the governance of academic entrepreneurship in a rentier state. This chapter discussed also the analysis of data which starts off with mapping out the social space, positioning the agents according to their volume and configuration of capital they hold, identifying the fields and illustrating the relationships between the agents and the structures through the mediating role of Bourdieu’s concept of habitus.

Also in this chapter the practical approach to implementing this research was discussed. The study was structured into a three-phase, seven-stage process; and the data analysis process was structured into five stages. Details of the activities and the implications of each stage of the research were discussed. The strength of the Bourdieusean approach adopted in this study was illustrated in
this chapter as its ability to transcendence agency and structure, and the
development of a Bourdieusean framework for studying sociology of
entrepreneurship was shown as one of the major contributions of this study. Next
chapter presents the data collected following the processes described in this
chapter.
Chapter 5  Presentation of Data

Descriptive, Quantitative, and Qualitative Data

5.0  Introduction

Section 1: Descriptive Data

5.1. Material State of Academic Entrepreneurship in Nigeria

The changing role of universities (see section 1.1) implies their significant and fundamental role in academic entrepreneurship. In Nigeria the total number of approved universities is one hundred and twenty seven (127), including 41 funded by the federal government, 25 state-funded, and 61 privately-funded universities as at September 2015 (NUC, 2015). Research and development is carried out by the universities under the funding and supervision of the Ministry of Education. Twenty-six (26) other independent research institutes carry out sector-specific research (NBS, 2014).

The majority of research in Nigeria occurs within Higher Education (Experton & Fevre (2010), however, mostly as a result of enormous strain brought on the national budget by other sectors of the Nigerian economy, several universities work in partnership with research institutes, both within Nigeria and outside for the purpose of conducting academic research (World_Bank, 2006).

One way of assessing the performance of universities in relation to research is by research output rankings (Marginson, 2007; Marginson & Van der Wende, 2007). This research conducted an assessment of the research output of Nigerian Universities and Research Institutes in comparison with those of their global counterparts.
SCI\textsuperscript{m}ago Institutions Rankings (SCI\textsuperscript{m}ago, 2014a) characterizes world universities/ research institutions according to their research outputs. The ranking is arrived at by counting each institution’s annual publication in the Scopus (Elsevier) scientific database; institutions with less than 100 publications are automatically excluded from the comparison. In the latest SCI\textsuperscript{m}ago ranking (2014), only sixteen out of one hundred and fifty-three (10.1%) Nigerian institutions were listed. The highest ranked Nigerian University (University of Ibadan) occupies 1,141\textsuperscript{st} position worldwide, and has a score of 1.46. On the average, Nigerian universities scored 0.47, and occupies an average ranking position of 3,256\textsuperscript{th} out of 5000 institutions compared worldwide.

A clearer picture of the situation of research in Nigeria is obtained by looking at the country’s innovation index which assesses factors related to research and development, including R&D spending, number of researchers, and creative outputs. One of the biggest determinants of research intensity is funding (Leydesdorff & Wagner, 2009); research expenditure is conveniently and conventionally expressed as percentage of a country’s overall expenditure. Using the latest available data for Nigeria (2007), the Gross Domestic Expenditure on R&D (GERD) as a percentage of GDP stands at 0.21\%, which totals NGN45,852,600.00 (or USD363,577.69) (UNdata, 2015). This makes Nigeria the 80\textsuperscript{th} in the world with regards to investment in research and development. 0.21\% is a far cry from 1\% GERD/GDP ratio recommended for African and other developing countries (UNESCO, 2010).

Further illustration of the situation of academic research in Nigeria is obtained by exploring the number of research professionals in the country. A headcount of
Academic Entrepreneurship in Petroleum Rentier States

research professionals involved in the creation and development of new knowledge, specifically, university-based academics involved in research (including PhD researchers). From the latest available statistics (2007), there are a total of 32,802 researchers in Nigeria. This translates to an average of 223 researchers per million of the Nigerian population (Unesco, 2015).

In terms of output, using the number of scientific articles published in the journals listed in the Science Citation index (SCI) and the Social Sciences Citation Index (SSCI), Nigeria has an output of 3.68 publications per billion PPP$ GDP (Dutta & Lanvin, 2014).

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Table 5.1 Summary of Nigeria’s research output by publication.
(Source: Scimago. (2007))

The Schimago database uses the H-index system to rank all the countries of the world in terms of their research output. The H-index citable document evaluation system (Bornmann & Daniel, 2007) quantifies a country’s scientific output, productivity and impact by assessing its total number of published articles and the total number of citations received by the publications. The index therefore
measures not only numbers but also the quality of the publications originating from a country.

The Schimago’s index system places Nigeria’s H-index at 103. This score is arrived at using the country’s total citable publications which stood at 45,612. These publications received 221 citations and additional 51,478 self-citations (SCImago, 2014b), placing Nigeria at the 51st position world-wide in terms of academic research/ publication output.

5.1.1 Academic Entrepreneurs in Nigeria

Academic entrepreneurs turn the outcomes of academic research into commercial ventures (Rasmussen & Sørheim, 2012; Wright, Lockett, Clarysse, & Binks, 2006). There is no data on the number of academic entrepreneurs in Nigeria, but the number of resident patents filed from Nigeria can be used as a proxy to measure the strength of academic entrepreneurship, since outcomes of academic research that progresses to commercialization typically files for a patent (Azoulay, Ding, & Stuart, 2009; Nerkar & Shane, 2003). Filing of patents on its own does not completely satisfy the definition of academic entrepreneurship in this study. This is because there are typologies of academic entrepreneurship that may not require patents, and there are research outcomes that progresses to commercialization but are themselves not patentable, and there also may be cases of researchers proceeding with commercialization without patenting their findings. As argued by Pakes & Griliches (1980) “patents are a flawed measure (of innovative output) particularly since not all new innovations are patented and since patents differ greatly in their economic impact.” (p.378). Hence the number of patents filed from a country may not give an accurate indication of the
prolificacy of academic entrepreneurship. More so, a single researcher or entrepreneur may file more than one patent, and some cases of patenting may never become cases of commercialization since they may never be turned into products, or result in emergence of new organisations. Direct measures such as sampling the ‘new product’ sections of local trade and technical journals as suggested by Acs, Anselin & Varga (2002) would have provided a more reliable data, but such journals are not in existent in Nigeria. In the absence of more accurate data on the number of academic entrepreneurs in Nigeria, recourse is made to the number of patent applications as a proxy, to gain an insight into the strength or prevalence of academic entrepreneurship in Nigeria. The report of patent filing applications related to Nigeria is presented in table. 5.2

<table>
<thead>
<tr>
<th>Year</th>
<th>Resident Filings</th>
<th>World Ranking</th>
<th>Non-Resident Filings</th>
<th>World Ranking</th>
<th>Resident Filings from Abroad</th>
<th>World Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
<td>4</td>
<td>115</td>
</tr>
<tr>
<td>2009</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
<td>22</td>
<td>87</td>
</tr>
<tr>
<td>2010</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
<td>40</td>
<td>84</td>
</tr>
<tr>
<td>2011</td>
<td>64</td>
<td>74</td>
<td>747</td>
<td>38</td>
<td>17</td>
<td>110</td>
</tr>
<tr>
<td>2012</td>
<td>42</td>
<td>80</td>
<td>676</td>
<td>39</td>
<td>10</td>
<td>123</td>
</tr>
<tr>
<td>2013</td>
<td>50</td>
<td>77</td>
<td>869</td>
<td>35</td>
<td>14</td>
<td>108</td>
</tr>
</tbody>
</table>

Source: WIPO statistics database (www.wipo.int/ipstats).

Table 5.2 Record of patent filing applications by Nigerian researchers

Latest available data (2013) shows there were only 50 patent applications filed from Nigeria by Nigerian residents, with an additional 869 applications filed from Nigeria by non-residents in the same year. During the same period there were

\[\text{Figures represent patent applications only, not patents granted}\]
14 applications filed from abroad by Nigerian residents. Overall Nigeria occupies the 108th position globally in respect of patent application filing. These statistics in comparison with the rest of the world show Nigeria’s innovation outputs as weak.

This work sought to understand the distribution of the patent applications across academic disciplines. This data was necessitated by the trend observed in the ‘Compendium of Research Results and Inventions’ obtained from the National Office for Technology Acquisition and Transfer (NOTAP) who keeps record of patentable findings of research conducted at Nigerian Universities. The compendium data indicates majority of the patentable research findings held by NOTAP are findings related to possible uses and commercial exploitation of naturally occurring plant extracts and mineral deposits.

The trend of the patent data (table 5.3) corresponds with the data obtained from NOTAP’s compendium of research. It shows that most academic entrepreneurs in Nigeria are most likely to be in the field of pharmaceuticals and biochemistry, followed by entrepreneurs whose work is related to electrical machinery, apparatus, and energy. The next most prolific discipline in terms of filing patent applications is the field of medical technology. This finding is important because commercialization of findings based on naturally occurring plant extracts and mineral deposits is likely lead to similar outcomes as rents from the extractive petroleum industry since the products are all similarly naturally occurring. This study however did not explore this further.
### Discipline of origin of the patents

<table>
<thead>
<tr>
<th>Discipline of origin of the patents</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmaceuticals/ Biochemistry</td>
<td>21.35%</td>
</tr>
<tr>
<td>Electrical machinery, apparatus, energy</td>
<td>16.85%</td>
</tr>
<tr>
<td>Medical technology</td>
<td>13.48%</td>
</tr>
<tr>
<td>Other consumer goods</td>
<td>7.87%</td>
</tr>
<tr>
<td>Biotechnology</td>
<td>6.74%</td>
</tr>
<tr>
<td>Furniture, games</td>
<td>6.74%</td>
</tr>
<tr>
<td>IT methods for management</td>
<td>4.49%</td>
</tr>
<tr>
<td>Control</td>
<td>4.49%</td>
</tr>
<tr>
<td>Civil engineering</td>
<td>4.49%</td>
</tr>
<tr>
<td>Organic fine chemistry</td>
<td>3.37%</td>
</tr>
<tr>
<td>Others</td>
<td>10.13%</td>
</tr>
</tbody>
</table>

*Table 5.3 Ratio of patent applications by Nigerian researchers by field*

### 5.1.2 Concrete Structures of Academic Entrepreneurship

The Nigerian government’s website: [http://www.nigeria.gov.ng/](http://www.nigeria.gov.ng/) provides information about the government of the Federal Republic of Nigeria, including all the ministries and agencies of the government and links to their websites. Data obtained from this source reveals that the government of Nigeria is structured into ministries, with each of these ministries responsible for a set of functions and activities which it executes through departments referred to as agencies. Thirty ministries and Ninety-two agencies form the executive arm of the Nigerian government (FRN, 2014). Website data was used to identify the ministries and agencies responsible for, or whose activities relate to academic entrepreneurship. The website data reveals that while the responsibility of
managing and overseeing universities and research in Nigeria is with the Federal Ministry of Education under the direct supervision of two agencies: the National Universities Commission (NUC) and the Nigeria Educational Research and Development Council (NERDC), the responsibility of managing the commercialization of outcomes of research as well as oversight of certain categories of research (research related to science and technology) lies with the Federal Ministry of Science and Technology (FMS&T). These two aspects of the process of academic entrepreneurship being managed by two separate ministries may be a source of tension and friction within the triple helix relationship, and to the process of transforming findings of research from academia to industry. It would have been interesting and useful to explore this further, but for reasons of scope management, and limitation of available resources, this study did not explore further, how this influences the process.

5.1.2.1 Roles within the Science and Technology Ministry

More detailed exploration of the data on the Nigerian Federal Ministry of Science and Technology, the statutory organ of the Nigerian Government whose mission is “facilitating the development and deployment of Science, Technology and Innovation to enhance the pace of socio-economic development of the country” (FMS&T, 2014) shows that the ministry “directs Science and Technology activities including the supervision of research in the areas of technology, Space, Engineering and Information Technology”, and its vision is recorded as “to facilitate the development and deployment of science and technology apparatus to enhance the pace of socio-economic development of the country through appropriate technological inputs into productive activities” (FRN, 2014). The Nigerian ministry of science and technology identifies its goals as:"
1. Formulation, monitoring and review of the National Policy on Science, Technology and Innovation to attain the macro-economic and social objectives of Vision 20:2020 as it relates to science and technology;

2. Acquisition and application of Science, Technology and Innovation contribution to increase agricultural and livestock productivity;

3. Increasing energy reliance through sustainable Research and Development (R&D) in nuclear, renewable and alternative energy sources for peaceful and development purposes;

4. Promotion of wealth creation through support to key industrial and manufacturing sectors;

5. Creation of Technology infrastructure and knowledge base of facilitate its wide application for development;

6. Application of natural medicine resources and technologies for health sector development;

7. Acquisition and application of Space Science and Technology as a key driver of economic development; and

8. Ensuring the impact of R&D results in the Nigerian economy through the promotion of indigenous research capacity to facilitate technology transfer”.

Item no ‘8’ in particular confirms the responsibility for the commercialization of R&D results on the FMS&T.

The ministry has 17 agencies under its supervision which are referred to as ‘parastatals’. These agencies serve as channels through which the ministry discharges its functions. These parastatals include:

1. National Board For Technology Incubation (NBTI)
2. Energy Commission of Nigeria (ECN)
3. The Nigerian Institute of Science Laboratory Technology (NISLT)
4. Nigerian Institute For Trypanosomiasis And Onchocerciasis (NITR)
5. National Biotechnology Development Agency (NABDA)
6. National Centre For Technology Management (NACETEM)
7. National Office For Technology Acquisition And Promotion (NOTAP)
8. Nigerian Natural Medicine Development Agency (NNMDA)
9. National Space Research & Development Agency (NARSDA)
10. Raw Materials Research and Development Council (RMRDC)
11. Nigerian Building and Road Research Institute (NBBRI)
12. National Institute of Leather Science and Technology (NILEST)
13. National Research Institute for Chemical Technology (NARICT)
14. Sheda Science and Technology Complex (SHESTCO)
15. Project Development Institute Enugu (PRODA)
16. Federal Institute of Industrial Research (FIIRO)
17. National Agency for Science and Engineering Infrastructure (NASENI)

Further exploration of the structure of the ministry was conducted to identify the
arms of the ministry or the specific parastatals that are responsible for this
mandate. It was found that the ministry is structured into seven departments:

1. Human Resources Management
2. Finance and Accounts
3. Planning Research and Policy Analysis
4. Physical & Life Sciences
5. Technology Acquisition and Assessment
6. Chemical Technology and Energy Research
7. Information and Communication Technology
Each of the departments has aspects of the responsibility of the ministry assigned to it. To narrow down the focus of this research, further scrutiny of the activities of each unit was conducted. Further analysis of the website data reveal that:

- Research in the areas of space technology, earth sciences, bio-resources, health sciences and natural medicine are under the supervision of the Department of Physical & Life sciences.
- Supervision/coordination of research in areas of chemical technology, industrial chemicals and renewable energy is assigned to the Chemical Technology and energy Research department, and
- The Department of Technology Acquisition and Assessment (TAA) “was established in November 1993 as a means to bridge the gap that has existed between Research and Industry” (FMS&T, 2014).

From this data, it became evident that the responsibility of the Technology Acquisition and Assessment department of the FMS&T is to support and supervise the commercialization of outcomes of research.

5.1.2.2 Technology Acquisition and Assessment Department

As earlier stated, the Department of Technology Acquisition and Assessment “was established in November 1993 as a means to bridge the gap that has existed between Research and Industry”. In describing its activities, the Department expands on this mandate:

“This ‘gap’ was traced to the absence of a clearly articulated plan showing how Research and Development (R&D) result could effectively be translated into viable industrial enterprise to produce useful products or service for the benefit of the populace. The lapse had indeed resulted in the lukewarm attitude of policy
makers towards the funding of Science and Technology (S&T) activities in Nigeria, this is gradually changing.

The obvious negative impact of the above trend had been the negligible contribution of the Ministry to the industrial and economic development of the country. The activities of the Department shall focus and provide guidelines to addressing these impacts through:

- Pursuit of the Commercialization of R&D results for effective research-to-industry linkage using Technology Incubation Programme
- Pilot commercialization ventures in collaboration with Private investors
- Consolidation and improving the activities of Technology Incubation Programme
- Encouraging and promoting of indigenous inventiveness and creativity
- Identifying the current technology needs in some selected critical sectors of the economy for the purpose of acquisition, adoption and adaptation of appropriate technologies.
- To generate development-friendly technology acquisition, adaptation and deployment structure that will support consultation and coordination amongst stakeholders to prosecute implementation processes."

(Source: http://www.scienceandtech.gov.ng/index.php/structure)

The statements from the FMS&T website above confirms the responsibility of Technology Acquisition and Assessment Department of the FMS&T for commercializing outcomes of research in Nigeria.
This research sought further from the data to identify the actual roles played by the department regarding commercialization of research. The website data from the FMS&T states:

“The following are the functions of the (TAA) Department:

Formulation of Policies on and coordination of activities for the:

- Acquisition of technology from the Nation’s Research Institutes and Tertiary Institutions of Learning;
- Assessment and acquisition of relevant and profitable technologies from other countries; and
- Assessment and promotion of technologies developed by indigenous inventors and entrepreneurs
- Design and coordination of programmes for the setting up of incubator industries resulting from technologies outlined on the above mentioned through collaborations with indigenous and/or foreign technical or financial partners;
- Liaise with the legislative functionaries of Government to appropriate laws to protect Nigerian enterprises resulting from locally motivated research and development results or from acquired foreign technologies;
- Liaise with appropriate Federal and State Ministries, their agencies and private sector on matter relating to the translation of R&D results into viable industrial enterprises”

To gain a deeper understanding of the mechanism of the operation and activities of the department, this study probed deeper into the data related to the structures, programmes and activities of the department. Seven out of the
seventeen agencies under the Ministry of science and technology (See section 5.1.2.1) are under the supervision of the department of Technology Acquisition and Assessment; the seven departments are:

- The National Agency for Science and Engineering Infrastructure (NASENI).
- The Raw Materials Research and Development Council (RMRDC).
- The National Office for Technology Acquisition and Promotion (NOTAP).
- The National Board for Technology Incubation (NBTI).
- The Nigerian Building and Road Research Institute (NBRI).
- The Federal Institute for Industrial Research (FIIRO).
- The Project Development Agency (PRODA).

The office of Technology Acquisition and Assessment is also responsible for the management of the Nigerian Model Science and Technology Park, and the Presidential Standing Committee on Inventions and Innovations (PSCII).

This study sought further data to understand what the activities of these departments are, and to identify the department specifically responsible for the commercialization of research. Of these seven departments, three:

1. National office for Technology Acquisition and Promotion (NOTAP)
2. National Board for Technology Incubation (NBTI), and
3. Project Development Agency (PRODA) have mandates that are directly linked to Academic entrepreneurship.

5.1.2.3 National Office for Technology Acquisition & Promotion

The National office for Technology Acquisition & Promotion (NOTAP) describes its activities to include: "Evaluation/Registration of Technology Transfer
Agreements; Promotion of Intellectual Property; Technology Advisory and Support Services; Commercialization of R&D Results; Research Industry Linkage; Production of Compendium Management Information System; Publication of Project Profiles on R&D Result“ (NOTAP, 2016)

The Agency further states its mandate as:

- **Encouragement of a more efficient process for the identification and selection of foreign technology**

- **Development of the negotiating skills of Nigerians with a view to ensuring the acquisition of the best contractual terms and conditions in the transfer of foreign technology agreements.**

- **Provision of a more efficient process for the adaptation of imported technology.**

- **Registration of all foreign technology transfer agreements having effect in Nigeria.**

- **Monitoring on a continuous basis of the implementation of any contract or agreement registered pursuant to the Act setting up the Office.**

- **Commercialization of R&D Results and Inventions.**

- **Promotion of locally generated technologies.**

- **Promotion of Intellectual Property.**

- **Promotion and encouragement of the development of creative and inventive skills among Nigerian Scientists, Researchers, Inventors and Innovators. (ibid)**
5.1.2.4 National Board for Technology Incubation

The National Board for Technical Incubation (NBTI) states its mandate as “to facilitate the establishment and coordinate the activities of Technology Incubation Centres and Science & Technology Parks which are designed to nurture new technology based start-up businesses nationwide”. The agency further specified its mandates to include:

- To sensitize all stakeholders for the establishment, supervision and regulation of Technology Incubation Centres.
- To provide institutional infrastructure and mechanisms for the development and commercialization of R & D outputs and inventions.
- To effectively involve all relevant stakeholders in the establishment of Technology Incubation Centres across the country.
- To source and develop commercially viable indigenous and foreign technologies.
- To source funds for the implementation of the Programme.
- To source entrepreneurs and investors for the commercialization of chosen technologies.
- To ensure competitiveness of the products of the Programme through value-added service support and effective linkages to knowledge providers to ensure continuous injection of innovation in materials processing and/or equipment.
- To ensure efficient and effective performance leading to accelerated growth of entrepreneurs in the Programme.
To subsidize all services provided by the Technology Incubation Programme in order to reduce the overhead burdens of start-up enterprises.

To ensure compliance with policy and regulations of the Programme.

To provide post-incubation survival scheme for the enterprises graduated from the Programme.

To promote the growth of private sector through the creation of competitive SMEs as the engine of growth of wealth creation, employment generation and poverty reduction.

To encourage value re-orientation to promote hard work, transparency and accountability in business operations.

To interface with research establishments and tertiary institutions for the commercialization of their R & D outputs.

The National Board for Technical Incubation provided this research with a web link to a list of its achievements which were stated as:

“Provision of functional mini e-library facilities at centres, Provision of functional quality control laboratories, Provision of functional engineering workshop at the centres, Rehabilitation and Renovation of Infrastructure at centres, Provision of firefighting equipment to all centres, Acquisition of functional demonstration equipment at centres, Development of prototype: Product improvement and fabrication, establishment of new Centres and strengthening of the existing ones, Commissioning of threshing machines, Commissioning of Bee-keeping technologies, Commissioning of Essential Oil Plant, Graduation of 25 entrepreneurs, Commissioning of NBTI monthly e-newsletter, Involvement of private shopping points for TIC products, Efforts towards amicable resolutions of
the protracted court cases between incubation centres and entrepreneurs, collaboration towards the establishment of Incubators at Tertiary Institutions”.

Analysis of these achievements suggest that they do not relate to commercialization of findings of research. However the agency also states among the list of its achievements:

“encourage product-based research activities to ensure greater commercialization, promoting entrepreneurship amongst the researchers and students spawning the growth of high-tech SME's commercializing R&D results".

The wording and tenses of this statement suggests it is an intended action, or intended ‘achievement’ of the department. What is interesting however is that this is listed as achievements of the department.

5.1.2.5  Project Development Agency

The Projects Development Institute (PRODA) states its mission as: "to facilitate the development and deployment of science and technology apparatus to enhance the pace of socioeconomic development of the country through appropriate technological inputs into productive activities", and its vision as "to make Nigeria one of the acknowledged leaders of the scientifically and technologically developed nations of the world".

PRODA stated its mandate as follows: The Projects Development Institute shall carry out research in industrial materials and processes to pilot plant stages, including engineering design, development and fabrication, and shall in particular conduct research into -
- **Materials science and technology, including metallurgy, foundry work, plastics and synthetic fibres;**
- **Processing of ceramic materials and other solid based minerals for industrial use, including development of ceramic, glass and mineral technology;**
- **Processing of local foodstuffs of economic value;**
- **Mechanical engineering including engineering design, fabrication, machining and other processes;**
- **Coal utilization;**
- **Electrical and electronic elements particularly electrical generators, motors, transformers and switchgear;**
- **Science laboratory equipment development including apparatus for teaching of the physical sciences and engineering;**
- **Economic evaluation of research results to establish their viability in industrial projects;**
- **Technical, analytical and consultancy service for existing and planned industries; and**
- **Any other related matters as may be determined from time to time by the Minister.**

The data illustrates that these three departments have the responsibilities in different capacities for the commercialization of findings of research.

### 5.1.3 Budgets and Financial Expenditure

This study sought to understand how the commercialization of outcomes of research is funded. It was difficult to obtain data about allocation of funds specific for the commercialization of research outcomes. This study therefore
sought to gain insight into commercialization expenditure by extracting from the Nigeria’s last (2014) budget, the various allocations to the FMS&T, and the amounts that were accounted under the names of the three departments that have commercialization of findings of research within their functions.

Table 5.4 shows the total budget of the Nigerian government, and the amount that was allocated the ministry, as well as amount the ministry spent through the three departments.
The breakdown of the findings indicates that out of the total £15,518,018,168.57\(^3\) budgeted, £103,098,344 was allocated to the FMS&T; this represents 0.67% of the Nigerian budget for 2014. Of the allocation to the FMS&T, the three departments whose responsibilities include the commercialization of research received a total of £63,207,424.33, which represents 0.41% of the Nigerian budget for 2014. This statistics does not absolutely represent Nigeria's spending on commercialization because the government agencies also have other responsibilities beside commercialization of findings of research. It, however, provides an insight on how much the Nigerian government spends on effort to commercialize findings of research.

\(^3\) 1 GBP = 299.198 NGN. Source: http://www.xe.com, Mid-market currency rates: 2015-12-05
The mechanisms of the expenditure of these funds, and their social impacts on the departments and the commercialization of findings of research are further discussed in Chapter 7 and 8, the data analysis sections of this research.

5.1.4 Intellectual Property Offices

The National Office for Technology Acquisition and Promotion (NOTAP) included among its activities:

- Commercialization of Research Results
- Compendium Management Information System
- Computerized Registry Information System
- Establishment of IPTTOs
- Technology Transfers

The NOTAP’s website states:

“NOTAP has established thirty Intellectual Property Technology Transfer Offices (IPTTOs) in Universities, Polytechnics and Research Institutions in Nigeria, to promote interaction and strengthen the linkage between University/Research Institutions and Industries. Consequently NOTAP advised that the fifteen institutions should appoint Heads of each IPTTO who should be a person of acclaimed research efforts in innovation creation as well as strong links with industry and the market, in order to ensure successful execution of the mandate of IPTTO.”

Efforts were made in this research obtain interviews from the intellectual property offices of at least one university. This effort however did not yield any result. Findings of this research suggest that the intellectual property offices (IPPTOs) of the three out of four universities sampled in this research do not
function. In two of the three cases the situation suggests that the offices are not operational. This research came to this conclusion because on several visits during office hours, the offices were locked up. Phone calls to the numbers provided on their sign posts did not accept calls. This study recoursed to the individual web pages of the intellectual property offices on their university websites.

Although some of these offices were not functional, the scrutiny of the budget of the FMS&T show expenditures on these offices. The interview data includes data related to the support the academics receive from the intellectual property offices during commercialization of findings of their research. Responses by the agents suggest that the intellectual property offices folded up months after they were set up. Aca_02 was asked:

**Q:** On the NOTAP website they said they have an office called the Intellectual Property and Technology Transfer Office at the University, Is that something you know about?

**A:** Intellectual? ...em, they can call it anything, but I know that when they started and I went there, they said its NOTAP office. They called it innovation center then, but it is no more. I don’t know if it is due to no activity, or they ran out of fund I don’t know but if you go there no you will see no one, it is locked....

While the response of Aca_02 suggests the office existed and the agent has had a contact with them in the past, the response of Aca_05 suggests the office never existed:
Q: The intellectual property office at the university, and it is being funded by NOTAP in Abuja, from what I understand their job is to liaise or contact people like you who research and discuss possibility of patenting your findings, and other possibilities of taking your findings to market. Have you ever had any contact?

A: No, I have not. Really I have not had any contact with them. One is, with due respects, they should make their existence more visible you know, so that people will know that they are there. Then they should expose their primary aims and objectives so that people can understand how they can get in to share their findings and then also their get their discoveries properly recorded and registered. I have never heard of them, I have never seen who they helped.

5.1.5 Outputs

This study also obtained data relating to the output of academic entrepreneurship. This relates to charges and receipts from intellectual property rights by Nigerian residents. This includes receipts from patents, copyrights, trademarks, technology licensing agreements, trade secrets, designs, etc. The most recent data available from the World Bank database (World_Bank, 2015a) is 2012, and it ranked Nigeria 50th in the world, receiving a total of £165,499,272.90 in 2012. Output of academic entrepreneurship from Nigeria was also assessed by the level of the country’s hi-tech exports, which reflects the total export of products with high R&D intensity, such as IT products, high profile pharmaceuticals, scientific instruments, electronics and electrical machinery, etc. Also the World Bank data (World_Bank, 2015b) was used to asses Nigeria’s output. In the latest available data, Nigeria ranked 69th, exporting a total of
£55,219,773.64 in 2013; this represents 0.2% in comparison with £27,130,528,947.39 received from petroleum export in the same period.

5.1.4 Summary

This chapter presented a descriptive account of the state of academic entrepreneurship in Nigeria. It provided a summary of the state of academic research and its commercialization in Nigeria. It provided an overview of the Nigerian scientific output using standard indices such as the SCImago ranking system that compares outputs of academic institutions worldwide in terms of volume and quality. Other indices such as R&D spending and intensity, number of researchers, patent filing data were used to assess Nigeria’s scientific output.

Also in this chapter data on the material structures that support academic entrepreneurship including government departments, their roles and mandates were analysed and discussed. The chapter finished with a discussion on the funding regime through which the government supports academic entrepreneurship, and a summary of the recorded outcomes of these investments.

This chapter provides a ‘snapshot’ of the state of affairs of academic entrepreneurship in Nigeria (see section 3.4). This is useful and provides an equivalence of Bourdieu's starting still “photograph” (Grenfell, 2004, p. 119) of the phenomenon being studied. The rest of the data and analysis presented in chapters 6, 7, 8, and 9 are used to explain 'state of affairs' captured in the ‘snapshot’, and the mechanisms that produces and governs them.
Section 2: Quantitative Data

5.2 The Forms of Capital in the Nigerian Rentier Space

This section presents data about the various forms of capital held by academic entrepreneurial agents in Nigeria. The forms of capital captured in this research are economic and cultural forms. Economic capital in the form of salaried income, while cultural capital in the form of formal education. The presentation of the data on the economic and cultural capital held by agents is prefaced with data on the economic capital accruable to Nigeria as a country. This data illustrates and confirms the status of Nigeria as a rentier state (discussed in section 2.2).

5.2.1 Economic Capital in the Rentier Social Space

Within a rentier state, economic capital is central because it is the core field force shaping the institutional outlook of the state (Cooley, 2001). For such rentier states economic capital is prevalently as rents from the export of natural resources, in particular for this study, rents from export of crude petroleum. Rents from petroleum is the major source of income to a rentier state, this makes the main role of a renter state government the distribution of the rents (Basedau & Lacher, 2006). Between 2010 and 2015, Nigeria earned a total of £174.01bn, out of which £134.07bn (74.5%) came from the export of crude oil while the remaining £46.02bn (25.55) came from other non-oil productive activities within the economy (CBN, 2016).
### Table 5.5 Nigeria’s total oil and non-oil income - 2005 - 2010

<table>
<thead>
<tr>
<th>Source of Income</th>
<th>Volume</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>£134.07bn</td>
<td>74.45%</td>
</tr>
<tr>
<td>Non-oil</td>
<td>£46.02bn</td>
<td>25.55%</td>
</tr>
<tr>
<td>Total</td>
<td>£180.09bn</td>
<td>100%</td>
</tr>
</tbody>
</table>

(source: http://www.cenbank.org/documents/quarterlyecoreports)

Table 5.5 Nigeria’s total oil and non-oil income - 2005 - 2010
Table 5.6 Nigeria’s economic capital (rents from oil export) 2010 - 2015

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>£24.35bn</td>
<td>£37.29bn</td>
<td>£29.47bn</td>
<td>£37.29bn</td>
<td>£33.77bn</td>
<td>£11.83bn</td>
</tr>
<tr>
<td>Oil</td>
<td>£18.03bn</td>
<td>£29.68bn</td>
<td>£27.13bn</td>
<td>£29.68bn</td>
<td>£22.71bn</td>
<td>£6.85bn</td>
</tr>
<tr>
<td>Non-Oil</td>
<td>£6.31bn</td>
<td>£7.62bn</td>
<td>£8.42bn</td>
<td>£7.62bn</td>
<td>£11.06bn</td>
<td>£4.98bn</td>
</tr>
</tbody>
</table>

Fig. 5.1 Economic capital from external rents vs internal production

(source: http://www.cenbank.org/documents/quarterlyecoreports)
5.2.1.1 Economic Capital in the Academic Field

Agents within the academic field hold economic capital mostly in the form of income from salaried employment; academics belong among the highest salary earners in Nigeria, with an academic reporting an average income of NGN3.4m per annum (£11,000.00 approximate)$^4,5$.

<table>
<thead>
<tr>
<th>Participant id</th>
<th>Annual Income (NGN)</th>
<th>Annual Income (GBP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aca 01$^6$</td>
<td>3,402,000.00</td>
<td>11,370.40</td>
</tr>
<tr>
<td>Aca 02</td>
<td>3,276,000.00</td>
<td>10,949.28</td>
</tr>
<tr>
<td>Aca 03</td>
<td>3,108,000.00</td>
<td>10,387.78</td>
</tr>
<tr>
<td>Aca 04</td>
<td>3,906,000.00</td>
<td>13,054.91</td>
</tr>
<tr>
<td>Aca 05</td>
<td>3,234,000.00</td>
<td>10,808.90</td>
</tr>
<tr>
<td>Aca 06</td>
<td>3,486,000.00</td>
<td>11,651.15</td>
</tr>
<tr>
<td>Aca 07</td>
<td>3,318,000.00</td>
<td>11,089.65</td>
</tr>
</tbody>
</table>

| Annual Average | 3,390,000.00         | 11,330.30           |

Table 5.7 Economic capital of academic agents based on income

The level of income earned by the academics is determined by the government through the Revenue Mobilisation Allocation and Fiscal Commission, a department of the Federal Government. The level of income set by the Commission serves only as a guide to the various universities in determining the level of salaries to offer academics. The implication is that the various universities

$^4$GDP Per capita in Nigeria is £2,119.85 (World Bank, 2015c)
$^5$ 1 GBP = 299.198 NGN. Source http://www.xe.com, Mid-market currency rates: 2015-12-05
$^6$ Aca 01 = Academic respondent 01
offer wide-ranging pay packages to academics of similar qualification and experience.

For private and state government owned Universities, the incomes of the agents are not subject to the guidance of the Revenue Mobilisation Allocation and Fiscal Commission. Being private enterprise, each they determine their salary scales based on their circumstances and objectives. The ranges in private and non-federal universities are however comparable with those of Federal Government universities, with private universities paying better in some instances and lower in others. Web research of emoluments of academics reveals that academics also acquire as part of their income other, non-monetary forms of economic capital such as free accommodation, free healthcare for family members, free club membership, etc., which results in financial savings that converts to economic capital.

These additional ‘employment benefits’ however are not uniform across all the universities. During the interview data collection process, the researcher was offered free accommodation within the University living quarters at one of the Universities. The researcher was also invited and granted free access to the facilities at the free ‘University Senior Staff Club’ throughout the data collection exercise. These forms of capital were difficult to measure accurately and were excluded from analysis in this study. There are also bonuses that accrue to academics often based on either individual performance, the performance of their departments, or the university in certain aspects.

Besides salaried incomes, academics generate other sporadic incomes through activities such as sponsored research, consultancy, book publication, etc. Some
academics reveal they also participate in other economic activities not related to their fields of expertise, such as ownership of boutiques and supermarkets, transportation ventures, cybercafés, bookshops, stationery stores, corner shops, etc. These sources of economic capital were beyond the scope of this research, and were thus excluded from the analysis because associated data were not collected. Although seven out of nine academics interviewed in this work own at least one patent, none receives royalty from their patents.

5.2.1.2 Economic Capital in the Industry Field
Agents within the field of industry can be identified as two groups: business owners and salaried workers. The sample included in this research consist of two business owners and five salaried employees. Salaried agents included were in senior decision-making positions in their organisations, and are involved in the day-to-day managing of their organisations, which are publicly listed companies. Agents in senior non-executive positions were excluded. The two business owners included in this study are involved in the day-to-day management the organisations they own. The agents receive salaries from their companies, but also reported that they also receive profits from their businesses at the end of a year, which they disclosed are sometimes losses which they also bear. Because of the difficulty it presented in the analysis, profits agents share at the end of a year was excluded from the analysis in this study. The incomes of the agents in the industry field is presented in table 5.8.
### Table 5.8 Economic capital of industry agents based on income

<table>
<thead>
<tr>
<th>Participant id</th>
<th>Annual Income (NGN)</th>
<th>Annual Income (GBP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ind 01</td>
<td>6,300,000.00</td>
<td>21,056.30</td>
</tr>
<tr>
<td>Ind 02</td>
<td>5,820,000.00</td>
<td>19,452.01</td>
</tr>
<tr>
<td>Ind 03</td>
<td>5,652,000.00</td>
<td>18,890.51</td>
</tr>
<tr>
<td>Ind 04</td>
<td>5,460,000.00</td>
<td>18,248.79</td>
</tr>
<tr>
<td>Ind 05</td>
<td>7,056,000.00</td>
<td>23,583.06</td>
</tr>
<tr>
<td>Ind 06</td>
<td>7,728,000.00</td>
<td>25,829.06</td>
</tr>
<tr>
<td>Ind 07</td>
<td>6,384,000.00</td>
<td>21,337.05</td>
</tr>
</tbody>
</table>

| Annual Average | 6,342,857.14 | 21,199.54 |

Agents in the Industry field acquire economic capital in the form of salaried incomes and employment benefits. Agents who own their own businesses also earn income in form of profits from their ventures, these were however excluded from analysis because of difficulty in resolving situations where agents have incurred losses in their business. Even in situations of losses agents continued to receive their salaries, hence salary was a more reliable indicator of economic capital than profit from private ventures. The incomes to the agents in the industry field were wide ranging, and depends on the industry subsector. Self-reported data from the survey and the desk research show that agents in the oil and gas sector earn the highest incomes in the industry field in Nigeria followed by agents in the manufacturing sector, in particular breweries, health and beauty,

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7 Ind 01 = Industrialist respondent 01
Academic Entrepreneurship in Petroleum Rentier States

and drug manufacturing. The average income in this field is NGN6.3m (£21,199.54). Desk research data reveal that agents in the field of industry also earn other non-monetary incomes such as housing benefits, free medicare, company-provided official cars, among others. These constitute part of their economic capital. The entitlements that are in monetary forms such as housing benefits were added to the agents’ salaries and included the analysis, but the non-monetary forms were excluded because of the difficulty in converting them to the financial equivalents.

5.2.1.3 Economic Capital in the Government Field

Agents in the government field consist of elected officials, political appointees, and civil servants. The constitutional duration of elected government officials in Nigeria is four years (Ajayi & Ojo, 2014), they can be re-elected for another four years after which they must leave office. Hence the maximum tenure of an elected government agent in Nigeria is eight years (Shehu, 2014). Civil servants spend 35 years in service before retiring (or 60 years of age, whichever comes first) (Orifowoomo, 2006), Political appointees in Nigeria have no specific duration in office (Adamolekun, 2015). Appointed officials often come with a new government and leave with it. However in some cases their appointments are terminated abruptly since it is within the powers of the appointer (Lawan, 2010).

The major source of (legitimate) economic capital to the agents in this field is salary. Elected and appointed government officials and civil servants have salaried incomes, level of the income determined by the Revenue Mobilisation Allocation and Fiscal Commission, a department within the government of the

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8 1 GBP = 299.198 NGN. Source http://www.xe.com, Mid-market currency rates: 2015-12-05
Federal Republic of Nigeria (RMAFC, 2015). For this study, appointed government officials, and civil servants limited to the FMS&T (including its various parastatals) were included in the study. The average income in the government field is NGN8.5m (£28,000.00)\(^9\).

<table>
<thead>
<tr>
<th>Participant id</th>
<th>Annual Income (NGN)</th>
<th>Annual Income (GBP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gov 01</td>
<td>10,044,000.00</td>
<td>33,569.76</td>
</tr>
<tr>
<td>Gov 02</td>
<td>8,208,000.00</td>
<td>27,433.35</td>
</tr>
<tr>
<td>Gov 03</td>
<td>9,072,000.00</td>
<td>30,321.07</td>
</tr>
<tr>
<td>Gov 04</td>
<td>6,588,000.00</td>
<td>22,018.87</td>
</tr>
<tr>
<td>Gov 05</td>
<td>8,316,000.00</td>
<td>27,794.32</td>
</tr>
<tr>
<td>Gov 06</td>
<td>9,936,000.00</td>
<td>33,208.79</td>
</tr>
<tr>
<td>Gov 07</td>
<td>7,236,000.00</td>
<td>24,184.67</td>
</tr>
</tbody>
</table>

| Annual Average | 8,485,714.29        | 28,361.55           |

*Table 5.9 Economic capital of government agents based on income*

This makes the agents in this field the highest holders of economic capital within the field of academic entrepreneurship. The government field being the recipient of the external rents from oil are associated with illegitimate apportion of economic capital to self, a phenomenon commonly referred to as ‘corruption’ (Fjelde, 2009); corruption constitute part of the strategy deployed by the agents in this field to enhance their positions. This is discussed in later sections of this report; however the economic capital acquired by the agents through this (illegitimate) strategy in the field of government being “complex, hidden and

\(^9\) 1 GBP = 299.198 NGN. Source http://www.xe.com, Mid-market currency rates: 2015-12-05
diversified” (Limam, 2012), makes it difficult to measure. It is excluded from the construction of the social space in this research.

5.2.1.5 Summary: Economic Capital in the Nigerian Rentier Space

Agents in the government field wield the highest volume of economic capital in the Nigerian rentier state. The least volume of capital held by a government agent is approximately £22,000.00 in comparison with £10,000.00 in the academic field and mid £18,000 in the industry field. The highest volume of capital held by an individual agent is also in the government field at £35,000.00. The highest volume of economic capital in the academic field is £13,000.00 while in the industry field it is approximately £25,000.00.

In order to determine the overall volume of capital held be each agent, the volume of economic capital held by an agent is analytically combined with the corresponding cultural capital held by the same agent. The cultural capital held by the academic entrepreneurs in Nigeria is presented in section 5.2.2. below.

5.2.2 Cultural Capital in the Nigerian Social Space

In Bourdieusean terms, cultural capital includes formal education, training, work experience, and other embodied forms of acquisition, in particular those that are relevant to the occupation of the agent being studied. Cultural capital in this work was measured using the sub-capital- education. Educational capital was measured by the level of education, given by the number of years spent in formal education by an agent. For each of the three different fields of academic entrepreneurship, the volumes of cultural capital held by the agents in the rentier state of Nigeria is presented and discussed.
5.2.2.1 Cultural Capital in the Government Field

Academic entrepreneurs in the government field possess the least total cultural capital. Agents in the industry spend an average of 18 years in formal education. Agents also occasionally attend training courses, in some cases overseas on various subjects related to their roles in government. They also attend internally organised seminars, symposia, workshops, etc. These trainings and workshop in Bourdieusean terms, are forms of cultural capital, but for convenience reason they are excluded from the analysis in this study. It will be cumbersome assigning value to these forms of cultural capital. The impracticality of measuring the real contents and duration of these courses, so as to accurately compare them among the various agents proved cumbersome. The volumes of cultural capital, in the form of education held by agents in this field vary considerably, with some agents possessing less than university degrees, the majority holding university (Bachelor's) degrees and a few more studying and acquiring a PhD. A good number of the agents in this field also have honourary doctorate degrees awarded by various universities within and outside Nigeria. Honourary degrees, although recognizable as a form of capital, does not constitute cultural capital and are thus excluded from this study. The number of years reportedly spent actively studying by the government agents sampled in this study is summarized in table 5.10. below.
<table>
<thead>
<tr>
<th>Participant id</th>
<th>Years of Education</th>
<th>Highest Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gov 01</td>
<td>12</td>
<td>GCE</td>
</tr>
<tr>
<td>Gov 02</td>
<td>11</td>
<td>GCE</td>
</tr>
<tr>
<td>Gov 03</td>
<td>16</td>
<td>BSc</td>
</tr>
<tr>
<td>Gov 04</td>
<td>17</td>
<td>BSc</td>
</tr>
<tr>
<td>Gov 05</td>
<td>13</td>
<td>GCE</td>
</tr>
<tr>
<td>Gov 06</td>
<td>15</td>
<td>BSc</td>
</tr>
<tr>
<td>Gov 07</td>
<td>16</td>
<td>BSc</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>14</strong></td>
<td><strong>GCE</strong></td>
</tr>
</tbody>
</table>

*Table 5.10 Cultural capital of government agents based on education*

### 5.2.2.2 Cultural Capital in the Industry Field

Academic entrepreneurs in the industry field possess higher volumes of capital in comparison with the agents within government field. Cultural capital, as in the case of government agents, is measured by the number of years an agent actively spent in formal education. Agents in this field also occasionally attend training courses, seminars, workshops, etc. Although these are equally forms of cultural capital, they are again as stated previously excluded from the analysis because of the difficulty it presents to the analysis of the data. All agents in this field possess a minimum of a Bachelor’s degree. The number of years reportedly spent actively studying by the industrialists involved in this study is summarized below:
<table>
<thead>
<tr>
<th>Participant id</th>
<th>Years of Education</th>
<th>Highest Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ind 01</td>
<td>16</td>
<td>BSc</td>
</tr>
<tr>
<td>Ind 02</td>
<td>18</td>
<td>MSc</td>
</tr>
<tr>
<td>Ind 03</td>
<td>15</td>
<td>BSc</td>
</tr>
<tr>
<td>Ind 04</td>
<td>13</td>
<td>GCE</td>
</tr>
<tr>
<td>Ind 05</td>
<td>18</td>
<td>MSc</td>
</tr>
<tr>
<td>Ind 06</td>
<td>17</td>
<td>BSc</td>
</tr>
<tr>
<td>Ind 07</td>
<td>18</td>
<td>MSc</td>
</tr>
</tbody>
</table>

| Average        | 16                 | BSc                   |

*Table 5.11 Cultural capital of industrial agents based on education*

### 5.2.2.3 Cultural Capital in the Academic Field

Agents in the academic field possess the highest volume of cultural capital. This is explainable by the high level of education required to enter the academic/research field. The minimum level of education of the participants in this study from the academic field is a PhD. Academics attend regular workshops, trainings, seminars, etc. as trainees, and in some instances as trainers. They also attend conferences, in some cases as attendees, and in others as presenters. While these activities are valid acquisition of cultural capital, they are excluded from the analysis for reasons of convenience. Academics also in some circumstances take time off to obtain further formal education. Sabbaticals, internships, trainings, etc. are included in the analysis in instances when the duration are over 12 months, in which case they count as additional years of education. The number of years reportedly spent by the academics in active formal education is summarised in table 5.12.
### Table 5.12 Cultural capital of academic agents based on education

<table>
<thead>
<tr>
<th>Participant id</th>
<th>Years of Education</th>
<th>Highest Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aca 01</td>
<td>22</td>
<td>PhD</td>
</tr>
<tr>
<td>Aca 02</td>
<td>24</td>
<td>PhD</td>
</tr>
<tr>
<td>Aca 03</td>
<td>26</td>
<td>PhD</td>
</tr>
<tr>
<td>Aca 04</td>
<td>31</td>
<td>PhD**</td>
</tr>
<tr>
<td>Aca 05</td>
<td>33</td>
<td>PhD</td>
</tr>
<tr>
<td>Aca 06</td>
<td>25</td>
<td>PhD**</td>
</tr>
<tr>
<td>Aca 07</td>
<td>24</td>
<td>PhD**</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>26</strong></td>
<td><strong>PhD</strong></td>
</tr>
</tbody>
</table>

Key: ** = Professor

### 5.2.2.4 Cultural Capital Summary

Agents in the Nigerian rentier state possess different forms of cultural capital including formal education, informal education, work experience, specialist knowledge, and skills. For analytical purpose in this work, cultural capital is measured using educational capital only as the indicator (see section 4.6). This was measured by the number of years an agent spent in active formal education. The data shows a differential volume of cultural capital across the three fields of academic entrepreneurship practice. Agents in the academic field possess the highest volume of this form of capital, followed by agents within the industry field, and agents in the government field possessing the least.
Chapter 6 Analysis of Data

The Nigerian Social Space

6.0 Introduction

The starting point of data analysis for this research is an execution of spatial positioning of all the agents who participated in this study to their relative social positions within the Nigerian social space (see methodology (section 4.7.1)). The position an agent occupies on the social space is determined by the volume and configuration of capital the individual agent holds. In this section, the data related to the economic and cultural capital held by the agents discussed in Chapter 5 is applied to determine the positions of the agents in the social space. The positioning is crucial to this study because it leads to the identification of the various ‘clouds’, or clusters (of individuals) that the agents belong to by the virtue of possessing similar volumes and configurations of capital. Each cloud of individuals will typically exhibit similar dispositions, habitus and practice, and it is the spatial distances between the agents that form the basis for the power relations between individual agents, and groups within the space. The various clusters of individuals correspond to the various fields of practice within the social space. Identifying the clusters of individuals sets the stage for the identification of the structural homologies that manifest themselves within the social space; these second stage of the Bourdieusean data analysis. It is the properties of the clouds, and of structural homologies identified that produces the understanding of the mechanisms that govern the observed state of academic entrepreneurship that are later inferred in chapter 8.
6.1 Spatial Positioning of Nigerian Academic Entrepreneurs

6.1.1 The Social Space

The primary data captured the various forms of capital held by the academic entrepreneurial agents (presented in Chapter 5) was used to construct the Nigerian academic entrepreneurial social space. The social space differentially positions the agents according to the volume and configuration of capital they possess. The overall volume of capital for each individual agent is the total economic and cultural capital the individual agent holds. In this study, the agents’ incomes were used to estimate the volume of their economic capital, while the level of education they achieved, measured by the number of years spent in formal education estimated their cultural capital.

The agents’ economic capital is in monetary values, and their cultural capital is in number of years. The overall capital held by the agents is a combination of the economic and cultural capital. In order to combine cultural with economic capital, the agents’ cultural capital measured in terms of their educational levels is converted into its economic equivalents. This is achieved by quantifying each year of education achieved by the agents in monetary terms. Each year of education is monetised by taking the corresponding increase in salary per year of education acquired. Each year of education corresponds to approximately NGN240,000.00 (£802.14)\(^{10}\). Monetization of the education of the agents resulted in the values for the equivalent cultural capital as below:

\(^{10}\) 1 GBP = 299.198 NGN. Source http://www.xe.com, Mid-market currency rates: 2015-12-05
### Table 6.1 Summary: agents' education and monetised equivalents (GBP)

<table>
<thead>
<tr>
<th>Government Field</th>
<th>Industry Field</th>
<th>Academic Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant Id</td>
<td>Education (Yrs)</td>
<td>Cultural Capital Equivalent (GBP)</td>
</tr>
<tr>
<td>Gov 01</td>
<td>12</td>
<td>£9,626</td>
</tr>
<tr>
<td>Gov 02</td>
<td>11</td>
<td>£8,824</td>
</tr>
<tr>
<td>Gov 03</td>
<td>16</td>
<td>£12,834</td>
</tr>
<tr>
<td>Gov 04</td>
<td>17</td>
<td>£13,636</td>
</tr>
<tr>
<td>Gov 05</td>
<td>13</td>
<td>£10,428</td>
</tr>
<tr>
<td>Gov 06</td>
<td>15</td>
<td>£12,032</td>
</tr>
<tr>
<td>Gov 07</td>
<td>16</td>
<td>£12,834</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov 01</td>
<td>16</td>
<td>£12,834</td>
</tr>
<tr>
<td>Gov 02</td>
<td>18</td>
<td>£14,439</td>
</tr>
<tr>
<td>Gov 03</td>
<td>15</td>
<td>£12,032</td>
</tr>
<tr>
<td>Gov 04</td>
<td>13</td>
<td>£10,428</td>
</tr>
<tr>
<td>Gov 05</td>
<td>18</td>
<td>£14,439</td>
</tr>
<tr>
<td>Gov 06</td>
<td>17</td>
<td>£13,636</td>
</tr>
<tr>
<td>Gov 07</td>
<td>18</td>
<td>£14,439</td>
</tr>
</tbody>
</table>

The sum of the economic capital held by the agents (see tables 5.7, 5.8, & 5.9) and the monetized equivalent of the cultural capital (table 6.1) is the overall total capital held (tables 6.2, 6.3, & 6.4).
<table>
<thead>
<tr>
<th>Participant Id</th>
<th>Cultural Capital</th>
<th>Economic Capital</th>
<th>Overall Capital Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gov 01</td>
<td>£9,626</td>
<td>33,569.76</td>
<td>£43,195</td>
</tr>
<tr>
<td>Gov 02</td>
<td>£8,824</td>
<td>27,433.35</td>
<td>£36,257</td>
</tr>
<tr>
<td>Gov 03</td>
<td>£12,834</td>
<td>30,321.07</td>
<td>£43,155</td>
</tr>
<tr>
<td>Gov 04</td>
<td>£13,636</td>
<td>22,018.87</td>
<td>£35,655</td>
</tr>
<tr>
<td>Gov 05</td>
<td>£10,428</td>
<td>27,794.32</td>
<td>£38,222</td>
</tr>
<tr>
<td>Gov 06</td>
<td>£12,032</td>
<td>33,208.79</td>
<td>£45,241</td>
</tr>
<tr>
<td>Gov 07</td>
<td>£12,834</td>
<td>24,184.67</td>
<td>£37,019</td>
</tr>
</tbody>
</table>

Table 6.2 Total volumes of capital held by government agents

<table>
<thead>
<tr>
<th>Participant Id</th>
<th>Cultural Capital</th>
<th>Economic Capital</th>
<th>Overall Capital Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ind 01</td>
<td>£12,834</td>
<td>21,056.30</td>
<td>£33,891</td>
</tr>
<tr>
<td>Ind 02</td>
<td>£14,439</td>
<td>19,452.01</td>
<td>£33,891</td>
</tr>
<tr>
<td>Ind 03</td>
<td>£12,032</td>
<td>18,890.51</td>
<td>£30,923</td>
</tr>
<tr>
<td>Ind 04</td>
<td>£10,428</td>
<td>18,248.79</td>
<td>£28,677</td>
</tr>
<tr>
<td>Ind 05</td>
<td>£14,439</td>
<td>23,583.06</td>
<td>£38,022</td>
</tr>
<tr>
<td>Ind 06</td>
<td>£13,636</td>
<td>25,829.06</td>
<td>£39,466</td>
</tr>
<tr>
<td>Ind 07</td>
<td>£14,439</td>
<td>21,337.05</td>
<td>£35,776</td>
</tr>
</tbody>
</table>

Table 6.3 Total volumes of capital held by the industrial agents
<table>
<thead>
<tr>
<th>Participant Id</th>
<th>Cultural Capital</th>
<th>Economic Capital</th>
<th>Overall Capital Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aca 01</td>
<td>£17,647</td>
<td>11,370.40</td>
<td>£29,018</td>
</tr>
<tr>
<td>Aca 02</td>
<td>£19,251</td>
<td>10,949.28</td>
<td>£30,201</td>
</tr>
<tr>
<td>Aca 03</td>
<td>£20,856</td>
<td>10,387.78</td>
<td>£31,244</td>
</tr>
<tr>
<td>Aca 04</td>
<td>£24,866</td>
<td>13,054.91</td>
<td>£37,921</td>
</tr>
<tr>
<td>Aca 05</td>
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<td>10,808.90</td>
<td>£37,280</td>
</tr>
<tr>
<td>Aca 06</td>
<td>£20,054</td>
<td>11,651.15</td>
<td>£31,705</td>
</tr>
<tr>
<td>Aca 07</td>
<td>£19,251</td>
<td>11,089.65</td>
<td>£30,341</td>
</tr>
</tbody>
</table>

Table 6.4 Total volumes of capital held by academic agents

The data (given in tables 6.2, 6.3, & 6.4) is plotted to scale with the total volume of capital represented on the vertical axis, and the proportion of cultural to economic capital that make up the volume plotted on the horizontal axis (explanatory model of plotting the social space is presented in section 4.7.1 and figure 4.3). The resultant social space representing the relative social positions of the agents is presented below (fig. 6.1).
Fig. 6.1 Spatial positioning of Nigerian academic entrepreneurs

The higher the agents are located on the space, the higher their social positions; the more they are positioned towards the right-hand side, the more dominant

---

11 +EC= increasing economic capital; -EC= decreasing economic capital
+CC= increasing cultural capital;  +CC= increasing cultural capital
they are in the society; this is because the right hand-side indicates higher economic capital which is the dominant capital in every social space (Bourdieu, 1986). It is important to understand that what is critical is the positions agents occupy relative to each other on the social space rather than absolute values of their capital. Possessing higher overall volumes of capital moves an agent up the vertical axis; thus agents with the highest volumes of capital occupy upper positions on the social space, while agents with the least overall volume of capital occupy lower positions. When plotted over a time span, the social space of any given society highlights the social mobility within the society represented on the space. However, as discussed in section 4.7.1, such historical shifts are not relevant to this research. Any vertical movement over time represents an increase in the overall volume of capital irrespective of what form it is.

The horizontal axis represents the configuration of capital owned by the agents; that is the proportion of the economic to the cultural capital that make up the overall volume (explained in detail in section 4.7.1 and figure 4.3). An agent whose position on the space is biased towards the right hand-side possesses more economic capital than cultural capital, while agents located towards the left-hand-side of the graph have more cultural capital than they have economic. The map of the Nigerian social space was created using the demographic information provided by 10 out of the 12 agents who participated in the interviews, and the supplementary survey data provided by 11 agents that participated in this survey, making a total of 21 agents represented on the social space.
Although the participants are anonymised, the social space map is colour-coded achieve easier recognition of the demographics of the agents. The academic agents are coded green, industrialists are coded blue while the government agents are coded red.

The exact value of the capital held by the agents as shown in the data presented (tables 6.2, 6.3, & 6.4) were plotted on paper using ruled scale; ruled scale positions the agents as accurately as possible to the value of the capital they hold. In the first representation of the social space and the fields of academic entrepreneurship in this work (fig. 6.1 & 6.3), the space is presented on the scaled graph, allowing for the absolute values to be read off the social space. Scaling the graph this way serves, like Grenfell (2014) argued "as a reminder that each individual is located in accordance with their scores for 'volume' and 'composition' of capital" (p.91). In subsequent representations of the social space in this work however, the scales are removed to make the plots easier to read, similar to Bourdieu who “generally deletes axis values from his graphs, only showing the relative positions of practices. This makes sense as only the relative positions have significance...” (ibid). ‘Cleaning up’ the constructed Nigerian social space by deleting the scale does not reduce its usefulness since it is the positioning of the agents relative to each other that is of essence in the analysis rather than the absolute values of the capital they hold. The cleaned up representation of the social space is presented as fig. 6.2.
Fig. 6.2 The Nigerian Social Space of Academic entrepreneurship
6.1.2 The Social Position of the Agents in Nigeria

The constructed social space (Fig.6.2) reveals that academic entrepreneurs occupy an elite position within the Nigerian social space. The social space constructed in this research does not cover the entire Nigerian society; it is limited and is focused on individuals involved in the commercialization of findings of research in Nigeria - the academic entrepreneurs. The elite positions (Khan, 2012) occupied by academic entrepreneurs in a rentier state is illustrated by their positioning above the upper-half of the social space have implications to this study. First it is an indication that this research studied high impact entrepreneurship (Morris, 2012). Reynolds et.al. (2005) differentiate between opportunity and necessity entrepreneurs explaining that opportunity entrepreneurs are those who, already well placed in the society pursue their businesses as a result of opportunity they identified, while necessity entrepreneurship is more need-based, arising out of a (desperate) need for a source of income. Ozdemir & Karadeniz (2009) found that there are considerable differences between opportunity and necessity entrepreneurship in terms of contribution to economic growth. Similarly, Acs & Varga (2005) studied 11 different countries to understand varying impact of opportunistic and necessitated entrepreneurship. Their study found that opportunistic entrepreneurship has high positive impact on economic development, while necessitated entrepreneurship has no significant effect. The elite position occupied by the agents illustrated on the social space is evidence of opportunity entrepreneurship. Acs (2008) explains that opportunity entrepreneurs are more likely to involve in “high impact entrepreneurship”, and contribute better to their countries’ economic development, and are in fact the key players “driving their
Acs, (2006) thus recommends for countries seeking economic development to pursue policies that encourage opportunistic entrepreneurship.

Secondly academic entrepreneurs being in an elite position in the social space are strong contenders in the power structure and institutional dynamism of a rentier state because “research in social sciences has emphasized the tendency of elites to persist and reproduce their power over time at “political and economic levels, potentially undermining the effectiveness of institutional reforms”” (Vergara, 2013, p. 32). Implication is that when the institutional framework of their society are unfavourable to the elites, they make use of their ‘powerful social positions’ to impose institutional changes, and when the institutional outlook are favourable to their interests, they employ their positions to maintain the status quo (Luong & Weinthal, 2006). Even when it is not possible to maintain the status quo indefinitely, they strive to influence the shape of the new order (Buechler, 1995)

6.2 Fields of Practice of Academic Entrepreneurship

Bourdieu approaches the analysis of the space by explaining the positioning of groups along both axes of the social space. A movement along the vertical axis represents an increase in the volume of capital owned by an agent. Agents at the top right hand side of the social space possess the highest volume of capital, made up mainly of economic capital which is always the dominant capital (Bourdieu, 1986, p. 85) (see section 3.14), even more so in a rentier state where the dominant group is the “rentier class” (Beblawi, 1987). In the Nigerian social space, the dominant position is occupied by the government agents/politicians. The high volume of economic capital held by the rentier class come from the

economies” (p.3).
access they have to the enormous rents coming to their countries from oil export (Yates, 1996). Industrialists occupy the middle position within the rentier social space while the academics, though high in cultural capital are aggregated at the lowest positions along the vertical axis, and left-most position on the horizontal axis (see fig. 6.3).
Fig. 6.3 Fields of practice of academic entrepreneurship in Nigeria
Fig. 6.4 Fields of practice of academic entrepreneurship in Nigeria
6.2.1 Identifying the Fields of Practice

Movement across the horizontal axis is a movement between fields. It is a movement across clusters of agents with similar configuration of capital irrespective of the overall volume of the capital. The academic field can be identified occupying the extreme left position on the chart. Academics have the most balanced configuration of capital, indicated by their closest placement near the vertical axis. Although entrepreneurs in the academic field are relatively low on economic capital (in comparison with the other two fields), their position on the social space is advanced by the high volume of the cultural capital they possess, this is mostly in the form of high educational attainment. Being lowest (in comparison with the other two fields) in terms of volume of economic capital held, the academic field is the dominated field. The implication of their dominated position is further discussed under Chapter 9 of this study.

6.2.1.1 The Government Field

The government field occupies the extreme right-hand position on the space. Two typologies make up this field: politicians and civil servants. This position is high in economic capital but relatively low in cultural capital. This is in correspondence with the comparatively low level of education required for entrance into the political field or the field of government. Although agents with high levels of education actively participate in the field of government, the minimum level of education required to enter the field throws the field open to agents with little or nearly no education. The minimum educational requirement for seeking elective political position in Nigeria is the General Certificate of Education (GCE), similar qualification is also the requirement for entry into the civil service. The Nigerian constitution stipulates:
“A person shall be qualified for election to the Office of President if: ...(d) has been educated up to at least school certificate level or its equivalent” (Adedimeji, 2015).

However individuals who join with qualifications less than university degrees cannot be promoted into senior positions; their promotion is capped (Dabalen, Oni, & Adekola, 2001). As a result, recently, university degrees have become an (unwritten) basic requirement into the Nigerian civil service as the agents strive to obtain degrees to enhance their chances of promotion.

In the 2015 Nigerian Presidential Elections it was widely reported by Nigerian newspapers including (Mail, 2015), that the leading presidential candidate was not in possession of a GCE (General Certificate in Education), the minimum requirement to vie for the office of the president. This is an indication of the low educational level required for entry into the field of government, and explains the low level of cultural capital held by members of this academic entrepreneurial field. The high level of economic capital held in this field makes the field the dominant field. The dominant status of this field and its implication for academic entrepreneurship in Nigeria is subjected to further analytical explanation as aspects of ‘power struggle’in Chapter 9 of this report.

6.2.1.2 The Industry Field

The Industry field occupies a mid-position between the field of government and the academic field. This field unlike the academic field which is distinctly clustered on the left hand side within the space, overlaps with the field of government. Explanation for this is found in the configuration of capital held by government agents. Although the government field require low cultural capital for entry,
significant members of this field have educational level comparable with those prevalent in the industry field. The broad middle position occupied by the field of industry and its implication to academic entrepreneurship in a rentier state is part of the ‘power struggles’ within the field discussed in chapter 9 of this report.

6.2.1.3 The Academic Field

The Academic field is the field of knowledge. Agents in this field possess very high level of cultural capital, education and knowledge capital rules the field. The minimum requirement to enter this field in Nigeria is a PhD. Although this is a recent requirement, agents already in the field before the new minimum requirement was set are expected to indicate plans to study for a PhD. Although agents in this field possess high levels of education (See table 5.12), they are comparatively low on overall capital volume. The comparatively low volume of economic capital held by agents in this field cancels out the impact of their high cultural capital on their positioning on the social space, which positions this field in this field as the dominated field within the Nigerian academic entrepreneurship social space.

6.3 Summary

This chapter is the starting point of the data analysis process. The main activity in this section was constructing the Nigerian academic entrepreneurship social space, accomplished using the data about the various forms of capital held by the agents. The construction of the social space positions the agents spatially, a representation that positions agents whose choices, preferences, actions, etc. are conceptually similar through Bourdieu’s concept of structural homology (Coulangeon & Lemel, 2009).
Bourdieu (1977) argues that the positions occupied by agents on the social space has relationship with their perceptions, understandings, and positions they take on issues relating to themselves, others, the society or environment of their existence and action. This invariably implicates similarity of action and practice through the dialectic between their positions and their habitus; an instigator of action.

Having in this chapter positioned the agents in their respective positions granted them by their socio-economic conditions, this study is set to, in the next chapter identify the various groups within the academic entrepreneurship ‘society’, and their dispositions (or habitus); those dispositions common to the various groups that determine individual and group responses to the conditions, events and situations arising within their ‘world’.
Chapter 7  Homologies and Opposition in the Fields

Fields and Habitus

7.0  Introduction

The concepts of homology and opposition in Bourdieusean terms are introduced in section 3.11 and 3.12. The previous chapter discusses how the three fields of practice of academic entrepreneurship within the Nigerian social space are structured based on the volumes and configurations of different forms of capitals held by agents. The next stage of the analysis identifies the structural characteristics, dispositions and actions specific to each of the three fields of academic entrepreneurship identified. The basic principle of Bourdieu’s framework is that practice (action) is an outcome of the ‘relation’ between the various forms of capital agents hold; capital which positions them in the social space, their dispositions (or habitus), giving consideration to the properties of the field of their practice. Mathematically stated:

\[(\text{capital}) \times (\text{habitus}) + \text{field} = \text{Practice} \quad (\text{Bourdieu, 1984, p. 101})\]

Having in the previous chapters identified and discussed the forms of capital existent in the Nigerian academic entrepreneurial social space, the differential distribution of the capital in the social space and how this positions the agents within the social space, the next stages of this research focuses on identifying the other components of the Bourdieu’s social practice equation viz: field, habitus and practice. Identifying these components of the Bourdieu’s equation of social practice is the precursor for an analysis of the spatial dynamics between these three (field, habitus and practice) and how their dynamism gives rise to academic entrepreneurship. This chapter identifies and discusses the characteristics of the
three fields of practice of academic entrepreneurship, and aspects of the habitus of the agents in the three fields that relate to academic entrepreneurship. Aspects of the habitus of the agents are obtained through a retroduction (see section 3.2.5) of the narratives of the agents recorded in the interview data. Capturing the habitus of the agents is followed by the identification of the agential actions that result from its (habitus) structuring and instigative powers in chapter eight.

7.1 Properties of the Fields of Academic Entrepreneurship

This section discusses the general properties of the rentier fields. Data from desk research, literature, and inferences from the interview data are used to build up a qualitative description of the various fields of academic entrepreneurship in Nigeria. This sets the stage for elaboration on the properties of the three fields of academic entrepreneurship: Government, Industry, and the Academia.

7.1.1 The Properties of the Government Field

The striking characteristic of the government field is its high political power; the government field is always the domain of political power in any society, even more in the Nigerian state where the rentier structure renders more political power on the government which typically in a rentier state is ran by the elites (Lecha & Zaccara, 2012). The high political power available to this field is derived from the control the field has over the rents entering the system from export of natural resources (Wantchekon, 2002). The government field is in direct receipt of the rents from the export of petroleum in Nigeria, and makes decisions about how, where, and on what the rent is spent. Being in receipt of and in direct control of the rents coming from the sale of oil in a rentier state, the role of distribution or allocation of resources to the other fields of academic
entrepreneurship thus falls on the government field. Being apprehended as ‘collective wealth’ necessary to be equitably shared among all stakeholders in a rentier state, other agents in the other fields of academic entrepreneurship strategise, dialogue, or battle with the agents in this field about what would constitute equitable ‘fair share’ of their allocation of the state resources that are under the control of the government field.

By the virtue of their position as recipients of the rents, agents in this field have direct access to the oil rents. Agents do not have to perform any special action to gain access to the rents from oil. They receive the rents and have the role of deciding how they are spent. The rents are allocated to their office according to their discretion. This is a critical property of the government field in a rentier system. The government field contravenes the work-reward causation; income accruable to the agents in this field is not related to work effort because the agents in this field have direct access to the economic resources for which accounts of its utilization is rarely demanded of the agents. The government field is characterised by a direct access to the rentier capital.

Another characteristic of this field is low academic knowledge, and in some cases low interest. As illustrated in the map of the social space, agents in this field possess low academic capital. This is as a result of the low level of educational qualification required to enter the field. Although there are agents in this field that possess high academic skills, these are outliers in the data, as the overall average academic capital remains low. This is often a source of tension between agents in this field and the agents in the academic field. The role and necessity of research is often poorly apprehended and thus undervalued by agents in the
government field, so also is the case with education, where education for years has often received the lowest allocation in Nigeria’s national budget. The low allocation to education by the Nigerian government has on several occasions resulted in industrial action by the agents in the academic field, often under the guise of Academic Staff of Nigerian Universities (ASUU), and Senior Staff Association of Nigerian Universities (SSANU). The various face-offs between the two fields often results in agreements about increased funding, and recently the Tertiary Education Trust Fund (TETFUND), severally referenced by agents from the academic field in the interviews conducted in this research.

Similarly agents in this field also possess low technical power. Technical power in this research refers to capacity to translate ideas into products, for example as is seen in the industry field where agents are able to apply design and manufacturing processes to create products, and or services. Agents in the government field may therefore not be in good position to understand the process of academic entrepreneurship. The field of government as a result relies on third parties to solve any technical problem, and may often invest in projects that may produce an outcome that is a far cry from the target. An example is the Nigerian Communications Satellite Project (Nicommsat) which was largely initiated to show Nigeria’s capabilities in the space. Although the government established a new department: National Space Research and Development Agency (NASRDA), to manage the project, the government yet signed a contract with a Chinese firm which designed, built and launched the satellite. The Nigerian government considered the launch of the satellite to be a feat, in contrast with the agents in the academic field who consider contracting the design, building, and launch of the satellite as a blunder by the Nigerian government.
Similarly, the government field is characterised with low business skills. Agents in this field in comparison with the industry field do not have strong skills that could be used in business. This again may be as a result of the low educational requirement for an entry into the field. Business skills come from education and business experience, both being activities that are not associated with the government field. The low business skills of the government field further complicates the abilities of the agents in the field to understand the process of transformation of research outcomes into economic enterprises or products. Agents in this field are therefore least likely of all the three fields to understand and appreciate the commercialization of findings of research. The low academic knowledge and low business skills levels that characterise the government field will likely diminish the abilities of the agents in the government field to understand the process of and need for transformation of research outcomes into economic enterprises or products.

### 7.1.2 The Properties of Industry Field

The Industry field is the technical field; the field is characterised by high technical power; technical power in this context refers to possession of technology, knowledge and skills for their use (Walsh & Linton, 2001). Agents in this field possess the capability for transforming designs and plans into products, and good knowledge about start-up of business enterprises. The largest activity of the industry field is capital investment, investment that is often on plant and production equipment (Cleary, 1999); level of investment in plant and equipment is the strongest indicator of the technical power of this field. Even when it is not utilizing outcomes of new research (academic entrepreneurship), the industry field thrives by commercializing its technical power. The high level of investment
in plant and equipment characterizing this field confers on the industry field a major role to play in the transformation of findings of research into products.

Rent-seeking behaviour is not a common feature of this field, the industry field gains access to economic capital in a rentier state by legitimately working for and earning it because the field identifies with the work-reward causation. This is possibly the reason profit is the main driver of decisions in this field. The industry field under normal circumstances have very little or no access to the rentier capital, although the presence of the rents from oil influences activities in this field by empowering consumers and driving demand for the products moved into the market by industry. The access the industry field has to the rentier capital is therefore ‘earned’.

There are however circumstances when indirect access to the rents from oil are open to the industry field. These are situations when the government field becomes the industry field’s direct customer, for example when industrial players (agents and organisations) become contractors, or suppliers to the government. A participant in this study disclosed a period when the Nigerian manufacturing industries were engaged by the government as a means of enhancing what it termed ‘the Nigeria Industrial Revolution Plan (NIRP)’. The Nigerian government awarded contracts to Nigerian manufacturers to produce and supply certain goods to the Nigerian public institutions such as schools and hospitals. The initiative, however, led to rent-seeking behaviour by the industry field (see verbatim in section 9.4.1). This reveals that in a rentier state, when exposed to opportunities of direct access to rentier circuits, the Industry field becomes rent-seeking similar to the other fields. Under its normal operating circumstances
however, the industry field lacks both direct and indirect access to the oil rents. The field must ‘earn’ its access to the rentier capital by following the classic work-reward causation and demand-supply economics, offering products to the domestic market for profit margins determined by the market forces.

The industry field is also characterised by a high knowledge of the market. This is related to the relationship existing between this field and the consumers. The output of the industry field are fed directly to the market, and to be successful the outputs must be acceptable to the market; to achieve acceptance in the market the industry field spends effort to study and understand the market and its needs. Knowledge of the market places the industry field in a crucial position in the commercialization of findings of research. It confers on the field the function of comparing the outputs of the research proposed for commercialization with the needs or demands of the market, and is able to advise or decide the economic rationality of the proposed commercialization. Although the industry are in possession of better knowledge of the market than the other two fields of academic entrepreneurship, its advice though based on real data is often not reliable since it is sometimes impossible to accurately predict the reaction of the market to a new product (Bstieler, 2005).

The industry field possesses an intermediate academic knowledge, academic knowledge that is much below that obtainable in the academic field, but higher than found in the government field. Being profit oriented and intermediate in academic knowledge; its high market knowledge and high business skills makes this field the field of commerce. Agents in this field are able to play a mediative role, able to identify the needs of the other fields and with adequate skills
evaluate and determine how to take advantage of market conditions to make profit. The industry field will strongly support an academic entrepreneurial project if it finds profitable opportunities in it.

### 7.1.3 The Properties of the Academic field

The strongest characteristic of the academic field is its strong affinity for acculturation of knowledge. Agents in this field are assessed and evaluated, not only by the level of academic knowledge they have acquired, but also by the volume of contribution they have made towards the development of new knowledge. The high level of research skills available in the academic field makes research and innovation the hallmark and distinguishing characteristic of the field.

The high level of knowledge and analytical ability of the agents in this field makes the field resilient and resistant to the domineering disposition of a typical rentier government field. In the Nigerian rentier state this results in constant face-offs between the field of government and the academic field.

In the academic field, agents have indirect access to the oil rents; ‘indirect’ because there are always opportunities to legitimately demand allocation of funds from the oil rents for purposes that are of interest to the Nigerian state. Funding of research and research-related activities is a responsibility accepted to rest with the Nigerian government, while similarly, conducting the research is a responsibility of the academic field. It is therefore open to the agents in the academic field to legitimately demand funds in different guises for the purposes of research and research-related activities. In this way, the agents in this field possess indirect access to the rentier capital; the academic field is characterised by an indirect access to rents from oil.
Agents in the field of academic entrepreneurship possess an intermediate level of business skills. The agents often, depending on their academic disciplines, are well educated in business management; possession of this knowledge often includes the two extremes of being very knowledgeable and being weakly knowledgeable depending on discipline. Often however, agents involved in research that have commercializable potentials are agents without strong knowledge of business management. The level of business skills available in the academic field is intermediate in comparison with those of the government field and the industry. It is higher than those of government because of their education low level of as discussed previously, but lower than those of industry who are not only well educated in business management but also have opportunities in their field to enhance their knowledge with practical experience more than agents in the academic field.

The field of academics is also characterized by intermediate technical power that is lower than the technical power available in the industry field, but higher than the level available in the government field. Intermediate technical power means that agents in this field possess the technical capability (knowledge and tools) to transform innovative findings and designs into products, but only to a limited extent. Agents are able to develop/ build prototypes of products, or go into production, but not on a large scale. This capability plays an intervening role in situations when the other legs of the triple helix model fails. For example when industry backs out of a commercialization project, agents are able to commercialize their findings themselves on a small scale basis, which are often not sustained.
7.1.4 Structure of the Dominant Government Field

The social and economic growth of any country is dependent on its governance of its resources (Venables, 2016). Governance has been viewed from the perspective of the traditions, structures, and processes through which power is exercised, how the citizens have their say, how decisions are taken and implemented, and how the decision-makers and enforcers of decisions are held accountable (Poggi, 2016). Within the field of innovation and entrepreneurship, the major role of government is making decisions regarding policy, and resource allocation, implementing these decisions, and accounting for decisions made and their implementation. These decisions, their implementation, and their accountability within a democratic setting are carried out by different arms of government. Owing to this crucial role of government, it is essential to understand the structure of the Nigerian government, a major actor in the field of Academic Entrepreneurship, and significant member of the triple helix relation.

Following Nigeria’s independence in 1960, coinciding with the discovery of abundant oil deposits in the Niger-Delta area of the country, there was great expectation that the country will rise to assume a strong position and lead the developing world in economic, social, and economic development. But Nigeria plunged into endless cycles of social, economic, and political crises. Strong arguments has been made, blaming Nigeria’s misfortune on the shaky, vulnerable, deficient, and fragile structures and institutions of governance set up the colonialists before granting independence to the country in 1960.

The colonial government, from which Nigeria gained independence, enthroned a Westminster-style parliamentary system of government where a Prime Minister
shared political power with a President. The powers of the executive arm of the government was part of the legislative arm, as such the executive derived its powers from its relationship with the legislative. Implication is that there was no clear separation of powers between the executive arm of the government and the legislative arm. This arrangement has been described by scholars (Dudley, 1982; Akinwumi, 2004) as confrontational, conflict-prone, and unstable. The first government set up by the colonialists in 1960 was toppled after just five years in a military coup after series of crises (Bourne, 2015). Following the return of democracy in 1979, Nigeria jettisoned the Westminster Parliamentary style, and adopted the Washington Presidential model, a tiered system of government that offers a clear separation of powers between the Legislative, Executive, and Judiciary arms of the government. As in most advanced democracies, while the Legislative made laws, the Executive implemented and enforced them; the Judiciary interpreted and had oversight roles.

According to the Constituent Assembly of 1977-78 that recommended the Washington (presidential) system of government, the new system would offer unity, energy, and dispatch to the business of governance, and the clearer separation of powers will ensure harmony and independence in the various organs and functions of governance. In the new system of government, political power came from the ballot, with the legislative and executive coming to power from elections, and the judiciary ascending into positions through maturity, seniority, and succession. Subsequent constitutional review assemblies upheld the presidential system of government despite several criticisms of the president as wielding excessive power and influence (Suberu, 2015).
The most current constitution of Nigeria maintains the structure of Nigeria as a confederation, consisting of 37 states (36 states and a Federal Capital Territory). The states are further divided into Local Governments, a total of 774 across the entire country. The Local Governments are accountable to the State Governments, while the State Governments, although constitutionally independent are dependent on the Federal Government for their economic wellbeing. They depend on financial allocation from the Federal Government; an arrangement that has recently come under heavy criticism (Oluwole, 2016). Allocation and distribution of resources, especially rents from petroleum is the major cause of strife and conflicts among the various federating units of Nigeria (Watts, 2016). Further details of the politics of rent allocation and distribution is discussed in this report under Section 1.2.6- Prebendalism, Ethnic and Religious Politics.

7.1.5 Summary

The three fields of academic entrepreneurship are differentially characterised in different regards. One striking manifestation is the tiered characterization of various attributes of the fields. For each attribute captured, each of the three fields occupies a position between positive, comparative, or superlative along the degrees of comparison line. With reference to academic knowledge and skill, the government field occupies the positive position; the industry occupies the comparative position, while the academic field occupies the superlative position. Similarly in respect of access to oil rents, the government field have a direct access, the academic field have indirect access, while the industry field have little or no access to the oil rents. A comparison of the positions of the three field regarding different field characteristics are presented in table 7.1.
<table>
<thead>
<tr>
<th>Field Property</th>
<th>Government Field</th>
<th>Industry Field</th>
<th>Academic Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to rents</td>
<td>Direct (high)</td>
<td>Earned (low)</td>
<td>Indirect (intermediate)</td>
</tr>
<tr>
<td>Academic knowledge</td>
<td>Low</td>
<td>Intermediate</td>
<td>High</td>
</tr>
<tr>
<td>Technical power</td>
<td>Low</td>
<td>High</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Business skills</td>
<td>Low</td>
<td>High</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Rent-seeking</td>
<td>High</td>
<td>Low</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Research skills</td>
<td>Low</td>
<td>Intermediate</td>
<td>High</td>
</tr>
</tbody>
</table>

*Table 7.1 Tiered comparison of the field properties across the three fields*

### 7.2 Habitus

The dynamics of the practice of academic entrepreneurship is illustrated by Bourdieu's equation of practice

\[
\text{(capital \times \text{habitus}) + field = practice} \quad \text{(Bourdieu, 1984, p. 101)}
\]

Previous sections of this report discussed the forms of capital existent in the Nigerian academic entrepreneurial social space, the differential distribution of capital in the social space, and how the differential distribution of capital determines the social positions of agents within the social space. The preceding section of this report also discussed the properties of the three fields of academic entrepreneurship in the Nigerian rentier space. To complete the left-hand side of Bourdieu's equation, this section focused on identifying the other components of the Bourdieu's social practice equation, viz: field, habitus and practice. Identifying these components of the Bourdieu’s equation of social practice paves way for an analysis of the spatial dynamics between these three that give rise to, and condition academic entrepreneurship. Identifying this mechanism was stated as
a major objective of this study. This chapter identified and discussed the characteristics of the three fields of practice of academic entrepreneurship, aspect of the habitus of the agents in the three fields that relate to academic entrepreneurship, and the various academic entrepreneurial actions prevalent in the three fields of academic entrepreneurship.

Habitus is difficult to grasp or measure directly (Costa & Murphy, 2015). To extract the habitus of the agents, questions were asked in the data regarding the various aspects of commercialization of findings of research, in particular questions related to:

i. Agents’ personal understandings of the various aspects of commercialization,

ii. Agents expectations from other players regarding the commercialization of outcomes of research, in particular players from the other fields of academic entrepreneurship,

iii. Agents’ position takings on issues related to commercialisation of findings of research regarding what they perceive as right or wrong, acceptable or unacceptable, normal or abnormal, usual or unusual, etc.

Evidence of the agents’ habitus and practices in the three fields of academic entrepreneurship were drawn from an analysis of their actions as well as their narratives given in interviews conducted in this research, granted to the media and available in the public domains, in various speeches and press releases, as well as opinions they shared on various social media platforms. Besides actions and dispositions, attributes of the agents and/or their academic entrepreneurial
fields related to their actions and dispositions were also identified in this process. The agential actions and associated field attributes were derived from the qualitative data by asking from the data:

i. What courses of actions did agents take in various situations while pursuing the commercialization of research?

ii. What choices or actions did the agents indicate they would have taken in different circumstances in pursuit of commercialization of outcomes of research?

iii. In what ways did agents make use of objects or resources related to the commercialization of research to advance their positions and/or interests?

iv. In what ways did agents make use of any opportunity, position or privilege that the commercialization of outcomes of research conferred on them to advance their interests?

v. What attributes within the agents’ individual fields are associated with the actions identified in i - iv above?

These questions were answered by categorising themes from the primary and secondary data sources described earlier. The next section of this report discusses the findings of this process as the habitus and practices of agents within the Nigerian rentier system.

7.3. Agential Habitus in the Three Fields

The agents within the three fields of academic entrepreneurship possess different habitus, shaped by the various life trajectories of the agents. Although no two
different individuals would have the same habitus because no two individuals
have exactly the same life trajectory, individuals whose life trajectories were
similar are likely to have “similarities in their habitus and lifestyle” (Bourdieu,
1984, p. 93). Individuals in the academic field are expected to possess similar
habitus, agents in the field of industry will have similar habitus, while those within
the government field will have approximately the same habitus. This is
explainable by the fact that “individuals who have a similar volume and
composition of capital are more likely to meet, interact and form relationships
(because, for example, they can afford the same type of housing, send their
children to the same schools, etc.) - is key to understanding the similarities in
their habitus and lifestyle. Habitus is shaped by interactions within concrete social
networks” (ibid). In this work, this section of the report discusses the habitus of
the agents in the three fields of academic entrepreneurship. The qualitative data
was applied to produce the space of academic entrepreneurial dispositions,
dispositions which are common to the agents occupying proximate positions
within the social space. This constitutes the habitus of the agents in the various
fields of academic entrepreneurship. The resulting space of dispositions in
academic entrepreneurship is represented in fig. 7.1.
7.3.1 The Field Habitus of the Government Field

The government field is the field of political power, agents in this field wields the political power within the rentier state, including control over resources and legitimate use of violence against perceived enemies. It is also the field of...
provision; the field that provides for the needs and demands of the other members of the society. The position of being the provider leads to a paternalistic habitus which is the strongest aspect of the habitus of the agents in this field. Agents in this field assume the position of the ‘parents’ of their nations, and assume responsibility for the needs of the citizens.

**Paternalism**

Agents in this field have a strong apprehension of their primary role as that of providing for the needs of agents in the other fields, and for the larger society. They perceive as theirs, the responsibility of providing like a father the needs of their families, and as such other members of a rentier state look upon the agents in this field to provide their various needs. Provision of the needs of the other members of the society is mostly in the form provision of funds, policy-making and law enforcement. This appears to be as a result of the agents in this field being in direct receipt of the rents from oil which is apprehended as a ‘collective wealth’ of the society. Rents from oil, or the ‘collective wealth’ of the rentier society accrues directly to this field, the virtue of being the trustee of the state’s collective wealth confers parenthood roles on the agents in this field. Thus, responsibility falls on the agents in this field as the ‘parents of the nation’, as agents in the field are often referred to, to decide where and how the rents would be spent using a formula that would be generally acceptable to all stakeholders. Agents thus allocate funds to themselves and their offices, other individuals, various groups, etc. according to what the agents in this field perceive or are able to argue as equitable, and only need to justify the decisions they make regarding where to allocate the funds, often to dissuade groups from rebellion.
Academic entrepreneurship: a society acceptance tool

The field of government is the most unstable, with agents coming into their positions through political means which can change or turn at any time for any reason. Apart from having very short tenures, agents in this field are conscious of the instability of their field, and this works on their habitus. The agents are conscious that their tenures are not only short, but could be cut even shorter by events in the larger society. As a result agents in this field strive to show themselves as visionary, efficient and suitable for their positions; they make efforts to endear themselves to the general society and to the various groups within the society. This opens the government field to attention seeking behaviours, seeking popularity at every opportunity, projecting the government field as a field of public interest and publicity. The agents in this field desire to be seen in a positive light by the general public and to various groups within the society, including the other fields of academic entrepreneurship. Government agents desire to convince the other two fields, and other fields within the wider Nigerian society that they protect their various interests. If commercialisation of research is of interest to any prominent group, or groups within the Nigerian rentier society, then agents in the government field strives to project positive interest in academic entrepreneurship mainly to gain the approval, trust, and support of the other interested fields. It is the instability of the government field that is the major driver of the perceived strong interest of the government field in academic entrepreneurship; an interest geared at gaining the approval and support of the academics, as well as wider society who believes that academic entrepreneurship is a key to diversifying the economy and creating new jobs.
Nigerian society perceives diversification of the Nigerian economy as important, and that academic entrepreneurship is a veritable tool for its achievement. This disposition makes the field of government positively disposed towards academic entrepreneurship. The Nigerian society believes that unemployment is a major social issue for Nigeria, and that academic entrepreneurship is a tool to deal with unemployment. This disposition of the Nigerian society drives agents in the government field towards a positive disposition towards academic entrepreneurship. The agents hence have a habitus disposed towards academic entrepreneurship as a tool for satisfying the yearnings of the Nigerian society, for keeping the population satisfied thereby enhancing the stability of the government.

Agents in the academic field desire the commercialization of the findings of their research. Being distinguished members of the society with strong voice in the Nigerian society, the government field strives to gain their approval by showing support for academic entrepreneurship which they apprehend mainly as tool for gaining the trust, confidence and support of the agents in the academic field. The habitus of the agents in the government field towards academic entrepreneurship is generally a vision of a tool for gaining societal acceptance and maintaining government stability. Agents in this field however also perceive wealth from petremeul as ‘free money’, money that has not been worked for, which could be misused without serious consequences.
Field of Rhetoric

Agents in this field have a habitus that spurs a sense of responsibility towards meeting the needs and demands of every member of the society, as a result they possess disposition towards grasping the feeling or understanding the pulse of the various groups in the social space with a view to making decisions, or making choices of actions that can satisfy their various needs and demands. In situations when this field have not satisfied the desires, or the demands of any group within the space, they strive to make it up by providing explanations, or seeking evidence that can show they are working towards it. Agents in this group can go distances in some circumstances to make claims and show evidence that they have done something substantial towards meeting them; often the evidence provided is unconvincing. In extreme circumstances they strive to shift the blame for not meeting up to the expectation to other groups. To achieve these, agents...
in this field resort to the mass media; the government field is the field of rhetorics (Atkins, Finlayson, Martin, & Turnbull, 2014, p. 25). In other words the agents have a disposition that they do not necessarily need to be efficient and productive in their roles, they only need to show and/or argue that they are so. Making inaccurate and unsubstantiated claims of deeds and achievements constitute acceptable actions in this field.

**Enticement and Rent-seeking Disposition**

Agents in this field receive rewards as salary assigned to their positions. However, they also perceive their positions as opportunities to gain further economic capital often through illegitimate entrepreneurial acts. Agents in the government field deploy various strategies in this regard. For agents occupying political positions, the financial capital under their control is perceived as ‘common wealth’ to which they have absolute control over its use as ‘parents of the nation’. The fund is treated as personal possession, and thus, they freely allocate the funds at their discretion, to themselves, their offices, friends, and areas of their interest including interest groups. The agents only need to justify their decisions, often questions are never asked except when political interests arise, or when political oppositions see in them opportunities to ‘attack’ the incumbent government. Bribery, subornment, and backhand are not strongly disapproved in this field, government agents for example expect contractors working for the government to return a percentage of the value of contracts they are awarded to the agents, often referred to as ‘ten percenters’ (Akinola, 2013, p. 130).

In the civil service, agents perceive their positions as positions attained through hard work for which there is an entitlement to being compensated by individuals
for services they rendered although they receive salaries. These illegitimate practices are not perceived as corrupt by the agents. Agents may demand enticements and kickbacks before or after a service is rendered; this they apprehend as legitimate depending on how the they were obtained, or if it was obtained before or after a service; this habitus is in opposition with the habitus of the agents in the academic field where illegitimate inducement is completely viewed with disdain.

In response to the question of the observed situation where the good policies, programmes and rhetoric originating from the government field fails to match the perceived inefficient and unproductive outputs of the field in respect of commercialization of outputs of research, an academic agent responded:

"Because number one: they put the wrong people in charge for the implementation, wrong in the sense that..., not that they don't have idea, but they place personal interests first. And you mortgage many things as soon as you take money. If we say now we want to develop our train (ie. rail transport) for instance ...contractors come to them and say, oga (ie. sir) er, we have a little bread money for you in your account, virtually sitting in your account. And you get there and you have N350m, you have never seen N1m before, and now in your account is N350m. It will take an, maybe an angel to say please, please go and withdraw that money or I'll blow it open..."

Citing a personal experience the academic agent continued:

"...In this environment decoration project I am doing for the University, I know for instance, some people have come with things, not necessarily money but goodies in gifts and what have you. I say no, I don't do that, what I want is
service to the university of Nigeria, they say, this is private, I say yes, I don’t want it, ... I don’t need this, what I need is perfect service to my university, that is the greatest offer you can give me. And when they saw I was serious about it, they went away. You see how that gave me the guts and boldness to go to them and say oga (sir), you are not doing your work properly and if you continue this way I will terminate your contract..."

The quotes above was the opinion from an agent from the academic field. In response to the same question an agent from the government field responded:

"...Someone came here..., there was a matter that came to attention some time ago someone asking for money to help his work go quicker...” "...that is a form of corruption. I know people who receive gifts. I receive gifts here myself sometimes, and if you receive a gift from someone coming to say ‘thank you’ because you helped me, you did a good job and I am satisfied with the way you have worked with me, ok, I’ll accept it, and I don’t frown at it with my workers. It is okay, it is okay to say thank you, don’t you think so? But I have to say when it becomes a condition for doing your work, you agree with me, well it is not acceptable”.

Are acceptance of such ‘gifts’ made openly, or declared to the departments by the recipients? The agents explained it was not necessary, and may cause credibility issues. Agents from the academic field perceive such gifts as exploitation and abuse of positions and narrated experiences of being required to part with money before necessary service is provided from the government field:
"...I know even they delayed it for some time for nothing, you know without following it up. But I had to go to NOTAP myself, and I had to, you know, pay them, go and follow up these things to make it come out. So... we are following it up, I was the person that was completely involved so I had to put my own effort to fast forward it, to make sure that the thing comes out. That was what I did, they were delaying because of er, they want..." (interview interrupted)...

In another instance an agent narrated a personal experience:

“Now B (director general (DG) of a government agency) is a person, the agency, and his workers and others are a different story. So the last time I went to them, someone said I should go and meet oga (the DG), that oga should carry my file. You know what the implication is- that I should go and meet B to carry my file? It means that the file should, when you open it you put money, and close it, otherwise... . So it has not been that funny. B can tell them do this and that, but he is not there to do everything... . that I should push it? And you know what it is to go from here to Abuja (Nigeria’s capital) to push my file? Let me tell now tell you, the patent we got it in December (2014) it is a patent we paid NGN120,000 for, instead of NGN50,000; it came out within six months. Are you getting me now?..."

A budding industrialist who commercialized a communications equipment and had to work with three different government ministries recalled:

“The problem with the ministries is the civil servants that work in the ministries. Because these people have been in the system for quite a while, and because that is the only thing they have always known, they tend to exploit whoever comes into that place for whatever reason, contracts, business, so what
you get to end up feeling is the frustration of doing business with the ministries. So the problems are not the ministers, the ministers are usually very, very smart, they know what to do, but what I’ve noticed is you always have to play ball with whoever the permanent secretary is or whoever the minister... whoever the people are around him. One way or the other you got to... no matter how rigid you are... the civil service people always break you down…”.

7.1.2 The Field Habitus of the Industry field

Agents in the government field perceive their positions and duties as positions for advancing their economic capital not only from their salaries, but by exploiting other opportunities presented by the services they render to the public, including through illegitimate means. The habitus of the agents regarding this is that it is part of the privilege of their positions.

The field of industry is the field of enterprise and profit, the biggest component of the entrepreneurial habitus in this field is economic gain. Academic entrepreneurship is perceived as a tool for making profit, thus any academic entrepreneurial venture that is considered unprofitable is not worth pursuing. Major property of this field is the high level of business skills possessed by the agents in the field, which includes business analytical skills and knowledge of the market that puts the agents in the position to determine what research outcome has potential for success in the market.

Academic Entrepreneurship: Opportunity for Profits

The main driver of actions and decisions made by agents in this field is profit. When agents are involved in the commercialization of findings of research, the purpose of their involvement is to make economic gains out of the
commercialization. A participant whose company has been to some shows organised to promote commercialization responded to a question about what they do consider when deciding to go for or not a particular commercialisation being proposed:

“...the thing is, the problem is to be involved, we need, ... they need to check if what they are doing has commercial value, that is primary. The value of..., it's value, the research, the economic value, ... the commercial this thing value. There is no need saying- oh, I found this, I found that... I have finished research, come, commercialize, commercialize, commercialize. You must first ask - how will it make money, or at all if it will make money, then how and how much? Does the market want it? Will the investor make profit? How much profit is it worth? Or will it make us money, set us..., get us better, er..., this thing for us than what we already have. You have to, very important, and if you don't do this, two things: one you will not find anybody to invest, or you will lose money- that is if you manage to see anybody to put their money in...”

The habitus of the agents in this field are pervaded by thoughts of profit. In deciding if their organisations will take up a commercialization project, the decision about whether to go or not to go is guided by any perceived profitability of the venture being proposed. Also, agents in this field possess high business and business analytical skills, and are able to weigh several options, make comparisons and decide if a new product or research finding being marketed is profitable or not.
Agents in this field have appreciation of social responsibility and are aware how commercialization for a mono economy like Nigeria could be an opportunity to demonstrate their socially responsible outlook. But being socially responsible is not, in the apprehension of the agents more important that being profitable.

“Ok sometimes you can say let’s help the university people, lets help them make some money, you know if you look at it from that angle. But that is if you are thinking of being socially responsible or charitable this thing you know. But reality is I want to be profitable, I want to be competitive, I want to make money, otherwise I will be shutting down, and what will I tell the workers? That I helped university of Lagos or Nsukka to make some money from their research but we now don’t make... didn’t make enough to pay them? No you tell me, you have to consider your position first. We are not a charity, we are for profit. So it is a question of what is the outcome of it, your action, your decision, that is what the
directors will ask you about, not how charitable or helpful you are to made in Nigeria things or research in Nigeria.”

**No Sentiments: End Justifies the Means**

Being disposed towards making profit, the agents in this field have a mind disposition that is focused on the end result- profit. If commercializing outcomes of research in Nigeria will yield profit, the agents will buy into it, but if it proves unprofitable, the agents will not be incentivised to get involved. In the academic field, agents are strongly moved by the fact of making an impact on the Nigerian society. Similarly the government field desires to solve Nigeria’s perceived problems, but in the field of industry, agents have no sentiment attached to what is made in Nigeria or what is not, or whether the Nigerian society benefits or not. The agents have no attachment to where the profit has come from, rather on whether profit is likely or not, and how much profit is possible.

“...Business is about achieving and overtaking targets, it is not where... it is not if it... it is not even how, or who, no,... more of, question of... of what it came to in the end. When performance is assessed, my bosses.... the people... directors, will, they will not be concerned if, about, about if I managed to make a product in Lagos or Abuja, Beijing or London, if I used solar energy or turbine energy, what I will be asked is how much did you make, what was the projected revenue and how close did you do in achieving that and so on. So I also... the truth, the truth is I don’t care if I use what was made in Nigeria universities or university of China, what I look at is which one will get me closer to my target... which one will make this get better, make me better profit, which makes better business...”
In the field of industry, assessment of performance is based on the outcome rather than how the outcome was reached. Attempting to sell a commercialization project to the agents in this field, or encouraging them to participate on the grounds that it would help the Nigerian society is unlikely going to have an impact as a result of the habitus of the agents in this field that focuses on profitable outcomes not minding its impact on the Nigerian society. To the agents in this field corporate social responsibility must be separated from profitability.

**Apprehension of work-reward dynamics**

Agents in this field believe they need to work and plan well in order to achieve their purpose of making profit. The better the plan they believe, the more the likelihood of making profit; the field follows the legitimate work-reward causation. As a result agents are more meticulous in decision-making and in deciding where to invest in contrast to the government field where expenditure is made with no consideration of profit or loss. This could be the reason why in this field social outcomes are shunned since it does not directly lead to profitability. Indeed agents perceive social responsibility as anti-profit.

“Ok sometimes you can say let’s help the university people, let’s help them make some money, you know if you look at it from that angle. But that is if you are thinking of being socially responsible or charitable this thing you know. But reality is I want to be profitable, I want to be competitive, I want to make money, otherwise I will be shutting down”

“We are not a charity we are for profit. So it is a question of what is the outcome of it, your action, your decision, that is what the directors will ask you about, not how charitable or helpful you are to made in Nigeria things or research in Nigeria.”
Commercialization: Support Tool for Diversification

There is however apprehension that utilizing outcomes of research is good because it can help the Nigerian economy to diversify. The apprehension of the relationship between oil rents and diversification of the economy however contrasts that of both the government field and the academic field. While the habitus of the government field strongly calls for an oil economy, with a belief that the economy would collapse without oil, the habitus in the field of industry is complacent about the presence and role of oil rents on the Nigerian economy but believes that diversification is essential so as to safeguard the future against possible glut using academic entrepreneurship which is acknowledged as a veritable tool for diversifying the economy:

“...Oil is there, let that continue, it is okay but we cannot fold our hands and say we are relying on oil. What if it finishes? What if nobody wants it? Research, new products can sustain any country if they know what they are doing, but the question is do we know what we are doing? See, some countries like Korea and Japan have no oil but is Nigeria better? Nigeria is not better than them. These countries basically sit on rocks, the whole country is on rock and sand, but they are able to turn things around by being innovative...”

“...So oil is good for our economy, it brings money into the system, but we need to do other things to support it, diversify, be serious about it and make it a business. Apple is a company built completely on innovation, Apple is richer than many African countries. So it is possible, commercialization can certainly help in diversifying our economy, it can create wealth and also help to spread it. I mean anyone can, not anyone, but I mean you don’t need a lot of capital to research,
to innovate. So people can innovate out of nothing and if they are lucky, that is wealth created, but it is not so with oil company. For you to play it in the oil industry you need huge capital.”

Funding Academic Entrepreneurship: Helping the Academics

Although the agents in this field are not very socially disposed in comparison with agents in the academic field, the disposition they have of the relationship between them and those in the academic field is more social than business. Their habitus apprehends they are helping the agents by commercializing their research outcomes:

"...So I also... the truth, the truth is I don’t care if I use what was made in Nigeria universities or university of China, what I look at is which one will get me closer to my target... which one will make this get better, make me better profit, which makes better business. Ok sometimes you can say let’s help the university people, let’s help them make some money, you know if you look at it from that angle. But that is if you are thinking of being socially responsible or charitable this thing you know..."

Agents in the academic field also acknowledge this situation and expresses it with regrets:

...the multi-nationals unfortunately don’t have in-house R&D in Nigeria, all they do, they just depend on the recipe the received from the parent company. And so they are not, even if you convince them to finance your research or buy your technology, they see it as just helping you, as a personal this thing, not that they need the technology. And that is the different thing, you know; the synergy
between the academia and the industry, that is what actually should lead to entrepreneurship.

Industry agents acknowledge seeing high quality research coming out of Nigerian universities, for which they have respect for the academics. However, they have as part of their habitus, an apprehension of the agents as having low business skills, or of not understanding business processes. They believe that commercialization of research in Nigeria may not pick up unless the agents begin to build in, the business case for their research into their research proposals.

“We got interested in it, but when we ask them for the numbers they don’t know. How can you be a lecturer, very educated and you are asking for business, but you don’t know the figures, what will be cost of production? ...So, I think we can make it, but the, they academics need to improve and become business-minded. I know some of those innovators are not in the business fields, but they have business departments in their schools, why don’t they bring them in, bring us in, everybody work things out and see things clearly before they even start.”

Oil Rents: Strengthening the economy

The disposition of the agents in the field of industry towards the presence of oil rent is positive. Aspects of the habitus of the agents apprehend that oil wealth strengthens the economy by making it possible for the population to afford the products their activities push to market.

“...If we have oil, good for us, because we can afford, we will have er,... there will be more money in circulation and people will be willing to spend, we can produce more, shift more stuff into the market and get them sold. So we do not have to stop oil..., I mean, stop oil from flowing. Ok we can maybe..., we need
to guard against the future because oil may finish or as it is now, not being sold. Now that it is not being sold, Nigeria oil is being rejected, are we rejoicing? We are not rejoicing because we need that money to be coming…”

Summary of the field habitus in the industry field
The most prominent feature of the habitus of the agents in the industry field is their strong disposition towards profit. To the agents in the industry field, action is only justified if it leads to profits. Agents will buy into commercialization of research findings only if it would lead to profit. The disposition of the agents in this field towards the academic field and research is that the academic field does not take business considerations into their research to ensure that the findings are profitable; they believe that some of the research being conducted in Nigerian universities are done, only to prove a point, not for the purpose of creating wealth out of them. Agents in this field however are convinced that academic entrepreneurship is a strong tool that could be applied to create wealth and diversify the Nigerian economy.

7.3.3 The Field Habitus in the Academic Field
A field of knowledge
The academic field is the field of knowledge. Agents in this field possess high levels of academic knowledge, and also possess highly analytical abilities; during interviews for instance, agents in this field did not only make statements, but most often followed up statements with explanation of how their conclusions were arrived at and the implication of the statements they made. The agents were conscious of their relative high abundance of knowledge in comparison with the agents in the other fields of academic entrepreneurship. Within the highly
analytical minds of the agents in this field also exists, a strong apprehension that the society is laden with problems; problems that are in desperate need of solutions, and problems they are in a position to solve. This is one of the strongest identifiable component of the habitus of the agents in this field.

Fig. 7.4 The space of dispositions- the academic field

A field of problem-solving disposition

The consciousness the agents, of their possession of, more than everyone else in the social space, the necessary knowledge and skills for the solutions to the society’s problems leads to a problem-solving disposition in this field. For instance, an agent involved in agricultural research and who have three findings being commercialized disclosed while explaining the contribution of commercialization of findings of his research to the society states:

“...Now people are dying in the Mediterranean Sea, people are dying in the desert, trying just to... what are they looking for? How to cross to Europe. Yet, we have so many things that can be done that can employ people and give people
food, and make people relax. It’s a problem; it’s a problem, major, major problem. It’s not an assignment one individual can just... we need to talk about it, we need to collaborate, look, look, look, if I tell you what I have seen...”.

Within this aspect of the agents’ habitus also lies the apprehension that some of the solutions to the society’s problems are achievable through research. While explaining his satisfaction with his contributions to the society, an academic agent explains:

“I look forward to the time when I’ll find myself doing the kind of research I want to do. The kind of research that... (words not clear) my spirit, when I design experiments that answers certain critical questions about our immediate environment. A lot of problems we are having in our environment, we are not going to look at the Western nations to come and solve these problems. Doing that, bringing answers and solutions which are clearly adaptable to our immediate environment, and also bringing up the younger ones that will take after me by the time we get tired, and I will think that (doing that) I’ve done my best...”

Income Disposition: Sustenance Rather than Opulence

Although academics show stronger leaning towards social outcomes than economic outcomes, they do not detest economic reward. They demand some economic gains from their work, at least to a sustenance level, a level where they are able to reinvest the funds so gained into further research rather than pursuit of opulence.

“Well, the only thing is that I am happy to see people, you know... in our church we say “your work is what you will be remembered for”. So when you do that kind of a thing, you find out that actually what I say is that I need a fund to do
more research... that is being... er, sustainability, okay? But the money should not be the major thrust of a particular thing; my thrust is to make sure that people..., that is the end users benefit maximally from these research outputs”.

Academic agents having placed their emphasis on the social outcomes of their work, they also expect the agents in the government field to also be of such disposition. They look up to the government field to fund their research and support the commercialization of the findings of their research on the basis that the government by so doing would be helping the society. The academic field expects that helping the society as a task belongs to all agents occupying privileged positions in the society; academic entrepreneurs in all three fields are in socially privileged positions in the social space. The academic agents expect the government agents to take up the responsibility of taking care of the needs of the society by identifying the problems and allocating fund (to the academic field) to solve them. In response to a question regarding their expectation of the government field, an academic agent responded:

“..Like I said, apart from Tetfund, special tetfund and it’s…, sometimes also maybe the Raw Materials Research and Development Council, these are government agencies, they are supposed to be funding that. Identifying the critical problem areas in our society, and providing requisite funds to their solutions. But the truth of the matter is that the money is not coming, they are not living up to the expectation. But it is their moral obligation; more than moral obligation. We are doing ours, doing research... ready to do research that will solve these problems, but they need to play their part…”

Division of labour between the fields
Aspect of the habitus of the agents in the academic field apprehends what their role is in the society as researching as to to identify problems and their solutions.

The academic agents also have an apprehension of the responsibilities expected of others occupying privileged positions in the society, in particular those whose roles relate to the commercialization of findings of research; a form of division of labour within academic entrepreneurship.

“We advocate, internationally people talk about the triple helix model of innovation, which is a model that involves the academia, the government, and the industry. And the three people, they must work in synergy. There are certain things that the government must have to do, there are certain things that the industries, and there are certain things that the academia must have to do. And once one of them is lacking, innovation is stalled”

The habitus within the academic field apprehends the role of co-ordinating the three members of the triple helix: academic, industry and government to be shouldered by the government, and there is a belief that the government has not done enough in this regard.

“...you see, the collaboration between the academia and the industry is very, very important, and then the government should be able to facilitate such collaboration, encourage that collaboration, but it is not doing so...”

Similarly the role of funding research and its commercialization is appropriated to the government field. The apprehension of the academic field is that agents in the government field are not doing enough:
"...So that is the thing lacking, you know in the country... there is no focus for that or something, so government funding is almost non-existent, you know. In some countries you know, for instance in Japan when I was there, every year every academic staff gets certain amount of money automatically from the government for research; you get it. It’s not much but it is something that you can use to this..., then you can now augment by now going out for research fund, both from private and international bodies... . There are some agencies that are supposed to be funding that, but the truth of the matter is that the money is not coming, they are not living up to the expectation”.

“when you talk of the Nigerian patents, you find out that they are not living up to expectations. Because, as far as I am concerned, what they are supposed to be doing is to go around (…not clear) collecting these patentable, or commercializable research findings from the institutions. And as a government agency, they are also supposed to be involved in match-making, looking for (…not clear) which are interested in some of these. That is what we are talking about when we talk about the triple helix; you know, that’s what the government is supposed to be doing. So they are supposed to be doing that, but I don’t think they are doing that.”

The academic field also has expectations of the Industry field:

"...I know the one that is easiest for me to do is to conceive ideas on how to solve our local problems, and then put it in print or by design. Yours is to use your equipment to give me a prototype of what I am looking for. Another person’s is to put it in the market using their wide network so that it becomes easily
accessible and easily affordable. So these are the hindrances, this is the reason oftentimes people die with their ideas...

An agent also reported:

"...basically you know you are at a point where it should now be like an industry intervention, (coming to say) we are interested, let us go from there, let's use it, then test what you have. (But) you are the one now being the manager, testing, producing. The people expect you to leave your academics to now go into production... . So that synergy does not exist. Even the Raw Materials Research Development Council that partners in this work, the Energy Commission of Nigeria, where are they till today? Are they asking about the work...?

Another agent suggested:

"...researchers who have developed a product must find a willing partner who will put it into market. His job is to design another one, design another one. People have twenty patents. You can't make it to twenty patents if you have just discovered one, you now leave your research lab and pursue it into the market. Just like a musician who have just developed a new music, sang a beautiful song, developed the album, your job is not to sell it. Or a novelist who has just written a very beautiful book, your business is not to sell. Your business is to find a willing partner who will publish it, or who has an already made market network like Amazon... . So there must be somebody willing to partner with me on the other side, so that I concentrate on one, concentrate on the area of my strongest strength, my strongest ability, you do your own bit, I do my own bit".
Agents in the academic have the apprehension in their habitus that for academic entrepreneurship to work, there must be collaborative relationship with the field of government and the Industry field, and that this has not happened and that the major blame for this failure lies with the government field.

The academic field, a social field

The academic field is a socially disposed field. Solving the problems of the society and being acknowledged as having provided the solution interests the agents in this field more than the economic benefits of doing so. Although economic outcomes is not denied by the agents, the agents are more disposed towards social outcomes than economic ones. This is shown in the statement of an academic in interview to this research:

“...What is life all about in the first instance? I think, to the best of my knowledge, getting out of... what am I getting out of anything now? Money? If I get money what do I do with the money? The virtue of things as far as I am concerned is how can you influence your society? How can you influence the people around you? For the rest of your life, how can you influence them positively?...”

The academic agent believe that impacting on people’s lives is more rewarding than economic gains. This comes from a socially disposed habitus prevalent in the academic field. This is further reinforced in the explanation given by another agent about what his dream as an academic entrepreneur was while on interview with this research; the agent stated:

“...But my own interest actually is to reach the grassroots, reach as many as I can, to improve their lives. If Nigeria is not interested, let these people, let their
welfare be improved and I go my way. So look at the refugee problems in Europe, Africans are all migrating, why, why? This is a place where you can build an empire for yourself. Has the government said, look, gentlemen come, what do we do, ...so that these our children will not be lost...?”

Again this statement originates from the socially disposed habitus of the academic agent, a habitus that drives individuals towards seeking solution to the society’s problems. This habitus was further highlighted by another participant in this research from an academic field. In response to the question about what would constitute success as an academic entrepreneur, the agent responded thus:

“I will be truly successful as a person when I meet the needs of those I had in mind when I started the research... . The biggest beneficiary will be the people who need my work, those who need what I do. I don't know why I have my mind on the rural people, the farmers, (...traffic event interrupts discussion) ...that is actually the way I look at it...”.

Socially disposed habitus is a property strongly homologous with the academic field. This is consistent in the interview data across the field, as is further illustrated by the respond of another academic agent to the question of what outcome of the commercialization of the outcomes of his research that would satisfy him most; the agent responded:

“.. it is the impact that this product will have on the society, it is the impact that the product will have on the society, and for this to happen, it means that the ground work must be thorough, and we have to look at, after the product has been tested and found suitable, as you know to go out for commercialization.
Then again you want to know how will it impact the society, will it impact them positively? Will it empower them, will it create job for them, will it better their wellbeing?... that will be my greatest delight, because it will empower the society. It will empower the rural folks, to have a source of livelihood. Take for example the pawpaw farming. We have started outsourcing, we produce seedlings, and we give to them free of charge, we produce the seed and we give to them free of charge...”

Evidence in the data strongly suggests that academic agents are strongly socially disposed, more than they are towards economic outcomes in their apprehension of their roles and position in the society. However the agents are not completely devoid of expectation of economic ‘returns’ on their investments in research. In this regard agents perceive their intellectual property as a bargaining tool, and believe that outcomes of their research although geared towards solving the society’s problems, are their personal property which must be protected. A way to protect, the agents believe, is to get the outcomes patented, or keep as secrets; keeping as secrets involves refusing to publish. This explains why it was difficult initially in this study to identify the academic entrepreneurs via publication. The first agent interviewed suggested that the method adopted for identifying academic entrepreneurs for this research be changed to a snowballing technique because most agents suitable for this research may not have made the outcomes of their findings public. He explained that when they perceive the outcomes of their research to be commercially viable, in view of the weak intellectual property regime in Nigeria, the agents may be reluctant to publicize their work. A snow-ballling technique as suggested was adopted, this boosted the
number of respondents identifiable to this research to seventeen (17). This is
evidence that agents are reluctant to make public the findings of their research.

Academic agents prefer to keep the findings of their research secret rather than
publish them. Whether patented or kept secret, agents work themselves into
positions where access to their findings must be negotiated and terms agreed
when any interest is shown. Explaining feeling towards the report that the Senate
of his University have picked interest in his privately funded research, outcome
of which was beginning to draw international interest, an academic agent
informing this research how he would want to safeguard his intellectual property
stated:

"...I don't know why the research... the university senate committee comes into
this now. So I think number one is... to me what I will do... because I think I
have stumbled on a breakthrough is to find ways of patenting it first. If I patent
it I make sure that now, this discovery is now safely belonging to me, okay? So
that nobody can now take it away from me..."

The agent’s statement suggests a concern that the University Senate may take
away his finding, and believes a way to safeguard it includes getting it patented.
The same disposition was revealed by another academic agents expressed the
danger he feels about losing his ideas if they are not patented. The agent stated:

"...if you don't have a patent right, or if you want to go through... (not clear), if
you don't have a copyright then you know your work... it’s just open, anybody
that have fund can even go to the market with your ideas or your product and
have it, so you keep it secret..."
These revelations by the agents show that although the agents are very strongly
disposed towards social outcomes of their work, they also give considerations to
the economic outcomes, and expect to benefit economically from their research
and from its commercialization.

**Intellectual Property- apprehended as a bargaining tool**

The policy existent in the Nigerian universities is that any intellectual property
resulting from research in the universities belongs to their universities if the
academic researchers are under full time employment of the university. The
Nigerian government have the duty of funding research through the universities.
But in many cases government funding fails to come as expected. Often in such
situations the agents pursue their research interests utilizing their personal
savings. This development may be the origin of the disposition that exist in this
field that contradicts the intellectual property agreements the agents have with
their universities. Agents perceive the findings of their research as their personal
properties even when they are under full time employment at universities. Agents
perceive them as personal properties which they could utilize to directly and
indirectly bargain for their interests. In response to the question of what his
reaction would be if the government decides to utilize outcome of his research to
solve a problem facing Nigerian people without paying for it, another academic
explained:

“...So after suffering and doing all these things using my resources, and
eventually stumbles on a breakthrough, you now want to come and say you want
to take it to benefit... it's not done that way, it's not done that way. The
government must show interest from the beginning, not just when the job is
done, when you have a finished product, you know nobody gives as damn what you passed through to get it done, okay, you now come... if the government is funding my research I now know that the outcome of that research belongs to the government, just like it is done in many societies... . But not when you have used your money to fund research, after several years of hard work, I now stumble on a breakthrough, you read the report on the internet, and now come to take it from me to benefit society; it's like robbing Peter to pay Paul, that won't be fair”

However when the research proposal and supervision are provided by the government the agents see the research as belonging to the government or any organisation that provided them. But even in circumstances when the government provided funding only but not the research proposal and/or supervision, agents yet perceive the outcomes as their properties which they treat as secrets as described earlier. This is interesting because it implicates a disposition of the agents that research funds provided to them by the government are earned and belongs to them.

This is further implicated by the fact that in many cases, the agents expend the research funds at their discretion, often accounting to no one, and in some cases no serious questions are asked. In some situations the agents expend the funds on matters not related to the purpose for which the funds were provided, including acquisition of personal properties. Within the habitus of the academic agents, research funds are incomes they have earned as a result of their hard work and distinguished positions, and therefore they are not accountable to anyone just as agents in the government field are not accountable to anyone on
the expenditure of the funding within their control, although the law stipulates accountability. Few participants in this research suggested a kind of ‘rewards’ to be given to academics whose works are distinguished in the form of research grants.

“In the area of infrastructural development, we are doing well, in the area of research, we have written our proposals, we sent them all out to tetfund (i.e. Tertiary Education Trust Fund), tetfund will now vet it, scrutinise it, and then reward those people they find have done well, and encourage us to write again”

Another participant suggested

“...And one thing is incentives, and the other one is that if you make a research finding and when eventually it’s commercialized, that you get certain things. Money, it may not be necessary to give you the money as an individual, but to give you in terms of research grants, if I’ve done this you say okay yea, because of that this percentage of this, we give it back to you, to either advance the same research or to venture into other researches or something like that...”.

The habitus that perceive research grants as a form of reward for efforts explains situations where agents make use of the research grants they obtained for other uses completely unrelated to research, and only conduct minimal research to justify the use of the grant. Thus applying for a research grant and justifying its use is more of an entrepreneurial behaviour in a rentier state. A participant in this research disclosed that:
“...you find where people get grants, just use it off, build houses and so on, and once they present a small research results they go through and nobody asks about it again...”.

Another participant, an agent within the academic field recalled:

“...I know a professor here that a grant came from Canada, the house he is living in here is one of the best upstairs around; he built it with that grant...”.

Agents apprehend research grants as their entitlement, a reward they have earned, a resource that has been placed within their control earned by the virtue of who they are within their society as proprietors of knowledge, by work they have done or effort they have put into the well-being of their society. This aspect of the agents’ habitus is in correspondence with the practice existent in the field of government where government agents regard their domains as their empires, themselves as emperors and the public funds within their control as their accomplishments. They also perceive their execution of their constitutional duties as free-will works of charity to their society, to which the society owes them gratitude- a common disposition of paternalistic rentier governments (Schlumberger, 2006).

In situations where agents in the academic field are required to, or prevailed upon to provide account of the expenditure of the research funds, organisation of, or attendance of seminars and workshops, conferences and symposia are utilized, or in some instances ‘invented’ for use in justifying or writing off the funds. In some instances senior members employ junior staff as cronies and proxies to do so. A researcher at a Nigerian University, a ‘junior’ academic but
with an acclaimed research outcome that have earned him international recognitions, which he has been pushing for its commercialization recalled:

“...in the last administration we were told every semester end, every session end to give them a list of our publications and conferences, do you know what they do with it? They use it to retire the tetfund; they make claims that you attended, they raise vouchers for you that you attended a conference where you did not, and retire the money that you travelled (for international conference). So it’s a corrupt system...”.

Disposition towards rents from petroleum

Regarding the status of the Nigerian nation as a state rich in petroleum, the common disposition within the academic field regarding oil wealth is that of abhorrence. This is in total contrast with the disposition in the field of government and in the Industry field where positive dispositions towards oil rents manifest. Academics are of the belief that the wealth from oil has strong negative impact on the Nigerian society, that the future of a Nigeria that is dependent on oil is bleak, and that the Nigerian society is better off looking away from oil. This aspect of the agents’ habitus in the academic field gives rise to agents considering finding alternatives to petro-incomes as critical contributions they are making to the solution of Nigeria’s many problems. Agents perceive a strong need to move the Nigerian economy away from oil, an opinion that is gradually being embraced by sections of the Nigerian society. This is shown in an agents’ perception of Nigeria’s situation with and without oil.

“...because of the availability of crude oil, the Nigerian nation do not really think about anything else, it is brain draining. Because once you have it, it’s very hard
to remove your mind from it and go forward. For instance 1975/76 before Nigeria discovered oil, if you talked about oil they would not believe you. They were more interested in the groundnut pyramids in the North, in agriculture, cocoa, palm oil. Until oil was really discovered and they got big money from it, then they said-oh, this is real, and then forgot the agricultural sector. ...what is the highest sought after employer of labour in Nigeria now, is it not the oil sector? Does a graduate graduate and think of going to have a farm... even an agricultural engineer... to work in a farm? He is interested in working in the oil and gas...”

From another agent:

“Dependence on oil is definitely not sustainable development. Then what we are doing is just like an old man in the village who inherited many pieces of land from his father, and he just relaxes and he says when he finishes he sells the other one, and you ask him he says it is his land. Yes, it is his land, but he doesn’t think he has a moral obligation, the father left them for him, that he has a moral obligation to also leave some for his own son. So the government you know we are very myopic, sell, pump, pump, and pump, no ...effort whatsoever to conserve. That is what it is..., and it is not that they are selling it to develop the infrastructure, to make room to diversify the economy, to make room for other companies or other industries, or bio-based industries or something like that, they are not doing that. That is why..., they have no obligation to actually stimulate other sectors of the economy, not just oil. They must have to do that, whether they like it or not. But I don’t see them being even conscious of it... So that is why sometimes I don’t know whether our oil is a curse or some other thing. Because we all make reference to Okpara (a politician and administrator
of the 1960s) days as the good golden days when we had no oil, where you had pyramids in the North... a lot of people, er, groundnut pyramids... (phone call interferes) ...so, and we talk about cocoa in the West, and we talk about palm oil in the East and so on and so forth, and they knew they must have to generate the money, and so the government fights and support industrialization as that was the only way they can make the money. But they disappeared because (oil being discovered) the government don’t have to make money, the oil money is there. All they need to do is only at the federal government level, all they fight for is how to sell more oil...”.

Another agent suggested:

“we must diversity, ...enough of sole dependence on oil revenue, so I am not in the school of thought that think that oil should remain the mainstay. We must begin now to move away from that. Let us use the revenue from oil to fund other sectors. Now is the time to begin to divert that revenue to other sectors of the economy. I think that will help us, I want to state that a stitch in time in this place will save nine”.

As shown by the narratives of the agents in the academic field, the habitus of the agents in the academic field apprehends oil as having negative impact on Nigeria, and as being a recipe for an impending doom on the future generation of Nigerians. This aspect of the agents’ habitus drives their desire to contribute to the diversification that would move the Nigerian economy away from oil through research and the commercialization of its outcomes.
Corruption

Agents in the academic field are aware of the existence of what is defined as corruption within the Nigerian system. A phenomenon sometimes described as a form of rent-seeking behaviour, which is prevalent in rentier states (Fjelde, 2009). Academic agents disapprove completely of corruption almost in all its guises. This contrasts with the position of agents in the field of government who are of the disposition that some forms of corruption are acceptable. Agents in the academic field are of the disposition that corruption, irrespective of how it is defined is intolerable. Despite this disposition however, practices within the field are found where agents produce fictitious claims of expenditure so as to write off their research funds when the funds have not been judiciously spent (See verbatim in section 7.3.3 under “Intellectual Property- apprehended as a bargaining tool”. This raises a question about the definition of corruption in a rentier state. This is discussed further in Chapter 9.
Chapter 8  Homologous Practices in the Fields

The Practice of Academic Entrepreneurship in a Rentier State

8.0  Introduction

This chapter focused on the various actions of agents existent in each of the three fields of academic entrepreneurship; actions that constitute their practice. Bourdieu defined 'practice' as the ongoing mix of human activities that make up the richness of everyday social life of agents, activities that arise out of the operation of the habitus of the agents (Bourdieu, 1990b). In this research, while 'action' refers to various discrete acts of agents, ‘practice’ refers to a logical, sequential, sets of actions that constitute the institutionalized 'way of life' of academic entrepreneurs. The various actions attributable to the agents within the three identified fields of academic entrepreneurship that arise out of the operation of the various habitus identified and discussed in Chapter 7 of this report. Having identified the habitus of the agents in the various fields, this section focused on identifying the actions of the agents in the three fields of academic entrepreneurship. Identification of the discrete actions of agents paves the way for accounting for how they arise, combine and give shape to the practice of academic entrepreneurship.

Evidence of agential action in the three fields of academic entrepreneurship were drawn from the analysis of the narratives given by agents in the interviews conducted in this research, and information available in the public domains as news reports, interviews, speeches, and those given away on social media platforms that give evidence of the actions taken by the agents in the three fields. The actions of the agents were derived by asking from the qualitative data:
i. What courses of actions did agents take in various situations while pursuing the commercialization of research?

ii. What choices or actions did the agents indicate they would have taken in different circumstances in pursuit of commercialization of outcomes of research?

iii. In what ways did agents make use of objects or resources related to the commercialization of research to advance their positions and/or interests?

iv. In what ways did agents make use of any opportunity, position or privilege that the commercialization of outcomes of research conferred on them to advance their interests?

These questions were answered through textual/thematic analysis of the primary and secondary data described above. Different actions were identified; each action identified was mapped onto the field of the agent from whom the action was related, and in this way the ‘space of academic entrepreneurial action’ (fig. 8.1) was developed. The rest of the chapter discusses the findings.

8.1 Academic Entrepreneurial Actions in the Academia

The academic field is the field of knowledge creation. Agents in this field with a habitus highly disposed towards seeking and finding solution to the society’s problems have strong interest in the creation of new knowledge through research; research is the primary acts engaged in by the agents in this field. Conditioned by an aspect of the agents’ habitus that is founded on the consciousness of the relatively high levels of academic knowledge and skill possessed by agents, and the habitus ingrained disposition that the society is
laden with problems, agents in this field are of the apprehension that the responsibility of searching for, and finding the solutions to the society’s problems rests on them. Hence the fundamental purpose or driver of this agential action (knowledge creation) is solution to the various problems plaguing the society.

Sequel to the knowledge creating action is dissemination. Agents disseminate the knowledge created out of research action through classrooms and via academic events especially conferences. Other disseminative outlets include workshops, seminars, symposiums, etc. Dissemination is also accomplished through publications. Agents disseminate findings of their research action via publication in academic journals, books, and other forms of print and electronic media. Dissemination as an academic entrepreneurial action is a source of economic capital for the agents since agents receive royalty due their publications, but the main purpose of disseminative action is to publicise and sometimes to test the findings agents achieve in their research action. Dissemination is also a means of amassing symbolic capital by the agents in this field, in the form of honour and recognition due their research outputs. Various strategies adopted by agents in order to enhance their positions using research and disseminative actions are discussed in the next chapter (Chapter 9) of this report.
Fig. 8.1 The academic entrepreneurship space of action
8.2 Academic Entrepreneurial Actions in the Industry Field

Profit is crucial in this field, agents in this field are focused on making profit, and in the profitability of any venture they are involved in. Agents in the Industry field as a result assesses every commercialization project before them to determine its profitability and feasibility. Any commercialization project not perceived as profitable will be of no interest to these agents, agents will advise against such proposed projects and will themselves withdraw from it. Thus the primary action performed by this field in a commercialization project is assessment, and the agents in this field are equipped with the technical and commercial wherewithal to perform such assessments more efficiently than the agents in the other two fields.

When a commercialisation project is adjudged as profitable, the industry field possesses the skills and network to raise the necessary funds for the commercialization. Often banks, venture capitalists, etc. fund the projects, but the process, including business planning and documentation as well as applications and registrations are roles the industry field performs.

The industry also possesses the technical power (plant and equipment) with which to carry out production in the case of a product outcome or research, as well as to set up a business start-up if this route becomes necessary. Marketing and management are all roles the industry also performs, equipped with their high knowledge of the market and its dynamics. The industry field also assesses the performance of the products and suggests and often implements necessary changes to correspond with the dynamic requirements of the market.
Another action found among agents in this field is goods importation. Being the world of commerce, certain goods that are in demand but not available in the market are identified by this field and provided to the market by importing from other markets. Especially for a rentier state with enormous foreign exchange earnings, importation is a common entrepreneurial action, and is prevalently executed by agents in the industry field. Importation is an important factor in relation to commercialization of research because imported goods act as substitutes in the market for products of commercialized outcomes of research. Agents compare profitability between imported goods and locally developed goods. Decision to either commercialize local outcomes of research, or to import finished product is determined by what agents in the industry field consider as more profitable. Agents in the industry field will back out of commercialization and opt for importation if importation suggest to be for them a more profitable venture.

8.2 Academic Entrepreneurial Actions in the Government Field

Distributive (or control) practice is the agential responsibility (or action) geared towards controlling the resources accruing to a rentier state, and being responsible for allocating the resources to the relevant fields of practice within the rentier space. Distributive actions in this field include decision-making regarding budgeting, funding of programmes, sponsorships, or essentially taking the responsibility of ensuring that all players within the social space are provided with the resources they need to carry out their activities. Distributive agents have the control, or strategize to gain or exercise control over the resources available,
and claim the responsibility of allocating the resources to various fields or agents within the space.

A distributive (government) agent within a government ministry within the Nigerian rentier state charged with the responsibility of research commercialization recalled as follows while giving an account of the part played by the government field within the field of practice of academic entrepreneurship in Nigeria.

“...so they (ie. Academics) have no excuse any longer because we have provided them with the funds. Our job... our duty..., our responsibility if you like... is to ensure that... yes policy, we make policy, we encourage innovation by making policy, and it is there; you can go and read the science and technology policy. It is there, it is not hidden; go to the internet you will find it, we also have duty to... of... em, providing the funds... of including... to er, to include, er, to consider their work in the budget... creating space in the budget for, er... the money they need to conduct their work... to research or to commercialize. They went on strike for this, demanding that we must allocate more fund... allocate more fund, we have done it, we have done our own, that is our job. We have the Raw Materials Council there... always there, and, er, er, NOTAP, they are there, they provide some limited funding... advice, links... linkages... but now they have these new ones created, TETFUND is now...(inaudible)... . They must now do their own... without blaming anybody. The money is there, it is for them... it is our job to make sure they have the money... and it is their job to make sure the money is used...”
Ensuring that fund is made available for the purpose of research and its commercialization is a duty the government of rentier states have accepted. Agents in the field of government assume this role by the virtue of being in control of the country's rentier capital in the form of rents from export of hydrocarbons. The external rents are received and allocated towards various aspects of national life through budgeting. Agents in the other fields of academic entrepreneurship also acknowledge and credit the field of government with this role:

"they are not challenged to make money, okay, so in other countries where for instance a Mayor of a city or something like that goes there to make money, he knows that unless he makes money which is mainly through tax he is not going to get any money to spend, to do anything. And so he must have to fight, that is why most people... most of the countries are talking about how to increase the population of the city. Because the more the number of people living there, the more tax you collect. And people are talking about industrializing the city, create conducive environment for many companies to move so that they pay corporate tax, and the company goes there, they pay corporate tax, they employ a lot of people, and each of the employees also pay tax and all these, and the city becomes rich. And so somebody who is aspiring to become this or that must be somebody who has that idea that you have to make these things happen. But where the case is that you go there to collect the money, all your problems is then how to spend the money, not how to make the money... . At the state (2nd tier of Nigerian federal government system) they don't even care, all they know is that at the end the Federal Government gives certain allocation to them. And we praise them, if they use the money to do certain things we clap for them that at least they are trying, they are trying by spending the money that is given to
them, so achievement (to them) is spending money allocated to them, not making it”.

This agrees with the finding of Moore (2004) who reported rentier states as "states whose domestic fiscal activity primarily comprises distribution" (p.15); He further described to role of the government in such a rentier apparatus to be that of a distributor of capital:

"The state as the locus of economic activity through public employment became the primary distributor of capital in the economy. Rates of direct taxation were negligible. Through a number of transfer schemes, the primary functions of the state ministries become distribution over extraction or regulation" (p.18).

Several rentier state literature identifies ‘allocation’ or ‘distribution’ of resources as a critical role of a rentier government. Writing on the effects of oil wealth and oil dependence on violent conflicts, Basedau and Lay (2009) wrote that governments in rentier states “engage in large-scale distributive or ‘populist’ policies by boosting public sector employment, allocating subsidies, or providing free education and healthcare...” (p.761). Desai et.al., (2005) similarly described the main function of the central government of the rentier state of Russia as that of redistribution of resource rents from oil, gas, and minerals from rich regions in form of budgetary transfers following inter-governmental revenue sharing rules. El-Katiri et.al. (2011) identified that Oil wealth in Kuwait has transformed the country through established extensive systems of distribution galvanised through “policies of rent distribution” that includes “domestic public investment, land purchases, public transfer payments, subsidies, public employment, intervention in the private sector, regulation of the environment and foreign investments”
It also identified how policies in a rentier state reflect the distributive disposition of the policy makers. “It is important to note that some of these channels do not involve direct distribution of resources, but rather involve the creation of regulatory rents which benefit certain sections of the society” (ibid).

The argument is not that 'allocation' or allocative action is limited to the governments of rentier states, but that in rentier states it forms not only the primary role of government but also a defining one. In his classic writing 'The Arab State', Luciani (1990) makes an argument that "Clearly all states aim at performing an allocative function, because in a sense this is what politics is about; and all states perform some allocative function. However for those that depend on income from abroad, allocation is the only relationship that they need to have with their domestic economy; all others ride their domestic economies" (p.72).

Luciani contrasts this state of affairs with that of production states where the major focus of government is rather how “the state can grow and (then) perform an allocative function only to the extent that the domestic economy provides the income which is needed to do so” (ibid.). He also posits that allocation as a major function of government of a rentier state in contrast with production states is the reason we should expect that “the rules of the political game will be different in an allocation state” (p.75).

Control and distribution of the resources available in the social space, particularly economic capital and where possible cultural and social capital forms the main concern of agents within the field of government in a rentier state. This function shapes and is shaped by the habitus of the agents operating in the field of government, and in turn to an extent, determines the disposition and action of
all agents within rentier states. The agents with equivalent volume and configuration of capital therefore strategize to move into and maintain ‘distributive positions’ within the social space. Entrepreneurial decisions are thus evaluated based on their capacity or potential to advance this position. Actions ‘seen’ as jeopardizing chances of maintaining this position is given little or no consideration while actions that show capacity of promoting the agents’ hold to this distributive positions in a rentier state is given approval.

Knowles (2005) writing on the Jordanian rentier state discussed control of resources as an agential strategy, describing its origin as what he termed the ‘rentier mentality’. “Rentier mentality is not only about gaining access to the rent circuit but also it allows those with the available resources to attempt to gain control of the rent. Finally protecting control and access becomes an integral part of economic strategy. ...Government policy takes on a two-dimensional role that involves maintaining control of an access to rent, while pursuing a politically driven expenditure policy” (p10). This tendency is replicated regarding academic entrepreneurship in a rentier state where agents in the government field take academic entrepreneurial decisions and actions based on the double-barrelled purposes of maintaining their ‘control’ positions, and serving as conduit for expenditure or distribution of rents.

There are several other mechanisms through which agential actions are deployed to support the agents’ maintenance or further promotion of their distributive positions, these include patronage, social desirability pursuance, and through rhetoric (Atkins, et.al., 2014). Patronage is when the government makes approval to projects or funds not out of genuine intention to pursue the objectives for
which they were approved, but for the purpose of granting access to the funds to the intended recipients. Patronage is classified within the same category as the various accessive strategies of the agents in a renter state discussed in section 8.2 of this report.

8.2.1 The Rhetoric Strategy

Rhetoric is a tool deployed by politicians and governments “for eluding critical interrogation” (Atkins, et.al., 2014, p. 25). “Rhetoric is the core of political persuasion; language and its descriptions are essential ways in which we are persuaded to make choices among alternatives, and how we choose is influenced by the dexterity of the verbal strategy and its ability to evoke powerful emotions, contrary to rational choice theory” (p. 26-27). The principal interest of a rentier government “is to maintain control over the state, society, and economy” (Heydemann, 2004, p. 106). To do so the government make use of rhetoric as a tool to calm agitation when it is unable to, have no plan to, or fail to perform a role which it knows it ought to. Government is able to identify the pulse of its population and harps on it. In British politics for example, immigration and the EU has become an important public issue (Blinder, 2013), hence immigration and the EU became core elements of British government rhetoric. In Nigeria, ‘Change’ became the core rhetoric of the opposition party in Nigeria’s 2015 general elections following perceived poor performance of the ruling party of 16 years. Unemployment, a characteristic of a rentier state has been a central public issue in the rentier state of Nigeria; job creation through economic diversification is believed to be the solution. As result ‘diversification’ conveniently became rhetoric of the Nigerian government.
The various Nigerian governments and the Nigerian population acknowledge that over-reliance on rents from oil is dangerous, its negative influence on employment is therefore very easily mentioned. Academic entrepreneurship, commonly referred to in the Nigerian rentier state as ‘commercialization’, considered key to the diversification of the Nigerian economy as a result became a priority for successive Nigerian rentier state governments. The Nigerian population acknowledges the diversification of Nigerian economy as a crucial move any responsible and committed government in Nigeria must pursue. Diversification of the economy therefore conveniently became rhetoric of the Nigerian government, and became a recurring quote during electioneering campaigns.

Presenting the newly launched 'Nigeria Industrial Revolution Plan (NIRP)', the Nigerian erstwhile president stated “This administration is launching the NIRP to fundamentally transform Nigeria’s industrial sector by boldly addressing the structural issues hindering manufacturing in Nigeria, and focusing on achieving tangible results to grow industry and diversify Nigeria’s economy and revenue' (NIPR, 2014, p. 13). Similarly the new Nigerian president shortly after being inaugurated declared that:

“The plummeted price of crude oil means that there are limited resources available to governments at all levels. Therefore the diversification of the economy is no longer an option for us as a nation. It is the only way to reclaim economic momentum and drive to prosperity” (Channels, 2015).

Rhetoric of the government corresponds to the other practices of agents in the field of government discussed in section 8.2.4 where the interests of government
agents show inconsistency with the actions they take, or are interested in taking. In line with this, an academic agent during interview for this study recalled:

“...you see, the policies are there, the structure is there; look at the agencies, they are there. And if you go out and look at their mandates, it’s beautiful. Look at the objectives underlining their set up, you can’t fault it, everything will be looking so perfect. But the issue is- how is it implemented? That is where the problem is. I may not know the details, but if there is no result, positive result, no matter how well a paper is crafted, no matter how well a document is written, if we don’t see good results coming out that is transforming lives, then it means that they have not achieved its purpose. So the structures are there, the policies, they look fine, you know, but how is it implemented, who are the drivers, what are their interior motives, you know, that is where the problems is. If you have the privilege to look at these documents yourself, so beautiful, so well written. You know, and when you go to conferences or talk where Nigerians... (not clear) with so much passion, so much vigour, and data to support, you will wonder why we are not just the first in the world. But something has continued to be fundamentally wrong. Where, what is that thing that is fundamentally wrong remains to be identified”

What is fundamentally wrong is that it is never the intention of the agents in the government field to implement the policies. The policies, form part of the government rhetoric and social desirability pursuits that are intended to make the rentier government appear committed to worthy causes, and in this way maintain the trust of the population.
8.2.1 Social Desirability Pursuance

Part of the social desirability strategy of the government field is to identify what is required of the field in terms of appropriate actions. The agents identify the necessary actions and create a scenario or present the case that the actions have been taken or that stringent effort has been put into it. Following the pressure from the academic field for increased funding for research, the Nigerian Minister of Education in 2014 came forward to decry what the government field termed “the refusal of the nation’s universities, polytechnics and colleges of education to access the N10 billion fund specially allocated to conducting research” (Omokhunu, 2014). The minister stated:

“N7.8 billion was yet to be accessed from the N10.052 billion allocated to universities, polytechnics and colleges of education for institution-based research. The fund, he explained, was provided by the Federal Government and domiciled with the Tertiary Education Trust Fund (TETFund) to revitalise research activities in Nigerian public higher institutions. The minister spoke in Abuja while inaugurating 20 TETFund-sponsored specialised higher education textbooks, guidelines on national research fund as well as guidelines on institution-based research. ...According to him, “the bad news is that over 70 per cent of these allocated funds are still un-accessed”’’

The minister then continued with part of the government’s rhetoric about research and its funding, absolving the government of any lag, passing the buck of developing Nigerian universities on academics:

“The trend is not acceptable and does not show seriousness on the part of stakeholders responsible to change the fortune of our tertiary institutions. He
stressed that research work remains the cardinal objective of any tertiary institution globally. “Lack of funding, rather than dearth of researchable work, generally used to be the complaint”.

Lamenting that the reverse has now became the case, he continued.

“I want to urge the academics to seize the opportunity presented by the launching of the TETFund guidelines on institution-based research to expedite efforts at accessing these funds and move our tertiary institutions and the country forward”. (Omokhunu, 2014).

During the interview conducted as part of this research, this statement of the minister was thrown to an academic thus:

Q: It is in the news sometime in the past that TETFund is there, but the academics were adamant about accessing it; why are you not accessing the fund?

A: (cuts in) That is more political, I am sorry; there are many people who are..., for instance right now, I have more than four applications, I have three university institutional TETFund application, and I have one national, this thing... application, many people apply, but they don’t get it; they don’t get it. They will come, I am sorry, that’s why... this is sensitive so you know, you are a Nigerian so you know how to... you don’t; I wouldn’t like to appear to just, say, want to criticise the government, but the truth of the matter is that the money is not available.

In reality the TETFund is in existence, but the actual amount made available for research shows the claim of the minister as bogus. Information on the Ministry’s/Organization’s website contradicts the claims of the minister.
Fig. 8.2 Tetfund allocation schedule.

Source: http://www.tetfund.gov.ng/

Total of N57m was made available for research between 2009 and 2013, N115m for conference attendance while N95 was spent on academic entrepreneurship in 2011 and 2013, a far cry from the claims of the minister.

The field of government emphasises diversification because of three main reasons:

- Diversification has the power to lead attention of the population away from oil income thus watering down the occasional calls for accountability from the population.

- It satisfies the yearning of the population, especially the call for employment creation. A government that pursues, or emphasises economic diversification of a rentier state will be more popular than a government that doesn’t. Diversification is emphasised by the government through policy initiatives, funding, and rhetoric.
Finally economic diversification creates legitimate conduits through which the distribution of the nation’s economic wealth is achieved, an avenue for other agential groups, or fields in the social space gain access to the rents from oil.

All the three points above form part of the strategic actions in the field of government aimed at holding on to the distributive positions by the agents, which is the major contribution of the government field to academic entrepreneurship. And to the wider rentier society. The dominant position occupied by the agents within the field of government is homologous with the dominant position occupied by economic rents from oil within a rentier social space. Similarly distributive dispositions and practices are homologous with agents with volumes and configurations of capital as those in within the government field within a rentier state. The homology identified the rentier social spaces is implicated in the shaping of the field of academic entrepreneurship within a rentier state. The configurations of capital held by agents in a production state is expected to be different from that in a production state, and as such the structural homology and strategies deployed by the agents in these two contexts are also expected to be different. For example in contrast to a rentier state, distribution though a function of government in a production state, does not constitute a core function of the government of a production state (Luciani, 1990). The distributive dispositions of the government of a rentier state is thus a major distinguishing feature of rentier states that influences the shape of academic entrepreneurship within rentier states. These dispositions, distribution formulae, access and utilization all contribute to determining the outcome and shape of academic
entrepreneurship within a rentier state. The access to, strategies for gaining access to, and the utilization of economic capital allocated to the field of academic entrepreneurship is a subject for further analysis in Chapter 9 of this report.

8.3 Summary

In this chapter, the various actions that agents take in the three fields of academic entrepreneurship were discussed. The relation between the actions of the various agents in the various fields constitute the practice of academic entrepreneurship. Bourdieu defined 'practice' as the ongoing mix of human activities that make up the richness of everyday social life of agents. These have their origins in the habitus of the agents (Bourdieu, 1990b). Because it is the 'collection' of actions that constitute practice, the identification of the various actions of the agents was crucial in understanding their practice.

This Chapter, together with Chapter 6 (Social Space), and Chapter 7 (Homology and Opposition) constitute the building blocks for developing the dynamic relationships between the context (fields), its internalization within the agents (habitus) and their practice. Evidence of agential action in the three fields of academic entrepreneurship were drawn from the analysis of the narratives given by agents in the interviews, and information publicly available as news reports, general interviews, speeches press releases, social media posts, etc. Having laid the foundation in this and preceding two chapters (Chapters 6 and 7), this research proceeds to the analysis of the mechanism of relations between the units of analysis of this study, which is the key thrust of this research. This is presented in the next chapter (Chapter 9).
Chapter 9  Academic Entrepreneurship in a Rentier State

Power Struggles of the Field

9.0  Introduction

This chapter discusses the relations between the properties of the three fields of academic entrepreneurship, the habitus of the agents in the three fields, and their various actions within their respective fields of academic entrepreneurship. It focuses on how these various aspects of the social reality of academic entrepreneurship relate to determine the existent shape of academic entrepreneurship in a rentier state. It is the various actions in the various fields of academic entrepreneurship that shape the practice of academic entrepreneurship in the rentier space.

This chapter focuses on the philosophy of action, what Bourdieu described as relational philosophy (Bourdieu, 1998a) which identifies the potentialities existent in the being of agents and within the structures inherent within their situations of action and the relations between the two. The cornerstone of this chapter is the dialectic relation between the objective structures of the various fields of academic entrepreneurship and the internalized structures (those of the habitus) of the academic entrepreneurial agents, with the Bourdieusean concepts of capital, habitus and field as the medium for transcending the respective levels of analysis.

‘Field action’ is the various strategic actions of the agents’ specific to the field within which it is found. To understand how the various actions from the various fields work together to give rise to, enable, or constrain academic entrepreneurship, this chapter deploys the concept of ‘practice’, defined as
series of inter-related actions (Giddens, 2013) that together give rise to an observed condition of a phenomena. Since practice consist of series of inter-related actions, and academic entrepreneurship consist of three fields (academic, industry, and government), this thesis logically argues that academic entrepreneurship practice consists of series of inter-related actions in its three fields of practice; relationally stated:

\[
\text{Academic Ent. Practice} = \text{Field Actions}_a + \text{Field Actions}_i + \text{Field Actions}_g
\]

Where \(a = \text{academic field, i = industry field, while g = government field.}\)

But Practice is given as:

\[
\text{Practice} = [(\text{capital} ) (\text{habitus })] + \text{field} \quad \ldots (\text{Bourdieu, 1984, p. 101})
\]

hence:

\[
\text{Academic Entrepreneurial Practice} =
\]

\[
|[(\text{capital) (habitus})]_a + \text{field properties}_a|
\]

\[
+ |[(\text{capital) (habitus})]_i + \text{field properties}_i|
\]

\[
+ |[(\text{capital) (habitus})]_g + \text{field properties}_g|
\]

Again \(a = \text{academic field, i = industry field, while g = government field.}\)

(Note: equation is author’s own derivation.)

This relational equation derived from Giddens’ (2013) definition of practice, and Bourdieu’s relational equation of practice forms the basis of the discussion presented in the rest of this chapter.
The discussion will focus on the relation between capital, habitus and field properties of the three identified fields of academic entrepreneurship. It analyses how the action produced by the interation of the agents’ capital, habitus, and the properties of each field relate. How these interact those of the other fields, and how the actions in these various fields give rise to, and condition academic entrepreneurship in the Nigerian rentier state. This chapter therefore provides an explanation of the underlying mechanisms of the relations that govern academic entrepreneurship in a rentier state.

9.1 Agential Actions, Field Struggles and Game Strategies

Agents and agential groups in a rentier social space strategize and compete with each other at various fronts, the ultimate being “to maintain or enhance their positions in the social order” (Swartz, 2012, p. 210). Agents in the three fields of academic entrepreneurship are consciously or unconsciously ‘aware’ of their positions in the social order, aware of the availability of various resources within the social space and aware of the barricading and enabling properties of their particular fields and strive to maintain and/or advance their positions in the rentier social structure by safeguarding or increasing the various forms of capital they hold. The agents strive for this by deploying the resources at their disposal in their various fields to gain more, and to efficiently convert their available capitals to preferred new forms; they strive to enhance or maintain their positions by "preserving, reinforcing, or transforming their stock of capital" (Swartz, 2012, p. 210).

The most sought after capital is economic capital whose significance in the social space is enhanced by the prevalent rentier apparatus that accords a primus status
to holders of this form of capital (Piketty, Postel-Vinay, & Rosenthal, 2014). The primacy of economic capital in the social space polarises the field struggles between the holders of prevalently cultural capital and holders of economic capital (Swartz, 2013).

All actions homologous to the three various fields of academic entrepreneurship can be classified under five typologies, the five typologies of entrepreneurial action define the practice of academic entrepreneurship in a rentier state, and include:

- Accessive Actions,
- Assessive Actions,
- Mediative Actions,
- Creative Actions And
- Allocative Actions.

Accessive action pervade the entire social space of a rentier state irrespective of field, and include all actions of the agents geared towards gaining access to the rentier capital. All agents in all fields within a rentier social space deploy accessive strategies, their social positions, or the volume and configuration of the forms of capital they hold determining the shape of their accessive actions, and the extent of access they can gain of the rentier circuits. The fundamental accessive strategy is access to the rentier capital through salaried employment. More detailed discussion of the accessive actions of the agents, as well as assessive, mediative, creative and allocative actions, field struggles and game strategies are presented in the remaining sections of this chapter.
9.2 Accessive Actions and Strategies

Accessive strategies are the various actions of agents in a rentier space that are aimed at gaining access to the rentier capital. Accessive strategies could be legitimate or illegitimate. Legitimate strategies include salaried employment, execution of contracts at a profit, supply of goods at a profit, etc. Illegitimate means of access to the rentier capital include kickbacks, bribery, corruption, and similar shadow activities. Economic gains accruing from employment and business activities such as supply of goods or services are normal economic actions in both rentier and production states, they are however of interest to this research and to rentier states because they go beyond the work-reward mechanism, it breaches the work-reward causation (Beblawi & Luciani, 1987).

"Economic behaviour in a rentier state distinguishes itself from conventional economic behaviour as it embodies a break in the work-reward causation" (p.52). "Rewards of income and wealth for the rentier do not come as a result of work, but rather are the result of chance or situation" (Yates, 1996, p. 21).

Salary awards and payments for supply of goods and services in government and academic sub-fields of academic entrepreneurship do not follow the work-reward causation, they are determined by situation. State employment in rentier states serves as means of granting a section of the population access to the rentier capital, in other words, agents utilize state employment as means of accessing the rentier capital. This explains why the State is the major employer of labour in rentier states (Gause, 1994; Shaffer, 2011). Strategies deployed by agents for accessing the rentier capital through employment are different in the three fields of academic entrepreneurship.
9.2.1 Employment as Access Strategy

Employment in Bourdieusean terms is a channel for converting cultural capital into economic capital and profits (Weis, 2009). Cultural capital in this regard relate primarily to education, experience and skills acquired over time and embodied in the agents. In any given society there are different categories of employment and different salary levels available, salary from employment being the primary legitimate means of capital conversion. The category of employment and salary sought by, or offered an agent relates to the agent’s social spatial positioning. Agents are aware consciously or unconsciously of their social positions and will seek employment and negotiate reward that corresponds with their positions. Agents negotiate their rewards not as a reflection of work, but as a reflection of their social positions and volumes of economic capital accruing to the state. Upward adjustment of salaries are negotiated during periods of increased rents from oil, and downwardly reviewed during dwindling oil revenues.

In Nigeria, the ‘Revenue Mobilisation Allocation and Fiscal Commission’ is responsible for regulating salaries, and occasionally reviews public sector salaries to reflect the level of rents accruing the Nigerian state from export of petroleum. A Nigerian newspaper reports:

"...chairman of Revenue Mobilisation Allocation and Fiscal Commission speaking to Daily Sun said the Commission is undergoing a procedure to regulate whether it (salaries) will be reviewed upward or downward. He stated that given the rough realities on ground, the 2008 Remuneration Act must be reviewed. His words: “The commission is not insensitive to the
realities on ground. **There is a drop in the oil price, there is a general economic downward trend.** Many states are even finding it difficult to pay salaries. In view of this situation, the commission has commenced the review of the present remuneration of Act of 2008 and by the time we conclude, we will make public our position with regard to the new Remuneration Act” (Ejiofor, 2015).

Public sector salaries in the Nigerian rentier state follow the tides of the external rents accruable to the state from petroleum. Although salary structure adjustments originate in the public sector, the private sector typically reacts to mirror adjustment to the earnings of public sector employees. Hence indirectly petroleum rents shape the salary levels in a rentier state.

### 9.2.2 Symbolic Violence in the Government Field

Agents in the three fields of academic entrepreneurship earn salaries. This serves as the primary apparatus for enhancing the economic capital held by agents in a rentier state. In each of the three fields, agents deploy resources available and opportunities presented by their fields to enhance the level of incomes accessible to them. They also exploit other opportunities presented by the properties of their fields to develop accessible strategies to legitimately or illegitimately gain further access to the rentier capital. In the government field, agents deploy the power and control they have over the rents from petroleum to enhance and maintain their dominant position over the other two fields of academic entrepreneurship by increasing the salary level of their field while ignoring the others. Even in the face of immorality, and possible illegality of such actions, the government field is able to justify and legitimize these actions.
Bourdieu (1990) describes as symbolic violence, the utilization of resources available to the agents to successfully legitimize unequal and oppressive social arrangements. According to Prasad (2005)

“Symbolic violence is most potent in those societies that (according to Bourdieu) are “doxic” in nature- that is, societies that are distinguished by an absence of questions (in the public and private spheres) about the socioeconomic structure and an overpowering silence about social injustices” (p.202).

Such is the case in rentier states where due to the vast amounts of external rents accruing to the state, it does not need to extract significant revenues from its population (Glasser, 2001, p. 7). Hence “the paradigm of "no taxation without representation" has been transformed into "no representation without taxation."” (Malick, 2005, p. 148). Omeje (2008) explains that “Tax-paying citizens invariably seek to hold the state to a high level of accountability, and in additions make demands of greater political rights and civil liberties. The non-tax revenue base of rentier states tends to hinder an active engagement with the citizens and society which is based on the principle that revenue extraction invariable provokes demands for political rights and representation” (p.224).

The explanation of Prasad (2005) is that liberal societies such as the rentier states characterised by an absence of questions about the socioeconomic structure and that are silent about social injustices are more open to the strategy of symbolic violence.

Being in control of the rentier capital available in the social space, the government field makes approvals for enormously high levels of salary incomes
for the agents in their field thereby widening the inequality gap between the field and the other two fields. Although perceived as ‘immoral’ and abuse of office by the other fields and members of the wider Nigerian rentier society, the government field utilizes the political advantage and power it wields to grant approval and legitimacy to their self-serving unequal and oppressive social arrangement.

Transparency International defines corruption as “the misuse of public power for private benefit” (Husted & Estudios, 1999). There is penalty for corruption in every society; in Nigeria, corruption is a common occurrence, but cases of corruption rarely get to the courts, and when they do, often get quashed (Odusote, 2013). On leaving office government officials obtain from courts, “perpetual injunctions” that protect their activities in office from being investigated (Duru, 2015; Kana, 2014). As a result the government field is characterised by possession of the highest level of economic capital by the agents, accruing from salaried incomes that are significantly higher than those of the other two fields of academic entrepreneurship, and from illegitimate access and personalization of the rentier capital belonging to the state.

The International Business Times reports regarding Nigerian government officials:

“More than 70 percent of the federal budget is spent on the salaries and benefits of one million government officials, leaving very little revenue to help impoverished Nigerians. Nigeria’s presidency plays a decisive role in dispensing state revenue... Nigerian lawmakers are some of the highest paid in the world,
earning up to $2 million a year, or 397.9 million naira. Politicians are said to take home more than the amount officially approved for them” (Morgan, 2015).

Especially in the government field, employment is the major purpose for engaging the agents who are charged with the role of facilitating academic entrepreneurship. The various activities they engage in within the responsible ministry including trainings, workshops, seminars, fairs and shows, conferences and other activities designed to promote the commercialization of research findings take secondary place. A Head of a Department charged with duty of commercialization explained:

"...So you can imagine Nigeria without oil. Without oil this ministry may only exist on paper. I mean we'll just pay salaries and that will be it... Once they are paid, you won't be talking of all these other things, trainings and conferences and shows because they cost money."

This statement indicates that the primary function of the department is paying salaries to the engaged agents. When departments charged with such enormous responsibility are not focused on the onerous responsibility they are charged with, the result will likely be poor attitude by the agents within this field, and limited understanding of the processes and their roles in commercialization. Persons poorly suited for commercialization roles are appointed into critical positions, and they struggle to fulfil these roles. In the discharge of their duties they pursue other objectives that may not support commercialization of research findings, whose aims rather focused on facilitating their access to the rentier circuits.
9.2.3 Rentrepreneurship- Government Field’s Accessive Strategy

Besides a skewed salary determination formula used by the government field to enhance the economic capital of the agents in the field over agents in the other two fields, the government agents also make use of opportunities presented by research and commercialization of research findings to illegitimately gain further economic capital. This strategy is termed in this research as ‘Rentrepreneurship’.

Rentrepreneurship is the entrepreneurial action where agents take advantage of their positions, and opportunities presented by their social positions to further advance their economic standing albeit illegitimately. This includes situations where agents seek further compensation from beneficiaries of services and programs for which they have already earned a salary. Even when they may not have provided any service themselves, by a display of their capacity by the virtue of their positions to influence outcomes of the services being delivered they make the beneficiaries of the services to comply with their illegitimate demands.

Funding of research and commercialization projects are avenues agents in the government field take advantage of to access further economic capital often illegitimately. As a result, contracts for supply of goods and services are conceived and awarded, not in line with needs or demands arising as necessity for research and its commercialization, rather for the purpose of creating the opportunities, and as conduits for accessing the rentier capital. An account given by an academic, regarding purchase of supply of goods and services for
research and commercialization indicates ulterior motives in the award of the contracts:

"...what they do is to give the contracts to somebody, businessmen or their cronies who will supply it. There is one instance here, where they supplied us from nowhere, without any request, hundreds; hundreds of bottles of sulphuric acid and kept it there for some time. And in the course of the developments, there came a time when it needed to be evacuated you know. They called those in chemistry department to come and take them, they probably thought: "This is acid, this is sulphuric acid, it has to be (needed by) people in chemistry (department), so people in chemistry come and evacuate all these". But people in chemistry said "we were not consulted before these things were purchased; besides we need only one bottle of sulphuric acid in two years to run our practicals, if you give us one hundred bottles of sulphuric acid, where are we going to safely store it? ...you see oil wealth is there but you know, our problem is corruption. This money doesn’t go down well to the things it should help in doing... ."

The supplied sulphuric acid was not intended for the purpose of experiments or research. Such contracts for goods and services required for research and commercialization serve as avenues for accessing the rentier capital by the agents and their cronies. The rentrepreneurs either award the contracts to themselves and their cronies, or they act as ‘ten percenters’ (Akinola, 2013, p. 130), receiving ten percent kickbacks privately from whomever they awarded the contracts to. This expectation of return of a percentage is in some circumstances extended to agents in the academic field whose research
outcomes are being commercialized who are expected to ‘do business’ with the government agents. An agent recalled of a commercialization experience with the government field:

“You face that big wall of mentality- he is young, so, in order to play it at that kind of level that means he is making a killing (ie. making enormous profits), ...because you are one of us, so you know, you must be overcharging something somewhere... oh he is doing it, and so they want a cut from it too…”

The government agents therefore see in commercialization projects opportunities to extract further capital from the agents whose work are being commercialized. The agent continued:

“The problem with the ministries is the civil servants that work in the ministries. Because these people have been in the system for quite a while, and because that is the only thing they had always known, they tend to exploit whoever comes into that place for whatever reason, contracts, business, so what you get to end up feeling is the frustration of doing business with the ministries. So the problems are not the ministers, the ministers are usually very, very smart. They know what to do, but what I’ve noticed is you always have to play ball with whoever the permanent secretary is or whoever the minister is, whoever the people are around him are. One way or the other you got to... no matter how rigid you are... the civil service people always break you down”

Agents in the government field strategize to extract from research and from commercialization projects as much economic capital as is possible using rentrepreneurial strategies beside their legitimate salaried incomes. To the government agents, extraction of economic capital if not the reason for,
constitutes for them the most important aspect of commercialization. There is little or no passion for seeing to a successful outcome, the commercialization of research findings; this is among the reasons that despite the enormous expenditure on academic entrepreneurship in Nigeria very little is achieved in terms of results. Rentrepreneurship can be categorized as an destructive form of entrepreneurship, in line with Baumol (1993). Rentrepreneurship possesses characteristics similar to prebendelism thesis of Joseph (1983, 2013) (discussed under section 1.2.6).

### 9.2.4 Academic Entrepreneurship for Justifying Budgetary Expenditure

The various government ministries and their departments including the departments responsible for the commercialization of research outcomes are required to justify their budget allocations by showing evidence that previous allocations have been judiciously spent. An agent during the interview reported:

“And also you need to understand how it works in the ministries, and sometimes this encourages corruption if you know what I mean. See, in the ministry... in, er, if you come... we have... every ministry have a budget, and you have to spend your budget within the year. So you have N100m as your budget, and you happen to spend only N20m which is actually what you need as a result of the actual activities in the ministry. Now the remaining N80m you have to return because you have excess. Good. That you will return it is not..., not only that you have to return it, next year you will see that your budget has been reduced to reflect the previous year to stop you from having excess if you know what I mean. So what does this bring? Reckless spending; you hear things like “we have to exhaust our budget, we have to exhaust our budget”, so
they are looking for where to spend it. Organise shows, conferences, unnecessary trainings, trips, purchases, change furniture and what have you just to exhaust the budget. And already even at the start of the year this mindset is there, so instead of saying “what is important for us to do this year to better our work, better the country, move forward”, we are saying “what do we need to do to exhaust our budget this year”; is it not madness?”

Expenditure items are created under the heading of research and its commercialization, and these form genuine and reasonable items for justifying expenditure of the various departments especially in the FMS&T. The actions taken including organisation of events are made rather to produce evidence that would be used to write-off funds or to justify budgetary allocations. Expenditure made towards research, and towards the commercialization of research findings will always be easy to justify because the Nigerian rentier society apprehends commercialization as a good cause for solving a rentier society’s major problem of unemployment as it potentially results in the diversification of economic activities. Expenditure on research and its commercialization to the citizens of a rentier state is expenditure well made for a right course. This makes commercialization expenditure a pseudo tool for justifying the budget. Actions are taken and activities to support commercialization such as seminars, symposia, shows, fairs, etc. are organized mainly to produced reasons and evidence to be included in the accounting for the budget allocation. This explains impressive volume of commercialization activities originating from the government field but outcomes of which are not at par with the effort put into them.
Commercialization activities motivated by the need to justify budgetary allocation are unlikely to produce positive outcomes especially considering that those who originated them will likely lack the corresponding passion and commitment towards seeing them to full results. Thus the reports of actions taken by the government field related to commercialization of research findings are as a result very impressive only on paper. An agent expressed surprise at the mismatched attitude of the government agents towards his commercialization project:

“I think February or January of 2014 I believe it was, there was an open data conference in Abuja (Nigerian Capital) and I was attending the conference, and one of the major topics they were discussing were how do we get data for different agencies so that they can use? It was organised by the World Bank. I spoke to one of the World Bank personnel, who coincidentally have spoken to the ministry of transport. I told them about the device (i.e. the agent’s invention), got into discussion with them, sent emails, I never got any response from the ministry of transport! ...the ministry of transport really just wasn’t interested; as to why that may be, I can’t tell. I don’t get it, and I can’t tell because this, this was an opportunity to get the data they wanted, but the reason why they did not show seriousness... . You know I think it all goes back to, em, just embracing the status quo. We are happy where we are, yes we have problems, but we are happy where we are, you know, and another thing I have noticed is, most of, not all, but most of the (not clear) is that there is a lot of hype over events, so they are very, it is always very interesting to talk about these things at events, and have lunch, and you know gloom over the possible solutions, and then bring out flyers, take pictures, videos, and talk about it, but
when it comes to implementation- oh no don’t bother, yes this is what we think it should be but we won’t bother doing it... It is just bureaucracy”.

The interests of the government agents are not always consistent with solution to the problems or carrying the commercialization projects to the end. The focus is rather on gaining access to economic capital that the projects opportune. Agents create academic entrepreneurial events and activities that would generate the receipts that could be used to justify the budgetary allocations and write off the expenditure of the departments. This is the reason the efforts, actions geared towards commercialization of research findings rentier states do not match their outcomes.

Part of the activities carried out by the FMS&T in support of commercialization was the establishment of intellectual property offices across 33 Nigerian universities and research institutes between 2006 and 2011. Establishment of intellectual property offices was highlighted by the ministry as among its top achievements regarding commercialization of research findings, and the existence of the offices were reflected in the annual budget of the ministry across 2006 - 2011. This continued to be the case despite most of the office being dysfunctional. Establishment and maintenance of the intellectual property offices served as an avenue for expending, writing off, and justifying the budgetary allocation to the ministry, and as a conduit for access of the rentier circuit for agents especially in the government field, and to an extent the academic field at the universities the offices were located.
9.2.5 Accessive Actions in the Academic Field

The academic field is the dominated field within the academic entrepreneurship social space. Agents in this field access the rentier capital primarily through salaried employment. The field is devoid of direct control over, or access to the rentier circuit, neither is the field possessive of the political power and structure required to set the dynamism of the social space in its favour, in contrast with the government field. Levels of income from salary available to the agents in the academic field are determined by the agents in the government field, utilizing a structure the government field termed the *Consolidated University Academic Salary Structure (CONUASS)*. The level of income set for the academic field by the government field are not comparable with the level the field of government sets for itself. The salary set for the academic more that of the government field acknowledges the work-reward causation, while those of the government field follow the tides of the state’s income from petroleum, rising when petro-income rises and reluctantly downwardly adjusted when income dwindles. To enhance the income levels available to the field, the academic field resorts to a strategy of undermining the state structure that threatens the stability of the government field. This is often in form of strikes and industrial action.

The academic field in Nigeria has over last few decades of oil boom been characterised by frequent strikes by the academic staff of the Nigerian universities. Their commonest demands include increase in budgetary allocation to the education sector vis-a-vis the universities, provision of educational infrastructure, and increases in their salaries.
9.3 Entrepreneurial Assessive Actions

Assessive actions are the assessment of proposals recommended for commercialization to determine their commercial values and determine their market potentials and suitability. In relation to commercialization projects, assessive actions make use of the relevant skills and knowledge available to the agents to determine if a proposed commercialization project has enough commercial potential to be pushed forward, and if continuing with the commercialization project makes good business sense.

Creative actions of agents in the academic field result in new products and processes which may possess different commercial values. Because commercialization is an expensive process, several economic and commercial considerations are essential in order to determine if proposed commercialization project is worth pushing forward. Often to the academics whose commercial skills range from weak to intermediate, most findings of their research are perceived by them as valuable and viable for commercialization. The findings are therefore pushed forward and commercial or industrial partners are invited.

However, for the industrial partners commercialization represents risks. The commercial value of the new proposed products are assessed and compared with the commercial value of existing alternatives. Sometimes the processes to market and the overall commercial potentials of the products are ranked and decisions made often based on technical, marketing, financial and commercial viability and feasibility of the research outcome proposed for commercialization. This entrepreneurial role of assessment is undertaken in the industry field whose
major consideration is profitability or economic rationality of the commercialization project.

9.3.1 Assessive Actions by the Industrial Field

The industry field being the field of high business knowledge and skill, and the habitus of the field being strongly disposed towards profit, agents in the industry field deploys the high commercial and business skill available in the field to determine the commercial potential of any outcome of research being proposed for commercialization, and whether or not the commercialization being proposed has potentials to go forward or not. Especially when the industry field was not involved in its conception, the industry agents will very often be cautious and often sceptical about the commercial value of the research outcome, remain adamant to taking the research outcome forward to commercialization; very often to the frustration of the academic agents.

An industry agent explained during the interview how unattractive a commercialization proposal could be to the industry field if the business side of the research were not given consideration at the conceptual stage of the research:

“But the thing is, the problem is- to be involved we need, ... they need to check if what they are doing has commercial value, that is primary. The value of..., its value, the research, the economic value, ... the commercial this thing..., value. There is no need saying oh, I found this, I found that... I have finished research, come, commercialize, commercialize, commercialize. You must first ask- how will it make money, or at all if it will make money, then how will it do so and how much? Does the market want it; is it what the market wants? Will the investor
make profit? How much profit is it worth? Or will it make us money, set us..., get us more, er..., better this thing, margins, profit margins than what we already have. You have to ask that question, very important, and if you don’t do so, two things I bet you: one you will hardly find anybody to invest, or you as investor will likely, very likely lose your money— that is if you manage to see anybody to put their money in. So that is it. They have to come to the investors, or the users first and ask what do you want, or what does the market want, and then the question of profit, how large is the market, how much profit is possible and how long will it take, is it sustainable in the market? Then you decide if you are willing to wait. I have to, they have to ask those questions, yes. So that is the barrier, when we try to come in, sometimes it doesn’t make sense to us. We explore... saying how can we get production cheaper, look for something local where you don’t have to spend foreign currency, but in the end we can’t continue because the business is not good enough, they don’t think of it as business. So the research sits there on their shelves as souvenir rather than business items.”

The underlying motive driving any research becomes crucial in determining its potential for commercialization. When research originates from a drive to access research funds as is often the case in the Nigerian rentier state, or is driven by the need of the agents to accrue more cultural capital that would enhance their advancement in their field, the fitness of the outcomes of such research for commercialization would more likely be subject to intense assessive scrutiny by the industry field when they are recommended for commercialization. The academic agents severally recounted their experience and often frustration from the industry field regarding proposals for the commercialization of their findings which the industry field often doubted their commercial potentials:
“...there is an agency that promised to give me some money, but they are not coming up with the money. I am trying to fund the thing myself because people are looking at this as, some people are saying it is a white elephant project.”

The academic agents believe that the industrial agents would more readily buy into their commercialization proposals if they see the products in the market and see it doing well. Perhaps a reason why academics strive to move the findings of their research into the market themselves:

“...so one of the things I have noticed is that people are willing to invest once they understand what you are trying to do. Now don't get me wrong, one of the reasons why I believe that one (his attempted commercialization project) didn't come through was because the revenue was not, we have not made enough revenue to warrant them to invest even further... so I couldn't get someone big coming in, yes, but one of the things one has to get on ground is you need to, one will need to have made some form of revenue in order to warrant more investments. ...it would serve as evidence that it is a viable business, er because, at the end of the day, they want to make some substantial returns.”

Another agent explained:

“...the industrialists are looking for (not clear) low risk kind of investment. So they don't... won't go to the academia to link to a potential finding and bring it to (not clear). It's not that they don't have the time, or they don't have the money, they just don't want to take such a risk that's it. Even when the product is there, if they have not seen a similar product they are not convinced that this is going to hit the market well, and they shy away from it".
Having approached several industrial agents with commercialization proposals, and agent explained:

“...the problem is conviction. So unless you have an external fund, now start the business, push it up to the level where people see it working, it becomes what I will say is a model, then others will now say “we have a confidence to key in”. That becomes the problem of commercialisation in Nigeria”.

Another agent while discussing how the outcomes of his research were successfully moved from University to the Industry for mass production explained:

“...they were also tangible products that you can see, that you can touch, you can use, because they were all food-based, and the other one was from microorganisms. They were using them in-house, so it was easy for them to assess what the discovery were, because they were not concepts; they were things that were tangible, things that you can touch...”

Assessive actions are more critical when a research whose findings are to be commercialized are conceptualized from the academic field. In such situations the owners of the research have to persuade the industry agents to take the project forward. When the industry field is involved in the conceptualization of the research, the assessment of the commercial value of the possible outcomes of the research form part of the conceptualization and therefore the findings are more likely to appeal to the industry field. Majority of the research outcomes recommended for commercialization in the Nigerian rentier state originated from the academic field and did not involve the industry. This may account for the reason their commercialization poorly appeal to the industry who would only pick
interest if the agents independently, and successfully commercialize their findings and in this way prove their commercial potentials. If majority of research continue to originate from the academic field, and continue to serve the purposes of accessing the rentier capital, career progression of the academics and budgetary accounting tools, it is unlikely that commercialization of the outcomes would be attractive to the industry field.

9.4 Mediative Actions

The major function of entrepreneurship is satisfying the needs and demands of the society (Chung, 1992). The industry field satisfies the needs of the society by providing products that satisfy the demands of the society. This essentially makes the industry field the field of commerce. Agents in the industry field mediate in the gap between the demands of the society and the supplies that satisfy the demands. When a particular outcome of research show potential that it can satisfy a given need or demand of the society. Industrial agents show interest in it and assess its potential for fulfilling the profit seeking needs of the field. The industry field thus carries out mediative roles within the academic entrepreneurial space.

9.4.1 Mediative Actions of the Industrial Field

Bringing findings of academic research from the academic field into the industry field is the major role the industry field plays in the process of academic entrepreneurship. This role is critical to the success of academic entrepreneurship in any given society given that the industry field is characterised by availability of high level commercial skill and high technical capacity, both essential requirements for successful academic entrepreneurship. While commercial skill is
essential for assessing proposals and developing business models out of the findings of research, technical capacity is essential for turning to business models into products and profits. To accomplish these roles the good knowledge of market, another characteristic peculiar also to the industry field is crucial.

To make a decision if a commercialization project would go forward or not, the industry field performs a cost-benefit comparison of the various profit-making options available to them. In particular, the market conditions are brought into consideration. The market potentials of a proposed new product is compared with the potentials of existing options including the lucrative import options. Availability of foreign exchange accruing from petroleum exports makes importation and consumption of foreign goods popular in rentier states. According to Widdowson & Howard (2013) “High levels of affluence create insatiable demands for foreign goods and products” p. 369. Imported goods are preferred as it signifies class, even when it is same quality as the imported alternatives. This leaves the industry agents with a choice to make between taking the outcome of research to market or bringing to the market the imported alternatives which presents a stiff competition against the local products.

Although his commercialized products are doing well in the market, and academic agent recounted, regarding the policies of the Nigerian government towards importation of goods:

“...they come up with policies that seem only targeted at frustrating the efforts of the indigenous manufacturer or entrepreneur, and they end up having everyone trying to become importers of goods. So the competition between the
foreign goods and the indigenously produced ones, that is actually what is nose-tightening life out of start-ups in our local or indigenous endeavours.”

The industry will consider the local options if they imply more profit to the profit-oriented field. Speaking of the benefits of commercialization from the industry perspective an industry agent explained:

“We explore... saying how can we get production cheaper, look(ing) for something local where you don’t have to spend foreign currency... For us as a business it opens new opportunities because it means we may end up producing at a cheaper cost, and producing at a cheaper cost is profit. Anything that would make us profitable is exciting for us. So you can say that it is beneficial in the sense that we are saving costs. Which you know that we are a business and at the end of the day the question will be how much profit did you make? And it is a matter of numbers, how much did it cost and how much did it bring back. So if the innovations of our universities make things cheaper we definitely go for them. So we encourage them... it is just to come out with good products, good research and if it makes business sense then it is beneficial to everyone. Wealth is created, and it also helps the researchers in the universities. If their research turns into good business then they are in, they are doing well, we’ll go with them.”

But often the industry field does not find outcomes of Nigerian university research commercially viable. But may give consideration to commercialization proposals from Nigerian universities as part of their corporate social responsibilities:

“Business is about achieving and overtaking targets. It is not where... it is not even how, or who... it’s more of, question of... of what it came to in the end.
When performance is assessed I will not be concerned if, about, about if I managed to make a product in Lagos or Abuja, Beijing or London, if I used solar energy or turbine energy, what I will be asked is how much did you make, what was the projected revenue and how close did you do in achieving that and so on.

So I also... the truth is I don’t care if I use what was made in Nigeria universities or university of China, what I look at is which one will get me closer to my target... which one will make this get better, make me better profit, which makes better business. Ok sometimes you can say let’s help the university people, lets help them make some money, you know if you look at it from that angle. But that is if you are thinking of being socially responsible or charitable, things like that you know”

The industry field are more disposed to and give preference to importing goods from abroad over local development. Occasionally the government field intervenes and provides incentive to the industry field to commit them to local production of goods. But such moves in a rentier state only creates opportunity for rent seeking behaviour in the industry field. Critical of the industry field, a government field participant of this research recalled:

“...sometime ago when we had PTF (petroleum trust fund) if you know about that, some big industries partnered with government, I know companies... er partnering em, er.. brought in to help industrialization if you know what I mean. They were given funds to produce certain items locally, to... er, to help train local hands. But what happened? Instead of training and employing people to do the production, they collect the money, go to the backyard, and through the backyard
import the products, turn round and supply imported finished products to the government as their products. Can you beat that?

**Why, why do they do... (cuts in)**

Ask me! Can you beat that? Well it is easy to work out. It is cheaper and makes more profit for them to import, they make savings and that goes to their pockets. They do the calculation and take the easy more profitable option. And they are also smart enough to get import duty waivers by claiming they are importing raw materials and machinery to help industrialization. But it turns out they are importing finished products... finished... or near finished products if you know what I mean. Sometimes they import finished products and just package them here and then write ‘made in Nigeria’, the products are made in China, what do you call that: Is that not er, em... corruption?"

The field of industry undertakes mediative actions where they close the gap between demand and supply. The field utilizes its knowledge of the needs and demands of the market, its commercial skills and its technical capacity to fill in the gaps in the market. The rentier apparatus favours foreign goods over local goods, and the cost and time implications of commercialization makes importation seemingly more profitable over commercialization. The industry field being profit-focused favours importation over commercializing local research outcomes. The industry field mediates by sourcing the needs of the local market abroad, further suppressing and suffocating commercialization of research findings of local universities. This situation contributes to the poor outcomes of academic entrepreneurship despite enormous research going on in Nigeria and
enormous financial investment of the Nigerian rentier government into its development.

9.5 Creative Actions

The major role of universities is the creation of knowledge (Godin & Gingras, 2000). Creative action as identified in this research is the role of creating new knowledge through research, that may give rise to new technology, new processes, new products, new organisations, etc. Creative actions are innovative actions. The academic field is the field of knowledge creation. Agents in this field with a habitus highly disposed towards seeking and finding solution to the society's problems create new knowledge through research, research being the primary academic entrepreneurial action of the agents in the academic field. Conditioned by an aspect of the agents' habitus that is founded on the consciousness of the relatively high levels of academic knowledge and skill possesse, and the disposition that the society is full of unsolved problems, agents in this field undertake the creative action of searching for, finding and creating new knowledge that helps solve the society's problems. Creative actions are homologous with the academic field.

9.5.1 Creative Actions in the Academic Field

The Academic field is the field of innovation. The main academic entrepreneurial activity of this field is research, and the outcome of research is creation of new and innovative knowledge; agents in this field create new knowledge that give rise to new products, new services and new organisations. Academic research is the mother of inventions (Field, 2013), it is the starting point of academic entrepreneurship since there must first be research, for there to be
commercialization of their findings. The major property of the academic field is high academic knowledge and research skills, and the prevalent habitus of the field is the apprehension of problematic outlook of the human society and the need to utilize the academic knowledge and skills available in the field to find solution to the societal problems.

The primary strategy of all individuals in a rentier state irrespective of social positioning is gaining access to the rentier capital legitimately or illegitimately. Legitimately through labour and enterprise, and illegitimately through various rent-seeking strategies described in this research as rentrepreneurship (see section 9.2.3) which includes bribery and corruption (Di John, 2009). Agents in the academic field perceive research and the commercialization of its outcomes as legitimate means of access to the rentier capital. Hence academics make a three-fold gain from conducting research: (1) they increase their stock of cultural capital by enhancing their professional values through research and publication thereby advancing their suitability for promotion and career progression, (2) they increase their stock of symbolic capital by the intellectual properties ascribable to their names resulting from their research, and (3) they enhance their economic capital through access to research funds. Often the research funds are misapprehended as earnings by the academic agents.

Also in the field of academics, agents require to advance their positions within the field. To advance within their field, academics are required to conduct research. The requirement for conducting research reinforces the disposition and aspiration of the academics towards the creative action of research. The biggest hindrance to research in the Nigerian rentier state however is poor funding and
poor infrastructure, academic agents mitigate against this by putting pressure on the paternalistic field of government to fund research and equip universities. This is the basis of the several industrial actions embarked upon by the academic field over poor funding of research and poor educational and research facilities at Nigerian universities. Being determined to conduct research as a result of reasons deduced above, agents in the academic field would improvise for equipment and occasionally make use of their personal savings to conduct research in order not to miss out on academic/ career progression and promotion available to them within their field.

Hence the academic field in a rentier state against all odds would continue to conduct research because:

(1) it is their interest, an interest of their professional field.
(2) it is an access route to the rentier capital made available by the government field, and
(3) it is a requirement for career progression in the field.

Hence the creative action of research is critical for the maintenance of the socio-economic positions of agents in this field. However outcomes of research pursued and conducted from the motive of access to funds and/ or advancement of career are unlikely to progress to commercialization. This is because completion of the research and publication of its findings satisfies the need for which the academics invested in the research. Most of the researches originating from these motives not only have low commercial potentials, but their commercial values may also not be detectable to the ‘owners’ of the research work who were from the outset not interested in their commercial values.
Academic research work originating in the ways described above would typically involve mainly the academic agents who initiate the research, and the government agents who fund the research. Agents from the industry field are most often completely left out of the equation, and only get involved if, and when the outcomes of the research are brought to the attention of the industry field via seminars, conferences, symposia, shows and fairs, etc., and occasional contacts and meetings arranged by the government field.

“The whole thing started when we were doing some exhibition. Some of these exhibitions I have gone, national exhibitions, they contacted me... The exhibition I met them was the exhibition organised by the NUC (National Universities Commission), okay, that was the way I went there, that was the place that I filled the form that made it possible... I had to fill my own form, and they followed it up, NOTAP took up the information from the university, then took it up to themselves, they are the agency that is responsible for all these communication.”

Agents initiate and conceptualize research with focus on solving a particular societal problem. Having created new knowledge that has potential commercial values with the conclusion of their research, the agents market their findings through workshops, seminars, conferences, shows, exhibitions, etc. In these cases the major role played by the industry field is the appraisal of the outcomes of the researches to assess its commercial value and potential for commercialization, these having not been considered at the conceptual stages of the research.

Few successful cases of commercialization of research findings found in Nigeria were originated by the industry field, agents in the field while seeking to solve
identified practical problems approach the academic field in acknowledgement of the high academic research knowledge and skill available in their field. A situation that mirrors academic entrepreneurship in production states where industry initiate and fund research (Gulbrandsen & Smeby, 2005). In such successful cases in rentier states, it is interesting that the government field plays no active part. Government participation in this instance is reduced to symbolic claims as to gain legitimacy, claiming to have influenced the success through its policies and conducive environment it created as an agent recounted:

“One of the first things, em, that came to light was after we started getting a lot of media attention, em, we got a lot of people em…, we got the minister of communications back then interested in what we were doing. But the thing we got from the government was er…, they exploited the situation to make themselves look good. So we had the opportunity to talk to the minister of communications, for example, but they (the minister) then used the opportunity to use our products as one of her, em…, agenda, what she did (achieved) as the minister. So essentially they overshadowed us with the fact that “oh this is one of our initiatives that panned out’”.

Most of the successful cases are recorded within the oil and gas industry- the most advanced industry in Nigeria, and involved universities located in the Nigeria’s oil-rich Niger-Delta region. Often, these are cases in the oil and gas sector where industrial production related problems faced by the industry field were taken to the academic field in search of solutions. In these instances the research motivations were different, the research were focused on solving real-time problems, and finding the solution has quantifiable commercial values which
formed a different form of motivation for the researchers, motivation from the economic capital accruable to them from solving the problem, and cultural capital of having their names on the solutions and associated products, in wide contrast to situations where motivation stemmed from gaining access to the research funds.

9.6 Allocative Actions

Allocative action is the major economic and governance action in a rentier state. Allocative action is the function of distributing and making available from the coffers of the state, necessary resources for the execution of the academic entrepreneurial actions. Allocative action includes receiving the incomes due the state from the export of petroleum and coordinating other sources of income due the state, determining the formula for sharing the incomes through budgeting, funding of activities including research and its commercialization, and transferring the funds to the relevant state departments responsible for utilizing them, and ensuring appropriate use of the resources for the purpose for which they were allocated.

Allocative action is the major function of a rentier government (Fawcett, 2013; Smith, 2004), and is the major academic entrepreneurial action taken within the government field. Others include policy-making and law enforcement. The allocative action of the government that constitute academic entrepreneurship include setting aside a percentage of the budget for the purpose of conducting academic research in the universities, the level set aside often being influenced by the level of pressure from the academic field. It also includes allocating funds for the commercialization of research findings directly by funding the agents to
commercialize their findings, and indirectly by funding sensitization programmes such as seminars and fairs, etc., and financing commercialization infrastructures such as buildings, equipment, and staffing intellectual property offices at universities and research institutes.

9.6.1 Allocative Actions of the Government Field

The allocative function of the rentier government stems from the habitus inherent in the government field which disposes a paternalistic role of providing for the needs and demands of the other two fields of academic entrepreneurship. The government field being in direct receipt of the rents from export of petroleum which is perceived as the rentier society’s ‘collective wealth’, apprehend their role as that of ensuring that all sections of the rentier society receives its fair share of the rents from oil with consideration given to its needs and contribution to the society. Research and commercialization are considered critical areas of a rentier state because of the high regard the population has for economic diversification. Moreso the academic field belong to the elite class of a rentier state and taking actions to support their needs and demands is critical to maintaining stability and resilience of a rentier state’s government.

There is an apprehension of instability of the government field and its vulnerability to destabilization by the elites. So the government seeks the support of the elites, ‘buying them off’ by funding their interests. Writing about rentier states, Franke, Gawrich, & Alakbarov (2009) asserts: “...oil rents accrue directly in the hands of the state, and loyalty to the state is gained through patron–client networks which help increase political stability, giving the government a certain measure of legitimacy” (p. 112).
invests heavily in research and commercialization of its findings; but the enormous investments in research and its commercialization is not an as a result of commitment of the government field to the success of academic entrepreneurship, it is not borne out of genuine desire to encourage commercialization, rather it is aimed at maintaining and consolidating their positions in the field by keeping at peace the academic field by providing for their needs and satisfying their demands for funding. As Cook (1970) and Yates (1996) argue, greater part of the resources and budgetary expenditure of a rentier state are devoted to maintaining the status quo. "Instead of attending to the task of expediting the basic socio-economic transformations, they devote the greater part of their resources to jealously guarding the status quo" (Cook, 1970, p. 443).

Having gained legitimacy, credibility and trust of the general population over the government field as a result of its social disposition, the population are more inclined to listen to the voices from the academic field over that from the rentier government field, a field generally apprehended by the population as untrustworthy, deceitful, greedy, and kleptomaniac. The legitimacy of the academic field and the fact that it is an elite field grants the field a capacity to unsettle the government field. The government field therefore strives to maintain the status quo by satisfying the demands from the academic field as a means of circumventing any form of restiveness from the field. This is part of the mechanism that drives investment by the rentier government field in research and in the commercialisation of research findings, which is of little real interest to the government field, but remains among the key interest of the academic field.
9.7 Summary

This chapter discussed the relations between the various field properties of the three fields of academic entrepreneurship: the government, the industry, and the academic fields. It discussed how the various actions that are derive from the habitus of the agents in each of the three fields relate with those from other fields to give rise to and shape the practice of academic entrepreneurship in a rentier state.

Applying Bourdieu's relational philosophy (Bourdieu, 1998a), the potentialities of academic entrepreneurial agency were related to the inherent structures of a rentier apparatus and applied to explain how the practice of academic entrepreneurship unfolds in a rentier state. The cornerstone of the chapter is the dialectic relation between the objective external rentier structures of the various fields of academic entrepreneurship and the internalized structures (habitus) of the academic entrepreneurial agents. These were drawn out using the concepts of capital, habitus and field; the Bourdieusean concepts that helped in transcending the dualism of agency and structure.

The chapter discussed how actions of agents are largely underpinned by the primary desire to gain access to the rentier circuit. Strategizing to gain access to the rentier capital is the primary entrepreneurial action of agents in a rentier. This manifests in various guises, each being shaped by the properties of the field to which the agent belong and the inherent opportunities, limitations and barriers presented by their fields. In this chapter, five typologies of entrepreneurial actions identified as both forms, and conditioners of academic
entrepreneurship in a rentier state: accessive actions, assessive actions, mediative actions, creative actions and allocative actions were discussed.

Accessive actions are the various legitimate and illegitimate actions of agents in a rentier space that are aimed at gaining access to the rentier capital; accessive actions were identified as common to all fields within a rentier state. Assessive actions are homologous with the industry field and consist of various moves by the agents aimed at assessing the commercial potentials and suitability of outcomes of research proposed for commercialisation, assessive actions are critical in the decision if any given commercialization project would go forward or not. It was identified that involving the industry field during the conceptualization of any research would ensure that the assessive actions are carried out earlier in the process thereby enhancing the likelihood that the eventual outcome of the research would be considered suitable for commercialization.

Mediative actions are homologous also to the industry field and involve agents in the industry field closing any gap between the demands and needs of the society and the supplies that satisfy those demands. The gaps can be closed by turning the outcomes of academic research into suitable products, or by importing the alternatives from abroad to satisfy the need. Situations of a rentier state favour importation over local production, thus constituting one of the biggest challenges of academic entrepreneurship in a rentier state. Academic entrepreneurship fills the gap by the creative actions of the academic field. Creative actions include mainly the role of creating new knowledge through research, resulting in outcomes may give rise to new technology, new
processes, new products, new organisations, etc. Creative actions are homologous with the academic field.

The rentier mentality is an aspect of the habitus of all agents in a rentier state. The result of the rentier mentality is that economic, governance and entrepreneurial actions work differently from how they do in a production state. Segments of the economy, for example industries, according to Grant (2014) are often targeted for development by state policies that “have non-market considerations in mind (e.g., jobs, prestige, symbolism, kickbacks, electoral patronage, or foreign pressures)...” (p.60). As a result outcomes of the policies and actions do not match their stated objectives. Agents employed to oversee commercialization of findings of research pursue other motives, primary being acquiring economic capital which they pursue by taking advantage of the vantage positions their employment grants them. The conclusion of this chapter is that the outcomes of academic entrepreneurship in a rentier state do not match the enormous resources invested and efforts directed towards it, this is discussed in further details in the concluding chapter.
Chapter 10  Conclusion

Summary of Findings and Recommendations

10.0 Introduction

This chapter summarises the findings of this research. It reflects on how the philosophy, method and approach adopted for this research were effective in answering the questions of this research, and the extent to which the questions of this study are answered. This chapter summarises the findings of the study, discusses their implications, highlights its contribution to knowledge and acknowledges the various limitations inherent in study. Also in this chapter recommendations are made to various stakeholders to whom this study holds interest. Discussion in this chapter also makes suggestions about possible future work that could enhance further, the contributions of this work to the body of knowledge. This chapter discusses how this chapter contributes to the body of knowledge of rentierism, academic entrepreneurship, and entrepreneurship research contextualization.

This research aimed to:

1. Develop a picture of the state of academic entrepreneurship in Nigeria.

2. Develop a multi-level sociological research framework applicable in studying entrepreneurship incorporates individual, organisational and contextual factors that influence entrepreneurship.

3. Develop understanding of how the presence of rents from oil influences the commercialization of findings of research, in particular to explain the underlying mechanisms that govern academic entrepreneurship in a petroleum rentier state, and to:
4. Enhance the body of knowledge as regards the contextualization of entrepreneurship research.

With regards to the ‘Aim 1’, this study found that academic entrepreneurship exists in Nigeria. The government, the industrial sector, and the Universities collaborate in the quest for the commercialization of findings of research in Nigeria. The government provides funding, the universities conduct research while the industry assesses potentials and turns findings of research into products, often with creation of new organisations. The level of funding made available for research by the government however very weakly compares with the World Bank recommended threshold, and research output, and the rate of turning of research outputs into commercial ventures are also inconspicuous when compared with the rest of the world. With regards to its second aim, this study developed a new conceptual framework based on Bourdieu’s sociological theories upon which entrepreneurship could be studied, with consideration given to the individual, organisational and contextual factors that influence the phenomenon. Following this framework, the rents entering the Nigerian society were conceptualized as ‘economic capital’, and the three members of the triple helix model conceptualized as ‘fields’, and the internalized externalities of agents as ‘habitus’.

The rest of this chapter discusses in further details, the findings and achievements of this research.
10.1 Key Findings

10.1.1 State of Academic Entrepreneurship in Nigeria

Following the methodological practice associated with Bourdieu, which starts research into a phenomenon with a ‘picture’ of the phenomenon (Grenfell, 2004, p. 119), this study commenced with developing a picture of ‘state of affairs’ of academic entrepreneurship in Nigeria. It has identified three typologies of academic entrepreneurs in Nigeria: government agents who fund research and its commercialization, academics who conduct research that produce the commercializable findings, and industrialists who take findings of research from research institutions to the industry. This finding conforms with (Etzkowitz, 2008) triple helix model of innovation.

It was found that Nigeria’s input into the process of research and its commercialization, and the country’s output from it are both below the world’s average when using the Global Innovation Index measures such as R & D spending, headcount of research practitioners, scientific and technical output. This situation contrasts the apparent government’s emphasis on diversifying the Nigerian economy through research, innovation and commercialization. Evidence of emphasis of the Nigerian government on diversifying the economy through academic entrepreneurship is shown in the speeches delivered and recorded on the Nigerian government websites, and in the media, in various funds set aside for the purpose (see fig. 8.2), and in various programmes set to facilitate commercialization. Related to this finding, this study also found that emphasis or apparent interest shown by the government of a rentier state towards commercialization of findings of research does not necessarily imply genuine
commitment to turning findings of research into new products or new organisations (see section 8.2.1).

This study found that demonstrating a commitment to academic entrepreneurship by speaking positively about it by the government, and committing funds into it is more of a means of gaining the approval of the population, who have faith in academic entrepreneurship as a tool for diversifying the economy and creating the much sought after jobs. Committing funds into academic entrepreneurship by the government similarly is more of a means of gaining the approval of, or ‘buying off’ the academics in whose interest the commercialization of findings of their research is. It is in the interest of a rentier state’s government that the elite class, which the academics belong to are placated as part of maintaining the government’s ‘patron–client networks’ (see section 9.6.1). This, alongside the discussions presented in the subsequent sections below explain the mismatch between the input into academic entrepreneurship in the Nigerian rentier state and its output.

10.1.2 Access to Rents: The Driver of Action

This study finds that the major driver of action in rentier states is access to the rentier circuits. Earlier studies on rentier states identify ‘rentier mentality’ (Beblawi & Luciani, 1987; Moore & Salloukh, 2007; Yates, 1996) as a property of rentier states. This study goes further and finds access to rents as the driver of every academic entrepreneurial action in rentier states. This study also finds that all entrepreneurial actions within a rentier state can be categorised into five typologies: ‘accessive actions ‘assessive actions’, ‘creative actions’ ‘distributive actions’, and ‘mediative actions’ (see section 9.1).
The finding that the primary driver of academic entrepreneurial action is access to the rentier capital agrees with (Althani, 2012) who states that “the primary focus of actors in the economy is to obtain a share in these revenues, whether through employment in the public sector, distribution via the welfare state or for entrepreneurs through preferential treatment in the form of subsidies or grants...” (p.28). This finding in this current study is also in line with the earlier finding of Nwokolo (2013) who found action by agents that lead conflicts in oil-rich states to be motivated by a desire to gain access to the oil rents, and the finding of Sandbakken (2006) who found socio-economic and political activities in rentier states to be questions of strategies that get access to the oil rents.

Other earlier studies eg. Grant (2014), (Gatti et.al., 2013), (Sandbakken, 2006), and (Losman, 2010) find employment and political appointments in rentier states as classic means of gaining access to the rents, a reason favouritism dominates the employment processes and government appointments. Here, social position and clientelism rather than suitability for the role determines who gets employed or appointed to positions as Grant (2014) argues “jobs and contracts and licences are given as an expression of patronage and clientelism rather than as reflection of sound economic rationale”. When the agents finally obtain employment positions, Grant (2014) explains further that they “see their principal duty as being available in their offices during working hours... The best and brightest seek out lucrative high-paying government posts. Everybody knows getting access to oil rent is how to get rich” (p.53). Gatti et.al. (2013) similarly found that “a characteristic of rentier states is their ability to secure consensus by sharing part of the rents, especially through subsidies and public employment. ...policies that have led to several unproductive outcomes: highly uneven
regulatory playing fields for firms, including discretionary access to credit, significant labour market rigidities, access to jobs based on personal networks rather than on objective signals of ability... “(p. 286-287).

This further mitigates against the work-reward causation and productivity of job positions as unqualified and uncommitted persons occupy strategic job positions. This constitutes a major hindrance to academic entrepreneurship as individuals given roles that relate to the commercialization of findings of research, in most cases, lack the relevant skills, knowledge and drive to carry the role through. This is further complicated by the shift in focus of the government agents from how to achieve successful commercialization projects, to how to achieve successful access to the rentier circuits through the opportunities offered by the commercialization process; an illegitimate entrepreneurial action which this study termed ‘rentrepreneurship’. The finding of this study is that access to the rentier capital is the major driver of academic entrepreneurship action, and that this situation makes a major contribution to the reasons investments made towards the process produces mismatched outcomes.

10.1.3 Working/ Failure of Government Initiatives

Several individuals including participants in this study, public opinionists and researchers in the field including Paler (2011), and Kieh & Kalu (2013) express surprise that the enormous financial resources available to rentier states such as Nigeria do not result in success of the programmes and initiatives of their governments considering that the funding required to sponsor such initiatives are easily available from incomes from the export of petroleum. This study found, in line with extant literature on rentier states (Beblawi, 1987; Mahdavy, 1970), that
the institutional dynamics prevalent in rentier states alter the dynamics of policy initiatives, giving rise to outcomes that are significantly below par with what similar initiatives produce in production states.

Several studies eg. Basedau & Lay (2009), Caselli & Cunningham (2009), Ross (2012) attempt to provide an explanation using economic and social units of analysis. All these explanations base their analysis on the natural resources endowments itself. But the finding of this study suggests that it is psychology of tgeagents that is at the base. This study logically argues that it is the same mechanism through which the volume and configuration, or forms of capital held by ‘groups’ shape their “class habitus” Bourdieu, 1977) and invariably their practice, that the volume and forms of capital (taxation income, aids, loans rents, etc.) held by different nations shape their ‘national habitus’ (De Cillia, Reisigl, & Wodak, 1999) that guide practice in the respective nations.

Knowledge of, or apprehension of the presence of the rents from oil rather than the oil itself governs the institutional dynamics of rentier states. The various negative developmental outcomes associated with the riches existent in rentier countries results from mind dispositions or psychology rather than the resources available to these countries. Regarding academic entrepreneurship, it is thus the habitus, ‘misconditioned’ by the knowledge by the government, the academics, and the industrialists of the presence of oil wealth that underlie the mismatch between the investments in academic entrepreneurship by rentier states and the outputs of these investments.
10.1.4 The Triple Helix Model in a Rentier State

This study finds that the triple helix model of innovation functions differently in a rentier state. Etzkowitz’s (2008) triple helix model states that triple helix relations in knowledge-based societies result when “university, industry, and government enter into a reciprocal relationship with each other in which each attempts to enhance the performance of the other” (p. 8). Similarly (Fetterman & Wandersman, 2005) states “the three partners in the relationship work together to build upon one another’s strengths to achieve results. The stakeholders are intertwined in a triple helix of accountability to one another to obtain results” (p.37). However, this current study finds contrast in the structure and dynamism of this relationship in rentier states where the three partners do not strive to enhance the performance of the other, rather they strive to advance themselves sometimes to the detriment of the other partners.

The government does not strive to enhance the academic or industry partners. It strives to gain advantage over them. One of its (government) strongest objectives for being in the relationship is to assuage both the public and the academics. The government desires to show to the population, its commitment towards diversification of the economy through commercialization of research. To achieve this objective, the government attempts to garner glory and praise from the population for the outcomes of individual efforts of the other partners in the relationship, even when they have provided little or no support the work for which they claim accolades. Similarly, to create a positive impression of self on the population, the government in different situations apportion blame to the other partners for failure to achieve results while attempting to absolve itself.
As a result, the triple helix in a rentier state involve intra-relational struggles and tensions that hinder its effectiveness in a rentier state. Among the major functions of the government within the relationship is making policy initiatives and providing enabling environment such as intellectual property regimes and law enforcement. The institutional dynamics of a rentier state, however, dictates that it is in the interest of the government that these institutions remain weak as (Bratton & Van de Walle, 1997) explains “In most rentier states, the ruling elite often undermine institutional integrity to protect their own rent-seeking interests” (p.19). The weak laws and weak enforcement of the law undermines the institutional framework required for academic entrepreneurship to flourish.

The main significance of this study is that it uncovered the nature of the mechanism and the underpinning structures that govern the triple helix relationship. It highlights the need to adapt the current statist model (Etzkowitz, 2003a, Yoon, 2015) currently in place in Nigeria whereby the government plans, directs and is in control of the relationship it has with industry and academia. This study has demonstrated that models of academia-government-industry relationships copied from countries where it worked without considering the institutional dynamics of rentier states may not produce results. Even more so when it is considered, as found in this study, that each of the three players within the relationship have multiple objectives, the rentier mentality that pervades the rentier space can potentially inhibit positive outcomes in rentier states. The finding of this study is of significance to policy makers in rentier states as it suggests that innovation models in rentier states borrowed from successful production states be redesigned to take into account the peculiarities of rentier states.
10.2 Contributions to Knowledge

This study contributes to two fields of knowledge. It contributes to the field of Entrepreneurship, and to the Rentier State field of study. To the field of entrepreneurship if offers a new methodology for studying entrepreneurship that transcends the agency-structure divide, it also contributes to what is known regarding academic entrepreneurship, and enhances knowledge about what is known regarding rentier states.

10.2.1 To Research Methodology

One of the major contributions of this work is to research methodology. This study developed a sociological research model based on Bourdieu’s sociological theories. The framework developed in this research could be applied to other new studies in the academic fields of entrepreneurship, organizational studies, and regional development. Although several studies identified the applicability of Bourdieu’s sociology to the study of management (see section 2.2), most of the studies only acknowledge Bourdieu as research lens, identifies and discusses the conceptual elements of Bourdieu’s sociology, without being guided practically by, or grounding their studies on Bourdieu’s conceptual offerings and methods. This is attributable to the fact that Bourdieu rarely explains how his methodology works, nor provide details of how his studies were implemented (Dörfler, et.al., 2003).

This study offers to the field of management and sociological research, a robust methodological framework for implementing research, based on Bourdieu’s sociological theories. Based on the concepts of field, capital and habitus, the framework aids transcendence of the external material structures and resources
available within a context being studied and the internal agential structures and conditions that give rise to, enable, and constrain action. The Bourdieusean concept of social space and field, allows account of the material structures within the environment being studied and their properties to be brought into the analysis. Over the years, despite the popularity of these concepts, researchers have lacked a reliable tool to bring these variables into their analysis in studies where Bourdieu has been adopted; this study now bridges this gap.

The concept of capital accounts for the objectified, embodied, and institutionalized resources available to agents within a given environment, while the concept of habitus accounts for the structures within the environment being studied, that are internalized within the mental modes of agents. By integrating field, capital and habitus, this new Bourdieu-based framework transcends the dualisms of internal and external, objectivity and subjectivity, agency and structure, and the inherent conflation they bring into analysis are expunged.

The framework developed in this research thus provides researchers with guidance about conceptualizing the research, what kind of data to collect, possible means of data collection, and an elegant guide for the analysis of data. Such a comprehensive framework has been lacking in management and sociology research. Its development in this current research constitutes one of its strongest contributions.

10.2.2 To the Field of Entrepreneurship

This study contributes to the sociology of entrepreneurship, it provides a sociological explanation of the triple helix model of innovation. It also sheds light on the neglected prevalence of illegitimate entrepreneurship (Bouchard & Dion,
Academic Entrepreneurship in Petroleum Rentier States

2009; Webb, Tihanyi, Ireland, & Sirmon, 2009) within legitimate businesses and organisations. This study introduces the concept rentrepreneurship to describe when agents use their legitimate positions to create illegitimate rent-seeking opportunities.

Rentrepreneurship is a common practice among the elites in rentier states. For example this study identified situations when academics conceptualize research projects to create opportunities to access the rentier capital, only to conduct minimal basic research (see verbatim under 'Intellectual Property- apprehended as a bargaining tool' under section 7.3.3). Rentrepreneurship is identified in this study as a typology of illegal, illegitimate, or shadow entrepreneurship. The concept is not fully developed in this study, and remains an area of entrepreneurship that would benefit from further investigation and analysis.

10.2.3 To the Theory of Entrepreneurial Action

This work contributes to the theory of entrepreneurial action (Alvarez & Barney 2007), which focuses on how entrepreneurial opportunities are either created, or discovered through the actions of individuals. Alvarez & Barney (2007) identified seven entrepreneurial actions relevant for opportunity creation and recognition including leadership, decision-making, human resource practices, strategy, finance, marketing, and sustaining competitive advantage. At a more advanced level than Alvarez & Barney (2007), this study found that all entrepreneurial action within the field of academic entrepreneurship fall within five typologies: Accessive, Assessive, Creative, Distributive, and Mediative actions. By uncovering the typologies of entrepreneurial action embedded within the field of academic entrepreneurship, this study advances the theory of entrepreneurial action,
supporting a further understanding of academic entrepreneurial action, and opening a gate for future research towards the understanding of these typologies of entrepreneurial action.

The finding on typologies of academic entrepreneurial action also supports understanding of how various academic entrepreneurship actions may contribute to the society, and their desirability when viewed from Baumol (1993)’s lens of productive, unproductive, and destructive entrepreneurship. The typologies of academic entrepreneurial action unravelled in this research presents a conceptual basis for operationalising empirical assessment of actions of academic entrepreneurs, and assessing their entrepreneurial orientation, their influence on the society, as well as their desirability both as individual agential actions and as group actions.

Extant entrepreneurship literature including Baumol (1993), Dallago (1997), and Foss (2002) attempted to identify actions such as litigation, tax evasion, lobbying, and various shadow activities such as racketeering, drug dealing and corrupt activities as either unproductive or destructive. Sauka (2008) acknowledges that entrepreneurship literature lacks “consensus on what determines productive, unproductive and destructive entrepreneurship on a conceptual level” (p.2). Typologies of entrepreneurial action as uncovered by this study extends Baumol (1993)’s thesis to the field of Academic Entrepreneurship by offering the elusive basis for categorising entrepreneurial actions based on the strategies of the actors, their underlying motives of action, and their contribution to the process of academic entrepreneurship; this categorization forms a sound basis for
determining the productivity, unproductivity, or destructivity of entrepreneurial action.

10.2.4 To the Rentier State Thesis

This study advances what is known regarding rentier states. In contrast with the 'resource curse' thesis canvassed by rentier state literature e.g. Ross (2012), Sala-i-Martin & Subramanian (2003), and Watts (2004); this study finds that it is not the wealth from oil that is responsible for the failed institutions prevalent in rentier states. The finding that rentierism is a socio-psychological phenomenon explains why studies on rentier states continue to describe rentierism as a paradox (Basedau & Lacher, 2006; Brunnschweiler & Bulte, 2008). This is because studies on the rentier state thesis continue to address and research rentierism as an economic phenomenon. The finding of this study suggests this is not the case; it demonstrates that it is a socio-psychological phenomenon deeply ingrained in the habitus of agents in rentiers states. Outcomes of research in its field will therefore be richer if studies on the phenomenon are correctly situated. This study therefore strongly recommends that studies on rentier states shift from the current 'economics of rentier states' towards the 'socio-psychology of rentier states'. This implies using socio-psychological units of analysis to develop models that take into account, the sociology and psychology of oil wealth into their analyses.

10.3 Limitations

One of the major achievements of this work is that it made the first construction of the Nigerian social space, and indeed among the few Bourdieu-based studies that emphasise the social space of the context it studies. Majority of Bourdieu-based studies evade the construction of the social space. However in this study,
the construction of the social space included data limited to the identified academic entrepreneurs in Nigeria. The study could have been richer if the constructed social space represented the entire Nigerian society, including members of the wider Nigerian society rather than only the identified academic entrepreneurs. This would imply constructing the ‘Nigerian social space’ rather than ‘Nigerian academic entrepreneurship social space’. Such Nigerian social space would have produced a richer understanding of the positions of the academic entrepreneurs from the three fields of academic entrepreneurship within, and relative to the rest of the Nigerian society.

Another limitation in this research is on the unequal number of interviews obtained from the three fields of academic entrepreneurship. The original design of this study was to interview academics who commercialize the outcome of their research findings, the design of this study was also to preliminarily interpret the data immediately they were obtained. This was a good approach because the preliminary interpretation of the data implicated the industry and the government as major players in the commercialization of findings of academic research. This necessitated a change in the methodology to include government and industry agents. Although the required number of surveys were obtained for all the three fields, only three interviews were obtained from the government and the industry field. With the academics the interviews continued in batches until the saturation point was reached, but due to the limitation of time, and a slow response to invitations from the government and industry agents, this process was not applied in these subsequent interviews with the industry and government respondents. It is considered that obtaining data from these two fields until saturation point was reached could have improved the robustness of the data.
obtained for this research from the two fields. Despite this perceived weakness however, this research considers obtaining the additional data from the two subsequent fields as strength because if provided further light to the subject, and added further richness to findings of the research.

10.4 Recommendations

One of the main findings of this work is that initiatives of governments in rentier states follow different dynamics in their implementation and working due to the institutional outlook of rentier states which has the power to alter policy trajectories. This study recommends that policies aimed at enhancing innovation and academic entrepreneurship especially when they are copied from production states be studied and analysed under the lens of a rentier state to understand how they could work before being implemented. The findings of this research suggests that the mere fact that a policy produced positive results in one country does not imply that it would reproduce the same in another. This research recommends that the current government-led statist (Etzkowitz, 2003) triple helix model in place in Nigeria be reviewed with an industry-led model adapted for a rentier state.

Secondly this research recommends that the current count of number of research conducted and number of publications made as a requirement for promotion of academic staff be strengthened with a requirement for the research to be industry-based. It is recommended that new innovation policies under construction consider strategies that would originate research in Nigeria from the industry rather than the current situation where research originates from academia.
While considering conferring the leadership of innovation to the industry, the government should also bring into consideration that policies if not properly considered may adversely affect the industry field; the industry field have shown tendencies to become rent-seeking when exposed to rent-seeking opportunities. It is therefore critical that the Nigerian government revisit and study its previous attempts at providing the Industry field with such stimulus, since such stimulus may be counter-productive, producing adverse illegitimate practices (see verbatim in section 9.4.1).

10.5 Future work

Having illustrated the underlying mechanisms that govern academic entrepreneurship in a rentier state, and the fundamental factors that lead to the observed mismatched outcomes, this study recommends that future work in this area consider investigating possible approaches or strategies that could turn the adverse situations round. Several previous studies on rentierism often come to the conclusion that the only way out for rentier states is to stop the oil incomes from coming into the state. Most of this studies however make their recommendation based on their findings that it is the presence of the rents from oil that causes the negative outcomes observed in rentier states. But this study has illustrated that rentierism is a dispositional construct. This study therefore recommends for future studies on rentierism to take socio-psychological approaches to further understand the dynamism of the formation and nature of the rentier ‘habitus’ with a view towards developing models and programmes that can expunge it, or turn it to the benefit of rentier states.
It is also recommended for future work on the subject of rentierism in Nigeria to consider constructing a social space that includes all members of the Nigerian society. It is further recommended that future research should include the other forms of capital besides the economic and the cultural to investigate their impact on the behaviour of agents.

This study identified that in Nigeria, research is supervised by the Ministry of Education, while the commercialization of its finding is under the Ministry of Science and Technology. The scope of this research did not include finding if this has any impact on research and the commercialization of its outcome. It is therefore recommended as an area of interest for future research. It will be beneficial to academic entrepreneurship in Nigeria to understand how this arrangement works and if there would be benefit in placing research and the commercialization of its findings under the same ministry, and if this will have any positive impact on research and the commercialization of research findings.

Another area of interest that emerged from this research is the effort of the National Office for Technology Acquisition and Transfer (NOTAP). NOTAP keeps what it termed ‘Compendium of Research Results and Inventions’, which is a record of outcomes of research from Nigerian universities that NOTAP considers commercializable, copy of the compendium was obtained during this research. The document shows that a number of the findings being recommended for commercialization relate to extractive industries. This is corresponds to trend found in the record of patents filed from Nigeria that shows the highest number of patents from Nigeria to be related to pharmaceutical products. These are naturally-occurring extractive substances. Considering that oil, which is at the
base of Nigeria’s rentier status is also an extractive product. It therefore is logical to study and find if these extractive, naturally-occurring basic products will produce similar rentier effects as petroleum. The finding of such research will help in identifying if it is sensible to pursue commercialization of these products as a solution to the problems created by petroleum, or if their commercialization will aggravate rentierism and the problems it brings.

Finally, this study found that of the three fields of academic entrepreneurship identified, the industry field is the least in rent-seeking, is profit oriented, and is entrepreneurial success oriented. The nature and structure of private universities in Nigeria as private business entities replicate the properties of the industry field. The private universities are profit-driven similar to the industry field, and they have no direct access to the rentier capital similar to the case of the industry field. It is also likely that they will as a result be more assessive rather than accessive in contrast to their government-owned counterparts. This study therefore considers that it is pertinent that further studies be conducted, and trials made on the potentialities of private universities to lead the onerous and evasive quest by Nigeria and other rentier states to diversify from petroleum through academic entrepreneurship.
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Appendices

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Appendix i  Research Ethics Review Checklist

FORM UPR16
Research Ethics Review Checklist
Please include this completed form as an appendix to your thesis (see the Postgraduate Research Student Handbook for more information)

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<td>First Supervisor: Dr. Zoe Dann</td>
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Thesis Word Count: 77083 (excluding ancillary data)

If you are unsure about any of the following, please contact the local representative on your Faculty Ethics Committee for advice. Please note that it is your responsibility to follow the University’s Ethics Policy and any relevant University, academic or professional guidelines in the conduct of your study

Although the Ethics Committee may have given your study a favourable opinion, the final responsibility for the ethical conduct of this work lies with the researcher(s).

UKRIO Finished Research Checklist:
(If you would like to know more about the checklist, please see your Faculty or Departmental Ethics Committee rep or see the online version of the full checklist at http://www.ukrio.org/what-we-do/code-of-practice-for-research/)

a) Have all of your research and findings been reported accurately, honestly and within a reasonable time frame? YES NO

b) Have all contributions to knowledge been acknowledged? YES NO

c) Have you complied with all agreements relating to intellectual property, publication and authorship? YES NO

d) Has your research data been retained in a secure and accessible form and will it remain so for the required duration? YES NO

e) Does your research comply with all legal, ethical, and contractual requirements? YES NO

Candidate Statement:
I have considered the ethical dimensions of the above named research project, and have successfully obtained the necessary ethical approval(s)

Ethical review number(s) from Faculty Ethics Committee (or from NRES/SCREC): E339

If you have not submitted your work for ethical review, and/or you have answered ‘No’ to one or more of questions a) to e), please explain below why this is so:

Signed (PGRS): Chidubem Andrew Ikeatuegwu Date: 31 Jan 2016
Appendix ii    Research Ethics Approval

17/11/2015
University of Portsmouth Staff Mail - Re: Ethics Review application ref. E339 [Chidubem Ikeatuegwu]

Re: Ethics Review application ref. E339 [Chidubem Ikeatuegwu]
1 message
12 May 2015 at 15:08
To: Chidubem Ikeatuegwu <chidubem.ikeatuegwu@port.ac.uk>, Zoe Dann <zoe.dann@port.ac.uk>

Sharman Rogers <sharman.rogers@port.ac.uk>

Dear Chidubem

Thank you for your email of 8th May. Ethics Committee is pleased to give a favourable opinion to your ethics application and wishes you success with your research project.

Best wishes

Sharman

On 8 May 2015 at 13:16, Chidubem Ikeatuegwu <chidubem.ikeatuegwu@port.ac.uk> wrote:

Dear Sharman,

Thank you very much for your email, and for the comments about the ethics application. The comments are acknowledged and amendment some on the application. Please find therefore the amended document attached with this email.

Please contact me should there be any need for clarification

Thank you and very kind regards,

Chidubem

On 1 May 2015 at 13:19, Sharman Rogers <sharman.rogers@port.ac.uk> wrote:

Dear Chidubem,

Thank you for your thorough application for an ethical opinion. The Faculty Ethics Committee (FEC) would like you to make the following minor amendments to your application to its satisfaction before being able to grant a favourable ethical opinion. Please submit the revised documentation to Sharman Rogers for the FEC's approval.

Q.11. First, please amend your answer to confirm that you will store data on the University's N: drive. This is both more secure than a hard drive and also remotely accessible. Second, what you say here about the period of data storage does not correspond to the statements on your information sheet and consent sheet that you intend to hold data ‘for up to five years’. Please review this, ensuring that what you say conforms with the University’s policy on management of research data (http://www.port.ac.uk/accessioninformation/policies/firsthandknowledgeandresource/transferservices/filetordownload,189755,en.pdf), and adjust the ethics form and supporting documents accordingly.

Q.15. We recommend additionally, for your own safety, that you should keep a local contact in Nigeria informed of your interview schedule and both parties should have a list of emergency contact numbers in case of any problems. Please add such details into your answer to this question.

We look forward to receipt of the amended documentation in due course.

Best wishes

Sharman

On 16 April 2015 at 11:48, Chidubem Ikeatuegwu <chidubem.ikeatuegwu@port.ac.uk> wrote:

Dear Sharman,
Appendix iii    Ethics Approval Application

PBS ETHICS APPROVAL V4: 2014

Ethical Review Checklist – Staff and Doctoral Students

This checklist should be completed by the researcher (PhD students to have DoS check) and sent to Sharman Rogers who will coordinate Ethics Committee scrutiny.

No primary data collection can be undertaken before the supervisor and/or Ethics Committee has given approval.

If, following review of this checklist, amendments to the proposals are agreed to be necessary, the researcher must provide Sharman with an amended version for scrutiny.

1. What are the objectives of the research project?

   This is a case-based study focused on the rentier state of Nigeria with the aim of:

   • Developing a picture of the state of academic entrepreneurship in Nigeria, and

   • Understanding how the presence of rents from oil influence the commercialization of research output, in particular the underlying mechanisms that govern academic entrepreneurship in a petroleum rentier state.

2. Does the research involve NHS patients, resources or staff?  YES [NO] (please circle).

   If YES, it is likely that full ethical review must be obtained from the NHS process before the research can start.

3. Does the research involve MoD staff?  YES [NO] (please circle).

   If YES, then ethical review may need to be undertaken by MoD REC. Please discuss your proposal with your Director of Studies and/or PBS Ethics Committee representative and, if necessary, include a copy of your MoD REC application for quality review.

4. Do you intend to collect primary data from human subjects or data that are identifiable with individuals? (This includes, for example, questionnaires and interviews.) YES / NO (please circle)

   If you do not intend to collect such primary data then please go to question 15.

   If you do intend to collect such primary data then please respond to ALL the questions 5 through 14. If you feel a question does not apply then please respond with n/a (for not applicable).

5. How will the primary data contribute to the objectives of the dissertation / research project?

   This study is a multi-level critical realist study with focus on understanding how the three levels of the individual, the organisation and national level material and ideal structures interact to produce or influence academic entrepreneurship.

   Secondary data would be obtained from documents available from various sources including repositories of government departments as well as those available on websites of government departments, agencies as well as organisations involved in the commercialization of research outcomes. While these sources produce evidence of
material structures, it is essential for a critical realist study to also gain access to the ideal structures.

Primary data is thus crucial for gaining access to the mental modes of individuals/agents in particular their apprehension of the presence of the rents from oil, and how this influences their mindsets, actions or inactions.

The primary data in the form of narratives of the agents which will be accessed through interviews will also add to the account of the state of academic entrepreneurship in the context being studied.

6. What is/are the survey population(s)?

The survey population is academic entrepreneurs operating independently, those operating within the government departments, and those operating within academic institutions in Nigeria. As such two typologies of academic entrepreneurs constitute the survey population:

- Academics who either by working independently or in collaboration with their universities or departments commercialize the outcomes of their research.
- Individuals facilitating the commercialization process, in particular those operating within their university’s Intellectual Property Technology Transfer Office (IPTTO), and those operating within the National Office for Technology Acquisition and Promotion (NOTAP).

7. How big is the sample for each of the survey populations and how was this sample arrived at?

The purpose of this study is not to achieve constant conjunctions through statistical inference, rather using few strong cases to unravel the underlying mechanisms that govern academic entrepreneurship in the rentier state of Nigeria.

The actual size of the study population is not known. The size of the study sample will be 22 consisting of 21 academic entrepreneurs drawn, seven (7) each from three academic institutions in Nigeria and one from the National Office for Technology Acquisition and Promotion (NOTAP). The strategy for selecting the three universities is described under ‘paragraph 8’ below. Other Academic Entrepreneurs operating independently, identified through the secondary data, not listed in the NOTAP compendium may be included in the sample if their story shows significant deviancy from those identified through the NOTAP compendium. In such situations the information oriented selection criteria will be applied in deciding the further cases to be included.
8. How will respondents be selected and recruited?

Participants will be identified and selected as follows:

The Nigerian government through its National Office for Technology Acquisition and Promotion (NOTAP) keeps what it terms "Compendium of Research Results and Inventions". NOTAP in partnership with Nigerian universities and research institutes collate and regularly update details of research results and inventions. The compendium also keeps information about researchers, their fields of expertise, and the current stage of their commercialization projects. Access to the database is available to members of the public on request. The compendium will be the starting point for identifying the academic entrepreneurs for this research.

Cases of commercialization will be identified and selected for inclusion in the study from the compendium. Selection for inclusion in the study shall be based on size of the project determined by the financial value of each project. The top twenty projects will be included in the study. The Academic Entrepreneurs who own the projects and their universities will be identified and their contacts obtained from the compendium or by contacting their Universities. For an in-depth study, the university with the largest number of cases within the selected twenty cases shall be selected for the purpose an in-depth study.

- Contact will be made with the identified academic entrepreneurs either by phone or email with a brief introduction of the research, its purpose and the reason they have been contacted. The invitation will also include an information sheet with more elaborate details of the research and what is expected of the participants. It will also include a consent form.
- Those who wish to participate will indicate interest by replying with a confirmation of their acceptance of the terms of the research by completing and signing the consent form (attached).
9. What steps are proposed to ensure that the requirements of informed consent will be met for those taking part in the research? If an Information Sheet for participants is to be used, please attach it to this form. If not, please explain how you will be able to demonstrate that informed consent has been gained from participants.

- Participants will be provided with information sheet, and a consent form. Participants will give their consent by signing the consent form confirming their acceptance of the terms of the research including consent:

  1. to be interviewed,
  2. for their voice to be recorded, and
  3. for the data generated to be stored used for the research and published.

- The consent will be taken as obtained once a participant signs and returns the consent form. They can also give an oral indication of interest to participate, in which case all necessary information will be provided as above, and the consent form is signed at the point of being interviewed. This process of informed consent shall be completed before any data is collected.

- It will be open to the participants to withdraw their participation before and during data collection. Interviews will be digitally recorded, and the researcher may also take notes during the interviews. Consent will again be dictated and verbally confirmed by the participants at the start of every interview. The oral confirmation will be captured at the start of the recording. If consent is not reconfirmed by the participant at this point, it shall be deemed to have been withdrawn and the interview cannot proceed. If the participant is happy to continue with the interview but has not consented to their voice being recorded, then the interview will proceed with the researcher only taking notes.

- Participants can also withdraw their participation at any time during data collection. If they do, their data will be used up to the point of their withdrawal. Withdrawal will be in writing to the researcher with a statement of their intention to withdraw their participation. Participation can also be orally withdrawn before or during the interview.
10. How will data be collected from each of the sample groups?

The data is qualitative in the forms of discourse, narratives and opinions of the participants. These will be elicited through semi-structured interviews which will be digitally recorded unless consent has not given for such recordings. Participants may also provide other forms of documentary materials they may have, these will not be solicited but will be accepted if the participants provide them.

11. How will data be stored and what will happen to the data at the end of the research?

Audio Recordings will be transcribed verbatim and held as a document in a University of Portsmouth secure N: drive alongside all notes and other documentary evidence obtained from the participants. All audio recordings, transcripts, notes, and materials provided by the participants will be password-protected where possible and securely stored on the University of Portsmouth N: drive during the research process. At the end of the research (expected to be February 2016), all data will be archived and retained. Retention will be in line with the University of Portsmouth Research Data Management Policy which requires that research must be retained for (10) years counting from whichever is the latest of:

• completion of the research,

• publication date of any findings emerging from the data,

• date of last request of the research data by a third party.

At the end of whichever of the above is applicable, the retention of the data will be reviewed. The outcome of the review will determine if the data will continue to be retained and for how long, or if the data will be destroyed.

12. What measures will be taken to prevent unauthorised persons gaining access to the data, and especially to data that may be attributed to identifiable individuals?

The data will only be held by the researcher until shared with members of the research team. At every time, the recording equipment and the computer onto which the data will be transferred will be password protected. Recordings will be deleted from the recording equipment once they are transferred to a secure
University computer. After the research is complete, all data will continue to be securely protected and held on a University computer until destroyed as described in Paragraph 11 above.

13. What steps are proposed to safeguard the anonymity of the respondents?

The participants’ identities will be anonymous. Participants will be assigned identification numbers which will be used only for the purpose of helping the researcher to identify and classify data. In all other places, even when quotes are used they will not be linked or traceable to any participant.

In situations when it is impossible for a participant’s identity to be firmly kept anonymous, for example when their case is so distinct that it is possible for their story or statement to be attributable to them, the possibility of their being identified will be discussed with the participant. In this situation the participant may chose to continue notwithstanding, withdraw their participation, or grant consent for they to be expressly named.

14. Are there any risks (physical or other, including reputational) to respondents that may result from taking part in this research? **YES** NO (please circle).

If YES, please specify and state what measures are proposed to deal with these risks.

There may be a risk that the reputation of participant or that of their institution may be affected as a result of their being investigated. The participants may highlight negative aspects of their work, their institutions, or their departments.

- For the individual participants, respondent anonymity earlier discussed will be strictly followed to ensure that their data are not traceable to them.

- In the case of institutions, the data, and the report will be made available to the institutions to peruse before being published. In a situation where the institution expresses concern, the data will be anonymized before being used/published. In extreme situations, the aspects of data/report where concern has been expressed will be removed from the report.
15. Are there any risks (physical or other, including reputational) to the researcher or to the University that may result from conducting this research? **YES/ NO** (please circle).

If YES, please specify and state what measures are proposed to manage these risks.¹

This research focuses on the rentier state of Nigeria, and the interviews will be conducted in Nigeria. There is warning on www.gov.uk about travelling to Nigeria, this information is continuously updated. The warnings and advice on this website will be followed both in timing the visits and in selecting sections of the country to visit. Reasonable care will be taken not to visit the volatile areas of Nigeria. In such situations, recourse may be made to telephone interviews.

No major specific risk is anticipated, but the researcher will be equipped with a mobile communication device dedicated for the research for the purpose of keeping in constant communication with local contacts in Nigeria and with the University.

Two local persons will be nominated in Nigeria. The researcher and the local persons will have a list of emergency contacts to contact should any adverse situation arise. Both persons will be given a schedule of the interviews including venue, date and time. At least one of the local persons will be contacted on the day of any interview and advised of the start and likely finish time; same person will again be contacted at the end of the interview to confirm there are no concerns. If contact is not established after two hours of scheduled finish time, the local person will initiate contact with appropriate local emergency contact.

16. Will any data be obtained from a company or other organisation? **YES/ NO** (please circle)

For example, information provided by an employer or its employees.

Information will be obtained from:

- NOTAP, an agency of the Nigerian government responsible for the commercialisation of research outcomes.
- Technology transfer offices of select Nigerian Universities
- University departments where the academic entrepreneurs belong
- Organisations that are spin-outs of Nigerian universities.

¹ Risk evaluation should take account of the broad liberty of expression provided by the principle of academic freedom. The university’s conduct with respect to academic freedom is set out in section 9.2 of the Articles of Government and its commitment to academic freedom is in section 1.2 of the Strategic Plan 2004-2008.
17. What steps are proposed to ensure that the requirements of informed consent will be met for that organisation? How will confidentiality be assured for the organisation, such that unauthorised persons will be prevented from accessing the data?

Contacts will be made with only members of these organisations who are in position to deal with issues of consent. Details of the research and the type of data being sought and how they will be used will be communicated to these individuals. Details of the procedures in place for safeguarding information including the University policy on confidentiality will be communicated and maintained throughout. The members of the organisation will sign the consent form confirming that they have given their consent.

No sensitive information will be divulged or shared except for the purpose of this research as detailed under paragraphs 10-13 above.

18. Does the organisation have its own ethics procedure relating to the research you intend to carry out? (YES/NO (please circle).

If YES, the University will require written evidence from the organisation that they have approved the research.

An application shall be made to the organisations requesting information about compliance to their ethics procedures. Compliance requirements for the organisation will be requested using the 'Letter for Approval from Organisation' which is herein attached.

19. Will the proposed research involve any of the following (please put a ✓ next to ‘yes’ or ‘no’; consult your supervisor if you are unsure):

- Vulnerable groups (e.g. children)? YES  NO ✓
- Particularly sensitive topics? YES  NO ✓
- Access to respondents via ‘gatekeepers’? YES  NO ✓
- Use of deception? YES  NO ✓
- Access to confidential personal data? YES  NO ✓
- Psychological stress, anxiety etc? YES  NO ✓
- Intrusive interventions? YES  NO ✓

If answers to any of the above are “YES”, how will the associated risks be minimised?

Care will be taken to ensure that only persons authorised to perform the required actions by the virtue of their positions in their organisations are contacted. In situations where it is not clear if the individuals are authorised to take the required actions, clarification will be sought from the heads of their departments.

Are there any other ethical issues that may arise from the proposed research? No.
Appendix iv  Letter of Introduction to Participants

Research Project Information

Research Title: Academic Entrepreneurship in a Petroleum Rentier State
REC Ref No: E339

Researcher:
- Chidubem Ikeatuegwu; Research Student, Strategy Enterprise and Innovation, University of Portsmouth Business School, chidubem.ikeatuegwu@port.ac.uk

Supervisory Team:
- Dr Zoe Dann, Director of Studies. Senior Lecturer, Strategy Enterprise and Innovation. Associate Dean (Students), University of Portsmouth Business School, zoe.dann@port.ac.uk
- Dr. Vilay Vyas, Associate Supervisor. Senior Lecturer in Enterprise and Entrepreneurship, Strategy Enterprise and Innovation, University of Portsmouth Business School, vilay.vyas@port.ac.uk
- Dr. Andreas Hoecht, Associate Supervisor. Principal Lecturer, Strategy Enterprise and Innovation, Research leader and research degree coordinator, University of Portsmouth Business School, andreas.hoecht@port.ac.uk

You are being invited to participate in our research project. Before you make a decision to or not participate, we wish to provide you information that would enable you understand the nature and subject of the research, and the role you will play should you chose to participate. Please be aware that you are free to ask further questions and seek clarification from us as well as your colleagues and others about any aspect of the invitation and the research project as a whole.

What is the purpose of the research?
Nigeria relies on rents from oil as its major source of income. There are also elaborate research activities going on in Nigeria, outcomes of which may have big commercial values. The aim of this research is to understand how the presence of the rents from oil influences the commercialization of outcomes of research for the purpose of generating national income.

The research originates from the University of Portsmouth- England, it is led by Chidubem Ikeatuegwu, and is expected to result in the award of Doctor of Philosophy (PhD).

Why have I been invited?
You have been invited because working independently or in collaboration with your university or department have developed one or more commercially viable research outcome namely

Date: 27 April 2015
Version No. A01
Do I have to take part?
Participation in this research is voluntary; you may accept or decline to participate. If you agree to participate, you will be asked to sign a consent form.

What will happen to me if I take part?
This aspect of this research involves individual interviews, the interviews will hold between July 2015 and August 2015. You will be interviewed once by the lead researcher (Chidubem Ikeatuegwui), the interview will last about one hour. In special circumstances a follow-up interviews may be necessary, you will be informed in due course if a follow up becomes necessary. Interviews may be over the telephone, or face-to-face at a place and time convenient to you.

Expenses and payments
Participation in this research is voluntary, and may take up to an hour of your time, unfortunately there will be no payment made for participating in this research. It is also not expected that you would incur any expense by participating.

What will I have to do?
The interview will be in a discussion format, you will be asked series of questions related to the process of commercialization of research. You will also be asked questions related to the commercialization projects you have been involved in, as well as your opinions on issues related to commercialization and Nigeria’s oil wealth. The interviews are projected to last under an hour, but may be longer in some circumstances. The interviews will be conducted over the telephone, but there may also be face-to-face meetings. If this will happen, it will be at a place and time most suited and convenient for you.

What are the possible disadvantages and risks of taking part?
Participating in the research may take a little of your time, and as result may impinge on your schedule, and other areas of your work. Also your voice will be recorded and will be played over by the researcher (and/ or transcriber); your opinions will be recorded and transcribed, they may also be quoted, reference will not be made to you as you will remain anonymous.

What are the possible benefits of taking part?
By participating you will be:

- Contributing the stock of knowledge of Academic Entrepreneurship
- Contributing to the knowledge that can bring about Nigeria’s economic diversification.
- Creating an opportunity for voice of Academic Researchers passionate about commercialization to be heard, especially as regards the struggles, challenges and constraints they face.
- Developing an opportunity to network, explore and exploit opportunities for international and cross-institutional collaboration especially regarding education, research, and entrepreneurship.

Will my taking part in the research be kept confidential?
- Your identity will be kept anonymous throughout the research process. During transcription and during analysis you will be assigned an identification number which will be used only for the purpose of helping the researcher to identify and classify data. At all other times, even when quotes are used, they will not be linked or traceable to you.
- In situations when it is impossible for your identity to remain anonymous, for example when your story is so distinct or already in the public domain, making it possible for you, your story or statements identifiable and attributable to you, this will be discussed with you. In such situation it will be open to you to allow the situation as is, withdraw your participation, or grant consent for you to be named.
The interview data generated from the interviews may be retained for future studies for which we will apply for further ethical clearance; you will be informed if this is the case.

Only designated researchers/supervisors from the University of Portsmouth Business School and yourself will have access to identifiable data.

The data will be retained for up to ten years in line with the University of Portsmouth policy on data retention, after which it will be disposed of securely.

You have the right to check the accuracy of data held and make corrections as appropriate.

**What will happen if at some point I wish to discontinue my participation in the research?**
If this be the case you can withdraw in writing. Please ask in writing to Chidubem Ikeatuegwu using the email address chidubem.ikeatuegwu@port.ac.uk. If you withdraw from the research, all data captured up to the point of your withdrawal will be retained.

**What if there is a problem?**
If you have any concerns about any aspect of this research, please do address your concerns to the researcher or the supervisors, who will do their best to answer your questions on +4423 9284 4827. If you are not satisfied and wish to complain formally, you can do this by contact Head of Subject Group – Paul Trott paul.trott@port.ac.uk

**What will happen to the results of the research?**
The results will in conjunction with other data generated for the research be reported as thesis, a part of the requirements for the award of the degree of Doctor of Philosophy (PhD) in Strategy, Enterprise and Innovation of the University of Portsmouth. Aspects of it may also be published as research papers, and in academic journals. In any of the cases, you will not be identified in any report/publication unless you have given your consent to be identified.

**Who is organising and funding the research?**
This research is privately funded and is organised and supervised by University of Portsmouth, UK.

**Who is reviewing this research?**
Research at the University of Portsmouth is overseen by an independent group within the University called the Research Ethics Committee; their major role is to protect your interests. This research has been reviewed and given a favourable opinion by the University of Portsmouth Business School Research Ethics Committee.

**Contacts:**
The Principal Investigator is Chidubem Ikeatuegwu, chidubem.ikeatuegwu@port.ac.uk. Should there be any issues or concerns, please at the first instance direct all correspondence and queries to Chidubem who will follow the University’s laid down procedures to refer any issues appropriately.

**Appreciation:**
The University of Portsmouth is grateful to you for considering participating in the research and taking time to read the information sheet. Should you decide to take part we will ask for a confirmation from you using the attached consent form.
Appendix v  Letter of Invitation to Participants

Invitation to Participate in Research

Study Title: Academic Entrepreneurship in a Petroleum Rentier State

REC Ref No: E339

Researcher:
- Chidubem Ikeateugwu: Research Student, Strategy Enterprise and Innovation, University of Portsmouth Business School, chidubem.ikeateugwu@port.ac.uk.

Supervisory Team:
- Dr Zoe Dann, Director of Studies. Senior Lecturer, Strategy Enterprise and Innovation. Associate Dean (Students), University of Portsmouth Business School. zoe.dann@port.ac.uk.
- Dr. Vijay Vyas, Associate Supervisor. Senior Lecturer in Enterprise and Entrepreneurship, Strategy Enterprise and Innovation, University of Portsmouth Business School, vijay.vyas@port.ac.uk
- Dr. Andreas Hoecht, Associate Supervisor. Principal Lecturer, Strategy Enterprise and Innovation, Research leader and research degree coordinator, University of Portsmouth Business School, andreas.hoecht@port.ac.uk.

Dear Academic Entrepreneur,

An Invitation to Participate in a Research

We are most honoured to invite a distinguished person as you to participate in our research project termed: Determinants and Dynamics of Academic Entrepreneurship in a Petroleum Rentier State.

What is the research about?
The research is focused on Academic Entrepreneurship: the commercialization of innovative outcomes of research in Nigeria. While Nigeria relies heavily on rents from oil as its major source of income, academic entrepreneurship has been argued to be the sustainable alternative to oil as the source of national income. The aim of this research is to understand how the presence of the rents from oil influences the commercialization of outcomes of research such as your xxxxxxxxxxxxxxxxxxxxxxx.

The research originates from the University of Portsmouth, United Kingdom, it is led by Chidubem Ikeateugwu, and is expected to result in the award of Doctor of Philosophy (PhD).
Why have I been invited?
You have been invited because working independently or in collaboration with your university or department have developed one or more commercially viable research outcomes, namely "xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx". You may have also have moved a step further towards commercializing this research outcome.

Do I have to take part?
Participation is voluntary, but we will be most grateful if you do. If you choose to participate, you will take part in an individual interview that will occur between July and August 2015. The interview will be conducted by Chidubem Ikeattegwu at may be over the telephone, or during a face-to-face meeting at a place convenient to you. The interview will typically last under an hour, but in some situations a follow-up interview may be necessary; you will be informed appropriately if a follow up interview becomes necessary.

If are kind to participate then we would be grateful if you could complete the attached consent form and return it by email. We will then contact you via email to arrange an interview. Your participation is entirely voluntary and you can withdraw your participation at any time by contacting the lead researcher in writing via email.

Thank you for your valuable time spent considering your participation, and we look forward to hearing from you.

Web: http://www.port.ac.uk/strategy-enterprise-and-innovation/our-phd-students/chidubem-andrew-ikeattegwu.html
Appendix vi  Participant Consent Form

Consent Form

Study Title: Academic Entrepreneurship in a Petroleum Rentier State

REC Ref No: E339

Researcher:
• Chidubem Ikeatuegwu; Research Student, Strategy Enterprise and Innovation, University of Portsmouth Business School, chidubem.ikeatuegwu@port.ac.uk.

Supervisory Team:
• Dr Zoe Dann, Director of Studies. Senior Lecturer, Strategy Enterprise and Innovation. Associate Dean (Students), University of Portsmouth Business School. zoe.dann@port.ac.uk.
• Dr. Vijay Vyas, Associate Supervisor. Senior Lecturer in Enterprise and Entrepreneurship, Strategy Enterprise and Innovation, University of Portsmouth Business School, vijay.vyas@port.ac.uk
• Dr. Andreas Hoecht, Associate Supervisor. Principal Lecturer, Strategy Enterprise and Innovation, Research leader and research degree coordinator, University of Portsmouth Business School, andreas.hoecht@port.ac.uk.

Please read the information below carefully and check the boxes as appropriate to indicate your consent

1
I have read the information sheet dated 03 July 2015 for the above study, and I do understand it. I also understand I have opportunity to ask questions. Where I have asked questions, I confirm that I have had my questions satisfactorily answered.
○ I Agree
○ I DO NOT agree

2
I understand that my participation is voluntary and that I have an option to withdraw at any time by writing to Mr. Chidubem Ikeatuegwu, up to the point when the data is analysed.
○ I Agree
○ I DO NOT agree

3
I agree to being interviewed and my voice being recorded onto an electronic device
○ I Agree
○ I DO NOT agree

4
I agree to notes being taken during the interviews.
○ I Agree
○ I DO NOT agree

5

Date: 05 July 2015  Version No. 001
I agree to being quoted verbatim, this shall be kept anonymous.
☐ I Agree
☐ I DO NOT agree

6
I understand that data collected during the study, may be looked at by individuals from the University of Portsmouth.
☐ I Agree
☐ I DO NOT agree

7
I give permission for these individuals to have access to the data I provided.
☐ I Agree
☐ I DO NOT agree

8
I agree to my discussion and other contributions being disseminated, once edited and final edited content agreed with me; my identity shall be kept anonymous.
☐ I Agree
☐ I DO NOT agree

9
I understand and agree that the data may be retained for up to five years.
☐ I Agree
☐ I DO NOT agree

10
I voluntarily agree to take part in the study as described above.
☐ I Agree
☐ I DO NOT agree

Please enter your name and initials in the boxes below to indicate that you are signing the form. There may be another opportunity to confirm your consent, and for a paper signature to be given before the interview.

Name (Researcher)  Name (Participant)
Chidubem Ikeatuegwu

Initials (Serves as your Signature)  Initials (Serves as your Signature)
CAI

Date  Date
03 Jul 2015

Please save the form, attach to an email and send to: chidubem.ikeatuegwu@port.ac.uk
<table>
<thead>
<tr>
<th>Question</th>
<th>Follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of department or office. Does the department have a formal name or is it more informal?</td>
<td>What do you consider the biggest challenge to the department and its mission?</td>
</tr>
<tr>
<td>Where would you want the government of your country to be more involved? Would you be open to taking on more responsibilities related to the oil industry?</td>
<td>Do you think there is enough research done by the government or your university?</td>
</tr>
<tr>
<td>What are the ways of revenue through which you can discuss with your university? Can you discuss any other incentives or support programs?</td>
<td>How did you become aware of these incentives?</td>
</tr>
<tr>
<td>Success or failure, what factors will you look at?</td>
<td>Expect what you will need to focus on most?</td>
</tr>
<tr>
<td>What do you consider to be the most important aspect of commercialization?</td>
<td>What do you consider your experience overall?</td>
</tr>
<tr>
<td>Project and actually undertake a commercialization project. Can you please tell me more about that?</td>
<td>What was the greatest success you have had? And how is that?</td>
</tr>
<tr>
<td>What is the greatest challenge you have faced?</td>
<td>Can you recall what inspired you the very first time you started your entrepreneurial journey?</td>
</tr>
</tbody>
</table>

**Notes**
Academic Entrepreneurship in Petroleum Rentier States

XX


Appendix viii  Survey Questionnaire

Title: Academic Entrepreneurship in a Petroleum Rentier State

Purpose of the research
Nigeria relies prevalently on rents from oil as her major source of income. The aim of this research is to understand how the presence of the rents from oil influences the commercialization of outcomes of research. You have been selected to participate in this research because you were identified as an Academic Entrepreneur because of your distinguished status as a reputable researcher, or because of your position as an industrialist that make use of outcomes of research, or because your position within the government which is related to the commercialization of outcomes of research.

Please read the section below carefully and select one option as your response to each question.

1
Please what best describes your highest academic qualification?

2
How many years in total did you spend in education after primary school?

3
How many years of working experience do you have?

4
How many years of experience do you have taking part in commercialization?

5
Please state your average monthly income (in Naira)

6
Which of these best describes your source of income? (You can select more than one)
○ Full time employment ○ Part time employment ○ Self employment
○ Business ownership ○ Consultant ○ Other

7
Which of these best describes your MAIN source of income? (Select only one please)
○ Full time employment ○ Part time employment ○ Self employment
○ Business ownership ○ Consultant ○ Other

Thank you for taking part
Your name (optional)  Your Organisation

If you have a question or any concern, please send me email using the contact address provided. Thank you for choosing to participate, God bless you.

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