

The Value of Academic Labour

Prof. Dr. E.P.J. Kleynhans

1. Introduction

The promotion of a university lecturer to the rank of a full professor it gives one the opportunity to philosophise and reflect on the value of our academic effort. In the inaugural lecture that follows the promotion to the highest level of one's career most lecturers usually summarises their career thus far. It can be assumed that the speaker will also promise his or her future intent.

I may now boastful verbalise about my exceptional publication record in excess of 50 research articles that appeared in accredited blind peer reviewed academic journals, all the places I read international papers and about my wonderful curriculum vitae. It is, however, assumed that the top management already did a proper screening of my credentials when they decided on my promotion.

Instead I wish to state why lecturers are involved in academic labour, to emphasise that academia have a very valuable product and that knowledge has intrinsic value of its own. I wish to state that through all our efforts the world is becoming a better place for all, that academic research yields valuable instruments to improve the world. Knowledge and skills that are useable. But I also wish to plea that universities should also promote more plain useless research, just for the sake of enjoyment, because one never knows when such knowledge will become useful and that knowledge has intrinsic value of its own.

I am, however, an economist and see the world from that perspective. That is probably the reason why my title of this presentation highlights value.

In this presentation I wish to highlight the:

- Value of knowledge and academic effort,
- The practical and useful contribution of academic labour
- The intrinsic value of knowledge
- Plea for basic research and research without a specific purpose
- High quality research

Academia stays committed to academic labour and stick with science as a career despite all the demands, stress, and uncertainties that such a career brings. Many might find this surprising (Bancewicz, 2015:38). Especially in today's uncertain world of "fees must fall", mergers and affirmative action.

Proff. Blaauw and Loots often says the fights among academia are so fierce because the stakes are so low. Bancewicz (2015:40) says perhaps academia are all a bit crazy; who would put in such long hours otherwise. But that is not the main reason most academia is at university. I am here to earn my bread and butter, of course, but

academia are never remunerated and treated fairly. If earning money were one's overriding aim, they would all work in the private sector, especially those trained in scarce skills and in high demand, such as economists.

But on the other hand the psychological remuneration of academic effort is also very positive. The rewards of academic labour range from the utilitarian, solving problems and to gain useful knowledge, to the spiritual (Bancewicz, 2015:39).

2. A Special Calling

Why we are here and why are we busying ourselves with academic labour can in the first instance be seen as exceptional calling. We make the world a better place. It is part of our cultural assignment from the All Mighty. It is because I am Christian. But even those who are not, also aim to achieve this goal. We build the economy, making it easier for ourselves and our fellow human beings.

Here I can see an academic's transcendent determination led by the immanent while focusing on a Higher Being, as Prof. Venter (1996) did in his inaugural address forty years ago. I can easily impress you with a speech that you understand nothing about. I do after all have a Master's degree in Philosophy; but I prefer to use language that you can all understand.

Realising that were ever one is, one is led there by God and should everyday do our work our absolute best implies that whatever one does is service to God. In that light the quality and the contribution academia makes is therefore almost holy, if not totally. This is a wonderful motivation, but also a very important responsibility.

About half of South Africa's workforce are unemployed, and then we do not even count the thousands of discouraged workers who gave up their work search long ago. Further more than half of South Africa's population lives in poverty. Below the absolute poverty line, which implies that they would all die if someone do not assist them now and then. Living in misery and destitute every day, with a very low self-esteem and no hope for tomorrow. To assist in this regard and to build our beautiful country are wonderful consequences of our academic effort.

2. The University as a Firm

A university is a knowledge factory. The first and foremost reason for its existence is that it generates new knowledge. In 1909 Lord Arthur Balfour stated that "the most important activity and purpose of a university is to discover new knowledge. To train men and women, too to use their faculties not merely to acquire knowledge ... but to discover new things and to, gain further control over the conditions in which we live, and to secure further understanding not only of nature but of man – that is the great business of the university" (Lankester, 1916:5).

Duncan Reekie, former dean of the University of the Witwatersrand (WITS) did extensive research on the university as a firm. Any institution should strive towards maximum profits or it will eventually be liquidated and will be forced to leave the industry. This also applies to institutions without a profit motive, the old art. 21

industries, such as the South African Academy of Science and Arts (SAAWK), which has assets and investments exceeding R52 million. And this excludes the prizes they award annually, such as the Hertzog Prize for literature and the MT Steyn Prize for science, both R50 000 and the Het Jan Marais Prize of half a million rand, which are sponsored by others.

Academia has a valuable commodity to sell in the face of all their knowledge, expertise and skills. The university's role as educator and researchers' offer of consultation should, however, be better marketed. Better salaries for lecturers are essential in order to develop a profession image. In 1916 Lankester attributed much of the scientific success in Germany to their excellent training, but also their well-paid body of scientific experts and investigators. He highlighted that "to set the machinery at work – you must pay them handsomely, and give them authority and the means of work." (Lankester, 1916:7&9). Academia should dress better and drive expensive motor vehicle, all in an effort to build a better image. Academia should be proud of their titles, such as professor or doctor, and use it much more.

Academia has a very special and useful product – a wonderful product to sell. The university is a knowledge factory and should emphasise that more and also package and advertise our products more. Degrees and research output should be seen by the public as wonderful and glamorise. Academia are often ashamed of the titles, but we should rather employ that strategically to add to our products and our competitive advantage.

3. Universities are not Schools

Nelson Mandela (1994:20) said "Education is the great engine of personal development. It is through education that the daughter of a peasant can become a doctor, that the son of a mine worker can become the head of the mine that the child of a farmworker can become the president of a great nation. It is what we make out with what we have, not what we are given, that separates one person from another". It should, however, be realised that universities are not schools or a vocational training facilities, even though they contribute much useful knowledge (Bancewicz, 2015:27).

Students enrolling at a university often enquires about the jobs they will be able to find with their university degrees. That is, however, not the purpose of a university. Universities are not career training facilities. Being knowledge generating institutions, universities should consist of only a few intelligentsia. A small status class of the most intelligent and highest educated people engaged in the complex mental labours that critique, guide, and lead in shaping and generating knowledge and wisdom.

Specific job training should be done at technical and other colleges. With this I do not only consider the training of electricians and boilermakers, but also accountants, banking administrators and economic analysts, to name a few. Our research on the banking industry clearly revealed many people with degrees that are unemployed (Oluwajodu *et al.*, 2015). Their skills does not match the job market.

I am pleading for a much larger number of colleges in the country providing technical and professional training to the masses to provide the labour market with people that are immediately employable and an asset to the economy of this country. Only a few

small universities should exist and they should busy themselves primarily with their main business of generating and developing new knowledge.

3. The practical value of academic effort

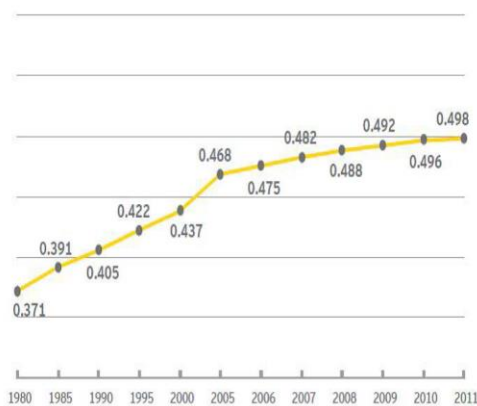
Academic effort has much practical value to better mankind. As an economist my research mainly focuses on industrial development and the competitiveness of firms. This involves the whole competitiveness platform, including resources, the environment, human capital, intellectual capital, location, micro-economic allocation, demand conditions, suppliers, firm structure, strategy and rivalry, supporting associations and industries, finance, banking, efficiency, innovations, technological and knowledge spillovers, energy, productivity, and economic geography. Economists are involved with academic study in order to understand the world, to explain, predict and design policy.

My research has clearly indicated the direct relationship between education and productivity, competitiveness, profits and growing income and job creation (see e.g. Kleynhans, 2016; Kleynhans & Labuschagne, 2012a & 2012; Kleynhans & Swart, 2012; Kleynhans & Zwedala, 2012, Kleynhans & Pradeep, 2013; Kleynhans, 2006).

Considering the economic development of nations it can be shown that people's wellbeing has improved continually during the past five decades.

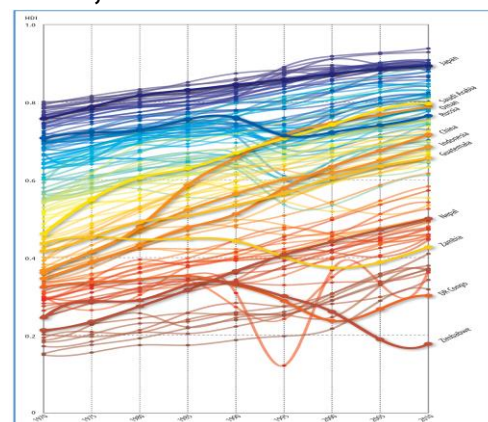
The human development index (HDI) is composed from the per capital national income and production (the GDP), life expectancy, adult literacy, and the average number of school education per capita; this income, health and education (Kleynhans & Naudé, 1999:28). Since 1980, at least, the HDI increased everywhere. Figure 1 shows a continuous rise in HDI. The same is true in Figure 2, which indicates all the countries in the world individually. People all over the world are developing and their living standards are rising (Ernst & Young, 2012:24; UNDP, 2010:27).

Figure 1: Human Development Index for Africa



Source: Ernst & Young, 2012: 24.

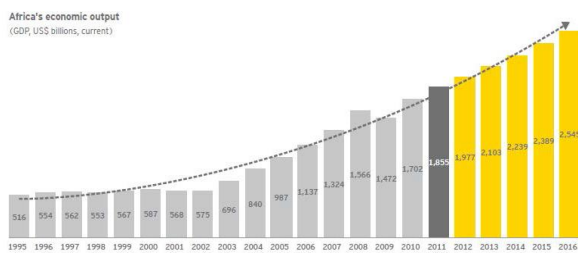
Figure 2: Human Development Index, 1970–2010



Source: UNDP, 2010:27.

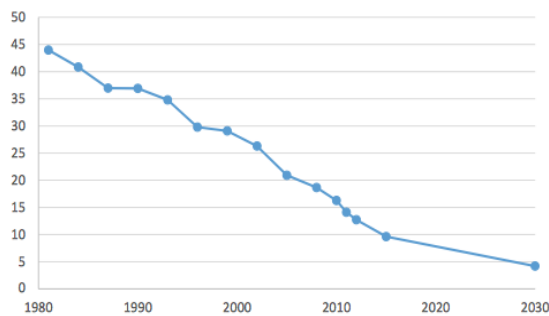
For most of the past four decades African economic growth has outperformed the rest of the world (IMF, 2011) (Figure 3). Economic growth implies a rise in production, income and living standards. According to the UNDP (UNDP, 2017:13 &14) the number of people living in poverty are declining as indicated in Figures 4 and 5. The worldwide poverty rate has declined from approximately 45% in 1980 to less than 10% by 2018.

Figure 3: Economic growth in Africa



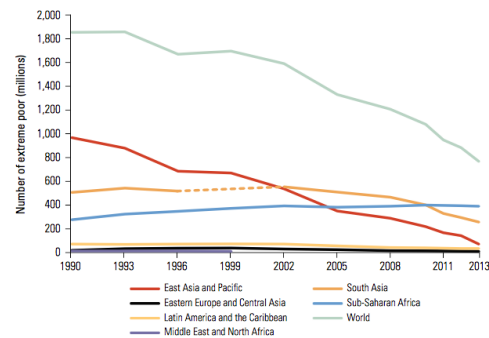
Source: IMF, 2011.

Figure 4: Global extreme poverty 1980-2030 (% of population living on less than US\$1.90 a day)



Source: UNDP, 2017:14.

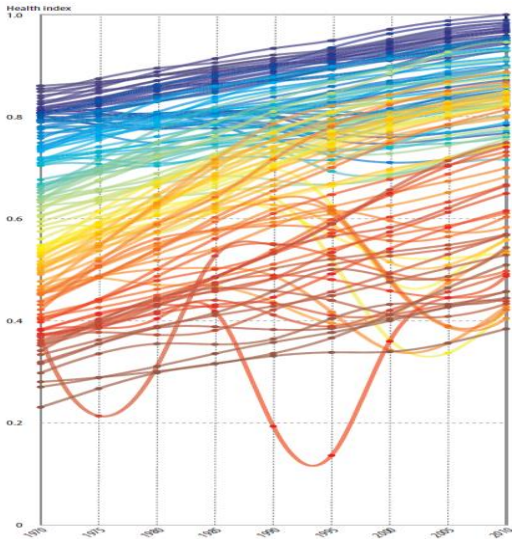
Figure 5: Number of people living below US\$1.90 a day (2011 PPP), 1990-2013



Source: UNDP, 2017:13.

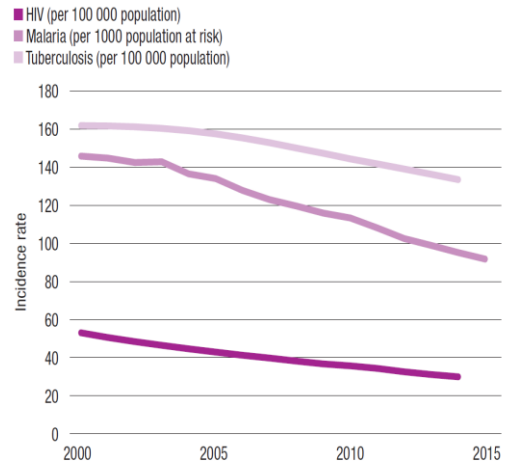
People's health and life expectancy also improved since the 1970s (UNDP, 2010:33). People live longer (Figure 6). The number of people dying from HIV, Malaria and TB are declining constantly as shown in Figure 7. Twenty years ago 140 out of every 100 000 people died, for example, of malaria, today less than 90 (WHO, 2015:103 & UNDP, 2017:51). These are all indications that the quality of people's living standards and circumstances are continually improving as people are becoming more civilised.

Figure 6: Worldwide trends in life expectancy, 1970 – 2010



Source: UNDP, 2010:33.

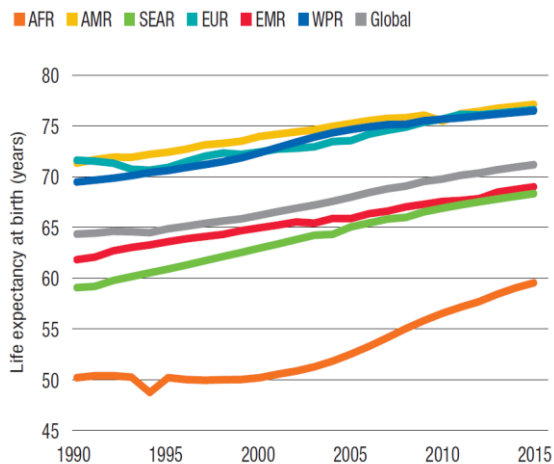
Figure 7: Global trends in HIV, malaria and TB incidence rates, 2000–2015



Source: WHO, 2015:103 & UNDP, 2017:51.

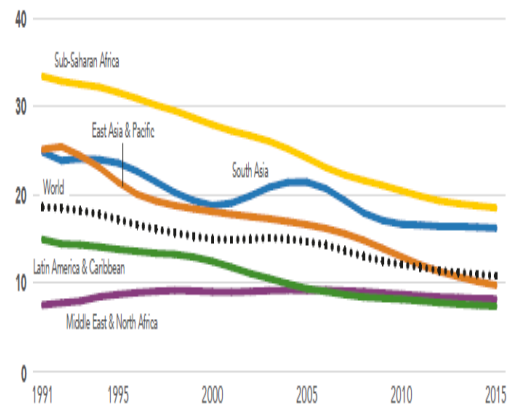
The World Health Organisation (WHO, 2015:11) confirms that people are living longer (Figure 8) and people are better fed. The World Bank (2017:10) indicates states that where 35% of Africa’s population were undernourished there decades ago, it declined to less than 20% today (2018) according to Figure 9.

Figure 8: Life Expectancy in Years



Source: WHO, 2015:11.

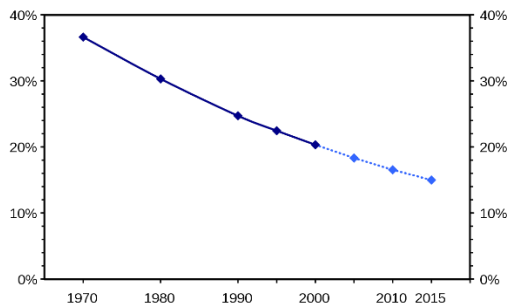
Figure 9: Undernourishment



Source: World Bank, 2017:10.

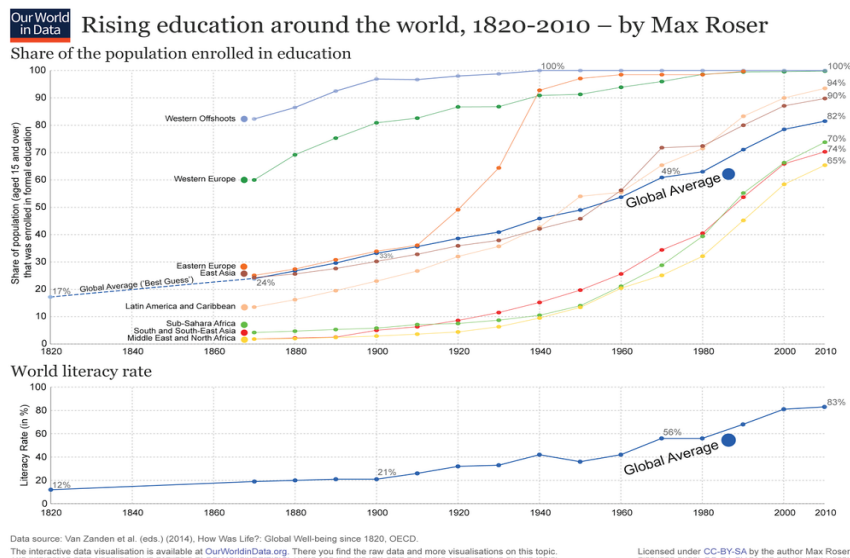
It might, however, be asked what that has to do with academic effort. My research referred to above clearly indicated a direct link between economic development and education and research, but one can also consider the link to education and literacy rates. Through the years the level of illiteracy has declined (Figure 10) and with that global literacy improved and more people are attending school and also for a longer periods – see Figures 10 and 11 (OWID, 2018). According to the World Bank (1980; 2016) literacy rates in Africa rose from 38% during 1945 to an average of 63.3% by 2015.

Figure 10: Illiteracy Rate



Source: OWID, 2018.

Figure 11: Population Education & Literacy Rates

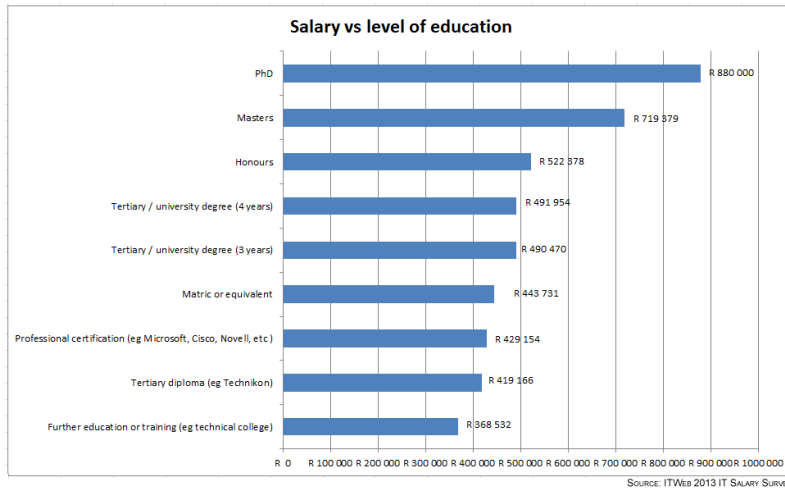


Source: OWID, 2018.

With all the figures considered in this section there is a clear association between academic effort as it configure in levels of education and research and the advantages of a better living for all. Development is the direct result of proper and robust research efforts.

Already in 1916 Lankester (1916:7) stressed the value and importance of scientific knowledge. Academia possess a valuable asset and should be proud about it. There is also a direct link between the level of education and people’s remuneration. Figure 12 shows the relationship between higher levels of education and salaries in South Africa.

Figure 12: South Africa: Salary vs Education



Source: Web Surveys. 2013.

Many academia does academic research because of the useful output that can be used to make the world a better place and delivers more comfort to everyone. Lankester (1916:1) stressed that the application of knowledge leads to great things and said “But there is, perhaps, a greater and more vivid satisfaction for those who do or make great and splendid things which all men can see, and for which all men are grateful”. In this way academia are servants of their fellow man. Academia also search for breakthroughs in knowledge and science to make a name for themselves and promote their careers.

Sir Ray Lankester stated in 1910 “The delight which are experienced by those who discover new things in the various branches of science is, no doubt, very great. To reveal to other men processes, properties, existences in the natural world hitherto unsuspected, or, if suspected, yet eluding the grasp of man. Is to do something which gives him who does it a sense that he is of value in the world – a sense which will uphold him and enable him to endure adversary, and even persecution, with equanimity” (Lankester, 1916:1).

Balfour in 1909 also states that the purpose of universities are to change the external surface of civilisation, which adds to the well-being of mankind, which is going to stimulate the imagination of all those who are interested in the universe in which our lot is cast. He would rather be known as having added to the sum of our knowledge of the truth of nature than anything else (Lankester, 1916:6).

4. The intrinsic value of knowledge.

The slogan “knowledge is power” is attributed the founder of the modern scientific method, Sir Francis Bacon (Henry, 2018), but knowledge also has much intrinsic value of its own. Already in the first century AD Cicero emphasised the importance of knowledge for its own sake. Newman (1915:85) and Reekie (1996:135) agreed and referred to Cicero who said that one always desires to learn more because that is still hidden or wonderful is essential for one’s happiness. Not knowing brings uncertainty and stress, but for an academic and researcher also the excitement when one has the opportunity to search for answers and understanding.

Knowledge entails the collection of facts, but also the internal networks and connexions between facts and the complicated dynamics behind it. It is necessary to explain the world. Knowledge also implies specific skills, as well as insight behind scientific phenomena to understand the world. The main objective behind the search for knowledge is to obtain wisdom. To always know what the correct thing is to do. To determine the correct policies and conduct to follow, to make predictions and to look into the future and do what would be best for civilisation to come.

Most of academia are on university because they have enquiring minds. They are curious about the world. God made the world a wonderful place, interesting and amazing. Everything are, however, not already known and people, and especially academia, have the wonderful opportunity to search for knowledge, insight and wisdom. We are explorers and inventors. We are in wonder and awe for God's creation. With an overwhelming feeling of wonder or admiration. Inspire to find out more. And if you are one of those who feel offended by my use of the words “God” and “creation”, well then I do not like it very much, but you are welcome to replace those words with something else you prefer, the principle remains the same. This give one a rational to conduct research and enjoy the most wonderful profession anyone can dream of.

This lecture started by illustrating how academic effort makes the world a better place. But knowledge has an intrinsic value in its own right. And I wish to plead to the authorities of this university and of our country, to recognise the value of basic research and even aimless research just for the enjoyment thereof, because knowledge are very valuable and one never knows where it would be needed next.

5. Wonder is the beginning of wisdom

Socrates said 500 years BC that wonder is the beginning of wisdom (Plato, 1986). Academia are motivated by curiosity and inspiring. Academic effort leads one to discover wonder, complexity, beauty and the unexplainable, which leads to curiosity about the natural world and even the deeper meaning of it all (Bancewicz, 2015:34 & 189). Hepburn (1980) saw wonder as a ‘desire for knowledge’.

The whole creation is given to man, but how it works and how it can be utilised to better people’s lives can only be discovered through hard work, an inquiring mind, dedication and much grace. Sir Isaac Newton saw himself as a child playing on a

beach, now and then discovering a beautiful or precious shell or a rock (Wootton, 2016). The founder of the modern scientific method, Sir Frances Bacon, saw the Almighty as a loving father hiding “Easter eggs” for researchers to discover (Dolnick, 2011).

Research in Economics let one, for example, stand in awe on how the free market can provide in everyone’s needs, how is it possible that econometrics can estimate further economic growth and development indicators so accurately, and how can millions of transactions can daily constitute equilibrium prices.

This also led me one wonder about economic aspects that interests one. I, for example, investigated the factors that enhance industrial competitiveness (Kleynhans 2016); how optimal allocation of resources on the factory floor can be improved to create higher profits, create jobs and generate wealth (Van Zyl & Kleynhans, 1995; Kleynhans, 2002). How technological and knowledge spillovers can improve competitiveness and industrial success, or even be harmful to the competitive position of firms? (Kleynhans, & Swart, 2012; Kleynhans & Zwedala, 2012). Does agricultural competitiveness differs from manufacturing firms? (Van der Merwe, Cloete, Van Schalkwyk, & Kleynhans, 2016; Kleynhans, 1998). Does technology has specific influence on competitiveness? How can economic activities in one district or region influence economic indicators, such as employment or income of others on the spatial economic landscape, and if so to what extend? What are the size of the multipliers? Has business confidence any influence on regional economic development? (Kleynhans & Coetzee, 2017.). Does people’s culture have any influence on development and competitiveness? (Kleynhans, 2004).

I wondered to what extend does location influence the competitiveness of industries and the efficiency of manufacturers (Kleynhans & Drewes, 2008a: 2018b). What are the specific risks that specific industries offer to foreign investment in our industries? (Coetzee, Bezuidenhout, Claassen & Kleynhans, 2016). The competitive advantage of specific industries in specific provinces, such as Mpumalanga and KwaZulu-Natal (Visser, Pisa, Kleynhans & Wait, 2015). The goldmines are becoming empty and overhead costs are rising. Are there other industries that could replace their place in the economic landscape? (Kleynhans & Sekhobela, 2008; 2011); the efficiency of the service industries? (2012). What about the size of firms? (Kleynhans, 2009). Global value chains (Bezuidenhout, Grater & Kleynhans, 2018.) and the competitive threat posed by steel imports from China? (Van der Merwe & Kleynhans, 2017). Does environmental legislation influence industrial competitiveness in any way? (Kleynhans & Kotzé, 2008). What influence does economic policies have on the efficiency and success of regional or industrial development, such as the Platinum Spatial Initiative (Kleynhans, Naudé & Van der Merwe, 2003; Drewes & Kleynhans, 2011; Kleynhans & Claassen, 2012), the relationship between economic growth in provinces and the level of infrastructure (Coetzee & Kleynhans, 2017) or industrial reforms in India (Kleynhans & Pradeep, 2013)? And are there economic convergence between municipal industries within provinces, such as KwaZulu-Natal (Coetzee & Kleynhans, 2018).

I also wondered about many other aspects that also led to research projects, such as how effective the Africa Union is (Bezuidenhout & Kleynhans, 2014), and what about trade liberalisation (Bongsha, Bezuidenhout, Kleynhans & Krugell, 2014), economic freedom (Coetzee & Kleynhans, 2017); the Wal-Mart/Massmart merger (Bezuidenhout & Kleynhans, 2015); sovereign oil funds (Van Ingen, Wait & Kleynhans, 2014); mine

water pollution (Steyn & Kleynhans, 2014.); electricity load-shedding by Eskom (Volkwyn & Kleynhans, 2014), Shale Gas (Chapman, Wait, & Kleynhans, 2016); nuclear (Lombaard & Kleynhans, 2016); and BEE (Kleynhans & Kruger, 2014).

Research gives one the opportunity to appreciate the beauty and wonder of the world and the universe. Doing science one can never fulfil intellectually complete, as it always leads to more questions to be investigate (Bancewicz, 2015:54). Science enables researcher to enjoy the amassing discoveries that academic effort reveals about the world and the people who live on it.

Some of the main drivers of science are fascination, wonder, curiosity, the enjoyment of meeting a challenge, the privilege of making discoveries, and perhaps ambition. Through the process of discovery and making sense of things (Bancewicz, 2015:39 & 173), humans may hopefully gain wisdom and the ability to explain, understand and make predictions (Mohr, 2015). Carson (1990) states that scientific investigation leads to a realisation that researchers are busy with something much deeper, lasting, greater and significant (Moltmann, 2003).

What makes the research investigation such an enjoyable experience is the wonder it reveals and one's fascination about the discoveries it brings about (Bancewicz, 2015:162). Albert Einstein (1931) said that a person who cannot stop and stand in wonder and awe about nature and the world, is as good as dead. Reality is always more surprising than anyone can imagine (Moltmann, 1999:161).

To find something you never imagined, going beyond the unexpected and say "Wow!" makes academic effort worthwhile. When research reveals something new one stands in awe and overwhelming with a realisation that one is busy with something much bigger than one selves. Research reveals things that is more beautiful, powerful and complex than oneself or one's imagination. Awe fills one with a feeling of reverence and respect (Bancewicz, 2015:161).

Discovering wonderful research results motivates one curious to seek for more (. One enjoys the process as one untangles the mysteries of the world. The researcher often requires one to change his paradigms and mental framework (Bancewicz, 2015:162).

The Greek philosopher saw wonder as the beginning of knowledge because when one finds something strange one searches for answers. The fathers of the scientific method, like Sir Francis Bacon and René Descartes regarded wonder as an opportunity to discover new knowledge (Bancewicz, 2015:162).

The enlightened thinkers, like Adam Smith, made an error when they stated that wonder and emotions should be eliminated when one is in the pursuit of knowledge. That is what motivated the researcher to continue his investigations and make academic effort worthwhile. Whether one is investigating consumer behaviour, entrepreneur actions, the effects of soil on plant growth, the action between acids and bases, the cooking of new dishes, or any other physical force acting in physics or the optimal allocation of resources, the scientist can always appreciate the beauty and strange phenomena, which motivates more research (Bancewicz, 2015:163), because amazement and wonder are the beginning of knowledge and wisdom.

Adam Smith believed that as knowledge increases wonder would disappear, but for the researcher that realise the interesting implications of the day to day discoveries

that research bring, the wonder and opportunities to investigate never ends as the researcher are in a continues circle of ignorance, wonder, discovery and informed wonder (Boden, 1985; Bancewicz, 2015:168 & 170). Deeper understanding leads to a deeper design to understand more and the wonder never ends (Boden, 1985:391).

There is also an immense satisfaction when things come together and begins to make sense (Bancewicz, 2015:39). There is that feeling of pure joy when one discovers something new. To thing you are the first to see some new insight or the beauty revealed by some scientific data. For the faithful there is also the added privilege of knowing one is studying the work of God and through that fulfilling once calling and exercising service to God (Bancewicz, 2015:40). Academia are privileged to exercise creativity and imagination (Bancewicz, 2015:39).

As academia engage in research it is important to reflect constantly on the wonder of their work and discoveries, big and small. The researcher should cultivate an attitude of wonder. It gives meaning to one's academic effort; it motivates and leads to renewed enthusiasm and energy to reach even better heights of research output. Only when a researcher allows the subject matter under study to astonish can things is understood properly (Moltmann, 2003). When a researcher gets the impression that he or she knows everything, perceptions shuts down and the research stagnates. To some extend the researcher should always maintain a degree of childlike awareness and wonder.

A delicate balance between believe and scepticism must prevail. When a researcher finds something new or interesting it supplies inspiration to discover and learn more continuing further research. One might wonder about the mechanism or the cause and so wonder motivates more research and this leads to a search for the deeper meaning of it all. Bancewicz (2015: 189-190) states that when knowledge begins with wonder, the researcher will never be satisfied with pet answers.

The universe has a fantastic level of order and that is beautiful (Bancewicz, 2015:45). Human beings, especially Homo *Economicus*, are rational beings and to large extend the world also works rationally. It is worth investigating nature. Experiments can be repeated and generic rules can be derived. Most interestingly, in human sciences, such as Economics, the world is dynamic and these rules can also evolve and change. The universe can be described logically and mathematically. These scientific assumptions are true and it works well, but it cannot be proven (Bancewicz, 2015:44).

When a researcher stands in wonder about the subject matter being investigated it leaves the realisation that what we are busy with something bigger than ourselves. The sea of knowledge is so deep that mankind will never be able to comprehend it completely. Deeper study let one realise how little we know. The deeper one studies the bigger the mystery becomes and the more inspired an academics. All that we can do is to utilise our analytical and descriptive tools at our disposal to the best of our ability (Bancewicz, 2015:190). In the end academic labour becomes service to God, as one stands in awe about His creation (Wiseman, 2012; Hardin, 2001:253).

6. The value of aimless and basic research

Academic effort and particularly research should, in the first instance, be conducted for the purely for the enjoyment it brings. Enjoyment enables people to become more

innovative and leads to more discoveries. Academic freedom that allows academia to conduct the research what interests them leads to better products. When people do what interest them, it is done with more motivation, care, time and creativity. Consider how much effort and time people usually put into their hobbies.

One often finds that a problem statement should be set to address a specific problem, and students and funding are only allowed if the particular research are of immediate value for South Africa and its people today, or the institution, or would immediately bring funds to the research unit of department. If that is not the case a student should find some other problem to study, or a research would find a new research focus.

Any research should generate knowledge that is generic in the sense that it can be applicable to many areas. Research with a much focused aim or problem to dissolve are often only of value in the short-term. One never knows where knowledge would be needed in future. To name a few examples:

When the ancient Greeks developed Euclidean geometry 300 BC, they never intended it to be used to teach our high school students logical thinking, nor putting a man on the moon.

When George Boole (1847) developed Boolean algebra in 1847 he never knew that it would be used to develop digital electronics and design digital computers; just as no one of us know where you would use multiplication when you learned it in grade 1 or Statistics as a first year student.

As a young academic the Nobel Prize winner in Physics, Richard Feynman, one day went to his superior and expressed his worries concerning the quality of his research and the topics he investigated. He was, however, told to investigate just what fascinates him and what he enjoys. One day he was sitting in a pizza parlour and the chef thrown a pizza, which wobbled through the air. He wondered about the curve the pizza followed and developed the mathematics of wobbles. This was exactly the mathematics he needed later on when he developed the theory of quantum electrodynamics and super fluids; eventually winning the Noble Prize.

The scientific method currently in use demands a clear problem statement and a specific hypothesis. This requires specific theory beforehand to motivate the problem statement, but could also cause bias, when one already tries to guess the research results using the hypothesis. This might cause bias from the researcher. It that regards new techniques, such as data mining might be of more value (Ayres, 2007). Taking the data and see where the research leads to. It was for example found that people with bad credit records also cause more motor vehicle accidents, which seems unrelated at first-hand, but are valuable to know, by insurance companies.

Searching for knowledge of knowledge's own sake, is thus valuable. Jevons saw a close relationship between the long-term business cycle, the Kondratiev, which has an economic boom every eleven years, coinciding with the accumulation of sunspots on the surface of the sun. We often experience that as interference on the radio, causing moments of silence and other times some phrases of speech or music repeated. This could make sense because less sunshine, can cause lower agricultural production, and a decline in the whole economy; especially in less developed African countries, where agriculture contributes a very large share to their gross domestic product.

Richard Feynman (2005:188) says "*There is a considerable amount of intellectual tyranny in the name of science*". At universities and the research community there often exists a kind of Academic Darwinism where those in power decides who gains funding and what kind of research people should do. I regard even the campaign against the so-called predatory journals as a way to keep competitors out. Academia should be encouraged to do research whatever they prefer. This will encourage research and eventually improves research excellence as practice makes perfect.

I am pleading for more basic and more useless research. When people enjoy what they do, the results are of better quality. More economic freedom to conduct the research academia wish to do will eventually be to everyone's advantage.

This does not, however, mean that quality should be compromised. Any research should always adhere to principles of the highest standards.

7. The way Science should be done

Science should still be thorough even if the researchers enjoy what they are doing. Academic effort requires a delicate balance between art and science. I do not say that one should just believe anything or do sloppy research and it is wrong to believe anything on insufficient evidence. (Clifford, 1999; Bancewicz, 2015:44). Nobel Prize laureate in Physics, Richard Feynman (2005), says: "Science is the belief in the ignorance of experts". Academic effort should always be conducted thoroughly. The aim is to discover the truth (Bancewicz, 2015:49). The validity of evidence and figures should always be confirmed by researcher. It is important to evaluate and investigate anything and establish from the start that what is assumed is correct.

In Economics, as in all cognitive sciences, the assumption is that people are rational and that the world is worth exploring, and that there exist set laws that can be discovered and exploited to the benefit of mankind. Science can be derived and described logically and mathematically. These assumptions work but one cannot proof it scientifically (Bancewicz, 2015:44).

The application of mathematic to science is the most powerful instrument in understanding the world. Since great thinkers such as Descartes, Leibnitz and Newton started applying mathematics to natural phenomena amazing realities had been discovered (Kline, 1996). Logical thinking has surpassed magic and faith in ancient Greek philosophers long dead. And with mathematics I mean all the related mathematical disciplines, which includes calculus, algebra, geometry, arithmetic, statistics and econometrics. A mathematical and logical approach leads to new insight and stimulates further curiosity (Eastaway, 2005).

The universe and science are logical and that enables the formulation of scientific laws that can be applied to man's advantage (Bronowski, 1966). When thought is applied to facts it leads to knowledge. The world is rational and through rationality and empirical observations and processing new knowledge is generated (Wootton, 2016).

It is possible to understand the physical universe through the application of mathematics and finite human brains. It is not only possible to understand but also to apply engineer knowledge so obtained to develop technology and make the world a better place for all living here. Some people find mathematics difficult and even says it makes their brains hurt, but researchers see it as a challenge as they realise its

value. Intellectual wrestling is also seen as a very special type of wonder (Bancewicz, 2015:180). As more is discovered deeper understanding leads to deeper levels of wonder.

Any academic labour should follow strict logical order. One often finds people lacking logical capacity; even students with degrees in Economics. Logic should be taught as a subject at school. A student would introduce an essay saying how wonderful socialism is, but the complete the rest of the paper, highlighting the merits of a free market economy. With the “Fees must fall Campaign” people assume that the state has lots of money, but if that was the case then why is it necessary for government to address there deficit before borrowing annually through large loans from abroad?

8. Summary and conclusion

Universities has a long history staring through history of the Greek philosophers and its traditions and inclination was especial established during the middle-aged. In the past, going to university and especially being inaugurated as a professor was a big occasion, accompanied with ceremony and honour. This is also what I experience here today with my inauguration. The procession, being clothed by my superiors and the inaugural speech presents the final achievement of a long career, hard work and dedication. In this presentation I expressed my views relating to the value of academic labour, defended my promotion and indicated how I see my way forward as an academic.

This presentation indicated my research focus on industrial economics and international competitiveness, but the focus is on the value of academic labour. The presentation first indicated that academia serves a higher calling. This firstly resides from the respect for academic wisdom, but also a feeling that one is serving a higher calling from the All Mighty.

I wished to indicate that academic labour, which includes research, teaching and self-study, has high value and that academia has a wonderful product and should market it better. Al the academic labour makes the world a better place and it was illustrated how large the improvement in economic development was during the past four development decades. Worldwide the levels of poverty and inequality had improved, as well as the levels of health and nourishment – and most importantly with that the literacy rates and years attending schooling improved.

The emphasis of the presentation was, however, a special plea that research should be conducted in the first instance for enjoyment and not necessary to impress others or for a specific purpose. Research results should be generic to sustain the test of time. It should be applicable in a wide range of problems and challenges. Especially useless research, or basic research or research without a specific objective can be particularly useful in the future. One never knows when a particular piece of knowledge will be needed in future. Examples were give relating to Euclidean geography, the mathematics of wobbles and Boolean algebra.

The Greek philosopher Cicero stated that wisdom starts with wonder. Academia does research because the stand in awe and amazement of the creation and the results their research produces. They always study and investigate because they have a desire to know more. Curiosity should always be the greatest motivator. Knowledge

has intrinsic value, which is more valuable than gold and coral. Economic studies may, of course also lead to material wealth, but the psychological remuneration brings the most and lasting fulfilment and satisfaction.

The presentation concluded stating that although research and academic labour should be for enjoyment and focused on the academic's personal interest, high academics and research principles should never be compromised. Economics and Econometric should be quantitative and apply mathematics appropriately. Academic standards are what makes academic labour valuable and are something that academia should be proud of.

-o0o-

Bibliography

- Ayres, I. 2007. Super crunchers. London: John Murry.
- Bancewicz, R.M. 2015. God in the lab. How science enhances faith. Oxford: Monarch Books.
- Bezuidenhout, H., Grater, S. & Kleynhans, E.P.J. 2018. Investigating the global value chain dimensions of FDI flows of the agro-industrial sector of South Africa. *Acta Commercii*. 18(1):1-13. a560. <https://doi.org/10.4102/ac.v18i1.560>
- Bezuidenhout, H. & Kleynhans, E.P.J. 2015. Implications of foreign direct investment on sovereignty: The Wal-Mart/Massmart merger as illustration. *South African Journal of International Affairs*. 22(1):93-110.
- Bezuidenhout, H. & Kleynhans, E.P.J. 2014. 'n Evaluasie van die Afrika-Unie as internasionale organisasie. *Tydskrif vir Geesteswetenskappe*. 54(2):267-282. <http://www.scielo.org.za/pdf/tvg/v54n2/07.pdf>
- Boden, M.A. 1985. Wonder and understanding. *Zygon*®, 20(4):391–400.
- Boole, G. 1847. Mathematical Analysis of Logic. Cambridge: McMillan.
- Bongsha, B., Bezuidenhout, H., Kleynhans, E.P.J. & Krugell, W.F. 2014. The Effect of Trade Liberalisation on Cameroonian Manufacturing Export Performance. *Studia Oeconomica*. 59(1):3-24. http://studiaoeconomica.ubbcluj.ro/Abstract/volume591/abstract_01.pdf
- Borgen Project. 2016. 5 Global Poverty Infographics Show 2015 Progress. 18 Feb. Seattle: Borgen Project. <https://borgenproject.org/2015-global-poverty-infographics/> Accessed 8 Aug. 2018.
- Bronowski, J. 1966. The common sense of science. Harmondsworth: Penguin.
- Carson, R. 1990. The sense of wonder. Berkeley, CA: Nature Company.
- Cahalan, S. 2018. 9 charts that prove there's never been a better time to be alive. *New York Post*. March 3. <https://nypost.com/2018/03/03/9-charts-that-prove-theres-never-been-a-better-time-to-be-alive/> Accessed 8 Aug. 2018.
- Chapman, G., Wait, R. & Kleynhans, E.P.J. 2016. The Governance of the Shale Gas Mining in South Africa. *South African Journal of International Affairs*. 23(1):69-

88. abstract:
<http://www.tandfonline.com/doi/abs/10.1080/10220461.2015.1096211> article:
<http://www.tandfonline.com/doi/pdf/10.1080/10220461.2015.1096211>
- Clifford, W.K. 1999. *The Ethics of Belief and Other Essays (Great Books in Philosophy)*. New York: Prometheus.
- Coetzee, C.E. & Kleynhans, E.P.J. 2017a. Public Capital Stock and Economic Growth– a KwaZulu-Natal Case Study. *South African Journal of Economic and Managerial Sciences*. 20(1): a1591: 1-10. DOI: <http://dx.doi.org/10.4102/sajems.v20i1.1591>
- Coetzee, C.E. & Kleynhans, E.P.J. 2017b. Economic Freedom and Economic Growth in South Africa. *Managing Global Transitions. International Research Journal*. 15(2):169-185. <http://www.fm-kp.si/zalozba/ISSN/1581-6311.htm>
- Coetzee, C.E. & Kleynhans, E.P.J. 2018. Investigating city economic convergence in KwaZulu-Natal, South Africa: Integration or isolation. *Regional Science, Policy and Practice*, 2018:1–20. <https://doi.org/10.1111/rsp3.12140>
- Coetzee, Z., Bezuidenhout, H., Claassen C. & Kleynhans, E.P.J. 2016. Profiling sectoral risks of foreign direct investment (FDI) in Africa for the first decade of the 21st century. *Journal of Economic and Financial Sciences*. 9(1):153-173. Abstract: <https://jefjournal.org.za/index.php/jef/article/view/35> Article: <https://jefjournal.org.za/index.php/jef/article/view/35/32>
- Dolnick, E. 2012. *Clockwork Universe: Isaac Newton, the Royal Society, and the Birth of the Modern World*. New York: Harper Perennial.
- Drewes, E. & Kleynhans, E.P.J. 2011. Re-Evaluation of the Platinum SDI: A Critical Commentary. *Journal of Economic and Financial Sciences*. 4(1):63-80. http://reference.sabinet.co.za/webx/access/electronic_journals/jefs/jefs_v4_n1_a5.pdf
- Du Sautoy, M. 2016. *What We Cannot Know: Explorations at the Edge of Knowledge*. London: Harper Collins.
- Eastaway, R. 2005. *Why do buses come in threes?* London: Robson Books.
- Einstein, A. 1931. *Living Philosophies* London: Ams Press.
- Ernst & Young. 2012. *Africa attractiveness survey: Africa: Building bridges*. London: EY.
- Feynman. R.P. 2005. *The pleasure of finding things out*. New York: Basic Books.
- Hardin, J. 2001. What is the perspective from bioscience? *Perspectives on Science and Christian Faith*. 53(4):248 – 537.
- Hardy, G.H. 1992. *A mathematician's apology*. Cambridge: Cambridge University Press.
- Hausman, D.M. red. 1984. *The Philosophy of Economics: An Anthology*. Cambridge: Cambridge University Press.
- Henry, J. 2018. *Knowledge Is Power*. London: Icon Books.
- Hepburn, R.W. 1980. Wonder. In: *Aristotelian Society Supplementary Volume*, 54(1):1–24.

- IMF. 2017. Regional economic outlook. Sub-Saharan Africa: Restarting the Growth Engine. Washington, D.C.: International Monetary Fund.
- IMF. 2011. Regional economic outlook. Sub-Saharan Africa: Slowing Growth, Rising Risks. Washington, D.C.: International Monetary Fund.
- Keynes, J.N. 1917. The Scope and Method of Political Economy. *In*: Hausman, D.M. The Philosophy of Economics. Cambridge: Cambridge University Press.
- Kleynhans E.P.J. 2016. Determinates of Industrial Competitiveness and the Role of Spillovers. *Journal of Applied Business Research*. 32(2):527-540.
<http://www.cluteinstitute.com/ojs/index.php/JABR/article/view/9594/9689>
- Kleynhans, E.P.J. 2012. Die Effek van Dalende Goudmynproduksievlakke op Indiensname in die Dr. Kenneth Kaunda-Distriksmunisipaliteit. *Tydskrif vir Geesteswetenskappe*. 52(4): 678-704.
<http://www.scielo.org.za/pdf/tvg/v52n4/14.pdf>
- Kleynhans, E.P.J. 2009. Size Matters: Comparing Competitiveness of Manufacturers of Various Sizes in South Africa. *Journal of Economic and Financial Sciences*. 3(1): 31-48.
http://reference.sabinet.co.za/webx/access/electronic_journals/jefs/jefs_v3_n1_a4.pdf
- Kleynhans, E.P.J. 2006. The Role of Human Capital in the Competitive Platform of South African Industries. *South African Journal of Human Resource Management*. 4(3): 56-63.
<http://www.sajhrm.co.za/index.php/sajhrm/article/viewFile/100/101>
- Kleynhans, E.P.J. 2004. 'n Geïntegreerde Benadering tot die Armoedevraagstuk met Inagneming van Ekonomie en Kultuur. *Tydskrif vir Geesteswetenskappe*. 44(2 & 3): 180-192. Jun. / Sep.
http://reference.sabinet.co.za.nwulib.nwu.ac.za/webx/access/electronic_journal_s/akgees/akgees_v44_n2_a10.pdf
- Kleynhans, 2002. A Macroeconomic Analysis of Productivity in the Manufacturing Industry of North West. *Journal of Industrial Psychology*. 28(1): 73-77.
<http://www.sajip.co.za/index.php/sajip/article/view/30/28>
- Kleynhans, E.P.J. 1998. Komparatiewe Voordeel in die Landbou. [*Comparative Advantage in Agriculture*]. *South African Journal of Economic and Management Sciences*. SAJEMS NS 1(3): 498-512.
- Kleynhans, E.P.J. & Claassen, C. 2012. A Shift-Share Analysis of Job Creation by the Platinum SDI during its first decade (1996-2006). *Journal of Economic and Financial Sciences*. 5(2): 591-606.
http://reference.sabinet.co.za/webx/access/electronic_journals/jefs/jefs_v5_n2_a16.pdf
- Kleynhans, E.P.J. & Coetzee, C.E. 2017. The Influence of Space on Business Confidence. *AfricaGrowth Agenda*. 14(1):15-17.
<http://journals.co.za/content/journal/10520/EJC-67c6157bf>
- Kleynhans, E.P.J. & Drewes, J.E. 2008a. The Influence of Location on the Efficiency of Manufacturers in South Africa. *Town and Regional Planning*. 53:1-
<http://apps.ufs.ac.za/journals/dl/system/docs/17/59/639/01-Kleynhans%20And%20Drewes.pdf>

- Kleynhans, E.P.J. & Drewes, J.E. 2008b. The Influence of Location on the International Competitiveness of South African Industries. *Journal of Economic and Financial Sciences*. 2(2): 139-158.
http://reference.sabinet.co.za/webx/access/electronic_journals/jefs/jefs_v2_n2_a3.pdf
- Kleynhans, E.P.J. & Kruger, M.C. 2014, Effect of Black Economic Empowerment on profit and competitiveness of firms in South Africa, *Acta Commercii*, 14(1), abstract: <http://dx.doi.org/10.4102/ac.v14i1.200> article: <http://www.actacommercii.co.za/index.php/acta/article/viewFile/200/314>
- Kleynhans, E.P.J. & Kotzé, L. 2008. The Effect of South African Environmental Legislation on the Competitiveness of Local Industries: A Critical Analysis in the Context of Sustainability. *The South African Journal of Environmental Law and Policy*. 15(2): 245-277.
- Kleynhans, E.P.J. & Labuschagne, R. 2012a. Human Capital Constraints in South Africa: A Firm Level Analysis. *Managing Global Transitions. International Research Journal*. 10(1): 71-88. http://www.fm-kp.si/zalozba/ISSN/1581-6311/10_069-086.pdf
- Kleynhans, E.P.J. & Labuschagne, R. 2012b. The Quality of Human Capital in South Africa: Evidence from a Firm Survey. *African Journal of Business Management*. 6(23): 6914-6923.
- Kleynhans, E.P.J. & Naudé, W.A. 1999. Economic Development Decisions & Policy – A South African Manual. Potchefstroom University for CHE
- Kleynhans, E.P.J. Naudé, W.A. & Van der Merwe, S.J. 2003. Spatial Economic Development in South Africa: An Overview and Evaluation of the Platinum Spatial Development Initiative. *Development Southern Africa*. 20(5): 617-631. Des. <http://www.tandfonline.com/doi/pdf/10.1080/0376835032000149261>
- Kleynhans, E.P.J. & Pradeep, V. 2013. Productivity, Technical Progress and Scale Efficiency in Indian Manufacturing: Post-Reform Performance. *Journal of Economic and Financial Sciences*. 6(2):479-495.
http://reference.sabinet.co.za/webx/access/electronic_journals/jefs/jefs_v6_n2_a12.pdf
- Kleynhans, E.P.J. & Sekhobela, M.J. 2011. Shift- Share Analysis of Production in the Manufacturing Industry of South Africa's Southern District Municipality. *Journal of Economic and Financial Sciences*. 4(1): 10-30.
http://reference.sabinet.co.za/webx/access/electronic_journals/jefs/jefs_v4_n1_a2.pdf
- Kleynhans, E.P.J. & Sekhobela, M.J. 2008a. Shift–Share Analysis of Manufacturing as a Measuring Instrument for Human Resource Management. *South African Journal of Human Resource Management*. 6(3): 14-21.
<http://www.sajhrm.co.za/index.php/sajhrm/article/view/158/168>
- Kleynhans, E.P.J. & Swart, A. 2012. Spillover Effects Enhancing Sales, Production and Competitiveness of South African Manufacturers. *African Journal of Business Management*. 6(10):3699-3705.
http://www.academicjournals.org/article/article1380874717_Kleynhans%20and%20Swart.pdf

- Kleynhans, E.P.J. & Zwedala, S. 2012. The Contribution of FDI, Technology and R&D to Spillovers in Industrial Development: A South African Firm-Level Investigation. *Managing Global Transitions. International Research Journal*. 10(4):341-359. http://www.fm-kp.si/zalozba/ISSN/1581-6311/10_341-359.pdf
- Kline, M. 1996. *Mathematics in Western Culture*. New York, N.Y. Oxford University Press.
- Lombaard, A.L. & Kleynhans, E.P.J. 2016. The feasibility of a Nuclear Renaissance: A cost-benefit analysis of nuclear energy as a power source. *Acta Commercii*. 16(1):1-11.
- Lankester, R. 1916. *Science from an easy chair*. London: Methuen.
- Mandela, M. 1994. *Long walk to freedom*. Boston: Little, Brown.
- Moltmann, J. 2003. *Science and wisdom*. London: SCM.
- Moltmann, J. 1999. *God for a secular society*. London: SCM.
- Mohr, P. 2015. *Economics for South African students*. Pretoria: Van Schaiks.
- Newman, J.H. 1915. *On the Scope and Nature of University Education*. London: Everyman, Dent.
- Oluwajodu, F., Blaauw, P.F., Greyling, L. & Kleynhans, E.P.J. 2015. Graduate Unemployment in South Africa's Banking Sector. *The South African Journal of Human Resource Management*. 13(1):1-9.
- Our World in Data (OWID). 2018. World is changing. Homepage. <https://ourworldindata.org/> Accessed 8 Aug. 2018.
- Plato. 1986. *The Dialogues of Plato*. Translated by Segal, E. New York: Bantam.
- Reekie, W.D. 1996. The university as a firm: Oxymoron or a Pour Parler se Tirer D'affaire? *South African Journal of Economics*. 64(3):139-150. <https://doi.org/10.1111/j.1813-6982.1996.tb01125.x>
- Steyn, J. & Kleynhans, E.P.J. 2014. Die Ekonomiese Impak van Belasting op Mynwater in Suid-Afrika. *SA Tydskrif vir Natuurwetenskap en Tegnologie*. 33(1), Abstract: <http://www.satnt.ac.za/index.php/satnt/article/view/780> article: <http://www.satnt.ac.za/index.php/satnt/article/viewFile/780/2691>
- Thurow, L.C. 1983. *Dangerous Currents. The State of Economics*. New York: Random House.
- UNDP. 2017. *Global trends. Challenges and opportunities in the implementation of the sustainable development goals*. New York: United Nations Development Programme and United Nations Research Institute for Social Development.
- UNDP. 2013. *Human Development Report 2013: Millennium Development Goals: A compact among nations to end human poverty*. New York: Oxford.
- UNDP. 2010. *Human Development Report 2010: The Real Wealth of Nations: Pathways to Human Development*. 20th Anniversary Edition. United Nations Development Programme.
- Van der Merwe, J.D.; Cloete; P.C.; Van Schalkwyk, H.D. & Kleynhans, E.P.J. 2016. The Competitive Status of the South African Wheat Industry. *Journal of Economic and Financial Sciences*. 9(3):651-666.

- Van der Merwe, W.R. & Kleynhans, E.P.J. 2017. Die Krisis in die Suid-Afrikaanse staalbedryf te midde van Sjinese Mededinging. *Tydskrif vir Geesteswetenskappe*. 57(2-2):521-541.
- Van Ingen, C., Wait, R. & Kleynhans, E.P.J. 2014. Fiscal Policy and Revenue Management in Resource-rich African Countries: A Comparative Study of Norway and Nigeria. *South African Journal of International Affairs*. 21(3):367-390. abstract: <http://dx.doi.org/10.1080/10220461.2014.968200> Article: <http://www.tandfonline.com/doi/pdf/10.1080/10220461.2014.968200>
- Van Zyl, G. & Kleynhans, E.P.J. 1995. A Cobb-Douglas Estimation of Labour Productivity in the South African Motor Vehicle Industry. *Journal of Industrial Psychology*, 21(1):6-9. <http://www.sajip.co.za/index.php/sajip/article/viewFile/581/531>
- Venter, W.J. 1976. Metodologiese verkenning in Ekonomie. Wetenskaplike bydraes van die PU vir CHO. Reeks H: Inougurele Redes Nr. 6. Potchefstroom: Potchefstroomse Universiteit vir Christelike Hoër Onderwys.
- Visser, M., Pisa, N.M., Kleynhans, E.P.J. & Wait, R. 2015. Identifying the comparative advantage of products and industries of South Africa's Mpumalanga Province. *Southern African Business Review*. 19(2): 27-50. http://www.unisa.ac.za/contents/faculties/service_dept/docs/Sabview_19_2_chap2.pdf
- Volkwyn, B.J. & Kleynhans, E.P.J. 2014. Die Verskaffing van Elektrisiteit deur Eskom: Die Impak van Beurtkrag en Hoër Pryse op die Suid- Afrikaanse Ekonomie, *Suid-Afrikaanse Tydskrif vir Natuurwetenskap en Tegnologie*, 33(1):1-11. Abstract: <http://dx.doi.org/10.4102/satnt.v33i1.430> article: <http://www.satnt.ac.za/index.php/satnt/article/viewFile/430/2597>
- Web Surveys. 2013. IT Salary Survey 2013. South Africa. http://v2.itweb.co.za/index.php?option=com_content&view=article&id=65848# Accessed 16 August 2018.
- WHO. 2015. Health in 2015: From MDGs, Millennium Goals to SDGs, Sustainable Development Goals. Geneva: World Health Organization.
- Wiseman, J. 2012. Science as an instrument of worship. *BioLogos*. 5 Mar. <https://biologos.org/blogs/archive/science-as-an-instrument-of-worship-part-1> Accessed 4 Aug. 2018
- Wootton. D. 2016. *The Invention of Science: A New History of the Scientific Revolution*. London: Penguin.
- World Bank. 2018b. *World Development Indicators 2018*. Washington: World Bank.
- World Bank. 2017. *Atlas of Sustainable Development Goals 2017, from World Development Indicators*. Washington: World Bank.
- World Bank. 1990. *World Development Report 1990: Poverty*. Washington: Oxford.
- World Bank. 1980. *World Development Report 1980: Poverty*. Washington: Oxford.