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Tourism and entrepreneurship: A literature review

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ABSTRACT

The purpose of this study was to examine the possible relationship between tourism and entrepreneurship. This paper, therefore, tried to investigate the research articles which were published in the journals indexed by SSCI, SCI and SCI-E between 1994 and 2018. Bibliometric methods were employed in the analysis of the articles. After analysing the available articles chosen in line with the criterion set for this study, the authors obtained 142 articles concerning tourism and entrepreneurship. The results of this study reveal that the articles compassing tourism and entrepreneurshipare grouped under three themes; a) small and medium tourism entreprises; b) types of entrepreneurship and c) the studies about entrepreneurship in tourism industry. The investigated articles were found to focus on different large scale topics in terms of quantity and quality. It was also found in the study that knowledge production of tourism and entrepreneurship has increased since the 2010s. This study is expected to contribute to the relevant literature by offering a wider perspective regarding the field of tourism and entrepreneurship in terms of the number of the studies, journals where articles were published, the countries where the researches were conducted, research methods and themes.

1. Introduction

The concept of entrepreneurship derived from the French word "entreprende" which means "undertake" (Carton, Hofer and Meeks, 1998). Entrepreneurship is efficiently used by different disciplines such as economics, sociology, finance, history, psychology and anthropology, each of which works in its own terms and uses the relevant concept (Low and MacMillan, 1988). Shane and Venkataraman (2000) define entrepreneurship as the use of opportunities for the discovery, evaluation and promotion of goods and services provided, forms of organization, markets, processes and raw materials that were not available before.

Previous literature shows that there are various approaches to entrepreneurship, and these approaches share a common legacy and language but point at different directions in the functions of entrepreneurs (Nooteboom, 1993). Parker (2004) grouped these views on entrepreneurship in a chronological order. Initially, entrepreneurship comes upwith arbitrage and uncertainty. Using the concept of entrepreneurship for the first time in 1755, Richard Cantillon in 1755, put entrepreneurship term to use by gathering landowners, entrepreneurs and employees among three different classes (Hébert and Link, 1989). Duing the following period, while Kirzner emphasized entrepreneurs as arbitrators; Knight emphasized that entrepreneurs should face uncertainty (Parker, 2004). By the 18th century, the French economist J. B. Say emphasized that entrepreneurs were at the centre of the economic system as they manage the factors of production and making a profit and identified entrepreneurs with a key role in shifting economic resources into high-efficiency areas (Dees, 1998; Drucker, 2002: 21).

In the 20th century, Joseph Schumpeter mentioned that entrepreneurship requires innovation and that entrepreneurs are responsible for doing new things or doing things in a new way. After that, Leibenstein has raised the issue of defining characteristics of entrepreneurs by mentioning that entrepreneurs have fulfiled changes with their abilities such as leadership, motivation, solving crises and taking risks (Parker, 2004). As the last of the views on entrepreneurship, McClelland touched on personal and psychological characteristics, emphasizing that individuals exhibit some behaviours depending on their needs such as establishing close relationships, obtaining power and achieving success (Iraz, 2010).

As a result of the spread of the globalization worldwide, the formation of a competitive environment has increased the importance and function of entrepreneurship in different fields (Küçükaltan, 2009); especially after the 1980s, the revival of small enterprises and the revival of entrepreneurship has attracted attention (Wennekers and Thurik, 1999).

Entrepreneurship, which has a characteristic in practice, plays an important role in the analysis and solution of both macro and micro problems (Baumol, 1968). Entrepreneurship also has a very important place in many sectors as it has contributed to economic stability, growth and prosperity (Özdevecioğlu and Karaca, 2015); to the creation of macroeconomic parameters that are important in national economies such as national income and employment (Küçükaltan, 2009) and to personal development and solution of social problems (Ball, 2005). Entrepreneurship has an increasing importance in the tourism sector as in all other sectors (Çalkın and Işık, 2017). The tourism sector is highly dependent on entrepreneurship because its survival is closely linked to entrepreneurial activities and sustainability (Crnogaj, Rebernik, Hojnik and Omerzel Gomezelj,2014). The ongoing research for responsible and sustainable practices in the tourism sector opens out alternative approaches contributing to the development of tourism; local communities' prioritization for innovative tourism entrepreneurship and development strategies (Aquino, Lück and Schanzel,2018).

While the attention to entrepreneurship as a new topic in the tourism industry is rising, the relevant literature still remains limited. The main scope of this study is to review the tourism and entrepreneurship researches in the literature, to explore the main aspects of the studies and to assess the current state of the available studies.

Because the entrepreneurship as a theme has variations, the number of studies on these themes remain limited and this consequently blocks the the production of the necessary knowledge (Solvoll, Alsos and Bulanova, 2015). This study not only reviews the literature but also aims to explore the emerging entrepreneurship themes within the tourism context. By revealing the remaining concepts and themes and by offering suggestions for uncommon themes, the study intends to give a clue for potential researchers and promote them to get the highlights of into consideration in their future researches. To gain a deeper insight into the related, relevant literature

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would definitely provide a guideline for future researches. The results of this study summarize what has been done so far and what needs to be done in the research fields of tourism and entrepreneurship.

In the study, the themes covered were found to have mainly been embedded in small and medium entreprises in tourism industry; types of entrepreneurship and the studies about entrepreneurship in tourism industry such as entrepreneurial behavior, entrepreneurship in sustainable tourism, economic aspects of entrepreneurship in tourism industry, entrepreneurship education in tourism etc. The results of the bibliometric analysis have been collated based on year, the country where the research was conducted, the method, theme, the journal and the index of the publishing journal.

Solvoll et al., (2015) emphasize that the literature directing entrepreneurship in tourism sector remains dispersed although the existing literatüre underlines the important role of entrepreneurship in creating value in the tourism sector. In this context, based on the literature reviews three basic studies appear on tourism and entrepreneurship. The first bibliometric analysis in the literature on tourism and entrepreneurship was conducted by Li (2008). The other studies in the literature were the studies of Solvoll et al. (2015) and Fu, Okumus Wu and Köseoglu(2019). Detailed information is provided under the section of the literature review.

Despite the growing amount of published research on tourism and entrepreneurship, little is known and has been done about the bibliometric process employed in these studies. Since the pioneering study by Li (2008), there have been only two different researches focusing on tourism and entrepreneurship. Thus this study aims to fill the gap in the relevant literature by focusing on the concepts of tourism and entrepreneurship and reviewing Web of Science database. Journals with SSCI, SCI, SCIE and A&HCI indexes were investigated for this purpose. The main differences of this study are laid out in three processes; a) the methodological approach which included the database, b) the studies which have been conducted between 1994 to 2018 and all of the countries where the studies were conducted or locations were counted in, c) the theoretical basis.

This study is a compilation of the studies covering tourism and entrepreneurship. It offers a summary including the number of studies, the countries where such studies were commonly conducted, the research methods, journals commonly publishing the articles, number of the studies per index and total index. This study has six parts consecutively; introduction,

2. Literature regarding tourism and entrepreneurship

Tourism is one of the world's most rapidly growing sector and it leads to a lot of economic effects. Both developed and developing countries try to increase their income via tourism for their economic growth (Hye and Khan, 2012; Kreishan, 2010; Lee and Chang, 2008). There are certainly some ways for countries to achieve this. But one of the most important of them is closely related to the concept of entrepreneurship.

Ateljevic and Li (2009) emphasize that the concept of tourism entrepreneurship is not well understood even though tourism seems to be an attractive sector for investors and entrepreneurs. The hospitality and tourism sector has been an efficient area for entrepreneurial attempts (e.g Thomas Cook's tour packages, Ray Kroc's McDonald's, Walt Disney's theme parks, J. W. Marriott and Conrad Hilton's hotels). It is certain that tourism and hospitality have a strong need for innovation and enterprises need to respond to the increasing and changing tourism demand in an innovative manner. This also explains the necessity and importance of entrepreneurship in tourism (Crnogaj et al., 2014). Entrepreneurship in tourism has increasingly been described as a strategy for economic development in underdeveloped regions (Jóhannesson and Huijbens, 2010), and several countries support new business start-ups within tourism, particularly in underdeveloped areas (Solvoll et al., 2015).

Examples of entrepreneurship that emerged as small-sized family companies and SMEs in the past, such as rural tourism (Beeton, 2002) agri-tourism (McGehee and Kim, 2004), homestay (Zamani-Farahani, 2011) and social entrepreneurship, have been continuing their existence in different genres. Sociological studies such as gender, age and education are also included in the entrepreneurship literature and this leads to the awareness regarding entrepreneurship education (Pırnar, 2015).

Changing tourists' lifestyles and their holiday patterns (Crnogaj et al., 2014) requires diversification of tourism products and services in order to meet the needs of new types of tourists in the sector (Lordkipanidze, Brezet and Backman, 2005). Thus, the continuous change in tourist motivations and preferences, the ongoing development in tourism trends, the increase in the demand for new tourism products and services, the increases in the number of new tourists and the increase in the severe industrial competitionall make the issue of tourismentrepreneurship a survival necessity for tourism and hospitality companies (Pırnar, 2015). Hospitality and Tourism (H &T) entrepreneurship focused on e-entrepreneurship (Oumlil and Juiz, 2018), ICT (Gössling and Hall, 2018) sustainable or green tourism with emerging technologies and innovations.

In the initial review of literature between 1986 and 2006, in Cornell Hotel and Restaurant Administration Quarterly (CHRAQ), International Journal of Hospitality Management (IJHM), International Journal of Contemporary Hospitality Management (IJCHM), Annals of Tourism Research (ATR), and Tourism Management (TM) journals, the articles related to tourism and entrepreneurship are classified according to the number, type and topic of the researches. Li (2008) states that the theoretical studies on tourism entrepreneurship remain limited as found out in the literature review. Li (2008) also states that the theoretical foundations of the studies are poor, many of them suffer from poor methodological designs, poor data quality and methodological complexity.

Solvoll et. al. (2015) discusses how the literature on tourism entrepreneurship is related to the mainstream entrepreneurship literature in terms of research questions, theoretical perspectives and the research methods in the articles published between 2000 and 2012. The articles on tourism entrepreneurship are examined under three categories (as part of another phenomenon, divergent approach and convergent approach) according to their relationship with the main literature on entrepreneurship by taking the advantage of Hjalager (2010) and Alsos, Eide and Madsen (2014)'s perspective. Solvoll et al. (2015) detects that the studies were mostly published in tourism journals despite the increase in the number of articles published in recent years. One of the main reasons is that the issues investigated were not accepted as an area of interest other than tourism. Other result drive out the increase in the number of studies in the field of tourism entrepreneurship the strenght of theoretical infrastructures and the improvement of methodological designs.

Fu et al. (2019) reviewes 108 SSCI publications published in three main databases in the last 22 years (1995-2016) which are ought to have contributions to the development of entrepreneurship in the field of H & T. Research results show that the research topics on entrepreneurship in H & T have been expanding from the developed countries to the developing countries. The research in the field of H & T starts at the meso level (firms) and gradually develops towards the micro level (individual entrepreneurs) and macro level (environment).

3. Methodology

Bibliometric analysis is a process of evaluating academic knowledge using some statistical analyses (Ruhanen, Weiler, Moyle and McLennan, 2015). This process is based on some parameters like the number of articles, journals, countries and authors. The basic idea behind the bibliometric studies is to gather and evaluate the quality and quantity of the available academic knowledge. Therefore, it is possible to see what has been done and what could be done. In other words, bibliometric studies reveal some key factors of academic knowledge production in a research field over time and give ideas about academic knowledge creation (Van Raan, 2005).

Although bibliometric studies in tourism field significantly have increased since 2008, there was also some studies using bibliometric analysis method prior to this period (Koseoglu, Rahimi, Okumuş and Liu, 2016). For example, there were discipline-based studies such as sustainable tourism (Ruhanen et al., 2015), host perceptions (Sharpley, 2014), tourism planning and policy (Dredge and Jamal, 2015). There were also some studies carried out with multidisciplinary perspectives on tourism field such as tourism and its economic impact (Comerio and Strozzi, 2018) and tourism and marketing (Mulet-Forteza, Martorell-Cunill, Merigó, Genovart-Balaguer and Mauleon-Mendez, 2018). As previously mentioned, Li (2008), Solvoll et al. (2015) and Fu et al. (2019) reviewed the studies in the field of tourism and entrepreneurship from different perspectives.

The main purpose of this study is to evaluate the general state of tourism and the studies on entrepreneurship that has been conducted between 1994 and 2018. Thus the sample data is based on a 24-years period. The reason starting by 1994 as the cutting edge is that the first studies in the Web of Science database available for authors were first published in 1994. The sub-purposes of this study are two-fold: 1) to investigate the quantity of the studies according to the number of studies, location, publishing journal, research methodology 2) to create a framework of the themes and reveal a theoretical relationship.

To analyze the obtained data, the following steps were applied. In the first section, two authors searched the WoS (Web of Science)database between January and February 2019. The authors looked for thekeywordsof “tourism” and “entrepreneurship”, “entrepreneurship in tourism” in the titles of the researches. To ensure that all studies were gathered, they also searched for the terms “entrepreneur” and “entrepreneurship”. Only the research articles were included in this search. In the second step, four authors reviewed the articles’ abstracts to ensure that all studies were relevant to the field of tourism and entrepreneurship. Some articles were found to have lacked the keywords looked for in their titles while some of them could be about tourism and entrepreneurship. The search was conducted by topic, and authors wanted to find out only the relevant articles. Therefore, the abstracts, literature sections and the findings of the articles were read, and finally, all studies were entered in the Excel by the four authors with the parameters, such as author’/authors’ name(s), title of the article, publication date, location, research method, results, theme, journal title and index. As a number of studies were available in Web of Science database, the repeating studies were identified in the main table. The finalised data set included 142 research articles which focused on tourism and entrepreneurship. All statistical analyses were made in Excel program calculating their frequencies. The aim of the later step was to clarify the number of researches according to the number of studies, the countries where studies were commonly conducted, the research methods, journals commonly publishing the articles. In the last step, the most studied themes were cretaed.

4. Results and Discussion

As seen in Figure 1, the number of studies per year began to increase from the year of 2010. After 2007, the upward trend continued with binary numbers and with the year, 2010 the increase gained momentum, the number of studies published was found to be more than five per year. After 2016, the number of studies has reached 10 or more. As the research period of this study ended in November 2018, the studies which were published in 2019, were not included.

Distribution of the studies by years reveals that the number of tourism and entrepreneurship studies have significantly increased especially in recent years. This result could be related to the fact that the number of academic studies in the field is also increasing.

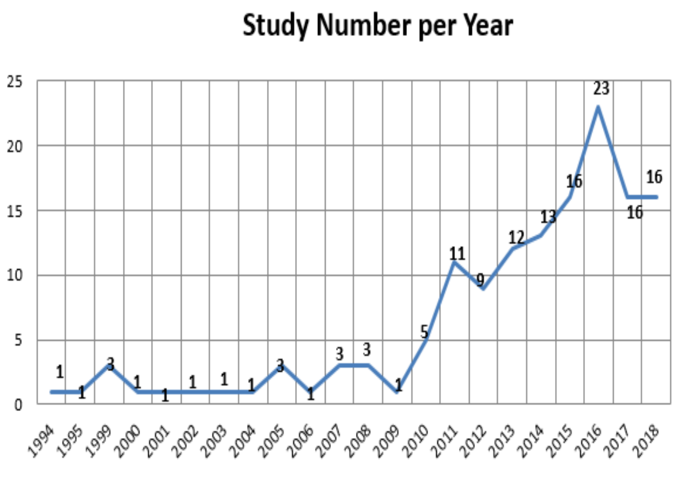

Fig. 1. Number of Studies Per Year

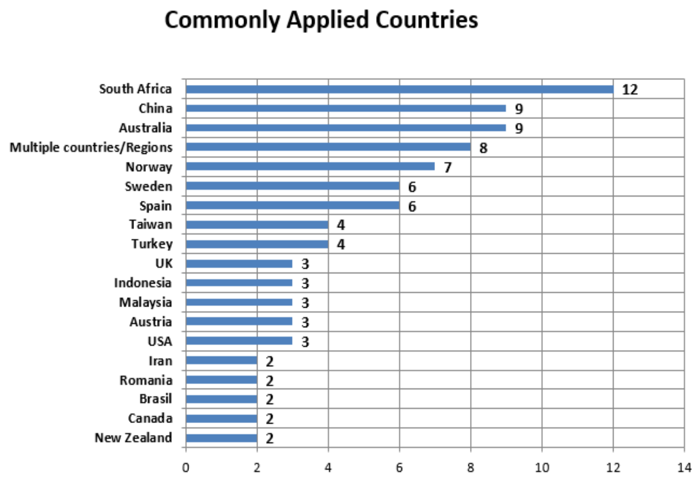

Figure 2. The Countries Where Studies were Commonly Conducted

Figure 2 covers the countries where the researches were most commonly conducted. In this bibliometric analysis, the total of 142 studies were examined in terms of where they were conducted and the research areas. After examining the 8 studies, which were conceptual studies or the area/country information was not given in the study, totally 134 studies were examined in detail. South Africa, China and Australia were found to be the popular research areas in the examined studies. On the other hand the figure shows that the least studies countries are New Zealand, Canada, Brasil, Romania and Iran.

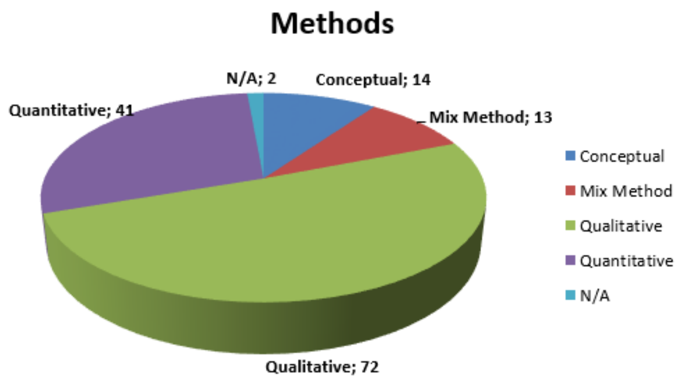

Figure 3. Research Methods

In Figure 3, the results of the analysis of the methodological approaches of academic studies are provided. The qualitative studies were found to be 72 and the quantitative studies were found to be 41. In the rest of the examined studies, mixed method and conceptual method were found to have been preferred.

Journal	Number of Studies
Tourism Management Perspectives	3
Journal of Sustainable Tourism	5
Sustainability	4
Tourism Geographies	4
Current Issues in Tourism	5
Journal of Hospitality and Tourism Management	5
Scandinavian Journal of Hospitality and Tourism	7
Asia Pacific Journal of Tourism Research	9
Annals of Tourism Reserarch	14
International Journal of Contemporary Hospitality Management	15
Tourism Management	19

Figure 4. Journals Commonly Published in

In the bibliometric analysis, 142 studies were obtained in the field of tourism and entrepreneurship and indexed in WOS database. These studies were found to have been published in 52 different journals. Figure 4 summarizes the journals that the studies were most commonly published. Tourism Management was found to be the most publishing journal. International Journal of Contemporary Hospitality, Annals of Tourism Research and Acia Pacific Journal of Tourism Research were found to be the other leading journals.

Another important finding of the study was about the themes of articles. After analyzing 142 studies, the authors of this study divided the obtained themes under groups. Although it was difficult to analyze the themes according to the number of the article, as the articles were commonly placed in multiple themes, the authors prefered to group the most studied and repeating themes. According to this, the most studied theme was small and medium tourism entreprises. Articles were found to generally focus on the following themes as; a) small and medium sized entreprises in tourism; b)types of entrepreneurship such as tourism/social/lifestyle/cultural/agri-tourism entrepreneurship etc. c) the studies about entrepreneurship in tourism industry such as entrepreneurial behaviour, entrepreneurship in sustainable tourism, entrepreneurship and economic geography, entrepreneurship education in tourism etc.

5. Conclusions

Bibliometric studies can provide helpful and timely information for researchers and managers. Therefore, scholars, managers, government officials and consultants in the tourism field can benefit from the outcomes of such bibliometric studies (Koseoglu et al., 2016). This review has particularly focused on the relationship between tourism and entrepreneurship in the related literature. Solvoll et al. (2015) found that the studies were mostly published in tourism journals despite the increase in the number of articles published in recent years. As one reason for this situation, the fact that the issues investigated were not accepted as an area of interest other than tourism could be given here. One of the results of the research is the increase in the number of the studies in the field of tourism entrepreneurship which has been developing rapidly, and in some studies, the theoretical infrastructures were founded on a more powerful baseand the methodological designs were improved.

In addition, it was emphasized that although many studies adopted a practical approach to responding the questions faced by tourism entrepreneurs and organizations seeking to improve the tourism sector, a synthesized and practical knowledge for researchers and policymakers have lackeddespitethe increasing number of the studies examining entrepreneurship in the tourism sector.

In addition to being the mostly interregional comparison, it is evident that researches have been conducted widely in the developed countries such as China, Australia, Scandinavian countries (Norway, Sweden) and also in the developing countries like South Africa, Malaysia. Tourism Management is the most published journal.

Ireland, Reutzel and Webb(2005) found that the use of the qualitative method was increasing among researchers in the field of entrepreneurship. Li (2008)suggested that future scholars might combine qualitative methods with quantitative ones, which is hoped to provide particularly rich and robust inquiries in the research in the field of entrepreneurship. Although the number of studies using mixed method increased, more than half of the studies conducted until the end of 2018 were found to be qualitative. In future studies, different methods can be used. The least used method was found to be in the conceptual studies. It is certain that the systematic progress of scientific knowledge depends on the existence and theoretical coherence of empirical research (Koppl, 2007). However, conceptual studies help to develop the quality of the investigated discipline or science (Adom, Hussein and Agyem, 2018). Therefore, further studies are suggested to focus on the concepts or theories of tourism and entrepreneurship, so they can be the focus points for empirical researches.

Entrepreneurship research is pursued within the established disciplines like economics, psychology, sociology and management (Landstrom, 2005). The array of dependent variables that entrepreneurship researches use may reflect that the field lacked a unifying theory or the complexity associated with entrepreneurship as an area of management scholarship (Ireland et. al, 2005). Entrepreneurship in tourism studies which initially emerged in the rural tourism areas and contributed to the economy tend to leave their place to the entrepreneurship studies which are considered to be a part of sustainable tourism, SMEs and niche tourism. There is a wide range of literature on entrepreneurship in tourism, particularly in the context of sustainable tourism, including sustainable community development and social entrepreneurship (Aquino et al.,2018), women entrepreneurs (Chipfuva, Nzonzo and Muchenje, 2012) and SMEs (Grant and Perren, 2002; Hallak, Brown and Lindsay, 2013). Initially, the studies on tourism and entrepreneurship mostly focus on the concept of entrepreneurship and its related theories. Tourism appears to be a study field among these studies for researchers. Tourism-based studies are mostly regarded with tourism types.

This study was designed to show the deficiencies of the available literature for future studies, to determine its direction and to reveal some efficient alternatives. It is expected to have an important contribution to the identification of the strengths of the studies and to improve its weaknesses for better. However, entrepreneurship and tourism issues have great potential to be combined with other disciplines.

6. Research gaps and an agenda for future research

As entrepreneurship has attracted greater attention in most countries especially through SMEs in the tourism sector, it is a trending topic in academic studies as well as the field of tourism research. With this regard, an updated review of the available international literature could tell a lot about the current state of the studies on tourism entrepreneurship. With this research, authors aimed to reveal the relationship between tourism and entrepreneurship examining the studies published in the high ranking journals in the field. For this purpose, the Web of Science databases were browsed to reach the related and targetted studies. Although the study covered one large databases, the other databases such as JSTOR, Emerald and Scopus could be explored to reach more studies on tourism and entrepreneurship topic. The search criteria set in the selection of the relevant studies were to the keywords of "tourism" and "entrepreneurship" in the titles, keywords, abstract of the available studies. Although the research was designed to reach all available studies in the field, there still could be more studies relevant to tourism and entrepreneurship which could not be included in the search list in this study.

One of the featured strengths of this study was to analyze the themes of the related researches. By categorizing these themes as tourism based, entrepreneurship-based and other-field-based, an overview of the topic has been gained. These themes are expected to shed some light into the future researchers revealing the most commonly studied fields and the fields that need to get more attention.

Distribution of the studies by years reveals that the number of tourism and entrepreneurship studies have significantly increased especially in recent years. This result could be related to the fact that the number of academic studies in the field is also increasing.

This study included the published articles on the related topic; however, dissertations, conference papers and books can be involved in the future researches. Including all kind of publications may help gain a more holistic view regarding the investigated issue. For future researches, citation and impact factors could also be the other variables considered in the analysis.

APPEX 1

Authors	Title	Country/City	Variables	Method	Results	Journal
Ionnides/ 1994	Strengthening the ties between tourism and economic geography: A theoretical agenda	ϕ	Tourism production system, economic geography	Conceptual	Identified the structure and organization of the principal agents comprising the tourism production system and the state's pivotal role, two under-researched issues relating to entrepreneurship and labor pools.	The Professional Geographer
Echtner/ 1995	Entrepreneurial training in developing countries	ϕ	Tourism education	Conceptual	The study has developed a three-pronged approach for tourism education; professional, vocational, and entrepreneurial training and has designed an entrepreneurial development program for tourism students.	Annals of Tourism Reserarch
Dahles & Bras/ 1999	Entrepreneurs in romance tourism in Indonesia	Indonesia / Yogyakarta & Lombok	Romance tourism, small-scale entrepreneurship, resort area cycle, Indonesia	Informal and structured interviews, data analysis	The position in the area life cycle affects the opportunities and restrictions that self-employed young males encounter in their participation in the informal tourism sector and, as a consequence, their expectations regarding relationships with female tourists.	Annals of Tourism Research
Rothman/ 1999	Selling the meaning of place: Entrepreneurship, tourism and community transformation in the twentieth-century American West	American West	ϕ	Secondary data analysis	ϕ	Pacific Historical Review
Russell & Faulkner/ 1999	Movers and shakers: Chaos makers in tourism development	Australia	ϕ	Case study	Entrepreneurs have been found to play a role as initiators of responses to chaos caused by both chaos and external factors.	Tourism Management
Wanhill/ 2000	Small and medium tourism enterprises	UK / Wales	SMEs, tourism, performance, Wales	Secondary data anaysis	The findings suggest that the small and medium tourism enterprises in question were either in line with or better than their employment targets.	Annals of Tourism Research
Lerner & Haber/ 2001	Performance factors of small tourism ventures: The interface of tourism, entrepreneurship and the environment	Israel, Negev	Tourism ventures, performance factors, environmental attractiveness components of tourism ventures	Mix method, in-depth interviews, questionnaire, Pearson correlation, stepwise regression analyses, T-test	Three environmental factors revealed; tourist related infrastructure, options for excursions and scenery. Attractiveness of the tourism venture's location, the external financial assistance and advisory support of a government incubator, the entrepreneur's characteristics, and the number of services offered by the venture factors are correlated differentially to the business performance measures.	Journal of Business Venturing
Green/ 2002	Marketing the nation: Carnival and tourism in Trinidad and Tobago	Island of Trinidad and Tobago	Festival, authenticity, commercialism, cultural entrepreneurship	Interview	Investigates if the festival is really authentic or part of a marketing process with the reviews from local people.	Critique of Anthrolopology
Osirim/ 2003	Carrying the burdens of adjustment and globalization - Women and microenterprise development in urban Zimbabwe	Zimbabwe	Entrepreneurship, globalization, microenterprises, structural adjustment, women, Zimbabwe	Content analysis	In this study, the effects of globalization and economic results of sub - Saharan African women working in micro enterprises were evaluated.	International Sociology
	The entrepreneurship factor in sustainable tourism development	Sweden	Entrepreneurship, tourism,	SWOT analysis	In this study social pressure has been identified as the reason for the weakness of	Journal of Cleaner Production

Lordkipanidze, Brezet & Backman/ 2005			sustainable Development		entrepreneurial culture in rural tourism areas in the case of ''Healthy Pig Farm'' which is an innovative and successful entrepreneurial enterprise in farm tourism.	
Matlay & Westhead/ 2005	Virtual teams and the rise of e-entrepreneurship in Europe	Europe	e-business, e-entrepreneurship, Europe, tourism And hospitality	Content analysis	The study documented and discussed advantages and disadvantages of Virtual Teams of e-entrepreneurs.	International Small Business Journal
Reichel & Haber/ 2005	A three-sector comparison of the business performance of small tourism enterprise: An exploratory study	Israel	Small tourism ventures, performance, sites of interests, accomodation, active recreation	One way ANOVA	The findings show that active recreation and sites of interest ventures perform better than accommodation ventures given their relatively high capacity, service variety and flexibility that enables them to cater simultaneously to various market segments and extend the tourist season.	Tourism Management
Russell & Faulkner/ 2005	Entrepreneurship, chaos and the tourism area lifecycle	Australia	Entrepreneurship, chaos, complexity, tourism area lifecycle	ϕ	The study shows that highlighting elements of turbulence, change, and, unpredictability in entrepreneurial activity when Chaos and complexity theory combined with the tourism area lifecycle model.	Annals of Tourism Research
Wilson/ 2006	'I thought horses was the best thing ever'	Ireland / Dublin	Dublin, entrepreneurship, Jarveys, semi-informalized employment, tourism	Interviews	According to this study jarveys who are taking tourists around the city by horse and carriage, are entrepreneurs due to both need (labor market disadvantage) and desire, and have carved out for themselves a photogenic niche in Dublin's tourist economy.	Critique of Anthropology
Haber & Reichel/ 2007	The cumulative nature of the entrepreneurial process: The contribution of human capital, planning and environment resources to small venture performance	Israel	Small tourism ventures, entrepreneur choices, resource accumulation	Pearson correlation, hierarchical regression	The human capital of the entrepreneur, particularly managerial skills are the greatest contributing factor to performance and unique nature of the entrepreneurial process defined as lifestyle businesses.	Journal of Business Venturing
McGehee, Kim & Jennings/ 2007	Gender and motivation for agri-tourism entrepreneurhip	Virginia	Agri-Tourism, gender, entrepreneurship, motivation	Confirmatory factor analysis, MANOVA	The findings indicate that women are found to have higher motivation for agri-tourism entrepreneurship but not consistently significant or in ways that necessarily supported the framework.	Tourism Management
Van Zyl & Mathur-Helm/ 2007	Exploring a conceptual model, based on the combined effects of entrepreneurial leadership, market orientation and relationship marketing orientation on South Africa's small tourism business performance	ϕ	unmentioned	Literature review	The findings indicate that there is a relationship between the identified constructs. However, the exact nature and extent of these relationships need to be further investigated.	South African Journal of Business Management
Li/2008	A review of entrepreneurship research published in the hospitality and tourism management journals	ϕ	Entrepreneurship research, hospitality, tourism, journals	Literature review	The article has shown more theoretical work is needed to map a course of study and to develop a framework unique to the entrepreneurship domain of hospitality and tourism research.	Tourism Management

Nieman, Visser & van Wyk/ 2008	Constraints facing tourism entrepreneurs in South Africa: A study in the Gauteng and Mpumalanga provinces, South Africa	South Africa	ϕ	Principal factor analysis	A three-factor instrument was developed to identify problems in order to manage sustainable tourism and prevent leakage of profits in South Africa.	Development Southern Africa
Yang & Wall/ 2008	Ethnic tourism and entrepreneurship: Xishuangbanna, Yunnan, China	China / Yunnan	Entrepreneurship, ethnic tourism, Xishuangbanna, China	Observation, interviews	It is revealed that entrepreneurs play a powerful role in developing ethnic tourism and they are crucial to the commodification and marketing of ethnic culture. However, most entrepreneurs in tourism businesses are not members of ethnic minorities; instead, they exploit minority resources for their own benefits.	Tourism Geographies
Naipaul & Wang/ 2009	Entrepreneurship and leadership in hospitality- Insights and implications for hospitality and tourism education	Central Florida	Entrepreneurship, leadership, hospitality management, hospitality education	Content analysis	The characteristics of entrepreneurs and leaders are emphasized based on the findings of the interviews.	International Journal of Contemporary Hospitality Management
Cederholm & Hultman/ 2010	The value of intimacy – negotiating commercial relationships in lifestyle entrepreneurship	Sweden	Hospitality, lifestyle entrepreneurship, intimacy, value co-creation, Simmel	Simmel's distance model	Tension between intimacy and distance in the interaction between hosts and guests is managed through negotiated boundary work.	Scandinavian Journal of Hospitality and Tourism
Isaac/ 2010	Alternative tourism: New forms of tourism in Bethlehem for the Palestinian tourism industry	Palestine	Alternative tourism, tourism enterprises, political instability	Conceptual	Tourism will be a major economic factor and have significant policy implications in Palestine and Bethlehem in particular, which lacks tourism facilities.	Current Issues in Tourism
Lovelock, Lovelock & Normann/ 2010	The big catch: Negotiating the transition from commercial fisher to tourism entrepreneur in island environments	New Zealand	Island tourism, peripheral commercial fishing, entrepreneurship	Interviews	This study reports on the transition from a fishing economy to a tourism economy, with a focus on the lived experiences of commercial fishers turned tourism entrepreneurs.	Asia Pacific Journal of Tourism Research
Mykletun & Gyimóthy/ 2010	Beyond the renaissance of the traditional Voss sheep's-head meal: Tradition, culinary art, scariness and entrepreneurship	Norway	Food tourism, traditional tourism, scarcy food, food adventure, sheep's-head meal, entrepreneurship	Content analysis	It is emphasized the role of entrepreneurship in the impact of the development of tourism destinations of traditional local foods.	Tourism Management
Tucker/ 2010	Peasant-entrepreneurs A longitudinal ethnography	Turkey / Cappadocia	Entrepreneurship, hybrid economy, Turkey, limited good	Longitudinal ethnography	The article concludes that peasant continuities create contradiction and ambivalence and thereby produce an ongoing hybrid entanglement of a moral and a capitalist economy wherein both cause fissures and tensions in each other. This highlights the usefulness of a critical postcolonial approach when considering tourism destinations in transition.	Annals of Tourism Research
Bosworth & Farrell/ 2011	Tourism entrepreneurs in Northumberland	United Kingdom	Lifestyle businesses, rural development, entrepreneurship, counter urbanisation, embeddedness	Interviews	Through a combination of extra-local networks and local embeddedness business owners are not only succeeding for themselves but they are stimulating other local businesses by increasing local trade, heightening competition and raising standards and aspirations among all small tourism firms.	Annals of Tourism Research

Butler & McDonnell/ 2011	One man and his boat (and hotel and pier …): Henry Gilbert Smith and the establishment of Manly, Australia	Australia	Resorts, morphology, Manly, entrepreneurs, development	Morphology	Manly Beaches survival and continued relevance of the classic seaside resort morphology recorded in earlier works.	Tourism Geographies
Castrogiovanni & Peris-Ortiz/2011	Human resource management practices and the importance of managers' perceptions	Spain	Perception, hospitality, strategy, structural equations, SME	Delphi method	Top managers with the most accurate perceptions tended to adopt strategy that was most strongly related to firm performance.	Canadian Journal of Administrative Sciences
Dawson, Fountain & Cohen/ 2011	Seasonality and the lifestyle "Conundrum": An analysis of lifestyle entrepreneurship in wine tourism regions	USA and New Zelland	Seasonality, wine tourism, lifestyle entrepreneurship	Semi-structured and in-depth interviews	Both the wine and tourism industries are highly seasonal, and rely on cooperation for regional initiatives to manage seasonality, through events or marketing, particularly when the businesses are small scale and located in peripheral areas.	Asia Pacific Journal of Tourism Research
Domenico & Miller/ 2011	Farming and tourism enterprise: Experiential authenticity in the diversification of independent small-scale family farming	UK, Yorkshire and East Anglia	Farming families, experiential authenticity, tourism enterprise	Multiple case study, interview	In conclusion, relating to the intersection of experiential authenticity with the farm family identity has been modelled and takes into account how farmers view their transition to a diversified business and the subsequent pressure to project a staged or even contrived product in order to be financially successful.	Tourism Management
Jaafar, Abdul-Aziz, Maideen & Mohd/ 2011	Entrepreneurship in the tourism industry: Issues in developing countries	Malaysia	Small-medium hotel enterpreneurs, demographic profile, entrepreneurship characteristics	Mix method, interview, observation, questionnaire, frequency analysis, chi-square test	Majority of hotel enterpreneurs were male, middle-aged, aware of information technologies for marketing, have strong self-confidence and independent personality characteristics which are important qualifications for an enterpreneur.	International Journal of Hospitality Management
Jones & Guan/ 2011	Bed and breakfast lodging development in mainland China: Who is the potential customer?	China	B&B households, potential customers	T-test, ANOVA, multiple regression	B&B commercial homes' the most potential customer would be younger males, certainly a difference from the customer in Western culture.	Asia Pacific Journal of Tourism Research
Sheng/ 2011	A political economy approach to foreign investment and local welfare	Macao	ϕ	ϕ	The author developed a political-economy model to analyze the diverging preferences of foreign investors and the host community with regard to a tourist city's openness in the presence of significant social–environmental side effects accompanying tourism boom.	The Social Science Journal
Thomas, Shawb & Page/ 2011	Understanding small firms in tourism: A perspective on research trends and challenges		Small tourism firms, SMES, tourism policy, tourism development	Literature review	The paper traces progress in this field by reviewing inter-, multi- and disciplinary studies that contribute to current understanding of small firms in tourism and how this understanding articulates with wider debates within tourism studies.	Tourism Management
Zhao, Ritchie & Echtner/ 2011	Social capital and tourism entrepreneurship	China / Guangxi	Social capital, entrepreneurship, business incubation, China, developing countries	Questionnaire-based survey, depth interviews, frequency analaysis, logistic regression analysis	The results show that structural social capital is positively related to both an individual's ability to enterprise and the individual's probability of establishing a tourism business. Relational social capital contributes to the ability to enterprise, but does not demonstrate any significant impact on the probability of start-up. Cognitive social capital is marginal in both cases.	Annals of Tourism Research

Williams & Shaw/ 2011	Internatıonalization and innovation in tourism	ϕ	Innovation, internationalization, entrepreneurship, labour, tourists	Literature review	According to this article internationalization is a form of innovation, successful internationalization requires innovation, and internationalization requires firms to have superior knowledge. Turning from this generic literature to the specificities of tourism, two aspects of the simultaneity of production and consumption critically shape internationalization: the requirement for co-presence, and consumer mobility.	Annals of Tourism Research
Fonneland/ 2012	Spiritual entrepreneurship in a Northern landscape: Spirituality, tourism and politics	Norway, Polmakmoen	Spiritual entepreneurship, experience economy, new age	Interview	Spirituality, holism, harmony, closeness to nature themes are used by spiritual entrepreneurs in tourism industry.	Temenos
Furunes & Mykletun/ 2012	Frozen adventure at risk? A 7-year follow-up study of Norwegian glacier tourism	Norway	Glacier tourism, climate change	Interview, participant observation, document analysis	Glacier tourism is not dependent on only glaciers, according to entrepreneurs demand will create its own supply.	Scandinavian Journal of Hospitality and Tourism
Hall, Matos, Sheehan & Silvestre/ 2012	Entrepreneurship and innovation at the base of the pyramid: A recipe for inclusive growth or social exclusion?	Brazil	Social entrepreneurship, innovation, socially inclusive growth	Grounded theory	Tourism entrepreneurship can provide opportunities to improve social wellfare, it can also be the cause of wider social problems.	Journal of Management Studies
Hallak, Brown & Lindsay/ 2012	The place identity – Performance relationship among tourism entrepreneurs: A structural equation modelling analysis	Australia	Place identity, entrepreneurial self-efficacy, support for community, entrepreneurial performance	Confirmatory factor analysis, structural equation modelling	The place identity of tourism entrepreneurs has a significant, positive effect on entrepreneurial self-efficacy and support for the community.	Tourism Management
Johanesson/ 2012	"To get things done": A relational approach to entrepreneurship	Iceland	Entrepreneurial process, actor–network theory, relationalism, tourism project	Interview, document analysis	Four styles of relational ordering identified in the translation process of a particular tourism development project in Iceland: economic development, fellowship, "sparks", "finding one's sea legs".	Scandinavian Journal of Hospitality and Tourism
Möller/ 2012	Gendered entrepreneurship in rural Latvia: Exploring feminities, work and livelihood within rural tourism	Latvia	Entrepreneurship, Latvia, gender, rurality, livelihood, tourism	Content analysis	The study pointed how women negotiate their 'livelihood action space', which includes a number of paradoxes between the quest for independence while facing both economic and social restrictions.	Journal of Baltic Studies
Sikora & Nybakk/ 2012	Rural development and forest owner innovativeness in a country in transition: Qualitative and quantitative insights from tourism in Poland	Poland	Entrepreneurship, risk attitude, learning orientation, social responsibility, institutional support, start-ups	Questionnaire, face-to face interviews, correlations and OLS regression	The results showed that, although a forest owner's attitudes towards risk, social responsibility and learning orientation positively impacted the owner's innovativeness, institutional support did not. Also the results imply that private forest owners in Poland require greater institutional support to start tourism businesses related to their forest land.	Forest Policy and Economics
Strobl & Peters/ 2012	Entrepreneurial reputation in destination networks	Austria	Entrepreneurship, destination governance, networks, social capital, reputation	Interviews, case study	Results unveil the importance of entrepreneurial reputation of actors, density of strong ties in the destination network and informal relationships between actors for destination governance.	Annals of Tourism Research

Von der Weppen & Cochrane/ 2012	Social enterprises in tourism: An exploratory study of operational models and success factors	ϕ	Social enterprise, responsible tourism, market-based approach, organisational culture, leadership; dynamics of change	Case study	The article finds that touristic social enterprises operate similarly to those in other sectors, although with a clear preference for three "Alter" models, depending on the type of activity, namely Service Subsidisation, Employment and the Market Intermediary Model. Success factors appear to be valid across all social enterprises in tourism, irrespective of primary business activity or operational model, and cannot be attributed to a single factor but to combinations of factors in the multiple dimensions of leadership, strategy and organisational culture.	Journal of Sustainable Tourism
Brouder & Eriksson/ 2013	Staying power: What influences micro-firm survival in tourism?	Sweden	Related experience, proximity, service sector, business survival, tourism, entrepreneurship, Sweden	Data analysis, Cox proportional hazards	Entrepreneurs with previous work experience in related sectors are more likely to survive and in this case, entrepreneurs without local experience tend to be less successful.	Tourism Geographies
Brundin & Wigren-Kristoferson / 2013	Where the two logics of institutıonal theory and entrepreneurship merge: Are family businesses caught in the past or stuck in the future?	South Africa	Family business; wine farms; institutional theory; entrepreneurial activities; legitimacy	Semi-structured interview, web site content analysis	Family businesses in the South African wine industry are subject to a process of institutionalisation in which entrepreneurial activities, which are part of this process, may not be as entrepreneurial as they appear at first.	South African Journal of Economic and Management Sciences
Carlisle, Kunc, Jones & Tiffin/ 2013	Supporting innovation for tourism development through multi-stakeholder approaches: Experiences from Africa	Gambia & Tanzania	Innovation, knowledge transfer, entrepreneurship, tourism, SMEs, LEDCs	Document analysis, cross-sectional analysis	Importance of multi-stakeholder collaboration by drawing on two distinct African case studies revealed.	Tourism Management
Chen & Elston/ 2013	Entrepreneurial motives and characteristics: An analysis of small restaurant owners	China	Entrepreneurship, restaurant industry, small businesses in China	Cluster analysis, Chi-square	The entrepreneurial business was the main source of the family's income.	International Journal of Hospitality Management
Ergassen & Cela/2013	Less developed countries, tourism investments and local economic development	Dominican Republic / Punta Cana	Differentiated tourism-related goods and services, over night stays, domestic entrepreneurship	Overnight stays and consumption of tourism related products analysis	Overnight stays are increasing in the number of differentiated tourism-related goods and services.	Review of Development Economics
Ferdin & Williams/ 2013	International festivals as experience production systems	Island of Trinidad and Tobago	Internationalizatio n, festivals	Case study, review of historical data, interview	TT Carnival can be viewed as an experience production system that provides an infrastructure for the exploitation of indigenous intangible resources by entrepreneurs and cultural practitioners.	Tourism Management
Fonnel/ 2013	Sami tourism and the signposting of spirituality. The case of Sami Tour: A spiritual entrepreneur in the contemporary experience economy	Norway, Sapmi	New age spirituality, religious, experinece economy	Document review, observation	Marketing of the Sapmi tourist destination cotains Sami religious symbols to attract people by their spiritual values.	Acta Borealia
Galdon, Garrigos & Gil-Pechuan/ 2013	Leakage, entrepreneurship, and satisfaction in hospitality	Spain	Leakage, entrepreneurship	Structural equatiton model	Entrepreneurial environment directly and positively affects improvements in employee and customer satisfaction and company competitiveness.	The Service Industries Journal

Hallak & Assaker/ 2013	Family vs. non-family business owners' commitment to their town: A multigroup invariance analysis	Australia	Family-owned and non-family-owned small and medium tourism enterprises, commitment to stay in the town	Exploratory factor analysis, confirmatory factor analysis, multigroup invariance analysis	Family business owners have a greater commitment to staying in their town.	Asia Pacific Journal of Tourism Research
Maclaren, Young & Lochrie/ 2013	Enterprise in the American west- taverns, inns and settlement development on the frontier during the 1800s	Fanthorp Inn, Texas, USA	Frontier taverns, inns, entrepreneurship, opportunity, settlement development, hospitality services	Multiple sources of evidence	It was emphasized that the public institutions (such as government and social structures) contributing to the assets of the taverns should be evaluated in a context-sensitive manner.	International Journal of Contemporary Hospitality Management
Roxas & Chadee/ 2013	Effects of formal institutions on the performance of the tourism sector in the Philippines: The mediating role of entrepreneurial orientation	Philippines	Tourism, entrepreneurial orientation, institutional environment, firm performance, developing economy, Philippines	Structural equation modelling	There is a strong mediation effect on the relationship between entrepreneurial orientation and corporate environment and firm performance. the government has an important role to play in promoting the entrepreneurship of the corporate environment, which enhances the performance of the tourism sector.	Tourism Management
Tejada & Moreno/ 2013	Patterns of innovation in tourism 'Small and medium-size enterprises'	Andalusia	Tourism, innovation, logistic regression	Logistic regressions	Although the results indicate that the diverse categories of innovation – product, process, marketing and organizational – are explained by different sets of variables, it is possible to outline the results related to a number of firm's characteristics, such as dependency on tour-operator, geographic localization or co-operation.	The Service Industries Journal
Alonso, Bressan, O'Shea & Krajsic/ 2014	Educating winery visitors and consumers: An international perspective	Italy & Spain	Wine; winerie, wine tourism, education, initiatives, social learning theory, visitors	Web site content analysis, independent samples t-test, one-way ANOVA	Given the important role wineries have as product and service providers in many rural areas and tourist destinations, the study's findings have several important implications for winery entrepreneurship and for wine tourism.	Current Issues in Tourism
Badulescu, Badulescu, Bac & Sipos-Gug/ 2014	Attitudes and intentions of business master students towards sustainable tourism and entrepreneurship	ϕ	Attitudes toward sustainable tourism and entrepreneurship, entrepreneurial intentions, business master students, U Mann-Whitney test, factorial analysis	U-Mann-Whitney test	Students are both in their current quality of tourists, as well as in their possible future as entrepreneurs, are evidenced by the agreement with statements representing dimensions of sustainable behaviour.	Amfiteatru Economic Journal
Badulescu & Badulescu/ 2014	Medical tourism: between entrepreneurship opportunities and bioethics boundaries: narrative review article	ϕ	Medical tourism, entrepreneurship, market, ethics	OECD documentary research, narrative analysis	Tourism comes to provide an organized and comfortable framework for all these choices, but many issues still re-main controversial and may worsen if national health systems and national and international regulations would not identify their problems and would continue to leave medical tourism to market mechanisms. Market will efficiently allocate the resources, but not always in an ethical manner.	Iranian Journal of Public Health

Cederholm & Sjöholm/ 2014	Living and selling a dream: Lifestyle entrepreneurship in the intersection between family, market and political rhetoric	Sweden	Lifestyle entrepreneurship, personal lifestyle motives, economic motives, rural entrepreneurship, tourism and hospitality firms	Interview	Balancing work between personal identities and economic practices is a practice of valuation, offering new insights into working conditions and markets situated in the intersection between markets and personal life spheres.	Sociologisk Forskning
Crnogaj, Rebernik & Hojnik/ 2014	Building a model of researching the sustainable entrepreneurship in the tourism sector	ϕ	Tourism, social responsibility, requisite variety, sustainable entrepreneurship, requisite holism	Conceptual	The proposed model provides systemic and systematic views on sustainable entrepreneurship in the tourism sector and contains various levels of analysis.	Kybernetes
Dana, Gurau & Lasch/ 2014	Entrepreneurship, tourism and regional development: A tale of two villages	France	Entrepreneurship, regional development, France, impact of tourism, rural regions	Semi-structured interviews, data analysis	Provides a twofold contribution to the existing literature: first, it enriches the methodological perspective using an interpretative framework based on the specific functions of rural territories; and second, it applies this framework to explain the specific evolution of the investigated villages, as well as the existing tensions and challenges for regional development and management.	Entrepreneurship & Regional Development
Galavas & Mathews/ 2014	How international entrepreneurship characteristics influence Internet capabilities for the international business processes of the firm	Australia	Small and medium sized tourism firms, international entrepreneurship characteristics, use of Internet capabilities, international business processes	Multiple case study	Successful international entrepreneurial firms integrate internet capabilities to a greater degree.	International Business Review
Glavas, Pike & Mathews/ 2014	Internet-enabled tourism entrepreneurs. International entrepreneurial values elicited through repertory test and laddering analysis	Australia& New Zealand& UK	Internet usage, international entrepreneurship	Repertory Test, laddering analysis	Internet-enabled tourism entrepreneurs share similar construct values.	International Journal of Tourism Research
Hallak, Assaker & O'Connor/ 2014	Are family and nonfamily tourism businesses different? An examination of the entrepreneurial self-efficacy–entrepreneurial performance relationship	Australia	Family business; small and medium tourism enterprises, SMTEs, entrepreneurial self-efficacy, business performance, structural equation modeling, multigroup invariance	Confirmatory factor analysis, structural equation modeling, multigroup invariance tests	Entrepreneurial self-efficacy (regardless of whether or not the business is family owned) is an important predictor of business performance.	Journal of Hospitality & Tourism Research
Honggang & Shaoyin/ 2014	Regional environment of destination and the entrepreneurship of small tourism businesses: A case study of Dali and Lijiang of Yunnan Province	China, Yunnan	Regional environmental factors, smaal tourism firms, entrepreneurship	Mix method, interview, questionnaire, factor analysis	Tourism attractiveness, information, communication, market potential and accessibility, regional economics factors, shared values, hobbies, family background, emotional support and experience drives the macro-location of small tourism firms and crucial for enterpreneurs.	Asia Pacific Journal of Tourism Research
Komppula/ 2014	The role of individual entrepreneurs in the development of competitiveness for a rural tourism destination - A case study	Finland	Rural tourism, destination competitiveness, tourism entrepreneurs	Case study, semi-structured interview	Collaboration between small tourism enterprises, municipalities and innovative, committed, and risk-taking entrepreneurs have a crucial role for rural destination's enterpreneur environment.	Tourism Management

Lundberg, Fredman & Wall-Reinius/ 2014	Going for the green- The role of money among nature-based tourism entrepreneurs	Swedish	Entrepreneurship, nature-based tourism, politics, tourism	Secondary data analysis	This study results suggest that the relationship between nature-based tourism entrepreneurs and money is complex and not fully understood.	Current Issues in Tourism
Nordbo/ 2014	Beyond the transfer of capital? Second-home owners as competence brokers for rural entrepreneurship and innovation	Norway	ϕ	Qualitative analysis, quantitative analysis	It was found that the second homeowners were willing to use their knowledge and competencies to contribute to the development of the local economy.	European Planning Studies
Ahmad/ 2015	Entrepreneurship in the small and medium-sized hotel sector	United Arab Emirates	Small- and medium-sized hotel, motivation, problems and challenges, hotel industry, United Arab Emirates	Multi-method, survey and interwiev	Business challenges highlighted by the owners/managers of SMSHs are stiff competition in the hotel industry, increased operating costs, reduced demand and lack of skilled employees.	Current Issues in Tourism
Alonso-Almeida, Bremser & Llach/ 2015	Proactive and reactive strategies deployed by restaurants in times of crisis: Effects on capabilities, organization and competitive advantage	Spain / Madrid	Tourism, financial crisis, restaurants, strategy, competitive advantage, dynamic capabilities	Structural equation modeling	The findings show that both proactive and reactive strategies reduce costs; however, only proactive strategies develop dynamic capabilities that improve competitive advantage.	International Journal of Contemporary Hospitality Management
Dahles & Susilowati/ 2015	Business resilience in times of growth and crisis	Indonesia / Yogyakarta	Small-scale business, crisis, business, resilience, embeddedness, livelihood, Indonesia	Ethnographic analysis	Local tourism businesses show remarkable resilience during the decade of crisis that affected the Indonesian tourism industry.	Annals of Tourism Research
Hallak, Assaker & Lee/ 2015	Tourism entrepreneurship performance: The effects of place identity, self-efficacy and gender	Australia	Entrepreneurial self-efficacy, entrepreneurial performance, place identity, gender	Exploratory factor analysis, confirmatory factor analysis, structural equation modeling, multigroup invariance analysis	Place identity was positively related to entrepreneurial self-efficacy and self-efficacy is a direct driver of performance for both genders.	Journal of Travel Research
Hingtgen, Kline, Fern&es & McGehee/ 2015	Cuba in transition: Tourism industry perceptions of entrepreneurial change	Cuba	Entrepreneurial climate, tourism enterpreneurs	Semi-structured interviews	Enterpreneur's perception of barriers and encouraging factors for tourism industry in Cuba addressed. Some recommendations for planning and policy have been placed.	Tourism Management
Istanbullu Dincer, Dincer & Yilmaz/ 2015	The economic contribution of Turkish tourism entrepreneurship on the development of tourism movements In Islamic countries	Turkey	Tourism economics, tourism entrepreneurship, development of tourism	SWOT analysis	Underlined the socio-economic importance of Turkish tourism on the development of Islamic Countries' tourism movements, and a macro level SWOT analysis is made in order to develop strategic views required for the generation of holistic policies	Procedia - Social and Behavioral Sciences
Jaafar, Rasoolimanesh & Lonik/ 2015	Tourism growth and entrepreneurship: Empirical analysis of development of rural highlands	Malaysia, Sabah	Small tourism business, rural tourism, demographic profile	Frequency analysis	Most of the entrepreneurs were female, middle-aged or older and poorly educated, used their own savings to establish and maintain their businesses without no financial support or training from government sources.	Tourism Management Perspectives

Lee, Kuo & Muhos/ 2015	Applying interpretive structural modeling to the planning of a sequence of marketing strategies: A case study of the architectural tourism in Taiwan	Taiwan	Marketing strategies, architectural tourism, old houses in Taiwan	Literature review, interpretive structural modeling	The study categorized the 30 most common problems faced by the Taiwanese old houses and their proprietors during transformation. 12 improvement themes took place to create a new strategy for development.	Asia Pacific Journal of Tourism Research
Lemelin, Koster & Youroukos/ 2015	Tangible and intangible indicators of successful aboriginal tourism initiatives: A case study of two successful aboriginal tourism lodges in Northern Canada	Canada	Aboriginal tourism, lodges, indicators for success, evaluations of success	Case study	Aboriginal-tourism success lies on not only social and geographical context of peripheral regions, the intangible elements like community and pride are very important too. Context of the community is central to generating appropriate constructs for evaluating success.	Tourism Management
Matilainen, Keskinarkaus & Törmä/ 2015	The economic significance of hunting tourism in East Lapland, Finland	Finland	Computable generel equilinrium models, economics, hunting tourism, rural entrepreneurship, small game	Descriptive frequencies, cross-tabulations	In this study, investment of hunting tourism potential was determined for East Lapland sub-region of northern and short and long term economic effects of hunting tourism were discussed.	Human Dımensıons of Wildlife
Navickiene Fominiene & Dias/ 2015	Entrepreneurship in the sustainable tourism sector. The case of tour operators in Lithuania	Lithuania	Entrepreneurship, sustainable tourism, tourism sector, Lithuania	Arithmetic mean, Pearson chi-square	The entrepreneurial characteristics (authenticity, inspiration, transformation) and leadership characteristics (community sense, ability to share values, diligence, curiosity, adaptability) of the Lithuanian tourism enterprises managers promote sustainable development of tourism.	Transformations in Business Economics
Pena, Olmo, Jamilena & Molina/ 2015	Market orientation adoption among rural tourism enterprises: The effect of the location and characteristics of the firm	Spain	Market orientation, rural tourism, entrepreneurs, location, spatial econometrics	Spatial econometric model	An explanatory econometric model was formed for the market orientation adopted by the rural tourism enterprises and the use of information and communication technology and the gender of the entrepreneur as the defining factors were determined. It has also been found that the position of the enterprise relative to the competitors may influence the adoption of the market orientation.	International Journal of Tourism Research
Şchiopu, Vasile & Ţuclea/ 2015	Principles and best practices in successful tourism business incubators	ɸ	Best practices, business incubators, tourism business incubators, emotions, entrepreneurship	Literature review	The article identifies several types of incubators that can be used successfully for the benefit of start-ups in the tourism sector, such as network incubators, incubators in ecotourism or nature-based incubator.	Amfiteatru Economic
Seilov/ 2015	Does the adoption of customer and competitor orientations make small hospitality businesses more entrepreneurial?: Evidence from Kazakhstan	Kazakhstan	Entrepreneurship, strategy, Kazakhstan, customer and competitor orientations, developing country	Questionnaire, descriptive statistics, regression	The findings of the study showed that hospitality in small businesses needs to embrace a new way of thinking and adopt a more strategic approach to their entrepreneurial activities through proactively responding to constantly changing customer needs and competitors' moves.	International Journal of Contemporary Hospitality Management
Skountridaki /2015	The internationalisation of healthcare and business aspirations of medical professionals	Greece	Internationalisation of healthcare, medical professionals, medical tourism/travel, professional entrepreneurship	Semi-structured interviews	Findings indicate that international patient movement has given an incentive to medical doctors to exhibit an entrepreneurial approach. Their attitudes portray professionals with business aspirations which go well	Sociology

					beyond their role as medics, and stand in contrast to the traditional image of medical professionals.	
Solvoll, Alsos & Bulanova/ 2015	Tourism entrepreneurship – Review and future directions	ɸ	Tourism, entrepreneurship, literature review, divergent/converg ent	Literature review, secondary data anaysis	The article found both weaknesses and potential strengths of the current literature. Despite the increase in the number of articles published in recent years, the articles are still largely published in tourism journals, and few are published in other high-ranked journals. This finding indicates either that the quality of this research is lower than the standards for high-impact journals or that the topics explored are not considered to be of interest outside of the tourism field.	Scandinavian Journal of Hospitality and Tourism
Van Wijk, Van der Duim, Lamers & Sumba/ 2015	The emergence of institutional innovations in tourism: The evolution of the African Wildlife Foundation's tourism conservation enterprises	Kenya	Institutional innovation, institutional entrepreneurship, conservation ngo, conservation tourism, Kenya	Interviews	This paper makes three contributions to the literature; the first contribution is to shed light on the role of conservation organizations at the conservation development tourism nexus, secondly contribute to the emergent literature on institutional innovations in tourism by illuminating how they develop through a process of “layering”. The study suggests that incremental innovations become gradually accepted as they are blended with existing frames of reference, practices and social networks through a trial-and-error process. Incremental innovations thus decrease the risks of opposition generally associated with processes of change.	Journal of Sustainable Tourism
Alegre & Berbegal-Mirabent/ 2016	Social innovation success factors: Hospitality and tourism social enterprises	Spain, Barcelona	Social innovation, social enterprises, hospitality and tourism sector, social business models	Semi-structured interviews, interviews, content analysis	Three factors, namely, value proposition, appropriate market research and stakeholder involvement, heavily contributed to firm’s success, corroborating previous studies. Social need pressures and managerial trust on employees are additional factors that drive social business model innovation.	International Journal of Contemporary Hospitality Management
Alsos, Clausen, Hytti & Solvoll/ 2016	Entrepreneurs’ social identity and the preference of causal and effectual behaviours in start-up processes	Norway	Entrepreneurial identity, social identity theory, causation, effectuation, entrepreneurial behaviour	Mixed-methods	Entrepreneurial identity influences whether the individual predominantly engages in effectual or causal behaviour.	Entrepreneurship & Regional Development
Campopiano, Minola &Sainaghi/ 2016	Students climbing the entrepreneurial ladder family social capital and environment-related motives in hospitality and tourism	GUESSS partners	GUESSS, entrepreneurship, entrepreneurial ladder, environmental mission, family embeddedness, family social capital	Regression analysis	It is stated that family acts as a fundamental institution fostering entrepreneurship, both through the provision of bonding and bridging social capital, and the nurturing of attitudes toward the environment	International Journal of Contemporary Hospitality Management

Font, Garay & Jones/ 2016	Sustainability motivations and practices in small tourism enterprises in European protected areas	European protected areas	Motivation for sustainability, small tourism enterprises	Two-step cluster analysis	Small firms are more involved in taking responsibility for being sustainable than previously expected. Business driven, legitimization dirven and value driven firmstake place in different clusters for their sustainability motivations.	Journal of Cleaner Production
Kimbu & Ngoasong/ 2016	Women as vectors of social entrepreneurship	Cameroon	Social entrepreneurship, women entrepreneurship, small tourism firms	Questionniare, frequency analysis, focus group, participant observation	Opportunities for women social entrepreneurship in the tourism sector and the development impacts of women-owned STFs have been identified.	Annals of Tourism Research
Laeis & Lemke/ 2016	Social entrepreneurship in tourism: Applying sustainable livelihoods approaches	South Africa, Western Cape Province,	Social entrepreneurship, sustainable livelihoods approach, non-profit tourism organisation, complex interrelations and interdependencies between social enterpreneurs	Case study, in-depth interviews	Due to competing aims between the profit and non-profit business and the lack of a clear vision and strategy, the agricultural project did not reach its full potential. Additional challenges were dependency on external funding and a lack of reciprocal communication between the stakeholders.	International Journal of Contemporary Hospitality Management
Lobo, Velez & Puerto/ 2016	Leadership, entrepreneurship and collective action: A case study from the Colombian pacific region	Colombia	Collective action, entrepreneurship, environmental enterprises, leadership, sustainability	Thematic analysis	Emphasized that entrepreneurship should be encouraged as a means of promoting sustainable development in rural communities.	International Journal of The Common
Mottiar/ 2016	Exploring the motivaions of tourism social entrepreneurs-The role of a national tourism policy as a motivator for social entrepreneurial activity in Ireland	Ireland	Social entrepreneurs, entrepreneurs, entrepreneurial motivations	Questionniare, focus group	Social entrepreneurship, which is important for local communities and tourists, also plays a major role in the development of tourism destinations.	International Journal of Contemporary Hospitality Management
Sigala/ 2016	Learning with the market: A Market approach and framework for developing social entrepreneurship in tourism and hospitality	ϕ	Tourism, market, social value, social entrepreneurship, hospitality, social transformation	Literature review	The paper provides practical implications about the capabilities that social enterprises should develop for engaging with other market actors to identify and exploit (new) market opportunities for social value co-creation, and influence market plasticity for forming new markets and driving social change. Social enterprises can engage with and form markets for co-creating social value and escalating their social impacts through social transformation.	International Journal of Contemporary Hospitality Management
Skokica, Lynchb & Morrison/ 2016	Hotel entrepreneurship in a turbulent environment	Croatia	Hotel entrepreneurs, lifestyle orientation, transition economies, Croatia	Interviews, inductive approach, framework analysis	The findings demonstrate that institutional deficiencies influence market orientationof the entrepreneurs and that the specific social context sets the conditions by which lifestyle-relatedmotives will exist or not. They also underscore that investigation of entrepreneurs needs to take account of a broad range of socio-cultural factors and not solely entrepreneurial agency.	International Journal of Hospitality Management

Strobl & Kronenberg/ 2016	Entrepreneurial networks across the business life cycle: The case of Alpine hospitality entrepreneurs	Austria	Relationship management, entrepreneurship, networks, cooperation, enterprise life cycle	Case Study, windows relation analysis	The findings suggest that networks of hospitality entrepreneurs shift from local ties to industry-specific actor groups to local and non-local ties to actor groups inside and outside the industry. Throughout the enterprise life cycle, entrepreneurs prefer strong ties. The transition from one family generation to the next and changes in the competitive environment are important triggers of network configurations.	International Journal of Contemporary Hospitality Management
Yeh, Ma & Huan/ 2016	Building Social entrepreneurship for the hotel industry by promoting environmental education	Taiwan	Tourism, tourism management	Questionnaire, SEM model	Model estimation shows that a moderating variable effect exists between environmental education and visitors' intentions. The cause is approximately 40 per cent direct and 60 per cent mediated through environmental motivation. That environmental education affects visit intention for green hotels both directly and through creating environmental motivation is evidence that the hotel industry can expect to enhance the use of their socially responsible green services by facilitating environmental education.	International Journal of Contemporary Hospitality Management
Wang, Duan & Yu/ 2016	From nonprofit organization to social enterprise: The paths and future of a Chinese social enterprise in the tourism field	China	China, social enterprise, structuration theory, 1kg.org, nonprofit organization	Semistructured in-depth interviews, secondary data	The article shows that because of the institutional environment, most nonprofit organizations in China do not have resource independence and clear legal identity. Meanwhile, social enterprise has emerged as a new organizational form with the objective of creating social value through profitable business operations. Social enterprise is still in its infancy in China, particularly in the tourism field.	International Journal of Contemporary Hospitality Management
Altinay, Sigala & Waligo/ 2016	Social value creation through tourism enterprise	Mozambique / Pemba	Social entrepreneurship, service dominant logic, social value, co-creation	Semi-structured interview	Stakeholder involvement and collaboration, and networking with and empowering communities are strategies in mobilising resources important for TSE.	Tourism Management
Andries & Daou/ 2016	Teaching case: ViaVia Yogyakarta: Choosing the right strategy to maximize social impact	Indonesia / Yogyakarta	Social entrepreneurship, social performance, economic performance, social impact, sustainable development	Interview	ViaVia café was regarded as a positive contributor to the local community.	Sustainability
Chan, Iankova, Zhang, McDonald & Qi/ 2016	The role of self-gentrification in sustainable tourism: Indigenous entrepreneurship at Honghe Hani Rice Terraces World Heritage Site, China	China / Yunnan	Self-gentrification, indigenous, entrepreneurship, tourism gentrification, sustainability, world heritage site	In-depth interviews	Concept of "self-gentrification" as a way to describe individuals who seek to improve themselves and their own communities, while threatened by gentrification, and offers ways to promote that concept to help conserve both heritage landscapes and Indigenous ways of life.	Journal of Sustainable Tourism

Iversen & Jacobsen/ 2016	Migrant tourism entrepreneurs in rural Norway	Norway	Migration, rural ttourism, small tourism enterprises	Case study, semi-structured intterview	Lifestyle factors were prevalent for becoming entrepreneurs in the tourism industry. Life stage, migration unit, and previous experience with selfemployment influenced motivations and decision-making.	Scandinavian Journal of Hospitality and Tourism
Lee, Hallak & Sardeshmuk h/ 2016	Innovation, entrepreneurship, and restaurant performance: A higher-order structural model	Australia	Innovation, entrepreneurial self-efficacy, (ESE), human capital, cafe-restaurant performance	PLS-SEM	Restaurant's innovation activities and the owner's ESE positively influence restaurant performance. The six ESE dimensions had varying effects on restaurant performance.	Tourism Management
Ngoasong & Kimbu/ 2016	Informal microfinance institutions and development-led tourism entrepreneurship	Cameroon	Development-led tourism entrpreneurship, informal microfinance institutions, social capital	Empricial analysis	It is stated that social capital shape collective action and support tourism entrepreneurship.	Tourism Management
Nikraftar & Hosseini/ 2016	Factors affecting entrepreneurial opportunities recognition in tourism small and medium sized enterprises	Iran	Entrepreneurship, tourism industry, opportunity recognition, tourism, entrepreneurial opportunities	Factor analysis, correlation analysis, structural equation modelling	It has been determined that entrepreneurial alertness contributes significantly to entrepreneurship opportunities and positively affects the self-efficacy, prior knowledge and social networks.	Tourism Review
Novelli, Morgan Mitchell & Ivanov/ 2016	Travel philanthrophy and sustainable development: The case of The Plymouth-Banjul challenge	Sub-Saharan Africa	Social entreprenerusḥip, social justice, travel philanthropy	Content analysis	Integrating destination-wide travel philanthropy engagements with local businesses or existing community based tourism initiatives provide more sustainability.	Journal of Sustainable Tourism
Adiyia, Rademaeker, Vanneste & Ahebwa/ 2017	Understanding local entrepreneurship and small enterprises in the tourism-development nexus: The case of western Uganda	Western Uganda	Local entrepreneurship small enterprises, Tourism, regional development; Western Uganda	Life-story interviewing	Tourism can act as a catalyst for small enterprise development in the local economy without inducing major skills' leakages.	Development Southern Africa
Buiga, Stegerean, Chiş & Lazăr/ 2017	Pricing of the tourism product: A tool for entrepreneurs to adapt to a flexible market	Romania	Tourism entrepreneurship, pricing strategy, hedonic pricing model, attributes for price setting	Data analysis, regression analysis	Managers have to pay more attention to their internal facilities, goods or amenities (as recreational facilities), and to be committed to increasing the quality of their service delivery process, but there is also an opportunity for higher prices supported by attractive neighbourhoods.	Economics and Management
Çiçek, Zencir & Kozak/ 2017	Women in Turkish tourism	Turkey	Women employees, tourism, oral history , Turkey	Oral history, interview	It has been concluded that tourism has transformed the traditions in the Turkish society and the women, who began to work in their homes firstly, gained strength in both economic, social and individual terms by entering the business and utilizing the opportunities that tourism has provided.	Journal of Hospitality and Tourism Management
Daniel, Costa, Pita & Costa/ 2017	Tourism education: What about entrepreneurial skills?	Portugal	Tourism education, entrepreneurship education, entrepreneurial skills, soft skills	Frequency analysis	Pertinent to identify best practices and propose guidelines for creating curricular spaces for the development of entrepreneurial skills.	Journal of Hospitality and Tourism Management

Dedeke/ 2017	Creating sustainable tourism ventures in protected areas: An actor network theory analysis	Brasil	Eco-tourism, sustainable tourism, entrepreneurship, actor-network theory, case study, private reserves	Interview, content analysis	The ability of the principal actor to learn new things, to adapt to change and her acts of creating spaces for global experts played a significant role in her success.	Tourism Management
Drăgoi, Iam, Munteanu, Ciobanu, Tartavulea & Ladaru/ 2017	Incentives for developing resilient agritourism entrepreneurship in rural communities in Romania in a European context	Romania	Agritourism entrepreneurship, economic and social development of regions, tourism development of regions	Ordinary least square regression	Economic indicators like regional GDP and kilometers of national roads have a positive influence on the number of agritourism business units; also, a positive impact on agritourism entrepreneurship was identified for tourism-related factors like number of employees, salaries in tourism, total tourists, preference of tourists for agritourism	Sustainability
Fadda & Sorensen/ 2017	The importance of destination attractiveness and entrepreneurial orientation in explaining firm performance in the Sardinian accommodation sector	Sardinia	Business perfromance, accomodation firms, entrepreneurial orientation and destination attractiveness	Ordered logit regression	Both EO and destination attractiveness were found to exert independent positive effects on firm performance. EO was found to have a larger effect on firm performance than destination attractiveness.	International Journal of Contemporary Hospitality Management
Hajilo, Masoom, Langroudi, Sabokbar & Pennington-Gray/ 2017	Spatial analysis of the distribution of small businesses in the eastern villages of Gilan Province with emphasis on the tourism sector in mountainous regions	Iran, Gilan	Rural tourism, business sector clustering	Analysis of spatial correlation, clustering, hot and cold spots analysis and buffer zones	The highest support for businesses was in the agricultural and services sectors, while the lowest support was in industry and tourism. The distribution of businesses in all activities was much higher in the plains and valleys as compared to the mountainous and hill areas.	Sustainability
Lado-Sestayo a, Vivel-Bua & Otero-Gonzalez/ 2017	Drivers and barriers to entry for new hotel start-ups	Spain	Hotel industry, start-up, impact of location attributes	Poisson model, negative binomial type i (nbi), type ii negative binomial model (nbii), truncated negative binomial type i (tnbi)	When the efficiency of labour is a driver for a start-up; initial investment and idle capacity is related to barriers to entry.	Tourism Management Perspectives
Lange & Dodds/ 2017	Increasing sustainable tourism through social entrepreneurship	Canada	Social entrepreneurship, sustainable tourism	Case study, literature review, document analysis	There is a lack of hospitality and tourism social entrepreneurship projects-businesses and/or they are not recognized yet.	International Journal of Contemporary Hospitality Management
Lee, K.S. Lee, Chua & Han/ 2017	Independent cafe entrepreneurships in Klang Valley, Malaysia – Challenges and critical factors for success: Does family matter?	Malaysia, Klang Valley	New entry cafes, challanges, actors for success, common practices	Multiple casestudy, interview	Critical success factors for a new entry cafe are; concept vs. strategies, an extended notion of location selection, building foundations, family factors and family life-cycle management.	Journal of Destination Marketing & Management
Liu & Fang/ 2017	Night markets: Entrepreneurship and achieving competitive advantage	Taiwan	Entrepreneurs, competitive advantage, night market	Multiple regression analysis, structural equation models (SEM)	The results indicate that competitive aggressiveness and being proactive are positively related to risk-taking among night market vendors, which, in turn, has a positive effect on innovativeness.	International Journal of Contemporary Hospitality Management
Movono & Dahles/ 2017	Female empowerment and tourism: A focus on businesses in a Fijian village	Fiji	Female empowerment, tourism, sustainable tourism, tourism impacts, pacific island tourism,	Case study, the Fiji Vanua Research Framework (FVRF)	The findings have shown that women in Vatuolalai village have become empowered through a process initiated by participation in tourism employment and enforced through entrepreneurial success.	Asia Pacific Journal of Tourism Research

			indigenous Fijian Communities			
Power, Domenico & Miller/2017	The nature of ethical entrepreneurship in tourism	ϕ	Entrepreneurial ethic, tourism entrepreneur, Weber's ideal-type, personal construct theory	Laddering method, qualitative content analysis	Findings show that ethical entrepreneurship in tourism is based on care and relationships, intuitionism, future-orientation, humility and benevolence as key virtues.	Annals of Tourism Research
Swanson & DeVereaux/ 2017	A theoretical framework for sustaining culture: Culturally sustainable entrepreneurship	USA / Arizona	Culture, sustainability, entrepreneurship, indigenous	Case study	The results show that culturally sustainable entrepreneurship encourages adapting entrepreneurial models that sustain and enhance the values and traditions of a community for its self-defined benefits, rather than imposing economic entrepreneurial models that may change conditions within a community. Entrepreneurial strategies in the mainstream proceed upon values that may diverge sharply from those of non-mainstream cultures.	Annals of Tourism Research
Zhou, Chan & Song/ 2017	Social capital and entrepreneurial mobility in early-stage tourism development: A case from rural China	China	Social capital, entrepreneurship, mobility, tourism development, integration, early-stage destination	Deductive and inductive analysis	The findings suggest that the inward entrepreneurs had unrealistic perceptions of the tourism industry before they entered; entrepreneurial mobility in tourism development is influenced by social capital	Tourism Management
Yazıcı, Köseoğlu & Okunmuş/ 2017	Identification of growth factors for small firms: Evidence from hotel companies on an island	North Cyprus	Hotels, growth, entrepreneurship, island	questionnaire, observation, interviews, focus group	The study findings revealed 16 important growth factors for hotels, including active risk taking, education, family history, networks of contacts, other business interests, family investing friends, key employee partners, customer concentration, autonomy, innovativeness, proactiveness, competitive aggressiveness, location, desire to succeed, age of founders, and state support where are strong, weak, and interrelated relationships among these factors.	Journal of Organizational Change Management
Aquino, Lück & Schänzel/ 2018	A conceptual framework of tourism social entrepreneurship for sustainable community development		Community capitals framework, community development, conceptual framework, social enterprise, social innovation, tourism social entrepreneurship	Conceptual framework, critical analysis	A conceptual framework that incorporates community development concepts, generic social entrepreneurship and tourism social entrepreneurship principles, and community capitals perspectives, is proposed.	Journal of Hospitality and Tourism Management
Alrawadieh & Alrawadieh/ 2018	Exploring entrepreneurship in the sharing accommodation sector: Empirical evidence from a developing country	Jordan / Petra	Peer-to-peer accommodation, sharing economy informal economy, entrepreneurship, tourism entrepreneurship, Airbnb	Semi-structured interview	Sharing accommodation entrepreneurs were mainly driven by the desire for economic and cultural benefits.	Tourism Management Perspectives
Aydin & Emeksiz/ 2018	Sustainable urban tourism success factors and the economic performance of small tourism enterprises	Turkey / Eskişehir	Sustainability, urban tourism, success factors, small tourism enterprises, economic performance	Structural equation modelling	Seven dimensions of urban tourism success factors and two dimensions of the economic performance of STEs have been determined and a significant relation was found between them.	Asia Pacific Journal of Tourism Research

Bakas, Duxbury & Castro/2018	Creative tourism: Catalysing artisan entrepreneur networks in rural Portugal	Portugal	Creativity, rural, entrepreneurship, networks	Semi-structured interview	Artisan entrepreneur–mediators in rural areas or small cities take on multiple roles as networking agents who organize and offer creative tourism experiences, providing the missing link between artisans and tourists.	International Journal of Entrepreneurial Behavior & Research
Battistella, Cagnina, Cicero & Preghenella/ 2018	Sustainable business models of SMEs: Challenges in yacht tourism sector	Italy, Spain, Portugal & Albania	Sustainable business model, triple bottom line, yacht tourism, business model innovation, service industry, SMEs, case study research	Semi-structured interviews, content analysis	Contributes in continuing the discourse on sustainable business models, adopting the perspective of the challenges for SMEs and offers food for thought for managers of SMEs in comparing their own business with the identified business model types.	Sustainability
Biddulph/ 2018	Social enterprise and inclusive tourism. Five cases in Siem Reap, Cambodia	Cambodia / Siem Reap	Inclusive tourism, inclusive development, social enterprise, Cambodia	Interview, web site content analysis	The enterprises have created worthwhile new opportunities for poor and marginalized people and contributed substantially to revitalizing elements of Cambodian culture.	Tourism Geographies
Çakmak, Lie & McCabe/ 2018	Reframing informal tourism entrepreneurial practices: Capital and field relations structuring the informal tourism economy of Chiang Mai	Thailand / Chiang Mai	Informal tourism, economy, entrepreneurship, fields, capitals, Bourdieu, Thailand	Narrative interviews, policy analysis	Importance of collaboration between informal entrepreneurs and other stakeholders, concluding with recommendations for policy makers.	Annals of Tourism Research
Carson, Carson & Eimermann/ 2018	International winter tourism entrepreneurs in northern Sweden: Understanding migration, lifestyle, and business motivations	Sweden	International lifestyle migration, lifestyle tourism entrepreneur, winter tourism, low-amenity rural area, northern Sweden	Semi-structured interviews	Northern winter and the undeveloped low-amenity character of the place were key factors in migration choices.	Scandinavian Journal of Hospitality and Tourism
Hikido/ 2018	Entrepreneurship in South African township tourism: The impact of interracial social capital	Cape Town	Social capital, capital, interracial, women entrepreneurs	Interview, participant observation	Entrepreneurial black women in Cape Town, who serves their home as bed&breakfast, do not simply cross but work the colour line in order to generate "linking" social capital and channel whites people's social, economic, cultural, and symbolic capital.	Ethnic and Racial Studies
Hjalager & Kwiatkowski /2018	Entrepreneurial implications, prospects and dilemmas in rural festivals	Denmark	Festival, rural tourism, business development	Mix method, case study, questionnaire, frequency analysis	Local businesses actually participate in rural festivals' ecosystems and there are numerous mutual interactions among local businesses in festival season.	Journal of Rural Studies
Johannesson & Lund/ 2018	Creative connections? Tourists, entrepreneurs and destination dynamics	Iceland	Creativity, tourism enterpreneurs, rural tourism, connection between tourist and life-style tourism encounters	Conceptual	The creative activities of life-style entrepreneurs are not necessarily a key to commercial success.	Scandinavian Journal of Hospitality and Tourism
Li, Liu, Zhu & Zhang/ 2018	Business characteristics and efficiency of rural tourism enterprises: An empirical study from China	China	Rural business, rural tourism enterprises	Data envelopment analysis	The findings show that business characteristics of rural tourism entreprises varied with their business strategy, property and rural industrial base.	Asia Pacific Journal of Tourism Research
Mackay, Nelson & Perkins/ 2018	Interpretive walks: Advancing the use of mobile methods in the study of entrepreneurial farm tourism setting	New Zealand	Mobile methods, walking interview, farms, tourism, rural entrepreneurhip	The interpretive walk	It has been determined that the interpretive walk method can be applied in socio-spatial settings where new rural tourism initiatives emerged, developed and adopted.	Geographical Research

Peters & Kallmuenzer /2018	Entrepreneurial orientation in family firms: The case of the hospitality industry	Austria	Family business, hospitality, entrepreneurial orientation, entrepreneurial behaviour, qualitative	Qualitative case study research	The results show that there are specific entrepreneurial behaviour patterns in the hospitality family firms.	Current Issues in Tourism
Thompson, Gillen & Friess/ 2018	Challenging the principles of ecotourism: Insights from entrepreneurs on environmental and economic sustainability in Langkawi, Malaysia	Langkawi / Malaysia	Conservation, entrepreneurship, governance, Mangrove, sustainable tourism, tour operators	Semi-structured interviews, content analysis of web sites, participant observation	The article contributes to the ecotourism literature by using a hierarchy of entrepreneurship as a means to better understand the environmental, social, and economic sustainability of an ecotourism operation. Sustainability is primarily considered in economic terms.	Journal of Sustainable Tourism
Yuan, Tsai & Chang/ 2018	Toward an entrepreneurship typology of bed and breakfasts	Taiwan / Miaoli County	Bed and breakfasts, b&bs, typology, entrepreneurship, cultural traits	Narrative analysis, synthesis of in-depth interviews	This research contributes to the literature by providing a framework for exploring B&B entrepreneurship. From the practical perspective, classifying B&Bs is of benefit to practitioners as it identifies their service delivery system and differentiates their B&Bs from competitors who attempt to provide apparently identical products.	Journal of Hospitality & Tourism Research

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Romanian rebound after the crisis and the re-launch of the banking credit

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ABSTRACT

During the 2007 crisis, Romania faced many economic challenges: a rise of inflation, large exchange rate fluctuations, drop of the banking credits, a high share of non-performing loans, drop of the banking profitability ratios. Starting with 2014, the Romanian economy has rebounded. The banking system relaunched its increasing trend of banking loans, mainly for consumption, the wages increased and the economic growth reached the highest level in the European Union (EU) area. The public debt and current account deficit largely increased, public deficit is higher than 3%, the inflation re-surged at high levels and the economic growth is mainly based on consumption which couldn't be sustainable in the long-run.

1. Introduction

In the fall of 2008, when the first signs of the financial crisis were felt in the USA, the highest administrative officials in Romania were declaring that our country would be bypassed by this financial crisis. Thus, the state authorities did not take into account the signs of the crisis visible in the last months of the year, namely the considerable reduction of liquidities and of direct foreign investments, the decrease in the state budget revenues, etc.

The decline of education in Europe was anticipated by specialists as an effect of the relaxation intervened within the shift towards postmodernism. The specialists consider the decline of the European professional training as one of the most significant issues of the period following 2006 that the old continent has ever faced. In the case of Romania, things are worse than in the rest of Europe, as Romania slipped faster to the path of professional training decline, where our country has not only lost the troop of technological innovation training but also faced weakened professionalism in several areas (Young, 2014).

The general causes of the financial crisis triggered in October 2008 in Romania are as follows: relaxation of the credit standards, the artificial increase in the real estate price, as well as the expansion of lending. In addition to these general causes, there are several specific causes, such as the shortage of highly qualified workforce, internal economic and financial imbalances, the inconsistency between the real and the nominal economy, the volatility of foreign capital, the prevalence of consumption in relation to savings and investments but also the poor development of the capital market contributing to the internal financing with a volume of funds 10 times lower than the banking system, being unable to carry out the financing function, being favourable to speculations.

The outbreak of the financial crisis in Romania was caused by the collapse of the listed stock exchange quotations, the slowdown in production, restricting access to credit by raising interest rates and tightening the lending conditions, rising inflation, the increase in the budget deficit and, last but not least, the exchange rate volatility. The effects of the financial crisis in Romania were most strongly felt by the people on low incomes and by the low-capitalized companies (Isarescu, 2009).

At the international level, the crisis particularly manifested in the banking system. However in Romania, the banking system was not severely affected due to lack of exposure to the toxic assets as well as due to the prudential policies implemented and consistently maintained by the National Bank of Romania which consistently opted for counter-cyclical measures to avoid the creation of speculative bubbles and destabilization of the financial system during the economic expansion periods and favouring of the monetary circulation in critical times (Ahmed, Barkley and Uppal, 2017).

2. Romania's recovery after the crisis

Quickly analysing the crisis years undergone by Romania, we notice a dramatic decline in the country's economy, then a cumbersome recovery, then between 2013 and 2015 we witnessed a new, consistent growth of the economy. The paradox created by the Romanian economy is given by the fact that the Gross Domestic Product (GDP) in 2015 was 200 billion RON higher than the level set in 2008, given the fact that the working population was reduced by 800,000 people, the number of employees being 2.8 million lower, and the national currency was significantly depreciated against the major currencies.

Four years after the economic crisis was imported into Romania, the country's economy underwent major changes that indirectly affected all the major areas. Some changes were made due to the need to correct imbalances, such as the current account deficit, which reached 14% of GDP in 2008, the budget deficit or the real estate prices accumulated in the crisis years. Other changes were made due to the external stimuli, thus the reduction in exports was due to the decrease in the external demand. There were also inherent changes that did not have causes related to specific economic policy measures.

The economic crisis penetrated Romania through several channels which influenced the real economy through the labour market and economic growth (Peicuti, 2011):

- Commercial channel, namely the decline in export demand due to the low consumption in partner countries for export. However, Romania displayed relatively good performances in the period 2009-2011, due to the economic support programmes from some countries such as Germany or France.
- Through the banking channel, by reducing the number of credits provided by the financial institutions.
- Financial channel, by withdrawing the capital inflows and through the significant decrease in the foreign direct investments.

Recession worsened the prospects for economic growth, affected the potential for GDP growth, most studies showing a loss of 1.5-2% of the potential GDP, the banks were more prudent in lending, and in the market labour, the prolonged unemployment generally lead to the discouragement of jobseekers.

In general terms, the year 2012 was characterized by an internal political crisis, poor agricultural production, the decline in the foreign investments and low absorption of European funds, which, added to the recessions of the European economies, led to a major deterioration of the Romanian economy. However, in 2012 the Romanian economy remained on a positive level due to the domestic consumption, also helped by the increase of the salaries in the public sector. Also in 2012, the euro area economy entered a technical recession for the second time in 2010-2013, which significantly reduced the external export demand (Marga, 2012).

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Table 1. Romanian indicators in 2012 against 2008

Indicators		June 2008	June 2012
GDP nominal (billions lei)		195,71	109,4
Annual growth rate for real GDP (%)		9,3	1,7
Exports (billions Euro)		17,03	22,3
Imports (billions Euro)		26	26,8
Current account deficit (billions Euro)		12,4	2,4
FDI (billions Euro)		7,13	0,621
Total employees (millions)		4,827	4,301
Unemployed workers		337 100	409 900
Unemployment rate (%)		3,7	4,56
Average gross wage		1738,5	2140
CPI (%)		8,56	2,04
Reference interest rate (%)		10	5,25
Exchange rate EUR/RON		3,6557	4,4603
Exchange rate USD/RON		2,3507	3,5570
Public budget deficit (% GDP)		1,18	1,12
Public revenues (% GDP)		18,2	15,3
Public spending (% GDP)		19,4	16,4
Public debt (% GDP)		13,4	34,6
External debt (billions Euro)		44,7	77,7
Credits (billions Lei)	Foreign currency	98,13	144,6
	Lei	80	82,4
Default credits (millions lei)		702,9	8 300
Defaulted debtors (thousands)		392,8	730
Deposits (billions lei)	Foreign currency	48	65,1
	Lei	92,7	125,8

Source: https://economie.hotnews.ro/stiri-finante_banci-13032759-analiza-cum-evoluat-economia-romaniei-declansarea-crizei-din-2008-vezi-diferentele-majore.htm

According to Table 1, in June 2008 the nominal Gross Domestic Product was at the level of 195.71 billion RON. In real terms, the GDP expansion was 9.3% in relation to the same period of the previous year. In June 2012, the nominal Gross Domestic Product was 109.4 billion RON, thus in the period 2008-2012, we had a 44% decrease, which represented 86.31 billion RON.

With regard to the total number of employees in the economy, according to Table 1, in 2008 there were 4.827 million employees, while the unemployment rate reached the 3.7% threshold, accounting for 337,100 unemployed. The average gross salary in June 2008 was 1738.5 RON and the average net salary was 1,273 RON. Against the backdrop of the recession and the slowdown in the economic activity, the number of employees steadily declined, and in June 2012, Romania reached the threshold of 4.301 million workers, with an unemployment rate of 4.56%, accounting for 409.9 thousand people. In 2012, the gross average salary reached 2,140 RON and the net average salary 1,552 RON.

During the first months of 2018, there was enthusiasm about the record economic growth displayed in 2017 which ranked Romania first in the European Union from this point of view.

In spite of this favourable economic period traversed by our country, spending remained at a higher level compared to the budget revenues, which meant we were resorting to borrowings.

The first alarm sign is that in 2017 compared to 2008, the public debt increased by about 3.5 times, which means an increase of over 45 billion euros in this period. From the point of view of the rapid growth of the public debt in the post-crisis period, within the European Union Romania is overcome only by Slovenia.

Another problem of the Romanian economy related to the economic growth in the last period is given by the fact that all this economic growth was based on consumption, which made it impossible to be reflected in the revenues as well.

According to Table 2, the gross average salary in 2018 was increased to 4,162 RON, and the net one varies depending on several factors; however, it is around 2,400 RON. We can notice a gradual increase in the gross and net salaries over the three significant years, thus since 2008, when the financial crisis broke out, to 2012 when it was over, we had a growth by 23% in the gross salary, that is 401.5 RON, respectively 22% in the net salary, that is 279 RON.

Table 2. Gross and net wages in Romania

Year	Gross wage	Net wage
2008	1738,5	1273
2009	1845	1361
2010	1902	1391
2011	1980	1444
2012	2140	1552
2013	2263	1579
2014	2328	1697
2015	2555	1859
2016	2809	2046
2017	3131	2196
2018	4162	2400

Source: Elaborated by the author according to data released by the National Institute of Statistics www.insse.ro

On paper, this salary increase seems very positive, with almost double the net salary, that is the one that employees use for their daily living. In spite of this increase, the Romanians' standard of living could not be felt because of the inflation which cancelled this salary increase.

The 2017 salary increase proves to be unsustainable, therefore Romania, instead of exceeding its 3% budget deficit target, due to the increase in salaries and pensions, will go up to 4%. In order to pay pensions and salaries, Romania is in debt because it already exceeded the level of tax revenue collected by the State from taxes and duties. Because of these issues, any economic downturn that Romania will face is going to jeopardize the unitary wage law, thus the state will have difficulties in maintaining salaries and pensions at the level they reached.

3. The anti-crisis policies promoted in Romania for the economic recovery

Trying to resuscitate the financial system, Romania accessed loans from the European Union, the International Monetary Fund (IMF), the European Bank for Reconstruction and Development and the World Bank. Following the agreement signed with the IMF, Romania took action regarding the value-added tax (VAT) by raising this tax from 19% to 24%, having a direct effect on the rise in inflation and the reduction of wage expenses for the employees in the public sector. This immediately led to an increase of non-performing loans among the employees in the public sector. In practice, the lack of correlation of the fiscal and budgetary policies with the economic rescue measures imposed by the National Bank of Romania (NBR) led to instability and mistrust in the entrepreneurial environment.

In Romania, anti-crisis policies began to emerge along with the emergence of the global financial crisis effects, which brought several anti-crisis measures:

- Reduction of the single tax rate to 10%, which led to the reduction of the fiscal pressure of the companies and individual taxpayers. Thus, by broadening the tax base, the collection rate and therefore the budget revenues are automatically increased.
- Reducing the VAT rate to 15%, from the initial value of 19%. This reduction stimulates consumption; therefore, it automatically helps to reduce the economic bottleneck by engaging production and investments.
- Banks intervene in the payment circuit of the tax liabilities so that the lack of state efficiency could be overcome. Thus, banks operate by a clear and timely collection of taxes and duties through credit instruments, such as bank guarantee letters, promissory notes and others.
- There has to be a balance with regard to the treatment towards the state on the one hand and the taxpayers on the other, with regard to the non-repayment or default of payment.
- The state has to reduce the involvement in managing the money the company produces as much as possible, because the state means a lack of efficiency and corruption.
- Stimulating the accumulation and circulation of capital, by reasonably deregulating the financial and banking market, in order to stimulate the emergence of savings banks and of other non-banking financial institutions.

4. Dynamics of the bank lending

The sustainable growth of the financial intermediation, in particular by widening the lending sphere to the corporate sector, continues to remain a challenge for the banking sector although progress has been made in this direction lately. The new flows of loans granted to the non-financial corporations displayed more rapid dynamics compared to those granted to the population, while, in the case of loans granted to the population sector, an important part (one third) was made through the "First Home" programme (Figure 1).

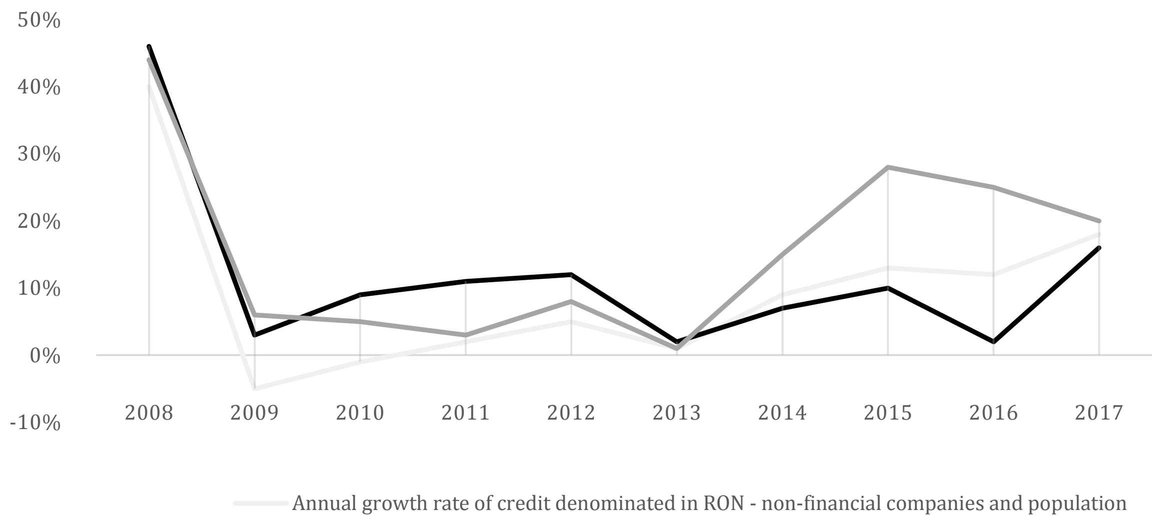

Figure 1. Banking credit developments during 2008 - 2017
Source: elaborated by the author according to data released by Council of the Romanian Banking Unions, « Banks and Economic Growth», November 2014 (updated in 2017).

The modest evolutions of the companies' financing by banks are influenced by a series of structural features both in the nature of demand and supply. The main elements limiting the solvable credit demand are represented by:

- the high number of companies with negative equity or which do not perform an activity;
- the high degree of indebtedness of certain categories of companies, especially micro-enterprises;
- deficiencies in the insolvency framework of the legal entities

As regards the credit supply, potential problems are related to the training degree of the banking staff involved in the lending activity, to the supply of financing products that do not address the specific problems of the non-financial companies, also due to the limited lending competences at local and even national level, and the preponderance of real estate loans.

Bank lending within the non-financial sector is low, as other financing sources are preferred, such as commercial credit, loans from shareholders or affiliated entities, respectively non-resident financial institutions. Historically, bank financing has been little used by the Romanian companies. For example, over the period 2004-2017, no more than 15 per cent of the companies active in the economy resorted to such loans. The major difficulties faced by companies in accessing financing from banks and / or NBFI (non-bank financial institution) are represented by the excessive interest and commission rate, the requirements regarding the value or the type of guarantee, and the bureaucracy.

Corporations increasingly resort to credits from the credit institutions; also banks are more inclined to large companies, with significant cash flows and higher asset holdings. Thus, about 56 per cent of the large-sized companies had a bank credit in September 2017, compared with only 11 per cent for small and medium-sized enterprises (SMEs). Moreover, in 2017 a more pronounced increase in the credit flow newly granted to corporations was observed, while the one granted to SMEs diminished compared to the previous year (Figure 2).

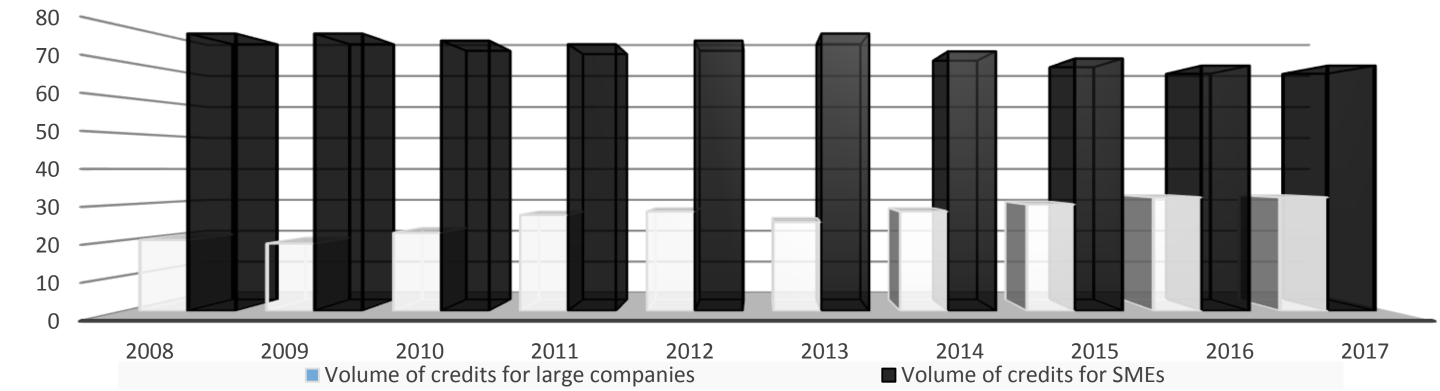

Figure 2. Share of the banking credits according to the companies'dimension
Source: elaborated by the author according to data released by Council of the Romanian Banking Unions, « Banks and Economic Growth», November 2014 (updated in 2017).

In addition, the credit use for investments is modest, most of the new loans in 2017 were directed to financing current corporate operations (60 per cent of the new credit volume without considering treasury credit). Credits for investments were allocated both to the purchase of equipment (about 29 per cent of the new credit total) and to real estate investments (11 per cent).

The number of the newly-credited companies almost doubled during 2016 compared to 2009, although it remained close to half the level during the pre-crisis period before 2007.

In the first part of 2016, after the temporary tightening of the credit standards for mortgage loans to the population, against the backdrop of the changes determined by Law no. 77/2016, banks again tightened the credit conditions for the public sector in the first six months of 2017. By the end of 2017, the credit institutions moderately relaxed lending standards for housing and land purchase loans granted to the public, and tightened those for consumer credits. The credit standards applied by banks to the non-financial companies sector remained relatively unchanged.

The assessment of the companies' borrowing capacity at the end of 2016 indicates the existence of a sustainable lending potential which can be exploited over time by the domestic banks (Figure 3). More than two-thirds of the additional financing volume may be absorbed by the private sector, while the rest by the state-owned sector. The most important amounts could be directed to areas of activity such as industry (26.3 per cent) or services (14.2 per cent).

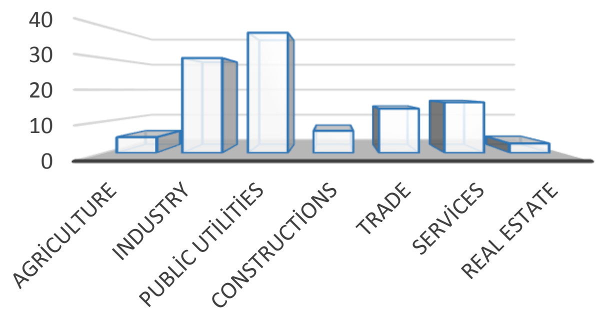

Figure 3 Credit potential according to the companies' economic area in 2017 (billions lei)
Source: elaborated by the author according to data released by Council of the Romanian Banking Unions, « Banks and Economic Growth», November 2014 (updated in 2017).

Increasing financial intermediation for companies could be an alternative drive for the economic growth, on condition that the payment discipline improves, the uncertainties are reduced and the market returns to a positive sense. The current account deficit, although rising, is significantly lower than at the onset of the 2008 crisis. However, Romania currently displays one of the largest current account deficits in the EU. The current account deficit related to GDP deepened after the financial crisis.

As a result of re-launching the banking credit, the profitability ratios of the Romanian banking system significantly improved after the crisis. The net profit of the banking system even surpassed its pre-crisis level, although the return on equity (ROE) is lower than its pre-crisis level (Figure 4). The return on assets (ROA) is quite similar to the pre-crisis levels. However, the number of credit institutions facing losses represents around 25% of the total credit institutions on the Romanian market. The solvency ratio of the Romanian banking system stays high (around 20%), while the non-performing credit ratio decreased during the last years from 10% to 7,9%.

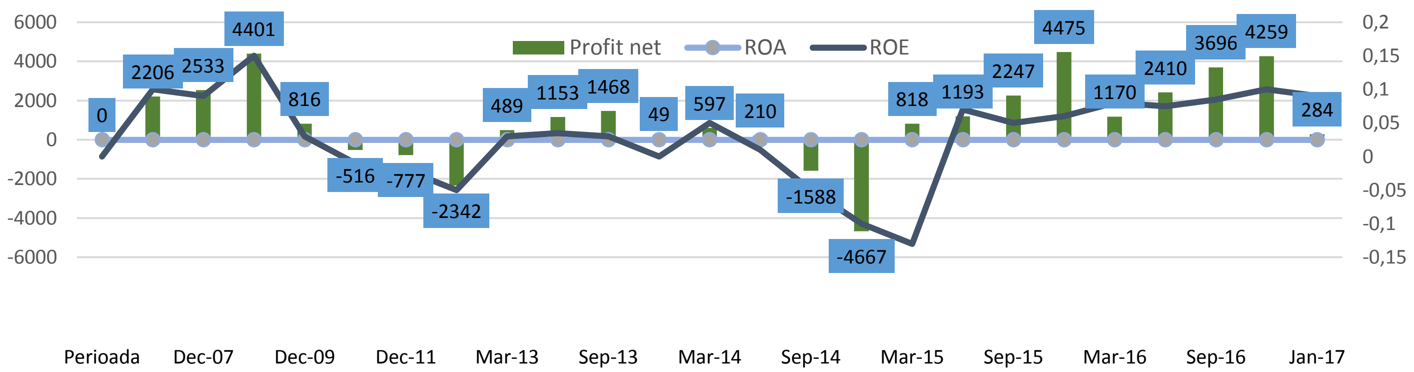

Figure 4. Profitability of the Romanian banking system during 2007-2017
Source: www.bnro.ro

5. Conclusions

The credit boom in the expanding economies within Eastern Europe originates in the permissive monetary policy of Federal Reserve (FED), Japan and of the European countries in the early 2000s. According to statistical data, since mid-1997, when the subprime panic began, the deposit dynamics ceased to keep pace with credit developments, the banking sector suddenly accumulating large debts, the majority in the short term. It is estimated that 90% of these debts were held by the European banks. The effects of the monetary expansion policy have been exacerbated by the distortion of incentives that shape the behaviours of the economic agents, mainly those of financial-banking institutions.

The legislative measures adopted by the American government to stimulate home purchasing have distorted the allocation of credit, by stimulating the expansion of housing construction and increasing the share of non-performing loans.

The interest rate of the monetary policy and that of the minimum statutory reserves, as well as the need for corporate equity in relation to borrowed funds above the EU average, as well as the supervision described as "excessive" even by the executives of some credit institutions carrying out activities in the domestic market allowed the banking system to avoid slippage. In spite of the measures adopted by the National Bank of Romania, both the internal imbalances as well as the foreign influence contributed to Romania in entering the recession, the lack of confidence in the economic recovery mechanisms ultimately leading to the limitation of lending, with direct effects on the real economy, despite the proper capitalization of the banking system.

At present, the Romanian economy is displaying a significant growth; therefore, in 2017 it had the highest level of economic growth in the post-crisis period. With this GDP, Romania ranks 16th in the EU. If the economic growth remains at least at the same level as in the previous year, Romania will overtake Portugal and the Czech Republic and thus reach the 14th position out of 28 member countries of the European Union. Although the Gross Domestic Product has increased in recent years, the GDP per capita remains very low, which places Romania on the penultimate position within the European Union, being followed by Bulgaria.

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Accessible tourism in Greece: What is the current status?

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ABSTRACT

Accessible tourism is a new emerging segment of tourism in Greece, as well as worldwide, related to the tourist activity of disabled people and elderly age groups. Travelers with disabilities and elderly people have their special needs when engaging in tourism. This paper attempts to present the existing status of the accessible tourism in Greece. More particularly, our research focuses on the travel needs and barriers faced by people with disabilities in order to evaluate the current accessibility level of the Greek tourism industry, as well as the quality of infrastructure, tourist services and products offered to disabled and aged people throughout the Greek tourist chain. For this purpose, questionnaires with experts involved in the Greek tourism industry were undertaken and a quantitative analysis has been used to present our results. Whenever it was possible, our results have been compared with those of other academic studies, conducted for Greece or other similar tourism destinations. Our results show that, first the "accessible tourism" product of Greece is not entirely satisfactory; therefore, demand for accessible tourism in Greece remains low, as the Greek tourist destinations lack the appropriate infrastructure and easy access to public transport; and second the dynamics and size of the accessible tourist market is not fully understood by the Greek tourist industry. Our findings enrich the existing limited literature by providing some valid conclusions for the accessible tourism in Greece, since similar academic research has not been conducted before.

1. Introduction

Tourism is the largest and fastest growing industry in the 21st century (WTO, 2015). The rapid growth of the tourist industry has brought a lot of changes in the way tourists perceive the offered tourist product. In recent years, along with the development of mass tourism, there has been a development and utilization of various alternative forms of tourism characterized by particular dynamics and diversity. Accessible tourism is considered as one of the alternative forms of tourism, and it is characterized as a newly emerging tourist market, which has shown a growing trend in the last decades. This is due to the fact that tourists are more experienced, more demanding and more selective in the way they are doing their tourist activities.

It is widely accepted that people, with or without a disability, have the same desire to travel. Their desire and the special needs that this niche source market has, has contributed to the development of the model of accessible tourism. This tourism model is using all the elements that a tourist product needs. The concept of "Accessible Tourism" refers to the adaptation of the environmental resources, tourism services and products, in order to allow all visitors' access, use and enjoyment, based on principles and international design standards (WTO, 2016b).

Darcy (2006) mentions that it is very important to define the definitions of accessible tourism and to develop a common code of statistical data (qualitative and quantitative) so that there is a common code of communication and perception by all public and private tourist sectors related to accessible tourism.

There is a big variety of different definitions of "Accessible Tourism" (ENAT, 2017). "Accessible Tourism", also known as "Access Tourism", "Universal Tourism", "Inclusive Tourism" and "Barrier-free Tourism" in Japan, is tourism and travel that is accessible to all people, with disabilities or not, including those with mobility, hearing, sight, cognitive, or intellectual and psychosocial disabilities, older persons and those with temporary disabilities" (ESCAP, 2009).

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According to Darcy and Dickson (2009, p.7), "accessible tourism enables people with access requirements, including mobility, vision, hearing and cognitive dimensions of access, to function independently and with equality and dignity through the delivery of universally designed tourism products, services, and environments. This definition is inclusive of all people, including those traveling with children in prams, people with disabilities and seniors".

ECTSAA's (2016) definition of accessible tourism that it is "about the process of making all tourism offers suitable and easy to use for the people with disabilities and for the wider range of customers who need - and benefit from - accessible surroundings, facilities, services, and information".

Accessibility benefits the whole population. It is argued that the people with impairments as well as the elderly population actually depend on accessibility information and determine if individuals go traveling or not (Buhalis et al., 2005). Accessible tourism targets any market segment that prefers easy access to a tourist experience. It is a fast-growing segment of the tourist market that includes people with some form of disability, as well as elderly people who often have diseases that can lead to disabilities (Buhalis and Michopoulou, 2011).

The aim of the paper is to examine why accessible tourism could be a new promising tourist market for growth in the Greek tourism industry. It presents a preliminary overview of the general situation within the country, giving information regarding the current situation.

Two objectives have been set through this research paper. The first one is to analyze the accessible tourism sector from the side of demand and supply. The second one is to examine the current situation of accessible tourism in Greece. Further, our research attempts to give a picture of accessible tourism from the present to the medium-term future and to investigate the level of supply of accessible infrastructure, customer service and activities provided by tourism businesses and operators.

The rest of the paper is organized as follows. Section 2 reviews the existing literature related to accessible tourism sector worldwide and in Greece. Section 3 presents the demand and supply of accessible tourism worldwide. Section 4 presents our methodology, the research's limitations and the data analysis. Section 5 presents the empirical findings of our research. The last section summarizes the main findings of this research and includes a recommendation for the development of accessible tourism in Greece.

2. Literature review

Through an extensive literature review on accessible tourism, we found that in the last two decades there has been an increase in the surveys and studies on accessible tourism. The concept of accessible tourism is a relatively new scientific field of research in the field of tourism. Most researchers and relevant literature focus on three main research areas:

- *The economic aspects* of accessible tourism and future economic forecasts from investment and the promotion of accessible tourism (Darcy, Cameron, & Pegg, 2010; University of Surrey, 2013; Bowtell, 2015; European Commission, 2015).
- *Different models of perception* of the characteristics and peculiarities of the people with disabilities, the social and political approach to accessible tourism (Darcy and Buhalis, 2011; Portales, 2015).
- The *practices and techniques for promoting accessible tourism* to types of tourist destinations, tourism (products & services) and destination management. (WTO, 2013, 2016a; Darcy, 2010; Naniopoulos et.al, 2015; Ambrose, 2016).

The common component of economic aspect and the economic forecasts for investment in accessible tourism is considered that accessible tourism is a low-profit tourism market with a stereotypical approach that wants people with disabilities and the elderly to have a significantly lower disposable income compared to the people without disabilities and younger people. All the research approves that accessible tourism has the potential to be one of the fastest growing tourism market segmentation. According to the University of Surrey (2013), the European travel market is losing more than 142 billion Euro every year, due to the lack of appropriate infrastructure, services, products and behavior towards tourists with special access needs. This driving force reduces the number of businesses who dare to invest for fear of losses (Portales, 2015).

Researching different models of perception of the characteristics and peculiarities of the people with disabilities based on the social and political approach to accessible tourism, they agree that accessible tourism is a tourism model that affects not only the people with disabilities but the whole society. The accessible tourism model reflects some positive trends in society, such as (i) increasing empathic position towards disabled people, (ii) a clear penchant for specialization in the field of accessible tourism and (iii) the value of changing the attitude toward diversity (Portales, 2015).

In the effort to apply all the practices and techniques for promoting accessible tourism to different types of tourist destinations, tourism (products & services) and destination management all the involved tourism stakeholders and the scientific community agrees that it must be a created universal design around the accessible tourism. To evaluate the tourist experience across different tourism sectors from demand and supply-side perspectives (European Commission, 2014), accessibility has to be measured as an indicator of quality.

Comparing all the above papers and conclusions of every field of research, the common affiliated is that there are two contradicting trends for accessible tourism. On one side, you have the scientific community together with the research communities (UNWTO, ENAT, W.H.O, Australian Foundation for Accessible Tourism, Accessible UK, South Africa's Universal Accessible Tourism Foundation, ONCE Foundation), who argue that there is clear evidence that accessible tourism is a new, big and rising tourist opportunity for investment and development.

On the other side, you see the lack of accessible tourist services and products and foremost a business reluctance, to take investment risks in the development of accessible facilities and in the design of tourist services and products (Buj, 2010).

Our review of the relevant literature and articles in Greece has shown that there is a significant lack of studies of the subject under investigation as far as Greek reality is concerned. There is a very small number of publications in Greek journals and academic research papers.

In 2006, Ikkos (2006), in collaboration with JBR Hellas Consultant Company, concluded that accessible tourism in Greece presents a large number of problems and weaknesses. Most of the tourist attractions, public transport and accessibility in public do not meet the requirements of the universal design.

Their research took place during 2015 and 2016. They researched the Greek tourism product from every different angle. Through their research, they investigated every tourism region in Greece, all the related tourism segments. Their aim was to investigate the travel patterns and behaviors of, and information provision for the people with access needs and compared different accessible tourism model that has been applied in Greece.

In contradiction to the saying of Ikkos (2006), Dimou and Velissariou (2016), in their research on accessible tourism in Crete, found that there are high levels of satisfaction of customer service, from the people

with disabilities, since there are hotels that meet many accessibility standards, several archaeological sites, and natural landscapes with disabilities, since there are hotels that meet many accessibility standards, several archaeological sites, and natural landscapes are easily accessible.

The sectors that do not allow Crete to become an absolutely accessible tourism destination, are the sectors of public transport and the urban infrastructure related to tourism. The results of their research concluded that Crete can become an important accessible tourist destination if it invests in that direction.

Their research was conducted during the summer season (May – October) of 2015; they focused their research on the region of Crete. The aim of their research was to examine the demand side; their research focused on the satisfaction of the people with disabilities using the accessible infrastructure. The participants were asked to provide any opinion or information they believe would be useful to improve the accessibility standard, to investigate from the demand side what the problems that they are facing during their vacations are. They used a questionnaire with a structure of twenty-five open and close-ended questions.

3. The demand and supply for accessible tourism

Accessible tourism analysis has two main components. A demand-side analysis of the niche market segment of accessible tourism; and a supply-side analysis which determines how the tourism-related business sectors support accessible tourism and what the level of accessibility is, including supply-chain effects.

3. 1. Accessible tourism: overall demand-side

Over the last decade, the connection between people with disabilities/impairments and the tourism sector have been increased due to the attention that is given to it by academic studies and governments (Darcy and Dickson, 2009).

The accessible tourist market is the largest tourist group of consumers when you consider the number of disabled people with a chronic or temporary disability, the rapid increase in the elderly population and the accompanying people when they are on holidays (families, friends, escorts etc.).

According to the World Tourism Organization, the tourism market which benefits from the infrastructure and the universal design of accessible tourism exceeds one billion international tourists traveling each year (WTO, 2016b).

As presented in Table 1, the European Commission (2014) estimated that the market segment for accessible tourism was approximately 138 million people in 2011 in EU27. This is basically in line with the findings of the OSSATE research by Buhalis et al. (2005) who suggested that there were 46.6 million people with disabilities (aged 16-64) and 80.9 million elderly populations (aged 65 or above), or equivalently 127.5 million people with access needs in 2005. The narrow gap between the two estimates can be explained by the fact that the population of the with access needs experienced mild growth over the past few years (European Commission, 2014). Furthermore, details about the future forecast of accessible tourism will be presented in Table 2.

In Greece in 2011, the population (aged 65 or above) were approximately 2 million people and the 776 thousand people with disabilities.

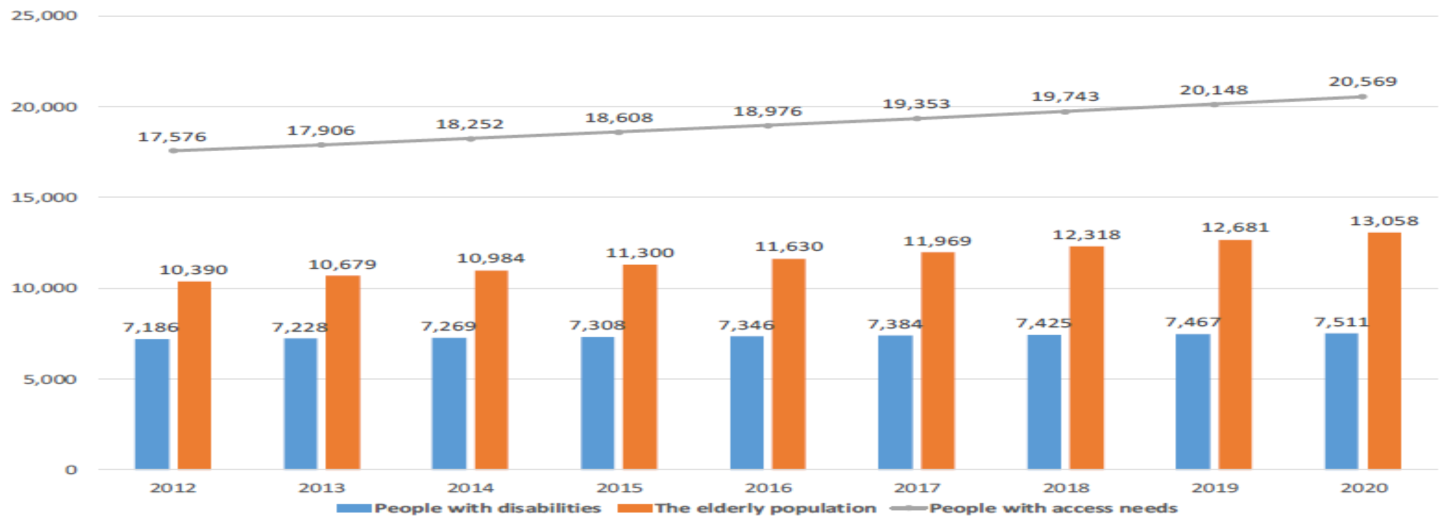
Table 1: People with access needs in the EU27 countries as of 2011

	Austria	Belgium	Bulgaria	Cyprus	Czech Rep.	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy
The elderly (Age 65 or above)	1,504	1,938	1,325	132	1,606	940	232	956	11,169	16,829	2,112	1,664	534	12,509
People with disabilities (Age 15-64)	729	1,327	64	96	1,506	724	79	1,141	10,394	4,534	776	780	364	2,621
Access Needs	2,233	3,265	1,389	228	3,112	1,664	311	2,097	21,563	21,636	2,888	2,444	898	15,13
	Latvia	Lithuania	Luxemburg	Malta	Holland	Polland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	U.K.	EU27 Countries
The elderly (Age 65 or above)	396	517	72	61	2,629	5,278	1,934	3,207	668	343	7,918	1,755	10,547	88,778
People with disabilities (Age 15-64)	84	260	41	18	2,829	3,334	1,454	866	325	277	2,726	1,258	11,219	49,825
Access Needs	480	777	113	79	8,612	8,612	3,388	4,073	993	620	10,644	3,013	21,766	138,603

Source: European Commission, 2014

Figure 1 presents the current and future demand for EU's accessible tourism by the people with access needs from the key international inbound markets from 2012 until 2020. As it is shown in Figure 1, there is a continuing increase in the demand for accessible tourism.

Figure 1. Current and future demand for EU's accessible tourism by the people with access needs from the key international inbound markets from 2012-2020.



Source: European Commission, 2014

The estimated increases in the future demand according to the European Commission (2014, p. 43) are based on that people with disabilities are believed to be more willing to travel and should also increase their budget to explore new destinations that they have not been before. Their prediction is based on the travel propensity and travel frequency researches that have been conducted.

Evolution of the population is grown steadily at an average annual rate of 0.5% (European Commission, 2014, p.44). According to the EU (OECD/EU, 2018) research "Health at a Glance: Europe 2018" presents that the life expectancy of the EU population is expected to increase between 2012 and 2020. According to the European Network of Accessible Tourism (ETCAATS, 2016), these are two main factors in the steady increase of accessible tourism in Europe.

Based on the assumption that disabled people travel alone, and they are willing to explore new destinations, Table 2 presents an overall prediction of the value of the accessible tourism market. As it is presented, the Greek total market value is expected to increase by 75 per cent and the world total market value is expected to increase by 65 per cent. From 2011 to 2020, the population of the people with access needs in the EU27 area is expected to experience a mild growth of 1.2% per year (European Commission, 2014). By looking at the European figures alone, as they are presented in Table 2, the total number of elderly citizens is estimated to increase by nearly 35% by the end of 2025. In 2005 in Greece, one in six persons (15.7%) used to live with impairment (ENAT, 2014).

Table 2. Accessible tourism market value forecast between 2005 – 2025 (in EUR) focusing on the elderly (>65) consumer segment

Accessible tourism market value forecast 2005-2025 (in EUR) focusing on the elderly (>65) consumer segment

Country (EU27 exc. Bulgaria, Croatia)	2005					2025						
	Elderly population >65 in 2005 (million PAX)	GDP/ capital 2005 (€)	Factor	Av. spend/ holiday/ head (€)	Market value 2005 (in € million)	Elderly population >65 in 2025 (million PAX)	GDP/ capital 2025 (€)	Factor	Av. spend/ holiday/ head (€)	Market value 2025 (in € million)	Elderly population change 2005 - 2025 (%)	Market value change 2005 - 2025 (%)
Austria	1,36	29,753	1,11	861	1.168	1,88	40,741	37	1.178	2.210	38	89
Belgium	1,81	29,182	1,09	844	1.525	2,39	39,046	34	1.129	2.699	32	77
Cyprus	0,09	13,536	0,5	391	35	0,16	12,797	-5	370	57	74	65
Czech Republic	1,46	9,776	0,36	283	412	2,25	17,077	75	494	1.113	55	170
Denmark	0,82	38,131	1,42	1.103	901	1,21	44,054	16	1.274	1.538	48	71
Estonia	0,22	8,378	0,31	242	54	0,26	16,884	102	488	127	17	135
Finland	0,83	30,556	1,14	884	734	1,29	41,952	37	1.213	1.565	55	113
France	9,96	27,193	1,01	786	7.835	13,98	30,99	14	896	12.530	40	60
Germany	15,58	26,831	1	776	12.088	19,82	37,582	40	1.087	21.537	27	78
Greece	2,01	18,237	0,68	527	1.059	2,47	19,631	8	568	1.404	23	33
Hungary	1,51	8,807	0,33	255	384	2,01	13,191	50	381	766	33	100
Ireland	0,64	38,632	1,44	1.117	711	0,81	35,540	-8	1.028	834	28	17
Italy	11,29	24,266	0,9	702	7.923	13,9	25,302	4	732	10.169	23	28
Latvia	0,37	5,63	0,21	163	60	0,41	10,879	93	315	130	12	116
Lithuania	0,55	5,806	0,22	168	92	0,71	12,411	114	359	253	29	176
Luxembourg	0,07	64,545	2,41	1.867	127	0,10	77,287	20	2.235	232	53	83
Malta	0,05	12,02	0,45	348	19	0,10	18,165	51	525	52	83	177
Netherlands	2,31	31,457	1,17	910	2.104	3,75	35,48	13	1.026	3.848	62	83
Poland	5,09	6,336	0,24	183	933	8,05	13,362	111	386	3.111	58	233
Portugal	1,8	14,591	0,54	422	760	2,33	15,745	8	455	1.061	29	40
Romania	3,26	3,584	0,13	104	337	-	6,896	92	200	-	-	-
Slovakia	0,64	9,972	0,37	288	185	1,06	20,377	104	589	622	64	236
Slovenia	0,31	14,288	0,53	413	128	0,45	21,576	51	624	283	47	122
Spain	7,1	20,778	0,77	601	4.269	9,00	20,653	-1	597	5.378	27	26
Sweden	1,57	33,091	1,23	957	1.501	2,16	47,497	44	1.374	2.964	38	98
UK	9,54	30,301	1,13	876	8.357	13,00	37,414	23	1.082	14.063	36	68
	80,22			618	53.701	103,54			793	88.549	29	65

Notes: a German data used as guideline for EU total spend/person/holiday (BMWA 2004, Buhalis et al., 2005, Euromonitor); b Assuming Average spend/person/holiday grows at the same rate as GDP/Capita between 2005 and 2025; c Unreliable or uncertain data

Source: Ratio of travel spend between able bodied and disabled tourists – BMWA (2004) in Buhalis et al. (2005); Population figures – US Census Bureau (2005) in Buhalis et al. (2005); German Travel Spend – BMWA 2004, Buhalis et al., 2005, Euromonitor (2013); GDP/CAPITA 2005-2025 – World Bank (2013)

Source: Bowtell, 2015

According to the potential market for European travelers that want to benefit from the accessibility, the anticipated demand for accessible tourism will double over the forthcoming years, as it is presented below in Table 3.

Based on the population figures of the people with access needs from Table 2, together with the travel behavioral profiling, the current and the future demand for accessible tourism is presented. The people with a disability tend to take their specific needs into account when preparing and booking their trip, with many checking accessibility conditions in advance or selecting trips where issues are unlikely to arise.

Table 3. The potential market for European travelers benefiting from the increased accessibility and tourist revenue

Overall demand	70% are physically and financially to travel	Multiplier effect of friend and family	Number of friends and family	Total potential market of travellers	Average spending per person and per vacation	Potential revenues from tourism
27,5 million	89,3 million	0,5	44,7 million	134 million	620 €	83 billion €
		2	178,6 million	267,9 million		166 billion €

Source: Alén, Dominguez and Losada, 2012

Therefore, the overall demand for accessible tourism in Europe is estimated to be more than 27.5 million people by 2025 and the businesses need to provide affordable services to meet the projected demand.

According to the World Tourism Organization (2011), it is estimated that 650 million people in the world live with some form of disability. If you include the family members of the disabled people to this group directly affected by disabilities, then the total tourist market would be estimated to be around two billion people, which accounts for almost one-third of the world's population (WTO, 2013).

The tourism industry has been paying more attention to the needs and requests of the tourists with disabilities, recognizing that those people have the same needs and desires for tourism as others (Loi and Kong, 2015). Therefore, it is important to take into account that people with disabilities have special and particular needs, but they have the same ambitions and human rights to travel (Buhalis et.al, 2005). However, Darcy and Buhalis (2011) showed that several factors affect the demand for the accessible tourism sector, such as the ageing population and the development of the tourism sector.

3.1.1. Market segmentation

Accessibility improvements do not only benefit disabled people, but also pregnant women and those with temporarily restricted capacities, such as children and families (Buhalis and Michopoulou, 2011). Senior tourism is directly linked to accessible tourism because disability is often directly related to the elderly population (Popiel, 2014). According to the World Health Organization (2011), 35% of people over 65 have some type of disability. In general, everyone benefits from accessibility (Buhalis and Michopoulou, 2011).

According to European Network for Accessible Tourism (ENAT), the future tourist market for accessible tourism in Europe is estimated to reach 130 million people with an annual turnover of over 68 billion € (Naniopoulos, Tsalis, and Nalmpantis, 2016).

3.1.2. Characteristics of tourists

Disabled travelers are more likely to take longer trips and if they have received excellent service, disabled customers will be loyal and be more likely to leave reviews and comments at the web sites dedicated to accessible travel (Alén, Dominguez and Losada, 2012).

For people with disabilities or special needs in the tourism sector, it has been observed that (Souca, 2010):

- They become regular customers after they find a tourist unit that suits their needs.
- They tend to take longer holiday breaks than average, so they spend more money per trip than an average tourist.
- They tend not to travel alone, but they are usually accompanied by someone who cares for them, their family and their friends. Statistics show that 50% travel with a company, 20% travel with the family or with a child, 20-25% with a companion and only a small percentage of about 5-10% travel alone.

Accessible tourism can contribute to reducing tourist seasonality as people with disabilities and their escorts choose to travel in the times of low season of tourist demand (European Commission, 2013). The concept of accessibility must be understood as a means of improving the overall tourist product and as an economic opportunity, which can contribute to providing higher quality services, hospitality, security, comfort and sustainability for all. Some of the more important advantages are (ETCAATS, 2016):

- Growing market segment through demographic and lifestyle changes
- Business opportunity
- Shifting away from seasonality
- Competitive and quality tourism.

According to Taleb Rifai, (UNWTO Secretary-General, 2017, p. 1), "Accessibility is a central element of any responsible and sustainable tourism policy. It is both a human right and an exceptional business opportunity. Above all, we must come to appreciate that accessible tourism does not only benefit persons with disabilities or special needs, but it also benefits us all".

3.2. Accessible tourism: supply side

Tourism service providers who are directly engaged in the tourism supply side have the most important role to play in the development of accessible tourism. Their opinion and attitudes towards accessible tourism will determine the future of this industry.

From the supply side, working with accessibility in the tourism sector results in a number of advantages. The later can be converted into opportunities that are reflected in the elderly tourist segment, in the disabled tourists, or those with temporarily restricted capacities (Alén, Dominguez & Losada, 2012).

Direct tourism suppliers refer to the hotels/accommodation, restaurants, cafés & bars, transportation services, tour operators, destination management organizations etc. The tourism supply chain can be divided into two main categories. Category one includes the information, the booking, the transport, the accommodation, the entertainment/leisure, culture etc. Category two includes different types of barriers such as physical barriers, operational system, information and social norms.

In category one, there are three basic approaches to accessible tourism (ENAT, 2014). The first approach refers to venues, facilities or service that are measured against specific performance standards for one or more sets of disability requirements to see if they comply or do not comply with the standards. The second approach refers to venues, facilities or services that are measured and described in detail, based on audits or self-assessment. The third approach refers to venues, facilities or services that are given a “rating”, evaluated by a user or by self-assessment.

Tourism consists of a big complex system of activities and services, which have numerous inter-relationships. These activities are, to a large extent, linked directly to the whole journey that a tourist makes. Accessible tourism considers this complexity. This implies that accessibility should be integrated within the whole chain; in booking, information provision, transport, the accommodation itself, attractions, staff attitudes, excursions, meals, etc.

Accessible tourism is often described as a chain with many different links that are highly interdepended on each other cross over the different stages of the process. This complexity makes it very hard to find correct measurement tools and so far the appropriate measurements haven’t been discovered. Thus making statistics hard to find that would more accurately describe the different links in the supply side (Darcy and Dickson, 2009).

Lots of businesses do not fully comprehend the meaning of accessible tourism, and therefore do not proceed with the implementation of some basic principles (ENAT, 2014). The supply side needs to understand and realize that accessibility benefits tourism. The enterprises should realize that accessible tourism is one of the fast growing markets, while the supply chain grounds its values on three important axels: Independence, Equity and Dignity.

The essential factor for the growth of accessible tourism is that the target group of accessible tourism isn't limited to tourists with and without disabilities, but includes also people working within the tourism sector, policy makers, etc. Efforts to improve the accessibility of hotels, transport, travel agencies, etc. do not only benefit tourists. Another important economic aspect (besides the higher market segment attracted) is the creation of new employment opportunities for people with disabilities (ENAT, 2014).

Supply-side improvement in accessibility of tourism will, therefore, improve the quality and comfort of all travelers, visitors and guests. It is currently limited “know how” about the process of creating values in the accessible tourism sector.

4. Research design: developing the case and measuring

The research methodology presented in this paper is mainly quantitative and it is based on a properly formulated questionnaire by collecting information on accessible tourism. The methodological approach was based on a multi scientific method, which was built on an extensive literature review and internet research.

Initially, the research questions and objectives were identified and the criteria for sampling and the parameters of the research were set.

The questionnaire was distributed both electronically and in hard copies. Prior to the final publication of the questionnaire, a pilot survey was conducted to check the questionnaire and correct any unclear questions, errors, and omissions.

After the end of the pilot survey, the questionnaire was posted on the social media networks: Facebook, LinkedIn and Google+ and was sent via e-mail to tourism businesses and public institutions across the Greek territory.

4.1. Duration of the research

As preliminary research, the administration of the survey lasted for two months. The distribution of the questionnaire and the collection of data began in January 2018 and were completed at the end of February 2018. After the data collection, the analysis of the results was carried out.

4.2. Research objectives

The aim is to probe the current situation of accessible tourism across the Greek tourism industry. Therefore, the survey's main objective is to probe the level of tourist infrastructure, customer services, and tourist activities offered to people with disabilities by tourist enterprises and the public sector.

4.3. Sub-questions include

The secondary sub-questions and goals of the survey were:

- The degree to which tourists and businesses want to target the disabled market or not.
- Exploring the proportion that tour operators and businesses have accessibility certifications
- Determining whether the services, products, and activities offered are in line with the principles of universal design.
- Exploring whether and how tourist agencies and businesses inform and advertise infrastructure, services, and activities aimed at people with disabilities.
- Finally, if the staff of the operators and the companies are properly trained for the personalized service for the people with disabilities.

4.4. Limitations

The literature has demonstrated that (i) there is limited research examining various issues of disabled and (ii) figures related to disabled tourists vary from source to source. The current academic literature on that topic concerning Greece seems insufficient to address what this group of travelers may need and desire. The main limitation of this research analysis is the extremely small sample and the time constraints while conducting the research.

4.5. Data analysis

Through our research, all twelve regions of Greece were covered as it is shown in Table 4. During our research, we focused more on covering the Greek region that every year attracts the most inbound arrivals from Europe. Our research was based on the annual stats of the Greek Tourism Confederation (SETE) on tourism arrivals per Greek region. We had a limited time to complete the survey, that's why we received 164 questionnaires meeting our restrictions.

Table 4. Area of tourist activity

	Area	%
1	Macedonia	34.8%
2	Dodecanese	27.2%
3	Attica	8.3%
4	Ionian islands	6.3%
5	Crete	5.1%
6	South Aegean Islands	4.4%
7	Thessaly	3.8%
8	Epirus	3.2%
9	Peloponnese	2.5%
10	Central Greece	2.5%
11	North Aegean Islands	1.3%
12	Thrace	0.6%

Source: Authors' own calculations

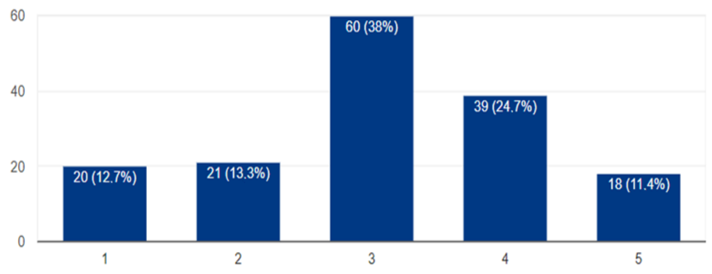
The responses regarding the business engagement of respondents are shown in Table 5. The majority of answers (54.4%) was provided by the people working in the "hotel & resorts" sector, while 21.5% was provided by the people working in the "Restaurant, Cafe & Bar" sector. A small percentage (4.4%) was derived from tourist offices' employees.

Table 5: Results of tourism businesses

	Tourism Buisnesses	%
1	Hotel & Resorts	54.4%
2	Restaurant, Café & Bar	21.5%
3	Rooms (For Rent, AirBnB etc)	5.7%
4	Tourist office	4.4%
5	Sales (Tourism products)	3.9%
6	Car rental office	1.9%
7	Businessmen in Tourism Sector	1.6%
8	Tourism Education	1.2%
9	Super Market	0.6%
10	Hotel Management Companies	0.6%
11	Public Tourism Organizations	0.6%
12	Water Sports - Diving Centers	0.6%
13	Lifeguard / Lifesaving	0.6%
14	Reception	0.6%
15	Animation	0.6%
16	Hotel Web Portal	0.6%
17	Tourist Guides	0.6%

Source: Authors' own calculations

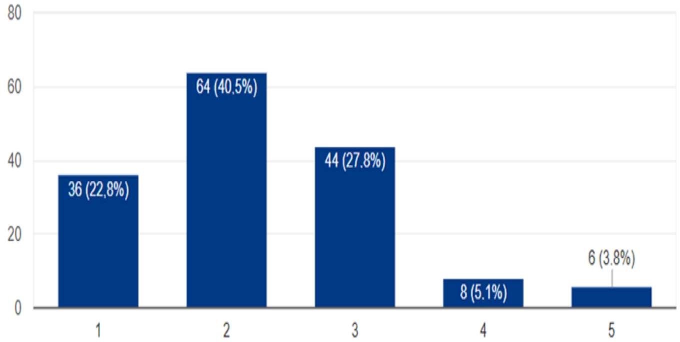
Regarding the question about the extent to which respondents are aware of accessible tourism, the majority of responses (38%) ranged to neutral answers (Figure 4). A percentage of 26% responded that they did not know at all/or had little knowledge of accessible tourism. The positive element, which results from the survey results, is that a percentage of 36% knows enough or "have a great knowledge" about the requirements of accessible tourism.



Source: Authors' own calculations

Figure 4. Knowledge of accessible tourism

Regarding the question about how accessible their tourist area would be considered for disabled people, the results were disappointing and somehow reflect the current situation of the Greek reality. The largest percentage (63.3%) responded that the level of accessibility is far from satisfactory. 27.8% of the respondents claimed that the level of accessibility of their destination was satisfactory. Only a small percentage (3.8%) mentioned that their site is friendly and easily accessible for people with disabilities (Figure 5).



Source: Authors' own calculations

Figure 5. Easy Access

Table 6 illustrates the results of the questionnaire regarding the accessibility levels by tourism chain category of the.

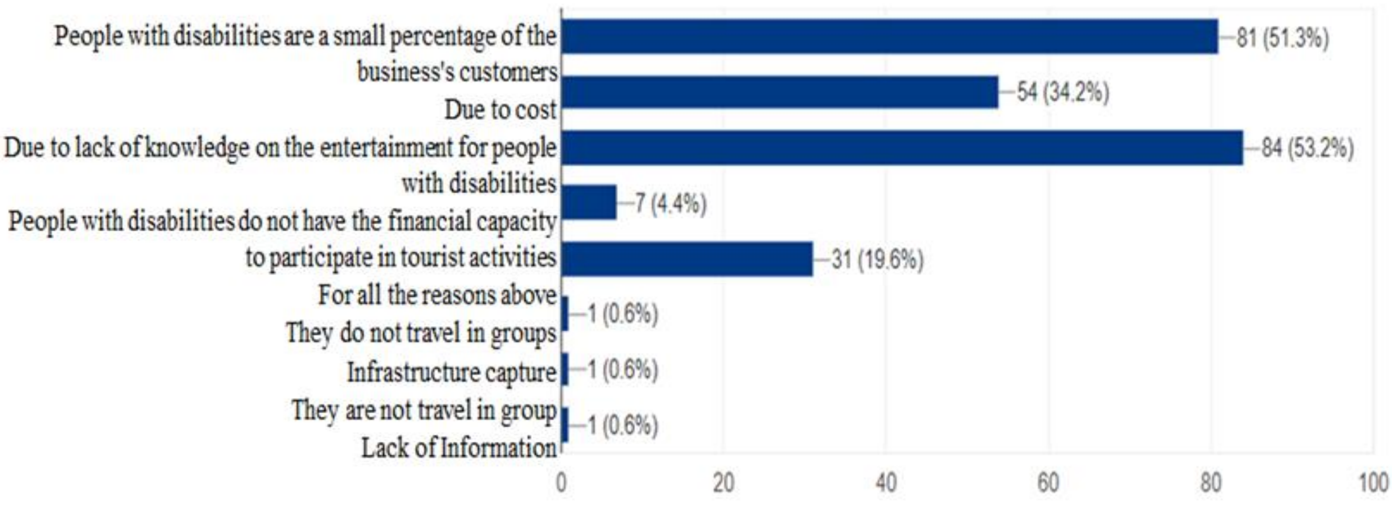
Overall, the assessment of the accessibility level is that, apart from the area of residence and shops, the other sectors that make up the "tourism chain" have a level of accessibility characterized by "no satisfactory" to "satisfactory". Table 6 clearly illustrates the current state of accessible tourism in Greece. The Greek tourist product of accessible tourism can be characterized as "not as satisfactory".

On our try to investigate the reasons for lack of services and products for the people with disabilities, the respondents answered that the reasons for lack of appropriate activities for the people with disabilities are by 53.2%, due to the lack of knowledge on ways of entertainment of people with disabilities and 51.3%, that people with disabilities represent a small percentage of the total clientele of a business. And finally, a small percentage of 4.4%, argues that people with disabilities do not have the financial capacity to participate in tourist activities (Figure 6).

Table 6. Accessibility Levels

	I do not know	Not at all satisfactory	Not so satisfactory	Satisfactory	Very satisfactory
Accommodation	7.5%	15.1%	36.7%	35.5%	5.2%
Restaurant, Bar and Café's	3.2%	26.5%	33%	31.6%	5.7%
Public Transport	3.2%	54.5%	26.5%	13.9%	1.9%
Tourist excursions	9.5%	31.1%	35.4%	20.2%	3.8%
Natural environment	4.4%	26.5%	34.1%	27.4%	7.6%
Tourist Attractions	6.9%	22.7%	29.1%	31.2%	10.1%
Cultural venues	4.4%	21.5%	28.4%	33.5%	12.2%
Shopping Malls	3.9%	21.5%	28.4%	38.6%	7.6%

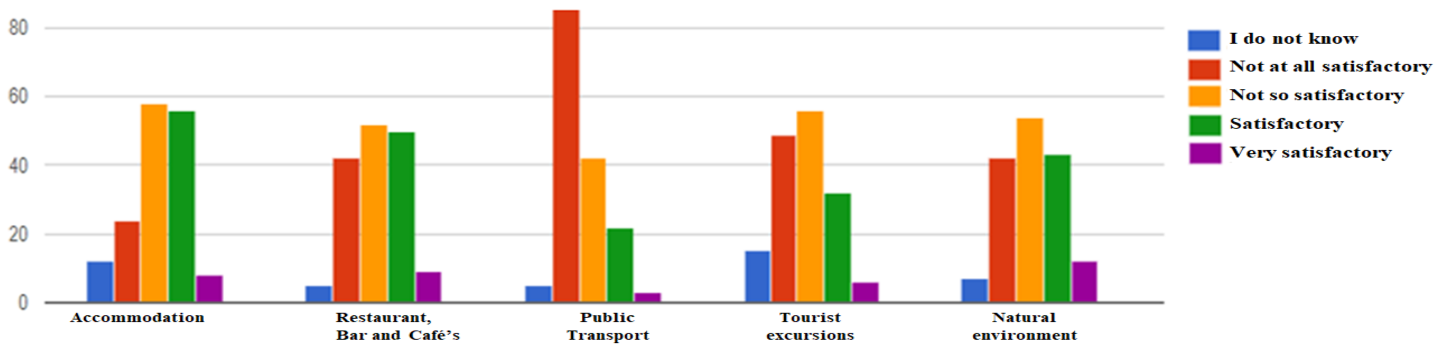
Source: Authors' own calculations



Source: Authors' own calculations

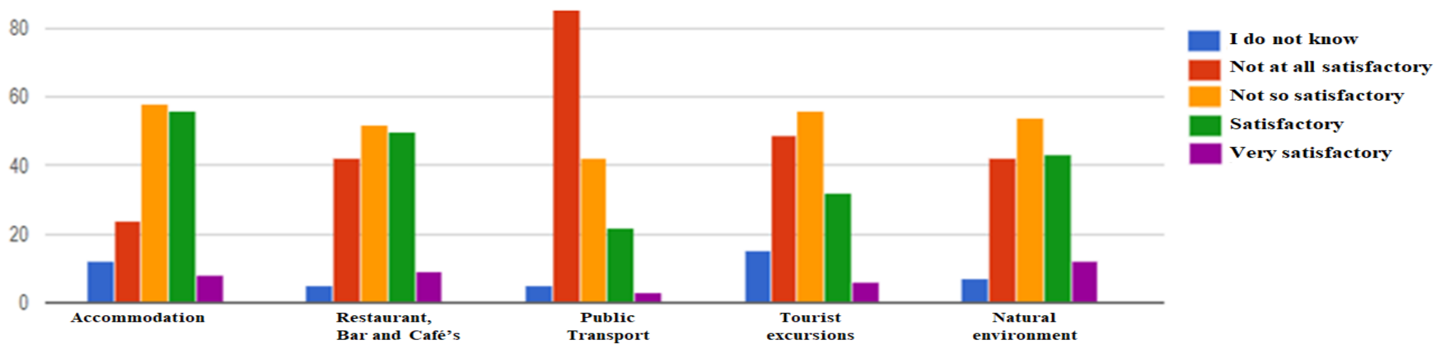
Figure 6. Reasons for lack of services and products for people with disabilities

Figures 7a and 7b illustrate the accessibility levels of the Greek tourism sector by category. The tourist areas that provide a good level of accessibility are shopping malls and cultural venues (cinemas, theatres, etc.) and the accommodation industry. On the contrary, the level of accessibility of public transport and tourist excursions is characterized by the majority as unsatisfactory. No one in the tourist chain has high rates of "high satisfaction".



Source: Authors' own calculations

Figure 7a. Level of Accessibility



Source: Authors' own calculations

Figure 7b. Level of Accessibility

The conclusion that emerges from the above diagram is that, although significant steps have been taken to improve accessibility conditions across tourism, many problems still exist. It is also noted that the "accessible tourist chain" is not uniform. While accommodation has satisfactory levels of accessibility, its approachability faces serious problems, which is a large disincentive for disabled people planning to travel to Greece.

5. Empirical findings

The results of the survey, with regard to the current state of the tourist infrastructure, services and activities, lead to the conclusion that the current state of Greece's accessible tourist product for travel, accommodation and recreation for the individuals with special access needs is too limited.

Tourist demand remains limited as Greece tourist destinations lack the appropriate infrastructure and easy access to public transport. The lack of easy accessibility by public transportation is the most dissuasive factor in making a trip for a disabled person. Most cultural venues are accessible at least to some extent, while most hotel complexes provide easy access to the rooms, but they have not made it easier to use communal facilities.

The fact that many of the infrastructures, services, and activities do not have satisfactory accessibility automatically deprives the tourism industry of a large number of visitors (p-consulting.gr, 2018).

The lack of valid and adequate information on the profit benefits of complying with accessibility is what makes it harder for hotels and tourist businesses to engage in such changes. The lack of information on how to adapt rooms, how to develop activities and change the accessibility infrastructure are also the factors that prohibit the supply side from quick adaptation to this tourism segment.

In order for disabled people to choose a destination, it is not enough to simply find the right hotel, but there are other activities so that people with disabilities do not stay in the hotel but they are given the opportunity to explore nearby venues, facilities and important cultural heritage.

What emerges from the analysis of the primary research is that to develop accessibility in the Greek territory, special attention and priority must be given to improve the infrastructure that will facilitate accessibility, not only on roads and transport but also in hotels, museums, shops, archaeological sites and other places of interest.

6. Conclusions

Globally, Greece is gaining ever higher ranking and has an increasing share of the global tourism market. In order to continue with this increase, there could be a vast improvement in the level of accessibility across the Greek territory, both in the public and in the private sector.

Greece has some of the most beautiful natural landscapes and cultural heritage buildings in Europe. Monuments, sights, and museums are the poles of attraction around which important economic activities are developed based on the principle of sustainable development.

The economic argument must be addressed, particularly in mature destinations where accessibility can provide a powerful competitive advantage over emerging markets that may be lacking in accessibility issues.

Greece could become an important accessible tourist destination if the government and the private sector were to give priority in developing accessible infrastructures and facilities that would be suitable for disabled tourists (Dimou and Velissariou, 2016).

Tourism is a part of society that has the potential to improve the quality of life for people with disabilities. A change of perception can highlight the social responsibility of businesses and help increase their share of the tourist market.

As we observed, there is a big gap between demand and supply in the accessible tourist infrastructure, services, and products. On the business side, there is a weakness in the hospitality of the people with disabilities because businesses - limited exceptions - have not made the appropriate investments to offer the right and suitable accessible services to their guests (Dwyer & Darcy, 2011).

Vogel (2006) sets three main reasons why the tourist industry is unaware of accessible tourism. The first reason is that people generally do not feel comfortable with the people with disabilities; the second reason concerns the belief that special needs of people with disabilities belong to a small niche market and the third reason is that the businesses are afraid of providing the "wrong" services to this group of people.

As can be seen from the analysis of literature references and the results of the research, the development of accessible tourism in the future will affect the competitiveness of tourist destinations. As the demand for accessible traveling will continue to increase due to the ageing population, the largest untapped opportunity for the travel industry will also be created accordingly.

If the turbulent tourism market is overlooked by the Greek tourism destinations, long-term results will be very negative as many tour operators are moving to meet this growing demand (ETCAATS, 2016).

Areas that could benefit from further research are:

- Further analysis of the tourist sub-groups of the tourist chain, providing useful data for understanding the needs of the specific tourist market.
- Further analysis of economic and social benefits from the development of accessible tourism.
- Exploring incentives, activities, interests and attitudes in the search for authenticity and focusing on the tourist experiences of the people with disabilities.

As society increasingly understands the needs of those with mobility restrictions and tourist destinations discover the potential of economic profit by improving accessibility, the process towards accessible tourism will continue to evolve and grow.

Accessible tourism is the responsibility of everyone; the public sector must lead this process by involving businesses and sensitize the whole society. We want to believe that in the nearest future, as farfetched as it might seem, our society will be accessible to everyone and to its fullest extent.

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Georg Simmel´s contribution towards: A sociological theory of socialism

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ABSTRACT

Despite its repeated socio-economic consequences of inefficiency, corruption and totalitarianism when implemented in practice, socialistic ideals claim wide spread attraction. Why? The following article tries to answer this question by referring to a sociological classic: Georg Simmel. According to Simmel, modernity is constituted by two ideals: liberty and equality. Liberty leads to competition and inequality, equality tends to a collectivisation of the means of production and a tight bond of the individual to state and society. Both ideals oppose as well as presuppose each other, and their dualistic interplay gets together within money economy. Hence the persistent attraction of socialistic ideas is inherent in modern society´s foundations, the clash of socialising and liberalising ideas is the usual case in so-called mixed economies.

1. Introduction

In 2018, Ipsos conducted a worldwide survey, it´s purpose was to measure – according to the title – "Attitudes towards Socialist Ideals in the 21st Century". 50% of the interviewed persons worldwide approve the claim, "that at present socialist ideals are of great value for societal progress" (Ipsos 2018: 2). China is on the top rung (84% approval), followed by India (72%) and Malaysia (68%). At the end of the chart rank France (31% approval), Hungary (28%) and Japan (21%). Just about 48% of all interviewed persons agreed with the sentence "that socialism is a system of political oppression, mass surveillance and state terror." (Ipsos 2018.: 5) 52% "think that individual freedom is more important than social justice" – one should maybe add: if this has to be a mutually exclusive either-or question – (Ipsos 2018: 4). Right down at the bottom rank Germany (38%), China (37%) and France (36%). India (72%), USA (66%) and South Africa (64%) exhibit approval rates below average. There seems to be a persistent as well as fascinating – but also culturally varying – attraction of socialism. In a way, the mentioned figures might surprise given the fact that corruption, economic inefficiency and dictatorship is a relatively stable pattern of socialistic systems; and also given the fact that economists have explained the reasons for socialisms malfunctioning very well a long time ago. But today´s Venezuela as well as politically supported expropriation plans in Berlin, Germany´s capital, are defiant examples (Stephens 2019; Streit & Kersting 2019).

According to Ludwig von Mises (1951) socialistic planning fails necessarily due to its absence of a price calculation system for the purpose of allocating scarce means on ends. Similarly Janos Kornai (1986) regarded soft budget constraints – the rational anticipation of government subsidies, irrespective of the firm´s resource efficiency– as an important factor for the soviet system´s economic collapse. Friedrich August von Hayek and Milton Friedman are not just economists and Nobel Prize winners, they were also social philosophers seeking the argument with socialism. After Friedman (2002: 17), individual freedom was not separable from the institution of a capitalistic market economy, just because even socialistic parties opposed to capitalism could promote their ideas – all they need is money. Whereas in socialism, as Friedman (2002: 18) says, economic activity is totally dependent on the central state power, a capitalistic opposition is – at least in principle – excluded, because it would be dependent on the government´s goodwill. Although not a sufficient condition, according to Friedman (2002: 10) a capitalistic market system is a sine qua non for democracy. Maybe the most famous social philosophical proponent of market liberalism and individualism against socialism was Friedrich August von Hayek with his book "the road to serfdom". According to Hayek (2001: 95), the socialisation of the means of production leads to a political totalitarianism with necessity. He shared Friedman´s proposition that a free market – with rules established and observed by the state – is a sine qua non for democracy (Hayek 2001: 73). The higher the degree of socialisation, Hayek says, the less the room for individualised values and goals (Hayek 2001: 59-74). Being the result of a century-long history of ideas since the Roman-Greek antiquity, in the 19th century the idea of individual freedom claimed to be the highest value (Hayek: 13-16, 73-74). In contrast to that a socialistic order is the denial of the individual by the collective (Hayek 2001: 24-25) – and by saying this Hayek explicitly included the fascism of national-socialistic nature. Hayek published his famous book 1944, just one year before the total surrender of Nazi-Germany. It was the rock bottom of a period which Hayek observed as an ongoing decadence of liberal values since 1870 (Hayek 2001: 21-23).

Offering plausible explanations for the economic and social consequences of socialism, the aforementioned theories do not explain the persistent – albeit internationally varying – 'demand' for socialism. Reasons may differ. First, it may be important to mention culturally different understandings of socialism: US-American Democrats for example seem to identify socialism with the social democratic welfare state in Europe (Ferguson 2019). Second, socialisms attractiveness may be due to markets unattractiveness: anonymous instead of state power structures, indifference and selfishness may contribute to a decline of trust in the "liberal project", Political Scientist Lea Ypi (2019) says. Third, there might be an additional generational gap. In the US, for example, according to a YouGov survey, of those Americans between 18-29 years old, 30% were in favour of capitalism in 2018, 9% less than in 2015; whereas Americans between 65 years and older, 56% are in favour of capitalism in 2918, with a decline about 3% from 59% approval in 2015 (Ballard 2018).

2. Dualism

I like to turn my attention to a form of explanation which does seek the reason for the persistent attractiveness of socialism in deep-rooted cultural ideas and principles – principles, which make socialism an integral part of modernity, not a deviation. In short, this idea is the idea of equality, equally ranking with the idea of liberty. This thesis of socialism being an integral part of modernity is to find in the oeuvre of Georg Simmel (1858-1918), one of the founding fathers of sociology. Besides Max Weber, maybe almost undisputed in his rank as a classic of social sciences and especially economic sociology, his friend and colleague Georg Simmel can also legitimately be considered a classic of economic sociology, which is due to his broadly and internationally received magnum opus "The Philosophy of Money" – also in part in economics (Laidler

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& Rowe 1980). However, Simmel´s analysis of socialism is almost non-existent in secondary literature (exceptions are Zikmund 1974; Capetillo-Ponce 2004/2005; Dodd 2012). What´s more, the articles are kind of isolated to each other. At least it is well-established that Simmel rejected Historical Materialism, claiming that the latter is useful as a heuristic, but epistemological inconsistent as a historical hypothesis (Simmel 1997; Saiedi 1987). Weber did likewise and in explicit accordance with Simmel (Cavalli 1994). Weber´s "Protestant Work Ethic and the Spirit of Capitalism" built on an explicit rejection of Historical Materialism (Weber 2001: 20, 36). Moreover, Simmel´s observations of socialism are thoroughly compatible with the classic liberal social philosophies. Simmel was predominantly occupied with the tense relation between individual self-assertion and his dependence on social institutions (Simmel 1950: 409; Simmel 1995: 86-91.; Appelrouth & Edles 2008: 236; Junge 2009: 65-78; Müller, Cavalli, & Ferrara 2018). The punch line of Simmel´s social philosophy is it´s *dualistic mode*, which means an ontological thesis whereby *reality is constituted by two mutually opposing, but at the same time presupposing principles* (Simmel 2010: 16; Frisby 1971: Lee, Moore & Silver 2007).

My upcoming considerations predominantly focus on Simmel´s "Philosophy of Money" (2004), where he bundled the aforementioned dualism between individuality and society in one institution, the money economy (Frisby 2004: 35-36). Money liberates the individual from social bonds *insofar* as social bonds are more and more monetarily mediated. What counts is the work for anonymous other in exchange for money. The modern money economy has its cultural foundation in the ideals of liberty *and* equality. The ideal of liberty aims at individuality, the ideal of equality aims at equally distributed opportunities for all. Both, liberty and equality, come together in creating the modern money economy. On the one hand constitutive for modernity, the ideal of equality works as a driving force of socialism, an idea of society grown out of and then opposed to the consequences of the modern money economy. The socialistic ideal is element *within* as well as antagonist *opposed* to the money economy. According to Simmel socialism and liberalism are principles that oppose and presuppose each other, they enable and limit each other. Both principles gain their function as well as their meaning in their dualistic form of interaction: No socialism without liberalism, and not liberalism without socialism. Just as freedom and equality work together in creating the modern money economy, the latter comprises both strands, socialism and individualism: money is the unity in difference (Simmel 2004: 53-54, 237, 502-504).

3. Life and money

Simmel generally reflects on socialism in a broader context. With the exception of "Socialism and Pessism" there is no essay exclusively dedicated to the matter of socialism, instead Simmel developed his analysis of socialism around the theme of individual liberty, Simmel´s recurring life theme. The section at hand unfolds the relationship between socialism and individualism on the one hand and the advent of the money economy on the other. For doing this, first we have to resort to Simmel`s general philosophy.

According to Simmel (2010: 1-17), individual life can only exist in self-created forms. These forms, once created, become independent, take a life of its own and retroact on their creators. Economy, science, religion and arts are among these forms, working only after their own laws, but still in need of the individuals as executors of form reproduction (Simmel 2010: 19-61). Individuals are existentially bound to the forms, at the same time individuals strive for liberation from the forms to unfold themselves. In analogy to the autonomous laws of social institutions Simmel refers to a law of the individual (Simmel 2010: 99-154). Both sides, individual and society, stand in a dualistic relation to each other: They need and they restrict each other, they presuppose and stand in opposition to each other, each at the same time (Simmel 2009: 45-49)[1].

In his "Philosophy of Money" (2004) Simmel elaborates the following thesis: in the form of a self-referentially operating money economy the individual creates the precondition for his own freedom from society. Though the contemporary individual have more needs to satisfy than in earlier, traditional periods, the money mediated dependency on society takes on an abstract instead of a concrete, personal form: societal bonds are – to a large extent, with regard to taxes for example – reduced to the individual obligation to earn money under the premise of freedom of occupational choice and freedom of choice between various suppliers regarding consumption (Simmel 2004: 293-304).

Exactly because anything personal is excluded from economy´s reproduction – supply and demand is just a reciprocation between goods, including labour force –, the individual force –, the individual is liberated into her personal responsibility – individuality takes on the form of the law of the individual (Simmel 2004.: 302).The liberation of the individual is, in other words, result of the historical liberation of the economy (Simmel 2004: 76-77, 334-339, 473-475). This brings me to the idealistic fundamentals of the modern money economy which Simmel observes: liberty and equality. According to Simmel, both values constitute cultural driving forces that overcome traditionally stratified forms of society and create the new form of money economy (Simmel 2004: 364-365; Simmel 1999: 122-149; Simmel 2009: 635-40, 651-652, 662)[1].

4. Liberty and equality

After Simmel, the idea of likewise equal and free individuals formed an inextricably uniform cultural driving force of the 18th century European Enlightenment, which shaped in the conditions of inequality under a regime of stratification (Simmel 1999: 128-137). Under this regime persons are assigned to social positions a priori by birth (Simmel 1999: 128; 136). Influential intellectuals mentioned by Simmel are, for example, Immanuel Kant and Jean-Jacques Rousseau: due to the fact that inequality between men is a result of the existing social order, individuals would find themselves and their true nature once they are liberated from the bonds of tradition: now only abiding by the same universal laws of reason, men would be free and equal (Simmel 1999: 135). Remaining cultural achievements of the ideal of equality to this day is the equality of all men before the law, regardless their status and position in society; but also the idea of an inviolable human dignity (Simmel 2004: 363-65). In market competition economic behaviour only discriminates on the basis of price and quality, the individual personality do not count – behind money and goods, all men are equal (Simmel 1991: 21; Simmel 2004: 298-304, 463; Simmel 2008a).

However, the historical overcoming of the traditional order entailed new inequalities. Material, substantial equality among individuals did not und could not prevail (Simmel 1999: 130-131, 148-149; Simmel 2004: 444). According to Simmel, the pair of liberty and equality had its blind spot, which became visible in the aftermath of the transformation (Simmel 1999: 143; Simmel 2009: 638-39). Once free and on one´s own – with attaining the equal right of occupational and free enterprise, for example – the logical result is free market competition, which, for its part, not only allows, but enforces the unfolding of an individual´s capabilities (Simmel 1999: 148; Simmel 2008a: 963; Simmel 2009: 651-652). Competition compels individuals to specialize, on the one hand; on the other hand, division of labour is the expected result if individuals are allowed to live out their various and different talents (Simmel 1995: 92-93; Simmel 1999 144-149). Inequality, then, is not mere of external nature – top-down via competition, so to say –, inequality is an objectification of the inner nature of men which varies from person to person at the same time – bottom-up via individual constitution, so to say (Simmel 1995: 96-97; Simmel 2008a: 977-978). Competition leads to a division of labour, and a growing division of labour entails a differentiated money economy: the more heterogeneous the products, the more needs individuals have, the more they depend on others to satisfy their needs – the more an abstract money is needed to coordinate exchange (Simmel 2004: 210-211, 473-474; Simmel 2009: 638-639, 651-652). Therefore, the ideals of liberty and equality come together in the differentiation of the modern money economy.

In the 19th century, the ideals of liberty and equality differentiated into antagonistic principles: into "the tendency towards equality without liberty and liberty without equality [...]. The first one pervades socialism, certainly not in an exhausting sense" (Simmel 1999: 137)[1]. Liberty without equality is the idea of an "incomparable individuality by his nature" (Simmel 1999: 143)[1]. Socialism and individualism constitute an antithetic relation, but their relation of mutual exclusion forms, at the same time, a relation of reciprocal conditions. This has to be explained further.

Corresponding to his dualistic way of thinking, "the effectiveness of some or perhaps all elements of life depends upon the concurrence of opposing elements." (Simmel 2004: 165) Economic policy of a given period may tend towards one or another direction, it may be more socialising or more liberalising. Success of a more socialistic – more 'left' – policy depends on remaining liberal respectively individualistic elements within the institutional framework, and vice versa in case of a policy of economic

[1] According to Fitzi (2003: 236-241) and Nedelmann (1991: 172), Simmel has not just rejected, but generalized Marx' theory of conflict between productive forces and relations of production.

[2] To regard equality and liberty as constitutive ideals for modern society might be nothing new (see LeBar 2013). Yet it is another question to state their dualistic relationship and, moreover, to draw a line from modernity´s roots to present days debates around free markets and socialism.

liberalism respectively individualism. But a complete implementation of a socialistic order would be dysfunctional (Simmel 2004: 165). Therefore, it is very important to distinguish the *logic* of socialism from the *path* to socialism and from the *completion* of the path to socialism, in other words 'pure' socialism, alike (Simmel 2004: 166). The same applies to the liberal principle of individualism.

According to Simmel, the private property of the means of production is a "multiplier of the individual forces" (Simmel 1999: 130)[1]. An unrestricted liberalism, Simmel says, leads to the lack of freedom of many in favour of few. A once established unequal distribution in the ownership of capital goods works like a slippery slope towards a further capital accumulation and, subsequently, concentration in the hands of few (Simmel 1999: 130-131). But Simmel regarded a complete socialisation of the means of production as „a very ill-adapted means to the desired end", that is to break the „capitalistic exploitation of labor" (Simmel 2008b: 172). The creation of equally favourable conditions under which each individual can live out his or her capabilities, this is the goal of socialism – "so that whatever each is in life, may be an accurate measure of his original and freely developed energy." (Simmel 2008b: 178) On the path of its realisation the socialistic antithesis has liberating effects which counterbalances the effect of capital good concentration by class origin and inheritance (Simmel 1999: 137-38). For example, Simmel mentions the limitation of maximum working hours by law (Simmel 1999: 138). Around 1900, result of the social democratic efforts in favour of the workers around were "the uplifting of their mental and spiritual life through an improvement in their material welfare" (Simmel 2008b: 171). These partial victories, Simmel says, raised the desire for a socialistic revolution in society as a whole. But: What first looked like the liberation of the proletarian out of the capitalistic rule, turns into an absorption of the individual by society once the implementation of a socialistic order of society is completed (Simmel 1905: 373; Simmel 2004: 297).

At the end of this paragraph I like to add something important for the purpose of comprehension. The antagonism between liberty and equality in the platonic 'sky of values' corresponds to a socio-anthropological thesis about the human being itself as a dualistic creature (Pyyhtinen 2008). Man is characterised by two kinds of impulses, on the one hand a differentiating drive, on the other hand a unifying drive, which manifest in each individual in different proportions (Simmel 1957: 541-542; Simmel 2004: 108-109,). Both kind of impulses objectify in the cultural conflict "between individualization and socialization." (Simmel 2004: 109) Human beings need and seek the bond to other humans, but they also have an innate drive to autonomy. Between both sides of his nature man oscillates. A non-economic example for this is fashion, which, after Simmel, serves both impulses: the impulse of differentiation against the others and the impulse of association with others via imitation (Simmel 1957: 542-543). The aforementioned dualism between societal institutions on the one hand and the individual on the other hand has its roots in the ontology of the individual himself. This aspect is of fundamental importance to decouple the explanation of the persistent attractiveness of socialistic ideals from reflections regarding efficiency and democracy under socialistic rule, because both, individualism and socialism, likewise appeal to man. Thus after Simmel a conflict between two competing principles for organising society has to be expected to be the normal case.

5. Money, individualism and socialism

As I will show in the following paragraph, Simmel conceives the ideal of socialism in a double relation to the logic of money economy: first socialism as an *element* of the money economy, second socialism as an *antagonist* to the money economy. This double relation corresponds to the aforementioned dualistic philosophy of Simmel. Socialism conceives itself as a remedy to aspects observed as negative consequences due to the money economy. However, once thoroughly established, socialism would counteract to its own intentions and produce converse effects. As a remedy socialism only works as long as it is confined to an oppositional role within a broader, still working money economy.

My argument goes the following line: 3.1 Socialism regards labour as the only and true source of value. But, realized in the form of a labour money, this conception presupposes perfect information or the consequences would be depersonalization and impoverishment; 3.2 Socialism´s alternative to competition is the harmony of planning. But the harmony of planning, appealing to man´s unifying instincts, reveals an underlying will to power; 3.3 Socialistic planning promises to allocate workforce according to its capabilities, put social positions are scarce in relation to capability supply. In consequence, socialism alienates the individual from social institutions more than a money economy does: whereas socialistic planning presuppose perfect information about capabilities, whereas a money economy can rely on the privatization of information; 3.4 Finally, socialism places personal closeness over the alienated objectivity of the money economy, but leads to dictatorship and the absorption of the individual by society.

To put my argument in a nutshell: the fundamental difference between socialism and money economy relates to the fact that socialism dissolves the contradiction between individuality and society to one side of the contradiction, to society, hence society absorbs the individual. In contrast, the money economy sustains the dualism between individual and society by turning the responsibility for its life over to the subject itself. Furthermore, the money economy allows, by its own logic, a socialistic opposition, it just needs money for the purpose of association. In contrast to that, any kind of opposition breaks with the harmonious logic of socialism, because it would be totally dependent on the goodwill of the central power.

5.1. Value and money

Man is a needy being, therefore he creates the "general form of exchange" (Simmel 2004: 84). Originating from the creative subject, exchange and value become an autonomous entity and confront the creative subject, so that the economic value is determined self-referentially in the exchange relation between objects, where the "quantity of one object corresponds in value with a given quantity of another object" (Simmel 2004: 76)[1]. Simmel explicitly advocated against a subjectivistic as well as an objectivistic value theory according to which value is an attribute of things itself – be it labour, be it production goods (Simmel 2004: 65)[1]. Instead he claimed, value is a relation between objects, detached from its subjective source, and the form of exchange – initiated and executed by individuals – is the social form of this relation (Simmel 2004: 77-88; Cantó y Milà 2005). Labour becomes a good, too, insofar as its value determination detaches from the subject and objectifies in the same sense as production and consumption goods do (Simmel 2004: 460-461). The function of the individual *within* the economy is confined to the mere *execution* of production and consumption, whereas the *individual* person with its diverse characteristics is excluded from the economy (Simmel 2004: 76, 332-344). This is a very important aspect in Simmel´s theory: the autonomy of the money economy is at the same time the condition for the autonomous individual (Simmel 2004: 334-35). In money individual freedom gets tangible: it leaves open the way of earning and spending money to individual self-determination (Simmel 2004: 298-304, 308); therefore, each individual enter exchange by choice and with the expectation of a subjective surplus value (Simmel 2004: 91, 292-293). Although not thoroughly feasible, money evolution tends towards a neutral medium: prices only articulate adjustments in exchange relations between goods, not the value of money itself (Simmel 2004: 117-120, 201-203). Simmel distinguishes between the evolution of money, its forms and uses in the past and its present-day necessity to enable exchange, the latter, the functional one, being the main aspect of concern for Simmel. The heterogeneity of goods within a production organised on division of labour on the one hand, the multiplicity of needs on the other demand neutral money for the purpose of exchange coordination (Simmel 2004: 473-474).

Simmel discards the labour value theory as well as the use value theory, whereby the value of things is determined either by the invested labour or by their utility (Laidler/Rowe 1980: 98). Both are components of a socialistic theory of society opposite to the ruling monetary economy. Simmel argues that already the assumption of reducing all exchange values to a common denominator – labour – is due to the actual traceability of all exchange values to the common denominator money (Simmel 2004: 412). In a thoroughly socialised economy, according to the labour value theory labour units are the real, underlying objects of exchange, and a labour money is needed to articulate the true value of things, in contrast to the current form of money economy, which detaches from its subjective basis and develops a life of its own (Simmel 2004: 412). The same applies to the value self-determination within exchange. According to labour value theory what counts is useful labour, not labour per se, therefore the labour value varies with labour´s use value (Simmel 2004: 429-430). If there has to be a labour money, Simmel says, the share of labour time in society as a whole which is allocated to the production of a certain good has to be kept in strict proportion to the usefulness of the same good for society as a whole (Simmel 2004: 430). The wage rate per hour may still differ, but it correlates with the product significance for society as a whole (Simmel 2004: 431). In this possible world, Simmel says, labour money would be a functional equivalent to the current money system, at the same time labour money would only reflect

[3] , [4] , [5] My translation

invested labour. Exchange value would be determined by invested labour. But, as Simmel adds, "this obviously presupposes a completely rationalized and providential economic order in which each labour activity regularly resulted from the absolute knowledge of needs and the labour requirements for each product – that is, an economic order such as socialism strives for." (Simmel 2004: 431).

An approximate proportion between use and value would be realistic only in those spheres of production where there is consensus about the society-wide use of a certain good, and this in turn, Simmel says, can only apply to goods serving basic human needs (Simmel 2004: 431). But higher developed cultures are characterised by a plurality as well as an individualisation of needs, where there is no realistic prospect of a society-wide consensus. Individuality entails dissent, thus "no regulation of the amounts of production could bring about a situation in which the relationship between need and labour applied was everywhere the same." (Simmel 2004: 431) Otherwise, if strict proportion between labour and society-wide use is to be sustained due to ideological reasons, then economic production would remain on the least level, excluding the development of higher culture and individuality (Simmel 2004: 431). Elimination of individuality in favour of a socially standardized production contradicts idea and intention of the labour money. Labour money, Simmel says, "would be more threatening to the differentiation and personal creation of life´s contents than money as it already exists!" (Simmel 2004: 431) In contrast to that the current money economy indeed cannot ensure a successful conduct of individual life, but it provides the adequate means (Simmel: 473-475). Since it does not prescribe the way of its earning or consumption, it allows an organic growth of the individual.

5.2. Competition and plan

Competition is, according to Simmel, an implication due to the monetary freedom to choose with regard to consumption (Simmel 2004: 295-297, Simmel 2008a: 958; Simmel 2009: 651-652). A socialistic organised society replaces competition by central planning of demand and supply (Simmel 2008b: 172). After his "sociology of competition", competition distributes profit unequal and under conditions of uncertainty, performance is attributable to the individual, whereas the socialisation of productive means promises certainty and distributive equality (Simmel 2008a: 969-970). From the bird´s eye view, each form is a means to an end which have to be weighed up regarding their adequacy for goal attainment, "whether satisfying a need, creating a value, shall be entrusted to competition between individual energies or to the rational organization of such energies" (Simmel 2008a: 968). This means, some goods – internal security for example – should better be produced and supplied by the state, and other goods – cars, for example – should be better produced and supplied by the market.

In practice, Simmel says, the choice between market and state is a matter of instinct and emotion, not so much one of intellectual nature. Technically emotions set a goal and reason chooses the appropriate means for reaching the goal, but reason does not have all information needed on the one hand, nor is it powerful enough to enforce its results (Simmel 2008a: 969). After all, emotions trump intellect. In consequence the aforementioned double nature of man comes into effect, which feels either more attracted by the unifying form of harmonious plans or by the individual liberty of competition which entails uncertainty and chance:

> "Therefore, regardless of all available intellectual justification, victory will very often go to that form of social organisation that we call socialism, driven by the immediate attraction of its unified organization, of its internal balance, of its ability to exclude any friction, in contrast to the rhapsodic procedure, the waste of energy, the ambiguity, and the unpredictable forms of production under conditions of competition. To the extent to which individuals approach this mood, they will exclude competition even in those areas whose content would not contradict competition" (Simmel 2008a: 969).

By the way, in another context Simmel says, the attractiveness of socialistic harmony is likewise of aesthetic and even intellectual nature. In the latter case, Simmel means intellectuals which "are ever striving to form rational conceptions of things." (Simmel 2008b: 172) Simmel mentions "the deep attraction of a notion of the harmonic, stabilized organization of human activity that has overcome the resistance of irrational individuality." (Simmel 2009: 495).

Its ambition of rationality, predictability and computability socialism takes from the calculation practice of money economy, which socialism opposes at the same time (Simmel 2004: 347f.).

Likewise, socialism takes its ambition of predictability from observation of the capitalistic organisation: if planning works on firm-level, it has to work on a larger scale – at societal level – as well (Simmel 2004: 499; Simmel 2008b: 172). The distinction between harmony and computability on the one hand and uncertainty and incalculability on the other is significant: uncertainty, incalculability, individual freedom and money economy constitute an inextricable unity, which is opposed by the likewise uniform association of certainty, harmony and bondage; both being antagonistic ideal types again, of course (Simmel 2004: 493-501; Simmel 2008a: 963-970; Simmel 2009: 533-537). Simmel does not confine his proposition to the economic sphere, but rather regards "liberal political constitutions" characterised by "irregularity, unpredictability and asymmetry […], whereas despotic compulsion culminates in symmetric structures, uniformity of elements and avoidance of anything that is improvised." (Simmel 2004: 339) There may be a coexistence between political despotism and economic freedom (Simmel 2004: 401), but there is no political freedom without the individual freedom of a money economy.

Simmel says, a man´s desire for "systemization" always "contains a test of power", because systemization "subjects a matter, which is outside thought, to a form", and this applies to "all attempts to organize a group in a principle" (Simmel 2009: 347). Simmel also mentions the "socialist systemization" (Simmel 2009: 347). The "making of plans" manifests "a will to power" and, additionally, a "particular inducement in the advancement of a schema of positions and their relationships of rank to make determinative use of a wide, future, and ideally submissive circle of human beings." (Simmel 2009: 347)

5.3. Allocation

Both, money economy and socialism, entail dependence relationships in the form of division of labour, but they differ as to their source of differentiation: bottom-up or top-down (Simmel 2004: 296-297)? In a money economy, division of labour is *both*, the result of individual aspirations as well as societal constraints (Simmel 1995: 96-97; Simmel 2008a: 977-978; Simmel 2009: 537). Socialism shifts the whole responsibility for differentiation to society alone, i. e. the state.

A self-referentially operating money economy is organised via competition and division of labour (Simmel 2009: 651-652). Individuality - with her personality – is excluded from the money economy, for which reason any individual only has to work for money. The specific content of labour is of secondary character, as long as it is demanded. This money form of abstraction of interpersonal relationships – economic relations are reduced to money relations – is the form of individual liberty, Simmel says (2004: 285-292). Thus, once excluded from the autonomous money economy, the individual is left on her own, but she has an inner calling to a determined social position (Simmel 1995: 97; Simmel 2009: 51). At the same time there are external, social forces, which work against the inner drives of individuality. Competition for scarce social positions forces individuals in specialised roles that do not match their inner calling (Simmel 1995: 92-97). The exploration of business niches suffices just for a moment, until competitors copy the innovation.

Now, Socialism promises to allocate individuals to occupations according their true capabilities. As I mentioned before, socialism understands itself as a remedy to socially undesired consequences of money economy. Whereas in a self-referential money economy action grows out of individual responsibility, in a socialistic organised society it is up to the state to direct individual actions: "a fully-fledged state socialism would erect, above the world of personalities, a world of objective forms of social action which would restrict and limit the impulses of individual personalities to very precisely and objectively determined expressions." (Simmel 2004: 297) Regarding the socialistic promise of allocating people according to their inner nature, Simmel says, it does not work, because there are always more qualified people than appropriate positions (Simmel 1999: 140-141). Simmel refers to the example of a hierarchical organisation – be it a party, an association, a company – , in which there always are less people in management or leading positions than in subordinated positions. Always there are more people capable of leading than there are leading positions. Hence, individuals living in a socialised economy will also get to know social

[6] Simmels seems to follow Marx (1973: 17), who also identified the commodity form as the basic unit of the economy.
[7] For a critic see Kalmonick (2001), who argues – amongst others – by means of Marx' value theory.

heteronomy and alienation. The difference between the collectivism of socialism and the individualism of money economy is the absence of any prescription of individual movements in the money structure itself, it is a neutral medium which allows for almost arbitrarily ways of working and living – just because the individual´s only connection to economy is via money (Simmel 2004: 308-313). Apart from that money relation it is thoroughly excluded from economy. The elasticity of money – it can be used as a means for any end (Simmel 2004: 210-217, 327-332) – allows an organic, inner growth of the individual, albeit there are other, social forces, pushing the individual aside from her inner calling. There is no need for comprehensive societal information about individual talents and preferences – quite the contrary to socialism.

5.4. Alienation and depersonalisation

A further aspect is man´s yearning for community within a depersonalised money economy. Socialism´s ideal of society, Simmel says, is an ideal of a personalised community, which descends from tribal structures of a past long ago, but at the same time the existing money economy supplies the necessary breeding ground for the socialistic ideal.

An autonomous money economy liberates the individual and leaves it on his own responsibility (Simmel 2004: 304, 335). It is excluded from the own logic of economy insofar as economic value is determined self-referentially between goods in their exchange relations, whereas the role of the individual person is interchangeable and thus confined to the execution of the production as well as the consumption function, although nothing is said about what specifically is produced (Simmel 2004: 462-463; Simmel 2009: 486) – in *this* regard, the money economy is widely open. Exclusion refers to the extent that subjectivity do not count in determining the exchange relations. The "capitalistic differentiation" into labour and capital is likewise a functional differentiation within money economy insofar as capital and labour are just roles which are – given perfect mobility – to be executed without being bound to provenance (Simmel 2004: 460; 2009: 533-536). The production process becomes autonomous and confronts the labourer: he does neither owe the products of his work, nor does he owe the machines he works with. The labourer even has – in principle at least – to pay for purchasing those products he produced himself (Simmel 2004: 460-461). The individual today has more needs than in the tribal past, and, more important, it cannot satisfy his needs on himself, because he is too specialised (Simmel 2004: 295-296). The tribal society was small and self-sufficient. There is no societal control over the economic production process, it reproduces self-referentially according to its own logic. Detached from its personal origin, a desire for a re-subjectification of the economy arises in man, and a collectivisation of production seems to be the means to the desired ends (Simmel 200: 465-466).

The money economy endows freedom. In contrast to earlier, feudal times there is a double-sided freedom of contract, on the part of the employer as well as on the part of the employee (Simmel 2004: 300-301). But this, according to Simmel, detaches the employer´s interest in the well-being of his employees, because the individual person is, as mentioned above, interchangeable. Slave societies as well as feudal societies did know only little individual freedom in general, but the master had – out of his self-interest – more to care for his inferiors (Simmel 2004: 301). The evolution of the employment contract entailed freedom, but also depersonalization as well as – the correlate to freedom – uncertainty (Simmel 2004: 339). Furthermore, competition relations entails social distance between competing suppliers on the one hand, on the other hand, discovering the needs of potential customers, Simmel says, is a kind of social rapprochement (Simmel 2008a: 961-962).

Now socialism intends to close the monetary gap between individual and her society. The socialistic ideal declares "war upon this monetary system, socialism seeks to abolish the individual´s isolation in relation to the group as embodied in the form of the purposive association, and at the same time it appeals to all the innermost and enthusiastic sympathies for the group that may lie dormant in the individual." (Simmel 2004: 347) This sympathies are a relic from man´s tribal past, hence Simmel calls them "hollow communistic instincts that […] still lie in the remote corners of the soul." (Simmel 2004: 348) The tribal groups were small and differentiated only to a low extent, they "hold their elements in strict and equal bonds" (Simmel 2004: 348). Socialism, arose out of and against the money economy, translates these "strict bonds" to the world society of present times. Furthermore, socialism´s demand for production control grows out of "the rationalistic money economy", socialism is "rationalism as well as a reaction to rationalism" and "is directed towards a rationalization of life, towards control of life´s chance and unique elements by the law-like regularities and calculations of reason." (Simmel 2004: 347-348) Socialism is, according to Simmel, of paradoxical nature insofar as it appeals to irrational communistic instincts on the one hand and a rationalistic mind on the other. This paradox nature of socialism, Simmel says, gives socialism "its power of attraction" (Simmel 2004: 348).

Whereas it´s thoroughly implementation runs counter to its intention, a working money economy creates space for – so to say – 'socialistic islands' of communitarisation. For example, Simmel mentions the French socialistic entrepreneur Jean-Baptise André Godin who founded "a large ironworks factory […] in the principle of complete sustenance for each worker and his family, guaranteeing a minimum subsistence, care and education of children at no cost, and collective provision of the necessities for life." (Simmel 2009: 54)

Simmel also mentions the explicitly monetarised founding of worker cooperatives for the purpose of lending credits or bulk purchases (Simmel 2004: 346). A Money economy allows the individual a selective association, just according to one´s own self-interest and without absorbing the whole personality into a collectivity – just *because* the individual´s personality is excluded from economy (Simmel 2004: 345-347). Trade unions will keep their independence not alone from capital, but also from the central state power within a money economy which explicitly allows the pursuit of very different, even contradictory goals. Within a money economy, there is no need for having the central power´s favour, whereas in socialism the allocation of resources is fully dependent on the central states planning. Hence opposition to the central state is, at least in principle, a contradiction.

6. Conclusion

To put the whole article in a nutshell: according to Simmel, modern society sustains itself in a dualism between socialism and liberalism, and money is their all-comprehensive unity insofar as money is a means to any end, even contradicting ones.

Starting point of my argumentation was the people´s persistent fascination for socialistic ideals despite repeated failures of its own idea. Georg Simmel´s dualistic social philosophy provides one possible explanation, according to which socialism and its underlying idea of equality as well as liberty are cultural pillars of modernity. Socialistic ideals appeal to a certain fundamental value – equality – which is integral part of the cultural basic equipment of modern individuals, just as liberty. Liberty and equality of individuals converge in the form of money economy, which *liberates* all individuals *likewise* from societal bonds. This happened with overcoming European stratified society – all men are equal before money. But equality and freedom do not stay in a easy relationship with each other. Individual freedom leads to competition and once again economic inequalities between individuals, whereas the now opposing ideal of equality underlies socialistic movements. The two ideals have their own logic which, each left on its own, lead to destructive consequences, and this applies likewise to socialism and liberalism. Put in interaction together, both have corrective effects on each other, which results in a more or less functioning society – the money economy, in which liberating and socialising ideals concur.

Put in modern terms, Simmel´s idea of a constitutive conflict between ideas of economic culture corresponds to the reality of mixed economies, in which state and market presuppose, limit and correct each other, and their actual arrangement is the – always provisional – result of a compromise between two distinct, likewise antagonistic and complementary institutions. An abstinence of this conflict in favour of a thorough implementation of just one principle would end in anarchy or totalitarianism. Also and especially liberal social philosophers like Milton Friedman (2002: 22) and Friedrich August von Hayek (2001: 40) not only saw the need for a state regulatory framework as the basis for a working market economy which grants individual freedom. Moreover, both explicitly considered it as a matter of weighing up, which form – market or state – is the suitable means for a given end. Simmel suggested, as we could see, likewise. What´s more, he hypothesized that there are varying, a-rational founded preferences for the relation between competition and coordination, a thesis, which suits very fine to the "varieties of capitalism" (Hall/Soskice 2001), whereby institutional variants in state-market-relations can be attributed to underlying cultural differences, which themselves are not rational, but supply the cultural basis for rational outcomes at all. Last but not least, Simmel´s argument was based predominantly on the institution of a money economy, not a market economy, although the latter is – according to Simmel – an implication of the individual freedom of a money economy. For Simmel, money was the symbol for the unity in difference, that societal form, which considered the conflict between mutual presupposing principles as the adequate form of its self-preservation.

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The conundrum of neoclassical economic theory and quantitative finance induced 2008 financial crisis and the great financial crisis enabled transition from cheap oil based mass-production economy to the emergence of cheap microchip enabled information economy [attention merchants' surveillance capitalism]

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ABSTRACT

The text examines the main insights of the new sciences and disciplines, and shows how they reveal the flaws of NEWTONIAN orthodox NEOCLASSICAL ECONOMIC THEORY, in explaining and predicting the catastrophic events of the near economic history of the Unites States, and provides new ways of understanding the role of monetary policy in the emergence of information economy of ASSET MANAGER CAPITALISM. A brief history of the transition from MANAGERIAL CAPITALISM of nation states of the post-World War II institutionalized with the BRETTON WOODS AGREEMENT, to global ASSET MANAGER CAPITALISM, is presented to enlighten the emergence of CHIMERICA [China+America], and President Trump's recent attempts to dismember it by enabling the emergence of a bipolar world - TECHNOLOGIC COLD WAR - by weaponized global interdependence. The globally interdependent techno-sphere is shown as an enabled outcome of the implementation of WASHINGTON CONCENSUS of Anglo-American ASSET MANAGER CAPITALISM, that survived a comatose near death experience in 2007-2008. The major warriors and battlegrounds of THE TECHNOLOGIC COLD WAR are identified.

The text shows how GAIA THEORY sheds new light on economic growth, how fuzzy logic affects the national accounts, how accounting systems over-value the assets of publicly traded multinational companies balance sheets, and how network theory reveals the value of relationships, and argues that the economy needs to be viewed as a complex, chaotic system, as scientists view nature, not as an equilibrium seeking NEWTONIAN construct.

1. Introduction

In the self-regulating banking system, put in place with GRAMM-LEACH-BLILEY FINACIAL SERVICES MODERNIZATION ACT that with PRESIDENT CLINTON's signature in 1999 repealed GLASS-STEAGALL BANKING ACT OF 1933 with FED's CHAIRMAN, ALAN GREESPAN's enthusiastic lobbying, 97% of money that were in the hands of the public consisted of bank deposits, and in the absence of a state-issued debt-free money, money needed for an economy to function, had be borrowed from the banking sector, and hence the lender of last resort, THE CENTRAL BANK.

After the implosion of NASDAQ's dot.com BUBBLE in March 2000 that the GREENSPAN PUT was instrumental in inflating, GREENSPAN kept the benchmark price for money at 1% for too long at the beginning of 21st century, and thus enabled the residential real estate bubbles in the United States and in different scales in various parts of the world, and in 2007 the real estate bubble collapsed in the United States ushering in a full blown global financial crisis in 2008, and that led to massive bailouts of the global financial system by their central banks and their governments.

During the 19 years [1987-2006] ALAN GREENSPAN was at the helm of monetary policy, at every opportunity he had to address the law-makers at the CAPITOL HILL, he lectured them on how unimpeded competitive markets deliver optimal welfare, and that the financial institutions which create money, and through which money is allocated, have no independent effect on the real equilibrium of the economy, but are only acting on behalf of well-informed sovereign consumers. And most of the law-makers, from the ways they voted, seemed to have bought in GREENSPAN'S storyline.

During GREENSPAN's reign, the forecasting models of the TREASURY and the FED lacked a financial sector. The assumption that future prices would move in line with current expectations removed any need to take precautions against financial collapse, despite a continuous history of financial manias and panics. Aiming to minimize regulation, DYNAMIC STOCASTIC GENERAL EQUILIBRIUM models of the economy ignored the financial sector.

GREENSPAN with the enthusiastic lobbying of LAWRENCE SUMMERS, ROBERT RUBIN and ARTHUR LEVITT was able to convince the law-makers to liberate finance from regulations and down-size whatever regulators were left, and within a decade liberated finance span out of control, and imploded. But few months before the 2007-2008 implosion, DICK CHANEY's and GEORGE W. BUSH's WHITE HOUSE, with impeccable prophesy, put a very competent economic historian schooled in Milton Friedman's and Anna J. Swartz's A MONETARY HISTORY OF THE UNITED STATES SINCE 1867-1960 (Friedman Swartz, 1971), a play book for central banks on how to manage financial crisis, showing the central bank's management of the 1929 implosion as the wrong play-book, in charge of FED, BEN BERNANKE.

The 2007-2008 FINANCIAL CRISIS started with some homeowners having bought homes they could not afford found it hard to make their monthly mortgage payments in some locations in the United States, and graduated into a first run on a British bank, NORTHERN ROCK, in 150 years. This inherent market instability was compounded by the financial regulators' failure to understand the built-in dynamics of banking networks. Before the crash, those regulators with ALAN GREENSPAN's assurances worked on the assumption that networks always serve to disperse risk, and so the

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regulations that they devised only monitored the nodes in the networks - individual banks - rather than overseeing the nature of their interconnections.

But the crash made clear that a network's structure can be robust-yet-fragile, as Nassim Nicholas Taleb explained in ANTIFRAGILE: THINGS THAT GAIN FROM DISORDER (Taleb, 2018). Network structure usually behaves as a robust shock-absorber, but then its positive feedback - as the character of the network evolves – switches it to become a fragile shock-amplifier. And, that caused 5 pillars of American finance to vanish in 2008. GREENSPAN's predecessor, BEN BERNANKE's first step was to lower the interest rate and lengthen the term on direct loans to banks from the FED's DISCOUNT WINDOW. As commercial banks were slow to respond, and as the liquidity situation worsened, FED announced the creation of TERM AUCTION FACILITY to make loans at its discount window cheaper and anonymous.

Institutions that posed systemic threats included not only commercial banks but also, if not primarily, investment banks as well as mortgage and insurance groups. They were desperately short of capital. Investment banks' funding base has been most volatile without access to retail deposits last two decades before 2008. Their assets tended to be very risky while engaging in huge volume of transactions among themselves, with hedge funds, and with commercial banks. In 1980 financial sector debt was only 10% of non-financial debt. In 2008 it stood at 50%, turning investment banks into machines that trade heavily with each other and reported handsome profits that justified the bankers' astronomical bonuses, bankers kept.

Leverage ratios in the banking industry competed with those of hedge funds. Neither were governments themselves, and for that matter the national economy, free of leverage. Summing up federal, state, local government, company and household liabilities: for every productive $1 there were $3.7 debt in 2008. Emergency lending was made to banks, and currency swap agreements were drawn up with 14 different countries in order to ensure that they had access to the dollars they needed.

The most important outcome, however, was that key interest rates across the world dropped precipitously. US FED FUNDS TARGET RATE went from 5.25% in August 2007 down to 0.25% target by December 2008. Likewise Bank of England dropped its primary interest rate from 5.0% in October 2008 to 0.5% by March 2009. October 2008 saw the crisis intensify, which led to an internationally coordinated interest rate cut by 6 major central banks.

By 2016 monetary policy makers had dropped interest rates 637 times. As this continued through the post crisis period and established a low interest rate environment for the global economy, a key enabling condition for parts of today's digital economy began to arise. But at a price. The bailouts required governments around the world to rescue major global banks whose net worth had turned out to be fictitious; with the bailouts continuing to impose heavy social costs ten years on with imploded public debts, squeezed public budgets, heavy household debt and negative returns for savers.

Over the period 2008-2014 in the United States, the FEDERAL RESERVE embarked on three different QUANTITATIVE EASING schemes, totaling $4.5trillion. In the UK, the BANK OF ENGLAND undertook 375billion pounds of QE between 2009 and 2012, and in Europe, the ECB committed 60billion euros per month from January 2015 to March 2017. By the end of 2016, central banks across the world had purchased more than $12.3trillion worth of worthless 'assets'. The primary argument for using quantitative easing was that it should lower the yields of other assets. If traditional monetary policy operates primarily by altering the short-term interest rate, quantitative easing is expected to affect the longer interest rates and the yields of alternative assets.

Granted that the assets are not perfect substitutes for one another, taking away or restricting supply of one asset should have some effect on demand for other assets. In particular, reducing the yield of US government bonds should increase the demand for other financial assets and raise the prices of stocks and subsequently create stockholder wealth, provided that the biggest holders of US government debt, IMF mandated 'independent' central banks of the world, do not sell, better yet are not allowed to sell. While the evidence is still not definitive, it does seem that quantitative easing has had an effect. Corporate bond yields have declined and stock markets have surged upwards until September 2018. That may have had an effect on all sectors of the US economy as well by making much of the economic recovery depend on $4.7trillion of new corporate debt since 2007.

FED announced its plans in September 2017 for a gradual unwinding of its $4.5trillion balance sheet that swelled during the previous decade as it engaged in QUANTITATIVE EASING to ease the pernicious effects of the global financial crisis. The plan was to set a path and proceed on autopilot. This it was hoped, would avoid the pace of unwinding being taken as a signal of the direction of interest rates. It would start slowly, just $10 billion a month from October 2017, and smoothly pick up pace. By October 2018 it had quickened, as planned, to $50billion. That coincided with the start of a bout of market turbulence. The S&P 500 INDEX of leading shares fell by 14% in the final 3 months of 2018.

BERNANKE's FED's expansion of balance sheet, in 2008, was announced to provide banks with liquidity they desperately needed; to signal to markets that monetary policy would remain loose for some considerable time, and to reduce the bond yields, encouraging investors to buy riskier assets.

Recently, in addition to loose monetary policy, there has been a significant growth in corporate cash hoarding in tax havens. In the United States, as of January 2016, $1.9trillion was held by companies in cash and cash like assets mostly in tax havens. In the wake of the crisis, offshore wealth grew by 25% between 2008 and 2014, which resulted in an estimated $7.6trillion of household financial wealth being held in tax havens. APPLE, FACEBOOK, AMAZON, and UBER seem to be the leaders of tax evasion schemes that give them use of the cash saved from the tax collector for mergers and acquisitions, that mostly centralizes existing capacity rather than building new.

Tax evasion, austerity, and extraordinary monetary policies were all mutually reinforcing. The outcomes of bailouts a decade later seem as losses of bad financial bets got nationalized, and profits of good bets got privatized, causing the public debt of rich economies to implode. Risks got socialized and rewards privatized as the global economy had begun a long-term transition from a mass-production economy based on cheap oil to an information economy based on cheap microchips.

Microchips are ubiquitous, embedded into most manufactured products from toasters and to ballistic missiles. WORLD SEMICONDUCTOR TRADE STATISTICS, a data provider, recons that the market for chips was worth $421billion in 2017, a rise of 1.6% on previous year (The Economist, 2018). If anything, these raw numbers understate the importance of chip-making. The global e-commerce is reckoned to have revenues over $2trillion a year, for example. If data are the new oil, microchips are the internal-combustion engines that turn them into something useful. The ubiquity of chips has led to the growth of a vast global industry when globalization was the center core of WASHINGTON CONSENSUS. Microchips have billions of components and are made in ultra-modern factories that required tens of billions of dollars of investment to build. Indeed, that such devices can be built at all is a living testament to global specialization and trade that was put in place with American leadership in the last two decades of the 20th century. These hugely complicated products have spawned an equally complex global know-how interdependence and supply chain involving thousands of specialized companies all around the world.

But in the age of "Making America Great Again", and "made in China" target dates, both China and the United States see the semiconductor technology as crucial to their future. For America, its lead in chip-making is a strategic asset. PENTAGON's guiding hand was instrumental in the development of the earlier uses of chips produced by Silicon Valley for the guidance systems of nuclear missiles. In 2014, China established the NATIONAL INTEGRATED CIRCUIT INDUSTRY INVESTMENT FUND to domestically supply its needs. In 2014, China's domestic supply capability was less than a third. The NATIONAL INTEGRATED INDUSTRY INVESTMENT FUND was set up to finance research and development for integrated circuit industry, and is planned to grow from $65billion in 2014 to $305billion by 2030 to supply its needs domestically and reduce China's dependence on foreign suppliers. It seems, President Trump has not welcomed China's plans.

A manifestation of the uneasiness of uncomfortable interdependence of CHIMERICA as summarized by Stephen Roach in UNBALANCED: THE CODEPENDENCE OF AMERICA AND CHINA (Roach, 2014) is their technological competition in chip-making at a historical moment in 2019. For 50 years, progress in chip-making has been summarized by MOORE'S LAW, which state that the number of components that can be crammed onto a chip doubles every two years and thus, roughly, so does its computing power. But the law is breaking down, losing its predictive capability, and leaving the future of the industry looking fuzzy and less certain than at any time in the past.

With a long decline in manufacturing profitability partly due to the income distribution system of MANAGERIAL CAPITALISM that the victors of WWII put in place in the rich economies, and partly due to the global overcapacity developed as the emerging economies of the world tried to catch up with the rich west, Anglo-American neoliberals have turned to globalize finance and data as one way to maintain economic growth and vitality in the face of sluggish manufacturing sector of the rich west giving birth to ASSET MANAGER CAPITALISM.

All economic doctrines, but the anarchists, presuppose the existence of some kind of state, even minimal 'night-watchman-state'. The main flaw of the globalization efforts of ASSET MANAGER CAPITALISM in the last two decades of the 20th century was the attempts to integrate markets, particularly financial markets, on a global scale without a state. And that has rendered life in the globalized markets more insecure, more criminal and less legitimate. It was the globally stateless deregulated global financial system that collapsed in 2008, ironically to be saved by central banks and their governments that the global financial system had down-sized and stripped their regulatory powers.

In the 21st century, enabled by developments in digital technologies, data have become increasingly central to firms in reorganizing their relations with their employees, customers, and competitors. The platform has emerged as a new business model capable of extracting and controlling immense amounts of data, and with this new business model monopolists of data emerged. At the most general level, platforms are digital infrastructures that enable two or more groups to interact. Rather than having to build a marketplace from the ground up, a platform provides the basic infrastructure to mediate between different groups. This is platforms' key advantage over traditional business models when it comes to data. Since a platform positions itself between users, as the ground upon which their activities occur, giving the platform a privileged access to record and own them.

Furthermore, digital platforms produce and are reliant on 'network effects', more users begetting more users developing an innate tendency to monopolize. Moreover, the ability to rapidly scale many platform businesses by relying on pre-existing infrastructure and low marginal costs with few limits to growth promotes monopolization. The rules of product and service development, as well as marketplace interactions are set by the platform owners. In their position as an intermediary, platforms gain not only access to more data but also control and governance over the rules of the game. Far from being mere owners of data, these companies are becoming owners of the infrastructures of society. Hence the monopolistic DNA of these platforms must be taken into account in any analysis of their effect on the broader economy. Neoclassical model to explain and predict the platform world in the making is distortional.

Since platforms are grounded upon the extraction of data and the generation of network effects, the following are some strategic options that seem to have emerged from the competitive dynamics of these large platforms. The Cross-subsidization Strategy: Their expansion of data extraction drives cross-subsidization of services and cross-subsidization is used by the platforms to draw users into their network. The Gatekeeper Strategy: The platforms position themselves as a gatekeeper to occupy key positions within the ecosystem around a core business neither by horizontal nor vertical nor conglomerate mergers. They are more like rhizoidal connections driven by permanent effort to place themselves in key platform positions. The Convergence of Market Strategy: The platforms work for convergence of markets. The convergence thesis is the tendency for different platform companies to become increasingly similar as they encroach upon the same market and data areas. The Siloed Platform Strategy: Enclosure of ecosystems funneling of data extraction into siloed platforms. Their strategic choices are being installed in our economic systems.

With the advent of ASSET MANAGER CAPITALISM, US monetary policy was set since 1987 under Maestro GREENSPAN's baton with low interest rates and ample credit fine-tuned to generate higher asset prices when the equity markets took a down-turn and create wealth effect to spark broader economic growth by making rich richer as chronicled by Bob Woodward's hagiography MAESTRO: GREEENSPAN'S FED AND THE AMERICAN BOOM (Woodward, 2000). The maestro fell short of achieving broader economic growth but was spot-on in creating the stock market bubble for dot.com startups followed it by delivering a residential real estate bubble after NASDAQ's crash and passed the baton to BEN BERNANKE in 2006 for the finale. The new maestro was one of the prominent disciples of MILTON FRIEDMAN's interpretation of 1929 FINANCIAL CRISIS, perhaps, the most apprenticed in FRIEDMAN's historical causes of 1929 GREAT DEPRESSION in his generation for the finale: the 2007-2008 GLOBAL FINANCIAL CRISIS. The new maestro was not going to repeat FED's mishandling of 1929 as he promised to Milton Friedman on Friedman's birthday celebration.

Yet, the real the real US GDP between 1975 and 2017 roughly tripled, from $5.9trillion to $17.19trillion. During this period, productivity grew by about 60%. But from 1979 onwards, real hourly wages for the great majority of American employees have stagnated or even fallen. In other words, for almost 4 decades a tiny elite has captured nearly all the gains from this expansion. Perhaps the greatest transfer of wealth in history, but certainly in the capitalist history not only in the United States but at differing rates in the world, took place and 6+ billion people watched 'eyes wide shut'.

According to 2017 OXFAM REPORT: AN ECONOMY FOR THE 99% (Vaoufakis et al., 2008), 62 men in 2016 owned the same amount of wealth as the poorest half of the world's population. The wealth of the 62 very richest individuals increased by 45% between 2010 and 2015, a jump more than half a trillion dollars in total. Over the same period, the wealth of the bottom half fell by just over a trillion dollars, a drop of 38%. In 2018, the world's top 26 billionaires owned as much as the poorest 3.8billion according to OXFAM, as the billionaires increased their fortunes by $2.5 billion per day, while the poorest half of humanity saw their wealth dwindle by 11% billionaires' riches increased by 12%. In 2018 the top 26 wealthiest people owned $1.4trillion, or as much as the 3.8billion poorest people. In 2017, it was the top 43 people. The mega wealthy have also become more concentrated.

Few weeks before the 2018 DAVOS WORLD ECONOMIC FORUM of select plutocrats who advocate markets' efficiency over governments' and globalism's superiority over nationalism, and some mega asset managers, BLOOMBERG announced that China produced 2 US $billionaires a week, about 100, in 2017, and updated the 2017 announcement to a US $billionaire every other day for 2018, about 180, few weeks before the 2019 DAVOS meeting. For more than 100 years, neoclassical economics ignored PARETO's explanation of the dynamics of wealth distribution, but embraced PARETO EFFICIENCY and OPTIMALITY.

The mainstream economic theory was neither able to offer convincing explanations of what, how, and why, nor was it able to predict these booms and busts, but the risk models of quantitative finance provided a mathematical cover-up helping many to watch the greatest transfer of wealth 'eyes wide open shut' as the digitally connected global financial network with capability to move money at the speed of light with its elite intact and firmer in charge was reorganized.

The last two decades of the 20th century witnessed the apparently boundless co-dependent rise of two forces: the information revolution and financial markets. The 21st century was inaugurated with FED's ALAN GREENSPAN's fear mongering of possibility of global computers' crashing, and with claims about the advent of a "new economy" characterized by the flourishing of IT and financial markets capable of relentless growth. Global computers did not crash but the possibility gave Greenspan to cut interest rates and flood the markets with easy credit to unsuccessfully prolong the dot.com bubble. It burst three months later. 8 years later, the 2008 FINANCIAL CRISIS spoiled the hyped bright expectations for 6+trillion residents of planet Earth.

The 2008 economic crisis, a demon of our own design, was also a crisis for orthodox neoclassical economic theory, the theory of its design. If the origins of the crisis are thoroughly human, so must be its solutions. A decade of trauma has had a chastening effect among some peddlers of neoclassical economic theories. They started thinking old ideas, asking new questions, and occasionally welcoming heretics back into the fold. Some believed that what failed was not just a financial system, and a way of regulating that financial system, but a set of economic theories, and that we need to reject simplicities of neoclassical economics, reject overly mathematical economics, and revisit the insights of the past and try to do good science by learning how good science is done from disciplines that succeeded.

Before 1980 many people believed that the market was something that has always existed in a quasi-natural state, much like gravity. It seemed to enjoy a material omnipresence, sharing many characteristics of the forces of nature, warranting a science of its own. The science was first called 'political economy' and then, after roughly 1870, 'economics'. The modern orthodoxy of that science, the neoclassical tradition, has always taken the nature of the market as the central province of economics. In fact, an overview of the history of the first century of neoclassical economics would confirm that its adherents had been much more fascinated with the status and nature of agents than with the structure and composition of markets.

Most of the time, the concept of the market was offhandedly treated as a synonym for the phenomenon of exchange itself. Even, in the few instances when major thinkers in the tradition felt they should discuss the actual sequence of bids and asks in their models of trade - LEON WALRAS with his TATONNEMENT or FRANCIS EDGEWORT with his RE-CONTRACTING PROCESS what becomes apparent is that they bore little relationship to the operation of any actual contemporary market. Mid-20th century attempts to develop accounts of price dynamics were, if anything, even further removed from the increasingly sophisticated diversity of market formats and structures, as well as the actual sequence of tasks that markets accomplish.

The market in neoclassical economics came to be modeled as a relatively homogeneous and undifferentiated entity.

Yanis Varoufakis, Joseph Halevi and Nicholas J. Theocarakis in MODERN POLITICAL ECONOMICS: MAKING SENSE OF THE POST-2008 WORLD[1] delve into major economic theories and map out the trajectories that MANAGERIAL CAPITALISM of the NEW DEAL embedded in BRETTON WOODS AGREEMENT's almost centrally coordinated stability's designed disintegration in the 1970s, and then to an intentional magnification of unsustainable imbalances of the 1980s delivered ASSET MANAGER CAPITALISM that globally privatized money creation during the 1990s and beyond to September 15, 2008. The authors' main finding is that any system of ideas whose purpose is to describe capitalism in mathematical or engineering terms lead to inevitable logical inconsistency. The only scientific truth about capitalism is its radical indeterminacy. NEWTONIAN science based economics is an illusion leading one closer to astrology than to astronomy and more akin to a mathematized religion than to mathematical physics.

The economic ideas have always been linked to politics, paradigm shifts in economic theory have been intertwined with configurations of the political landscape. ADAM SMITH's ideas helped inspire dramatic expansion in free trade in the 19th century. KARL MARX's theories provided the impetus for cataclysmic changes in the 20th century. The neoclassical paradigm laid the intellectual foundations of FINANCIAL CAPITALISM, as JOHN MAYNARD KEYNES's solutions to the GREAT DEPRESSION tempered FINANCIAL CAPITALISM with the directorial role for the state and developed the foundations of MANGERIAL CAPITALISM. It was in this period that the idea of the state as a benevolent guardian of the public interest gained currency.

In the period after World War II, state activism of MANAGERIAL CAPITALISM grew to new heights, until Ronald Reagan and Margaret Thatcher ushered in ASSET MANAGER CATIPALISM in the 1980s after falling under the spell of Milton Friedman's and Friedrich Hayek's versions of neoclassical paradigm explains Daniel Stedman Jones in MASTERS OF THE UNIVERSE: HAYEK, FRIEDMAN, AND THE BIRTH OF NEOLIBERAL POLITICS (Jones, 2008). The KEYNESIAN regime ran into trouble in the STAGFLATIONARY 1970s and was superseded by MONETARISM, which was in fact a reversion to PRE-KEYNESIAN orthodoxy about both money and governments.

During the last 40 years the balance of power has shifted decisively from labor to capital; from working class to the business class; and from the old business elites to new financial elites, the ASSET MANAGERS. The homage, NEW CONSENSUS – mixture of 'new' CLASSICAL and 'new' KEYNESIAN economics - pays to power helped to render the power shift invisible.

Whether we consider the quantitative policies taken by Sweden's central bank in the 1980s and 1990s, or the policies of the central banks in the United States, Asian Countries, or Japan, the historic fact is that central banks have been at the center of the boom-and-bust cycles that have plagued the world economy as they increased their independence and decreased their accountability. The independent central banks were instrumental in delivering the shift of power from working class to business class, from the old business elites to new financial elites, the ASSET MANAGERS.

At the onset of the GREAT RECESSION, as house prices sank, and joblessness soared, many commentators concluded that the economic convictions behind the disaster would now be consigned to history. Instead a political class started to blame the government interventions for the disaster and demanded global drive for austerity, stagflation and an international sovereign debt crisis. Philip Mirowski in NEVER LET A SERIOUS CRISIS GO TO WASTE: HOW NEOLIBERALISM SURVIVED THE FINANCIAL MELTDOWN (Mirowski, 2013) finds an apt comparison in this situation in classic studies of cognitive dissonance. He concludes that neoliberal thought has become so pervasive that any countervailing evidence only serves to further convince disciples of its ultimate truth. Once neoliberalism became a THEORY OF EVERYTHING providing a revolutionary account of self, knowledge, information, markets, and government, it could no longer be falsified by anything as mundane as data from the 'real' economy. After financial apocalypse, neoliberalism rose from the dead observes Philip Mirowski.

2. The birth of attention merchants' surveillance capitalism

Fundamental shifts in human affairs come mostly in two guises, as low probability events that could in an instant "change everything", and as persistent, gradually unfolding trends that have no less far-reaching impacts in the long term. Fundamental changes come both as unpredictable discontinuities and as gradually unfolding trends as NIKOLAI KONDRATIEFF argued and paid with his life in MARXIST-LENINIST RUSSIA in the first quarter of the 20th century. The gradually unfolding events deserves at least a brief acknowledgement. They are epoch making technical developments: incremental engineering progress, improvements in efficiency and reliability, reduction of unit costs, and gradual diffusion of new techniques, usually following fairly predictable logistic curves are very much in evidence, but they are punctuated by surprising, sometimes stunning discontinuities.

Economics, having taken its cue from ISAAC NEWTON's physics, is an equilibrium system, disturbances are to be short and self-correcting. It is centered on equilibrium: an economy's natural resting state. Solving a set of equations that describes a market, conceived of as populated by predictably self-interested individuals who face various constraints, yields that equilibrium, the prices that balance supply and demand. Physicists have over the centuries used mathematics to understand the nature of gravity, light, electricity, magnetism and nuclear forces. Analytic solutions were achieved when their equations were linear, the noise GAUSSIAN, and the variables separable. Our world was written by them in the passive voice: rivers flow, rocks fall, planets orbit. There are no doings. Only happenings.

And yet, we are in a world of living creatures that construct themselves. What neoclassical economic theory misses is the idea of a system that constructs itself. The rhythmic character of economic life, the waves of innovation and destruction, the rise and fall of systems of political economy do not abide well with the conditions neoclassical economic theory portray, because network equations turn out to be nonlinear, noise associated with them non-GAUSSIAN, and variables non-separable. They do not have explicit solutions.

Some post-2008 FINANCIAL CRISIS economists draw on strands of the discipline less enamored of equilibrium. JOAN ROBINSON worried that equilibrium models understated the role of history in determining outcomes. JOSEPH SCHUMPETER saw the economy as undergoing constant change powered by innovation. FRIEDRICH HAYEK wrote on how the separate actions of individuals could generate 'spontaneous order' of incomprehensible complexity.

A famous economic theory of cycles is the KONDRATIEFF CYCLE, a long wave of 40 or 50 years, which starts with a cluster of new technologies and exhausts itself when they have been used up. SCHUMPETER drew on this idea in his depiction of capitalism's cycles of creation and destruction. In SCHUMPETERIAN view, capitalism is a dynamic disequilibrium system. The new only rarely supplements the old; it usually destroys it. The old, however, does not, as it were, simply give up but rather tries to forestall death or co-opt its usurper – a la KRONOS – with important implications.

There is neither a unique full employment equilibrium nor the variety of equilibria posited by KEYNES. Nevertheless, there is a potential meeting between KEYNES and SCHUMPETER, since SCHUMPETER, like the earlier generation of REAL BUSINESSS CYCLE THEORISTS, would not have denied that stabilization policy could make rocking less violent. Within the long cycles are shorter cycles of boom and bust, lasting 8 to 10 years. Lacking proper scientific explanation Paul Samuelson called cycle theories SCIENCE FICTION, nevertheless cycles have had great influence on macroeconomic policy. Typical macroeconomic constructions, such as the CYCLICALLY ADJUSTED BUDGET DEFICIT, refer to short cycles of definite duration, which oscillate round some 'normal' or 'long-run' situation.

DAVID HUME, in the tradition of British Empiricism, thought of a passive observing mind/brain in a vat and wondered how that observing mind could have reliable knowledge of the world. He rightly noted that from what is observed to be the case, one cannot deduce what ought to be the case. One cannot deduce an ought from an is. Yet, ever since DAVID HUME, economists have distinguished between short-run and the long-run effects of economic change, including the effects of policy interventions. The distinction has served to protect the theory of equilibrium, by enabling it to be stated in a form which took some account of reality.

In economics, the short-run now typically stands for the period during which a market or an economy of markets temporarily deviates from its long-term equilibrium position under the impact of some 'shock'; like a pendulum temporarily dislodged from a position of rest. This way of thinking suggests that governments should leave it to markets to discover their natural long-run equilibrium positions.

Reminding us of the harsh reality that in the long-run we will all be dead, JOHN MARNARD KEYNES pointed out that the long-run may be too long to be relevant. Historical cycles, on the other hand, refer to disturbances of a moral, socio-political, rather than technological equilibrium. That is; they embed technological innovation within the wider frame of political and social change. Societies are said to swing like pendulums between alternative phases of vigor and decay, progress and reaction, prodigality and puritanism. Each expansive movement produces a crisis of excess that leads to a reaction. The equilibrium position is hard to achieve and is always unstable.

By far the most important concatenation of these fundamental advances took place between 1867 and 1914, when electricity generation, steam and water turbines, internal combustion engines, inexpensive steel, aluminum, explosives, synthetic fertilizers, and electronic components created the technical foundations of the 20th century. A second remarkable saltation took place during the 1930s and 1940s with the introduction of gas turbines, nuclear fission, electronic computing, semiconductors, key plastics, insecticides, and herbicides. The history of jet flight is a good illustration of the inherently unpredictable nature of these rapid technical shifts.

Before the scientific revolution of the 17th century, there was no suggestion that there might be simple, orderly laws underpinning the confusion of the world, and the nearest anyone came offering a reason for the behavior of wind, and weather, the occurrence of famines, or the orbits of planets was that they resulted from the whim of God, or gods. NEWTON made the Universe seem an orderly place, with no room for interference from capricious gods. He provided laws of motion, which describe the behavior of moving objects in the laboratory, or in the world at large, or in the SOLAR SYSTEM and beyond, and which, by extension, must also be thought of as universal laws, applying everywhere and at all times.

The kinetic theory of gasses was a significant example of how the universal laws of physics brought order out of chaos. The term "gas" was coined by JAN VAN HELMONT from the Greek word for chaos. It was ISAAC NEWTON's fellows' world-view that unleashed a theory of progress with human creativity and free will at its core.

ISAAC NEWTON worked out the mathematical basis of physics, RENE DESCARTES, its dualist philosophy, and FRANCIS BACON's the experimental method that subsequently led science to reach its heights. The experimental method that delivered CERTAIN results in physics came to be called REDUCTIONISM. REDUCTIONISM assumes that matter is the basis of all existence and that material world is composed of a multitude of separate objects assembled into a huge structure. Consequently, complex phenomena can be understood by reducing them to their basic building blocks, and by looking for the mechanisms through which these building blocks interact. Although physics led the way, the reductionist methodology eventually permeated all the sciences.

With the triumphs of DESCARTES, NEWTON, and LAPLACE, we have come to regard physics as the answer to our questions about what reality "is". In that search, we have come to think of the world as a vast "machine". This fundamental framework, extended by SPECIAL AND GENERAL RELATIVITY, QUANTUM MECHANICS, and QUANTUM FIELD THEORY alter some of the basic deterministic aspects of NEWTONIAN physics but not the view of reality as a giant "machine". Evolving life is not a "machine", neither is its biosphere. Unlike physics where laws hold sway, no laws at all entail the becoming of the biosphere.

We do not know what shall become as the biosphere evolves and shapes its own future in ways we cannot state in advance. This lawless emergence is contingent yet not random. Biosphere constructs itself and does so into a biosphere of increasing diversity. The living world can become more diverse and complex and in an ongoing way creates its own potential to do so. That requires harnessing of the release of energy to build order faster than that order can be dissipated by the second law of thermodynamics.

Much of the scientific method relied on taking a reductive stance toward nature, breaking the complex into simple basic units. In physics, this meant seeing objects as aggregates of individual atoms. In human affairs, it meant building a notion of society based on an understanding of the individual. THOMAS HOBBES, thus began his political treatise with the individual, a radical and strikingly modern step. According to the Christian doctrine dominating HOBBES's day, societies were organic wholes with individuals as part of the body of CHRIST. Individuals ultimately derived their identity from that larger collective vision. Each part had no shape except by relation to the social whole.

HOBBES reversed all that, putting the individual before society and seeing society as nothing more than aggregate of individuals. HOBBES's individuals were self-interested and social. Just as the atoms of the physics of his day were constantly in in motion, so too were HOBBES's individuals propelled by internal drives that kept them in constant motion. The inevitable result was conflict. Leading in his vision of "war of all against all".

Sigmund Freud in CIVILIZATION AND ITS DISCONTENTS[1] argued that civilization stems from primordial guilt that first arose with patricide, perhaps as a band of sons rose up to kill their father. FREUD speculated that in the aftermath of that bloody act, feelings of shame so overwhelmed them that they formed laws and social institutions to prohibit such acts. FREUD thus located our civilizing tendency in guilt, an emotional impulse. In contrast, HOBBES believed humans were rational calculators of self-interest, and for HOBBES rationality ultimately saves humans from themselves. Reason moves HOBBES's individuals, driven by the selfish desire for self-preservation, to relinquish liberty for security, ceding absolute control to a sovereign, a LEVIATHAN, in exchange for security.

The basis of life together is this social contract, in which the state exists only to safeguard the individual's self-preservation. JOHN LOCKE retained HOBBES's ideas of social contract as the glue of society, but attacked HOBBES's vision of absolute monarchy, arguing that it simply transferred the war of all against all to one between the monarch and his subjects. LOCKE thus argued for a limited, constitutional government, which in essence the modern limited, liberal state. Whereas HOBBES believed that only absolute rule could curb self-interest, ADAM SMITH saw self-interest as the basis or social order. The invisible hand of the marketplace thus replaced the sovereign LEVIATHAN, and common interest simply flowed out of collective pursuit of self-interest. So was SMITH's fantasy.

In TURNING POINT: SCIENCE, SOCIETY, AND THE RISING CULTURE (Capra, 1983), Fritiof Capra contends that the NEWTONIAN view of scientific method has crashed and that the first discipline to crash has been physics itself, where CARTESIAN philosophical foundation and the reductionist methodology had seemed most secure. First, quantum theory played havoc with DESCARTES's CERTAINTY PRINCIPLE, and the second discovery pertaining to the nonlocal connections of individual events abolished DESCARTES's separation of mind from matter.

In this 18th century system of the world, NEWTON brought together two themes. Embodied in his calculus and physics, one Newtonian revelation rendered the physical world predictable and measureable. Craving the authority of science, economists then mimicked Newton's laws of motion in their theories, describing the economy as if it were a stable, mechanical system. In the late 19th century, a handful of mathematically minded economists set out to make economics a science as reputable as physics, turned to differential calculus to describe the economy with a set of axioms and equations.

Just as Newton had uncovered the physical laws of motion that explained the world from the scale of a single atom to the movement of the planets, the mathematically minded economists sought to uncover the economic laws of motion that explained the market, starting with a single representative consumer and scaling up to national output. Thus, 150 years of economic theory biased our understanding with static mechanistic models and metaphors, when the economy is better understood as a complex adaptive system, made up of interdependent humans in a dynamic living world. The individual is not only embedded within a system but is directly involved in that system's self-organization. Long before DARWIN, IMMANUEL KANT understood this. "An organized being then, has the property that the parts exist for by means of the whole." KANTIAN WHOLE.

Another, less celebrated, was NEWTON's key role in establishing the trustworthy GOLD STANDARD, which made economic valuations as calculable and reliable as the physical dimensions of items in trade. For 200 years after 1717, except for its suspension in the Napoleonic wars, Newton, as master to the Royal Mint, having fixed the value of the pound to gold, the sterling pound, based on chemical irreversibility of gold, became the stable and reliable monetary Polaris. Newton's attempted and failed alchemical endeavors to reverse-engineer gold so that it could be made from base metals such as lead and mercury yielded crucial knowledge for his defense of the gold based pound. Newton's regime rendered money essentially as irreversible as gold, as irreversible as time itself as measurement of economic transactions.

These two concatenations substituted continuous processes for discrete production and gave us the classic image of wheels of industry, rolls of paper, spools of thread, ribbons of steel, classic assembly line of films like CHARLIE CHAPLIN's MODERN TIMES. Such industries represented only part of even industrial nations' output, but the ideal of the continuous process inspired capitalists and socialists alike. In the centuries of continuous process technology, it was manufacturers, refiners, and distributors who seemed to have excessive power over information, now a few disruptive platform companies do. Mass production economy based on cheap fossil fuel is evolving into information economy based on cheap micro-electronics in the 21st century. Industrial civilization flourished at the expense of nature and now threatens the ecology of the living Planet Earth.

In A WORLD BEYOND PHYSICS: THE EMERGENCE & EVOLUTION OF LIFE (Kauffman, 2019), Stuart A. Kauffman sums the economy to be a network of complements and substitutes that he calls the ECONOMIC WEB. Like the biosphere, ECOMONIC WEB's evolution cannot substantially pre-tested, and is "context dependent". And creates its own growing "context" that subtends its "adjacent possible". The adjacent possible is what can arise next in this evolution. This evolution is sucked into the very adjacent possible opportunities it itself creates.

The 80-year history of Information technology is an example. In the 1930s, TURING invented the TURING MACHINE, an abstract formulation

of a digital computer. By mid-World War II, TURING's idea was crafted at the

University of Pennsylvania into ENIAC machine to calculate the trajectories of naval shells. After the war, VON NEUMANN invented the mainframe computer; and shortly later, IBM made the first commercial machines, expecting to sell only a few. But the mainframe sold widely, and with the invention of the microchip, paved the way for the personal computer.

Chip-making was an in-house affair at the onset of the industry until 1961 when FAIRCHILD SEMICONDUCTOR began assembling and testing products in Hong Kong mostly to arbitrage labor costs. Internationalization of the production processes has accelerated as microchips have become more complicated and more manufacturing processes have been outsourced to specialized firms that emerged in Asia. The result was a multi-national complex constellation of thousands of companies that The ECONOMIST (The Economist 2018) roughly lumped into three categories. Designing [APPLE, INTEL, HUAWEI, QUALCOMM]; Manufacturing [INTEL, SAMSUNG, MICRON, TSMC] Packaging/Assembly [AMCOR, JCET, ASE, KING YUAN]. Designing is supplied by ARM, XILINX, SYNOPSYS, ZUKEN. Manufacturing, and Packaging/Assembly is supplied by AIR LIQUIDE, APPLIED MATERIALS, ASML, KMG CHEMICALS, LAM REASERCH, NAURA, SUMCO, TOKYO ELECTRON.

A typical itinerary of raw silicon to completed microchip is a fair illustration of the elaborate supply chains that emerged. Microchip's initial travel may start in the Appalachian Mountains in north America, where deposits of silicon dioxide are of the highest quality. The sand may arrive in Japan to be turned into pure ingots of silicon. The ingots of silicon are then sliced into standardized wafers, 300mm across, and sent to a "fab", a chip factory, in Taiwan or South Korea for high-tech and to China for low-tech. It is in this stage that the slices will be imprinted with a particular pattern using photolithography equipment made in Holland by AML. AML announced its compliance decision with COMMERCE DEPARTMENT and notified HUAWEI of its decision. The particular pattern will be determined by the overall design of the chip. This design might come from ARM, a British company owned by SOFTBANK. The design can be tweaked for specific applications by one of the company's many licensees.

In its next phase, it must be assembled into a package, in which the etched silicon is placed inside the ceramic or plastic containers that are dotted across any circuit board. Then testing follows. Packaging might take place in China, Vietnam or the Philippines. The integration into a circuit board could happen somewhere else again. The final result will be one of the many components that arrive at factories from Mexico to Germany to China, for assembly into a final product: an industrial robot, a smart vacuum cleaner or a tablet. China's domestic microchip industry started at the lower-value end of this process, SEMICONDUCTOR MANUFACTURING INTERNATIONAL CORP, China's largest maker of semiconductors. Fueled by a fast growing domestic market, China established NATIONAL INTEGRATED CIRCUIT INDUSTRY INVESTMENT FUND help to turn promote design and higher-value manufacturing.

The 2011 earthquake and tsunami in Japan besides revealing how globally integrated the manufacturing had become, starkly revealed that Japanese firms have been producing the bulk of chemicals and other materials to make microchips. Japanese firms had substantial control over copper foils for printed circuit boards, silicon wafers to make chips, and resin to package them. For many components Japan was the home of biggest, sometimes the only, supplier.

President Trump's WEAPONIZATION OF INTERDEPENDENCE, his threats to cut off foreign financial institutions from SWIFT banking network and the dollar clearing system for doing business with countries or entities he does not like highlighted China's vulnerabilities. One of the gravest is China's dominant role in electronics assembly. China is home to half of the world's capacity. In May 2019 COMMERCE DEPARTMENT blacklisted HUAWEI and its 70 affiliates, barring American firms from selling certain technologies without government approval to them. This shed light on another global network: microchip industry.

Around half of the modem chips to manage wireless connections of the world's baseband processors are made by QUALCOMM. Virtually all "server-class" chips used in world's data centers are made by INTEL. Chips based on designs licensed from ARM are ubiquitous in almost every advanced smart-phone. For their part, QUALCOMM, ARM and other chip designers depend on foundries to turn silicon into microprocessors. INTEL, SAMSUNG, and TSMC, in turn, rely on a bevy of specialized equipment suppliers to equip their factories. The emerged technically interdependent complexity of chip-making is multinational as its financial structure.

The mainframe did not cause the invention of the personal computer, but the wide market the mainframe created enabled the rather easy penetration of the personal computer into an expanding market. In addition, the spreadsheet is often described in histories of technologies as the killer app that caused an explosion of the personal computer market. The spreadsheet is the complement of the personal computer. Each helped the other gain market share. The personal computer did not cause but enabled the invention of word processing, and software companies like MICROSOFT emerged, which was originally founded to make the operating system for IBM personal computers.

The invention of word processing and abundant files invited the possibility of file sharing, and the modem was invented. The existence of file sharing did not cause, but invited, the invention of the WORLD WIDE WEB. The existence of the WEB did not cause, but enabled, selling on the WEB, and eBay and AMAZON emerged. And eBay and AMAZON put content on the WEB as did myriad other users, enabling the invention of WEB browsers; and also companies like GOOGLE emerged. Thence has followed social media and FACEBOOK.

Almost all of these successive innovations are the complements of the preceding ones. The existing goods and services at each state are the context in which the next good and/or service emerges. Word processing is a complement of the personal computer, the modem a complement of word processing, the WEB is a vast interconnected modem and is a complement and much more to file file-sharing. The opportunity to share files invited the invention of the modem. Accordingly, SCHUMPETER's depiction of capitalism's cycles of creation and destruction need to be modified to reflect goods and services as contexts that do not cause, but enable, the invention and introduction of the next good or service. Enablement is not a neoclassical equilibrium theory concept.

The prolonged decline in manufacturing profitability partly due to the income distribution system of MANAGERIAL CAPITALISM that the victors of WWII put in place in the rich economies, and partly due to the global overcapacity developed as the emerging economies of the world tried to catch up with the rich west, Anglo-American neoliberals have turned to globalize finance and data as one way to maintain economic growth and vitality in the face of sluggish manufacturing sector of the rich west giving birth to ASSET MANAGER CAPITALISM. All economic doctrines, but the anarchists, presuppose the existence of some kind of state, even minimal 'night-watchman-state'. The main flaw of the globalization efforts of ASSET MANAGER CAPITALISM in the last two decades of the 20th century was the attempts to integrate markets, particularly financial markets, on a global scale without a state. And, that has rendered life in the globalized markets more insecure, more criminal and less legitimate. It was the globally stateless, deregulated global financial structure that collapsed in 2008 ironically to be saved by all governments adversely effected.

As the 21st century developments in digital technologies enabled firms to generate and amass data, data have become increasingly central to firms to recast their relations with their employees, their customers, and competitors. A new business model has emerged, the platform, capable of extracting and controlling unimagined amounts of data, and with this development, there emerged gigantic monopolistic data owning centers. Primarily, platforms are digital infrastructures that enable two or more groups to interact. Instead of having to build a marketplace from the ground up, a platform provides the basic infrastructure to mediate between different groups. This is platforms' key advantage over traditional business models when it comes to data. A platform positions itself between users, as the medium upon which their activities take place, hence giving the platform the privileged access to record the users' activities and store and own them.

Moreover, digital platforms produce and depend on 'network effects', more users begetting more users which develop their innate inertia to monopolize. The ability to rapidly scale many platform businesses by relying on pre-existing infrastructure and low marginal costs with few limits to growth further enables monopolization. Platform owners set the rules of service and development, as they set marketplace interactions. In their intermediary positions, platforms gain not only access to more data but also control and governance over the rules of the game. Far from simply being the owners of data, these data giants are emerging to become the owners of the emerging infrastructures of societies in the future.

The monopolistic DNA of these platforms must be taken into account in any analysis of their effect on the broader economy. "Capitalism without competition is not capitalism." warn Jonathan Tepper with Denise Hearn in THE MYTH OF CAPTITALISM: MONOPOLIES AND THE DEATH OF COMPETITION (Tepper and Hearn, 2014). The vocal defender of the monopoly form is Peter Thiel, a Silicon Valley entrepreneur and the author of ZERO TO ONE: NOTES ON STARTUPS, OR HOW TO BUILD THE FUTURE (Thiel and Masters, 2018). Labelling the competitive-economy a "relic of history" and a "trap", he proclaims that "only one thing can allow a business to transcend that daily brute struggle for survival: monopoly profits." FACEBOOK to "bringing the world together" requires a global monopoly. Meanwhile, GOOGLE wants to organize the world's information and AMAZON wants nothing more than all the information to serve the world's consumers. Neoclassicals' economic model to explain and predict the platform world in the making is not helpful, but actually distorting.

Since platforms are grounded on the extraction of data and generation of network effects, the following broad strategies seem to have emerged from the competitive dynamics of these large platforms. Expansion of Data Extraction Strategies by driving cross-subsidization of services to draw users into their network. Gatekeeper Strategies by positioning as a gatekeeper to occupy key positions within the ecosystem around a core business neither by horizontal nor vertical nor conglomerate mergers. They are more like rhizoidal connections driven by permanent effort to place themselves in key platform positions. Convergence of Markets Strategies. The convergence thesis is the tendency for different platform companies to become increasingly similar as they encroach upon the same market and data areas. Siloed Platform Strategies by enclosing ecosystems and funneling of data extraction into siloed platforms. Their strategic choices are being installed in the 21st century ecosystems.

Continuous production may still be going strong, in fact stronger than ever thanks to industrial robots, but it has lost its excitement of the early and middle twentieth century particularly in the United States, with the emergence of ASSET MANAGER CAPITALISM. The platform company, which uses software to bring together buyers and sellers of goods and services, represents a new kind of efficiency, based less on the organization of machines and human labor than on gathering, analysis, and exchange of data. This is disruptive business process innovation. It reduces transaction costs by matching buyers and sellers with automated software.

The platform era that began in the late 1990s with AMAZON.com entered a new phase in the 21st century with the rise of search engines, smartphones, social media, networked web-based software, and a revival of artificial intelligence. In the 1990s ALAN GREENSPAN's monetary policies fueled Wall Street's romance with platform-based efficiency and diverted capital and talent from riskier but ultimately more broadly beneficial market creating innovation to dot.com IPOs. And transferred trillions of dollars from those that bought dot.com stocks to those that sold. Retirement funds of the rich countries that fell under GREENSPAN's spell were major buyers, therefore losers. The money managers of the retirement funds, however, kept their bonuses. RASPUTIN would have envied.

The continuous process innovations did not just reduce friction. In eliminating some jobs, they created many others, often more skilled and higher paid. Some believe that this phase of technology was a one-time event that will not be repeated by 21st century platform companies. Such a view is not tweeted by President Trump who has promised to bring the off-shored jobs back to his nostalgic supporters. Now, we are in the midst of the third saltation that McAfee and Brynjolfsson call it the second machine age in THE SECOND MACHINE AGE: WORK, PROGRESS, AND PROSPERITY IN A TIME OF BRILLIANT TECHNOLOGIES (Bryniolfsson and McAfee, 2014), and in MACHINE, PLATFORM, CROWD: HARNESSING OUR DIGITAL FUTURE (McAfee and Brynjolfsson, 2017), they offer explanations of these technologies.

Nick Bostrom calls the third saltation superintelligence in SUPERINTELLIGENCE: PATHS, DANGERS, STRATEGIES (Tegmak, 2017), Max Tegmark's moniker is life:3.0 in LIFE 3.0: BEING HUMAN IN THE AGE OF ARTIFICIAL INTELLIGENCE[1]. GOOGLE's in house technology guru Ray Kurzweil declares THE SINGULARITY IS NEAR: WHEN HUMANS TRANSCEND BIOLOGY (Brynjolfsson and McAfee, 2014), and also in HOW TO CREATE A MIND: THE SECRETS OF HUMAN THOUGHT REVEALED (Kurzweil, 2013), 2018). In THE DEEP LEARNING REVOLUTION (Sejnowski, 2018), Terrence J. Sejnowski give us a concise history of learning algorithms that extract information from raw data; how information can be used to create knowledge; how knowledge underlies understanding; and how understanding leads to wisdom.

The information theory of KURT GODEL, JOHN VON NEUMANN, ALAN TURING, and CLAUDE SHANNON tells us that human creations and communications are transmissions across a channel, whether that channel is a wire or the www measure the outcome as its "news" or surprise, defined as entropy and consummated as knowledge. Entropy is higher or lower depending on the freedom of choice of the sender. The larger the available alphabet of symbols – that is, the larger the set of possible messages – the greater the composer's choice and the higher the entropy and information of the message. Information is not order but disorder, not the predictable regularity that contains no news, but the unexpected modulation, the surprising bits.

But, human creativity and surprise depend upon a matrix of regularities, from the laws of physics to the stability of money. Since these creations and communications can be business plans or experiments, information theory provides the foundation for an economics driven not by equilibrium or order but by falsifiable entrepreneurial surprises. Information theory has impelled the global ascendancy of information technology. From worldwide webs of glass and light to a boom in biotech based on treating life itself as chiefly an information system, a new system of the world is transforming our lives. And, the static neoclassical economic theory is not at all helpful in understanding this transformation, actually a hindrance.

CLAUDE SHANNON's breakthrough was mapping electrical circuits to BOOLE's symbolic logic and then explaining how BOOLEAN logic could be used to create a working circuit for adding 1s and 0s. SHANNON had figured out that computers had two layers: physical [container] and logical [the code]. While SHANNON was working to fuse BOOLEAN logic onto physical circuits, TURING was testing LEIBNIZ's language translator that could represent all mathematical and scientific knowledge. Turing aimed to prove what was called the ENTSCHEIDUNGSPROBLEM, or "decision problem", that is: no algorithm can exist that determines whether an arbitrary mathematical statement is true or false. The answer would be negative.

TURING was able to prove that no algorithm exists, but as a byproduct, he formulated a mathematical model for an all-purpose computing machine. TURING figured out that a program and data it used could be stored inside a computer. TURING's universal machine intertwined the machine, the program and the data. From a mechanical standpoint, the logic that operated circuits and switches also encoded into the program and data. The container, the program, and data were part of a singular entity. Not unlike humans. We too are containers [our bodies], programs [autonomous cellular functions], and data [our DNA combined with indirect and direct sensory information].

DATAISM regards the universe to consist of data flows and the value of any phenomenon or entity to be determined by its contribution to data processing. DATAISM was born from the confluence of life sciences that came to see organisms, since the publication of Charles Darwin's ON THE ORIGIN OF SPECIES, as biological algorithms and ALAN TURING's idea of TURING MACHINE. Computer scientists have learned to engineer increasingly sophisticated electronic algorithms. An algorithm is a methodical set of steps that can be used to make calculations, resolve problems and reach decisions. An algorithm is not a particular calculation, but the method followed when making the calculation.

DATAISM puts the two together pointing out that the same mathematical laws apply to both biochemical and electronic algorithms. DATAISM, eliminating the barrier between animals and machines, expects electronic algorithms to eventually decipher and outperform biochemical algorithms. According to DATAISM, MOZART's MAGIC FLUTE, stock market bubble, HIV virus are three patterns of data flow that can be analyzed using the same basic concepts and tools.

Humans are expected to distil data into information, information into knowledge, and knowledge into wisdom. But, DATAISTS believe that humans can no longer cope with the immense flows of data, hence they cannot distil data into information, let alone into knowledge or wisdom. The work of processing data should therefore be entrusted to electronic algorithms, whose capacity far exceeds that of human brain. DATAISTS, skeptical of human knowledge and wisdom, prefer to put their trust in BIG DATA and computer algorithms. It was biology's embrace of DATAISM that turned the breakthrough in computer science into a possibility that may transform the very nature of life.

Not only individual organisms are seen today as data processing systems, but also entire societies such as beehives, ant hills, bacteria colonies, forests and human cities. Markets are data processing systems, as HAYEK reminded us half a century ago when he argued for its superiority over central planners. According DATAISTS, free market capitalism and state-controlled communism are not competing ideologies, ethical creeds or political institutions. They are in essence, competing data processing systems. Capitalism uses distributed processing, whereas communism relies on centralized processing.

Computers and other digital advances are doing for mental power, the ability to use our brains to understand and shape our environments, what the steam engine and its descendants did for muscle power. They are allowing us to blow past previous limitations and taking us into new territory. DANIEL DENNETT in FROM BACTERIA TO BACH AND BACK: THE EVOLUTION OF MINDS (Dennett, 2017) tells the tale of human neurons, distant relatives of tiny yeast cells that are themselves distant relatives of even simpler microbes are organized in structures that are capable of astonishing feats of creativity by revisiting and extending half a century of work on the topic. Just as computers can perform complex calculations without understanding arithmetic behind it, so creatures can display finely tuned behavior without understanding why they do so. COMPETENCE

WITHOUT COMREHENSION.

People do not have a special faculty of comprehension. Rather, the human mind has been enhanced by the process of cultural evolution operating on memes. Memes are behavior that can be copied. Words are a good example. Words and other memes gave humans powerful new competences in communicating, explicit representation, reflection, self-interrogation and self-monitoring. To use a computer analogy, memetic evolution provided “thinking tools”- a bit like smartphone apps – which transformed humans into comprehending intelligent designers, triggering an explosion of civilization and technologies.

DANIEL DENNETT expects that computers will continue to increase in competence but doubts that they will soon develop genuine comprehension, since they lack the autonomy and social practices that have nurtured comprehension in humans. The so-called super-intelligence does not succeed by deeper understanding of the games of GO, CHESS, or ATARI, to cite most fashionable examples. Super AI succeeds vastly accelerating the speed of game playing, capturing much of the possibility space of bounded and deterministic regime. Daniel Dennett worries that people may overestimate the intelligence of their artifacts and become over reliant on them and that the institutions and practices on which human comprehension depends may erode as a result. How exactly this transition will play out remains unknown. Rapid and accelerating digitalization is likely to bring economic disruptions. Orthodox neoclassical toolbox you acquired will not be much help unless, block chain technology creates a virtual decentralized reality, platonic habitat for HOMO ECONOMICUS. Neoclassical market fundamentalists’ utopia, but dystopia for others.

After four billion years of organic life evolving by natural selection, science is ushering in the era of inorganic life shaped by intelligent design, and the designers are human scientists. The combination of biotechnology and AI might result in physical and mental traits that completely break free of the hominid mold. YUVAL NOAH HARARI in HOMO DEUS: A BRIEF HISTORY OF TOMORROW (Harari, 2017) warns. We still share most of our bodily structures, physical abilities, and mental faculties with Neanderthals and chimpanzees. Not only our hands, eyes, and brains distinctly hominid, but also are our lust, our love, our anger, and our social bonds.

3. Dialectic evolution of the internet: from global commons to monitized private enclosures and to the emergence of splinternet

In INFORMATION RULES: A STRATEGIC GUIDE TO NETWORK ECONOMY (Shapiro and Varian, 1998), CARL SHAPIRO and HAL VARIAN popularized the term NETWORK EFFECT which came to mean that in digital world size easily begets size. Hal Varian has been described as the ADAM SMITH of the discipline of GOOGLENOMICS and the godfather of GOOGLE’s advertising model.

Jack Goldsmith and Tim Wu in WHO CONTROLS THE INTERNET: ILLUSIONS OF A BORDERLESS WORLD (Goldsmith and Wu, 2018) tells the story of the death of the dream of self-governing cyber-communities that would escape geography forever, and also tells the story of the birth and early years of a new kind of INTERNET, a bordered network where territorial law, government power, and international relations matter as much as technological invention. As China and America wall off their respective digital markets from one another, each are looking for growth in the rest of the world. A divided world wide web or SPLINTERNET is already a reality, as China’s internet grows behind a great firewall of censorship. AMAZON is promoting payment services in India. China’s ALIPAY service is active in Brazil.

To understand the internet’s recent history, it helps to keep in mind that like most digital systems, it is designed in layers. At the bottom are all the protocols that allow different sorts of networks and devices to exchange information, or INTERNETWORK; hence INTERNET. At that level, it is still largely decentralized. No single company controls these protocols, although the number of firms providing internet access has dropped sharply. The INTERNET’s base was designed to move data around and publish information, so its protocols did not record what had been transmitted previously by whom.

The INTERNET was built without memory. The INTERNET’s arrival seemed to herald a new way of ordering human affairs that would free us from the tyranny of territorial rule. Self-governing cyber-communities would escape geography forever. But the last decade has shown that national governments have an array of techniques for controlling offshore INTERNET communications, thus enforcing their laws, by exercising coercion within their borders. INTERNET is splitting apart and becoming bordered. Far from flattening the world, the INTERNET, its language, its content, its norms, is conforming to local conditions.

The result is an INTERNET that differs among nations and regions that are increasingly separated by walls of bandwidth, language, and filters. This bordered INTERNET reflects top-down pressures from governments that are imposing national laws on the INTERNET within their borders. It also reflects bottom-up pressures from individuals in different places who demand an INTERNET that corresponds to local preferences, and from the web page operators and other content providers who shape the INTERNET

experience to satisfy these demands.

The INTERNET’s design was not the result of some grand theory or vision that emerged fully formed. Rather, open design of the INTERNET was necessitated by the particularities of the specific engineering challenges. The INTERNET’s creators, mainly academics operating within and outside the government, lacked the power or ambition to create an information empire. They faced a world in which the wires were owned by AT&T and computing power was a patchwork of fiefdoms centered on the mainframe computers, each with idiosyncratic protocols and systems.

INTERNET works over an infrastructure that does not belong to those using it. The owner is always someone else, and in the 1970s, it was generally AT&T in the United States. It was designed to link human brains, but it had no control over their activities than that. Egalitarianism born of necessity would persist as the network grew over decades to include everyone.

The concept of ENCAPSULATION was how a network interconnected with other networks. It means wrapping information from local networks in an envelope that INTERNETWORK could recognize and direct. In what would come to be known as TRANSMISSION CONTROL PROTOCOL [TCP] created a standard for the size and flow rate of data packets, thereby furnishing computer users with a LINGUA FRANCO [ESPERANTO] that could work among all networks. As a practical matter, this innovation would allow the INTERNET to run on any infrastructure, and carry any application, it packets traveling any type of wire or radio broadcast, even those owned by an entity as given to strict controls as AT&T.

It was an electronic information network independent of the physical infrastructure over which it ran. The invention of ENCAPSULATION permitted the layered structure of the INTERNET, whereby communications functions are segregated allowing the network to negotiate the differing technical standards of various devices, media, and applications. This was also born of necessity to link different types of networks by inventing a protocol that took account of the existence of many networks over which the creators had limited power.

TRANSMISSION CONTROL PROTOCOL/INTERNET PROTOCOL [TCP/IP] and other aspects of the INTERNET’s architecture rested on the founders’ beliefs about networks. In technical jargon, they created a network with “open architecture”, or “end-to-end” design. In non-technical terms, the founders embraced a design that distrusted centralized control. In effect, they built strains of American liberalism, and even 1960s idealism, into the universal language of INTERNET. The INTERNET’s design was open, minimalist and neutral. It was open, because it was willing to accept almost any kind of computer network to join in one universal network-of-networks. It was minimalist, because it required very little of the computers that wanted to join in. Finally, it was neutral between applications.

The INTERNET plays a central role in the American economy as it does in the Chinese. But there is a profound flaw in its architecture. Its software stack lacks a trust and transactions capability. Its OPEN SYSTEM INTERCONNECTIONS [OSI] model defines seven layers. While some of the layers have merged, none of the existing layers provide trust or validation or factuality or veracity of real monetary values. Perhaps, that abides well with the theoretical mainframe of the MBA programs: the money neutral neoclassical economic theory.

The original distributed INTERNET architecture sufficed when everything was “free”, as the INTERNET was not a vehicle for transactions. When all it was doing was displaying WEB pages, transmitting emails, running discussions forums and news groups, and hyperlinking academic sites. The NET did not absolutely need a foundation of security. But when the INTERNET became a forum for monetary transactions, new security regimes became indispensable. The groups which developed the original protocols, the INTERNET ENGINEERING TASK FORCE and the WORLD WIDE WEB could have added security regimes to the rule book. But they did so, only belatedly. Perhaps, one reason was that many internet pioneers believed that the protocols would have been enough to prevent centralization. They were proven wrong.

To understand the contemporary INTERNET, one needs to start with STACKs which imitate hardware and transcend it in virtual threads and cores and chains. The seven-layer NETPLEX scheme of the OPEN SYSTEMS INTERCONNECTION model of the INTERNATIONAL STANDARDS

ORGANIZATION consists of a hierarchical stack in which lower functions are controlled by higher functions. At the bottom is the physical layer, the fiber-optic lines, microwave oscillators, mixers, 1550 and 900-nanometer lasers, photodetectors, silicon routers, erbium-doped amplifiers, and twisted-pair telephone wires, antennas, coaxial cables – the list is endless – that carry the data packets across the network at the behest of the layers above it.

In OSI stack, above the physical layer is the DATALINK. This is the medium where hardware becomes "firmware" and software that define the

electrical specifications, timing rules, and electron-photon conversions that

enable the transmission of information across a link from one node or computational address to the next. SWITCHES operate at level two, passing packets only to the next node. Local area networks such as ETHERNET or WiFi function at this level. The third layer is the NETWORK layer, the domain of routers, which combines with the transport layer [layer four] to establish the end-to-end links that constitute the TPC/IP INTERNET PROTOCOLS. This is the entire system of IP addresses and TRANSPORT CONTROL PROTOCOL traffic shuffles that comprises the connections from end to end across the NET.

Layer three does the headers on the packets, the identities and addresses. Layer four does the actual transmission and reception of data packets and traffic management, load balancing and ACKS [I got it!] and NACKS [I'm still waiting] that assure connections. Layers three and four tend to be the bastion of central powers, where governments and their intelligence arms chase down domain names and addresses. Layer five governs a particular two-way communication from beginning to end, whether a video stream, a SKYPE call, a SESSION INITIATION PROTOCOL conference, a messaging exchange, an email post, or a transaction. Layers six and seven are the schemes for presentations and applications – user interfaces, windows, formats, operating systems. These are summed up in schemes of hyperlinks. The 70% of all links came to be handled through GOOGLE and FACEBOOK.

The INTERNET needs a new payment method that conforms to the shape and reach of global networking and commerce. It is to obviate the constant exchange of floating currencies, more volatile than the global economy that they supposedly measure. The new system should be distributed as far as INTERNET devices are distributed: a dispersed heterarchy based on peer-to-peer links between users rather than a centralized hierarchy based on national financial institutions. It is invented and called BITCOIN BLOCKCHAIN.

On top of the existing seven layers of INTERNET infrastructure, the BITCOIN ledger builds a new layer of functionality – layer 8 – just as hypertext transfer protocol [http] builds network layer on the TRANSMISSION CONTROL PROTOCOL /INTERNET PROTOCOL [TCP/IP] network layer. This new transactions layer allows for the separation of the security and identification functions from the network. Based on new breakthroughs in information theory, security can be heterarchical rather than hierarchical – distributed on millions of provably safe devices beyond the network and unreachable from it. It is a security paradigm diametrically opposed to existing morass of passwords, usernames, PINS, personal tokens, and post-hack fixes on the network. In a BITCOIN transaction, there is no more need for the disclosure of personal information than in cash transactions.

With the ascendancy of AMAZON, APPLE and other on line emporia early in the 21st century, much of the INTERNET was occupied with transactions, and the industry retreated to the CLOUD. Abandoning the distributed INTERNET architecture, the leading Silicon Valley entrepreneurs replaced it with centralized and segmented subscription systems, such as PAYPAL, AMAZON, APPLE's iTUNES, FACEBOOK, and GOOGLE's CLOUD. UBER, Airbnb, and other UNICORNS followed. These centralized fortresses violate the COASE THEOREM OF CORPORATE REACH. "Business should internalize transactions only to the point that the costs of finding and contracting with outside parties exceed the inefficiencies incurred by the absence of real prices, internal markets, and economies of scale.", states the theorem. The industry sought safety in centralization, but centralization is not safe. It turned out to be.

Google developed the integrated model of reality combining a theory of knowledge, named BIG DATA, a technological vision, CENTRALIZED CLOUD COMPUTING, a cult of commons rooted in OPEN SOURCE software. The GOOGLE theory of knowledge, BIG DATA, is as radical as Newton's as intimidating as Newton's was liberating. Newton proposed a few relatively simple laws by which any new datum could be interpreted and the store of knowledge augmented and adjusted. Hundreds of thousands of engineers have added and are adding to the store of human knowledge by interpreting one datum at a time. John Gribbin, in DEEP SIMPLICITY: BRINGING ORDER TO CHAOS AND COMPLEXITY (Gribbin, 2004), shows how chaos and complexity permeate the universe on every scale, governing the evolution of life and galaxies alike. Far from overturning all that has gone before, chaos and complexity are triumphant extensions of simple scientific laws.

BIG DATA's approach is different. The idea of BIG DATA is that the previous slow, clumsy, step-by-step search for knowledge by human brains can be replaced if two conditions are met. All the data in the world can be compiled in a single "place", and algorithms sufficiently comprehensive to analyze them can be written. Upholding this theory of knowledge is a theory of mind derived from the pursuit of artificial intelligence. In this view, the brain is also fundamentally algorithmic, iteratively processing data to reach conclusions. Belying this notion of the brain are the studies of actual brains which show human brains to be much more like sensory processors than

logic machines.

Iain McGilchrist argues in THE MASTER AND HIS EMISSARY: THE DIVIDED BRAIN AND THE MAKING OF THE WESTERN WORLD (McGilchrist, 2010) that one's feelings are not reaction to, or a superposition on, one's cognitive assessment, but the reverse: the affect comes first, the thinking later. We make an intuitive assessment of the whole before any cognitive process come into play, though they will, no doubt, later be used to 'explain' and justify, our choice. We make an assessment of the whole at once, and pieces of information about specific aspects are judged in the light of the whole, rather than the other way around. The implication is that our affective judgement and our sense of the whole, depend on the right hemisphere, occur before cognitive assessment of the parts, the contribution of the left hemisphere of the brain. Marvin Minsky in THE EMOTION MACHINE: COMMONSENSE THINKING, ARTIFICIAL INTELLIGENCE, THE FUTURE OF THE HUMAN MIND (Minsky, 2006) offers a nuanced version.

The CLOUD is the great new heavy industry of gargantuan data centers composed of immense systems of data storage and processors, linked together by millions of miles of fiber optic lines and consuming electric power and radiating heat to an extent that exceeds most industrial enterprises in history. In 2006, GOOGLE purchased ANDROID, an open source operating system that is endowing companies around the world with ability to compete with iPHONE. As ANDROID thrives, two things become apparent. The INTERNET may have ushered in a new age of sustainable open systems, but as APPLE have shown an integrated closed system monopoly remains as irresistible as ever.

The next layer up has become more concentrated, including many consumer services, from on line search to social networking. Centralization is rampant in what could be called the "third layer" of the INTERNET. All of its the extensions has spawned. APPLE's iOS or GOOGLE's ANDROID are what most people use as their smartphones' operating system. AMAZON, GOOGLE and MICROSOFT are the major competitors in cloud services outside of China. ALIBABA has a strong global lead in cloud services. In 2017 ALIBABA captured 45% of China's fledging cloud services market worth 69billion yuan [$10billion] compared to 10% for TENCENT according to BLOOMBERG. TENCET's WeChat, however, is on 4 in every 5 Chinese smartphones, and thus offers multiple products and a massive market for firms.

FACEBOOK may be the world's largest social network, but TENCENT's broad product based business model and technology is, by many measures, far superior. Less than 20% of TENCENT's revenue comes from online advertising, 98% of FACEBOOK's revenue, the other hand, is from online advertising. TENCENT has a digital assistant, XIAOWEI, a mobile payment system, TENPAY, and a cloud service, WEIYUN and also launched a movie studio, TENCENT PICTURES. In 2007, it introduced a cloud-based platform that allows companies to ssoffer services to users in WeChat via 'mini programs' [i.e. tiny apps.]. More than 1million such 'mini programs' are used by over 200million people every day, and most of them are WeChat users. TENCENT's revenue from such mini programs, for now, is marginal, and furthermore, competitors like BYTEDANCE, are crowding what is on the offer with their 'mini programs'.

Quick success develops its own downside is a folk-wisdom. In February 2019 in America, BYTEDANCE, the parent of TikTok paid $5.7million fine for illegally collecting data on users under the age of 13, and in April an Indian court banned the app on the grounds that it abets sexual predators. BYTEDANCE's largest market outside China is in India where 2 of 5 TikTok users live. According to SOUTH CHINA MORNING POST's ABACUS, BAIDU, ALIBABA, TENCENT [BAT] hold stakes in 150 companies abroad. ALIBABA has 56 data centers overseas, according to ABACUS, and TENCENT's equity in SNAP is 17.5% and 7.5% in SPOTIFY. But in 2018, THE COMMITTEE ON FOREIGN INVESTMENT IN THE UNITED STATES, [CFIUS], blocked several Chinese firms' investments, largest being $1.2billion purchase of MoneyGram by ALIBABA's ANT FINANCIAL. In 2019, Chinese firms' investments in America fell below $5billion. It was $46billion in 2016. So far, President Trump's "MAG" policies seem to be set to defer global spaghetti-like financial entanglements, not untangle them.

The data giants, AMAZON, FACEBOOK and GOOGLE, as they dominate their respective core markets, they also have accumulated more digital information than any other Western company. They use the information they store to sell targeted advertising and to fuel the development of their artificial intelligence [AI] services. At its core, GOOGLE is a list of websites and a database of people's search histories. FACEBOOK keeps track of their users' identity and interactions among them. AMAZON collects credit-card numbers and purchasing behavior.

So far, the American data giants seem to have adopted the business model of ATTENTION MERCHANTS. They capture out attention by providing us with free information, services, and entertainment, and they then sell our attention to advertisers. The data giants seem to have far higher goals than

any previous ATTENTION MERCHANTS. In 1920s, SIGMUND FREUD's nephew EDWARD BERNAYS, realized that his uncle's psychotherapy opened up a new lucrative world of retail therapy by inventing the public relations industry. Despite being far richer than kings of old, we are too easily trapped on a treadmill of consumerism, continually searching for identity, connection and self-transformation through the things we buy. EDWARD BERNAYS's method of persuasion – tastefully named 'public relations' – transformed marketing worldwide and, over the course of the 20th century embedded consumer culture as a way of life. Drawing on his uncle's insights into the workings of the human mind convinced some women on behalf of the AMERICAN TOBACCO CORP. that cigarettes were their TORCHES OF FREEDOM.

These data giants' strategic goal is not to sell adverting, their tactical goal for now is. By capturing our attention, they manage to accumulate immense amounts of data about us, [how, when, where, why we behave] which is worth more than any advertising revenue. It is not accurate to think of GOOGLE's users as its customers. There is no economic exchange, no price, and no profit. Nor do users function in the role of workers. Users are not paid for their labor, nor do they operate the means of production. The user is not the product, but rather they are the sources of raw-material supply. GOOGLE's products are derived from data about users' behavior. Its products are about predicting users without caring what the users do or what is done to the users.

In the medium term, this data hoard opens path to a radically different business model whose victim will be the advertising industry itself. The strategic business model is based on transferring decision making from humans to algorithms, including the authority to choose and buy things. Once algorithms choose and buy things for us, the traditional advertising industry will be redundant. GOOGLE is aiming to reach a point where we can ask GOOGLE anything and get the "best answer" in the world. Shoshana Zuboff in THE AGE OF SURVEILLANCE CAPITALISM: THE FIGHT FOR A HUMAN FUTURE AT THE NEW FRONTIER OF POWER (Zuboff, 2019) explains the new order in the making as an economic order that expropriates human experience as free raw material for hidden commercial practices of extraction, prediction, and sales that subordinate production of goods and services to a new architecture of behavioral modification.

In the longer term, by bringing together enough data and enough computing power, the data giants could hack the deepest secrets of life, and then use this knowledge not just to make choices for us or manipulate us but also to reengineer organic life and create inorganic life forms. Selling advertisements may be necessary to sustain the giants in the short term, but tech companies often evaluate apps, products, and other companies according to the data they harvest rather than according to the money they generate. The business model of a popular app may be a money loser, but as long as it sucks data, it could be worth billions. The rate of return analysis of corporate finance does not help much.

Tim Wu in THE MASTER SWITCH: THE RISE AND FALL OF INFORMATION EMPIRES (Wu, 20119) suggest that to understand the forces threatening the INTERNET as we know it, we must understand how information technologies give rise to industries and industries to monolithic structures. As with any economic theory, there are no laboratories but past experience. Illuminating the past to anticipate the future is the raison d'etre of economic history, which is conspicuously absent in MBA programs mass-marketed by American universities. Understandably so, because history, many times, negates their neoclassical mantra.

SCHUMPETER had no patience for what he deemed ADAM SMITH's fantasy of price warfare, growth through undercutting your competitor and improving the market's overall efficiency thereby. "In capitalist reality as distinguished from its textbook picture, it is not that kind of competition which counts," argued SCHUMPETER, but rather "the competition from the new commodity, the new technology, the new source of supply; the new type of organization." SCHUMPETER's THEORY did not account for the power of law to stave off industrial death and arrest the CREATIVE DISTRUCTION or help to speed up the destructive process by not regulating mergers and acquisitions.

ALPHABET, GOOGLE's holding company, in 2018 was the second largest company in the world. Measured by market capitalization, APPLE was first. Joined by AMAZON, MICROSOFT and FACEBOOK, the five form an increasingly feared global oligopoly.

In the 1970s, the microprocessor radically reduced the cost of computers. In the 1990s, OPEN SOURCE software started to dethrone

WINDOWS, MICROSOFT's then dominant operating system. MICROSOFT might never have come to rule PC software if IBM, accused of monopolizing mainframes, had not decided in 1969 to market computers and their programs separately, a move that created the software industry. GOOGLE might not have taken off in the way it did had MICROSOFT not agreed, at the end of its antitrust trials in America and Europe in the 2000s, not to discriminate against rival browsers and to license technical information which allows other operating systems to work easily with WINDOWS.

MICROSOFT's first operating system [MS-DOS] that MICROSOFT acquired MICROSOFT's copy of NAVIGATOR, and soon NAVIGATOR was nowhere EXPLORER was everywhere. In few short years NETSCAPE was bankrupt. With minimal antitrust enforcement, MICROSOFT would have been in a perfect position to control the future of internet, had Department of from another firm, SEATTLE COMPUTER PRODUCTS, was actually a clone of CP/M, another operating system. MCROSOFT WINDOWS was a rip-off of the APPLE MACINTOSH operating system; MICROSOFT WORD and EXCEL were copies of WORDPERFECT and LOTUS 1-2-3 respectively. By late 1990s, MICROSOFT unleashed its predatory strategy against NETSCAPE. EXPLORER was Justice not decided to prosecute the last big antitrust case of the 20th century.

FIREFOX, a web browser made by the non-profit MOZILLA FOUNDATION, was born as 'phoenix'. It rose from the ashes of NETSCAPE NAVIGATOR, slain by MICROSOFT's INTERNET EXPLORER. In 2012, MOZILLA created FIREFOX OS, to rival APPLE's IOS and GOOGLE's ANDROID mobile operating systems. Unable to compete with the duopoly, MOZILLA killed the project. Another 'phoenix' has arisen from it. KAIOS, an operating system conjured from the defunct software, powered 30million devices in 2017 and another 50millioin in 2018. Most were simple flip-phones sold in the West for about $80 a piece, or even simpler ones which Indians and Indonesians can have for as little as $20 or $7, respectively. KAIOS, based in Hong Kong, designed the software for smart-ish phones with old-fashioned number pad and long battery life, plus 4G connectivity, popular apps like FACEBOOK and features like contactless payments without snazzy touchscreens. GOOGLE invested $22million in KAIOS in 2018. Even if KAIOS powers another 70million devices in 2019, as the company expects in 2019, that would barely be one tenth of the 1.5billion APPLE and ANDROID phones sold annually.

A decade ago American firms took an early lead in 4G setting standards for new handsets and applications that spread word-wide. That dominance helped APPLE, GOOGLE, and other American businesses generating billions of dollars in revenues. China learned its lessons, investing $180billion to deploy 5G networks over the next 5 years and assigning swathes of wireless spectrum to three state providers. In America the same part of the spectrum is largely off-limits commercially because it is used by the federal government. American firms are experimenting with different parts of the spectrum that has some advantages under laboratory conditions but easily blocked by buildings and trees.

The potential consequences of the market power held by the new technology giants are greater and more pernicious than anything seen at the turn of the 20th century. Then the market power of companies like SWIFT, STANDARD OIL, AMERICAN TOBACCO, The AMERICAN SUGAR REFINING COMPNAY, or US STEEL allowed them to raise the price they charged for food, steel, tobacco, sugar and oil. Now, it is about more than just the price.

The equivalent course of action now is to force today's giants to open up their data vaults, thus lowering the barriers to entry and giving newcomers a better chance to compete. Now it is the turn of data. Today online applications bundle user interface, code and data. FACEBOOK, for example, is known for its website and app, but both are just the tip of a virtual iceberg. Most of the software and all the information that keep social network going live in the firm's CLOUD. Controlling those data gives these companies power. Users are free to move to another service, but they would lose all that information, including the links to their friends.

EUROPEAN COMMISSION fined GOOGLE 4.3billion Euros on 7/18/2018 and ordered to GOOGLE to stop emulating the 1990s MICROSOFT's product strategy. To assure its market lead, instead of giving the buyers the option to choose, MICROSOFT bundled several software in tie-in contracts and offered the bundle to the buyers. GOOGLE's case involved its mobile operating system, ANDROID, and bundled related software and services, such as GOOGLE PLAY, its app store, INTERNET search and several other apps. GOOGLE, in practice, gives smart phone makers and telecoms operators an all or, nothing choice as MIROSOFT did in the 1990s. If, the makers want to install any of these programs on their devices, they have to install them all and show their icons in prominent positions. Since firms need at least the app store to make their products commercially viable, they have no choice but to comply. Furthermore, GOOGLE does not allow the phone manufacturers to install competing versions of ANDROID on any of their models.

By contrast, in WEB 3.0 interface, code and data are meant to be kept separate. This would allow power to flow back to users, who would decide which application can access their information. If they were not happy with one social network, they could easily switch to another. With such decentralized applications, [DAPPs], users could also interact directly with other users without an information-hoarding intermediary in the middle. Similar ideas have been tossed around. Decentralized services, then called "peer-to-peer" briefly flourished in the late 1990s and 2000s. They fizzed out mainly because a robust decentralized database did not exist.

Combining database and network technologies, BLOCKCHAIN is a digital peer-to-peer decentralized platform for tracking all kinds of value exchanged between people. Its name derives from the blocks of data, each one a snapshot of all transactions that have just been made in the network, which are linked together to create a chain of data blocks, adding up to a minute-by-minute record of the network's activity. Since, that record is stored on every computer in the network, it acts as a public ledger that cannot be altered, corrupted or deleted, making it a highly secure digital backbone for the future of e-commerce and transparent governance.

With the invention of BLOCKCHAIN, a ledger without a centralized administrator maintained collectively by some of its users, called "miners", who also protect the BLOCKCHAIN and keep others in check a robust decentralized system is feasible. The BLOCKCHAIN is a specialized database in the form of an immutable record of the transaction history, a digital BABYLONIAN TABLETS. Most WEB 3.0 projects comes with SMART CONTRACTS, snippets of code that encapsulate business rules which are automatically executed if certain events occur. The advanced projects focus on building the software infrastructure needed for DAPPs. BLOCKSTACK, arguably very ambitious, is seen as an operating system for such applications. One digital currency that uses BLOCKCHAIN technology is ETHEREUM, which among its possible applications, is enabling electricity micro-grids to set up peer-to-peer trading in renewable energy. These micro-grids allow every nearby home, office or institution with a smart meter, INTERNET CONNECTION, and solar panel on its roof to hook in and sell or buy surplus electrons as they are generated, all automatically recorded in units of the digital currency. Such decentralized networks, ranging from a neighborhood block to a whole city, build community resilience against blackouts and cut long-distance energy transmission losses at the same time.

The landscape of Chinese FINTECH is dominated by two players: ANT FIANCIAL of ALIBABA, and TENCENT, best known for WeChat, its social media network. ANT was estimated to be worth $150billion in 2017, a little less than HSBS. Both firms got their start in payments. ANT FINANCIAL stems from ALIPAY created in 2004, TENPAY was launched in 2005 for QQ, TENCENT's online-messaging platform, and was later grafted into WeChat. Both have boomed by linking mobile apps with offline payments. Almost all merchants in China provide QR codes to be scanned by phone in order to pay. In 2017, ALIPAY had 54% of the mobile-payment market. It worked with more than 250 financial firms outside of China so that Chinese tourists can use it.

ANT and TENCENT are more interested in hooking users on other financial services than in payments alone. Once a user is on their platforms, mutual funds, insurance products, and virtual credit cards are accessible with a tap of a finger on smart phone. The duo's move into retail banking with TENCENT's WeBank and ANT's MyBank increased regulator's concerns for money-laundering, but also protecting the banks from FINTECH's competition.

The control structures built to ensure the ironclad hold of the founders of corporations are referred as "Key man risk", and is a big point of contention in China and abroad. China does not allow foreign entities to own sensitive assets, such as government licenses needed. These licenses are owned by Chinese individuals, often including the founders, are bundled into VARIABLE INTEREST ENTITIES. In addition, the Chinese companies listed in America have "dual class" stock structure which allows founders to own a special class of stocks with superior voting rights. JD.com, for example, ALIBABA's rival in e-commerce, has the ratio set at one share to 20 votes, enabling Richard Liu, the founder of JD.com, to control 80% of JD.com voting rights by owning less than 20% of the stock. JD.com has not convened an annual stockholders' meeting since its floatation in 2014 which is allowed under corporate governance laws of Cayman Islands where it is incorporated as most global Chinese tech champions are. Cayman Islands, one of Britain's Caribbean territories, seem to be the most favored location to incorporate for Chinese companies set to list in New York. BAIDU, for example, listed in America in 2005, and to list it incorporated in Cayman Islands, but has not held a stockholder's meeting since 2008. TENCENT of BAT is different. It has VARIABLE INTEREST ENTITIES, but one-stock-one-vote, and listed in Hong Kong in 2004.

Another first of GOOGLE in Silicon Valley was to introduce a dual-class share structure with its 2004 public offering. The two founders, PAGE and BRIN, would control the super-class B voting stock, shares that each carried 10 votes, as compared to the A class of shares, which each carried only 1 vote. The arrangement inoculated PAGE and BRIN from market and investor pressures. Subsequently, the founders imposed a tri-share structure adding a C class of zero voting rights stock. By 2017, BRIN and PAGE controlled 83% of the super-voting-class of B shares, which translated into 51% of the voting power.

When GOOGLE's leads, many Silicon Valley founders follow. By 2015, 15% of IPOs were introduced with dual-class structure, compared to 1% in 2005. In 2012 FACEBOOK's IPO with a two-tiered stock structure left MARK ZUCKERBERG in control of voting rights. The company then issued nonvoting class C shares in 2016, solidifying ZUCKERBERG's personal control over decisions. While the consequences of these share structures are being debated, absolute corporate control enabled the founders of GOOGLE and FACEBOOK to aggressively pursue acquisitions of start-ups in facial recognition, deep learning, augmented reality and more.

BRIN and PAGE at GOOGLE who do not enjoy the legitimacy of the vote, democratic oversight, or the demands of shareholder governance exercise control over their organization and presentation of the world's information, but neither do BAIDU's and ALIBABA's CEOs. ZUCKERBERG at FACEBOOK who does not enjoy the legitimacy of the vote, democratic oversight, or the demands of shareholder governance exercise control over an increasingly universal means of social connection along with the information concealed in its networks. So does JACK MA.

JACK MA, a founder of ALIBABA is a member of the Chinese Communist Party, and indirectly owns four of its five VARIABLE INTEREST ENTITIES with one of his co-founders. In 2019, when JACK MA steps down as chairman, as he said he would, all VARIABLE INTEREST ENTITIES will be transferred to two layers of holding companies, in turn owned by a broad set of ALIBABA's senior Chinese staff. JACK MA will remain a lifetime member of the ALIBABA Partnership, which concentrates control of the company in a club of 36 senior staff. ALIBABA Partnership is empowered to appoint majority of board seats. Thus, Jack Ma will keep to have an influential role in the company's culture and ecosystem. This succession plan will unite ALIBABA's, CHAIRMAN and CEO, under DANIEL ZHANG. He has been an adroit CEO for ALIBABA since 2015. The succession plans of the founders of the Chinese tech firms who are now in their 40s and 50s, is expected to develop new challenges for global corporate governance in the next decade.

4.How to fit a fast changing world into a static theory

In 2017 the UK's ECONOMIC AND SOCIAL RESEARCH COUNCIL have let it be known that it was setting up a network of experts from different disciplines including psychology, anthropology, sociology, neuro-science, economic history, political science, biology and physics whose task it would be to revolutionize the field of economics. Eric D. Beinhocker in THE ORIGIN OF WEALTH: EVOLUTION, COMPLEXITY AND THE RADICAL REMAKING OF ECONOMICS (Beinhocker, 2007) makes the reasons for this spirit of revolutionary zeal apparent enough. While both biological and economic systems share the core algorithm of evolution – differentiate, select, and amplify – and thus have similarities. Their realizations of evolution are in fact different and must be understood in their individual contexts. Director of the CENTER FOR COGNITIVE STUDIES, Daniel Dennett in DARWIN'S DANGEROUS IDEA: EVOLUTION AND THE MEANING OF LIFE (Dennett, 1995) presents evolution as a general purpose algorithm for creating 'designs without a designer'.

The notion that the economy is an evolutionary system is a radical idea because it directly contradicts the mainstream paradigm of economics that portrayed the economy as a system that moves from equilibrium point to equilibrium point over time, propelled along by external shocks from technology, politics, changes in consumer tastes, and other external factors. But it is far from a new idea. Richard Nelson's and Sidney Winter's AN EVOLUTIONARY THEORY OF ECONOMIC CHANGE (Nelson and Winter, 1982) was an early attempt to marry evolutionary theory to economics, and the recently developed tool of computer simulation. J. Stanley Metcalfe in EVOLUTIONARY ECONOMICS AND CREATIVE DESTRUCTION (Metcalfe, 1998) integrates many of the relevant themes into a formal analytical treatment based around Fisher's Principle, a central theme in his evolutionary theory; namely that variety drives change.

Substrate-neutral algorithmic theory, with John H. Holland's landmarks ADAPTATION IN NATURAL AND ARTIFICAL SYSTEMS: AN INTRODUCTORY ANALYSIS WITH APPLICATIONS TO BIOLOGY, CONTROL AND ARTIFICIAL INTELLIGENCE (Holland, 1992), and HIDDEN ORDER: HOW ADAPTATION BUILDS COMPLEXITY (Smith, 1982); John Maynard Smith's EVOLUTION AND THE THEORY OF GAMES[1], and Stuart Kauffman's ORIGINS OF ORDER: SELF ORGANIZATION AND SELECTION IN EVOLUTION Kauffman, 1993) provided germ seeds that have flourished COMPLEXITY ECONOMICS that views the economic system as a complex adaptive system as W. Brian Arthur of SANTA FE INSTITUTE summarizes in COMPLEXITY AND THE ECONOMY (Arthur, 2015).

Theoretical physicist Geoffrey West of SANTA FE INSTITUTE, a pioneer in the fields of complexity science, in SCALE: THE UNIVERSAL LAWS OF GROWTH, INNOVATION, SUSTAINABILITY, AND THE PACE OF LIFE IN ORGANISMS, CITIES, ECONOMIES, AND COMPANIES (West, 2017) explains why some companies thrive while others fail, why the rate of innovation continues and why this dynamic threatens global sustainability.

Almost half a century ago, in THE ENTROPHY AND THE ECONOMIC PROCESS (Georgescu-Roege, 1971) Nicholas Georgescu-Roegen's basic insight was that economic activity is fundamentally about order creation, and that evolution is the mechanism by which that order is created. He argued that while the biological form of the human species continues to evolve slowly, or 'endosomatically', through our genes, we are at the same time rapidly evolving 'exosomatically' through our culture. Georgescu-Roegen was not the first to make this observation. Darwin saw this as an implication of his theory, and 1960s Pierre Teilhard de Chardin in THE FUTURE OF MAN (Teilhard de Chardin, 2004) developed a philosophy based on the idea of endosomatic and exosomatic evolution. Nor was Georgescu-Roegen was the only economist looking to cultural evolution for answers.

Friedrich Hayek wrote about cultural evolution in THE CONSTITUTION OF LIBERTY (Hayek, 1978) and Kenneth E. Boulding presented his theory in ECODYNAMICS: A NEW THEORY OF SOCIETAL EVOLUTION (Boulding, 1979). It was Georgescu-Roegen, though who grounded his theory in science, in particular the connection between evolution and the SECOND LAW OF THERMODYNAMICS, the principle that the universe is inevitably moving from a state of low entropy to a state of high entropy. Economic systems exist in the real physical world, therefore, they must obey the same law of entropy as everything else in the universe does, was his argument.

David Orrell in QUANTUM ECONOMICS: THE NEW SCIENCE OF MONEY (Orrell, 2018) offers another out from the orthodoxy as do Alexander Wendt in QUANTUM MIND AND SOCIAL SCIENCE: UNIFYING PHYSICAL AND SOCIAL ONTOLOGY (Busumeyer and Bruza, 2012), as do Jerome R. Busemeyer and Peter D. Bruza in QUANTUM MODELS OF COGNITION AND DECISION[1]. In mathematical finance quantum physics-inspired methodology offers some computational advantages over usual statistical approach, but also changes the way one thinks about financial system, from being a mechanistic system with additional randomness, to a world of overlapping alternative possibilities, in which uncertainty is intrinsic to the system rather than an extra added feature. The emerging fields of quantum cognition and quantum social science, meanwhile, take a broader inspiration from quantum mechanics to think about how human beings make decisions and interact with one another.

Mainstream neoclassical economics is based on a NEWTONIAN picture of the economy as a mechanistic system, made up of self-interested atomistic individuals who interact only by exchanging goods and services and move the markets to a stable equilibrium thus viewing price changes as random perturbations. Money has no important role and acts primarily as an inert medium of exchange. For the past 150 years, neoclassical economics has clung to a number of assumptions that were mostly at odds with reality. Such as the idea that the economy is a self-stabilizing machine that maximizes utility composed of atomistic units like independent NEWTONIAN particles that can be understood and predicted using deterministic laws, and the idea of rational economic man, HOMO ECONOMICUS, the atomistic unit which forms the core of neoclassical models. Economic agents were viewed as particles, while marginal utility or disutility for a particular commodity defined as satisfaction gained from consuming one more unit or more unit of it was viewed as a force acting in a kind of commodity space.

A property of NEWTONIAN dynamics is that it can be expressed mathematically as a kind of optimization problem. Objects moving in a field take the path of least action, where 'action' represents a form of energy expenditure. Following the same script, neoclassical economists assumed that in the economy, individuals act to optimize their own utility by spending their limited resources. Economists could then make NEWTONIAN calculations about how prices would be set in a market economy, to arrive at what WILLIAM STANLEY JEVONS called a "mechanics of self-interest and utility".

One area where HOMO ECONOMICUS played a conspicuous role was the field of JOHN VON NEUMANN's game theory. A key technique in game theory was BROUWER's FIXED-POINT THEOREM, which is a method for demonstrating that a system of equations, in this case representing the possible outcomes of a game, has a stable and optimal solution. GAME THEORY was initially developed for economics, but came into its own in developing the doctrine of MUTUALLY ASSURED DESTRUCTION [MAD] during COLD WAR. According ssto MAD, rational actors can achieve a stable equilibrium if both know that starting a war will lead to instant annihilation of both sides. It is also used as an explanation of PEOPLE'S BANK OF CHINA's accumulation of high dollar reserves in 21st century. Though, the doctrine of MAD did not prevent President Trump from declaring trade wars to implement his selective protectionism.

HOMO ECONOMICUS also played a role in KENNETH ARROW and GERARD DEBREU's proof that, again involved BROUWER's FIXED-POINT THEOREM, showed based on a highly idealized version of market economy, that free markets lead to an optimal 'fixed point', in which prices are set at their correct levels, and nothing can be changed without making at least one person worse off, a condition known as PARETO OPTIMALITY. But to accomplish this feat, the powers of HOMO ECONOMICUS had to be extended to include infinite computational power and the ability to devise plans for every future eventuality. The ARROW-DEBREU model seemed to provide mathematical proof of ADAM SMITH's invisible hand, SMITH's theory that free markets are inherently self-stabilizing and set prices to their optimal levels.

The ARROW-DEBREU proof inspired the development of GENERAL EQUILIBRIUM MODELs and later DYNAMIC STOCHASTIC GENERAL EQUILIBRIUM MODELs [DSGE] which are still relied on by policy makers today in spite of their failure in 2008 FINANCIAL CRISIS. DSGE models deal in aggregates, ignore complexity, see the economy as an equilibrium system, and flatten the intricate structure of an economy down to a single uniform dimension. The name is misleading. 'Dynamic' refers only to changes to a model equilibrium over time as it adjusts to external shocks, not to any internal dynamism. 'Stochastic', meaning randomly determined, refers to random perturbations such as oil price shocks or technological developments which are treated as external effects. But these external effects come from a stable distribution and so can be estimated from past experience, and linear in the sense that small shocks have small effects and a shock twice as big as another has double the effect. "General" means that the model is supposed to include all markets, but omits derivatives and other forms of financial entanglements. The models assume that supply and demand drive prices to an equilibrium point where consumers are maximizing their utility, firms are maximizing their profits, and all markets clear.

DSGE models embedded into the RATIONAL EXPECTATIONS HYPOTHESIS, [REH], and REAL BUSINESS CYCLE, [RBC], structure a number of nominal rigidities and market imperfections. Most common were price and wage rigidities and various forms of consumer myopia. These allowed for temporary demand shortages, on which central bank policy could have a significant short-run impact. In accepting the REH and RBC theory as the framework for macroeconomic analysis, DSGE modelers surrendered Keynes's emphasis on uncertainty. In DSGE models, there was no uncertainty, only contingently imperfect information within known probability distributions. DSCE models have a very limited role for the existence of money, medium of exchange, and thus provides an ideal diversion from the important facts of reality.

Instead of behaving like independent NEWTONIAN particles, as assumed in mainstream neoclassical economics, participants of economic activities are actually closely entangled and engaged in a sort of collective quantum dance. As Karen Barad puts it, "Existence is not an individual affair. Individuals do not preexist their interactions; rather, individuals emerge through and as part of their entangled intra-relating."

We need to reorient our focus to understand human behaviors and preferences as they are, not as they find it easy to model. Most real world resource allocation decisions are made by humans whose brains include a prefrontal cortex capable of ratiocination and limbic system which is coded by evolution to act in deeply instinctive and emotional ways. Marvin Minsky, the co-founder of the ARTIFICIAL INTELLIGENCE LABORATORY of MIT, in THE EMOTION MACHINE: COMMONSENSE THINKING, ARTIFICIAL INTELLIGENCE, AND FUTURE OF THE HUMAN MIND (Minsky, 2006) shows the way how the human cognitive system can be studied to develop artificial intelligence to aid in improving resource allocation decisions as more and more such decisions are being assigned to be made by artificial intelligence [AI] enabled machines. And in THE SOCIETY OF MIND (Minsky, 1986), he claims that what we call 'intelligence' is not a singular thing; rather, it is an emergent phenomenon that arises from collective interactions of many individual parts. The magic of intelligence is that when those parts are organized in a particular way, they can do things that no individual part could do on its own. Minsky called this description of intelligence 'the society of mind'.

Iain McGilchrist in THE MASTER AND HIS EMISSARY: THE DIVIDED BRAIN AND THE MAKING OF THE WESTERN WORLD (McGilchrist, 2010) suggest that attention is not just another function alongside other cognitive functions. Rather, the kind of attention we bring to bear on the world actually alters the nature of the world we attend to. Attention changes what kind of a thing comes into being for us. In that way it changes the world. This transformative or world-changing aspect of attention can be seen in every form of relationship we encounter and experience. Adjusting our mode of attention can have far-reaching and profound effects, and one might call this striking ability 'the attention effect'. As a remarkable a phenomenon in its way as recognition in quantum mechanics of how the act of observation alters what is being observed. This is because, 'I am my attention, everything else is given, is not mine.'

This unique role of attention has also been recognized in the new digital technologies of the modern 'attention economy', in which the human gaze is increasingly being monetarized and mined as a resource, again pointing to its central position in the landscape of the 21st century. The free service producers of Silicon Valley compete to capture our attention and emotional engagement and monetarize them to generate the cash flow necessary for their survival. The internet scene in China is different. The major source of their cash flow is not from advertising.

The objective of science is said to be not to pander to human preconceptions but to reduce our ignorance and folly. Cognitive science, in Nick Bostrom's SUPERINTELLIGENCE: PATHS, DANGERS, STRATEGIES (Bostrom, 2016), and in Max Tegmark's LIFE 3.0: BEING HUMAN IN THE AGE OF ARTIFICIAL INTELLIGENCE (Tedmark, 2013) is at the threshold of a breakthrough in artificial intelligence that may change how allocative decisions are to be made. In THE DEEP LEARNING REVOLUTION (Terrence and Sejnowski, 2018), Terrence J. Sejnowski shows how learning algorithms extract information from raw data; how information can be used to create knowledge; how knowledge underlies understanding; and how understanding leads to wisdom. Ray Kurzweil in THE SINGULARITY IS NEAR: WHEN HUMANS TRANSCEND BIOLOGY (Kurzweil, 2005, 2013) and in HOW TO CREATE A MIND: THE SECRET OF HUMAN THOUGHT REVEALED (Kurzweil, 2005, 2013) explain why and how.

The singularity or artificial superintelligence involves computers whose ability to understand and manipulate the world dwarfs our own, comparable to the intelligence gap between human being and, say, earth worms; developing utopians and dystopians. The utopians, Ray Kurzweil, GOOGLE's guru in residence for example, envisions a radical future in which humans and machines fully merge to expand our consciousness and conquer mortality. Other utopians see ARTIFICIAL GENERAL INTELLIGENCE enabling us in decoding the mysteries of the physical universe, understanding the universe at levels that humans cannot conceive of, and solving intractable problems. Dystopians disagree.

Algorithms increasingly make choices for us. More and more, these algorithms work by learning from the trails of data we leave in our newly digital world. Machine learning is the automation of discovery. It enables intelligent robots and computes to program themselves. The scientific method on steroids. In THE MASTER ALGORITHM: HOW THE QUEST FOR THE ULTIMATE LEARNING MACHINE WILL REMAKE OUR WORD (Domingos, 2015), Pedro Domingos outlines each one of the machine learning' five major schools of thought -"symbolists", "connectionists", "evolutionists", Bayesians, and "analogizers"- has its own master algorithm, a general purpose learner that you can in principle use to discover knowledge from data in any domain. The symbolists' master algorithm is inverse deduction, the connectionists' is backpropagation, the evolutionists' is genetic programming, the Bayesians' is Bayesian inference, and the analogizers' is the support vector machine. At its core machine learning is about prediction. Predicting what we want, the result of our actions, and how we achieve our goals from digital metadata. Neoclassical economics belong to the symbolists' tribe.

It is time to explain the financial markets as they actually operate, not as neoclassical economists assume them to operate, observing the way in which information is processed, observing the serial correlations, bonanzas, and sudden stops, not assuming these away as noise around the edges of efficient and rational markets. We need to present the world as is, not the world as neoclassical economists have assumed to make their mathematics easy. Economic history matters. We need to study the history of financial crashes as well as the theories and mathematics that failed to forecast them, but were required to formalize them.

At various stages in history the lust for easy riches has spread out from the afflicted few to consume the whole classes of society. This happened in Amsterdam in the 17th century when the road to riches was apparently strewn with tulips. In London in the 18th century when it was not so much a road as a seaway to the South Seas. In London again in the 19th century when it was railroad. In New York in the early 20th century when it was indeed a road, a railroad, and an airway combined, and in the late 20th century when it was the information superhighway.

All of these were 'bubbles', a period of rapidly rising equity prices in a particular sector that were unfounded and thus liable to collapse equally rapidly. Carlota Perez's TECHNOLOGICAL REVOLUTIONS AND FINANCIAL CAPITAL: THE DYNAMICS OF BUBBLES AND GOLDEN AGES (Perez, 2002) demonstrates that big changes in technology entailed not just the extraordinarily rapid growth of few industries, but a 'techno-economic paradigm shift'. ALAN GREENSPAN in 1990s used the expression to sell his monetary policy that made the dot.com bubble possible to Congress.

There is an observable to pattern to economic booms and busts. They start with an anticipated exciting change in the economy. Managers and investors with the help of spin doctors collectively create a story about it, which initially begins as a plausible explanation, then morphs into an extrapolation, and then into an exaggeration. Eventually the data contradict the narrative, as optimism turn into pessimism boom turns into bust, and a bout of austerity follows. A rout in platform companies' stock prices since August 2018 has led many to ask if the tech industry is experiencing the classic sequence of Greek drama: HUBRIS, ATE and NEMESIS for the second time in two decades. First, in the second half of the 1990s ending in March 2000, and the second, since September 2018. De ja vu. The level of hype was particularly high, a consequence of ubiquity of data on the internet and some of the numbers were decidedly soft.

Rarely in stock market history have so many investors made so much money from so few stocks going up for so long. Some 37% of the rise in the value of all firms in the S&P500 index since 2013 is explained by 6 of its members: ALPHABET, AMAZON, APPLE, FACEBOOK, MICROSOFT and NETFLIX. About 28% of the rise in Chinese equities over the same period is owing to 2 firms: ALIBABA and TENCENT. The median drop in value of those eight firms has been 21% in September and October 2018, double the decline in global stock markets. Some $900billion has vaporized by the end of October 2018. WALMART paid $16billion to buy 77% of FLIPKART, an Indian e-commerce firm which in November 2018 is expected to lose $1billion in 2019 and more thereafter before the market rout which according to TV talk-heads are caused by a rise in global real interest rates, but also by decelerating growth, falling profit forecasts as a result, and rising capital intensity. Total investment for the 8 firms was $180billion a year between 2013 and 2018. Only one of the 8 firms needed capital markets to finance itself, NETFLIX.

We need to ask questions about objectives of economic activity. In defining the objectives of economic activity, the instrumental conventional wisdom, which have dominated the policy implementations of neoclassical economists for several decades, has simply assumed that maximizing growth in per capita GDP is an axiomatically desirable objective, and that inequality is justified because it helps maximize growth. Many circumstances conspire to extinguish scientific discoveries, especially those that cause discomfort about culture's sacred norms. As species, we cling to the familiar, comforting conformities of the mainstream. Deep inquiry into the objectives of economic activity and into the links between economic variables, such as income, and fundamental objectives, such as sustainability of human well-being in its universe, GAIA, the living Earth, is essential to good economics for our survival, no matter how difficult.

There is compelling evidence that the biological and physical components of our planet are part of a single network that operates in a self-regulating way to maintain conditions that are broadly suitable for the existence of life, but that undergoes fluctuations on all scales, including ice age-interglacial rhythms and mass extinctions, analogous to the fluctuations that occur in self-organizing systems on the edge of chaos. GAIA theory is a way of studying structuring matter at a molecular scale by slotting each atom into its needful place. It is a way of understanding flows of energy on every scale from that of the smallest living cell to that of the whole living planet. It an approach of understanding of growing order and surprise in a universe that its physical respects tend towards entropic stagnation. Life is Earth's entropy reduction process.

The concept GAIA postulates the idea that the Earth is alive. Aspects of the atmospheric gases and surface rocks and water are regulated by the growth, death, metabolism, and other activities of living organisms. The entire planetary air system is "metastable", stable in its reactive instability. The persistence of chemical reactivity arises from the combined actions of living beings. The entire planetary surface, not just the living bodies but the atmosphere that we think of as an inert background, is so far from chemical equilibrium that the entire planetary surface is best regarded as alive. The Earth is a single, mega-living system. Symbiosis is simply the living together in physical contact of organisms of different species. Partners in symbiosis, fellow symbionts abide in the same place at the same time, literally touching each other or even inside each other. A nuanced view of universe, not akin to neoclassical economists'.

Lynn Margulis explains that view in SYMBIOTIC PLANET: A NEW LOOK AT EVOLUTION (Margullis, 1998). She shows that symbiotic origins of novel life forms, symbio-genesis, has been far more common than ever dreamt by evolutionary biologists steeped in the DARWINIAN tradition. A tradition that emphasizes competition far more than cooperation in the evolutionary process. Orthodox economists' overemphasis of atomistic competition empowered by AI and algorithms of digital platforms can in fact lead to wasted efforts, missed opportunities, and above all an inability to break out of established patterns argues Edward Tenner in THE EFFICIENCY PARADOX: WHAT BIG DATA CAN'T DO (Tenner, 2018).

More and more of what we choose to spend our money on is itself some form of knowledge. More and more of things we wish to buy are not things, they are not "things" at all. They are intangible; that is to say, strictly speaking, they are neither a good nor a service. They are non-things, products of human mind, not manufactures but MENTEFACTURES. Examples include computer software, medical treatments, films, recorded music. We have reached a stage where knowledge produces knowledge. The knowledge components of consumption goods possess some striking characteristics. The same characteristics as knowledge applied to the production process. They occupy no physical space and have no weight. Consequently, they take up no real resources whatsoever. If I consume more I do not reduce the quantity available for you to consume. Infinite expansibility. Whether a film is seen by 200 or 2,000,000 or more people has no effect on its cost of production. Orthodox economists' quandary.

Jeremy Rivkin in THE ZERO MARGINAL COST SOCIETY: THE INTERNET OF THINGS, THE COLLABORATIVE COMMONS, AND THE ECLIPSE OF CAPITALISM (Riykin, 2015) heralds "zero marginal cost society" where the price of every incremental good and service, from search to software, from news to energy, will plunge towards "free" as every device and entity in the world is subsumed in an INTERNET OF THINGS where exponential network effects yield a new economy of leisure and abundance.

THE FINANCIAL CRASH OF 2008, in the long sweep of history, may prove as a radical turning point as the 1929 crisis of free market capitalism, FINANCIAL CAPITALISM, that in the 1930s gave birth to MANAGERIAL CAPITALISM, and the crisis of managerial capitalism in the 1960s and 1970s that evolved to ASSET MANAGER CAPITALISM from 1980s to 2008. The GREAT DEPRESSION of the 1930s led to a regime devoted to the maintenance of full employment. The GREAT INFLATION of the 1970s led to the maintenance of low inflation. The GREAT ILLUSION of the 1990s, some claim, will lead to a regime devoted to the maintenance of financial stability. So far in October 2018 according to elegant Christine Laggard of IMF, in President Trump's America evidence is supportive of increased risks of financial instability.

For more than 50 years, the dominant strain of academic economics has been concerned with exploring, through complex mathematics, how economically rational human beings interact in markets. The conclusions reached have appeared optimistic, indeed at times PANGLOSSIAN. KENNETH ARROW and GERARD DEBREU illustrated that a competitive market economy with a fully complete set of markets was Pareto-efficient. Neoclassical economist, ROBERT LUCAS, argued that if human beings are not only rational in their preferences and choices but also in their expectations, the macro economy will have a strong tendency toward equilibrium, with sustained involuntary unemployment, a non-problem. RATIONAL EXPECTATIONS THEORY.

Neoclassical economics have developed models of firms behaving as monopolies, duopolies, and perfect competitors, but in the realm of few firms their modeling and predictions run into difficulty. Mainly, because in modeling, they assume economic agents to be hyper-rational and well informed, time to be instantaneous, and place nonexistent, economic agents to be represented by a single prototype, and are left isolated seeking equilibrium in a system fraught with change. The message of neoclassical economics is that is humans can just behave rationally enough, and if we possess enough information, then the economy will be revealed as a universe of clockwork predictability. Even the uncertainty of neoclassical economics is of the well-behaved kind. The dream of clockwork universe ended for science in the 20th century, and is to end for economics in the 21st. The economy is too complex, too nonlinear, too dynamic, and too sensitive to the twists and turns of chance to be amenable to prediction over anything but very shortest of terms.

The EFFICIENT MARKET HYPOTHESIS appeared to illustrate that liquid financial markets are driven not by the patterns of chartist phantasy but by efficient processing of all available information, making the actual price of a security a good estimate of its intrinsic value. Economists therefore provided arguments for the proposition that totally free markets achieved the objective of allocative efficiency. And they also argued that allocative efficiency and income growth over time were desirable objectives, and that increased income delivered increased utility, which they equated with life satisfaction. This was in part because any deeper inquiry into the relationship between income and welfare or happiness would have interfered with mathematical precision, which required a precisely defined maximand. Regrettably, as a description of neoclassical academic economics, this may be construed as simplification.

Overhauling the way economics is taught is to produce students better equipped to understand the modern world if that is the goal. Even better, it should improve the discipline's ability to describe and predict the economic reality.

The economic crisis is also a crisis for economic theory. Most analyses of the evolution of the 2008 crisis invoke three themes – contagion, networks, and trust – yet none of these play a major role in orthodox economic theory, argues Alan Kirman in COMPLEX ECONOMICS: INDIVIDUAL AND COLLECTIVE RATIONALITY (Kirman, 2011). The economy and the financial sector had organized itself into a highly interdependent system. Paradoxically, the excessive interlocking of the components and the heavy trading of the derivatives actually concealed information rather than revealed it. Thus, the system organized its own self destruction, leading to a radical change in the aggregate situation. This is interaction and interdependence and breakdown of relations of trust which had emerged and not one of an external shock to a stable market. The direct interaction between individuals, firms, and banks does not simply produce imperfections in the functioning of the economy but is the very basis of the functioning of a modern economy.

The economy needs to be considered as a complex adaptive system in which the agents constantly react to each other. We are familiar from statistical physics and biology for example, the behavior of the aggregate cannot be deduced from the behavior of the average or "representative" agent. Just as the organized activity of an ants' nest cannot be understood from the behavior of a "representative ant". All ants are endowed with "competence without comprehension". The macroeconomic phenomena should not be deduced from the representative individual and the representative firm. Though, the representative firms are managed by people endowed with "comprehension".

The neoclassical economic theory considers each "representative agent" in isolation, but "representative agent's" fitness is a complex function of all "representative agents". If "representative agents" are independent, the relative frequencies of their variants rapidly converge to the maximum fitness point and remain in equilibrium thereafter. But if "representative agents" interact, evolution – the search for maximum fitness – is vastly more complex. Echoing Fred Hoyle's observations in THE INTELLIGENT UNIVERSE: A NEW VIEW OF CREATION AND EVOLUTION (Hoyle, 1988), the universe is "an inextricable loop where everything exists at the courtesy of everything else". For instance, if electrons were much lighter, there would be no stable stars, and if they were much heavier, there could be no ordered structures such as crystals and DNA molecules. If protons were 0.2% heavier, they would decay into neutrons unable to hold electrons, so there would be no atoms. If they were instead much lighter, then neutrons inside of atoms would decay into protons, so there would be no stable atoms except hydrogen.

JOSEPH SCHUMPETER believed that speculative manias often occur with the inception of a new industry or technology, when people overestimate the gains and underestimate the effects that the attraction of new capital will have in depressing returns. CHARLES KINDLEBERGER, in MANIAS, PANICS AND CRASHES: A HISTORY OF FINANCIAL CRISES (Kindleberger, 2005), suggested something similar. The first stage is displacement, which excites speculative interest. This is followed by positive feedback, as rising stock prices attract new investors who then drive prices up further. The final stage is euphoria, when investors take leave of their senses.

In JOSEPH SCHUMPETER's writings, the economy evolves by cracks and leaps. Booms and busts are endemic, and are to be welcome as the result of the economy's life force. Similarly, he excoriated the orthodox economist's emphasis on the benefits of perfect competition and even thought that monopoly could be beneficial as a spur to innovation. Physicists call a sudden change in the character of a system a phase transition. In random networks, the phase transition from small clusters to giant clusters happens at a specific point, when the ratio of segments of edges to nodes exceeds the value of 1. One can think of the ratio of one edge to one node as the 'tipping point' where a random network suddenly goes from being sparsely connected to densely connected. THE S CURVE is the shape of phase transitions of all kinds, the shape of creative destruction, ice melting, the spread of new technologies, paradigm shifts in science, the fall of empires. THE TIPPING POINT could well be entitled the S CURVE. Many phenomena we think of as linear are in fact S CURVES, because nothing can grow without limit. Because of relativity, and contra NEWTON, acceleration does not increase linearly with force, but follows an S CURVE centered at zero.

5. Not so representative agents in their ever changing diverse environments

The contemporary American business corporation, though legally a creature of the state from which it derives its charter, has a substantial but somewhat indefinite sphere of autonomy and privacy. In the United States it is known as "corporate personhood". The American legal system considers a corporation to be an individual in many ways, bizarrely one that is psychopathic in the sense of having no conscience and being solely interested in profits. Its defining features are limited liability and profit maximization. The corporation is therefore a tool for generating wealth while limiting responsibility.

In 1886 the MICHIGAN SUPREME COURT ruled that a corporation was entitled to the same legal status as a person, with rights including freedom of speech. In 1916, when HENRY FORD tried to prioritize business investments over dividends, his stockholders successfully sued. The court ruled the main purpose of a corporation is to maximize the shareholders' profits. As MILTON FRIEDMAN wrote in 1962, "Few trends could so thoroughly undermine the very foundations of our free society as acceptance by corporate officials of a social responsibility other than to make as much money for their stockholders as possible." Corporations are rational economic man, HOMO ECONOMICUS, writ large, according to orthodox neoclassical economic theory. Like the individual citizen, the corporation is taxed and regulated and may be rewarded with public employment, punished for mischief by judicial action, and possibly called on for sacrifice in the national interest, and once in a while, may be saved from bankruptcy with generous handouts, as the western banks' bailouts were in the GREAT FINANCIAL CRISIS. The people running a corporation are occasionally criminally responsible when the corporation has done something illegal. However, they are not when the corporation does something legal yet immoral.

There is much more to any system of managerial process than meets the eye by studying the charts of organizations which are intended to represent the structure of organizations. The impressive thing about the organizational environment of corporations, although not unique to them, is the extent to which rationality is expected, encouraged, and even enforced. Substantial resources are devoted to developing information and to the discussion of its implications for action. Where rationality becomes institutionalized, that is, becomes a socially sanctioned rule of conduct, the legally prescribed institutional structure and performance that specify how actions and interactions ought to be are important elements that cannot be overlooked. But actual alternatives of managerial styles are affected by all sorts of other factors. These are the necessities of economics with linkages to the political and social system.

The motivations and the habits of the decision makers of the corporations are also influenced by their personal, unique situations - the precise points in their bureaucracies at which they find themselves. Yet there have been demonstrable periodic regularities in the ways they were managed, as there have been differences in the ways they were run when their habitat changed from FINANCIAL CAPITALISM [- The Great Depression], to MANAGERIAL CAPITALISM, [New Deal – Thatcher-Reagan Liberalism], and then to ASSET MANAGER CAPITALISM I[1980s – 2008 The Great Financial Crisis]. ASSET MANAGER CAPITALISM II and/or STATE CAPITALISM [2008-].

6. Managerial dictatorship or market chaos

Paul Seabright in THE COMPANY OF STRANGERS: A NATURAL HISTORY OF ECONOMIC LIFE (Seabright, 2010) explains how the shirt he bought in New York had its cotton grown in India from seeds developed in the United State; the artificial fiber in the thread came from Portugal and the material in the dyes from at least 6 other countries; its collar linings came from Brazil and the machinery for weaving, cutting, and sewing from Germany; the shirt itself was made up in Malaysia. The project of making a shirt and delivering to Paul Seabright in New York has been a long time in planning, since well before two winters ago when an Indian farmer outside of Coimbatore planted the seeds he bought from the MONSANTO's distributor. Engineers in Cologne and chemists in Birmingham were involved in the preparation many years ago. A marvel of global production with no authority in charge. The firms that make up the many links in different countries with different legal infrastructures in the chain that supplied the shirt at point of purchase had merely obeyed market prices.

The metaphor of the pin made famous by ADAM SMITH does not have a single maker, but 25 persons involved, all collaborating without a central planner, a collaboration the mainstay of 18th and 19th century classical and classical economic theory. But, the economists of the day failed to shed light on the question of why some activities were directed by market forces and others by firms, and what the determinants of an economy's infrastructural organization were.

According to Ronald H. Coase, "Firms are a response to the high cost of using markets, transaction costs" (Coase, 10990). So he wrote in 1937. Instead of negotiating and enforcing separate contracts for every transaction, it, generally, costs less to manage tasks by fiat. In markets for standardized goods and services such "transaction costs" are low, argued RONALD COASE. A well-defined task can easily be put out to the market, out-sourced, where a contractor is contracted and paid an agreed sum for doing it. The firm comes into its own when simple contracts of this kind will not suffice. Alternatively, an employee is contracted to follow varied and changing instructions, up to agreed limits, for a contractually agreed salary. Thus, the hierarchical authority structure of the firm trumps the invisible hand of the market. With the advance of platform corporation, the boundary between the firm and the market might appear to be dissolving altogether. The share of self-employed contractors in the global labor force has risen. In the "gig economy" exemplified by UBER [DIDI in China] drivers are mushrooming.

Open APPLICATION PROGRAMING INTERFACES, API, enable organizations to offer access to their platforms without taking enormous risks or offering much in the way of support. Multiple players participate in a broadly open ecosystem of developing, using, and refining computer applications as well as data that flow between them. From the perspective of those who develop on these platforms, API can provide important shortcuts that can help to avoid reinventing the wheel on the way towards offering customers breakthrough product, but running the risk that the organization offering the platform service [FACEBOOK, APPLE, MIROSOFT, et.al] might unexpectedly pull the rug out from under them. The promises of this emerging ecosystem by AI empowered machines, platforms and crowds are tremendous, but the full implications of this inter-reliance remain to be seen. The global business systems turbo charged by CHIMERICA and lesser degree by the other members of BRICS [Brazil, Russia, India, South Africa] are changing the global ecosystem fast as the rich, the emerging and the poor societies move deeper into the information economy. But in this 21st century chaos lies opportunities that will shape how employees-employers, customers-suppliers are going to relate to each other, and the epistemology of neoclassical economics does not help.

The idea behind open innovation is as simple as powerful. The creators of new ideas do not have to be within your organization in order to be helpful. Recent advances in IT have made the frictionless sharing of experiences and lawyer-free integration of platforms possible. Yet firms have not withered away in globalized 21st century, and in President Trump's version. Managerial dictatorship of the firm with differing institutional arrangements between the firm's "stakeholders" [its customers, suppliers, creditors, CEO and staff, employees, investors, sovereign governments, international institutions [IMF, WORLD BANK, BIS, WTO, NAFTA, EU] and the very visible as well as the textbook-invisible hand of the market chaotically co-exist, for now.

Nick Srnicel in PLATFORM CAPITALISM (Srnicel, 2017) offers an overview of the emerging landscape by presenting five different types of platforms: ADVERTISING PLATFORMS [e.g. GOOGLE, FACEBOOK] which extract information on users, undertake analysis, and the use the products of that process to sell ad space; CLOUD PLATFORMS [e.g. AWS, SalesForce] which owns hardware and software of digital dependent businesses and are renting them out as needed; INDUSTRIAL PLATFORMS [e.g. GE, SIEMENS] which build the hardware and software necessary to transform traditional manufacturing into internet-connected processes that lower the costs of production and transform goods into services; PRODUCT PLATFORMS [e.g. ROLLS ROYCE, SPOTIFY] which generate revenue by using other platforms to transform a traditional good into a service and by collecting rent or subscription fees on them; and LEAN PLATFORMS; [e.g. UBER, Airbnb] which attempt to reduce their ownership of assets to a minimum and to profit by reducing costs as much as possible. These analytical divisions can and often do run together within any one firm.

Artificial intelligence is barging its way into business. Firms of all types are harnessing AI to forecast demand, hire workers and deal with customers. In 2017, companies spent $22billion on AI related mergers and acquisitions. Even after 2008 financial catastrophe, it is still fashionable to do it in the financial markets rather than in R&D shops. Regardless of how it is acquired, AI is not only changing how the work place is managed, but the managerial process itself.

AMAZON has a patented a wrist-band designed to tract the hand movements of warehouse workers that uses AI guided vibrations to nudge employees into making the "right" moves and eliminate the "wrong", and resultantly make warehouse workers more efficient. FREDERICK TAYLOR would have approved. Another software company, WORKDAY, crunches around 60 factors to predict which employees will leave the company by collecting and analyzing 60 factors, such as pay, time between holidays taken and turnover in managers to whom the employee reports, and flags those at risk of quitting and for-warning Human Resource departments. Still another startup, HUMANYZE, sells smart ID badges that can tract employees around the office and reveal how well they interact with their colleagues. ID badges the size of a credit card and depth of a book of matches are strapped on employees' wrists to collect data to be analyzed. The ID badges contain a microphone that picks up employees' conversations with each other; BLUETOOTH and infrared sensors are to monitor employees' locations; and an accelerometer records when they move. AI makes ubiquitous surveillance worthwhile, because every bit of data is potentially valuable for DATA ANALYTICS. The idea behind the project is not panoptic or scrutiny according to the founders' description. So, they claim. The revenue of HUMANYZE come not only from sales of hardware and software but from the use of data their badges generate for HUMANYZE.

ALEX PENTLAND, the director of HUMAN DYNAMICS LAB within MIT's MEDIA LAB, the godfather of wearables, especially GOOGLE GLASS, the author of SOCIAL PHYSICS: HOW SOCIAL NETWORKS CAN MAKE US SMARTER (Pentland, 2015), and HONEST SIGNALS: HOW THEY SHAPE OUR WORLD (Pentland, 2008) and his students have spent last two decades inventing instruments and methods that can transform all of human behavior, especially social behavior, into highly predictive math. One result was to introduce the SOCIOMETER, a wearable sensor that combines a microphone, accelerometer, BLUETOOTH connection, analytic software, and machine learning techniques designed to infer the structure and dynamic relationships in human groups.

PENTLAND and his teams have worked to crack the code on the instrumentation and instrumentation enhancement of social processes in the name of a totalistic social vision founded on a comprehensive means of behavior modification. In 2010, PENTLAND founded SOCIOMETRIC SOLUTIONS to apply the rigors of his SOCIAL PHYSICS to captive populations of office workers. By 2015, the company rebranded itself: HUMANYZE. Its technology is described as a platform that uses a "smart employee badge to collect employee behavioral data, which it links to specific metrics with the goal of improving business performance.

BEN WABER, its CEO, portrays the company's work as "money ball" for business enabling any organization to manage its employees like sports team based on measures that reveal how people move through the day, with whom they interact, their tone of voice, if they lean into listen, their position in the social network across a variety of office situations, and much more, all of it to produce 40 separate measures that are then integrated with a "business metric dashboard" in PEOPLE ANALYTICS: HOW SOCIAL SENSING TECHNOLOGY WILL TRANSFORM BUSINESS AND WHAT IT TELLS US ABOUT THE FUTURE OF WORK (Waber, 2013).

An artificial intelligence enhanced video-interview service, HireView, video-interviews candidates as HireView's AI program analyzes the facial expressions, body postures and the verbal skills, intonation and gestures of the candidates. Such machine-sorting can be helpful for companies that recruit globally when candidates are from different cultures or speak another first language, but with the worrisome possibility of rejecting the wrong candidate. Video-interview is the first step of the recruitment process in HireView, only when applicants pass the video-interview they meet some humans of the Human Resources Departments. Another recruitment service company, PYMETRICS, helps to develop data about candidates without conventional qualifications by providing games that ignore factors such as gender, race and level of education for candidates to play. The candidates are also tested for some 80 traits such as memory and attitude to risk. PYMETRICS then uses machine learning to measure applicants against top performers and predict their suitability for a role. PYMETRICS aims to helps the recruiter to identify employable among candidates without conventional qualifications.

In another start-up, COGNITO's AI-enhanced software listens to customer-service calls and assigns an "empathy score" based on call centers' agent's compassion and capability in settling complaints. Among employee surveillance startups, VERIATO, goes so far as to track and log every keystroke an employee makes on his computer in order to gauge employee's commitment to the company. VERIATO's software searches for signals that may indicate poor productivity and malicious activity, like stealing company records, and scans e-mails to gauge how employee's sentiment changes over time. Companies can use services offered by SLACK to sift through not just employees' professional communications but their social-media profiles too. SLACK stands for searchable log of all conversation and knowledge. AI and DATA ANALYTICS empowered employee surveillance systems are changing the work environment, redefining the rights and obligations of employees and employers. Few laws exist to govern how data are to be collected at work, and many employees unguardedly consent to surveillance when they sign their employment contract. The emerging work environment of the 21st century is beginning to look very different from the 20th. So far, managerial authority seems to be the expanding its sphere of control at the expense of reduced sphere of decision options of the employees.

At MICROSOFT employees can track their own movements with MyAnalytics, a program which puts together data from e-mails, calendars and show employees how they spend their time, how often they are in touch with key contacts and whether they multitask too much. MyAnalytics is a feedback tool provided to the employee mainly for self-help, it is not designed as a surveillance tool to enhance managerial control mechanism. MyAnalytics also aggregates the data and offers the summaries to the employees to help them manage their departments and see how their teams are doing.

AMAZON has an in-house Optimization Squad, a unit that writes algorithms AMAZON uses to constantly streamline its own operations. In AMAZON's fulfilment centers, vast warehouses more than 100 in North America and 60-odd around the world, the packages move on conveyor belts at the speed of an escalator in a shopping mall. The deafening noise of the facility is matched by conspicuous lack of humans. There are, instead, thousands of yellow 6 feet tall cuboid shelving units inside a fenced-off area, the size of a football field. In AMAZON's vernacular, they are "pods". These pod are shuffled by hundreds of robots in and out of neat rows by sliding beneath the pods and dragging them around. Associates, human workers in AMAZON's terminology, are assigned to stations at gaps in the fence that surrounds this 'robot field'. Some of the associates pick items out of pods brought to the by a robot, others pack items into empty pods, to be whirred away and stored. For the system to keep track, the associates pick or place an item, scan the product and the relevant shelf with a bar-code reader. To minimize the down-time of human workers and have faster flow of goods through the warehouse, the amount of down-time human workers has to wait before a robot drags a pod to their station need to be shorter and fewer. Optimization squad for fulfilment centers are developing these algorithms for robots.

AMAZON has an AI body-tracking system pilot project that AMAZON refers as NIKE INTENT DETECTION which is to track what the associates pick and place on shelves to get rid of the hand-held bar-code reader. Such manual scanning by the associates takes time that can be saved if the cameras can keep track. What AMAZON GO is to do for shoppers, NIKE INTENT DETECTION is to do it for fulfilment associates. It is to track what they pick and place on shelves. AMAZON's algorithmic venture, a cashier-free grocery, AMAZON GO, that watches shoppers with a bank of hundreds of cameras converting visual data into a 3D profile that track hands and arms as they handle a product. AMAZON GO records which items shoppers pick up and bills them to their AMAZON account when they leave the store.

Platform companies' reality can best be understood by deciphering the hidden DNA of AMAZON, APPLE, FACEBOOK, and GOOGLE [ALPHABET], the American disruptors, and their Chinese counterparts, ALIBABA, BAIDU, TENCENT, XIAOMI, HUAWEI, ZTE, OPPO, LENOVO, HAIER to understand how they are changing the rules of business. FACEBOOK and GOOGLE suck up two-thirds of America's on line ad revenues. AMAZON controls more than 40% of the country's booming online shopping market. In some countries GOOGLE processes 90% of web searches. Not only is the message but the platform is also the market.

The gig economy is assembling a reserve force of atomized laborers who wait to be summoned, via electronic foremen, to deliver people's food, clean their houses or act as their chauffeurs. The 21st century lumpen proletariat, some say. Figures from the BUREAU OF LABOR STATISTICS, released on June 7, 2018 show that group of American workers to be only 10.1% of the employed. Not an alarming figure supporting the much heralded decline of the conventional jobs in recent years caused by disruptive platform companies.

As with its Great Firewall, China was able to prevent American firms from taking on Chinese rivals in China, and Chinese companies were kept out of America, Europe fell under the spell of Silicon Valley before Chinese tech had matured. APPLE was an exception to flourish in China. But now, ALIBABA is taking on AMAZON, BAIDU is matched against GOOGLE, and TENCENT is to prove its technological superiority against FACEBOOK. They have very different strategies, however. American firms typically set up outposts firm scratch. They fund subsidiaries that offer much of the same service to Indians or Mexicans as their domestic users might expect. One-size-fits-all.

ALIBABA's strategy in emerging markets, on the other hand, has been not to set up shop itself, but instead to invest in local companies. ALIBABA's partners include PAYTM and BIGBASKET in India, TOKOPEDIA in Indonesia, LAZADA in Singapore, DARAZ in Pakistan, TRENDYOL in Turkey.

Since GOOGLE and FACEBOOK earn bulk of their revenue from advertising, and therefore, there is less incentive to localize, and furthermore, their optimization algorithms reflecting factor scarcities of America make little efficiency sense in emerging markets' price priorities. Chinese firms' competitive advantage, by contrast, has come from being able to process payments and organize distribution of goods in a country where doing such things had previously been tricky. "One size fits all" solutions are hard to implement. Partnership with local entrepreneurs is the Chinese customized strategy.

The annual conferences of AMAZON, FACEBOOK and GOOGLE held to announce new tools, features, and acquisitions, send shock waves of fear through venture capitalists and entrepreneurs of Silicon Valley. Venture capitalists attend to see which of their companies are going to fall in "kill-zone" around the giants. Tech giants try to squash startups by copying them, or they pay to scoop them up early to eliminate a threat. The idea of a kill-zone may bring to mind MICROSOFT's long reign in the 1990s, as it embraced a strategy of "embrace, extend, and extinguish" and tried to intimidate startups from entering its domain. But entrepreneurs' and venture capitalists' concerns are striking because for a long while afterwards, startups had free rein.

Venture capitalists are wary of backing startups in online search, social media, and e-commerce. The wariness comes from seeing what happens to startups when they enter the kill-zone, either deliberately or accidentally. Amazon's cloud service, AMAZON WEB SERVICES, [AWS], have labelled many startups as "partners", only to copy their functionality and offer them as a cheap or free service. A giant pushing into startup's territory, while controlling the platform that startup depends on for distribution, makes life tricky. The KRONOS EFFECT is the efforts undertaken by a dominant company to consume its potential successors in their infancy. Understanding this effect is critical to understanding the cycle of from open to closed system, from a freely accessible channel to one strictly controlled by a single corporation or cartel.

By 2017, FACEBOOK managed, unchallenged by ANTITRUST authorities, 67 acquisitions, AMAZON undertook 91 and GOOGLE got away with 214. In this way, the tech industry became essentially composed of just a few giant trusts as their competitors became marginalized with every passing day says Tim Wu in THE CURSE OF BIGNESS: ANTITRUST IN THE NEW AGE (Wu, 2013).

The monopolistic structure that typified the 20th century information industry found its footing on the INTERNET when APPLE while it had always wavered on openness, committed itself to work exclusively on the network of AT&T, to a set of ideals well aligned with the interests of the faltering old media, the entertainment conglomerates, and newspaper magnates like Rupert Murdoch. While a difficult partner in many respects, APPLE provided the old monopolistic firms a rejuvenation at last via the INTERNET through the great promise of the iPAD. Combination of APPLE, AT&T and entertainment conglomerates was welcome after the spectacular failure of AOL and TIME WARNER merger. As APPLE befriended the old monopolistic media, GOOGLE remained the de facto leader of a different coalition that depended on the WWW and an open INTERNET when the early 21st century dream of vertically integrated MICROSOFT-GE, AOL TIME WARNER, and COMCAST-DISNEY fell apart.

In China, fewer and fewer tech startup companies are able to escape the radar screens of BAIDU's, ALIBABA's and TENCENT's investment groups on the look-out for potential winners. In 2019, BAT as the tech triumvirate is known, has already invested, directly or indirectly, in more than half of the 124 startups counted as "unicorns" [those worth $1billion or more] according to IT JUZI, a database of startups in Beijing reports The ECONOMIST (The Economist, 2018). By the time firms hit the $5billion mark, over 80% have taken a form of BAT investment. The KRONOS EFFECT with Chinese letters. Of the three, two are bigger. Even after declines in tech stock prices in the third quarter of 2018, ALIBABA and TENCENT are still worth close to half a trillion dollars. Lately, both have moved out of their core business into areas as varied as financial services, bike-sharing, ride-haling and food delivery, clashing along the way. Gracefully maturing and increasingly powerful, they are ruthlessly blocking and tackling not only each other, but any firm that sides with the enemy, and not only in China anymore.

To the Chinese, the scene of American venture capital firms may seem familiar, a scaled down version of the Chinese scenario. "Kill-zone" is the metaphor that describes acquisitive investment strategies of technology giants, AMAZON, FACEBOOK and GOOGLE, in acquiring startups particularly in consumer-internet products. According to McKINSEY, a consultant, America's giants make just 5% of all domestic venture capital investments, whereas BAT account for close to half of those in China. TENCENT has a portfolio of 600 stake-holdings acquired during 2012-2017. ALIBABA and TENCENT are offering more than just large checks. They offer their platforms. TENCENT's WeChat counts over 1billion users. ALIBABA's emporia are home to 1million merchants. Through WeChat PAY and ALIPAY, their competing payment systems, ALIBABA and TENCENT account for 94% of mobile transactions.

Venture capitalists, in the United States, shy away from backing startups whose business centers on the consumer-internet, when the preferences of GOOGLE and FACEBOOK are conspicuously evident. In China, however, that is not yet the case, because of sufficient availability of early-round financing. Many Chinese venture capitalists' strategy is try to identify the sparkiest startups, anticipating generous sell-out later when the giant steps in to buy. When TENCENT invested $600million in MOBIKE, a shared-bike startup in 2017, ALIBABA countered with a $700million stake in a rival OFO, forcing dozens of smaller competitors out of the race, but richly rewarding those venture capitalists that provided early-round financing for MOBIKE and OFO. The government is unlikely to break up the "walled gardens" that giants have built around their offerings, in which startups must also operate so long as the giants follow the government's directives in directing its knowhow according to the state's industrial plans.

The narrow profit maximizing efficiency focus of corporations has inspired the launch of an OPEN SOURCE CIRCULAR ECONOMY movement. Its worldwide network of innovators, designers and activists aims to follow in the footsteps of open-source software by creating the knowledge commons needed to unleash the full potential of circular manufacturing. The full regenerative potential of circular production cannot be reached by individual companies seeking to make it all within their own factory walls. If every tractor, refrigerator and laptop manufacturer attempts to recover, refurbish and resell all and only its own brand of products within proprietary cycle of material flow. The system wide regenerative potential cannot be achieved.

OPEN SOURCE CIRCULAR ECONOMY movement believes that circular manufacturing must be open source because the principles behind open source design are strongest fit for the circular economy's needs. Those principles include modularity, that is making products with parts that are easy to assemble, disassemble and rearrange; open standards, that is designing components to a common shape and size; open source, that is full information on the composition of materials and how to use them; and open data, that is documenting the location and availability of materials. In the collaborative commons, millions of innovators are defying the mainstream economic theory that without intellectual property protection innovators, not being able to recoup their costs, will not bring new products to market.

They are co-creating and using free open-source software known as FOSS as well as free-open source hardware, FOSH. GLOBAL VILLAGE CONSTRUCTION SET demonstrates step-by-step how to build from scratch 50 universally useful machines, from tractors to wind turbines. OPEN BUILDING INSTITUTE aims to make open-source designs for ecological, off-grid, affordable housing available to all.

Many WEB 3.0 projects have developed their crypto-economic models after SATOSHI MAKAMATO pointed the way. The idea is to replace a centralized firm with a decentralized network, held together by incentives created by a token – a kind of "crypto-co-operative". All those involved, including the users, are meant to have a personal stake in the enterprise and get their fair share of the value created by a protocol. The invisible hand of the market replacing "the firm". SATOSHI MAKAMATO provided the tools for the defenders of JEFFERSONIAN CAPITALISM to challenge the enshrined HAMILTONIAN centralized corporate hierarchy of managerial authoritarianism as AI enabled HAMILTONIAN corporation incorporated the invisible hand of the market to manage its internal affairs, CROWD SOURCING, is flattening the layers of corporate hierarchy of managerial authoritarianism.

7. 20th century lessons

By the 1910s, the Unites States had surpassed the United Kingdom as the world's largest economy. The reason was largely the strength of US manufacturing companies, which accounted for approximately 50% of the country's GDP at the time. American factories were powered first by flowing water that turned waterwheels, then by steam. Around the start of the 20th century, electricity appeared as another viable option. It first gained traction as a more efficient replacement for the single big steam engine that sat in the basement of factories and supplied power to all of their machines. Electrification was one of the most disruptive technologies ever. In the first decades of the 20th century, it caused something close to mass extinction in US manufacturing industries.

At the start of 20th century, manufacturing industries in the United States were dominated by "industrial trusts". They were large companies born of mergers. Their owners aimed at to take advantage of scale economies in production, purchasing, distribution, and marketing. Certain trust builders also hoped to create companies so large that they would become monopolies able to set prices. A survey published in 1904 tallied more than 300 such trusts, managerial dictatorship a l'Americaine. The THIRD REICH coopted the state and the industrial cartels as the Japanese state coopted ZAIBATSUs to form uber managerial dictatorships not only to compete with Moscow's monolithic command-control system, but also quickly solve the mass misery of the GREAT DEPRESSION.

Consider a listing of the top American companies from about 1910 or so. It would include U.S. STEEL and BETHLEHEM STEEL, STANDARD OIL, and GULF, SWIFT ARMOUR, and GENERAL FOODS, AT&T, GENERAL ELECTRIC, and WESTINGHOUSE, ANACONDA COPPER, and ALCOA, DUPONT, and AMERICAN TOBACCO. At the time, US industrial trusts seemed positioned to reign for a long time. They were well capitalized, staffed by the first generation of professional managers, and far from hostile new technologies. They learned to communicate by telegraph and ship goods via railroad, and switched from steam to electric power in their factories. A survey in 1935 found that over 40% of the industrial trusts formed between 1888 and 1905 had failed by the early 1930s.

The great shake-up in the early 20th century American manufacturing had multiple causes, including the upheavals of WWI and President TEDDY ROOSEVELT's trust-busting crusade, but the many shocks of electrification were one of the fundamental reasons why so many top companies failed or floundered. The big gains came not from simple substitution of electric motors, but from the redesign of the production process itself that involved techno-economic paradigm shift.

Except for companies from new industries, like GENERAL MOTORS and RCA, the listing of companies in 1970s is much the same as they were at the start of 20th century. Despite all the vicissitudes of mergers, name changes, and antitrust, the top companies in 1910 mostly held their positions for the next seventy years.

The successful companies of the early 1900's had emerged from the most savagely Darwinian Industrial maelstrom in history. ROCKEFELLER, CARNEGIE, and their ilk, clawed to the top through ruthless efficiency and lethal execution. The best German or British chemical and steel companies could beat the Americans in this or that niche, but across the board the United States possessed the most formidable array of industrial power ever seen.

And then Americans slacked off. Almost as soon as US STEEL was born from a string of mergers in 1901, its chief, Elbert Gary, started working out market-sharing and the price maintenance agreements with his competition. US STEEL was born controlling more than half the market. Gary argued that if his fellow steel moguls just adopted U.S. Steel's high price structure, they would each maintain their market shares, and all could flourish together. After the standard break up in 1911, the oil industry fell into a similar pattern, and eventually so did newer industries, like automobiles and televisions. A steel company chief once explained the logic of price maintenance to a Senate antitrust committee: "If we were to lower our prices, then it would be met by our competitors, and that would drop their profit, so we would still be right back to the same price, relatively."

War preserved and extended Americans' hegemonies. Companies could wax fat on wartime weapons orders and post war reconstruction, and at the same time, help destroy their overseas competitors. A 1950s steel sales executive bragged, "Our salesmen don't sell steel; they allocate it." But by defanging competition, Gary's system of "administered pricing" froze technology. The locus of innovation in steel-making shifted to Europe and Japan.

In the United States, MANAGERIAL CAPITALISM emerged out of the Great Depression and its set up was characterized by stable high economic growth and shared prosperity. Indeed, the 25 years following World War II were called the "Golden Age" of capitalism. Prior to the Great Depression, FINANCE CAPITALISM prevailed in the United States. It was characterized by a small government, gold standard constrained with little regulation of banking and finance or anything else, and a growing income and wealth inequalities, essentially laissez faire capitalism. As a consequence, the economy was much more financially unstable and recorded numerous, frequent, and prolonged economic contractions.

From 1931, the size of government spending progressively grew and with the NEW DEAL, a new stage of capitalism progressively emerged that increasingly involved the federal government in macroeconomic and regulatory affairs, MANAGERIAL CAPITALISM. Partly due to federal government's involvement in macroeconomic management, the distribution of income and wealth narrowed and real income grew across all income categories. A broad range of households benefitted from the prosperity and were able to increase and maintain their standard of living without recourse to debt.

Prior to 1933, The FEDERAL RESERVE operated under a gold standard domestically and externally, and it was constrained in its discounting operations by the Real Bills Doctrine. GOLD RESERVE ACT of 1934 removed any obligation to convert U.S. currency into gold on demand, and forbade any contractual clause requiring final payment in gold. In addition, the GLASS-STEAGAL ACT of 1933 ended the Real Bills Doctrine by allowing any economic unit access to the DISCOUNT WINDOW, and by allowing the latter to accept any type of collateral. By making the U.S. dollar an inconvertible currency domestically, and by broadening the powers of the Federal Reserve, the United States acquired more, but not full, monetary sovereignty and so acquired more financial flexibility to promote economic and financial stability. In addition to a big bank, a big government was also created through a large increase in federal expenditures and purchases.

KEYNES proposed that in normal circumstances there is not enough effective demand from private firms and households to ensure the use of all potential resources, resources which could be brought into use by existing technology and business organization. Therefore, government policies should add to private demand, not just in a downturn, but in normal times. The governments' budgets' proper job was not to balance the governments' accounts, but to balance the nations' accounts – aggregate supply and demand- at full employment. Whether this required a budget surplus, zero balance, or deficit depended on the state of aggregate demand. In principle, therefore, the budget could be used to restrain demand as well as to increase it, with the fiscal multiplier giving a precise arithmetic estimate of both.

Governments could calculate the difference between potential and actual output and adjust taxes and spending accordingly. Monetary policy was to support fiscal policy. Interest rates were to be kept permanently low, their main purpose being to minimize the cost of capital and enable the government to borrow as cheaply as possible. The political implications of KEYNESIAN policy were contentious. Conservative politicians, committed to reducing taxes, gravitated towards monetary policy as part of their long-term goal of minimizing the state's role in allocating capital, and assign the management of the business cycle to the weaker of the two possible options: the monetary policy.

FIRE [Finance, Insurance, Real Estate] was a much smaller portion of the GDP and so was consumer finance in banks' loans. Bankers did not entice households and companies to use a lot of leverage to improve their economic well-being. Bankers' profitability rested on a careful examination of creditworthiness of borrowers and the establishment of long-term recurring relationships, rather than the aggressive expansion of their market by increasing debt loads. An originate-and-hold banking model, and labor conditions promoted sustained shared prosperity. Union membership was at its peak in the United States in 1950s with about a third of the employed and a quarter of the labor force. Given its institutional characteristics, and the politico-economic environment, MANAGERIAL CAPITALISM was less prone to financial instability with the decline of economic volatility. Not only were the financial crises less numerous during the post war era but they were also milder.

The WWII had subordinated capitalism to society. KEYNESIANISM was part of the democratic attempt to keep control over capitalist economy in peacetime. All Western governments were committed to ACTIVIST REAL OUTPUT MANAGEMENT with big differences between the kind of activism they thought was needed. Sweden practiced a form of SUPPLY-SIDE KEYNESIANISM derived from the STOCKHOLM SCHOOL. A high level of welfare spending was coupled to activate labor market measures to force up labor productivity: a policy tailor-made for a small export-economy. The French state, which emerged from the war as the nation's chief investor, had experimented with STATISM since COLBERT in the 18th century. The German post-war economic policy, on the other hand, was influenced by the FREIBURG SCHOOL that rejected both NAZISM and STATE SOCIALISM. It accepted the original liberal belief in a competitive market system, but thought that the gaps in classical thought needed to be filled not by the state budget, but by a constitutional framework. This was necessary to protect competition from distortion, see benefits equally distributed and protect markets from the encroachment of government. These ideas coalesced in ORDO-LIBERALISM and the SOCIAL MARKET ECONOMY. The independent BUNDESBANK became the monetary pillar of the new German constitution. ORDO-LIBERALISM blended with industrial co-partnership in a German version of incomes policy.

Taking the advanced countries as a whole, a Keynesian commitment to full employment was a common element in a wider mix of national compromises between right and left, capital and labor.

Countercyclical policy, improved protection for labor, partial state ownership of some industries, active supply-side policy, enlarged welfare spending, indicative planning, the social market economy, short-term lending facilities through IMF were promoted in different countries as middle ways between LAISSEZ-FAIRE and central planning. In the COLD WAR era they did important political work in protecting Western societies from communism, and the success of post-war capitalism was in marked contrast to FINANCE CAPITALISM's dismal global record between WWI and WWII.

After the devastation of WWII, American manufacturing was in a globally dominant position. It was marked by large manufacturing plants built along FORDIST lines, with the automobile industry functioning as the paradigm. These factories were oriented towards mass production, top-down managerial control, and 'just in case' approach that demanded extra workers and inventories in case of surges in demand. The labor process was organized along TAYLORIST principles, which sought to break tasks down into smaller deskilled pieces and reorganized them in the most efficient way. The workers were gathered together in large numbers in large factories collectively represented by labor unions. Collective bargaining ensured that wages grew at a healthy pace with relatively permanent jobs, high wages, and guaranteed pensions. Meanwhile the welfare state redistributed money to those left outside the labor market.

Pre-World War II writings about management presumed managers to be completely in charge of the enterprise and knew it holistically from top to bottom, but needed to take their social duties more seriously, see how they were beholden to their fellow human beings, to society, and even more narrowly, to their customers. Most managers had worked their way through the firm, from the bottom up, as did Andrew Carnegie. This holistic style of thinking has re-emerged in the STAKEHOLDER THEORY of MANAGERIAL CAPITALISM, which sought to restore a balance between shareholders and those of the rest of the people and social institutions that interact through the firm's activities.

BIG LABOR was inducted into the system in the 1950's, with the GENERAL MOTORS formula for labor settlements. The industry price setter usually took the lead in union negotiations. Contracts would normally cover three years, and would include wage awards in line with forecasted productivity increases. Later, as inflation picked up, contracts included both the expected productivity increase plus biannual adjustments for inflation. But when productivity flattened out in the 1970's, and inflation accelerated at the same time, the companies were left with a cost problem they could not wish away.

Even contemporaries understood that the 1950's and early 1960's were something of a golden age. Most big companies became providers of pension and health benefits. For a large slice of the population, the American dream of a house with a lawn and a decent school for the kids came true. JOHN KENNETH GALBRAITH's THE AFFLUENT SOCIETY (Galbraith, 1960) in 1958 announced that the problem of production had been solved, and that it was time to focus on "expelling pain, tension, sorrow and the ubiquitous curse of ignorance".

Labor schools for Union activists flourished in the 1950s and 1960s. Most of them were run by Catholics, many at Jesuit colleges. The big industrial unions were often two-thirds Catholic. The schools taught bargaining and organization techniques, labor law, and labor economics, while extolling the "solidarist" power-sharing arrangements characteristic of Catholic Europe. Businessmen often attended the courses. Union leaders and executives began to regard themselves as industrial statesmen.

The stakeholder theory of MANAGERIAL CAPITALISM was more than a theory of how to run a company better. It had a far-reaching social and economic implications. In sharp contrasts to Milton Friedman and Michael Jensen who advocated strongly that a company succeeds simply through profit maximization, a stakeholder view emphasized the social relationships between management and employees, between the company and the community, the quality of the products produced and so on. These relationships gave the company social goals as well as financial ones. Together they can create more sustainable 'competitive advantage'. And because value is created collectively, through investments of resources by a multitude of actors, it should be also distributed more collectively, not just to the stockholders.

In contrast to stockholder value maximization and its goal of short-term profit maximization and its marginalization of human capital and research and development of ASSET MANAGER CAPITALISM, stakeholder values of MANAGERIAL CAPITALISM saw people not just as inputs but as essential contributors who need to be nurtured. Trust was then built between workers and managers, in a process that acknowledged the vital role of workers and managers in value creation. Investing in people was an admission that employees add value.

At the business schools, the reign of the big companies was taken as part of the natural order. The hot topics of the 1950s and 1960s were organization and finance, essentially rearranging furniture within the stable multi-unit enterprises of modern MANAGERIAL CAPITALISM. There was a 1960s merger movement, but it had academic, chalk-dust smell. The idea was that if companies assembled diverse portfolios of businesses, they could smooth out their earnings cycles. Absurdly, EXXON went into office equipment, bought a circus and a department store chain.

As business administration migrated to the graduate schools, executive ranks drifted farther from the shop floor. The consistent message of management textbooks from as late as the 1970s was that FORD, GENERAL MOTORS, and DuPont had written the sacred texts of production practices in the 1920s. The most important post war developments were mathematical techniques for optimizing machine maintenance and inventories. You could work on the formulas without going near a factory. Philip Mirowski in MACHINE DREAMS: ECONOMICS BECOMES A CYBORG SCIENCE (Mirowsky, 2002) traces the present-day predicaments of neoclassical economic theory to its intellectual reformulation and institutional restructuring at the COWLES COMMISSION and RAND CORPORATION by military funding and in the crucibles of WWII and the COLD WAR.

Philip Mirowski demonstrates that the mathematical economics of the postwar era was a complex response to the challenges of cyborg science, the attempt to unify the study of human beings and intelligent machines through JOHN VON NEUMAN's GENERAL THEORY OF AUTOMATA, and SIGMUND FREUD's PROSTHETHIC GOD. The dream of creating machines that can think has affected social sciences. He shows that what is conventionally thought to be 'history of technology' can be integrated with the history of economic ideas, focusing on the history of the computer. His analysis combines COLD WAR history with the history of the postwar economics in America, revealing that the PAX AMERICANA had much to do with the content of such abstruse and formal doctrines as linear programming and game theory.

Like flightless birds on a predator-free island, American companies had no defenses when hungry and hard-eyed competitors finally came hunting from overseas. It was a slaughter! By 1980, for all practical purposes America no longer manufactured televisions or radios, the Germans and Japanese controlled the machine tool industry, the American steel and textile industries were a catastrophe. Even IBM's mainframe computers were being challenged powerfully by AMDAHL and FUJITSU.

Spasmodic attempts to react to the foreign onslaught only revealed how incompetent American companies had become. During the years that Detroit was mesmerized by chrome-laden tailfins and theories of "planned obsolescence," companies like TOYOTA and VOLKSWAGEN introduced Americans to the advantages of small, well-made, fuel-efficient cars. Subcompact imports began to gain enough market share that FORD and CHEVROLET responded with small cars of their own, the PINTO and the VEGA, both introduced in 1970. When the oil price shocks hit in 1973 and small-car sales took off, the American entries were exposed as embarrassing duds. FORBES magazine later ranked them among the worst cars of all time.

8. The money illusion

In the 1960s, the FED encouraged US banks to step up credit creation, and more euro-dollars were created, and they spilled over as foreign investment. US companies undertook large purchases of European corporations - LE DEFI AMERICAIN. In 1971, when the French realized that American corporations bought up Europe with money created by American banks, they called the United States' bluff - $35:1 Troy ounce of 24K Gold. The French sent all those dollars that had been flooding into France, and demanded that they be converted into gold.

On August 15, 1971 the United States had to suspend the convertibility of dollars into gold. The fixed exchange rate system of BRETTON WOODS collapsed and the US dollar fell sharply on world markets, and the price of gold sky-rocketed. The reserve currency of the world officially became fiat money, no longer pegged to gold. The reserve currency of the world came to be created by private bank credit, debt, and eventually, derivatives securitized by debt, more derivatives securitized by securitized-debt. And banks traded and swapped a lot of bad debt among themselves behind closed doors assigning values to their trades as they see fit. In 2018, the nominal value of DERIVATIVES that TOO-BIG-TO-FAIL BANKS carry as assets on their balance sheets were staggering. The nominal value of all derivatives, according to BIS, stood at $639trillion.

In the 1980s, Japanese automobile manufacturing was the envy of the world. Having mastered a suite of production processes like just-in-time inventory systems, simultaneous engineering in which the design specifications of interdependent components are worked out concurrently rather than consecutively, and mutual monitoring, Japanese firms like TOYOTA and HONDA had come to epitomize the concept of a modern lean corporation. TOYOTA, in particular, was held up to the world by management experts as a shining example of brutal efficiency cohabitating with creative flexibility. The industrial behemoth that produces TOYOTA cars and trucks is a group of roughly two hundred companies integrated by their common interest in supplying the TOYOTA itself with everything from electronic components to seat covers known as the TOYOTA PRODUCTION SYSTEM.

Companies in the group routinely exchanged personnel, shared intellectual property and assisted each other at the cost of their own time and resources, all without the requirement of formal contracts or detailed record keeping. Firms like TOYOTA that rely on networks of suppliers and subcontractors have to think of their partners' profitability rather than optimize their own short-term profitability. A network [the Japanese KEIRETSU] is a team effort, the art of building and maintaining relationships, ability to attract talent are important for network's sustainability as is its bottom line. Networks also experience a kind of inertia. Their evolution is path-dependent and often irreversible, so what happens in the early stages can be critical.

Network economics is very different from the orthodox economic theory's singular, overreaching, one-size-fits-all orthodox dogma. Unification, the search for a simple and all-encompassing theory, is the Holy Grail of science. But, the network theory suggests that in economics we need a plurality of theories for different contexts. The neoclassical theory's emphasis on competition only represents half of the story, because cooperation is not only essential for survival, but necessary for path determined existence.

According to Richard A. Werner's narrative in PRINCES OF THE YEN: JAPAN'S CENTRAL BANKERS AND THE TRANSFORMATION OF THE ECONOMY (Werner, 2018) and in NEW PARADIGM IN MACROECONOMICS: SOLVING THE RIDDLE OF JAPANESE MACROECONOMIC PERFORMANCE Werner, 2005) from the time of the MONGOLS' attempt to invade Japan in the 13th century through PERRY'S BLACK SHIPS to the PLAZA AGREEMENT, changes in Japan's economic, social, and political system have happened only three time in modern Japanese history during MEIJI PERIOD, in the late 19th century, and during WWII and Japan's defeat 74 years ago, and the 1989 crash and its longest and deepest recession that followed. In all three cases, crises triggered the change. And BoJ's reaction to PLAZA ACCORD triggered the last crisis.

The threat of colonization by foreign countries propelled the MEIJI REFORMS. THE GREAT DEPRESSION, the PACIFIC WAR, and the consequent defeat were the triggers for the second major mutation. The post war miracle of high growth was despite all its achievements, largely a quantitative change, one that took place within the unchanged economic and political institutions that had been put in place largely during WWII as an output-maximizing mobilized war economy. The third crisis was engineered by BoJ to implement PLAZA ACCORD's structural change agenda.

Once, when East was East and West was West, the chasm between them was not only geographical, but moral and historical too. ASIA was a term invented by Europeans to emphasize their own distinctiveness. To KIPLING-era imperialists, Asian societies were backward, despotic and unchanging. By contrast, Europe had made the decisive break to pursue a scientific approach to human affairs which justified Europe's domain over other continents. Condescension was met with emulation. Since Japan's MEIJI RESTORATION in 1868, Asia modernization was long a matter of copying the West, either out of admiration for Europeans or to repel them or both. Asia's economic transformations since the second world war were partly shaped by the needs of Western markets.

The US occupation, officially in charge until 1952, implemented the US program of reeducation and democratization of the Japanese people. It provided Japan with a new constitution, political parties, free elections also for women, a market-oriented capitalist economic system. MAC ARTHUR's reforms allowed labor unions, broke up the ZAIBATSU, and introduced sweeping land reforms. It was during the war that virtually all of the characteristics of the Japanese social, economic, and political system of postwar era that later came to be called the Japanese Miracle were formed.

US occupation purged the capitalist class, the owning families of ZAIBATSUs that mainly controlled their ZAIBATSU firms through holding companies which owned the majority of ZAIBATSU firms' stock. While the capitalist families disappeared from the economic landscape their large conglomerates remained and regrouped as KEIRETSU business groups. US occupation's other major change of the economic landscape was full-scale land reform that expropriated large-scale land and redistributed among peasants purging the land owning class. Having capitalist and land owning classes purged, the US occupation put KEIRETSU managers and government bureaucrats in charge of Japan.

Freed of profit maximizing capitalists and maximum rent demanding landlords, Japan's bureaucracy, thanks to US occupation, managed to realize its wartime fantasy of managing entirely free from the profit oriented interests of individual ownership. The wartime vision of managers not aiming at profits, but their own goals, had become entrenched reality. And managers' aims are advanced best when the firm grows – growth for the glory of the nation.

A mobilized MANAGERIAL CAPITALISM was established. Japan became a nation run by public and private bureaucrat-soldiers in the fight for economic supremacy. The stellar economic performance of Japan and the East Asian economies were not achieved through free markets, liberalization or deregulation policies advanced by neoclassical economics. As the WORLD BANK in 1993 recognized in its EAST ASIAN MIRACLE study, the EAST ASIAN success was due to government intervention in the form of clever institutional design and direct intervention in resource allocation especially in the credit markets. Ha-Joon Chang in GLOBALIZATION, ECONOMIC GROWTH AND THE ROLE OF THE STATE (Chang, 2003) and in greater detail in THE EAST ASIAN DEVELOPMENT: THE MIRACLE, THE CRISIS AND THE FUTURE (Chang, 2007) presents the historical data in the economic development model he advocates.

Until the end of the 1980s, the post war Japanese economic structure was characterized by restricted and incomplete capital markets, reliance of corporate finance on bank funding, weak stockholder influence, a large number of government regulations, direct government interference in the form of guidance, a large number of formal and informal cartels, inflexible labor markets offering full-time staff at large enterprises job security, promotion based on the seniority in terms of years spent with the firm and in-house company unions. Firms could afford to maintain cross stockholdings even if stock prices fell, because Japan was using German style book value accounting. Without pressure from stockholders, firms could plan for the long term and grow fast. Book value accounting had the additional benefit that it shielded companies from unnecessary volatility due to stock market movements and contributed to overall economic stability.

Japan, under American pressure, agreed to resolve growing trade surplus with the United States by pushing the yen higher with the PLAZA ACCORD of 1985. Dependent on America for security, Japan was constrained in its pushback. The PLAZA ACCORD also involved Britain, France, and West Germany. The countries announced that they wanted the dollar depreciate and intervened in currency markets to make it happen. Within a year the yen soared by nearly 50% against the dollar.

The PLAZA ACCORD is best understood not as a one-off event but as a critical stage in a multi-year dispute, which ranged from agriculture to electronics. America accused Japan of stealing intellectual property and plotting to control future industries. Robert Lighthizer, America's lead negotiator against China in 2019, gained his experience in Japanese-American negotiations. Back then Japan and Germany placated President Reagan's negotiators by agreeing to strengthen yen and D-mark against the dollar, making American goods a bit more competitive. Japan, in particular, was bullied into voluntarily restricting exports of from textiles to cars. More constructively, Japanese firms opened car factories in America, bringing Japanese quality management with them. But in 2019, the Chinese are not welcome to invest in America, where they stand accused of stealing technology and threatening national security. In 1990, Japan agreed to a STRUCTURAL IMPEDIMENTS INITIATIVE. America wanted Japan to improve its competition laws, open more widely to foreign investors and weaken its conglomerates, the KEIRETSU groups. Not very different from what President Trump wants from China.

ENDAKA, the strong yen, accompanied by the tight money policy of BoJ of the 1990s accelerated the shift of manufacturing units into Asia and promoted the opening up Japanese domestic economy to imports. The unprecedented shift of factories out of the Japan has virtually created a second Japan outside its borders. In financial year 1995, Japan produced more abroad than it exported from mainland Japan. ENDAKA, at the same time, boosted imports. A large part of imports was re-imports from Japanese factories that were offshored.

The PLAZA ACCORD set Japan on a path to doom. To counter the effect of strong yen, an obvious drag on exports, Japan slashed interest rates and unleashed fiscal stimulus. These moves brought about a short lived economic rebound. But they also generated asset bubbles. Stock and land prices tripled within five years after the PLAZA ACCORD. These bubbles burst and the economy slumped, never to recover its former mojo. In nominal terms Japanese stocks are, in 2019, 40% below their peak on the final official trading day of 1989. The PLAZA ACCORD did succeed in defusing tensions between the second largest economy, Japan, and America by neutering Japan as a challenger. How America dealt with LE DEFI JAPONAIS has percolated into thinking in China.

The sequence of Japan's woes does seem to make for damning indictment. But a close look at each step shows that they were not preordained. One point, clear in retrospect, is that under American pressure without European support Japan overcompensated for the slowdown in exports. Within 18 months of the PLAZA ACCORD, BoJ had cut benchmark interest rates from 5% to 2.5%. It also announced a big stimulus package, increasing government spending and cutting taxes in May 1987, though by then its recovery was already under way. It did not shift gears and raise rates again until 1989, when its asset bubbles were already a few years old.

There were at least two other factors that could have led to a different outcome. Excessive stimulus, by itself, did not guarantee that Japan would suffer an asset bubble. But, BoJ's credit expansion became much more effective when it was combined with financial deregulation, which led banks to lend more to property developers and home buyers. Guided cheap credit expansion is the recipe to inflate bubbles. GREENSPAN must have taken notice.

The bursting of the double bubbles did not guarantee that Japan would suffer a lost decade, let alone three. A confusingly sluggish response by regulators compounded the trouble. Rather than pushing banks to raise capital as post 2008 Western regulators did, they encouraged them to go on lending to zombie firms, perhaps to share to costs of the double real and financial assets' crashes.

The domestic economy changed after the offshoring of factories and the influx of manufactured goods. In order to compete with rising imports, firms had to lower prices, reduce inefficiencies, and increase productivity. Employment practices had to change and consumer preferences had to be taken more seriously. In April 1995, double crisis of economic slump and the shock of yen at 80 yen to a dollar convinced even the conservatives that Japan had to deregulate. All the barriers against foreign firms came down. As Japan shifted its economic system to ASSET MANAGER CAPIITALISM, the center of the economy moved from main-banks to stock markets. Since mid-1994, the Japanese service sector employed more people than the manufacturing sector.

Japanese MANAGERIAL CAPITALISM without capitalists had become increasingly embattled during the 1990s. The collapse of stock market bubble ensuing the credit crunch engineered by BoJ forced many companies to sell off cross stockholdings that had been created during the war, ZIBATSUs and in the postwar era, KEIRETSUs. NIKKEI 225 index closing at a twenty-year low on the last day of 2002 provided foreign investors with the opportunity to buy the ownership of Japanese companies. In March 1999, the share of stocks listed on the TOKYO STOCK EXCHANGE that were owned by foreigners reached a postwar record high of 14.1%. By March 2001, it had risen to 18.3%, a long way above the 2.8% recorded in 1978.

Mark-to-market accounting was adopted by the Ministry of Finance in 2001 speeding the transformation away from the corporate governance of MANAGERIAL CAPITAISM to corporate governance of ASSET MANAGER CAPITALISM. By 2005, the corporate governance landscape was reshaped, making main-bank system history. KEIRETSU's cross stockholdings have become exception, not the rule, it was before the crash. As a result, accountability to shareholders became a reality for the first time since the 1920s. Corporate management became increasingly profit oriented and companies are run for stockholders' wealth maximization not managers' and employees' income maximization.

In other EAST ASIAN countries there were close similarities, some were put in place already under Japanese colonial rule. The phenomenal growth of the Chinese economy since 1980 has also occurred without the benefits of the free market model of neoclassical economics.

The main reason why the extraordinary nature of Japan's MANAGERIAL CAPITALISM has remained unknown in the MBA programs for so long is the a-historic and usually counterfactual approach of neoclassical economic theory. History provides data set for the scientific economists to study. Ignoring history means neglecting the facts. The peacetime war economy of Japan's MANAGERIAL CAPITALISM was highly successful, actually by many measurements the most in the world. In the 1950s and 1960s, Japan expanded continuously at double-digit growth rates. From 1960 to 1970, Japan's real GDP rose from 71.6trillion yen to 188.3trillion – up 2.6 times. Japan overtook Germany to become the second economic power in the world reducing the world's and especially American tolerance of Japan's highly successful economic system.

After 20 years of almost continuous double-digit growth, the real GDP growth suddenly contracted in 1974. The recession lasted longer and was more severe than had been anticipated. The necessary and sufficient condition for economic recovery was an increase in credit growth. Many studies concluded that Japan would not be able to maintain the historical growth rates mainly based on exports. It would have to revamp its economy. Thus, the events of the 1970s were more than a wake-up call and a test run for BANK OF JAPAN.

It cannot be denied that BoJ had gained valuable experience in the mechanics of the creation and propagation of a real estate based credit boom and the collapse that must follow. To cope with the aftermath of 8/15/1971 NIXON's unilateral decision that ended the BRETTON WOODS fixed exchange regime, BoJ bought a lot of yen and domestic financial assets with the newly created money. Already flush in liquidity for productive projects, the firms used the increased bank loans to embark on speculative land purchases. Urban land prices jumped by more than 50% from 1972 to 1974. BoJ induced credit boom was large enough to spill over from asset markets to real economy. All this happened before the oil shock of November 1973.

From mid-1980s until the end of the decade, Japanese foreign investments dominated international capital flows. Japanese long-term capital flows multiplied from a net inflow of more than $2billion in 1980 to an outflow of nearly $10billion in 1981 to reach $65billion in 1985, $132billion in 1986, and $137billion in 1987. Japan was purchasing far more assets abroad than it could afford due to its exports. To fund its international shopping spree in the 1980s, Japan actually had to borrow foreign currency. Japan created new hot money and then bought up the world. Despite the enormous capital outflow, the yen did not weaken. To the contrary, it rose 106% from 1985 to 1987. And in the West, management gurus urged business leaders to adopt Japanese techniques as the last resort to withstand LE DEFI JAPONAIS.

Japan pulled off the same strategy corporate America used in the 1950s and 1960s, when US banks excessively created dollars, Eurodollars. Corporate America used Eurodollars, hot money of the day, to buy up European companies. While the United States had the cover of the dollar standard,[$35:1 Troy ounce of 24karat gold] Japan's cover was its significant trade surpluses, which was enough to convince observers that the yen had to be strong. As the yen did not weaken, the world suffered from the biggest bout of illusion on record. The great yen illusion.

Approximately 40% of the cumulative value of Japanese overseas investments were wiped out in yen terms between January of 1985 and January of 1987. Despite the losses, Japanese investors continued to invest in sizable amounts in US and other foreign assets. This anomaly persisted over several years despite the fact that the intention of the PLAZA ACCORD – namely to strengthen the yen – was not in doubt. In 1991, as Japanese current account was heading for new record surpluses, topping $90billion, net long-term capital outflows had suddenly vanished. Japan remained a net seller of foreign assets throughout 1991. With increasing losses on their foreign investments, it had become apparent that Japanese corporations, and particular the country's financial institutions, had not invested to make profits.

The crisis of 1990 has spelled the end of Japanese miracle model. Japan in the 21st century is again in the process of switching to a fundamentally different form of economic organization, namely, an ASSET MANAGER CAPITALISM. Few were and are aware of the fact that in 1920s Japan's economy in many ways looked a lot more like pre-GREAT DEPRESSION US economy, FINANCIAL CAPITALISM.

Transformation of Japan's economic system was no small undertaking. The war economy system internally consistent and permeated all sectors and levels of the economy and even society. It had shaped the labor market, the capital market, the corporate governance structure, the legal system and the behavior of firms, government bureaucrats, and politicians as ordinary people. To change Japan, it seemed, one need to change everything. Only if one abandoned all features of the old system would it be possible to create a different economic structure. The Japanese needed to be made conscious of the need for such a historically unprecedented transformation. They needed an unprecedented peace time crisis. Two asset bubbles and their bust. BoJ delivered them all.

9. Financialization in the age of baby boom

The complacent incompetence of American business was bad enough, but with the demographic tides they were a double whammy. Ask an economist about the 1970's plunge in American productivity, and he will point to the fall off in investment. Possibly, some executives were slothful and incompetent, but rising inflation and interest rates made capital very expensive. On the other hand, a demographer would point to an upsurge in young workers. People in the BABY BOOM GENERATION entered their twenties in the 1970s, creating downward pressure on wages. "When workers are cheap and capital expensive, it is sensible to reduce investment." claimed orthodox economists, but the Chinese mandarins disagreed and achieved highest growth rates per annum for their economy by investing more than half of their GDP in most years in the last two decades of the 20th century. So great was the overhang of Chinese mandarins' investment strategy in manufacturing sector that by the second decade of the 21st century Chinese companies' prices have become global prices.

The baby boom illustrates the impact of marginal changes in a population cohort. Eighteen-to twenty-four-year-olds were 4.3% of the population in 1960, and 5.6% of the population in 1970, which looks like only modest change. But the total numbers of eighteen-to twenty-four-year-olds jumped by about 50%, from 7.6 million to 11.4 million, and that was utterly disruptive.

Richard A. Easterlin (2004), who wrote one of the earliest and thorough analyses of the boomer phenomena, emphasized the size of a birth cohort compared to the one just before. Birth rates dropped sharply during the Depression years, so the generation of men entering the labor market in the 1950s was an unusually small one and was much in demand. The pay gap between young workers and older workers, therefore became unusually narrow, facilitating early marriage and greater economic security also made couples more willing to have children. In Easterlin's formulation, the cohort changes became self-amplifying.

Sometime in the mid-1950s, however, the amplifying mechanisms began tilting toward disruption. When the boomers reached school age, elementary schools everywhere were forced onto double and triple sessions. It was even worse in the suburbs, where schools had to be built from scratch. As they hit their teens, juvenile delinquency moved to the top of the social agenda. Struggling to cope, police forces became more selective about the behaviors that elicited an intervention, a process that Daniel Patrick Moynihan later called "defining deviance down."

When REAGAN took office in 1981 and PAUL VOLCKER launched his assault on inflation, the great American industrial firms built during the halcyon years from the 1940 to 1960s were already intrinsically vulnerable. MONETARISM would in effect, blow them apart, for the double digit interest rates VOLCKER and REAGAN brought on in 1981 had three catastrophic effects on these sectors. First, it destroyed their export markets, sending economies in Latin America, Africa, and parts of Asia into a tailspin from which they could not recover, in some cases, for twenty years. Second, the recession destroyed, though more briefly, their home markets. Thirdly, the interest rates drove up the value of the dollar, by around 60% in relation to the U.S. trading partners.

Those who could still purchase equipment could get it at lower price from Japan or Germany, from KOMATSU or SIEMENS rather than CATERPILLAR or INTERNATIONAL HARVESTER or ALLIS-CHALMERS. The great American Industrial belt and the labor unions it housed were kicked to pieces. And the process of dismantling of the institutions of the NEW DEAL began in the United States.

By the midpoint of the Reagan era, many large corporations had been bankrupted by high interest rates, the ensuing recession in 1981 and 1982, and the competitive boost that the high dollar gave to competing industries in Japan and Europe. A major reorganization of the most technologically advanced sectors took place. Technology wizards left the large integrated companies to form their own start-ups in Silicon Valley and Seattle. In the 1990s and after, what remained of some of America's once great industrial and technical firms would fall victim to new waves of financial fraud. Plainly, the great American corporation was neither permanent nor invincible. Many that taught at business schools in early 1980s in America basically decided to pretend that the demise of large corporations had its roots in bad macro management and government's regulatory interferences with the market.

"Government was the cause", President REAGAN assured "not the corporations' market power". The business school mantra asserted that the presence of the Japanese and Germans on the world stage meant that there was competition after all without specifying the two systems' different structures and macro policies. Power dispersed in several directions. Some of it went to technologists, as they set off to California and Washington to establish their own independent companies, transforming the large integrated enterprises from producers to consumers of scientific and technical research. Some of it went to asset managers of hedge funds and private equity groups concentrated in Manhattan and London, who came to reassert their own standards of financial performance on large companies, at the risk of a disciplinary raid and hostile acquisition. Some of it was lost overseas, to the encroaching enterprises of Europe and Japan. Some of it devolved unto members of the chief executive class, previously subordinate in practice to the techno-structure.

These four phenomena, the rise of international trade, the reassertion of financial power, the outsourcing of technological development, and the ascendance of an oligarchy in the executive class that coupled with REAGAN's and THATCHER's deregulations over the last two decades of the twentieth century had dramatic effects on American corporations, on the way they are run and on their broadly declining position in the world.

The decline of national industrial corporations in the United States can be seen in part as a process of dispersion of the techno-structure's power. This occurred partly in response to growing global competition, partly following a countercoup of asset managers from the world of international finance, partly in response to a change in the organization of technology, and partly as the result of the rise of a class of oligarchs, the new CEO's who became once again an autonomous force in the life of companies they oversaw.

The high interest rates of the 1980s, cost of funds, became a predominant consideration for the survival of the enterprise. REAGAN's monetarism thus made the industrial firm dependent on its source of finance. It re-established the preeminent power of financial institutions in the United States. Wall Street was put back in charge. Mutual funds sprang up, allowing ordinary baby boomers to pool resources and have access to "professional" investment managers. A constant stream of money from pension contributions and shift of savings from bank accounts to mutual funds helped investment markets to grow. A modern fund management was born, ASSET MANAGER CAPITALISM. Insurance companies reengineered themselves into wealth managers. QUANTITATIVE FINANCE was born with four key principles for fund management. Harry Markowitz's DIVERSIFICATION, Eugene Fama's EFFICIENT MARKETS, MEAN/VARIANCE which estimated risk as standard deviation or variance as measure of volatility, and William Sharpe's CAPITAL ASSETS' PRICING MODEL that concluded: "if you took more risk then you needed higher returns." Old time investors cried with joy. They had been doing CAPMs without knowing it.

CAPM assumes that all investors hold portfolios of stocks that optimize the trade-off between risks and returns. If everyone in the market owns such portfolios, they can then be combined to create market portfolio. The risk of an individual stock is then measured relative to the theoretical market portfolio. Thus risk factor, known as beta, is then used to calculate the cost of equity, or the return that stockholders need to receive to make the risk worthwhile. The problem is that implementing CAPM is virtually impossible, because the theory assumes perfect information on company risk, an unlimited ability to sell stocks short, and the same time horizon for all investors. In addition, because risk and return profiles change, the market portfolio must be continuously upgraded which in reality involve significant transaction costs. The asset managers tend to be evaluated against S&P 500 or FTSE 100. Furthermore, evidence shows that asset managers 'chase returns' rather than optimize risk-return trade-offs in the CAPM assumes.

The assumption that the market behaves like a collection of independent, perfectly informed individuals was originally adopted in order to aid computation, but has turned out to be a persistent feature of orthodox economics. In 1965, 100 years after Jevons wrote his THEORY OF POLITICAL ECONOMY, Eugene Fama presented the EFFICIENT MARKET HYPOTHESIS. Echoing JEVONS, FAMA imagined a market where there are a large numbers of rational profit maximizers actively competing, with each trying to predict future market values of individual securities and where important current information is almost freely available to all participants.

FAMA's hypothesis was that such a market would efficiently allocate resources, and allocate financial risks towards economic entities that are most able to bear them. The efficient market hypothesis also states that market mechanisms tend to self-correct and eliminate any disequilibrium such as bubbles or crashes. FAMA's hypothesis has been at the core of financial regulation over the past 40 years. The 2005 BASEL ACCORD of BANK OF INTERNATIONAL SETTLEMENT emphasized market discipline and self-regulation of large banks as core pillars of international financial regulation, and still does when many regard the EFFICIENT MARKET HYPOTHESIS as a myth born of NEWTONIAN theories of equilibrium and BACHELIER's random walk.

Orthodox economics assumes the market is made up of free individuals, who interact only to maximize their own utility, and that the economy can be modelled by aggregating over these individuals. Network theory, on the other hand, instead of seeing a group of people as nothing but a collection of individuals that act independently of one another, focuses on relationships between them. By analyzing the dynamics that occur during a period of relative economic stability, we will try to understand why and how market forces actually lead to financial instability rather than equilibrium that efficient market hypothesis professes.

Since the 19th century, the economy had been viewed as an essentially static system, which when perturbed from the outside by external events, automatically self-adjusted to get back to its optimal equilibrium. Of course there is a constant supply of news to be assimilated, so the market never quite settles, but at any single moment it is nearly in a state of perfect balance. Since news is random and unexpected, it follows that price fluctuations, too, should be random – like the toss of a dice, or a draw from a pack of cards. One could not say whether its next move would be up or down for sure. However, as LOUIS BACHELIER argued in his 1900 dissertation THEORIE DE LA SPECULATION, the market's behavior was essentially random and it was "impossible to hope for mathematical forecasting" although it was still possible to calculate the odds using the laws of chance. If one assumed price changes were the result of many independent fluctuations, each with the same probability distribution, then they should follow the familiar normal, or bell-curve, distribution.

Mathematicians and physicists had already constructed sophisticated techniques for dealing with randomness. Application of these methods became known as ZAITEKU in Japan FINANCIAL ENGINEERING in the West. The reason we cannot predict the economy not because the market is irrational, but because it is too rational, FAMA argued. FAMA and BACHELIER seemingly argued for very similar conclusions. Their difference was that BACHELIER, 65 years earlier, saw the market as impenetrable to reason, while FAMA saw it as being itself the reason. The market was the sum total of "many intelligent participants", so its collective wisdom was greater than that of any one person. FAMA's thesis was based on empirical evidence, which showed that economic forecasters were consistently unable to predict market movements.

Benoit Mandelbrot in FRACTALS AND SCALING IN FINANCE: DISCONTINUITY, CONCENTRATION, RISK (Mandelbrot, 1997) and in THE [MIS]BEHAVIOR OF MARKET: A FRACTAL VIEW OF RISK, RUIN, AND REWARD (Mandelbrot, 2004) with R. I. Hudson in four strokes falsified the random-walk hypothesis. 1. There were more extreme price swings than random walk would predict because the data had much fatter tails than a bell-shaped curve had. 2. The extreme events were in fact quite extreme; large proportion of the total variance was explained by just a few violent price movements. 3. There appeared to be some clustering of price movements in time, a pattern punctuated equilibrium. 4. The statistics describing the data were not stationary as the random walk predicted, but changed over time. Not only did MANDELBROT falsified the random walk hypothesis, but he also proposed an alternative. Power law neatly explained the fat tails and extreme volatility of price movements that EFFICIENT MARKET HYPOTHESIS could not explain. MANDELBROT described the market prices as having fractal geometry.

Rational economic man reached his highest state of perfection with THE RATIONAL EXPECTATIONS THEORY of ROBERT LUCAS. This assumed not only that market participants were rational but also that they had a perfect model of the economy in their head, in the sense that they did not make systematic errors. As with the efficient market hypothesis, the theory assumed that markets were at static equilibrium. If prices were too high or too low that would imply that people were not rational. RATIONAL EXPECTATIONS does not imply that agents never make mistakes. Agents may make mistakes on occasion. But these mistakes are only random, so each agent is correct on average over time, and, at each point in time the aggregate decisions of a large pool of agents are rational.

In technical terms LUCAS defined expectations as the mean of a distribution of a random variable. As the number of observations increases, the distribution resembles a bell curve, a normal distribution, and the expectation coincides with the peak of the curve, the average of the observations. Similarly, the error or random events causing these errors adhere to the bell-shaped distribution, but their mean/expectation is zero. RATIONAL EXPECTATIONS HYPOTHESIS assumes that agents are rational and equipped with the same information and preferences, and treats the economy as the outcome of the decisions of only one individual, the REPRESENTATIVE AGENT. Agents who are identical in terms of their rationality, information sets and preferences will take identical decisions. So analyzing their decisions as a group is equivalent to analyzing their independent decisions. Therefore, mathematically, instead of maximizing the sum utility functions, you just have to maximize one utility function.

The idea of rational behavior was also given a credibility boost in the 1970s by Richard Dawkins, who provided a link between genetics and natural selection. As he wrote in THE SELFISH GENE (Dawkins, 1989), "If you look at the way natural selection works, it seems to follow that anything that has evolved by natural selection should be selfish." We are rational, utility maximizing machines because our genes are. An implication of this was that economic success reflected superior genes. This is the core concept of "a chicken is just an egg's way of making another egg" – the organism is just a vehicle for the genome to be replicated in the next generation, and behavior is just this wispy epiphenomenon that facilitates the replication.

This gene-centered view can be divided in two. One is that the genome [i.e., collection of all the genes, regulatory elements, and so on] is the best level to think about things. The more radical view held by Dawkins, is that the most appropriate level is that of individual genes – [i.e., selfish genes], rather than selfish genomes. Moreover, most evolution historically took place in microorganisms and has involved a process called endosymbiosis, in which species exchange components or come together to form new species. Furthermore, biological systems have a remarkable capacity for self-organization in which highly organized can emerge without any planning or selection. Complexity scientists see patterns of nature emerging from internal dynamics, rather than just natural selection. Dawkins emphasis on mutations and the survival of the fittest is consistent with the idea, going back to Democritus, that the world is determined by the random shuffling of the atoms. "Everything existing in the universe is the fruit of chance and necessity." But the random mutation and selection are clearly important drivers of evolution that does not grant them exclusivity. The difference between the mainstream reductionist approach and the complexity approach is revealing.

Kate Raworth in DOUGHNUT ECONOMICS: 7 WAYS TO THINK LIKE A 21ST CENTURY ECONOMIST (Raworth, 2017) calls for replacement of HOMO ECONOMICUS with more complex portrait of human behavior: First, rather than narrowly self-interested, we are social and reciprocating. Second, in place of fixed preferences, we have fluid values. Third instead of isolated, we are interdependent. Fourth, rather than calculate, we usually approximate. Fifth, far from having dominion over nature, we are deeply embedded in the web of life. The appropriate framework for sketching this portrait in mathematical terms seems to be quantum formalism.

The main problem with EFFICIENT MARKET HYPOTHESIS is the notion of "intrinsic value". The theory was born out of the neoclassical belief that the economy has some kind of stable equilibrium – a unique set of prices that perfectly matches buyers and sellers. For a dynamic system such as the economy, there is no requirement that an equilibrium point even exist. The stable point was a mathematical convenience, modeled by 19th century economists after the physics of their time. Viewed in this way, it seems bizarre that unpredictability could somehow be taken as a sign of efficiency and rationality. The reason investors cannot accurately predict fluctuations in the price of gold is not because they cannot determine the substance's intrinsic value. It is because intrinsic value does not exist. The price of an asset reflects the market's consensus about its future value, which is highly variable and prone to all sorts of forces, including irrational ones.

One area where advanced mathematical techniques have been enthusiastically adopted is the proprietary statistical algorithms used by quantitative traders who are often mathematicians or physicists by training at banks and hedge funds. Analysts scour financial data for subtle but persistent patterns for a while that, according to efficient market theory, should not exist, and use them to devise trading strategies. Thriving through leverage and arbitrage, fast trading and risk shuffling, the traders in the major banks have long had access to virtually unlimited funds at near-zero interest rates after 2008 crisis, while the TREASURY and FED anointed most of them as TOO-BIG-TO-FAIL.

In effect the federal government, through FED and scores of other regulators, has socialized the downside of these institutions, enabling them to carry on what they call CREATIVE RISK TAKING. With zero-interest money from FED, the TOO-BIG-TO-FAIL banks bought trillions of dollars' worth of government bonds, and expropriated the spread. Zero interest rates resulted in easy money for highly leveraged WALL STREET speculators, cheap money for the government, but a barren credit landscape for entrepreneurial small businesses. Some 2,600 community banks went out of business. It seemed they were TOO-SMALL-TO-BAIL.

Although EFFICIENT MARKET HYPOTHESIS may not be good science, financial markets are evolutionary systems. Markets are social technology devised for integrating the views of large numbers of people to put prices on complex assets, and allocate capital, not to best use at times and very expensively. The competitive intensity of markets ensures that they are fast at processing information, and that there is pressure on their participants to continuously innovate. Andrew Lo in ADAPTIVE MARKETS: FINANCIAL EVOLUTION AT THE SPEED OF THOUGHT (Lo, 2017) calls the evolutionary effectiveness of markets ADAPTIVE MARKET HYPOTHESIS and argues that the theory of market efficiency is not wrong, but incomplete. Andrew Lo's paradigm explains how financial evolution shapes behavior and markets at the speed of thought revealed by swings of stability and crisis, profits and loss, and innovation and regulation.

The genius of EFFICIENT MARKET HYPOTHESIS was the way it co-opted the mantras of economic theory, "efficiency" and "rational", to free markets. The equations showed why free markets were so good at setting prices and creating wealth. They also rationalized away problems such as the unequal distribution of riches. Because the markets were rational and efficient, it followed that everything companies or individuals did was in the best interest of society, even if it did not look that way. Anything that impeded its workings, such as government regulation or unions or anti-globalization movements, was by definition inefficient and irrational. But the EFFICIENT MARKET HYPOTHESIS only predicts that we cannot predict, thus providing a convenient explanation for missed forecasts like the 2008 FINANCIAL CRISIS.

In 1974, PAUL SAMUELSON canonized FAMA's EFFICIENT MARKET HYPOTHESIS by suggesting that most stock-pickers should go out of business, for even the best of them could not always beat the market average. In line with his suggestions, the following year, VANGUARD launched an index fund for retail investors. It was not eagerly received, only raising $17million by 1980. WALL STREET propaganda machine denounced it "un-American". Index investing has prospered lately in the last two decades. Index funds have grown around 6 times faster than those managed by active fund managers who select stocks to buy and sell. Many investors get the average stock market returns for a fee of .03%.

SAMUELSON's case for an indexed fund is grounded in the idea that stock markets are "efficient". Any relevant news about a company's prospects is quickly reflected in its stock price. If there were obvious bargains, a little effort would reward the attentive at the expense of slothful investors. But, if more people are buying the index, might it become "deficient"? And might that, in turn, create opportunities for the very stock-pickers who SAMUELSON suggested should cease trading? In fact, the opposite is more likely. If index investing has displaced bad stock-pickers, it will have made the market more "efficient", not less.

The whole is the sum of its part, a tautology, is essential to an understanding of why this is so. With index investing the average investor can do as well as the stock market average. For some investors to beat the market, others must be beaten by it. Stock-pickers go to great pains to gather facts, to assess them and to trade them. In spite of the fact that the performance of most mutual funds does not justify these costs, the turnover of stocks has actually increased over time. Active investors are more active than ever. Another supportive observation of financialization.

The result, much applauded in business schools, was the rise of "stockholders' wealth maximization" as raison d'etre of corporations, and "short termism" as the emergent phenomena, at the top of the corporation. Financial targets were set and had to be met, whatever their implications for the long term viability of the enterprise. A company that failed to do so could be punished by a declining stock price and, ultimately, the discipline of a hostile takeover, followed by aggressive disruption of the techno-structure. The situation greatly favored the emergence of firms that, unlike the integrated industrial behemoths of the 1950s and 1960s, were purely focused on advanced technology. It is no surprise that high technology elements tended to separate from the large corporation, leading to the emergence of a separate technology sector in the 1990s, the platform company.

Most CEOs are criticized for being slaves to short-term profit targets. Yet few flout the orthodoxy in flamboyant fashion. Consider TESLA, a maker of electric cars. By September in 2017, it missed its production targets and lost $1.86billion of its free cash flow, the money firms generate after capital investment has been subtracted. No matter. When Elon Musk, its founder, muses aloud about driverless cars, space travel, TESLA's stocks rise. 66% since January to October 2017. AMAZON lost $4billion between 2012 and 2014 without being punished by the stock markets. Only 25, or 3.3%, of the Russell 1000 index of large American firms lost over $1billion free cash flow in 2016. In 2007 the share was 1.4%, and in 1997, under 1%. In 2017, NETFLIX and UBER are the other billion-dollar losing tech companies that claim their, so far unproven business models, will transform industries, the other $billion losers were energy companies in the doldrums as they adjusted to the plunge in oil prices. CHESAPEAKE ENERGY has lost at least $1billion of free cash flow a year for 14 years in a row. NEXTERA ENERGY managed 12 rears on the trot. Collectively, TESLA, UBER, NETFLIX, CHESAPEAKE ENERGY and NEXTERA ENERGY have burned $100billion in the past decade, yet they boast a total market value of about $300billion.

DuPont, on the other hand, grew from a start-up gunpowder maker in 1802 to a major global chemicals, materials and life sciences company that has endured for over 2 centuries with more than 60,000 employees in 2005 and $27billion in revenue underperformed the broad market indices for much of its history. DuPont's management's focus had been on the endurance of the firm, not on short-term stockholders' wealth. APPLE Inc. is different. In the spring of 2013, Tim Cooks, the company's CEO decided to borrow $17billion, when it already had $145billion sitting in the banks outside of the US, with another $3billion in profits in every month, for buy-backs to goose the company's lagging stock price. The tactic worked. The stock soared, making APPLE the biggest according to market capitalization and yielding hundreds of millions of dollars in paper wealth for APPLE' board members who approved the tactic and for the company's stockholders of whom Tim Cook is one of the largest. APPLE seemed to have applied same level of creativity in financially engineering its balance sheet as it did engineering its products.

One of the quandaries of the last three decades has been the way in which reductions in spending on research and development have coincided with an increasing financialization of the private sector. While causality may be hard to ascertain that will meet Judea Pearl and Dana Mackenzie's expectation they explain in THE BOOK OF WHY: THE NEW SCIENCE OF CAUSE AND EFFECT (Pearl and Mackenzie, 2018) , it cannot be denied that at the same time that private pharma companies have been reducing their research and development budgets, they have been increasing the amount of funds used to repurchase their own stocks, seemingly to boost their stock price, which affects the price of stock options and executive pay linked to such options. In 2011, along with $6.2billion paid in dividends, PFIZER repurchased $9billion in stock, equivalent to 90% of its net income and 99% of its research and development expenditures. AMGEN, the biggest biopharma company, has repurchased stock every year since 1992, for a total of $4.2billion through 2001, including $8.3billion in 2011. Since 2002 the cost of AMGEN's stock repurchases has surpassed the company's research and development expenditures every year except 2004, and for the period 1992-2011 it was equal to fully 115% of research and development outlays and 113% of net income (The Economist, 2018). Boosting stock prices does not create value, but facilitates extraction, rewarding stockholders and executives. The problem of stock buybacks is not isolated but rampant. In the last decade, S&P 500 companies have spent $3trillion on buybacks.

William Lazonick in SUSTAINABLE PROSPERITY IN THE NEW ECONOMY: BUSINESS ORGANIZATION AND THE HIGH-TECH EMPLOYMENT IN THE UNITED STATES (Lazonick, 2009) chronicling stock buyback identifies two trends, when taken together, as a shift from a model of 'Retain and Invest' to "Downsize and Distribute". "Retain and Invest" strategy uses finance only to set up a company and start production. Once profits are being made loans are likely to be at least partly repaid because retained earnings are a cheap way of financing the next production cycle and investments to expand market share. "Downsize and Distribute" is different. It views companies merely as "cash cows" whose least productive branches have to be sold. The resulting revenue then distributed to managers and stockholders, rather than to others such as workers who have also contributed and are contributing to the business. The results may hamper the growth of the company. If the stockholders are happy, however, the strategy is justified.

Perversely it was the conservative Japanese who took trading within corporations to a new level. They were slavish lovers of American management theory. They had used the work of FREDERICK TAYLOR and EDWARD DEMING to revolutionize manufacturing. TOTAL QUALITY MANAGEMENT, JUST-IN-TIME and ZERO DEFECT. They would do the same with financial management. This was ZAITEC or ZAITEKU, financial engineering. The treasury, the financial function within companies, was to be a profit center. ZAITEKU meant trading in financial instruments to earn revenues for the company. Banks used corporate business to trade and make profits so corporations could use their own flows to make money as well. In management jargon, it was "internalization".

Japanese corporations embraced ZAITEKU with a passion. Following the PLAZA ACCORD in 1985, the yen appreciated, creating havoc among Japanese exporters who had come to rely on the cheap currency. The shift meant that these exporters had to change strategy, which in most cases meant moving production facilities offshore. Unfortunately, one cannot move a car plant to Ohio overnight. Japanese companies tried to use ZAITEKU to generate earnings to cover up the weak profitability of the main businesses. Japanese corporations traded foreign exchange, bonds, commodities, and even equities. Derivatives with their leverage and off-balance sheet nature, were ideal.

In 1967 Sheen Kassouf and Edward O. Thorp in BEAT THE MARKET: A SCIENTIFIC STOCK MARKET SYSTEM (Kassouf and Thorp, 1967) explained how to price convertible bonds which are hybrid securities made up of a bond, which pays a regular interest payment, and those thinly traded warrants, which give the owner the right to convert the security to stock [hence the name of the bonds]. Pricing a warrant was a difficult task, since its value depends on forecasting the likely price of the underlying stock at some future date. The system THORP and KASSOUF devised helped them make predictions about the future course of stock prices, and enabling them to discover which convertible bonds were mispriced. The future movement of a stock, a variable known as "volatility" is random, and therefore quantifiable. And if the warrant is priced in a way that underestimates, or overestimates, from its likely volatility, money can be made. THORP and KASSOUF were the first to devise a quantitative method to discover valuation metrics for warrants, as well as correlations between how much stock investors should hold to hedge their position in those warrants. Over time, this way of arbitraging came to be called DELTA HEDGING.

The most famous form of ZAITEKU was the "Japanese warrants arbitrage". Japanese companies issued bonds with attached equity warrants. The warrants gave the buyer the right to buy shares in the company, effectively a call option on the shares. The company received the premium for the option as a low interest rate on its borrowing. The Japanese companies competed with each other to get lower interest rates. Dealers competed with each other to give the Japanese companies lower interest rates. The coupon on the bond reached zero and in some cases the cost of the debt was negative. The companies invested the borrowed money in matching bonds, locking in the difference between the interest they received and the interest they paid, if they paid any at all. The companies booked the difference as profit. Under Japanese accounting rules, the shares to be issued if warrants were exercised did not seem to be taken into account.

Companies invested in bonds that they or other companies issued as part of the debt plus equity warrants issue. The warrants were stripped off and placed with someone, leaving only the bond. The warrant buyer paid a hefty premium to punt on Japanese stock markets going up. In 1980s the NIKKEI only went up. The premium allowed the holder of the bond to earn a decent rate of interest. This was all done with the magic of derivatives, an asset swap.

The company issued bonds with warrants at almost no interest cost, then they invested the proceeds in the same or near-identical bonds at higher rates to lock in profits. The dealers did not care. They were making money going in and coming out. In 1989, the Japanese bubble burst. Japanese companies reported losses, some totaling, billions of dollars. It was not fashionable any more to have treasuries as profit centers in Japanese corporations.

NIKKEI, after reaching a high of more than 39,000 in 1989, took a nosedive and everything else followed. Few warrants were ever exercised. The Japanese companies had sold the call options on their own stock at the top of the market and banked profits. The warrant buyers were the losers. In a perverse twist, the American and European companies, having exported ZAITEKU to Japan, began feverishly to copy it.

Without heeding the lessons of how ZAITEKU's application ended in Japan, academics and commentators eulogized financial engineering as the revolutionary new thing, and some still do even after the 2008 financial crisis.

In ASSET MANAGER CAPITALISM that developed in the United States on the other hand, for those with exceptional imagination, scientific talent, quantitative wizardry, or just skills to persuade venture finance that they possess these traits, the prospects and outcomes were spectacular. They could raise huge sums, pay themselves well, and start new companies in a hurry. There emerged a new business elite: young, mysteriously knowledgeable, independent, and fabulously rich after their dot.com IPOs with a lot of hype from the media that they paid for, and help they got from FED's Chairman GREENSPAN's monetary policy, the GREENSPAN PUT, that eventually the taxpayers and/or owners of worthless bonds, Western retirement systems and their central banks would pay for.

At first glance, the new business elite of the 1990s appeared to be very different than salaried, bureaucratic engineers and organization men of the 1950s and the 1960s who ran the large corporations associated with ALFRED SLOAN at GENRAL MOTORS. In fact, they appeared to be a familiar type, much celebrated in the economics of an earlier age. The identification of the new class of business leaders with the old entrepreneurial archetype was irresistible in an age when ideas of FRIEDMAN and HAYEK were being aggressively promoted in business schools to justify the triumph of free markets. In fact, there was little similarity between the old and the new entrepreneurs. To a large degree, the new technology entrepreneurs were in fact the same people who had formerly worked in the great labs of the large corporations. There was also a large difference in what they did.

The "rugged entrepreneur" of the supposed old days triumphed by building smarter and cheaper and by working harder and by attracting and holding customers and market share. All of that took time, and time was something for which the information technology boom had no time. Instead, in the new age, there was a shortcut. Getting rich simply meant getting the approval of the capital markets. The right connections, a patent, a trade secret, and a business plan where the preconditions for raising money. Actual business success would come later, if it came at all. One would find out, after the fact, who had a brilliant innovation and the capacity to pursue it and who did not. But all the executives were rich, at least for a while, as soon as the money had been raised.

The investment bankers and the technologists were closely allied in the emerging ASSET MANAGER CAPITALISM. Innovation in one area, Michael Milken's JUNK BOND MARKET, helped fuel the growth of the other. The financiers combined with the techno-entrepreneurs promoted a new vision of the NEW ECONOMY, a NEW PARADIGM, hence the 1990's business school heresy. EFFICIENT MARKET HYPOTHESIS holds that all the information available that could affect the market price is already embodied in the market price. So although the market may turn out to have been "wrong" in retrospect, in the sense that it priced a stock cheaply that subsequently soared, or priced expensively another one that subsequently plummeted. It is never wrong prospectively. That is to say, it never ignores or misuses information, leading to systematic mispricing. Accordingly, if market prices diverged substantially from what traditional valuation models suggested was fair and reasonable, there must be something wrong with traditional models. The search was on for new models suggesting that market values were fair and reasonable. Hence the idea of the NEW ECONOMY and the spate of new ways of valuing companies, especially those that did not make any profits and seemed unlikely to do so for the foreseeable future.

There is a difference between a manager running a company that is not his own and an owner-operated business in which the manager does not need to report numbers to anyone but himself, and for which he has a downside. Corporate managers have incentives without disincentives. The asymmetry is visibly present. Volatility benefits managers since they only get one side of the payoffs. The main point is that they stand to gain from volatility, the more variations, the more value to this asymmetry.

In 2018, Larry Culp, the new CEO of GENERAL ELECTRIC, was awarded a contract that could pay out $237million. In 2017, a CEO at one of America's 350 largest firms earned on average $18.9million, according to ECONOMIC POLICY INSTITUTE of Washington D.C., that is 312 times as much as the average worker's earnings- a ratio close to its peak, 344, in 2000. The similarity between 2000 and 2017 is the soaring value of stock options. The stock market was at the end of a long boom in 2000 and surged again in 2017, prompting many CEOs to cash in their stocks. Before enthusiasm for awarding stock options to executives took off as USA moved from MANAGERIAL CAPITALISM to ASSET MANAGER CAPITALISM, the ratio between CEO and worker pay was 32, just as CEOs started to be paid more in form of equity, the stock market took off. At the start of 1985 American stocks traded at on a cyclically adjusted ratio of 10, in 2018 the ratio is over 31 according to Robert Schiller of Yale University.

A FORTUNE study in 2013 showed that only 1% of the American companies poached a CEO from abroad, and many promote from the inside. In Japan CEOs have rarely been given stock options, and Japanese executive pay is a little more than a 10th of that in America, and about a quarter of the British level. Deborah Hargreaves in ARE CHIEF EXECUTIVES OVERPAID? (Hargreaves, 2019) summarizes that CEOs' pay in FTSE 350 companies rose by 350% while pre-tax profits rose by 195% and revenues by 140% between 2000 and 2013. One problem is that the award of equity to executives means that the income-rich and the capital-rich are more than ever the same people in the USA and the UK.

Near industrial history of the United States, according to business school mantra, was to be seen as indistinguishable from a world of free and competitive markets. In the textbook sense, a very large number of very small firms, each produced a standard product by standard methods and taking prices as given by the market itself. The well-developed, highly stylized, utterly irrelevant principles of the free and competitive markets were to be applied to the world of unstable and changing corporations, whatever the violence to the facts. The business schools in America propagated the revival of conservative myth, the application of a set of aged ideas to a world in no way suited to receive them.

Orthodox neoclassical economic theory is a mathematical representation of human behavior, and like any mathematical model it is based on certain assumptions. In the case of economics, the assumptions are largely out of touch with reality. Many think the assumptions are reasonable because they are based on ideas from areas like physics or engineering that are part of the West's 2,500-year scientific heritage dating back to ancient Greeks. Superficially orthodox economic theory seems to have the look and feel of science, without empirical verification of sciences.

The orthodox economic theory, in its linearity, rationality, and obsession with concepts such as scarcity and equilibrium, is PYTHAGOREAN to the core, and has been ever since the subject was modelled after physics in the 19th century. Neoclassical economics was explicitly modeled after NEWTON's "rational mechanics". NEWTONIAN dynamics can be expressed through the calculus of variations as an optimization problem: objects moving in a field take the path of least action. LEIBNIZ had explained the idea by comparing

God to an architect who "utilizes his location and the funds destined for the building in the most advantageous manner." Reasoning along the same lines, neoclassical economists assumed that in the economy, individuals act to optimize their own utility – defined rather hazily as being whatever is pleasurable for that person – by spending their limited funds. Economists could then make NEWTONIAN calculations about how prices would be set in a market economy to arrive at what WILLIAM STANLEY JEVONS called a "mechanics of self-interest and utility".

A reason why mathematics works so well in physics is that, as far as we are told, subatomic particles such as electrons and quarks are the same everywhere in the universe. As a result, a hydrogen atom on Earth is the same as one in the Sun. People on the other hand, are different. To get around that problem, economists argued that what really counted was the behavior of the "average man". This concept was first introduced by the French sociologist, ADOLPHE QUETELET, who saw the average man as representing "perfect harmony, alike removed from excess or defect of every kind...the type of all which is beautiful – of all which is good". As economist FRANCIS EDGEWORTH put it, "the first principle of economics is that every agent is actuated only by self-interest." Thus was born HOMO ECONOMICUS, or "rational economic man" – an idealized expression of Nietzsche's APOLLONIAN PRINCIPIUM INDIVIDUATIONIS.

Using this imaginary being as the atom of the economy, economists argued that in a competitive market prices would be driven to a stable equilibrium via ADAM SMITH's invisible hand. If a particular good were too expensive, then more suppliers would enter the market and competition would drive the price down. If prices were too low, then suppliers would go broke or leave and the price would rise. The result, according to FRANCIS EDGEWORTH, would be "the maximum pleasure" for both individuals and society as a whole. In the 1940s, JOHN VON NEUMANN used "rational economic man" as the basis for his game theory, which studied the interactions between rational actors who are trying to optimize their own outcomes in conflict.

In the 1960s, economists KENNETH ARROW and GERARD DEBREU used a method popular in game theory known as BROUWER's FIXED-POINT THEOREM to prove that, under certain conditions, free markets lead to optimal "fixed point" for the economy in which prices are set at their correct levels and nothing can be changed without making at least one person worse off. This result – a harmony of parts in which any change is for the worse - was soon being claimed as proof that capitalism was superior to communism. But to accomplish this feat, the powers of "rational economic man" had to be extended to include infinite computational power and the ability to devise plans for every future eventuality. The ARROW-DEBREU MODEL is called the crown jewel of neoclassical economics, and inspired the development of GNERAL EQUILIBRIUM MODELS which are still relied on by policy makers today. Unfortunately, numerous studies have shown their predictive accuracy is not much better than random guessing.

10.Fire [finance, insurance, real estate] on planet earth, is it arsony?

The whole of economic life is a mixture of creative and distributive activities. At any given stage of economic development, successful societies maximize the creative and minimize the distributive. Societies where everyone can only achieve gains at the expense of others are generally impoverished. They are also usually intensely violent. A critical distinction that Roger Bootle makes in THE TROUBLE WITH MARKETS: SAVING CAPITALISM FROM ITSELF (Bootle, 2012) is between creative and purely distributive activities. Bootle's distinction is close to what William J. Baumol highlighted in his delineation of ENTREPRENEURSHIP, MANAGEMENT, AND THE STRUCTURE OF PAYOFFS (Baumol, 1993). The market economy creates GDP growth not because every person is continually involved in activities that, in classic income-accounting terms, create value, but because on the average competition between individuals and firms are in their direct effects purely distributive.

Bootle suggests that as average income increases richer societies tend to become more litigious societies. In richer societies consumers are able to devote a significant slice of income to buying goods solely because they bear a brand. An increasingly rich economy is likely to be one in which more of productive activities are devoted to zero-sum and distributive competition. As the richer societies get, as measured by per capita GDP, the more arbitrary and uncertain some of the conventions required to calculate GDP becomes.

Rana Foroohar in MAKERS AND TAKERS: THE RISE OF FINANCE AND THE FALL OF AMERICAN BUSINESS (Foroohar, 2016) agrees with Adair Turner who in BETWEEN DEBT AND THE DEVIL (Turner, 2016) explains that rather than funding new ideas and projects that create jobs and raise wages, finance has shifted its attention to securitizing existing assets like homes, stocks, and bonds and such, turning them into tradable products that can be sliced and diced and sold as many times as possible, that is, until things blow up, as they did in 2008. Turner estimates that a mere 15% of all financial flows now go into projects in the real economy. The rest simply stays inside the financial system, enriching financiers, corporate titans, and the wealthiest fraction of the population, which hold the vast majority of financial assets in the United States and, indeed the world.

Rana Foroohar claims that America's shift to ASSET MANAGER CAPITALISM in which finance became an end of itself, rather than a helpmeet for Main Street, has been facilitated by many changes within the financial services industry. One of them is a decrease in lending, and another is an increase in trading, particularly the kind of rapid-fire computerized trading that now make up more than half of all US stock market activity. The entire value of the New York Stock Exchange now turns over once every 19 months, a rate that has tripled since 1970s, growing the size of the securities industry 5-fold as a share of GDP between 1980 and mid-2000s while bank deposits shrunk from 70 to 50% of GDP.

In this man-made ecology, the financial sector's share of the US GDP has soared from 2.5% in 1947 to 4.4% in 1977 to 7.7% in 2000. By then some 40% of corporate profits of the companies listed in S&P 500 were in the financial sector. These firms' share of the total S&P 500 market capitalization was approximately 25%. Even more startling, the combined income of the nation's top 25 hedge fund managers exceeded the compensation of the combined income of the CEOs of all companies listed in the S&P 500. In 2008, no less than one in every $13 in compensation in the US went to people working in finance. By contrast, after WWII a mere one in $40 was the compensation of the people who worked in finance. In the first half of 2015, the United States boasted $81.7trillion worth of financial assets, more than combined total of next three countries, China, Japan and the United Kingdom. One of the most pernicious effects of ASSET MANAGER CAPITALISM has been the rise of finance and its role in the growth of massive inequality.

The attenuation of ownership has reached a point where between one-third and one-half of most of the large corporations in the United States are owned by institutions, not by only mutual funds, but insurance and pension funds, charitable endowments, churches, colleges and universities, public service foundations, and private trusts funds generally. At first glance one might think that the vesting of ownership in such responsible hands of money managers would make for stability. Quite the contrary. The managers of funds are indeed responsible, but theirs is a fiduciary responsibility, which constrains them to accept whatever offer promises the highest immediate gain for beneficiaries and their asymmetric bonuses. If they do not, they may find themselves defendants in a suit for damages.

The predominant neoclassical economics has perceived increased financial activity – greater market liquidity, more active trading, financial innovation – as broadly positive development. This is because extensive financial activity is essential to 'complete' markets. The first fundamental theorem of welfare economics, demonstrated mathematically by KENNETH ARROW and GERARD DEBREU, illustrates that a competitive equilibrium is efficient. Complete and perfect markets deliver a PARETO-EFFICIENT equilibrium, in which no one person can be made better off without making someone worse off. And the development of the efficient-market and rational-expectations hypotheses suggested that financial markets are in fact efficient, and that the conditions required for efficiency and for rational and stable equilibria apply even in contracts between the present and the future, which financial markets provide. Together these ideas provided the intellectual underpinning for the powerful ideology of market liberalization and deregulation, an ideology that became increasingly dominant over the last several decades – the WASHINGTON CONSENSUS.

According to WASHINGTON CONSENSUS, almost all economic activities could be made more efficient if markets were allowed to operate with minimal interference. Free trade, product-market liberalization, and structural reform of labor markets were all perceived as elements of a universally relevant policy approach, and free financial markets with unrestricted flow of long and short term capital, and financial deepening with access to a wide array of different financial markets and services as essential to the efficient allocation of capital.

The political ideology was free-market capitalism. The intellectual underpinning was the concept of market completion. The idea that the more market contracts could exist, and the more freely, fairly, and transparently they could be struck, the closer we could get to the most efficient possible outcome, the one most favorable to human welfare. One of the consequences of the capital-account and financial-market liberalization that followed was a very steep increase over the last 30 to 40 years in the relative scale of financial activities within the economy, with dramatic increases in capital flows, in the financial markets' trading volumes, and in the size of financial institutions' balance sheets relative to real non-financial activities.

The financial system had grown too large. It had ceased to be a means to an end and had become an end in itself. The size and scale of financial market activity in relation to the underlying economy has led some to question whether unfettered free market economy had promoted finance, the servant, to the position of master of the economy and, more broadly, society. An excessively large financial sector relative to the GDP should be a cause of concern to those interested in long-term economic growth because financial crises are often associated with unsustainable growth of the financial sector. Mariana Mazzucato in THE VALUE OF EVERYTHING: MAKING AND TAKING IN THE GLOBAL ECONOMY (Mazzucato, 2018) scrutinizes the way economic value has been accounted and reveals how neoclassical theory failed to delineate the difference between value creation and value extraction, allowing certain actors in the economy moving around existing value or, even worse destroying it to benefit themselves.

A 2011 study by the SWISS FEDERAL INSTITUTE OF TECHNOLOGY mapped the network of direct and indirect ownership links between 43,000 transnational corporations to make a map of financial power in the global economy. The research summarized that less than 1% of the companies were able to control 40% of the entire network. Most of these powerful companies were financial institutions from the "virtual" financial economy, companies that make money out of money. As the researchers point out, this dominance by a small group can be viewed as the outcome of a natural process and does not demonstrate conspiracy or collusion.

The distribution of power in the economy is related to the fractal structure which characterizes many natural systems. A common property of fractal objects is that their features exhibit what is known as scale-free, power-law statistics. There is no typical size or scale. The only rule is that the larger event or feature is, the less likely it is to happen. There is no such thing as "normal" pattern and extreme events are part of the landscape. Similar relationships hold for price changes in a stock market, the size of craters on the Moon, the diameters of blood vessels, the populations of cities, wealth distribution in societies, and many other phenomena. But it is clear from the network map of the SWISS FEDERAL INSTITUTE OF TECHNOLOGY that the symmetrical neoclassical picture, which sees the economy as being made up of independent "average" firms of similar power, is rather misleading as Benoit Mandelbrot has argued since 1975 in FRACTALS: FORM, CHANCE AND DIMENTION (Mandelbrot, 1998).

In the three decades before the crisis, the financial services industry has undergone exorbitant and utterly unwarranted growth, driven by financial liberalization, financial innovation, elimination of capital controls, and globalization of finance. This triumph of finance is inexorable so long as ownership carries no responsibilities. Irresponsible owners are classical HOMO ECONOMICUS par excellence, and they go where they can get the most of what they are interested in, which is money. Hence they put pressure on brokers to find them companies that will slake their thirst. Brokers pressured investment bankers to float the issues of such companies. Investment bankers pressured commercial bankers to give priority to such companies. Pressure, then was brought to bear on the management of public companies to do whatever needed to be done to thicken the bottom line. Frequently, merger-and-acquisition-and-diversification is the outcome. Bottom line is improved by rationalizing the merged companies by downsizing, closing plants and firing people. Finance remained relatively independent from the rest of economic activity, and even became predatory and destructive toward it.

One property of such networks is that they are susceptible to seizure-like failures. As Albert-Laszlo Barabasi wrote in BURSTS: THE HIDDEN PATTERNS BEHIND EVERYTHING WE DO, FROM YOUR E-MAIL TO BLOODY CRUSADES (Barabasi, 2011) "Cascading failures are a direct consequence of a network economy, of Inter-dependencies induced by the fact that in a global economy no institution can work alone." Orthodox neoclassical economic theory is based on a very particular type of network, one in which economic agents have no connection with one another at all, except to buy and sell.

11. The cesarean birth of fx market: privatization of the measuring stick of world's monies

We need to try to model the economy not as an efficient and independent machine, but as something more like a living ecosystem. ADAM SMITH's invisible hand is an emergent property of this system, which never reaches an optimal equilibrium, but instead is fundamentally dynamic and unstable, with complex effect on society. The financial network is both highly creative and prone to seizure-like crashes. The entire financial system is now described as a kind of virtual network of electronic information. Since NIXON's exit from BRETTON WOODS AGREEMENT, currencies have floated against one another. The result has been an explosion in the amount of currency dealing. Every day, around $5trillion is shuffled around computer networks, bouncing off satellites, relaying through computer terminals, like the neural signals of a giant electronic brain.

Excess credit creation of American banks and their affiliates in EURODOLLARs resulted in radical increases of foreign investments by American corporations in Europe in the 1960s. Then the US dollar was effectively the world's currency, and thus additional creation of dollars was expected to be diffused around the world without any adjustment in exchange rates until the world rebelled. When the US corporations tried to buy the world with the credit American banks and their affiliates created, France called the US's bluff that set the value of the US dollar at $35 for one Troy ounce of 24 karat gold with BRETTON WOODS AGREEMENT. France decided to convert US dollars into gold at the official fixed price, as BRETTON WOODS SYSTEM formally provided for. The US leadership had to make the decision either to keep its promise and redeem the excessively created dollars into gold, or break its promise and with it bring down the BRETTON WOODS SYSTEM of fixed exchange rates. France proceeded to demand conversion of dollars into gold, in an episode later called the "French raid on Fort Knox". Nixon decided to break US's promise. He closed the GOLD WINDOW. With this, the fixed exchange rate system had ended, and currencies started to float for the first time without any link to gold. The fiat money float began to emerge, FOREIGN-EXCHANGE [FX] market.

President Nixon ended dollar's tie to gold on 8/15/1971. Two decades later, monetary policies of ALAN GREENSPAN pushed the prices of financial assets and real estate up making them havens for investors to avoid US dollars' depreciation, as the US economy changed from an industrial powerhouse into a financial and consumption casino that imploded with 2007-2008 financial crisis. According to BANK OF INTERNATIONAL SETTLEMENTS [BIS], in 2013 at $5.3trillion per day, FX, currency trading dwarfed all the globe's stock markets and was 73 times greater than all global trade in goods and services.

It seems that nobody called Japan's bluff during the 1980s, when the credit Japanese banks created enabled Japanese corporations' purchasing sprees of buying foreign assets. The world seemed to have enjoyed not suffered from YEN ILLUSION. When BANK OF JAPAN abruptly stopped credit creation in 1989, JAPAN's double bubbles burst and capital outflows from Japan came to a halt and eventually reversed.

However, in this new world of floating currencies Nixon's decision gave birth to placed a great burden on the newly born foreign exchange markets. If a country decides to create more purchasing power than is backed by its real economic activity, the task of recognizing this was now foreign exchange markets' by selling enough of this currency to reduce its value. The Japanese experience of the 1980s demonstrated that even the yen-dollar foreign exchange market, the most liquid market in the world, failed its responsibility. Apparently foreign exchange market participants for years were either unaware of the BoJ's excessive credit creation., or failed to understand its implications and act accordingly.

The FORIEGN-EXCHANGE [FX] market is not transparent, but opaque. It is technologically old to accommodate its oligopolistic market structure. Old-boys' network. And, it is colossal. Most of its $5trillion of daily trading happens 'over-the-counter' [OTC], in deals negotiated between banks and private customers, rather than on exchanges. Many orders are still placed by phone. To Gauge its market's size and structure usually mandates reliance on outdated surveys provided by outsiders. The most comprehensive review, by the BANK OF INTERNATIONAL SETTLEMENTS, is conducted only once every three years. Yet modernity is arriving in fits and starts. In April, 2019, it emerged that DEUTSCHE BORSE, Europe's third largest stock exchange, was negotiating to buy FXall, an electronic FX-trading platform, for a reported $3.5billion. It signals at a shake-up in a sector that has long been deemed antediluvian.

The FX market serves not only investors, but corporations and governments seeking to protect trade or bonds against currency swings. FX contracts can be 'spot' for immediate delivery, 'forward' for delivery at a later date, or 'swap' when currency is exchanged back at maturity. Buyers go through dealers, mostly big banks, which source liquidity. Specific needs, such as matching cash-flow dates, are met using OTC trades. This is not likely to change soon. Rather, DEUTSCHE BORSE is betting that buyers will abandon "voice" orders, placed via single banks, in favor of digital platforms that pool prices from multiple dealers. The trend is already boosting e-trading in spot FX. Over the last 10 years, volumes have doubled and FXall's share of this electronic activity has reached 40%.

The change has been slower with longer-dated FX-derivatives contracts, such as forwards. The longer the maturities, the fewer the transactions, and the harder it is to connect enough users simultaneously in order to get e-trading to work. But, tighter regulation is increasing costs, that asset managers are seeking to offset elsewhere. European regulators demand that they demonstrate that they are trading at the best possible price. E-trade, by connecting buyers with multiple dealers in an instant, as well as leaving a clear audit trail achieves both. As long-dated contracts become more common, liquidity will be boosted.

As FX goes digital, the ranks of dealers are expected to be reduced. In the spot market, the trend has developed "principal" trading firms, which buy and sell on their account using algorithms. It has also fueled competition among banks, slashing margins and pushing smaller ones to exit the business, leaving bulk of the deals to handful of big banks, often in partnership with principal trading firms. A cozy arrangement for the time being. Maturities beyond a week have been little affected so far. The rise of centralized clearing is also helping to level the playing field. Only 3% of FX derivatives' trades currently go through clearing houses, which absorb the risk one party defaults. Clearing is set to become more attractive for traders, in part because regulators are requiring higher collateral to be held on some un-cleared FX deals. E-trading already makes it easier for users to find non-bank dealers. By moving counterparty risk, clearing will weaken the advantage that banks with big balance-sheets enjoy over the newer trading firms.

To deal with increases in the floods of money, major banks spent half a trillion dollars on information technology, decisively leading all other sectors on computer outlays. The work of maintaining the measuring stick function of money is estimated to cost 20% more in computer equipment than all the world's information technology for manufacturing new goods. With vastly greater speed and automation, the large banks with big balance sheets perform the role previously played by the gold peg, while at the same time putting constraints on every country to follow its own exchange policy.

Dangerously banking intensive, the system channels all the world's commerce through the portals of the great international banks. Just 10 in the United States and 15 in United Kingdom and enables these to collect fees. With 16.11% of total trading in May 2015, the largest player was CITIBANK, DEUTSCHE BANK ranked second with 14.54% (The Economist, 2019). Moreover, that work yields a volatile but steady rising proportion of all banking profits. In this emerged system of private SEIGNIORAGE – profiting from creating money – the largest traders capture hundreds of billions of dollar's equivalents every year from setting the measuring stick. FX market is a speculative ocean of currencies that banks surf for profits. These banks extract the fees as a kind of volatility tax on entities that use them to hedge currencies.

By various measures 90% to 97% of all transactions are judged to be "speculative" devoted not to enable trade in goods and services but to harvest profits and fees from arbitrage and leverage. Transacting some 77% of the business are 10 banks in the Western countries. In the forefront of the foreign exchange operations are the US and Europe, with London accounting for 36% of all trades. Some 87% of transactions involve the US$, in which 63% of all international trade is denominated and which accounts for more than half of all global reserves held by central banks to back their currencies.

Currency trading has been rising at least 20 times faster than productivity growth. Devoid of ISAAC NEWTON's gold standard that made economic valuations calculable and reliable as the physical dimension of traded items, China, Hong Kong, Singapore and Taiwan, that have spearheaded the global trade expansion in recent decades, have all largely opted out of the floating-currency system. Against agonized protests from the West, lately loudly from President Donald Trump's White House, they fix their currencies on the dollar as much as possible, and some of them impose controls on capital movements. Outside of the Asian emerging sector, world trade has inched up only slowly. Likewise, global GDP growth. A privatized SEIGNIORAGE conundrum.

12. Is planet earth alive?

It is a habit of contemporary public relations to frame today's the global economy as 'economy' and, more insidiously, to present it as a natural phenomenon whose putative laws must be regarded with the same deference as the laws of physics. But as some argue cogently, our global economy is but one of many possible economies, and, unlike the laws of physics, we have political choices to determine when, where, and to what degree the so-called laws of economic behavior should be allowed to hold sway. An economy is a man-made ecology, or rather the man-made part of our larger ecology of interaction between the man-made and natural worlds. Neoclassical economic perspective generally fails to recognize that economy is merely one aspect of a whole ecological and social fabric. And at times economists have tried to remodel the environment to fit to the neoclassical model as during Russian transition to capitalism and globalization of finance at the end of 20th century explains Roger E. Backhouse in THE PUZZLE OF MODERN ECONOMICS: SCIENCE OR IDEOLOGY? (Backhouse, 2010).

Planet Earth is a living system composed of human beings in continual interaction with one another and with their natural resources, most of which are, in turn, part of mega-living system, GAIA. Planetary physiology, GAIA, is the result of innumerable beings. GAIA is symbiosis seen from space. Any organism that appears or species that evolves at first has a chance. But to persist, life forms must survive not on their own but within a global environment. They become integrated, or they die away. In the long run organic beings confront their limits of their multiplication. They survive not alone but within a context of global life. Lynn Margulis and Dorion Sagan in WHAT IS LIFE? (Margullis and Sagan, 2000) argue that the strength of symbiosis as an evolutionary force undermines the prevalent notion of individuality as something fixed, something secure and sacred. A human being in particular is not a single, but a composite. Each of us provide a fine environment for bacteria, fungi, roundworms, mites, and others that live in and on us. Our bodies are actually joint property of the descendants of diverse ancestors. Survival seems always to require networking, more interaction with members of other species, which integrates surviving species further into global physiology.

The basic reductionist error of the social sciences is to divide this fabric into fragments, assumed to be independent and to be dealt with in separate academic disciplines. Those economists who wished to study economic phenomena as they actually existed, embedded within society and the ecosystem, and who therefore dissented from the narrow economic viewpoint were virtually forced to place themselves outside economic 'science', thus saving the economics fraternity from dealing with the issues their critics raised. MAX WEBER, for example, the 19th century critic of capitalism, is generally regarded as an economic historian. JOHN KENNETH GALBRAITH and ROBERT HEILBRONER are often thought of as sociologists. KENNETH BOULDING is referred as a philosopher. KARL MARX, by contrast, refused to be called an economist and saw himself as a social critic, asserting that economists were merely apologists for the existing capitalist order. In fact, the term 'socialist' originally described those who did not accept the economists' atomistic view of the world.

By subsuming land within the category of capital, almost all post classical economists treated Nature to be a subset of the human economy, an endless pile of resources to be transformed into wealth. Where economists assume that needed resources will magically arise because the marketplace demands them, a more holistic model would begin with the observation that the economy only exists because resources are available. The economists also assumed that natural resources could always be substituted with some other form of capital, money or technology.

The reality, of course, is that the human economy exists within and entirely depends on Nature, and many natural resources have no realistic substitutes. The natural world is not a subset of the economy. It is the other way around. The economy is a subset of the natural world. This fundamental logical and philosophical mistake, embedded at the very core of mainstream economic philosophies, set society directly on a course toward the current era of climate change and resource depletion, and its persistence makes conventional economic theories, of both Keynesian and neoliberal varieties, utterly incapable of dealing with the economic and environmental survival threats to civilization in the 21st century.

In classical NEWTONIAN science nature was seen as a mechanical system composed of basic building blocks. In accordance with this view, DARWIN proposed a theory of evolution in which the unit of survival was the species, the subspecies, or some other building block of the biological world. But a century later it has become quite clear that the unit of survival is not any of these entities. What survives is 'the organism-in-its-environment'. Matt Ridley in NATURE VIA NURTURE (Ridley, 2003) shows that nature evolves via nurture. An organism that thinks only in terms of its own survival will invariably destroy its environment and, as we are learning from bitter experience, will thus destroy itself.

From the systems point of view the unit of survival is not an entity, but rather a pattern of organization adopted by an organism in its interactions with its environment. Evolution is basically open and indeterminate. There is no goal in it, or purpose, and yet there is a recognizable pattern of development. The details of this pattern are unpredictable. In the systems view, the process of evolution is not dominated by 'blind chance' but represents an unfolding of order and complexity that can be seen as a kind of learning process, involving autonomy and freedom of choice.

The systems approach to economics will make it possible to bring some order into the present conceptual chaos by giving economists the urgently needed ecological perspective. According to the systems view, the economy is a living system composed of human beings and social organizations in continual interaction with one another and with the surrounding ecosystems on which our lives depend. Like individual organisms, ecosystems are self-organizing and self-regulating systems in which animals, plants, microorganisms, and inanimate substances are linked through a complex web of interdependencies involving the exchange of matter and energy in continual cycles. Linear cause-and-effect relationships exist only very rarely in these ecosystems, therefore linear models are not very useful to describe the functional interdependencies of the embedded social and economic systems and their technologies.

The nonlinear interconnectedness of living systems suggests two important rules for the management of social and economic systems. First, there is an optimal size for every structure, organization, and institution, and maximizing any single variable, profit, efficiency, or GNP for example, will inevitably destroy the larger system. Second, the more an economy is based on the continual recycling of its natural resources, the more it is in harmony with the surrounding environment. In THE TURNING POINT: SCIENCE, SOCIETY, AND THE RISING CULTURE (Capra, 1983), Fritjof Capra offers a compelling vision of a reality, a reconstruction of science and the human spirit for a balanced future. In a world, where everything is anteceded and interconnected, there is no room for autonomous sources of causation. To claim otherwise is scientific heresy and a philosophical death wish. The entelechy, the uncaused causal agent, is fiction and its source is delusional. Fritjof Capra and Pier Luigi Luisi in THE SYSTEMS VIEW OF LIFE: A UNIFYING VISION (Capra and Luisi, 1983) examine autopoiesis, dissipative structures, social networks, and a systemic understanding of evolution and develop a coherent framework by taking a broad sweep through history and across scientific disciplines.

13. Can cook ratios be cooked under bis's watchful eyes?

The literal failure of the financial system, and the deep and long recession it triggered, offered a dramatic demonstration of the unsustainability of the way the global financial system had been operating. The huge burden of public debt created in the course of the financial breakdown remains, and remains unsustainable. The debt burden due to financial crisis comes on top of existing government debt burdens, sometimes acknowledged, more often off the books either as a deliberate sleight of hand or because they are implicit in the promise of future pension and welfare payments. As well as repaying the debts incurred in sorting out the banking crisis, taxpayers will have to shoulder the debts created by a system of pensions and social welfare, particularly in the rich countries.

The repaying of the public debt of the financial sector's bailout coincides with the developing demographic problem. In 2019, 40 countries have shrinking working-age populations, defined as 16-65 year-olds, up from 9 in late 1980s, according to the WORLD BANK. China, Russia, Spain joined recently. Thailand and Sri Lanka soon will. The balance between people over 65 and those working age, is known as the old-age dependency. It is likely to deteriorate faster because the ranks of employable are decreasing. In Japan where young people are few and life expectancy long, demographers expect 48 people over the age of 65 for every 100 people of working-age in 2020. In 1990 there were just 17. Some countries face gentle downward slopes. Others face steep slopes. Both China and France are gradually losing working-age people. Numbers in France are expected to fall slowly over the next few decades, but in China the numbers will soon plunge. Partly as consequence of its one-child policy.

For more than a generation Western governments have been borrowing on a large scale from their own citizens. But, the governments of the UK and the USA borrowed increasingly from foreigners, from much poorer countries, and are now also facing old-age dependency problems. The cost of these promises will be piled onto taxpayers as yet unborn or too young to vote plus, of course, the added to the costs of debts created by the bank bail-outs. In some countries the scale of the government debt is so large that it can depress those countries' potential to grow enough ever to meet the burden of repayment.

A growth strategy based on financial deregulation was first adopted by the US and the UK in the early 1980s, and later more extreme forms were implemented by Iceland, Ireland, Latvia and Dubai. What was encouraging more and more countries to adopt a growth strategy based on deregulated finance was the fact that in such a system it is easier to make money in financial activities than through other activities, or so it seemed until the 2007-2008 crises.

The financial crisis comes down to one simple fact: liquidity. In other words, the amount of outstanding discounted bills of credit and thus the amount of credit and debt of various agents has increased dramatically by comparison to what was in the 1970s. It seems inflation in the price of goods, or in costs, including wages, for the years 1970-1980 has been replaced by an inflation of financial assets in the 1990s and after.

The multiplication of liquidity means of payment on the basis of credit, the true source of the ex nihilo creation of money, has been observed at all stages of history of money and has taken different and highly technical forms lately with derivatives and collateral instruments. The key thing to understand is that transformations of the rules of governing monetary creation in the various different aggregates are all expanding.

The percentage of liquid assets, in other words, the means of mobilizing resources immediately in cash, which previously stood at 8% of their commitment: a proportion known as the COOK RATIO, has been modified. In order to determine the maximum credit that a bank can give in relation to its own funds, that is the capital it is able to mobilize very quickly in order to address repayment requirements, operational risk has now been added, risk of losses due to people or systems failures. This seems to add a measure of improvement, but also a MARKET RISK, so that the value of credit granted by the bank has to be adjusted to its market value. If the bank is listed and if the market is on the way up, the assets of the bank increase and the bank itself can grant more credit. If the reverse is true, the bank will have to increase its stockholders' equity by selling shares. This is pro-cyclical. Rather than countering and balancing cyclical movements, it accentuates them. It acts as an accelerator of MARKET EXUBERANCE, as GREENSPAN phrased it, during expansionary periods, and also a decelerator of depression during downturns.

Financial deregulation has been marked by a series of financial innovations such as the securitization of public debt, real estate loans, collateral debt obligations, agreements for insurance on payment default, swaps, leveraged buyouts. There is no point in asking which of these financial innovations and changes in accounting practice came first. Like the chicken and the egg, they emerged in rapid response to each other and each provides backup for the other. It was not clear what the unintended consequences of financial innovations would be at the time, but later we will able to observe what they were. Nationalization of liabilities financial institutions turned their losses into public debt.

Leveraging, or the ability to increase the amount of loans granted on the basis of advance deposits and more globally on the basis of the equity of financial institutions, has increased almost five-fold. Whereas formerly $1 of resources immediately convertible into cash would have allowed between $5 to $8 of credit, or fresh liquidity, the COOK RATIO, to be offered. By the eve of the crisis the figure was more in the region of $30 to $35.

Once a financial backwater with a reputation for excessive regulation, with its stock market only set up in 1985, Iceland was transformed into a new hub in the emerging global financial system. From the late 1990s, Iceland grew at an extraordinary rate and became the 5th richest country in the world after Norway, Luxemburg, Switzerland and Denmark. Ireland tried to become another financial hub through the same strategy, with its financial assets reaching the equivalent of 900% of GDP in 2007 and 11 times before the crisis. And then in 2008, Iceland and Ireland collapsed.

14.Accounting systems that mis-account: is the chinese accounting system a panacea or placebo?

Financial accounting has evolved to generate annually published financial statements that are meant to provide corporate transparency. Thereby, enabling the investing public to evaluate corporate behavior and provide the capital markets with the information to help the markets function efficiently. The financial information is provided in three 'statements': the income statement, the cash-flow statement and statement of retained earnings and the balance sheet. But as the notorious implosions of Enron, and other corporate scandals in the late 1990s and early years of the first decade of the 21st century showed these accounting tools cannot be trusted to convey the true state of a business at all. And yet governments, managers, policy makers and shareholders alike depend upon this information when making decisions that affect the lives of everyone.

The world lost its trust in the US GAAP and its auditors after the accounting scandals that bankrupted very large American multinational corporations destroying the savings of millions of investors who bought their stocks and bonds. The US GAAP are the accounting standards United States developed and imposed on the world after the Second World War through the two institutions created to manage the global economic system; the IMF and the WORLD BANK. To deal with the limitations of the US GAAP, the Europeans formalized the INTERNATIONAL ACCOUNTING STANDARDS in the last decade of 20th Century. The 21st Century had the European and the American Standards. Most of the stock markets of the world mandated the financial statements to comply with the European Standards, but not the American Exchanges. The Peoples' Republic of China's first choice was the European

Standards, but later after 2008 they decided to establish their own accounting standards.

The annual financial statements of ROYAL BANK of SCOTLAND kept in compliance with the INTERNATIONAL ACCOUNTING STANDARDS were signed by the auditors in February of 2008. By asset size RBS was bigger than the GDP of the UK. Two months later, RBS was sinking with a loss bigger than 100billion British Pounds. The behemoths of finance and banking regardless of the accounting standards they used brought the financial system down to be bailed out by tax-payers in 2008 causing massive unemployment around the globe. The financial crisis of 2007-2008 seemed to be a gross failure of both of the prevailing financial accounting systems. They both failed to present a true picture of the economic transactions and the true health of the financial institutions.

The financial accounting systems were not the only problems. There are things profoundly wrong with the way we calculate GNP and GDP, our national income and stock of wealth. These numbers generate alarming anomalies, and yet these numbers continue to rule the policy decisions of governments, financial institutions, corporations and communities. The flawed numbers rule our lives. So sacred is the single GDP figure to the US economy that a complex ritual evolved around its announcement, rivalling in mystique and secrecy the selection and announcement of a new Catholic pope. 12 times a year, chief US statistician and his team lock themselves up in Washington without phones and internet, draw the curtains and carry out a task refined over 50 years to arrive at a single number through the convergence of some 10,000 data streams from recent economic activity in the US. That number must not be spoken out loud. Instead, it is explained in a press release the next day by the US PRESIDENT's COUNCIL OF ECONOMIC ADVISERS. So powerful is this figure that no one must utter it before its official revelation. It is released at 8:30 am the next day. And that presented a unique opportunity for President Trump to capture world's attention with his tweet before the revelation.

But the GDP was not designed for this purpose. It was not conceived to be the primary gauge of the economic health of a nation. It was not created to be a key tool for policymakers and investors. It was not born to govern the global financial markets. As a measure of national wellbeing, the GDP is a deeply flawed summary. It was developed in the 1930s in the United States to have a better handle to get the economy out of recession. Simon Kuznets, one of its creators, warned of the limitations of GDP measures, especially their exclusion of household production and other non-market activity, as well as the many omitted costs of ecological damage of economic activity. Global warming and other disasters are some of the consequences of mis-accounting of micro and macro-economic activity.

The internalization of the uniform approaches to estimate GDP by IMF and the WB created global neglect of assessing the cost of damages the developed nations have inflicted on the eco-system. The emerging economies are continuing the abuse of the eco-system at higher and faster rates. The fastest growing doubled its GDP every 7 years in the last two decades of 20th century. The GDP figures, of course, do not include the cost of environmental damage done in the process. On the contrary, actually, as the air quality deteriorates, the resources spent on cleaning the mess and additional health care necessary to reduce the negative impact increases, so does GDP. Some development.

Peoples' Republic of China until 1979 tried to manage its economy by a centrally planned model it imported from Moscow. The results were deemed unsatisfactory. And they were. The mis-accounting of economic activities of the centrally planned years created environmental disasters, also matched in the USSR. GDP accounting system was not designed to treat nature as a scarce good, but treated it as a 'free' good with infinite supply to be exploited. Environmental disasters could have been eliminated had they changed their metrics of micro and macro-economic activities. In importing the accounting systems of market economies, the decision makers overlooked the inherent biases and limitations of market based evaluations, prices, and the total neglect of the costs of public goods exploited in economic development that these accounting systems had.

Accountants, mostly until recently, have assumed that natural resources are so plentiful that any loss of them is insignificant, not worth worrying to count. They assumed, or were told to assume that natural resources like water, soil, forest and air were free gifts of nature. They did not consider that the natural world could be used up worn out in the way that buildings and equipment can. But just as the 19th Century railway entrepreneurs had to learn that human-made capital, rails and trains, wears out and must be depreciated, so some accountants are beginning to understand that nature's capital is also subject to wear and tear, and worse, depletion. GDP's main weakness lies in the fact that it is insensitive to depreciation of capital assets. From an environmental point of view, this is very critical. It actually can be catastrophic.

GNP accounting reflect key economic flows: production, consumption, savings, investment, but they do not measure the state of capital stocks. Social, human and natural resources, as well as human-made capital such as building and equipment from which production is drawn needs to be included. By selectively focusing on flows the GDP sends misleading signals to policy makers. Activities that maximize production in the short term need not preserve the capital stocks that are central to long-term prosperity. Indeed, focusing just on GDP actually creates incentives to deplete capital stocks because the returns are treated as income. Ultimately, not recording the costs of reinvestments to sustain healthy ecosystems creates and conceals ecological liabilities. Sustainability and climate change are the big challenges of our time. We need to stop denying the escalating environmental problems by leaving environmental costs off our books.

It seems that international organizations like the IMF and the WORLD BANK, governments and businesses that are not held responsible for the environmental costs of the damages they inflict have vested interests in GDP measures which emphasize and even exaggerate economic growth. The United States published its first adjusted GDP for depletion of oil and other non-renewable resources in 1994. The figures with their downgraded estimate of US wealth proved so controversial and politically explosive that Congress shut down the program. The lawmakers solved the controversy by shooting the messenger.

From Beijing, the public and private accounting systems of the world do not look like ideal models to import in their totality. Actually, a good number of Chinese eco-system related problems could have been avoided had the decision makers been selective in using market metrics. The changes the Chinese will make in public and private accounting systems are very important with implications beyond their borders. China, for example, is a very important contributor to global warming. By rejecting KYOTO PROTOCOL, President Bush made US position clear on the issue. And so did Donald Trump in 2018 by rejecting PARIS AGREEMENT. The world needs a new leader to offer immediate solutions to a very pressing global problem. The new leader must reform public and private accounting systems to be better metrics of economic activity. We need to understand the new Chinese private accounting system.

On firms' balance sheets GOODWILL appears as an intangible asset and represents the differences between the price the company paid to buy another firm and the purchased firm's original book value. BLOOMBERG's estimate of the total GOODWILL for all listed companies in the world was $8trillion in 2018. Its estimate of total physical assets of all globally listed companies was $14trillion. Not surprisingly, the biggest goodwill reporters were mergers and acquisitions, [M&A], junkies. AT&T had $143billion; ANHEUSER-BUSCH INBEV had $137billion; GE had $82billion; BERKSHIRE HATHAWAY had $81billion. APPLE was a rarity. It had little goodwill because it has eschewed big deals. INTERNATIONAL ACCOUNTING STANDARDS BOARD, [IASB], which frames the rules in most countries apart from America, after an ongoing review, is planning a change. The existing rules are almost identical in America and Europe. When an acquirer buys a firm, it books the GOODWILL, the difference between what the firm has paid to buy the acquired and the acquired firm's book value, on its balance sheet. There is a queasy circularity about GOODWILL. The more companies bid up the price of acquisitions, the bigger the asset they can book. That may be a partial explanation why M&As peek at bull markets. The acquirer then periodically reviews this sum in an impairment test. The revised value is based on new forecasts of the expected cash-flows of the new post-M&A entity. The write-off appears as a loss on the buyer's income statement. Meanwhile, the process of impairment is horrendously subjective.

In the early turbulent stage of the global financial crisis in 2009, leaders at theG20 summit in Pittsburgh decided that the chaotic world of the DERIVATIVES that American law-makers made possible by deregulating them needed to be made safer by ensuring that they are to be centrally cleared. A decade later, the notional value of all derivatives outstanding that are parked as assets of multinational banks globally stands at $639trillion. 68% of them are centrally cleared through a handful of clearing houses. Thus, collectively these institutions contain one of the biggest concentrations of financial risk on the planet.

A subset of these derivatives are traded over the counter, [OTC], by dealers and investors rather than on exchanges. The ECONOMIST (2019) finds OTCs worrisome. The notional value of these OTC DERIVATIVES, according to BIS, is $544trillion, of which 62% are centrally cleared, and traders who avoid clearing houses will be financially penalized when new rules are implemented. Hopefully, clearing houses will work as intended if they do not fail. The clearing house is to sit between market participants, and to guarantee that the buyer gets what the buyer bought and the seller gets the payment. Since, cash-equity trades are settled within 2 days, and a party going bust is minimal. But, the lack of transparency of bilateral trade of options stems from the buyers' and the sellers' of the option facing each other for the life of the option, and that played a big part in the 2008 financial crisis. Bilateral trades require each to keep tabs on the other's creditworthiness. When they do not know each other's positions, keeping tabs on the other's creditworthiness is difficult. If the buyer wanted to close its position early, for example, it might sell an offsetting position to another buyer. If all trades centrally clear, however, that would be known to everyone. There will be greater transparency. The raison d'etre of central clearing.

Clearing houses are mostly for-profit institutions. Their profits are expected to rise with their transaction volume, but losses for bad trades are largely to be borne by the members of the clearing houses. That seems to be a standing temptation to lower standards. Skimpy margin requirements or shallow default funds increase the chance that default of a big trade would leave a clearing house with large unmatched positions. That would then need to be covered by 4 possible sources of capital: 1. Its owner, usually an exchange, 2. its members, usually investment banks, 3. its customers, mostly investment funds, 4. The taxpayer in extremis

Clearing houses have collapsed in the past. A Parisian house collapsed in 1974 when its members defaulted on margin calls when sugar prices plummeted. One in Kuala Lumpur failed in 1983 when palm-oil futures crashed. When the Hong Kong Futures Exchange clearing house collapsed in 1987, the regulators closed the stock exchange while the government and city-state's largest banks arranged a bail-out.

The shift to central clearing has been in interest-rate derivatives and credit derivatives. Clearing houses are a new group of financial institutions that are assumed TOO-BIG-TO-FAIL. Without certainty about where a clearing house in distress can seek capital, its members and customers will be more likely to behave in ways that mean it needs that capital. Rules intended to protect taxpayers may have the paradoxical effect of putting them back on the hook. The perpetual MORAL HAZARD problem.

15. Is taxonomy alchemy?

Not many MBA programs offer 20th century French philosophy, but they could certainly can befit from it. MICHEL FOUCAULT argued that how you structure information is a source of power. FOUCAULT was obsessed with taxonomies, or how humans split the world into arbitrary mental categories in order to tame the wild "profusion of existing things". When we flip these around, "we apprehend in one great leap…. the exotic charm of another system of thought." But most MBA students are familiar with Daniel Kahneman's THINKING, FAST AND SLOW (Kahneman, 2011) that explains how these two systems, fast being intuitive and emotional, and slow being deliberate and logical drive the way we think. Daniel Kahneman's term for FOUCAULT's perception of taxonomies is "framing".

Jeff Bezos, Elon Musk, Warren Buffet and Masayoshi Son understand its importance, and with the expertise of their public relations skillfully manage how outsiders see their firms. By 2015 investors began to see AMAZON as a low low-margin retail business. Mr. Bezos changed AMAZON's image by reframing AMAZON as a high-tech firm, AWS. Its new cloud business produced a consistent and fast-growing cash flow and broke away from serial loss-making. Warren Buffet is an accomplished taxonomist who insists that BERKSHIRE HATHAWAY is neither a conglomerate nor an investment vehicle, but a one-off that can only be analyzed using a special set of rules that he has provided in an "owner's manual". This framing has shielded BERKSHIRE HATHAWAY from scrutiny and criticism over the past decade, even as it has underperformed the stock market. If, of course, you do see BERKSHIRE HATHAWAY as one-off to be analyzed by a unique set of rules.

Masayoshi Son criticized for its weak cash flow and high debt of the telecoms and tech conglomerate began to describe it as a venture capital to be assessed using his venture capital measure of internal rate of return which is both flattering and unverifiable. He has since completed the shift by setting up the VISION FUND, a giant $100billion investment vehicle in London. Elon Musk infers that TESLA cannot and should not be judged in the present by its past performance, but judged in the future. With the help of image managers, by reframing how their firms are classified and subdivided, managers can be successful in changing perceptions, lowering cost of capital when the investors keep on buying their stocks and intimidating competitors. Taxonomies are not alchemy. Eventually the firms must succeed.

Since 1926, most stock market returns in America have come from a tiny fraction of shares claims Hendrick Bessembinder in DO STOCKS OUTPERFORM TREASURY BILLS?[1] Just five stocks [APPLE, EXXON MOBIL,MICROSOFT, GE and IBM] accounted for a tenth of all the wealth created for stockholders between 1926 and 2016. The top 50 stocks account for 40% of the total wealth created. More than half the 25,000 or so stocks listed in America in the past 90 years proved to be worse investments than Treasury bills. The rise that FAANG stocks [FACEBOOK, AMAZON, APPLE, NETFLIX, GOOGLE] have held since 2015 is not unusual. The clout of leading stocks in the S&P 500 has often been higher in the past, but they were not free cash destroyers. A 21st century conundrum. Hendrick Bessembider's results are supportive of another research, which states that most stock returns are made on relatively few trading days. In the first half of 2018, 3 companies AMAZON. NETFLIX, ALPHABET accounted for 71% of DJI and 78% of S&P 500.

One of the greatest quandaries of the last three decades has been the way in which reductions in spending on research and development have coincided with an increasing financialization of the private sector. While causality may be hard to prove, it cannot be denied that at the same time that private pharma companies have been reducing their research and development budgets, they have been increasing the amount of funds used to repurchase their own shares, seemingly to boost their stock price, which affects the price of stock options and executive pay linked to such options.

In 2011, along with $6.2billion paid in dividends, PFIZER repurchased $9billion in stock, equivalent to 90% of its net income and 99% of its research and development expenditures. AMGEN, the largest biopharma company, has repurchased stock every year since 1992, for a total of $42.2billion through 2011, including $8.3billion in 2011. Since 2002 the cost of AMGEN's stock repurchases has surpassed the company's research and development expenditures in every year except 2004, and for period 1992-2011 was equal to fully 115% of research and development outlays and 113% of net income. Boosting stock prices does not create value, but facilitates extraction, rewarding stockholders and executives. The problem of stock buybacks is not isolated but rampant. In the last decade, S&P 500 companies have spent $3trillion on buybacks.

A common critique of buy-backs is an inchoate sense that firms buying themselves is unnatural. But actually, buy-backs are like dividends. Cash moves from the firm to its owners. Buy-backs' advantage is their flexibility. Unlike with dividends, stockholders can elect to participate or not, and the firm can turn the tap on and off without disappointing investors.

A second claim is that buy-backs create shareholder wealth. Does withdrawing dollars from an ATM makes you richer? No. But, buy-backs can transfer wealth between stockholders. If one sells at a price that later turns out to be lower, it makes the seller wealthier and lower price in the future lowers the remaining stock holders' wealth. Though, buy-backs send signals about managers' intent in allocating capital. They are using cash for buy-backs.

A third criticism is that firms' main motivation is to manipulate either their stock prices or their earnings per share, EPS, which can be cosmetically boosted as the number of shares falls. A fourth is that executive-pay schemes that are designed around EPS, can encourage buy-backs. A fifth concern is that buy-backs lead to low investment. There is supportive data. The firms' cash flow has risen relative to GDP since 1990s, but a lower proportion has been spent on investment.

The sixth claim is that buy-backs are a good measure of whether corporate tax reform was in the public interest. They are not. Better alternatives are whether overall investment rises more than annual tax break, whether firms' wage bills are rising and whether these effects will last. Most criticism of buy-backs is motivated by legitimate concerns about serious problems, including excessively high profits and squeezed wages, concentrated ownership of firms and reluctance of the financial industry to back more capital hungry startups.

The negative signal sent by surging buy-backs is their increasing leverage. 54% of firms had buy-backs more than they earned in the first quarter of 2018. When firms splurge on their own stock, it is a sign of excessive optimism. Note that, last time they did was right before the 2008 crash.

Jan De Loecker and Jan Eeckhout in GLOBAL MARKET POWER[1] using financial statements of 70,000 firms in 134 countries, examined markups [selling prices divided by production costs] and found average markups rose from 1.1 in 1980 to 1.6 in 2016. America and Europe saw the biggest increases. But many emerging markets markups barely rose. In China they fell. That suggests rich-world firms may have been able to increase markups by outsourcing to cut labor costs. Another possibility is that corporate concentration may have increased because of lax antitrust enforcement or the growing heft of companies benefitting from network effects, like internet firms. APPLE's staggering earnings was $60billion, or $8 per person on Earth.

As Peter Orszag, Obama's former DIRECTOR OF MANAGEMENT AND BUDGET, later at CITIGROUP, and Jason Furman, Barack Obama's CHAIR OF COUNCIL OF ECONOMIC ADVISORS, reported in a research paper that two-thirds of nonfinancial firms that had managed to achieve a return on invested capital of 45% or more between 2010 and 2014 were in either health care or information technology sectors. What allowed such gigantic profits and enormous CEO compensation in these sectors were market power. Silicon Valley saw no need to apologize. Theirs was the great technological and entrepreneurial success story of the late 20th and early21st centuries.

Antitrust, data protection and intrusive tax investigations were, as far as Tim Cook, CEO of APPLE was concerned, nothing more than "political crap", antiquated road bumps on the highway to the future. As tech oligarch Peter Theil told audiences and readers, "Creating value isn't enough – you also need to capture some of the value you create." That depends on market power. "Americans mythologize competition and credit it with saving us from socialist bread lines." but Theil knew better. As far as he was concerned, "Capitalism and competition are opposites. Capitalism is premised on the accumulation of capital, but under perfect competition all profits get competed away. The lesson for entrepreneur is clear….. Competition is for losers."

It is to the George W. Bush era that dismantled most of the checks on industry concentration and helped to shape the present state of US economy. American industry reached levels of concentration arguably unseen since the original Trust era. A full 75% of industries witnessed increased concentration from 1997 to 2012 according to Gustavo Grullon. The AT&T monopoly which had been forced to divide itself into 8 companies, was allowed to reconstitute itself into VERIZON and AT&T. AT&T bought DirecTV and TIME WARNER (Grullon, Larkin and Michaely, 2017).

Historically, six companies invited political backlash that only twice led to their breakup. First, the EAST INDIA COMPANY, a British private empire involved in opium production and trade supplying Chinese addiction among other equally awful things, lost its long standing legal monopoly over trade with India in 1813. In 1911, US SUPREME COURT broke up John D. Rockefeller's STANDARD OIL, and US DEPARTMENT OF JUSTICE's anti-trust division also initiated legal action against US STEEL, the other giant of the Gilded Age. DOJ went after IBM in 1969, and in 1974 DOJ sought to break AT&T's grip on telecoms, and did. And, the DEPARTMENT OF JUSTICE sued to dismember MICROSOFT in 1998.

16. In the age of weaponized interdependence of techological cold war, are multinationals national companies doing business abroad or are they stateless multinationals of washington consensus?

The American tech company, QUALCOMM, doing 65% of its business in People's Republic of China, with most of its profits in 2017 booked in Singapore to minimize their taxes in the Unites States, convinced the Trump administration in March 2018 to block a hostile takeover by BROADCOM, another tech company listed in the United States but domiciled in Singapore for tax efficiency, on the grounds that QUALCOMM's independence was vital to ensure America's strategic technical supremacy over China. The predator, BROADCOM, on 11/2/2017, four days before its hostile bid, announced to shift its legal base to the US.

THE PATRIOT ACT passed after 9/11 allowed the US Treasury to label foreign banks as threats to financial integrity and to ban them from the system for clearing dollar payments. In 2001-2003 America won the right to monitor SWIFT, which originally was the confidential global bank messaging system. Between 2002 and 2008 the TREASURY experimented with minör offenders. It brought to heel Victor Bout, an arms dealer; BANCO DELTA ASIA, a bank in Macau that traded with North Korea; and Nauru, a Pacific island with a sideline in exotic finance. Then went after a state owned Turkish bank, HALK BANKASI. Since 2008 Western banks have been fined for breaking American rules in the past, but not banned from dollar clearing.

The US TREASURY accused BANCO DELTA ASIA of laundering money for North Korea, prompting depositors to panic, other banks to keep their distance and Macau government to step in. The US TREASURY subsequently barred American financial institutions from holding a correspondent account for the bank, excluding BDA from the American financial system. "It is hard to escape the long arm of the dollar" was proven. Dollars dominance reflects what the economists call network externalities. The more people use it the more useful it becomes to everyone else. The dollar also benefits from a hub-and-spoke model for the exchange of currencies, the invoicing of trade and the settlement of international payments.

The global financial system is like a sewer and all of the pipes run through New York. This gives US TREASURY great punitive power and jurisdictional reach. However, not all dollar settlements are subject to American jurisdiction. It is possible to clear dollar payments in Tokyo and Hong Kong and elsewhere. But America's FEDWIRE and CHIPS, handled transactions were worth $4.5trillion a day in 2017. Hong Kong's system which runs through HSBC dealt with .8% of that amount. More over the ability of offshore dollars [Eurodollars] to enter and leave the American financial system if necessary is vital to their appeal. The liquidity of Hong Kong's system is buttressed by ~~HSBC~~'s ability to handle dollars in New York. China is developing its own international payments system based on its currency. Russia and China have agreed to increasingly conduct trade in their own currencies, rather than US$s. President Trump's withdrawal from the Iranian deal Obama and American allies have concluded increased trading in in RMB-denominated oil futures contracts China launched in Shanghai recently. OPEC's price of its exports is still in US$, and OPEC's global exports are a very large part of international trade. Increasing crude oil trades in currencies other than US$ will result in gradual de facto de-dollarization of global finance.

At the end of 2017, ZTE was the world's fourth biggest telecoms-equipment maker, with an enterprise value of $17billion with a Chinese state owned enterprise, [SOE], as its main stock-holder. ZTE's US sales were only 15%. On 4/26/2018, the US DEPARTMENT OF COMMERCE banned American companies from supplying ZTE with components for 7 years. ZTE had admitted trading with Iran and North Korea and lied about remedies it had put in place. ZTE's stocks were suspended temporarily. Though, subsequently the Trump administration softened its position.

Companies that break the law or act in concert with banned governments do not deserve sympathy. But there are unsettling concerns drawn from US government use of such weapons against big foreign companies. First, any large company can be reached. No fewer than 2,000 big companies outside America issue dollar bonds. The total dollar debt owed by companies outside America is over $5trillion. Cross-border supply chains mean most firms rely on American tech components in some way. Second, these powers can be misused, either for overtly political end or because they are badly calibrated. After ZTE, the global business community worried that HUAWEI could be next. And was in December 2018.

IT supply chains are highly specialized and globally tangled. Cutting companies off, WEAPONIZING INTERDEPENDENCE, in military jargon, can cause serious disruptions. HUAWEI is China's most prized high-tech company. Its name proudly translates as "Chinese achievement". $150billion revenues put HUAWEI in the same league as MICROSOFT. SAMSUNG is the only company that sells more smart-phones. In superfast 5G mobile networks, HUAWEI is a global forerunner with valuable patents, and has the largest manufacturing capability of telecoms equipment in the world. Its demise can cause shock waves that would rattle all of the tech world. On May 15, 2019, President Trump barred American firms from using telecoms equipment made by firms posing a "risk to national security". His was a seismic decision. All technology firms are highly interconnected. No technology firm is an island.

On May 20, GOOGLE announced its decision of stopping to supply the proprietary components of its ANDROID mobile operating system to HUAWEI. INTEL, QUALCOMM, and MICRON have also joined GOOGLE and announced their decisions of stopping sales. Interdependence, we are told, cuts both ways. HUAWEI is a very important buyer of American high-tech. QORVO, the maker of wireless communication chips derives 15% of its revenue from HUAWEI. HUAWEI is also an important customer of MICRON. INFORMATION TECHNOLOGY & INNOVATION FOUDATION estimated the cost of export controls to American firms to be $56billion in lost sales over 5 years[1]. The stock prices of American technology companies fell as a result. TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, [TSMC], announced its decision to continue supplying HUAWEI. Last few years HUAWEI has consciously made strategic moves to become less reliant on American proprietary technology by increasingly making use of chips designed by HiSilicon, its in-house chip-design unit that TSMC produces for HUAWEI. Chinese chip factories are not capable of manufacturing HiSilicon's sophisticated designs. Despite years of efforts to be self-sufficient by manufacturing its own computer chips, China spent more in 2018 on importing chips than it did on importing crude oil.

In the globally tangled chip-industry supply-chains, many non-American companies make use of American parts and intellectual property. They may therefore consider themselves covered, wholly or partially, by the American ban. ARM, a SOFTBANK owned British domociled company, whose technology powers chips in virtually every phone in the world, including those made by HiSilicon, announced its compliance with the COMMERCE DEPARTMENT's rules. That suggests that ARM will not grant HUAWEI new licenses. It is not, however, clear whether ARM will support existing licenses.

A return to business as usual seems unlikely even when the ban is lifted in exchange for trade concessions. President Trump's administration have to has twice demonstrated a willingness to throttle two big Chinese companies. Trust in American technology firms has been eroded. China has committed billions of dollars to efforts to boost its domestic capabilities in chip-making and technology. If the ban is, on the other hand, a tactic of the strategy of the US campaign to take down HUAWEI, HUAWEI will need to look for alternative chips and software that Chinese suppliers will try to provide. The Chinese IT companies do not seem to have other options. The global supply-chains put in place with American leadership look vulnerable. Interdependence that can be weaponized is weaponized to "Make America Great Again". Global supply-chains' vulnerabilities are exposed. Like the Japanese earthquake and tsunami induced wake-up call exposing the rigid interdependencies of the globalized supply-chains.

As, generally, is the pattern in developing economies in their catch-up phase, the Chinese domestic microchip industry started at the lower-value end of the process. Its comparative strength lies in assembly and packaging chips. Dozens of firms around Yangzi delta near Shanghai, for example, specialize in this sort of work. JCET, TIANSHUI HUATIAN, and TFME are better known ones. In the age of Technologic Cold war, China is turning to design and manufacturing. Chinese firms critically rely on modifying designs from ARM. The SOFTBANK owned company's chips dominate the mobile-computing business and probably will be able to be a major if not a dominant supplier of smart devices that will make up INTERNET OF THINGS. According to company releases, ARM has plans to enter high-powered CLOUD-COMPUTING chips market.

Making progress in manufacturing high-tech chips turned out to be arduous for the Chinese companies. The Chinese up-starts face tough competition from incumbents in other countries with intimidating accumulated know-how of the best army of most trained engineers with decades of experience. Manufacturing is the most demanding part of chip making to replicate. The semiconductor manufacturing industry is about repetitive cycles of learning. HiSilicon's Kirin 980 was first smartphone chip to be produced on the 7-nanometer node, the current state of the art for squeezing in computer power. TSMC of Taiwan had the needed technology. Like APPLE and QUALCOMM, HiSilicon, had to have its chips manufactured in Taiwan, by TSMC. Furthermore, there were 29 companies with advanced fab facilities in 2001 after consolidation there are 5 in 2019. The suppliers of equipment for these fab facilities are even fewer. The Dutch, [ASML], is the dominant supplier of extreme ultra-violet lithography.

President Trump's tweets grumble about Chinese companies' pilfering American intellectual property. The idea that Chinese firms have some technology companies of their own to offer may seem unrealistic propaganda. Actually, Western technology firms increasingly show interest in Chinese tech. In some cases, they bought Chinese rivals outright. Such acquisitions date back to 2016. Most deals were small and involved niche industries. Maker of power-trains and sensors for electric vehicles, or agencies managing social-media influencers.

The French FAURECIA, leading global supplier of vehicle interiors, acquired JIANGXI COAGENT ELECTRONICS, which develops human machine interfaces in 2017. In 2018, XILINX, an American chip-maker acquired DeePhi Tech, a machine-learning start-up in Beijing. All told, American technology companies have invested $1billion in Chinese since January, 2018, according to DEALOGIC, a data provider. Chinese tech firms invested nearly four times as much, $3.8billion into those in America. In 216, APPLE put $1billion into DIDI CHUXING, and MICROSOFT took a stake in LAIYE, an AI BUTLER that handles voice commands through an app. INTEL has taken stakes in several start-ups, including, in 2018, a cloud-service provider and in 2019 a firm that writes software for cashier-free stores.

In 2018, ALPHABET paid $550million for a stake less than 1% in JD.com, the e-commerce competitor of ALIBABA. NVIDIA, an American maker of AI chips, invested in WeRide.ai, a Chinese self-driving tech, and TuSimple, an autonomous-truck stat-up. In 2018, INTUITIVE SURGICAL, a robotics company, took a stake in BRONCUS, a Chinese start-up.

In the last ten years or so, China has blocked only one foreign acquisition. And, that was COCA COLA's $2.4billion bid for HUIYUAN JUICE, a soft-drinks company in 2009. In 2018, the Chinese "negative list" of areas where investments are restricted shrank from 63 to 48 industries. Chinese regulators surprised many by not blocking DeePhi, despite how strategic its technology could turn out to be defense related and thus un-acquirable.

In 2017, the Treasury considered sanctioning CCB and AGRICULTURAL BANK, two very big Chinese banks. According to BLOOMBERG the two Chinese banks have $344billion liabilities. Sanctions could be unsettlingly counterproductive. A realistic concern is that some countries will try to develop ways to escape America's dollar reach. Careful studies of the Treasury's implementation of its new soft-power of weaponized interdependence offer a step-by-step guide what a country needs to survive without America's permission: semiconductors, several global currencies, and clearing system, credit rating agencies, commodity exchanges, a pool of investors and shipping companies.

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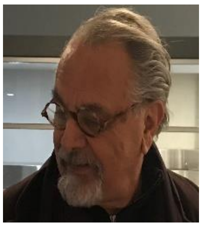

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Implemention of Kanban Method at Mechrom Industry

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ABSTRACT

Quality is at the top of most agendas, and improving quality is probably the most important task that any institution faces. Using the Kanban method became an effective tool to support running a production system as a whole, and an excellent way to promote improvement. Taking into account the need for quality and the time it takes to deliver the project, such software can help to sort the tasks according to priorities and project progress. Using Kanban digital like Trello can expose both your creativity and organizational qualities in a smart campaign. The aim of this study is to improve the working processes of the entire team and to optimize the existing operations.

1. Introduction

Most of Campagnolo customers are professional cyclists, and their expectations for bicycles are very high, so Campagnolo and Mechrom Industry in Romania are constantly adapting to market demands. Including the wheels, brakes or transmission components, Campagnolo always starts with the premise that each product it projects is primarily a safety device before being delivered as a performance tool. In order to produce components and wheels that are the best in terms of performance, durability and functionality, much has to be invested in both development and testing. Each product, either component or wheel, is designed within Mechrom, then developed and tested inside the mother company, Campagnolo.

As soon as Mechrom Industry produces necessary components, they are sent to Campagnolo, and they are tested in the company's testing departments, which are dedicated departments to support all the developmental stages of the company. This department is equipped with state-of-the-art technologies, some of which have been developed internally to meet the company's technological needs.

Because Campagnolo bikes are designed for professional cyclists, and the needs and expectations are high, the Mechrom Industry is always up to date with customers' needs and is constantly trying to adapt Campagnolo bikes to meet expectations.

In this case, the same Campagnolo engineers developing new products, develop everything that is needed to test the performance, durability and quality of the products.

Due to the desire for continuous improvement, Campagnolo constantly pursues the customers' behavior, new preferences and therefore new products are repeatedly subjected to testing cycles to precisely ensure that the same qualities identified during the design and developmental stages are maintained throughout the processing and the production phases at an industrial level.

In accordance with the declared policy, the overall objectives of the OHSM system are:

- Preventing and minimizing the risks of accidents and occupational illnesses as well as reducing their consequences;
- Permanent adaptation of productive activity to the human factor;
- Ensuring the improvement of personnel and ensuring the conditions for continuous improvement of the level of professional training;
- Ensuring the improvement of the managerial capacity by adapting the requirements of the legislation in force and through improving the information and communication system;
- Ensuring the necessary organizational framework and adequate resources for investment so that it can ensure a steady increase in the quality of OSH activities;
- Implementation and maintenance of a management system for health and safety in the labor market compliance with the requirements of the reference standard.

Based on the overall objectives, the departments, involved in these activities that may have an impact on OHSs, set specific measurable targets.

2. Society and company values

In over eighty years of innovation, quality and sporting success, Campagnolo is a premium brand that preserves its reputation throughout the world. Our long history, which has greatly contributed to the birth and development of modern cycling, is inspired by the innovative spirit, and has become an integral part of our DNA society.

A continuous search for performance and maximum quality, combined with the inherent Italian taste for style and shape, makes the Campagnolo world and its products stand out in all its aspects. Service and customer care emphasize the continued pursuit of excellence, guaranteeing every customer to find an unrivalled ally in Campagnolo's passion for cycling.

Starting with the 1930s, from the first system that allows quick wheel assembly and dismounting, to the first wheel gear and the pre-assembled front wheels, to the new electronic clusters and new carbon wheels, we have defined our passion for the new.

The company has always stayed on this road in this long-running industrial success story: it has always continued to offer something more evolved, performing, and highest quality.

Over the years and throughout generations, this way of thinking and creation has become a kind of natural footprint for their mark, for society and for those working with them.

In the post-modern society of cycling and triathlon, with a long tradition in the Western world, Campagnolo produces components, groups and wheels through two production units located in Romania. Campagnolo products are distinguished with the high technology, innovation and processes used in every stage, from conception, development, and production to testing.

In the 1950s, Campagnolo was the first to introduce the concept of the complete group, then the first company to think of the race bike racing train as a single element, composed of components that need to work together in a perfect symbiosis.

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Today, Campagnolo is present in Romania, in the commune of Maracineni, Argeş county, through Mechrom Industry, known as Mechrom 1, having industrial experience of over 12 years. The second Campagnolo factory in Romania, also known as Mechrom 2, is located in Curtisoara commune in Old County. Mechrom 2, the new Campagnolo production unit, inaugurated in early 2018, includes plenty of new and revolutionary technologies in the field of environmentalism and energy efficiency.

Continuous Innovation of Campagnolo Technologies follows solutions that have led to the miniaturization of electronic components, the introduction of power units into frames and the optimization of changes in both accuracy and speed. Named EPS, Electronic Power Systems, all these systems are proudly produced in the Mechrom 1 units in Maracineni. However, this is not all. Campagnolo is also the first cycling world which introduced the concept of "fully assembled wheel". In the late eighties, Shamal was the first "ready-to-use" wheel on the market, proudly produced in the Mechrom 2 units in Curtisoara.

Today, Campagnolo offers the cycling fans around the world wheels for road bikes in carbon, aluminium and even in aluminium-carbon. Solutions that meet all the users' requirements, ranging from low- profile climbers to high-profile wheels, are designed to optimize aerodynamic penetration and thus to provide maximum benefits under all conditions of use not only at high speed but also in racing or triathlon.

The Campagnolo range is also complemented by mid-range wheels, an excellent training solution or mixed stage if the bike setting requires maximum versatility.

The structure of the OHSM system documentation and procedures are responsible for its elaboration so that accidents are prevented, and incidents and professional illnesses are avoided in its application.

In this regard:

- The standard requirements that are applicable at the company level have been identified;
- The activities that require documented processes and procedures have been identified;
- It is ensured that all departments prepare detailed working instructions on the activities which involve risks for the health and safety of the employees;
- An OSH manual has been developed to record company policy, organization of related functions of OHS and the main processes for occupational health and safety management;

3. Implemention of the Kanban method

Kanban is a scheduling system for lean manufacturing and just-in-time manufacturing (JIT). Taiichi Ohno, an industrial engineer at Toyota, developed Kanban to improve manufacturing efficiency. Kanban is one method to achieve JIT. The system takes its name from the cards that track production within a factory. For many in the automotive sector, Kanban is known as the "Toyota nameplate system" and as such the term is not used by some other automakers.

Kanban become an effective tool to support running a production system as a whole, and an excellent way to promote improvement. Problem areas are highlighted by measuring lead time and cycle time of the entire process and the process steps. One of the main benefits of the Kanban system is to set an upper limit to work in process inventory in order to avoid overcapacity.

A goal of the Kanban system is to limit the buildup of excess inventory at any point in production. Limits on the number of items waiting at supply points are established and then reduced as inefficiencies are identified and removed. Whenever a limit is exceeded, this points to an inefficiency that should be addressed.

Currently, Kanban is not only used in the production of physical goods. The method is generally used in project management to view the workflow and to identify the potential obstacles in the development of a project. However, Kanban is equally effective in other areas or even used to organize personal activities. Forty years have passed since Kanban's invention and many have changed since then, the technology has evolved, and today we live in an era of digitization. So, what if we replace paper and glue with pixels? First, let's see what benefits come with the implementation of the Kanban system in marketing projects.

4. Implemention of the Kanban method

The Kanban system is currently used in the business environment for several reasons:

- It helps you visualize the entire activity of a project in a visual way.
- You can identify and remove any obstacles during the course of the project.
- It enhances team spirit by improving the employee's collaboration and the project success rate.
- It increases the speed of workflow through the transparency of the entire process.

Using this system, you can accurately distribute tasks among your team members and identify unnecessary activities that may be temporarily ignored. Additionally, this method can solve your productivity, concentration, and the time division problems.

In essence, the Kanban method consists in creating tables divided into three columns ("To Do", "In Progress", "Finished"). Job optimization can be done through a table where tasks can be moved from one stage of the project to another until they are finished.

Kanban's primary goal is to eliminate losses by streamlining workflows and to present the activities in a visual way to help identify the potential hazards that can delay the completion of the project.

5. Informational system

An information system can be defined as the ensemble of elements involved in the process of collecting, transmitting, processing information, and giving it the central role in the system. Within the informational system, one can find: the information, the information documents, the personnel, the means of communication, the processing systems (usually, automatic) of the information, etc.

Among the possible activities under this system can be listed: the acquisition of information from the basic system, the completion of documents and their transfer between different compartments, the centralization of data, etc. In the broadest sense, an information system refers to the various interactions between people, processes, data and technologies; thus, the term refers not only to the ICT aspects that an organization uses, but also to how people interact with technology to support business processes.

The information system is an ensemble of information flows and circuits organized in a unitary design. In any area of economic or social activity, there is an informational flow on which any activity is carried out. At the level of an economic agent, the information system provides the link between the decisional and the operational system (management system and execution system); thus, the functioning of the information system implies the following activities: - entering the data on the operational system - processing the data in order to provide useful information in the decision-making process - obtaining the requested information, then making decisions that will be transmitted to the operational system - control and follow-up of decision-making.

Within an information system, most of the activities can be deployed using computing techniques. The primary data can be processed and then the result can be transferred further to another compartment for processing. The transfer can also be done electronically via a computer network.

The set of elements involved in the whole process of processing and transmitting data by electronic means make up an information system. In a computer system, computers, data transmission systems, hardware and software components, processed data, personnel using the computing technique, theories behind the processing algorithms, etc. can be introduced. Informational system-information system report: the information system includes within it the computer system, the latter being an essential component of the first one.

It should be noted that the information system should not be confused or overlapped completely with the information system. In general, the information system is interposedbetween the decision-making and the operational system. The IT system is a structured set of procedures and electronic equipment that allow for automatic data processing and obtaining information.

A computer system includes the following components: - the organizational framework of the firm and the data circulated in the information system corresponding to the activities carried out; - human resources (the beneficiaries of the system and the specialized personnel who design / implement it) - methods and techniques of computer systems design - hardware for data storage and processing. - software used to achieve the objectives of the IT system.

6. Kanban digital

The classical method of notes glued to a whiteboard is no longer as effective as before. Information can easily be lost and is not easily accessible by the entire team. These are the reasons for Kanban's online variants with the development of technology. A Kanban digital allows you to filter your data according to the criteria you set. So, you can concentrate on those tasks that are really important for a certain stage of the project. In addition, it can help you organize your work without the clutter and chaos of a classic table. Traditional tables do not allow too much personalization. A virtual workspace can be tailored to your exact needs if you want a certain order of tasks, more bold colors, or even images to help you identify activities faster. In fact, what underlying the Kanban method is the simplicity and ease of use that makes it accessible to any user.

The best-known tool you can use to create a Kanban table is Trello. It is easy to use, and it provides a simple interface that can also be used for personal purposes. Kanban tables can be used irrespective of the industry in which you work. Planning is the key element of any successful campaign. Through a digital app, you can expose both your creativity and organizational qualities in a smart campaign. In the following example, you can see a marketing plan made with Trello:

Such an application can be used collaboratively. Thus, all members of the marketing team will have access to the project and will be able to make improvements to it.

At the same time, online platforms allow you to store files directly into your app. This means not only that you can communicate with your team directly on the project, but also that they will have non-stop access to the project files and dates. A properly designed plan gives you total control over your project.

Also, the complexity of the tables does not stop here, you should know that there are also applications that provide detailed Kanban table templates. In general, the projects, involving a high number of employees or departments, can be more easily monitored through a table with an advanced structure.

As a result, you can create a transparent work environment where all employees are aware of the project's status and everything that's going on with it. Thus, all tasks will be much easier to distribute and track, and their day-to-day monitoring will support careful analysis of the parameters needed to resolve the project.

7. Conclusion

Taking into account the need for quality and the time it takes to deliver the project, such software can help you sort your tasks according to your priority and project progress. The focus of our work is to improve the working processes of the entire team and to optimize the existing operations. At the same time, we will avoid the clutter of responsibilities and tasks in order not to overwork your employees. In a project that uses this organizational system, the entire team is responsible for its smooth running. This process can help the team communicate better and avoid misunderstandings to prevent possible mistakes. A task can be assigned to a single employee or can be fulfilled by several members. We have the option of making the entire team responsible for a particular task to ensure compliance with all the customer's standards.

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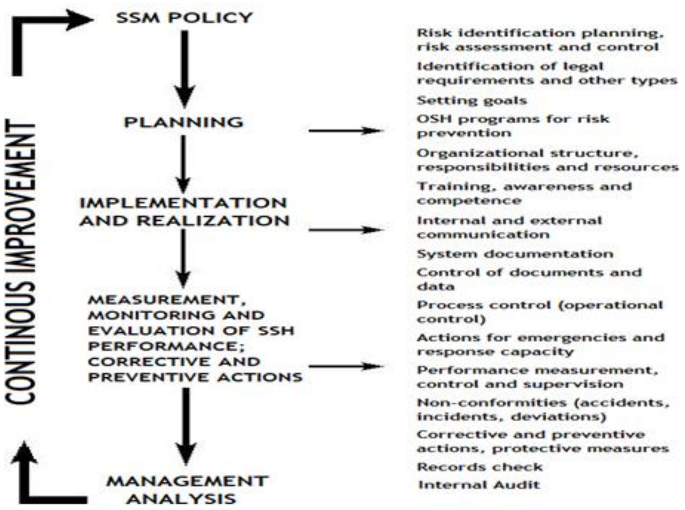
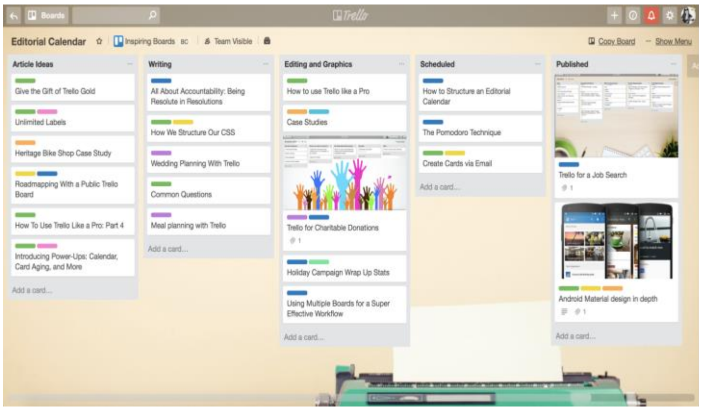


Source: Internal Documents of Mechron Industry, Romania

Figure 1. Structure of the OHSM System



Source: Internal Documents of Mechron Industry, Romania

Figure 2. TrelloWorkflow

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