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AN EMPIRICAL STUDY ON THE IMPACT OF RISK PERCEPTION ON GERMAN CONSUMERS' ONLINE BUYING INTENTION

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Abstract

An online purchase decision confronts consumers with some challenges. Internet offers consumers access to a vast amount of information but the sources of information mostly are not reliable. Literature suggests that perception of risk acts as barrier to online shopping. The aim of this study is to determine the impact of perception of risk on consumers' online buying intention in Germany. Moreover, in order to get indications of consumers' online shopping behavior, the effect of perceived behavioral control and e-WOM credibility has also been investigated. In this research different analysis including descriptive statistics, confirmatory factor analysis and multiple regression analysis have been used. The *hypotheses* of the research have been *partially supported. The results indicate that* perceived behavioral control *has influence on consumers' perception of risk and online buying intention.* However, e-Wom credibility didn't have any effect on *consumers' perception of risk* and online buying intention. Moreover findings of current study do not support any significant relationship between *consumers' perception of risk and their online buying intention in Germany.*

Keywords: Online Buying Intention, Perceived Behavioral Control, e-WOM Credibility, Perception of Risk

JEL Classification: M13, M20, M31

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1. Introduction

Through the internet, business could easily reach out the consumers and stay in contact with them. In a recent research, one of the world's leading market intelligence agencies, called Mintel, has revealed that on 2017, 93 percent of Germans have shopped online by using computer, laptop, tablet and smartphone. Choice availability and ease of comparing different products is among the top of priorities to online shopping in Germany (Mintel, 2017). Shared databases, document repositories, workflow applications and discussion forums make the accessibility to knowledge for organizations easier (Lopez-Nicolas and Molina-Castillo, 2008: 103).On the other hand, the interactive elements of electronic platforms such as social media platforms have shifted the power from companies toward the consumers and have changed customer relationship management drastically. Therefore, e-Wom and user generated sources of information have provided more help for consumers to control their media behavior. In consumer behavior literature, risk perception has been acknowledged as critical factor in buying decision-making process and has a restrainer function in purchase behavior (Peter and Ryan, 1976). Lutz and Reilly (1974) have suggested that e-Wom is a crucial factor for reducing risk perception in online purchase process. Perceived behavioral control which has been defined as individual's perception regarding to the ease or difficulty of performing a given behavior (Ajzen, 1991), has been examined as the second key factor that reduce risk perception and positively affects online purchase intention.This study aim to expand the knowledge of consumers' purchase behavior on online platforms by examining the impact of e-WOM Credibility, perceived behavioral control and risk perception on consumers' online buying intention in Germany.

2. Theoretical Background

2.1. Purchase Intention vs Purchase Performance

According to the theory of planned behavior, "performance of a behavior is a joint function of intentions and perceived behavioral control" (Ajzen, 1991). One of the key factors in the theory of planned behavior is Intention to perform a given behavior. Intentions are influenced by motivational factors (Ajzen, 1991). However, some non-motivational factors such as money, time, skills and cooperation of other people (Ajzen, 1985) should also be available. It has been assumed that the stronger the intention to perform a behavior, the more likely is the behavior. In other words motivations increase the intention of performing a behavior and access to required resources increase the probability of succeeding in the performance.

Researches propose that the intention to perform a behavior is the most related cognitive antecedent for the actual performance of the behavior (Fishbein & Ajzen, 1975). In another word, we should be able to predict a specific behavior based on individual's intention to engage in the behavior. However the time interval between measuring intended behavior and assessing actual behavior should be taken to consideration because with the passage of time changes in external factors, such as events, may affect intentions and cause them to change. So large time interval between measurement of intention and assessment of the behavior will make the intention a poor predictor of expected behavior (Ajzen and Fishbein, 2005).

Even when the measures of intention and behavior are stable and compatible, a gap between words and deeds must be taken into consideration. Donald campbell (1963) suggests that the illogical lack of compatibility between what people say and do is

because some intentions are difficult to be performed as a behavior. A recent study (Ajzen, Brown, & Carvajal, 2004) shows that partcipants agree to contribute money to a scholarship fund when the question was hypothetical however under real payment situation many of them chose not to make any contribution.

2.2. Key Factors of Online Purchase Experience

Literature on consumer behavior suggests different approaches toward successful performance outcomes in online purchase platforms. The importance of customer experience on the growth of e-retailing has been recognized by Elliot and Fowell (2000). Motwani (2016) has emphasized on the importance of consumer's attitude, intent and behavior to achieve competitive advantage in online platforms. Gentile, Spiller, and Noci (2007) has found evidence of six key components of online customer experience which includes sensorial, emotional, cognitive, pragmatic, lifestyle, and relational components. Rose and et al. (2012) have developed a model of the relationship between antecedents and outcomes of online customer experience. They have empirically tested their model on 220 online shoppers in USA and Europe. Their findings suggest that factors such as skill, technical capability of the users and speed of the website are not any more determinents of judgment of online purchase experience, rather technical functionality of e-retail websites including visual design and graphical features is important. One more important finding in this research emphesis on a sense of control by consumers which influence their feelings in online transactions. According to the research source of control is consist of three factors; the ease of use, ability to customize one's own space and connectedness (Rose and et al., 2012).

2.3. Perceived Behavioral Control in Online Buying

Many investigations have shown that individual's behavior is strongly influenced by their confidence in their ability to perform a task; Ajzen (1991) in the theory of planned behavior has defined Perceived behavioral control as individual's perception regarding to the ease or difficulty of performing a given behavior. Atkinson (1964) in theory of achievement motivation has quite similar view and defined expectancy of success as the perceived probability of succeeding at a given task. Bandura (1982) has defined perceived self-efficacy as the judgments of how well an individual can execute courses of action to deal with a prospective situation.

Dutta et al. (2015) have defined personal innovativeness as the degree of willingness of an individual to try out any new domain-specific information technology or innovation (Dutta et al., 2015: 532). Personal innovativeness can be defined at either global trait level, or domain-specific level. Domain specific innovativeness is defined by the virtue of identifiable characteristics and actual acquisition of new information, ideas and products (Lin and Fillieri, 2015: 159). Agarwal and Prasad (1998) have found out that personal innovativeness is strictly correlated with technology awareness, technology adoption and technology acceptance. When technology becomes critical, these issues' importance rises (Agarwal and Prasad, 1998: 204). A recent study on online purchase intention on Turkish customers has shown that personal innovativeness increase online shopping intention and reduces the perception of online purchase risk (Bilgen and S. Zoghi, 2017)

Davis (1989) in Technology Acceptance Model has proposed perceived usefulness and perceived ease of use as two factors that affect individual's intention to use technology. According to the model perceived usefulness is the extent to which an individual believes that the use of technology will improve one's job performance. Perceived ease of use is the extent to which an individual perceive the useage of the technology easy and effortless.

Innovation diffusion theory views the diffusion as the process by which the innovation flows from one person to another through the social system. Five attributes of innovation have been indicated as influential in adoption process which includes relative advantage of using the innovation compare to the prior practice, compatibility of the innovation with what people do, complexity of usage, observability of the results to others and trialability before adopting or rejecting the innovation (Rogers, 2003). Innovation characteristics such as relative advantage, complexity of usage, result demonstrability and image are among most important factors in predicting user intention to use an innovation (Yi, et al, 2006). Many scholars have developed specific scales to measure innovativeness in distinct products and services based on innovation diffusion theory (Jackson, Yi and Park, 2013: 154). Hence;
H_1: Perceived behavioral control has a significant effect on perception of risk.
H2: Perceived behavioral control has a significant effect on online buying intention.

2.4. e-WOM Source Credibility

e-Wom has been defined as "any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the internet" (Hennig-Thurau et al, 2004). Digital communication platforms have helped individuals and marketers to share information easily and to spread electronic word of mouth (e-WOM). There are many pros and cons regarding to e-Wom impact; e-WOM positive impact includes the dimensions below (Levy and Gvili, 2015: 96):

- Because of digital channels, business and target market have more strong relationship.
- E-Wom facilitates the flow of more specific and detailed information among consumers.
- Most forums employ people to manage the communication activity.

However, source credibility is one of the major construct within e-Wom that might have negative impact. Do people trust on the message sources and find it credible? For a message to be considered credible the source has to be trustworthy and it must possess appropriate level of expertise and knowledge of the subject to make a specific judgment about the product or service (Kelley et al., 2016). Recent studies have showed that online reviews may increases or decreases customer satisfaction. Objective reviews tend to affect intentions. Moreover, consumers are able to easily understand these reviews and it is an advantage for these reviews (Obiedat, 2013: 17). Some of other independent factors which influence credibility are valence, objectivity, subjectivity, volume, usefulness and being attribute-centric (Lee and Koo, 2012: 1981). Kelley et al. (2016) have proposed that because of unique characteristics of the online environment additional factors that the authors refer to as message relevance affect the impact of eWOM communication on consumer decision making. The authors has identified two dimensions underlying

message relevance; the first dimension is "persona similarity" which refers to the degree that a consumer who posts information online is like the person that read the information in terms of character, background, and expectations and the second dimension is "usage similarity" which refer to the degree which a consumer who postes the information online using the product in the same manner that the person who read the information intend to use it. So, the expectation is that higher levels of persona similarity and usage similarity will be associated with higher levels of message relevance, and will eventually lead to higher levels of eWOM impact (Kelley et al., 2016).

Bilgen and S. Zoghi (2016) in a recent research on consumers' online buying intention have revealed that among many factors which affect online purchase intention, personal innovativeness, eWOM source credibility and customers' perceived risk are the most important factors that affect online purchase intention. Authors have proposed that developing tools to make online purchase more secure and creating a positive eWom among customers can decrease customers' perceived risk and increase online buying intention among Turkish customers (Bilgen and S. Zoghi, 2016).
Moreover, there are various e-WOM channels like forums, websites, social media etc. and adoption of customers can differ by these channels. Yan et al. (2016) have recently investigated the relations between e-WOM credibility and adoption on forums and social media and have proposed that there are some mediators in this relationship. According to the authors, source credibility affects e-WOM credibility positively (Yan et al., 2016: 71). Hence;
H3: e-Wom source credibility has a significant effect on perception of risk.
H4: e-Wom source credibility has a significant effect on online buying intention.

2.5. Perception of Risk in Online Buying Behavior
Perceived risk has been identified as a critical determinant of consumers' willingness to buy a new product or brand (Peter et al. 1975; Grewal and et al., 1994).There is an important difference between risk and perceived risk. Risk or objective risk is based on the outcomes of alternatives and their probabilities (Das and Teng, 2001). On the other hand, perceived risk or subjective risk refers to customer's estimate of objective risk (Dowling 1986; Fischhoff 1985). So customers may have different estimates of risk in different situations.

In consumer behavior literature, risk perception has been defined as the expectation of losses associated with purchase of goods or services and it has a restrainer function in purchase behavior (Peter and Ryan, 1976). Customer perceived risk is related to the perception of uncertainty and adverse consequences of buying a product or service. Risk can be observed not only particular in pre-purchase process, but also on the time of purchasing and after the purchase process. In order to reduce risk, customers gather information from the firms' communication channels. Lowering the risk leads to increasing in willingness to pay and perceived value for money. Even in post-purchase process, customers can face information from environment which increases their risk perception (Petersen and Kumar, 2015: 270).

Frequency of purchase, level of involvement in the purchase decision and satisfaction with previous purchase experience are among the most important factors that affect the

impact of perceived risk on online purchase behavior (Pires et al., 2004). Strength of the relationship between perceived risk and intentions can differ among frequently shopping customers and non-frequently shopping customers. One of the recent researches has proved that the levels are different across groups and experience plays a significant role (Martin, Mortimer and Andrews, 2015: 91). Keh and Sun (2008) have compared perceived risk among Chinese and Singaporean customers in 2008. They have gathered data from 309 Chinese and 193 Singaporean consumers. Research results have showed that customer perceived risk differ by cultures. Also, personal and non-personal risks had varying levels of impact on perceived value and customer satisfaction (Keh and Sun, 2008: 140). Pappas (2016) has analyzed the relation between different variables such as customer perceived risk, product marketing strategies, web-vendor marketing strategies, product consumer trust, web-vendor consumer trust and intention to buy online. Findings of the study have indicated that the customers' perception of risk can be about product quality, product price, web-vendor quality, web-vendor security (Pappas, 2016: 96). Hence;

H_4: Perception of risk has a significant effect on online buying intention.

3. Research Methodology

This study aim to expand the knowledge of consumers' buying behavior on online platforms by examining the impact of e-WOM Credibility, perceived behavioral control and risk perception on consumers' online buying intention in Germany. A descriptive research has been designed in order to define the relations between different variables. The target population of the research is young consumers, university students, who purchase products and services online. Convenience sampling method has been used to gather data from 123 respondents through online survey. Scales used in this research have been adopted from literature. All variables of the study have been measured by 5 item Likert scales.

4. Data Analysis and Findings

Demographics of respondents have been summarized on table 1. The frequency of gender is almost the same between male (49.6 percent) and female (50.4 percent) participants. The majority of participants are single (95.9 percent), mostly bachelor student (63.4 percent), from 19 to 30 years old (91.1 percent) and earning less than 999 Euros per month (64.2 percent). Young consumers have been selected because of their adoption to new technologies and devices such as smartphones and tablets and using internet and social media as the main source of information searching.

Table 1: Descriptive Analysis

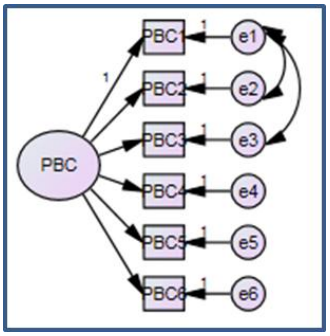
		Frequency	%
Gender	Female	62	50.4
	Male	61	49.6
Marital Status	Single	118	95.9
	Married	5	4.1
Age	Less than 18	1	0.8
	19-30	112	91.1
	31-40	9	7.3
	41-50	1	0.8
Occupation	Bachelor Student	78	63.4
	Master Student	35	28.5
	PhD Student	1	0.8
	Post-doc Student	1	0.8
	Employee	6	4.9
	Self-employed	1	0.8
	Other	1	0.8
Income	Less than 999 Euro/Month	79	64.2
	From 1000 to 1999 Euro/Month	32	26.0
	From 2000 to 2999 Euro/Month	5	4.1
	Above 3000 Euro/Month	7	5.7

We have asked three questions about participants' online shopping experience including; have the respondents ever done online shopping before, how often they do online shopping and which items they normally prefer to purchase online. Table 2 shows the frequency of the answers. All respondents have experienced online shopping before. Most popular items are books, tickets and clothes. 62.6 percent of the respondents have mentioned that they are buying products and goods occasionally.

Table 2: Online Buying Frequencies

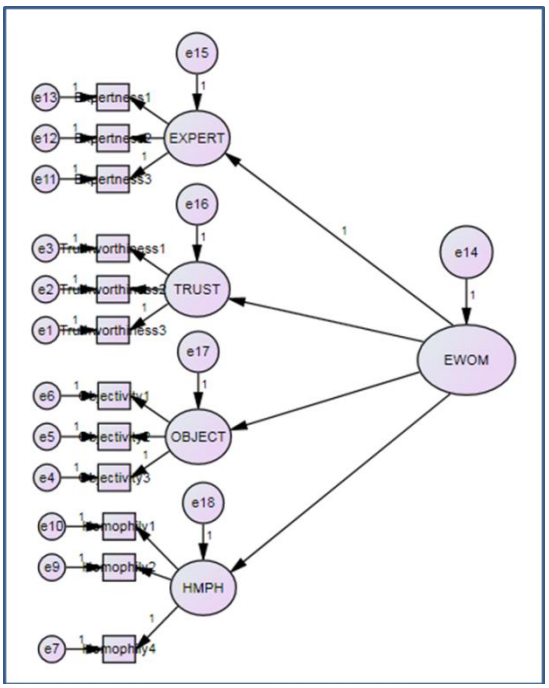
	Frequency	%
Several times per week	7	5.7
Once a week	17	13.8
Fortnightly	22	17.9
Occasionally	77	62.6

Confirmatory factor analyses (CFAs) have been used to define factor structures of scales used in the research. CFA of perceived behavioral control has been shown on the figure 1.



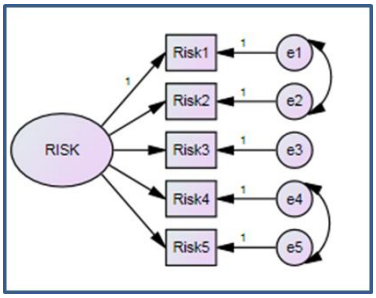
Chi square/Degree of Freedom: 1.761; RMSEA: 0.079; GFI: 0.968; CFI: 0.985
Figure 1: Perceived Behavioral Control Scale's CFA

e-WOM credibility has 4 dimensions including expert, trust, object and HMPH. The CFA model of e-WOM credibility fits as well (Figure 2).

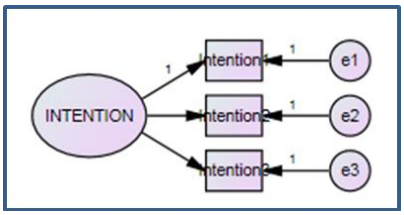


Chi square/Degree of Freedom: 1.458; RMSEA: 0.061; GFI: 0.911; CFI: 0.910
Figure 2: e-WOM Credibility Scale's CFA

Perception of Risk Scale has 5 items. Findings indicate that the model fits for Perception of Risk Scale (Figure 3)



Chi square/Degree of Freedom: 0.426; RMSEA: 0.000; GFI: 0.996; CFI: 1.000
Figure 3: Perception of Risk Scale's CFA
Online shopping intention has 3 items and its CFA has been presented on figure 4.



Chi square/Degree of Freedom: - ; RMSEA: 0.494; GFI: 1.000; CFI: 1.000
Figure 4: Online Shopping Intention Scale's CFA

Moreover, reliability results of the scales have been summarized on Table 3. Cronbach's Alpha of all scales indicate that all the scales used in this research are reliable.

Table 3: Reliability Results of the Scales

Scale	**Cronbach's Alpha**
Perceived Behavioral Control	0.876
e-WOM Source Credibility	0.760
Perception of Risk	0.776
Online Buying Intention	0.747

Multiple regression analyses have been applied to test the research hypotheses. First hypothesis, "Perceived behavioral control has a significant effect on perception of risk", has been supported. Table 4 shows the results.

Table 4: Multiple Regression between Perceived Behavioral Control and Perception of Risk

R	**R^2**	**F**	**Beta**	**t**	**p**
0.248	0.061	7.927	-0.248	-2.816	0.006

As seen in table 5, the second hypothesis of the study, "Perceived behavioral control has a significant effect on online buying intention" has been supported too; however the strength is very low.

Table 5: Multiple Regression between Perceived Behavioral Control and Online Buying Intention

R	R^2	F	Beta	t	p
0.095	0.009	1.113	0.294	1.055	0.294

The third hypothesis of the study, "e-Wom source credibility has a significant effect on risk perception", has been rejected. Table 6 shows the results.

Table 6: Multiple Regression between e-Wom source credibility and Perception of Risk

R	R^2	F	p		Beta	t	p	VIF
0.132	0.018	0.527	0.716	Expertness	-0.063	-0.537	0.592	1.665
				Trustworthiness	0.020	0.184	0.854	1.368
				Objectivity	-0.086	-0.807	0.421	1.356
				Homophily	0.135	1.287	0.201	1.324

The forth hypothesis of the study, "e-Wom source credibility has a significant effect on online buying intention" has been rejected. The results can be seen in table 7.

Table 7: Multiple Regression between e-Wom Source Credibility and Online Buying Intention

R	R^2	F	p		Beta	t	p	VIF
0.177	0.031	0.951	0.437	Expertness	-0.073	-0.623	0.535	1.665
				Trustworthiness	0.098	0.925	0.357	1.368
				Objectivity	0.006	0.055	0.956	1.356
				Homophily	0.170	1.634	0.105	1.324

The fifth hypothesis of the study, "Perception of risk has a significant effect on online buying intention", has been rejected. Table 8 shows the results.

Table 8: Multiple Regression between Perception of Risk and Online Buying Intention

R	R^2	F	Beta	t	p
0.036	0.001	0.159	-0.036	-0.399	0.690

5. Discussion and Conclusion

In this research we have examined the impact of risk perception on German consumers' online buying intention. Findings indicate that perceived behavioral control has a negative effect on customers' perception of risk and a positive effect on online buying intention. In consumer behavior literature e-Wom has been acknowledged as a crucial factor for reducing risk perception in online purchase proces (Lutz and Reilly, 1974). Risk perception itself has been identified as a key factor in buying decision-making process and has a restrainer function in purchase behavior (Peter and Ryan, 1976). In current research, however, e-Wom credibility does not have any significant effect on customers' perception of risk and online buying intention. Moreover, risk perception does not have any significant effect on online buying intention.

A strict interpretation of results emphasizes the need of focusing on cultural aspects of German consumers. Risk perception is consumers' subjective evaluation of probability of various outcomes, so personal characteristic, culture and environment may affect

customers' decision making process significantly and exhibit different risk behaviors in online shopping process (S. Zoghi and Arslan, 2017). We have used Hofstede's cultural dimensions including Individualism, Indulgence and Uncertainity Avoidance , to interpreate the results.

Individualism has been defined as "the degree of interdependence a society maintains among its members" and Indulgence has been defined as "the extent to which people try to control their desires and impulses". Germany is an individualist (the score is 67) and a highly decentralized society, loyalty is based on personal preferences.The low score of 40 on indulgence dimension indicates that German consumers have a tendency to control the pleasure of their desires (hofstede-insights.com- last visited on 30.07.2018). So, the probability of hedonic shopping is very low in online and offline consumer markets in Germany. In a cross-cultural study on online shopping behavior, Smith and et al (2013) have compared consumers in Norway, Germany and United State to examine the differences in their shopping behavior. Findings of the research show that full Technology Acceptance Model (TAM) does not hold for the European samples and there is no meaningful relationship between affective involvement and behavioral intention in German sample.

Uncertainity avoidance has been defined as "The extent to which the members of a culture feel threatened by ambiguous or unknown situations and have created beliefs and institutions that try to avoid these". The score of Uncertainity avoidance in Germany is 65. German consumers follow a systematic approach toward shopping process. There is a strong preference for deductive approach in thinking and planning in Germany. They make their online purchase decision based on reliable sources of information and they compare the selected product or service to similar products or services in the market. German consumers compensate for their uncertainty by strongly relying on expertise (hofstede-insights.com- last visited on 30.07.2018). Quick-and-easy transactions and benefitting from expert advice are among the most important motivations to do online shopping in German consumers. Marketing promotions such as lower prices, discounts and fad in common consumer items, however, are not affecting German consumers significantly (Join the Dots, 2016).

Moreover, Germany is one of the most cash-intensive economies among developed countries. German consumers for different reasons such as privacy issues prefer to use cash, Direct Debits or to be invoiced on delivery. Contactless payments and mobile payments via smartphones have been unsuccessful due to the trust concerns in German consumers (Euromonitor International, 2015).

Altogether, Germans are very concerned about their personal data protection and due to a systematic decision making process they try to minimize the risk perception in online shopping platforms. On the other hand, due to their individualist personal characteristics they are not getting influenced by environmental factors such as e-Wom unless they find the source of information credible and reliable.

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ABUNDANCE ECONOMICS FOR SOCIAL SUSTAINABILITY: MACROECONOMIC AND TRANSDISCIPLINARY ANALYSIS MODELS FOR LOCAL AND GLOBAL POLICY PERSPECTIVES

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Abstract

Abundance Economics, also called post-scarcity economics, increasingly attracts attention in macroeconomic research as well as in policy practice, with its relevance predicted to be ever growing. After a historical overview, this article traces that research attention, shows the need and motivation for this investigation, and then predefines and differentiates the concept. Conceptually, abundance and post-scarcity economics is discussed within the frameworks of heterodox and post-Keynesian economics, before examining how writings on abundance economics confront and overcome the scarcity paradigm within economics. Hence the first conceptual contribution of this research is the systematization of abundance economics within classical, heterodox and post-Keynesian economics in a concise yet comprehensive form that does not yet exist in macroeconomic literature. The second conceptual contribution is the investigation of abundance economics as a macroeconomic paradigm shift, together with this paradigm shift's pragmatic advantages in today's world. The third conceptual contribution is the precise definition, itemization and scrutiny of abundance economics within the global macroeconomic system, in a form also not yet existing in the literature. Methodologically, this research evaluates a range of suggested disciplines contributing to, and benefitting from abundance economics, before studying the arguments for their use and introducing its own multidisciplinary approach. Hence its methodological contribution is the consideration, combination and practical application of a coherent multidisciplinary framework for evaluating the macroeconomic potential of abundance economics in 21st century scenarios. Its final and overall contribution is the synthesis, analysis and discussion of eight distinct yet relatable solutions for conceiving and using abundance economics in economic, social, political, ecological and cultural sustainability reflections and recommendations for local practice and global policy.

Keywords: Abundance Economics, Post-Scarcity Economics, Post-Keynesian Economics, Heterodox Economics, Wealth and Welfare.

JEL Classification: B55, E12, E71, O35, P46.

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1. Introduction and Overview

1.1. Recent Research Interest in Abundance or Post-Scarcity Economics

Recent macroeconomic research focuses on the concept and applications of the economics of abundance, or post-scarcity, from various angles. While some ask openly: "Is there an economics of abundance?" (Jennings, 2015, p. 5), others depict it as one of the macroeconomically and socioeconomically most progressive and fulfilling theories to date: "A new philosophy of economics…as an economic theory of the future…*Abundance Economics,* is necessary for the contemporary moment" (Swan, 2017, pp. 19, 25, original emphasis). Others stress its future relevance: "A new economics of abundance is under way and in reach" (Jennings, 2015, p. 7). Still others underline the urgency to understand the concept and to apply it: "The post-scarcity world will put tremendous pressure on current business models, potentially rendering them irrelevant and obsolete in the future….If traditional businesses do not adapt to this emerging world…many of the strong, traditional organizations of the early twenty-first century will cease to exist over the next 50 years" (Aguilar-Millan, Feeney, Oberg and Rudd 2010, p. 36). Some hold that abundance has already arrived in the 21st century, in theory and practice, exemplified by new media applications: "Abundance thinking – understanding the implications of 'practically free' – is a core competence of our age. It brought us everything from the iPod ('what if storage were so cheap you could put your entire music collection in your pocket?') to Gmail ('why should you ever have to delete an email?')" (Peters (2009, p. 10).

1.2. Macroeconomic Need, Motive, and Scope of Research on Abundance

Sheehan (2010, p. vii) describes the need for more exploratory and explanatory research at the intersection of heterodox economics and abundance economics: "Mainstream and heterodox economics…had little to offer to the explanation of…affluent consumers. Other disciplines have taken the topic much more seriously, but with perhaps insufficient appreciation of the general market form in the system of abundance". Our research directly addresses these research lacunae, fully appreciating the general market, with a macroeconomic analysis focus, and in detailed engagement with heterodox economics, as shown below.

This research respects the lack of material goods by many people in today's world, yet also acknowledges the generally rising worldwide economic progress over the last two centuries that allowed ever more people to raise their living standards: "Over the past twenty years, the proportion of the global population living in extreme poverty has halved. This is absolutely revolutionary…[and] the most important change that has happened in the world [in the last century]" (Rosling and Rönnlund, 2018, p. 6). This research also acknowledges the rise of "lifestyle diseases" or "diseases of affluence" in developed and industrialized countries, such as "heart attack, hypertension, diabetes and obesity" (Chockalingam and Chockalingam, 2014, p. 5) caused by "overconsumption of sugar, salt, processed foods, meat and meat products, cigarettes and alcohol, combined with a lack of exercise" (Gillespie Cook and Halsall, 2012, pp. 22-23). Yet these potentially negative consequences of abundances should not detract from its positive ones.

Some (Aguilar-Millan, Feeney, Oberg and Rudd, 2010) detail areas of abundance with macroeconomic implications; yet several of these are outside the scope of this research, either because parts of them relate to other academic disciplines (such as sociology, world politics, international relations or international finance), or because of strong microeconomic elements. Some of these areas are: the post-scarcity company (2010, pp. 36-37), post-scarcity society (2010, pp. 37-38); post-scarcity geopolitics (2010, pp. 38-39), or the post-scarcity financial system (2010, pp. 39-40). Likewise beyond the scope of this research are specific challenges of resource abundance for affluent societies, whether they have positive connotations (such as government spending and public investments) or negative ones (such as economic or political mismanagement): "There are still problems in an affluent society. First, there is the problem of poverty or the problem of income distribution. Just because there is enough for everyone on average does not mean that everyone will get enough to survive. Second, there is the problem of public squalor and private affluence" (Pressman, 2011, p. 4). This research focuses on the positive connotations of the concept and practical implications of abundance economics from macroeconomic and sociopolitical perspectives, which can then serve as a sound basis for local and global policy measures and recommendations.

2. Literature Review

2.1. Terminology and Differentiation of Abundance Economics

Some of the current macroeconomic synonyms are "abundance economics" (Shi, 2018, p. 432; Swan, 2016, p. 907); "economy of abundance" (Shi, 2018, p. 425), "post-scarcity economics" (Pressman, 2011, p. 3); or generally "post-scarcity" (Peters, 2009, p. 11). For clarity and consistency, this research only uses the two terms "abundance" and "post-scarcity", either in connection with "economics" to underline its macroeconomic focus, or in isolation to accentuate the idea of abundance or post-scarcity itself. Specifically, "post-scarcity" is used to point out the effort of, or the success in overcoming real or perceived scarcities, while "abundance" is used to underline either real plentitudes, or at least their potential.

The literature on abundance or post-scarcity economics does not suggest goods to exist or to be obtainable in a form that is unlimited, effortless, without opportunity costs, or promoting laziness: some explicitly do "not equate abundance with infinity" (Saunders, 2015, p. 4). Others clarify: "Abundance does not mean that goods are free. Abundance means adequacy, not satiation. The level of adequacy is not constant, but is relative to the community's…technological progress… [which] has propelled the human community from the Stone Age to the Space Age" (Dugger and Peach, 2009, p. 3). The literature on abundance also holds that "opportunity cost – the cost of the next best alternative – is indeed a meaningful short-run concept, and everyone faces short-run tradeoffs. Nevertheless, scarcity in the short run obscures rather than illuminates the most important facts, trends, and issues of modern economies" (Dugger and Peach, 2009, p. x). Similarly, abundance is not equated with laziness: "Abundance does not mean that people will ever be able to sit back and do nothing but pluck juicy apples off the tree. There is much work that needs to be done in the world, products to make and services to perform" (Dugger and Peach, 2009, p. xiii).

2.2. Pre-Definition of Abundance Economics

A concise pre-definition of abundance economics facilitates its below historical embedding, detailed macroeconomic definition, and engagement with the scarcity paradigm. Recent writings consider it a combination of economic, political, social, cultural and personal goods: "Abundance means that everyone has adequate health care, nutrition, education, transportation, recreation, housing, self-expression, and personal security" (Shi, 2018, p. 432; Dugger and Peach, 2009, p. 3). It is seen as more than just a theory, namely a practical, lived-in reality: "Abundance is… analysed as an experienced reality rather than an abstract future utopia" (Sheehan, 2010, pp. 2-3). It starts from a material baseline but then transcends into other dimensions: "Abundance…is the eradication of scarcity in terms of having material needs covered, in the notion of recouping a baseline, but…also means open-ended possibility up from baseline, defining the area of social goods that humans need to thrive, not merely survive" (Swan, 2016, p. 905).

Some pre-define abundance concisely in both prose and itemization (Saunders, 2015, p. 8; my numbering below): "There are enough human talents and resources together to satisfy the needs of the inhabitants of the planet…[and] to devise strategies and action plans to ensure that tall human needs are met…[In] an economic regime based on abundance:

1) Everyone is able to acquire the material resources that satisfy their needs;
2) There are no gaping differences in material holdings between people;
3) There are no gaps in social standing related to material possessions;
4) People are enriched as they come together;
5) The 'moral distance' of obscene wealth in the midst of excessive deprivation is removed".

2.3. Classical and Heterodox Economics as Basis of Abundance Economics

While strongly discussed in recent literature, indications of the idea of abundance or post-scarcity economics are already found in macroeconomic writings as of the second half of the 20th century, even if in isolated and scattered form. As of the restructuring period after the Second World War, sources consolidated themselves around the ideas of technological optimism, employment conditions, democratic management, and peace studies (Peters, 2009, p. 11). Subsequently, interest in the concept and applications of abundance economics has steadily risen until the end of the second decade of the 21st century. Its current relevance is exemplified with the recent property and stock bubbles, resulting credit crunches and national bank bailouts, and their global economic ripple effects of public mistrust and economic recession, parts of which are still with us today (Aguilar-Millan, Feeney, Oberg and Rudd 2010, p. 35). It is further stressed that the post-scarcity world is already challenging our macroeconomic assumptions, exemplified by online information, shopping, advertising and entertainment: "As we enter into the post-scarcity world, we will also be entering a time of significant challenge to the traditional capitalist business models, concepts, and assumptions that have developed over the past 200 years" (Aguilar-Millan, Feeney, Oberg and Rudd, 2010, p. 36).

On that basis, recent macroeconomic writings remind us of classical economists as being forerunners of later heterodox and today's abundance economics: "Noted economists

such as Adam Smith, Karl Marx, Thorstein Veblen, John Keynes, and more recent thinkers such as R. H. Tawney, John A. Hobson and Eric Zimmerman taught 'abundance economics'" (Shi, 2018, p. 432; similarly Lavoie, 2014, p. 23). The literature then contrasts "the two wide traditions that exist in economics… heterodox economics and orthodox economics", calling orthodox economics also "neoclassical", "old paradigm", "mainstream" or "marginalism" economics; and heterodox economics also "real-world economics", "post-classical paradigm", or "new paradigm economics" (Lavoie, 2014, p. 5). While some hold that "there is no agreed concept of heterodox economics" (Mearman, 2011, p. 481), for others, orthodox schools stress "exchange, allocation, scarcity", while heterodox schools highlight "production, growth, abundance" (Dugger and Peach, 2009, p. 5). This, finally, leads to associations of orthodox economics with scarcity, and heterodox economics with abundance: "Orthodox economics is…research…of a world of scarcity, [while] heterodox economics is…research…of a world of abundance (sometimes in the midst of poverty)" (Lavoie, 2014, p. 24).

2.4. Post-Keynesian Economics as Refined Basis for Abundance Economics

One of the still most influential schools of heterodox economics is Post-Keynesian economics (see Lavoie, 2014, p. 2; Mearman, 2011, p. 482), based on "the seminal ideas that were developed by the followers of John Maynard Keynes" (Lavoie, 2014, p. 4). Post-Keynesian economics has found recent and staunch support in the wake of the 2008 Global Financial Crisis, in that it should already have been considered after the 1990 Asian Financial crisis that involved Japan and East Asia (Lavoie, 2014, p. 1). Consequently, for our current times, "the necessity of a post-Keynesian alternative" is put forward (Lavoie, 2014, p. 4). Some even suggest post-Keynesian economics as an ecologically sound basis to remedy some of our current, 21st-century environmental challenges and concerns (Lavoie, 2014, pp. 578-580). Theses stances reflect our research orientation including ecological and cultural sustainability, and focusing on related local practices and global policies.

2.5. Galbraith's Outlook as Visionary Basis for Abundance Economics

John Kenneth Galbraith is considered as one of the foremost representatives of Post-Keynesianism. In his seminal book, *The Affluent Society*, Galbraith pointed out that the world had moved past the epochs of considering its resources purely in terms of economic scarcity, since "the economic ideas which once interpreted the world of mass poverty…[need] adjustment to the world of affluence" (1958, pp. 1-2). He urged research to address "the economics of affluence of the world in which we live" (1958, p. 131), and concluded with these two pleas: to "put elimination of poverty in the affluent society strongly, even centrally, on the social and political agenda", and to "protect our affluence from…destructive tendencies" (1958, p. 263). Both pleas explicitly state affluence as a reality already during his days and in parts of the world. Recent literature confirms Galbraith's contributions to the macroeconomic theory and practice of abundance economics: for theory, in that "Galbraith has provided…a Post Keynesian approach to key macroeconomic issues" (Pressman, 2011, p. 1; similarly Lavoie, 2014, p. 4; Lloyd, 1980, p. 377); for practice, by regretting that "Galbraith's challenge has sadly been ignored by economists for the last 50 years…[namely] constructing a

different type of economics – the economics of abundance… [which] puts aside the conventional wisdom of universal scarcity" (Sheehan, 2010, p. 1).

2.6. Abundance Economics Confronting the Scarcity Paradigm

According to often-used definitions, scarcity is an integral element of economics as "the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses" (Robbins, 1932, p. 15; also Backhouse and Medema, 2009, p. 805; Zinam, 1982, p. 61), or of economics as a system "engaged in the production and distribution of scarce material goods" (Swan, 2017, p. 25). Hence for some, "abundance is defined relative to…scarcity and sufficiency" (Sheehan, 2010, p. 3); while others see them "at two ends of a single continuum of value and distribution" (Jennings, 2015, p. 7; similarly Zinam, 1982, p. 61), while finally others differentiate, in that abundance is an "alleviation of scarcity…but it is also more" (Swan, 2017, p. 26; similarly 2016, p. 905).

In relation to needs and wants, scarcity "is based on the assumption that we have unlimited wants and desires and there are limited or insufficient resources to satisfy these wants and desires" (Saunders, 2015, p. 10). Some bluntly summarize the last two centuries of industrialization thus: "Scarcity is the dominant driver of the industrial age. Scarce resources, scarce machines, scarce labor and scarce shelf space" (Godin, 2012, p. 12). For the future, some even hold that "the world between 2010 and 2050 is likely to be characterized by scarcities…of credit…of food…of energy…of water, and…of mineral resources" (Aguilar-Millan, Feeney, Oberg and Rudd, 2010, p. 35). Some differentiate between absolute scarcity, where "people are condemned to conflict and poverty" and relative scarcity, which is merely "irrational as each person tries to consume more than everyone else" (Dugger and Peach, 2009, p. 4). Our research acknowledges those past and present shortages, and those who suffer from them, but tries to offer conceptual solution models and practical alternatives based on current worldwide developments.

Some take the dichotomy between scarcity and abundance to the theoretical extreme, pondering whether "abundance has no economics, since there is enough for all: the economic problem is solved" (Jennings, 2105, p. 6), or whether "universal scarcity excludes abundance from economics", since "the clash of abundance and scarcity…suggests that they are irreconcilable" (Jennings, 2105, p. 6). Some stress the utopian nature of abundance: "Abundance economics might be overly optimistic and unrealistic to achieve…how to accomplish this in practice is not clear" (Swan, 2017, p. 29). This research addresses both the relationship between scarcity and abundance as well as its practical realizability, by developing a range of concrete solution models in the analysis and discussion part below.

Others mention that a minimum of costs will always be there, given that "ideas, materials, innovation, and time are all necessary to produce the first of anything, and that these are costs to creators…[which] can never be fully eliminated". Yet even they concede that "the transition to the 'free' business model is already being made…successfully" (Aguilar-Millan, Feeney, Oberg and Rudd, 2010, p. 37), giving examples of online companies and the elimination of margin costs once the first exemplar of a new type of online product has been created and launched.

Finally, some argue that even under conditions of material abundance and ever increasing technological progress, there will always be scarcity, at least of "time": "Human beings [might not] have unlimited time to make decisions…Time is scarce, and it grows scarcer by the day as the tempo of life increases…Digitization does make a difference to economic and social behaviours, but it does not eliminate the limit of time" (Peters, 2009, pp. 11-13). However, even this stance only holds the *non-material* element of time to be scarce, and does not contest the potential or already existing abundance of *material* goods. Hence our solution suggestions below aim to reconcile the factor of time (which, at least in principle, is equal for all) with abundance in other areas (whether material or non-material).

2.7. Abundance Economics Overcoming the Scarcity Paradigm

A wide part of the macroeconomic literature then tries to overcome the limitations of the scarcity paradigm from conceptual and practical perspectives, criticizing it as either having negative macroeconomic implications, or as preventing positive ones. These arguments are condensed and enumerated below in twelve key points, in a way that does not yet exist in this form in the macroeconomic literature:

1) Conceptually, considering scarcity as the only, or main criterion for material evaluation, already bars any *theoretical* contributions of abundance: "Scarcity issues appear right at the core of economics…which begins and ends with insatiable wants against limited means, with trade-offs inherent to human existence…and seldom mention abundance" (Jennings, 2015, pp. 5-6).
2) Logically, strict scarcity thinking excludes any positive *practical* potential of abundance: "To define economics as the study of scarcity…assume[s] that the current institutional arrangements that promote scarcity cannot change. This…denies the possibility of abundance…[and] is too narrow. Economics should include the study of abundance" (Dugger and Peach, 2009, pp. ix-x).
3) Historically, scarcity ignores the evolution in human productivity: "Scarcity economics…misses the remarkable technological and institutional changes associated with…the…ongoing…industrial revolution. The world's capacity to produce goods and services has increased dramatically over the last few centuries and is continuing to increase" (Dugger and Peach, 2009, p. x).
4) Treating scarcity as a one-fit-all category is unsuitable to the changed global macroeconomic and social realities: "The mainstream definition of scarcity…is a constraint on resources relative to the scale of wants (or demand)…[It] universalizes scarcity…[in a] fixation with what people *lack*" (Sheehan, 2010, pp. 3-4, original emphasis; similarly Zinam, 1982, p. 61).
5) Scarcity economics only looks at original human needs and wants, ignoring man-made, artificial ones: "Economics is the study of how people allocate their limited resources…to satisfy their unlimited wants. I advance here a different thesis: human beings have limited wants and needs, but capitalist institutions seek to continuously generate new forms of scarcity by creating ever new needs" (Hoeschele, 2010, pp. 1, 3).
6) Scarcity, as a zero-sum-game, is limiting: "'The scarcity mentality is the zero-sum paradigm of life' where people 'see life as having only so much'. So whatever anyone gets, there is less for anyone else…Conversely, the abundance mentality

asserts that there is enough for all: 'It results in sharing prestige, of recognition, of profits, of decision making. It opens possibilities, options, alternatives, and creativity'…The psychological distance between these two mind-sets is significant" (Jennings, 2015, p. 5, citing Covey).

7) Scarcity is not a problem of material resources, but of limited human ingenuity and sociopolitical will: "Today's food, energy…scarcities are not caused by limitations of the earth's material endowments, but rather follow from man's limited horizons and…performance. There is ample scope for continuous progress…The real problem is the political will of man…to create economic, legal and social conditions that encourage…productive activity…[so as] to contribute to national progress" (Malenbaum, 1975, p. 72).
8) Scarcity is already an outdated notion in many economic and industrial fields, such as the automation economy, or digital goods (for instance social robotics, or software and digital images): "A central focus on the production and distribution of scarce resources is no longer the case in all economic systems…since there is…evidence of situations in the world where scarcity is…not the governing parameter" (Swan, 2016, p. 905).
9) Scarcity favors producers, while it disadvantages consumers: "An economic system that favors producers will emphasize scarcity, while 'the interest of the consumer runs parallel with the public interest' in seeking abundance" (Jennings, 2015, p. 6, citing Pinto, Bastiat and Rusch). "Scarcity…enables producers to charge a price for the goods and services they provide…Without scarcity…charging a price to consumers as a means of generating revenue will be unworkable" (Aguilar-Millan, Feeney, Oberg and Rudd, 2010, p. 37).
10) Scarcity then creates artificial high-price politics, mainly for-profit purposes: "Prices…are supposed to provide all the information required to make the market system function efficiently, because prices are the measure of scarcity, so that the knowledge of prices allows agents to respond to changes in scarce resources" (Lavoie, 2014, p. 22). Yet this has become a problem where "prices did misallocate financial resources", as exemplified by the recent 21st century stock market crashes, real estate bubbles, and accelerating unemployment and inflation rates (Lavoie, 2014, p. 22-23). "Scarcity, then, is a means towards the end of profit maximization" (Hoeschele, 2010, pp. 1-2).
11) Scarcity poses an ecological danger on national and international levels, as it limits biodiversity with implications for local and global food supply, such as when "cash crops" are cultivated for macroeconomic profit, willfully ignoring the needs of the national population: "The scarcity economy is inclined to reduce diversity in the name of efficiency…[which means] producing at the lowest possible cost…[via] standardisation and homogeneity…where communities cease growing crops conducive to their environments and plant for exporting to richer nations" (Saunders, 2015, p. 18).
12) Finally, scarcity poses a range of sociopolitical dangers worldwide, due to social and income inequality: "The modern world needs an economics based on modern notions of widespread abundance and equality rather than concepts of scarcity and inequality" (Dugger and Peach, 2009, p. x). "Income inequality refers to the uneven distribution of income within a society…It is a worsening global problem that has both economic and social consequences…These include violence, mental illness,

drug addiction, obesity, imprisonment, and poorer social conditions for children" (Swan, 2017, p. 24).

2.8. Abundance Economics as a Macroeconomic Paradigm Shift

Progressive voices try to move past scarcity towards a new abundance paradigm. They are analyzed below in a form that also does also not yet exist in the literature. Macroeconomic writings insist that "abundance economics…is…an alternative paradigm" (Shi, 2018, p. 432), or that "a new philosophy of economics that is an abundance theory of flourishing can be developed by articulating the social goods that might be produced for humans" (Swan, 2016, p. 906). This paradigm shift from scarcity to abundance could be summarized in a nutshell as "seeing the world's resources in a paradigm of availability as opposed to paucity" (Swan, 2017, p. 26)", to "enable a movement from competition to collaboration, from self-interest to shared interest, and from greed to generosity" (Shi, 2018, pp. 425-426), all based on the "fundamental assumption that *there is enough; there is abundance*", which means that "economics becomes the study of how we allocate abundant resources" (Saunders, 2015, pp. 22-23, original emphasis).

Some exemplify this paradigm shift as an already workable, helpful reality in very specific economic contexts, such as digital goods or the music industry: "When goods become digital and available online then scarcity disappears. They are non-rivalrous so that if a copy is taken, it is still available for others" (Weller, 2011, p. 85). Others uphold the same idea for other digital and intangible goods, calling for "a new philosophy of economic theory": "A broad share of the goods valorized in the contemporary economy are intangible. These include non-monetary currencies such as reputation, intention, attention, access, influence, choice, autonomy, recognition, and creativity. Intangible goods have properties that are different from material goods; they are often complementary and non-rival, and they can make more of themselves when consumed…they can agglomerate. Thus a new philosophy of economic theory is needed to make sense of digital economics" (Swan, 2017, p. 25; similarly 2016, p. 905). Finally, for some, abundance flows out of "disruptive technologies", examples being 21st-century hard- and software innovations such as the iPod, Gmail or Amazon, which lowered storage cost and space to almost zero: "Disruptive technologies…take a scarcity assumption and, thanks to some technology that generates abundance, simply turn it on its head" (Peters (2009, p. 10), meaning in those cases that "storage space…was no longer a limiting factor…[but] available at the click of a mouse" (Weller, 2011, p. 86).

2.9. Advantages of the Macroeconomic Paradigm Shift towards Abundance

The literature mentions a range of macroeconomic advantages of the abundance paradigm over the scarcity paradigm. Some sum up these advantages in a nutshell by stressing social goods: "Abundance economics…focuses on social goods production in addition to material goods production…While material goods attend to survival, social goods attend to thriving" (Swan, 2016, pp. 905, 907). Others emphasize broader socio-political gains such as freedom, justice, or equality: "For a post-scarcity society to develop in such a way that it adds to net human freedom, justice, and well-being, we need more than ever to reinforce the principles of equality, generosity, tolerance, compassion, and mutual interdependence" (Aguilar-Millan, Feeney, Oberg and Rudd,

2010: 39). Some even see abundance economics as solving most of the current global productivity and employment challenges: "If all 200 million [currently worldwide] unemployed people went to work at a living wage…[the] additional production would transform the global economy in a generation" (Dugger and Peach, 2009, p. xiii). Finally, some stress the point of individual and societal well-being in considerable detail: "Abundance does not rely merely on price and money evaluations [but on] the neighbour who voluntarily cares for a child while his mother is on a job is providing care, safety, and stability…Abundance does not necessarily require more, but it may require better…Not…more food…[but] better, tastier, and nutritious food…Not another car, but…better transportation" (Saunders, 2015, p. 20).

On a global level, the abundance paradigm results in a more balanced, responsible and sustainable interaction between people and the planet: "An abundant economy should be characterised by its tendency towards balance…[to] take into account not only the needs of today but also the needs of and consequences for tomorrow…[and] to act and interact with others and the planet with integrity and stewardship in the present as well as for the future" (Saunders (2015, p. 22). In the same vein, some hold abundance to overcome competition via cooperation and connection: "The abundance model…promulgates social harmony and generosity in its sharing of value with others and supporting common property measures and distributional equity…based on connection, ongoing change, and a process of cocreation" (Jennings, 2015, p. 7). Others even consider the social goods of psychological safety and emotional well-being, leading to individual and social fulfilment at the top levels of Maslow's hierarchy of needs: "Abundance invoke[s] the social goods of certainty and reliance about the real-time availability of resources for need fulfillment…related to liberation such as self-respect, self-esteem, and self-realization" (Swan, 2016, p. 906).

2.10. The Global Macroeconomic System of Abundance Economics

Based on the idea of "relative, rather than absolute, abundance", Sheehan (2010, pp. 3-4) differentiates between "three economic systems", focuses on conditions and the people within them, and then defines each in relation to the other two. He begins broadly, highlighting: "Relative abundance…concentrates on what people have; the unequal distribution of what people have; and the different reasons why different peoples want more". He then stresses what he calls "the symbiosis of the three economic systems": "The three economic systems – scarcity, sufficiency and abundance – recognise no national boundary or city limits…[They] cut across the boundaries of formal organisations such as transnational corporations, informal social networks…and even large categories such as a national workforce…Each system interacts with the others, as they are all symbiotically interconnected…[in] a wider global community" (2010, p. 12). These three economic systems are then labeled as being of the "people of poverty", the "people of adequacy", and the "people of plenty", and defined in relation to each other like this (2010, pp. 2-3):

1) "The people of poverty [are] living within the system of scarcity which has an extremely limited productive capacity…The people of poverty appreciate that the people of adequacy have somewhat more than them, although the differences are not extreme, because the latter can access a slightly more productive economic system with some more opportunities for betterment".

2) "The people of adequacy…whose existence is passable enough with all the essentials to get by…have …access to the necessities and some decencies that make life bearable plus the occasional treat, and the opportunity to make some limited economic progress…Nevertheless…the standards of living, and the economic system, experienced by the people of plenty are significantly, often vastly, different from their own".
3) "The people of plenty [are] living in an economic system that has solved the problem of production…indeed the people of plenty seem to live in a different world…[They] realise that there are members of the global community who are significantly poorer than they are – the people of adequacy – and then those who live in wretched conditions…the people of poverty".

Sheehan (2010, pp. 7-9) then specifically details the third system, of the "people of plenty" (a term however already used in Potter's 1954 eponymous book). The central items of this system are condensed and enumerated below in fifteen key points that also do not yet exist in this concise form in macroeconomic literature:

1) Roughly 30% of the world population, or around 2 billion people, experience the "system of abundance"; they are the "people of plenty";
2) Compared to the other two systems (of poverty and of sufficiency), they enjoy much higher living standards, with a lot more of everything;
3) There are no national boundaries to this system; it is a global community that stretches across geography and classes of society;
4) It is a phenomenon of industrialized societies such as Western Europe, most of Central Europe and parts of Eastern Europe; the United States; Canada and Australia; urban concentrations in the Middle East and Russia, South and South-East Asia; and the Eastern seaboards of China and Latin America;
5) These people live in a world saturated by branded products, which inhabit every aspect of their daily practical lives;
6) Entrepreneurial production and distribution channels are mostly in the hands of global corporations, constantly using and investing in the most updated technologies, most educated workers, and latest organizational systems;
7) The system of abundance has solved the problem of production, turning out a near limitless number and variety of products around the clock;
8) This economic system is founded and run on the maximum advance of the three basic capitalist principles of entrepreneurship, investment, and growth;
9) All the necessities and decencies of life are provided, including for instance education, health care, housing, water, electricity, etc.;
10) Beyond that, people enjoy affluent lifestyles with clothing, cars, refrigerators, washing machines, dish washers, electronic equipment, multimedia access, and sophisticated financial systems;
11) Other available services include for example cleaners, doctors, lawyers, personal assistants, trainers, bodyguards, etc.;
12) Even the less well-off among those 30% of the world population can be called to live in a "culture of contentment" (term from Galbraith, 1992, p. 1);
13) Even the least well off in this group, for instance those living on welfare payments, still have access to more than enough food, acceptable housing, free education and health care, various possessions, and occasional holidays;

14) Consumption is paramount; as the problem of production has been overcome, consumption remains the main economic driver of this system;
15) Continuous consumption requires spending, which in turn relies on ceaseless promotion, propaganda and marketing of products and services.

3. Research Methodology

3.1. Abundance Economics Calling on Specific Academic Disciplines

Recent writings on abundance economics (Yamash'ta, Tadashi and Hill, 2018, p. 6) favor a methodological approach "in developing our critique of current global economic thought and practice" that can "draw from the full spectrum of human and academic knowledge…[such as] from philosophy…political economics… politics…across their dividing boundaries". Similarly, some mention a catalog of academic disciplines that can be enriched by the insights of abundance economics: "Anthropology, economic and social history, sociology, social psychology, sustainable development, architecture, art and design, marketing and cultural studies…will…embrace its ideas" (Sheehan, 2010, p. vii). Drawing the circle of fields that can benefit from abundance economics even wider, some point out that "discussions of scarcity and abundance are not confined to the field of economics; they can occur in theology, among psychologists and social theorists…[and] influence personal growth and business management" (Jennings, 2015, p. 5).

These stances find support in the historical development of abundance economics within the disciplinary square of economics, politics, sociology and philosophy: already Galbraith drew attention to the repercussions of abundance economics for the theory and practice of politics and sociology: "The effect of affluence goes beyond economics to influence politics and political behavior…[and] political theory" (1958, pp. 261-262). In his footsteps, others considered the field of socioeconomics: "We must become highly aware of abundance now. This can only be done if we develop out of economics into socioeconomics" (Theobald, 1970, p. 10). Commenting on Galbraith's work, some even combine economics, politics and history, lamenting that across the second half of the twentieth century "the study of economics and the study of politics have been severed from their historical and philosophical dimensions, separated from each other, and carefully subdivided into distinct internal fields of specialization…[while once] concerned with what is good for human beings" (Lloyd, 1980, pp. 368-369).

3.2. Abundance Economics Calling for Multidisciplinary Research Approaches

Based on those calls on a range of academic disciplines, recent macroeconomic writings favor multidisciplinary research approaches for abundance economics. For instance, some provide several "suggestions" within a package of "advice for heterodox or post-Keynesian economists", indirectly calling for multidisciplinary approaches, such as "cooperate with other social sciences" or "be eclectic and cooperate with other heterodox schools of thought" (Lavoie, 2014, p. 577). Others explicitly define the "multidisciplinary" nature of abundance economics in terms of embedded in heterodox economics as a "multidisciplinary process…to extract some of the best of what other disciplines have had to offer to develop a distinctive heterodox economic perspective"

(Sheehan, 2010, p. vii). Finally, some advocate the great academic divide between social and natural sciences to be bridged, to overcome the scarcity paradigm with the abundance paradigm: "It is necessary to develop a new approach, consistent with advances in other social and natural sciences, which…aims at putting an end to scarcity by creating abundance" (Hoeschele, 2010, p. 2). Correspondingly, the methodological contribution of this research lies in unifying and using these calls for multidisciplinary approaches in a new methodological framework: for the hitherto conceptual analysis, for the following analysis and synthesis of different solution models, and finally for the discussion and development of suggestions for local practice and global policy.

4. Analysis and Discussion

The solution models in this section are ordered from some that could be said to be already part of our lives (at least for the "people of plenty"), over others which are immediately applicable (and would require only relatively small modifications in current legislation, political orientation, work organization, consumer attitudes, or economic outlooks), up to more esoteric ones that would involve considerable individual, communal or societal changes, or even new philosophies of life (such as adopting more caring attitudinal and behavioral patterns). This is also the main contribution of our research, in that it combines conceptual elements and practical application: first synthesizing all currently advocated solution models related to abundance economics, then logically and creatively structuring them on several levels of economic, social, political, ecological, cultural and personal realization and implementation, and all this consistent with our aim of making conceptually sound and practically useful suggestions for local practice and global policy.

The solution models are ordered on three levels of increasing progressiveness: the first level (solutions 1-3) ranges from merely not wasting the already existing and abundant resources (solution 1) over the case of digital or free goods (solution 2) to contributory knowledge use (solution 3). The second level (solutions 4-6) aims at either relieving people from work via the automation economy (solution 4), or modifying their working patterns (solution 5) or even the nature of their work, such as working for fulfilment instead of sustenance (solution 6). Finally, the third level (solutions 7 and 8) aims as high as a new, spiritual form of macroeconomy that includes education for abundance, or a creative or connection economy that redefines scarcity, for a completely new era and understanding of abundance or post-scarcity economics. To facilitate applying these solutions to macroeconomic and political reality as well as social and personal practice, alternative headings (in brackets) sum up each main heading in form of a slogan or catchphrase. Further developed in the conclusions, these solutions can also be creatively combined.

4.1. Solution 1: Tomato Economics (Avoiding Waste)

One claim is that there is enough vital material for all (food, raw materials, natural and man-made resources etc.), and if it were evenly distributed, everyone would get a fair share. The example given (and that names this model) is that of the global production of tomatoes, which, although limited to a few localities, could nourish all the people around the world who wanted them (Saunders, 2015). One notable (or even notorious) example

is the annual tomato festival "La Tomatina" in the town of Buñol in the Spanish central eastern region of Valencia, where during just one hour of one day, the public uses to destroys over a hundred tons of tomatoes by throwing them at each other. While there are several theories about the roots of this festival, none has to do with a celebration of the tomato harvest; the most frequent explanations go back to a public riot that ensued when several youngsters were excluded from participating in a procession (Ávila López, 2016, pp. 339-340). This festival has inspired a range of imitations around the world, from North America over South America to South Asia. However, as an example of cultural and administrative reactions, "India has placed multiple barriers to host similar events in Delhi and Bangalore where local government officials have cancelled and banned such events because they consider them a huge waste of food, which is badly needed in other towns with poor populations" (Fandino, 2014, p. 309).

4.2. Solution 2: Digital or Free Goods (Sharing What is Already There)

Linking up with our discussion of the abundance paradigm, it is invoked that "the evolution toward free goods and a lack of scarcity is…already under way, thanks primarily to technologies (such as computers and the Internet) that have enabled and driven the growth of digitization over the last 20 years" (Jennings, 2015, p. 6). Furthermore, and in a complete reversal of scarcity economics, it is held that "in the digital world…when one item is used (copied, connected to another) there is at least one more item available (thus decreasing scarcity)…[which] explains exactly how digitization is driving an age of free goods and removing scarcity" (Aguilar-Millan, Feeney, Oberg and Rudd, 2010, p. 37). A range of examples of such digital or free goods is given, attributed to free online services and providers, which are held to be commercially successful because they "are all making money from free goods" (Aguilar-Millan, Feeney, Oberg and Rudd, 2010, p. 37). The most well-known of these examples are mentioned below (with own numbering, paraphrasing and additions, ordered from near-limitless service providers or space storage applications, up to specific site providers, such as individual newspapers):

1) Online search devices, such as Google or Yahoo;
2) Online marketplaces, such as Amazon or eBay;
3) Downloadable books and other reading material;
4) Email with unlimited storage, such as Gmail;
5) Music downloads, often from the artists themselves;
6) Photo-sharing services, such as provided by Flickr;
7) Information and collation websites, such as Wikipedia;
8) Local classifieds and forums, such as Craigslist; or
9) Single-provider and information sites, such as The Wall Street Journal.

4.3. Solution 3: Contributory Resource Use (Growing by Sharing)

Given that goods are not offered completely free, "a blended business model, such as charging fees for premium versions of free goods and services" is argued for: even in an abundance economy, there will not be exclusive government provision of goods or services, but instead always a degree of private property and personal ownership. The specific character of ownership and consumption will depend on "both the availability of resources and the materials used" (Aguilar-Millan, Feeney, Oberg and Rudd, 2010, p.

37). Hence the following macroeconomic reorientations are recommended (own ordering, numbering and paraphrasing):

1) Planned obsolescence (as it is, still widespread for calculating manufactured goods' durability and thus production cycles) should itself become obsolete;
2) Cradle-to-cradle manufacturing (that is, a kind of closed-cycle manufacturing without waste production) is expected to become more widespread;
3) Leasing of goods (with the manufacturer responsible for repair, replacement, or recycling of the item) is recommended to be more in demand.

As a special case, "one of the most important contributory resource uses is the free use of knowledge. The more people use a specific kind of knowledge, the more of that knowledge is…available". In practice, "to ensure that innovation can proceed is to ensure that everyone seeking knowledge has access to it" (Hoeschele, 2010, p. 150). The main restriction for such free knowledge access is seen in the current patent regime that is focused on scarcity and profit, both counter-productive as they create even more scarcity and thus unbalanced research, such as "expensive medicines over healthy practices available to everyone, software monopolized by a few corporations over free sharing of innovations by a community of computer users, and ever new chemicals with unknown environmental impacts over ecological research". By contrast, it is pointed out that "many fields of knowledge (including the humanities, the social sciences, and large parts of the nature sciences) advance in the total absence of any patent protection, motivated by…the intellectual joy of discovery, the satisfaction of imparting new knowledge to others and thereby making a positive contribution to society, and the prestige of being recognized for advancing one's field of study". The suggested solution is thus either national funding or curbing or even abolishing patent privileges: "The state as well as private foundations and individual donors could increase their support for innovation by offering grants and other supports to people with innovative ideas, to help put those ideas into practice" (Hoeschele, 2010, p. 152).

4.4. Solution 4: The Automation Economy (Delegating Work to Machines)

The arguments of the automation economy are based on technological and social innovations that include the interconnected areas of artificial intelligence, social robotics, and nanotechnology. Convinced that "there is no economic law that producing a good or service must require human labor", it is argued that "technology has supplemented or replaced non-elective human labor" (Swan, 2017, p. 27). Thus "the automation economy is concerned not just with human survival, but an improved quality of live such that humans can thrive" (Swan, 2016, p. 905). Fitting with the shift to the abundance paradigm, it is held that "the automation economy…is accommodated more congruently with an economics of abundance than with an economics of scarcity" (Swan, 2016, p. 905), which in the process might stimulate significant changes in social and individual mindsets: "The magnitude of a rapid shift towards the automation economy could simultaneously engender a rethinking of economic principles, with significant shifts in mindset, for example from…exclusively human agents to multiple forms of intelligent and emotional agents comprising society" (Swan, 2016, p. 908).

Correspondingly, social robotics is predicted to "figure prominently in both an automation economy that focuses on reduced requirements for human labor and an

abundance economy that targets improved quality of life…since social robotics implies a much closer connection between humans and technology than other platforms" (Swan, 2016, p. 903). Linking automation, abundance and human nature, this is seen as especially helpful since "there should be a balance between 'hard' and 'soft' tasks in social robotics, connecting with both the mechanical labor-saving and the emotional side of human needs…to facilitate shifts to situations such as the post-labor automation economy and improved human quality of life in a social goods economy of abundance" (Swan, 2016, p. 907).

Nanotechnology promises to accomplish such work on a highly specialized level, in many and varied forms, but all equally embedded in an abundance framework: "The case for a 'postscarcity economy' of abundance stands on advances in nanotechnology…Self-replicating automated mining of asteroids, energy from nuclear fusion or solar-powered satellites, and products from personal nanofactories or fabrication laboratories automated through artificial intelligence all are invoked to imagine economies of abundance" (Jennings, 2015, p. 6). Similarly, "scientists…emphasize the benefits of nanotechnology with an abundance of raw material and self-replicating technologies" (Peters, 2009, p. 11).

Finally, futuristic outlooks on artificial intelligence are found both in research and fiction. Recent research asks for instance: "Why not…[use] AI personal robots, creating a digital utopia that everyone can enjoy?…[An] AI-drive economy would not only eliminate stress and drudgery and produce and abundance of everything we want today, but would also supply a bounty of wonderful products and services that today's consumers haven't yet realized that they want" (Tegmark, 2017, p. 119). Finally and interestingly, similar (even if as of yet still fictional) models of ongoing research into artificial intelligence are increasingly featured in globally bestselling novels or Hollywood movies, such as Dan Brown's 2017 novel *Origin*, or the 2004 Will Smith movie *I, Robot*, in which the fusion of man and machine creates a new species on earth, a crossing between humans and technology, called for instance "technium", which both assists and transforms humans, and lets them accomplish hitherto unimaginable tasks (see Brown, 2017, pp. 408-413).

4.5. Solution 5: Changing Work Patterns (Working Differently)

Increasingly scrutinized is a range of possible macroeconomic changes in working patterns (see Aguilar-Millan, Feeney, Oberg and Rudd, 2010, pp. 37-38). Work might still be done largely from outside the home, so the suggested changes regard mainly the nature and the quality of the work. These changes could be summarized as a ten-point catalog as follows (own numbering, ordering and paraphrasing):

1) One of the few constants is that work might remain to be done from outside the home, even if home-stay work and shorter hours are ever more in demand.
2) Given that many countries are developing economically, working hours are in that process, at least initially, set to increase.
3) These countries will then however experience resource shortages, which are bound to neutralize that rise in working time.
4) Increased efficiency and better resource reuse and recycling mean less overall consumption, therefore less production, and maybe also higher prices.

5) Countries' increased populations will also increase their numbers of working people, which might fortuitously reduce or even eliminate child labor.
6) Women 's increased and improved access to education and work might reduce the number of children who are required to work outside the home.
7) Progress in health care and quality of life lets people work up to a higher age; this would especially benefit the already developed countries, where birthrates have typically declined as countries have advanced economically.
8) With increased populations and people working longer along their lifetimes, the higher number of working people might force governments to mandate reduced working hours and part-time work, to create more jobs.
9) Workplace interactions across distances will increasingly be done virtually by means of technology, such as online communication or conference calls.
10) Increasing environmental and ecological awareness in combination with technological advances might lead to more low-cost and low-impact travel.

A recently much-debated suggestion of working differently, equally based on the abundance model and on the consideration that "many countries are becoming rich enough", is "decoupling labor-based work from sustenance-remuneration", and "to pay individuals a guaranteed basic income to cover basic survival needs" (Swan, 2016, p. 905). Already being tested in several European countries and in Canada, these pilot programs and test cases are praised as "a practical response to the inefficiencies of welfare systems". Any public resistance is considered as less directed against their benefits, but against them attracting immigrants – which however "only serves to confirm their perceived value" (Swan, 2017, p. 28).

4.6. Solution 6: The Actualization Economy (Working for Fulfilment)

The relationship between work and leisure is suggested to be redefined at the top level of Maslow's hierarchy of needs, namely to work less for survival and rather for self-actualization and fulfilment: "In the labor-to-fulfillment mindset shift, work becomes…optional productive engagement for the purpose of personal fulfillment". As the predicted macroeconomic gain, "beyond work for pay, these opportunities for meaningful engagement could create as much work as needed, and produce many valuable social goods". This model is as well embedded in abundance thinking: "In abundance economics…the good life expands to a fuller multi-category experience…with an orientation to both social and material goods production" (Swan, 2017, pp. 27-28). Correspondingly, some of the suggested activities are these (own numbering, paraphrasing, and detailing; ordered from formal, work-related scopes and actions to more informal, leisure-related ones):

1) Continuous, lifelong learning (for example soft skills, such as languages);
2) Altruistic vocations and voluntary work (such as coaching or mentoring);
3) Community engagement (at political or social, civic, local or grassroot levels);
4) Voluntary collaboration (development aid; material or monetary donations);
5) Health and sports activities (exercise with team and league participations);
6) Creative arts, activities and expressions (art, music, singing, or filmmaking);
7) Social entertainment (discovery or exploration tours or their facilitation); or
8) Spiritual and mindfulness activities (group retreats, happenings, meditations).

The danger of complacency is noted, for instance due to basic income guarantees, in that "there might be little incentive for anyone to be interested in the production of any goods, whether social or material". Yet it is countered that "complacency is already a social good (or social pathology) produced by many economies, even if mostly as an unintended consequence" (Swan, 2017, p. 29). On that basis, there could be "many fulfilling and remunerative employment categories of the future", such as the following (in own numbering and order, from professions with familiar elements yet in fresh combinations, to entirely novel types of professions):

1) Urban farmer;
2) Smart-home handyperson;
3) Freelance professor;
4) Remote health care specialist;
5) Neuroimplant technician;
6) 3D printing specialist;
7) Blockchain smart-contract writers;
8) Audio interface designers;
9) Virtual reality experience designer;
10) Social robotics interaction specialist.

4.7. Solution 7: Spiritual Macroeconomy (Education for Abundance)

One solution that wishes to forge a "spiritual macroeconomy" is also firmly based on the abundance paradigm, in that "limitations and scarcity…[are] inconsistent with…spiritual principles" (Saunders, 2015, p. 38). By contrast, "[in] abundance economics…commodity is merit or endless human virtues. Progress is now measured in more intangible terms where the harmony of individual self-interests may be achieved in today's market mechanism" (Shi, 2018, p. 432). Such spiritual principles are based on clearly outlined economic and sociopolitical dangers, for instance some of the current human practices causing ecological disasters: "The world's current globalized economic systems are…leading humanity towards… the edge of ecological disaster for the…profit of some but not all; divisiveness that must inevitably lead to conflict and war; and loss of shared meaning…[This is] impoverishing…our shared spiritual core and ultimate potential" (Hill, 2018, p. 33). Yet solution offers remain still general in concept and application, ranging for instance from an "intertextual milieu of economics, community, humanity and the spiritual" as a "moral community" (Arrington and Gonzalez Basurto, 2018, p. 89), to applying humanist ideals such as social harmony and human virtue across sectors of society and economy: "'social harmony'…will need to start from…all spheres of the economy and its governance…[to access] our spirituality…of what humanity is and can aspire to" (Yamash'ta, Yagi and Hill, 2018, pp. 4-5).

One version of spiritual macroeconomy, a "socially-engaged Buddhist economic model", invokes that "the Buddhist philosophy of formlessness, selflessness and desirelessness assumes an abundant world that is inexhaustible, boundless and infinite" (Shi, 2018, p. 426). While values that are "both tangible and intangible (such as wisdom and virtues), play an important role", one of this model's central socioeconomic tenets is that "stability and harmony in society arise from equality and fair distribution of wealth" (Shi, 2018, p. 429). Applying empirical insights from a Buddhist community, the merit that is found in altruism and collaboration on a small scale could solve problems on a

global scale: "Merit is measured by the extent of one's altruism: how far-reaching the benefits are to others and into the future…[while] collaborative community-building can lead to social harmony and world peace…[as] an example in generating positive socio-economic impact through spiritual practices in human enterprises" (2018, p. 432). Such a "growth of such intangible, inexhaustible capital" is favored over "economic growth at the expense of non-renewable resources" (2018, p. 426). Most importantly for the aim of operationalizable alternatives for local and global policy measures, this opinion stresses the importance of education for paradigm shifts, especially the one that is advocated in the reorientation from scarcity to abundance economics: "Education is the key to shifting paradigms, worldviews and value systems" (2018, p. 432).

4.8. Solution 8: The Creative or Connection Economy (Redefining Scarcity)

Finally, models are developed at the threshold between abundance economics and art economics, invoking that in the 21st century, the discourse about scarcity and abundance should be continued on a different level altogether, or at least with flipped indicators: a productive view and application of scarcity and abundance becomes the trademark of a skillfully and artfully led life: "One kind of scarcity involves effort…Another kind of scarcity involves physical resources…The third, new kind of scarcity is the emotional labor of art…involved in digging deep to connect and surprise…to build trust…to say, 'I made this'" (Godin, 2012, p. 12). Regarding these new types or levels of scarcity, it is maintained: "Scarcity and abundance have been flipped. High-quality work is no longer scarce. Competence is no longer scarce, either. We have too many good choices – there's an abundance of things to buy and people to hire. What's scarce is trust, connection, and surprise. There are three elements in the work of a successful artist" (Godin, 2012, p. 18). This new macroeconomic environment is then called the "connection economy": "The connection economy thrives on abundance. Connection creates more connection. Trust creates more trust. Ideas create more ideas" (Godin, 2012, p. 26). Finally, examples are given of how to realize this connection economy's new abundance: "The Internet doesn't have a firewall. We're all able to connect. The network connects people to one another, people to organizations, and best of all, people to ideas. This new network celebrates art, enables connections, helps tribes to form, amplifies weirdness, and spreads ideas" (Godin, 2012, p. 38).

5. Conclusions

There is an ever-growing interest in finding, and an ever more interestingly found variety, breadth and depth of models and approaches for conceiving and practicing abundance economics. What they all share is a new outlook on today's world's plentitude of material goods, their repercussions for economic, sociopolitical, ecological and cultural aspects of our lives, and the suggested requirements for change to allow them to happen. The discussed solution models are evaluated one by one below, connecting them meaningfully in a way that summarizes ongoing efforts while either opening or pointing towards roads of future investigations.

Tomato economics reflects a concern that has been held in developed parts of the world since the economic reconstruction and political achievements of the second part of the twentieth century, namely to counteract the frequently wasteful ways in which we

consider and consume goods such as food or industrial products. Whether or not one is a partisan of abundance economics, following this solution's precepts in one's daily life and actions can only benefit individual consumers, societies, nations and the global community, including the planet's biodiversity.

Digital or free goods enjoy the practical advantage of having been familiar to, and embraced by virtually everyone within the "societies of plenty" for a generation, having become part of their people's personal and social fabric in their private and professional lives. As those goods are under constant and intense market share and price pressures, their economic development is very transparent for all, which could make them one of the most accessible and agreeable products of abundance economics. Similarly, the notion of changed consumption patterns by constructing or designing consumer goods in a way that does not already plan for their fast and profitable obsolescence (as widely wooed for instance by car or computer owners) could lead not only to longer-lasting and thus more abundant goods, but to a host of positive side effects, such as reduction of waste and pollution, and therefore of health or environmental hazards, let alone the savings on constant reacquisitions.

Compared to digital or free goods as a relatively recent form of abundance or post-scarcity, contributory resource use, especially in the form of knowledge sharing, has long historical and humanistic roots: since Classical Greek Antiquity, the inscription over the Oracle at Delphi that reads "Know Thyself" stands for the quest to push the boundaries of knowledge, and to inspire others on that voyage. These two models could thus enrich each other to great benefit: if the technology of digital or free goods were used with the motivation of letting others partake in the abundance of human ideas and progress, then a larger share of those societies described as the "people of adequacy" and "people of poverty" could partake in, benefit from, and themselves multiply those riches. The idea of either abolishing or fundamentally changing the current patent regime deserves consideration: on the one hand, the presence of patents is one of the main arguments of industrialized societies against efforts from developing nations to copy their innovations without having to invest in research and development themselves; on the other hand, the benefits of freely sharing those innovations without hoarding them in the hands and for the benefits for few (already well-endowed people) has the argumentative strength of global fairness, development aid, and international idealism on its side.

The automation economy, social robotics and nanotechnology, while being fields that still seem reserved for cutting-edge technologies and the most specialized of professions, have nevertheless found their way even into entertainment, such as in recent bestselling novels or popular movies. This level of acceptance in the media reveals that those three solutions have already steeped the societies of the" people of plenty" with their imagery and shaped widespread expectations for industry, business and lifestyles in ways that promise to become as commonplace within the next generation as digital or free goods have become over the last.

Changes in the way we consider and do work have become part of our professional parlance, from "ergonomic workstations" to "work-life balance". The suggested abundance models take those discussions several steps further, reorienting and redefining our entire professional existence and purpose. Working not just to live, but

instead for personal fulfilment, has found concrete and traceable, conceptual and empirical support in socioeconomic proposals and implementations of fixed minimum wages. While the jury as to the results and desirability of minimum wage proposals and implementations is still out there, it seems relatively safe to say that, of all people and places, those who can call themselves "of plenty" should be the first to provide all with more data and generalizable results on their success. If the minimum wage model proves workable, it could solve a host of issues, from chronic unemployment that ravages even the societies of plenty (especially the hopes and dreams of much of their youths), over worldwide levels of productivity, up to the creation of new professions, and the concomitant release of pressure on individuals and groups to follow certain career path mainly out of the motivation of making a living. Especially interesting here is that some of the names and types of those new professions are still hard just to visualize, much more to substantiate, but – if the development of professional labels, activities and impacts of the digital revolution is anything to go by – might soon become household names.

Spiritual or Buddhist economics might be religiously well thought-through and even empirically tested for some cases and places, but it is still hard to imagine prescribing, or just offering this model and its indispensable philosophical basis to economic communities outside of its Eastern geographical and traditional remit. Even if that were possible, the notions of "desirelessness" and the related absence of many of the physical goods that make our modern life so convenient – and that we have become used to, or at least learned to appreciate precisely because of that abundance which the new macroeconomic paradigm now pursues – might be still an overly long stretch of the imagination – and thus "hard sell" – in today's world.

The connection economy, or creative economy, is currently the latest and most progressive model of possible abundance and post-scarcity economics systems and scenarios, mindsets and philosophies. The examples given by their proponents of how to realize the connection or creative economy however still resemble the ones for digital goods or free goods, or of contributory resource use in the form of knowledge, or of the actualization economy in the form of working not for a living but for professional self-realization and personal fulfilment.

The latter insight carries with it revelations and implications on several levels: it highlights the interlinked nature of the solutions, underlines the potential infinity of ways how to conceive and use abundance, and offers a strong underlying thread to link those notions and their motives, in theory and practice. These insights and their interconnectedness allow for many ways to adopt abundance for one's own needs and practices. This then gives hope for these way's solidity and realizability: on the one hand, if abundance economics were not workable, it is hard to imagine how so many qualified thinkers and practitioners could all agree on its desirability and general shape. On the other hand, these voices could hardly have reached the same goal on so many different yet seemingly suitable pathways, if the advantages of abundance economics could not be implemented, in practice and with great gain, by many different people and groups worldwide, suitable for their respective economic, social, political, ecological and cultural frameworks and situations.

Abundance economics or post-scarcity economics might, in pure or absolute form, never be attainable, but then as such might neither be desirable or required. As is already implied in the terms themselves, as soon as we can confirm, and as long as we can celebrate the existence of abundance and post-scarcity in our societies (respecting and assisting those for whom their conditions are still distant or under development), then the goal is already half reached (or the glass half full): once we have abundance of basic things, there should be no more need to compete over what has ceded to be scarce. The point would then less be whether we are (already) there, but whether we have already enough to stop worrying whether we are there, because for all accounts and purposes we have (already more than) enough, and sharing it becomes less a luxury, or even an act of generosity, but rather the most suitable way of allocating this abundance for each other's benefit and even profit.

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TRANSFORMING ETHIOPIA'S DEVELOPMENTAL STATE MODEL FOR THE FUTURE

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Abstract

Inspired by the miraculous transformation achievement of Taiwan and South Korea's developmental state model, in 2001, Ethiopia adopted and thrived by adjusting the East Asian state-led Developmental State Model to reflect its own historical conditions and enhance economic growth and wipe out poverty. As a result, Ethiopia's Developmental State Model has created miraculous economic growth for the last fifteen years. In 2015, however, an increasingly lazy and inept EPRDF began to drag the country into political unrest. Currently, Ethiopia is faced with an abysmal economic, political upheaval, and ethnic strife because the country's chief engine of growth—Ethiopia's Developmental State Model—has been cracking due to administrative obsolescence. If the recent wide-scale economic crisis is not addressed immediately, it could ultimately disrupt Ethiopia's political legitimacy. Therefore, as other developmental countries have done, Ethiopia needs to form a hybrid paradigm where some developmentalist practices coexist with the prevalence of privatization policies to harness a free market operation.

Keywords: Developmental State Model, Transformation, Economic Growth, Hybrid Paradigm

Jel Classification: O10, O21, O40

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1. Introduction

Development role of the state with little reliance on market forces was used as the cornerstone for the renaissance of the economically successful Northeast Asian countries, such as Hong Kong, South Korea, Singapore, and Taiwan (Zhang, 2018, Ricz, 2016). Following the spectacular growth of many economies in East Asia, developmental state is increasingly gaining ground in sub-Saharan Africa. For instance, Botswana, Mauritius, Cote d'Ivoire, Malawi, Kenya, Tanzania, Rwanda, and South Africa are labeling themselves as "developmental" (Seshamani and Ndhlovu (2016).

To avoid the colossal failure of famine, insidious civil wars, poor education, and deteriorating healthcare programs that Ethiopia faced during the military rule (Dergue), the Ethiopian People's Revolutionary Democratic Front (EPRDF) established Agricultural Development Led Industrialization (ADLI) in 1991 to deal with socio-economic challenges. According to Lefort (2012), the ADLI was expected to increase the productivity of smallholders involved in subsistence farming and to facilitate national food security in Ethiopia.

An evaluation of the impact of the Structural Adjustment Programs (SAPs), reveals that the SAPs as intended failed to rescue crisis-ridden African countries. Instead, the SAPs ended in disaster and contributed to the lost decades of economic development in Africa (Mukuria, 2014). Given this, it was no wonder that the former Prime Minister of Ethiopia, Meles Zenawi, persuasively argued that neo-liberalism is "a dead end in Africa". Consequently, Prime Minister Meles urged Africa to pursue the democratic developmental state paradigm to free itself from the shackles of perpetual impoverishment and work toward an eventual renaissance (2006).

In 2001, Inspired by miraculous transformations in Taiwan and South Korea, the Meles regime began adopting and adjusting the East Asian Developmental State Model to the Ethiopian economy. Thus, the Ethiopian state developed wide-ranging, pervasive, and discretionary intervention and control over the market to allocate the country's scarce resources and influence the direction of its economic growth and industrialization process.

Retrospectively, the late Prime Minister Meles argued that he implemented the East Asian Developmental State Model to: 1) create state autonomy and have full control over the commanding heights of the economy (i.e., resources, banks, utilities, etho-telecom, and other production sectors) 2) accelerate Ethiopia's economic growth and focus exclusively on value creation, and 3) protect the domestic micro-scale enterprises over foreign direct investments (See for example, de Waal, August 2018).

Realizing the challenge and stress of a shift from an agricultural to industrial ladder, the Ethiopian government allocated twenty percent of its GDP to reengineer its infrastructural services, such as roads, schools, railways, air transport, dams, telecommunication services. Also, it attempted strengthen the backward and forward linkages of agricultural and industrial sectors to promote macroeconomic stability (Johnson, 1982, Desta, 2014, Shumuye, 2017).

After Ethiopia emerged from the traumatic post-2005-election political crisis between the ruling party, Ethiopian Peoples' Revolutionary Democratic Front (EPRDF) and the opposition; the EPRDF shifted its ideological orientation from revolutionary democratic

centralism to Democratic Developmentalism in order to address the effects of soaring political upheavals and embark on the roaring wave of globalization. Instead of continuing as a vanguard party, the EPRDF was also reorganized as a transmission belt and serve as a catalyst. Unlike before, the Ruling Party, EPRDF, promised to expand the country's democratic space by allowing the proliferation of think tanks, including elements of political parties, government departments, corporation and philanthropists. It further initiated Ethiopia's economy to pursue a relatively free and competitive market system (African Development Bank Group, 2011, and Lefort, 2012, de Waal, 2018). Before opening Ethiopian companies to private sector investment, however, the late Prime Minister Meles decreed, with an authorized capital of 10 billion Ethiopian *birr*, to establish Metals and Engineering Corporation (METEC), a military-run industrial conglomerate, to serve as greenhouses or major hub for training highly qualified military force in building factories and infrastructure (Reuters, November 14, 2008). Then, to gradually attract foreign investment, Meles' government not only invested heavily in infrastructure, it also provided macroeconomic stimulations, such as tax holidays, subsidies, R& D support, tax relief on imported capital. Furthermore, he allowed leases on virgin farmlands to foreign investors (Desta, 2014).

Ten years after these economic reforms, an increasingly lazy and inept EPRDF drove the country into political unrest. Consequently, Ethiopia's unemployed and frustrated youth—the *Querro, Fano,* and *Zerma*—began to rise and challenge the ruling party, causing political turmoil throughout the Ethiopian landscape. Whether by design or by default, these popular protests created a golden opportunity for Dr. Abiy to step in and lead the EPRDF Party. On April 2018, Dr. Abiy (hereafter referred to PM Abiy) emerged as Ethiopia's Prime Minister (Gelan, 2018, Desta, 2018).

A cursory view of PM Abiy's actions and speeches over a year suggests that PM Abiy has shifted from EPRDF's ideological platform. Often in defiance of his party members and the Ethiopian Parliament, PM Abiy is unilaterally reversing the country's long-held developmental state. Using the dwindling foreign-exchange reserves as an excuse, PM Abiy is bending to the core tenets of the liberalization and privatization processes. For instance, it surprised Ethiopians to hear PM Abiy, in his inaugural speech, order Ethiopia's Privatization and Liberalization Office to accelerate the sales of minority stakes of some of the country's most prized public assets to foreign investors. More specifically, contrary to the EPRDF's long-standing policy, PM Abiy, in a very noticeable way, is privatizing government owned firms in order to generate foreign exchange. Guided by the liberalization policy, PM Abiy has ordered Ethiopia's lucrative state-owned mega companies, such as Ethio-Telecom, the electrical company, and the booming Ethiopian Airlines, to start liquidating minority stakes to private investors.

To relieve the United States from facing tough competition with China in Ethiopia's priority arena, PM Abiy's regime seems to have practically turned its back on China. Over the years, China has been Ethiopia's major provider of hard-earned strategic and concessionary loans, investments, grants, and aid (Desta, 2018). As a result, despite Ethiopia's failure to meet World Bank standards, the World Bank has promised $1 billion for Ethiopia's budget support.

Based on Abiy's current tactics, critics could argue that he rejects Ethiopia's Developmental State Model and that he may even plan to replace it with neoliberal

model. As a result, a number of African countries wonder why, when the developmental state model has enabled Ethiopia to achieve economic growth in the past, PM Abiy would now consider a shift to Washington Consensus Model as a possible panacea for Ethiopia's future socio-economic development.

Given Ethiopia's current situation, many strategists of the Washington Consensus—a program sponsored by the World Bank and the International Monetary Fund that requires dismantling the developmental state and borrowing countries to have free market, open goods and financial service markets to foreign investors—seem ecstatic. Even though this neo-liberal recipe has already ruined many developing African countries and substantially reduced their social welfare programs (Garcia, 2013, Balayan, 2017 and Gebre, 2018, Stiglitz, July 2016), some former admirers of Ethiopia's developmental model are now re-considering the neo-liberal model as their future path.

When Africa had no other choice, it had to implement the neoliberal or the Washington Consensus-structural adjustment process in order to borrow funds from the IMF. As a result, it lost a quarter century of industrialization. As revealed, the SAPs, didn't restore Africa's internal and external macroeconomic stability. Rather, during the SAPs era, Sub-Sharan Africa experienced a pathetic 0.35% GDP growth. Politically, the SAPs process merely encouraged authoritarian military regimes that ignored basic human rights in most sub-Saharan countries (Kofi and Desta, 2008).

Fortunately, the African continent has been saved from the disgrace that it encountered during SAPs period. As the Chinese economy is transitioning through the "Lewis' Turning Point," the cost of production is gaining in productivities and China is hollowing out of low-end manufacturing and state-driven Chinese investments. As a result, China's investments in Africa are mushrooming (Davis, 2015). It is imperative to stress that, as Ethiopia has pursued its developmental state model, China has played a vital role and given impetus to Ethiopia's industrialization process. Ethiopia has recorded one of the fastest-growing economies in the world largely because China has established cooperative, pro-business investment, which has helped Ethiopia build fundamental infrastructures (Stiglitz, July 2016; Desta, 2014).

While straying from the Developmental State Model that has helped Ethiopia achieve such miraculous economic growth, Ethiopia's most recent GDP data reveals a slide from 8.7 percent in 2014/15 to 7.7 percent in 2017. As noted in *Ethiopia Economic Outlook* on Dec,13, 2018, Ethiopia can attribute this decline to "…softer expansions in the agricultural and manufacturing sectors, while mining activity contracted sharply. Meanwhile, foreign exchange rate shortages plagued dynamics, hampering several sectors…"

More recently, as rampant unemployment, staggering inflation, poverty, and ethno-nationalistic conflict currently plague Ethiopia, Ethiopia's survival as a viable state stands in jeopardy. Instead of focusing of reviving the economy, Abiy's regime depends heavily upon the financial aid of the U.S., Saudi Arabia and the United Arab Emirates. Meanwhile, Abiy's regime creates aimless committees to diffuse the regimes' fundamental leadership crisis and indulges in empty polemics.

Given the economic meltdown, political uncertainties, and numerous ethnic tensions that prevail in Ethiopia, this study will investigate and analyze the status of Ethiopia's

development state model as well as offer suggestions to Ethiopian policy makers for the future viability of the Ethiopian state.

The article proceeds as follows: Part One analyzes the economic vitality of Ethiopia's current developmental state. Part Two summarizes the main findings of the paper, and Part Three proposes political and economic suggestions for restructuring Ethiopia's existing developmental state model for the foreseeable future.

2. The Economic Vitality of Ethiopia's Current Developmental State Model

When Ethiopia's military rule (1974-91) is assessed by almost every major index of economic growth, it shows Ethiopia in perpetual decline. Due mainly to poor policies, war, environmental degradation, a rapidly growing population, adverse external development, Ethiopia's per capita income became progressively worse. As persuasively stated by Cole (1992), though some called Ethiopia the breadbasket of the Middle East, the country couldn't even feed its own people.

However, pursuing the developmental state model for the past seventeen years, the EPRDF, though not enough to expand the country's social services, lifted Ethiopia from decades of slow growth under socialist military rule to achieve a record of staggering economic growth. Indeed, the United Nations Development Programme (April 18-20, 2018) persuasively demonstrates that from the demand side of public and private investment, between 2003/4 and 2016/17, Ethiopia recorded a strong growth of about 36.3 percent. From the supply side, the value added in agriculture services and construction sectors grew by 39.3 percent. Overall, between 2003/04 and 2016/17, Ethiopia has achieved over 10 percent growth rate per year in its Gross Domestic Product (GDP).

Though not sufficient for domestic investment, Ethiopia's domestic saving has shown a dramatic swing from 17.2 percent in 2010/11 to 24 percent of its GDP in 2016/17. Consequently, the overall investment in hydro-energy and the reengineering in infrastructures, such as building road networks and improvement in tele-density and airports have greatly contributed to Ethiopia's economic growth.

In social services (such as education, health, water and sanitation, as well as infrastructure—i.e., roads, railways, telecom, and power generation), Ethiopia has demonstrated a phenomenal growth rate. By 2015, access to universal primary education, health coverage, and potable water has accelerated by 100%, 98%, and 65% respectively. Since Ethiopia's Human Development Index (HDI) increased by 16% from 2005 to 2011, the country's life expectancy has risen to around 64.6 years. As a result of this miraculous growth in its economic and social services, Ethiopia's poverty reduction, as measured by poverty head count, has substantially declined from 45.5 percent in 2000 to 29.2% by the end of 2009/10, and 23.5 percent in 2016. Overall, income inequality as measured by the Gini coefficient, Ethiopia has fallen below 30 percent (Shyumuye, 2017). In summary, "Although Ethiopia started from a low base, its investment in pro-poor and agriculture has paid-off and led to tremendous achievements in economic growth and poverty reduction, which in turn have helped improve the economic prospects of its citizens" (Guang Zhe Chen, January 20, 2015).

Writing on developmental states, Zhang (2018) argues that developmental states generally contribute to positive economic outcomes, facilitate the minimization of social problems, and avoid dependence on the Western industrial powers. Given Zhang's line of reasoning, the ruling party in Ethiopia has used the developmental state model to harness political stability, achieve extraordinary economic growth and transform the country into Africa's economic-powerhouse.

In other words, given the core matrix of Ethiopia's Developmental State model is economic growth, Ethiopia remains a compelling example of how an African country has achieved a steady state-directed economic growth for the last fifteen years. In recent years, however, the Federal Democratic Republic of Ethiopia is faced with high youth unemployment, rampant inflation, superfluous extensive foreign debt, and profound environmental challenges.

2.1.Youth Unemployment:

Although there are variations in the measurement of unemployment rate, over fifty percent of young Ethiopians (ages 15-24), with secondary and higher education in Ethiopia, though willing to work, are either actively seeking jobs or have given up looking for work (Badalau, 2012). Types of unemployment generally include cyclical or demand deficient unemployment (caused by falling output during an economic recession), structural unemployment (results from a mismatch between training and job placement, and frictional unemployment (arises due to labor turnover or the continuous flow of workers from one job to another).

By and large, youth unemployment in Ethiopia can be attributed exclusively to structural factors. Put simply, schools fail to meet the needs of the labor market, resulting in structural unemployment. Meanwhile, the longer the youth remain unemployed, the more likely they indulge in illegal activities such as robbery, kidnapping, drug trafficking, and prostitution. For example, in Ethiopia, the school systems lack the capacity to provide adequate information on job vacancies to their students. This inadequacy in employment information has increased the waiting period of the certified to attain productive employment. As a result, many unemployed Ethiopian youth, aimlessly roam the streets of Addis Ababa and other cities and towns (The Ethiopian Herald, Addis Ababa, April 18, 2018). *The Ethiopian Herald* (April 18, 2018) documents how these highly-trained but unemployed Ethiopian youth—blocked from attaining their goals by flaws in the system—fall prey to drug addiction, face depression, vandalize private and public properties, and generally disrupt Ethiopia's peace and tranquility.

If the present political upheaval and trends in massive unemployment in Ethiopia continue unchecked, Ethiopia's sustained productivity and economic growth over last fifteen years will gradually diminish. Also, the wasting of highly trained and qualified young workers due to structural limitations will deprive the country of the valuable skills knowledge, and services they could be providing.

By and large, the unemployed youth in Ethiopia who inadvertently created the opportunity for Abiy to come to power have turned to violence because they see that both the educational system and labor markets are distressed. More particularly, higher educational institutions in Ethiopia have seriously failed to meet the challenges of the

new millennium. In particular, the universities and TVET (Technical Vocational Education and Training) programs have seriously failed to create the necessary structured experiential learning or internship programs to provide the graduates with current knowledge and skills. Instead, they have abandoned their graduates to swim aimlessly, looking for jobs they're not qualified to fill (Nwogwugwu and Irechukwu, 2015).

2.2. Inflation

With accelerated economic growth, inflation-- a continuous rise and fall in the prices that consumers pay for a standard basket of goods has remained a scourge of the Ethiopian economy. With a sustained economic growth, Ethiopia has been experiencing an unsustainable double-digit increase in the price of goods that averaged 16.12 percent from 2008 until 2018 (Ethiopia Government Statistics). Overall, the rampant inflation in Ethiopia is due to demand-pull (the availability of too much money but too few goods), cost-push (acceleration in production cost), and structural inflation (i.e., deficiencies in food production with inefficient distribution system) proliferates inefficiency and disrupts investment and results in currency devaluation (Desta, 2009, Biresaw, 2013).

More specifically, for the last several years, Ethiopia has been driven into an inflationary trap of about 15 percent per annum due the lack of articulation between demand-pull and cost-push factors, monetary phenomena (qualitative easing or increase in the quantity of money that encourages imprudence among banks that lend at a massive scale), and budget deficit. As established by Barro (1996), since the rate of inflation in Ethiopia exceeds 15 percent of the break-even point, inflation will most likely damage Ethiopia's economic growth. The rise in inflationary pressure generates distortions in the allocation of resources and reduces the purchasing power of the *birr*. Thus, with the current increase in inflation, Ethiopians now suffer from expected inflation and a loss of confidence in the stability of the Ethiopian *birr*. Therefore, if uncontrolled, Ethiopia's current inflation will most likely deter savings and prohibit productive investments.

2.3. External Debt

Short of internal low income and relatively low domestic savings, a country—provided it can make future payments on its debt—can borrow funds from external sources, such as bilateral institutions, multilateral institutions, and international capital markets to gain the necessary resources for internal capital formations and to harness economic growth. For example, during the Dergue's era, the military government relied on domestic sources (such as the capital of nationalized firms, taxes, domestic loan,) and external sources (mainly from foreign remittance and loans from the Soviet Union and other socialist countries) to finance its military missions and domestic projects (Adugna, 2015).

Therefore, to restore economic growth battered by civil wars, droughts, and the previous military regime's mismanagement, to facilitate social services (education and health) to the vulnerable groups of the Ethiopian society (African Development Bank Group, 2000), and to transform the country from central planning to market economy, Ethiopia has to date borrowed US $63.55 million (i.e., 69 % of the funds were from the International Development Agency-IDA) from the World Bank's soft window. Meanwhile, Ethiopia borrowed an additional 24% of the funds from the African

Development Fund to implement the Structural Adjustment Program (SAP) from 1993-1996.

Following the loan period and the full implementation of the EPRDF's developmental state model, on the basis of growth expectations, Ethiopia's external debt dramatically increased by 41.8%, 26.9%, 20.5%, 27.4%, 31.8%, 34.9% and 33.5%, in 2006, 2008, 2010, 2012, 2014, 2016, and 2017, respectively (Trading Economics.com, 2018). Due to rapid inflation, bad harvests, and deterioration of export earnings, Ethiopia's total debt service (% of exports of goods, services, and primary income, including the sum of principal repayments and interest) dramatically increased from 3.95 % in 2010 to 21.01% in 2016 (IMF, 2016). Similarly, Atingi-Ego etal, (2017) argue that Ethiopia's exports in 2016/17 deteriorated "…due to a weak external environment and delays in completing key export-oriented projects, and the maturing of non-concessional borrowing contracted in the last 5 years."

As stated above, Ethiopia has used most of its external loans on productive projects. Nonetheless, Ethiopia currently carries heavy debt, either because the overvalued *birr* might have choked off the country's exports, the borrowed funds were mismanaged to run inefficient state-run companies, or they were invested on over-ambitious infrastructural projects or other capital intensive projects. Thus, Ethiopia's external debt crisis can be systematically attributed to a combination of imprudent lending (supply side), internal mis-management of borrowed funds, and international economic conditions that deal with interest rates on borrowed funds, terms of trade, and the prices of oil imports (Desta, 1993).

Nonetheless, to enhance its capacity to service its external debt, Ethiopia must undergo macroeconomic adjustments to leverage its export earnings or reduce its debt burden through rescheduling, refinancing, or spreading its debt obligations. However, as suggested by Lovejoy (1984), one of the most innovative strategies to alleviate external debt crisis would be for Ethiopia to deliberately swap its external debt for sustainability projects.

In other words, Ethiopia could avoid defaulting on its loans and gain access to further external loans, provided some philanthropic, environmental non-government organizations (NGOs) could buy Ethiopia's loans at substantial discount from private creditors. Then, the NGOs could negotiate with the Central Bank of Ethiopia to issue the face value of the total external loan in domestic currency, or *birr*, and earmark the total loan for the environmental protection or conservation projects.

2.4. Environmental Degradation

Over the years, partly conditioned by the law of diminishing returns, Ethiopia's rapid economic growth has simultaneously contributed to massive degradation (Desta, 2009). Aklilu (2001) argues that environmental degradation in Ethiopia could be explained by the interplay between physical environment and population. With the increase in population, Aklilu states that the limited land holding, mass land degradation, soil nutrient depletion, and inefficient production techniques play a major role in explaining Ethiopia's environmental degradation.

In rural areas, the use of dung for fire, the use of dry aquifers, or the overuse use of chemical fertilizers are the main causes of environmental degradation. In urban Ethiopia,

smog release of carbon dioxide from old cars and outdated industries causes particular concern. As Edwards pinpoints (2004), through the misguided application of chemicals, Ethiopia has accumulated one of the largest stockpiles of obsolete pesticides on the African continent. Specifically, the use of agro-chemicals such as herbicides, pesticides, and fertilizers for horticulture commodities—all designed to earn foreign exchange—has flooded Ethiopia with hazardous waste (See Edwards 2004, and Desta, 2009). Thus, if Ethiopia is to improve its degraded environment in a sustainable way, Aklilu (2001) persuasively suggests that it can be "…accomplished effectively through education to create awareness and shape the capacity of people's attitudes in such a way they would use environmental resources without damaging the resource base and compromise the needs of the next generation to make use of the same resource base."

3. Conclusion

Inspired by the miraculous transformation achievement of Taiwan and South Korea's developmental state model, in 2001, Ethiopia adopted and thrived by adjusting the East Asian state-led Developmental State Model to reflect its own historical conditions and specific context. As a result, Ethiopia's Developmental State Model was designed to have a preponderance of discretionary intervention and control over the market to allocate its scarce resources and influence toward economic growth and industrialization. In short, Ethiopia adopted its Developmental state model with the belief that the state economic intervention could enhance economic growth and wipe out poverty. Specifically, the Ethiopian state exerted strong control on natural resources, land, infrastructure development, airways, credit, agriculture, manufacturing and investment, foreign trade, foreign currency transaction, and on the international movement of capital by both firms and individuals.

In addition, to address the wave of globalization and adjust to the post-2005-elections political crisis that arose between the ruling party—the Ethiopian Peoples' Revolutionary Democratic Front (EPRDF)—and its opposition, the EPRDF shifted its future ideological orientation from revolutionary democratic centralism to a Democratic Developmental State. Modifying itself from a vanguard party to a transformation belt, the EPRDF Party began encouraging the proliferation of think tanks that included elements of political parties, government departments, corporations and philanthropists.

In economic terms, the ruling Party promised to pursue a freely competitive market system (African Development Bank Group, 2011, and Lefort, 2012, de Waal, 2018). To induce direct foreign investment, the ruling party invested heavily in rebuilding its infrastructure. Furthermore, the Ethiopian state promised to provide tax holidays, tax relief on imported capital, various investment incentives, and to allow foreign ventures to lease virgin farmlands (Desta, 2014).

At the time, Ethiopia recorded the fastest-growing economy, and it emerged as a hub of economic engine in sub-Sharan Africa. In 2015, an increasingly lazy and inept EPRDF began to drag the country into political unrest. Protests by the angry and increasingly unemployed youth cost the ruling party its power and control over Ethiopia's landscape. Either by design or default, these popular protests opened the door for Abiy to become not only the chair of the EPRDF, but also Ethiopia's Prime Minister on April 2018, (Gelan, 2018, Desta, Ethiopian Observer, 2018).

To the surprise of some party members, PM Abiy took an ideological turn after he became Prime Minister. In opposition to his party members and the Ethiopian Parliament, PM Abiy began unliterally reversing the country's long-held developmental state. Imagining that implementation of liberalization and privatization could succeed and using the dwindling foreign-exchange reserves as an excuse, PM Abiy ordered Ethiopia to start opening its doors to world investors to purchase publicly-owned stocks.

As stated above, Ethiopia's Developmental State Model has created miraculous economic growth for the last fifteen years. And yet, as if PM Abiy had not been part of the old process, he currently ridicules and openly questions Ethiopia's economic successes.

However, due to political instability, ethno-nationalistic conflict, and communal strife's, the Ethiopian topography has made it almost impossible for citizens and merchants to move freely from one ethnic-zoned region to another. In addition, exporting of processed goods by the recently erected industrial parks and competitive firms to foreign countries has become unmanageable. Domestic merchants and entrepreneurial farmers have also struggled to sell their products in Ethiopia's other regional states. Consequently, a gradual decline in the GDP, rampant poverty, inflation, external debt, and unemployment have led to an inevitable demise of Ethiopia's developmental state model.

Looking forward

Over fifteen years, Ethiopia's economic growth has enabled it to become Africa's greatest success story. However, Ethiopia now faces a decline in GDP, rampant inflation, and gradually rising unemployment. If the recent wide-scale economic crisis is not addressed immediately, it could ultimately disrupt Ethiopia's political legitimacy. Instead of using the achievement of the previous Ethiopia's Developmental State model as a base to create future harmony, PM Abiy's regime is undoing past successes and sheltering Ethiopia under the hegemony of the U.S. and U.S, Arab Allies, guided by the Washington Consensus paradigm. As chronicled by Stiglitz (2016), the neo-liberal model has damaged the economic health of many nations. Given the experience of other developing countries, observers can reasonably predict that if Ethiopia pursues the neo-liberal model, Abiy could harm his country politically, economically, and socioeconomically.

Instead of sticking to an ideological premise that politics will determine a large aspect of the Ethiopia's economy, it is high time that PM Abiy should follow the advice of Bert Lance: "If it isn't broke, don't fix it" (May,1977). Ethiopia currently faces an abysmal economic decline, political upheaval, and ethnic strife because the country's chief engine of growth—Ethiopia's Developmental State Model—has been cracking due to administrative obsolescence.

Tragically, the Ethiopian federal government has remained indifferent when residents, because of their ethnicity, are butchered, killed, harassed, and beaten with batons. Angry protesters are burning down churches and residential homes. Innocent victims who manage to escape on foot to other regions are found starving while sheltering in crowded churches, mosques, or other dilapidated buildings. Meanwhile, as ethnocentric outlaws and myopic bandits deliberately block inter-regional roads, Ethiopia's Federal

Government seems to turn a blind eye. Consequently, merchants, farmers and various entrepreneurs from local areas are prevented from crossing inter-state roads to offer their commercial operations. Sadly, starvation has become rampant in many communities.

In its current state of anarchy, where citizens literally slaughter one another, Ethiopia has become number one globally in terms of internally displaced people and human misery (Abraham, 23 Nov. 2018). Given this horrible truth, PM Abiy's regime has no choice but to take responsibility and enforce peace, stability, and legitimacy so the Ethiopian people can move freely between regions and interact peacefully without fear of atrocities.

To honor the Federal and state governments' promises to foreign investors who have invested in the various Industrial Parks by bringing new technology, acted as incubators for new entrepreneurs, and promoted just-in-time export of the internally produced products to the outside world, PM Abiy's regime should realize the economy's hard infrastructure (road network, buildings, power supplies, water, sewer systems, railways, airports, internet services), and the soft infrastructure (educational, legal framework, security, labor force) are malfunctioning in some parts of the country.

Hoping that peace and tranquility would thrive in Ethiopia—and using the same methods Japan, South Korea, Taiwan, Malaysia, and other countries undertook to tackle the "Asian Crisis of 1997" (Ginsburg, 2002)—PM Abiy's regime must conduct a systematic analysis of the Strengths, Weaknesses, Opportunities, and Threats (SWOT) for Ethiopia's Developmental Model. The results of the SWOT analysis could then be used as foundational base to sagaciously redesign an ongoing dynamic adaptive post-developmental model (Cai, 2010). Furthermore, using this type of analysis, Ethiopia could skip shock therapy and smoothly traverse the era of globalization to achieve dynamic, long-term growth.

Modifying the premise of Ethiopia's existing Developmental State model so the embedded state autonomy is primarily tailored to achieve economic growth, PM Abiy's regime must surge forward and apply a competitive market; this market must be driven by sweeping privatization that Ethiopia could take advantage of backwardness in its industrial upgrading process (Lin 2011). Given this, future Ethiopia could design its post-developmental reform to incorporate the three pillars: i.e., the economic, social, and environmental factors sustainable development.

In other words, from the core contents and strategies of the current Developmental state model, PM Abiy's regime doesn't need to sell the stocks of some of the profit-making state-owned enterprises (SOEs), such as Ethiopian Airlines, Ethio-telecom, and others to private investors because they have a solid history of surviving tough competition in the global markets. However, to minimize the monopoly power that these big companies have long entertained, as state-owned enterprises, in tandem with market liberation principles, they must be encouraged to compete seriously with other global investors. That is, PM Abiy's government must gradually reduce the various domestic subsidized credits and foreign currency that the SOE's monopolies have been collecting at no cost from the government budget, as well as the artificially repressed interest rate loans they accessed for many years. It is time that the SOE's monopolies be charged to pay the market-determined interest rates for funds borrowed for investment and/or to lower operational expenses.

To transit from the patterns that prevailed during the earlier developmental state period to the proposed post-reform state with a well -functioning market economy, PM Abiy's regime would have to remove the structural imbalances and distortion in finance and natural resources (except for the command-quality standards and control-negative externalities regulations) (Cai, 2011, Maman and Rosenhek, 2012).

As other developmental countries have done, Ethiopia could form a hybrid paradigm where some developmentalist practices coexist with the prevalence of privatization policies to harness a free market operation. Thus, the Ethiopian state could strategize the:

1) entry of joint venture investors, joint production, and wholly-owned green investment (with new production facilities), facilitating cheap inputs, lower operational costs, liberal exchange rates, and providing incentives like lower taxes and free land;

2) entry of investors in telecommunication, power, internet services;

3) entry of foreign banks to invest in Ethiopia;

4) privatization of the state-owned commercial banks;

5) efficiency of market forces to determine interest rates and the exchange rate on the Ethiopian currency (*birr*);

6) upgrading of the regulatory and supervisory capacity of the National Bank of Ethiopia to facilitate efficiency in the banking sector (Bezabeh and Desta, 2014);

7) development of small local banks which could extend credit to small household farms and small and medium-sized manufacturing enterprise; and

8) Privatization of depleted urban public houses (nationalized by the Dergue to fulfill

the pillars of socialist welfare ideology that propagated that housing is not a commodity with an exchange value, but must instead be provided by the state at a nominal rent); and sold to current residents at approximately 25 percent of their monthly income amortized by public banks for thirty years. The privatization of public houses could not only help refurbish the depleting houses but also improve the infrastructures (i.e., pipes, sewer systems, powersupplies) that residents lack. The privatization of public urban houses could also harness employment and contribute to economic growth. In addition to the current, meager, urban safety nets designed to help unemployed youth search for jobs, PM Abiy's regime must reform the country's educational quality in order to prepare graduates with skills suited to the modern labor market, in lieu of the fact that employment is a cardinal human right, as stated in my book (2017) Re-thinking Ethiopia's Ethnic Federalism:

a) in collaboration with Technical and Vocational Education and Training (TVET) institutions, the current government must integrate an "Employer of last Resort" (ELR) model to retrain unemployed youth on sustainable projects and expose

them to work in community-based, environmentally sensitive public services across a wide range of institutional settings.

b) To control the inflationary pressure in Ethiopia, the fiscal budget must be tightened. The National Bank of Ethiopia must be immune from political pressures in order to tighten monetary policy by auditing financial institutions; this would maintain reserve requirements and help encourage more prudent lending procedures.

To Achieve optimal sustainable development, and thereby feed its people, Ethiopia must focus on an integrated, environmentally sensitive, and cooperative agro-industrial style of development. By improving its environmental quality, Ethiopia can venture into the proposed post-developmental state era. However, to adopt a green development path, each state in Ethiopia must consider green technology development necessary as engines for economic growth, employment, and innovation (Mazzucato, 2013 and Ricz, 2016).

Currently, political cadres recruited from various ethnic groups run the Ethiopian Government. To make it efficient, governmental recruitment needs to be intensively competitive. Once recruited, in addition requiring each recruit to undergo a political orientation, government employees must act as autonomous civil servants—primarily recruited on merit and obliged to their institutions as opposed to their own political ends. Instead of recruiting state employees from a single ethnic group or based on political connections, PM Abiy can best serve the public by hiring people with technical expertise in order to professionalize the federal state bureaucracy and fully realize Ethiopia's post-developmental model.

However, for fundamental change to occur in Ethiopia, the existing mono-party system must give way to multi-party system. With the new political atmosphere, Ethiopia's journey toward autonomous democratic federalism can become a reality if it redesigns its form of federalism and practices predictable and transparent democracy incorporating adequate checks and balances. For example, the decentralization system promulgated by the Ethiopian government in 2001, a democratic self-rule of *woredas* could serve as the organizational structure for Ethiopia's federal system. Transferring political authority to local government through the establishment of democratically elected local government would propel direct citizen participation and accountability in Ethiopia.

Therefore, as this author suggests (Desta, 2017), to implement true democracy, the election system in Ethiopia must follow a proportional electoral system that allows multiple ballot choices to all Ethiopian citizens. Under this broad electoral spectrum, no Ethiopian eligible to vote can be left out. Proportional representation also minimizes the rampant ethnic tensions in Ethiopia. Therefore, with adequate public participation using the proportional electoral system, Ethiopia would undoubtedly remain stable as it marches peacefully toward the proposed post-development state paradigm.

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PRODUCTIVITY ATTRIBUTABLE TO OFFSHORING IN SELECTED COUNTRIES

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Abstract

The term offshoring refers to the process when firms decide to manufacture products abroad to reduce costs and to produce more efficiently. In the field of economics, offshoring is not a new topic, however, the rapid increase in offshoring induced by the incentive of creating a more efficient production, technological changes, and competition to reduce costs has been globally overlooked. Nonetheless, the rate of change in productivity is different among countries due to their uniqueness and resources, as well as between the different sectors of the economy. Although there are many published studies about inward Foreign Direct Investment (FDI), there are not many available studies that focus on the relationship between outward FDI and productivity, additionally, much less in sectors of the economy other than manufacturing and services. For this reason, in an effort to explain the phenomenon of the latter, a multiple linear regression was created to determine the outward FDI of the sectors of the economy that significantly influence productivity. To measure productivity attributable to offshoring, the model used data on outward FDI per sector of the economy and compared to each country's Gross Domestic Product (GDP) per hour worked. It was found that, in general, there is a distinctively higher productivity in the manufacturing and services sector than other sectors of the economy. This paper presents an alternative way to measure the productivity of offshoring.

Keywords: Offshoring, productivity, sectors of the economy, inward Foreign Direct Investment (FDI), outward Foreign Direct Investment (FDI)

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1. Introduction

Firms tend to find innovative ways to reduce production costs in an effort to make higher profits. The process of offshoring is the relocation of goods and services from companies to a foreign country in an effort to reduce production costs. The rapid increase in offshoring has been induced by the incentive of creating more efficient production, increased technological changes, while competition to reduce costs has been globally overlooked (Olsen, 2006, p. 6). Nonetheless, the rate of change in productivity is different among countries due to their uniqueness and resources hence, it also varies among the different sectors. Offshoring is a process that has increasingly grown over the last century and will continue to increase as it impacts the rate of productivity in each country. For this reason, it should not be overlooked, but studied into further detail. Therefore, this paper will examine the connection of offshoring to productivity in some selected countries, analyzing from a different perspective the correlation of outward FDI and productivity. Additionally, offshoring will be assessed among distinct sectors. The economic indicator known as outward foreign direct investment (FDI), which is defined as a business strategy in which a domestic firm expands its operations to a foreign country, will be used to measure offshoring. Additionally, this paper will evaluate the effect that the outward FDI has on productivity in the different sectors.

2. Methodology

To measure productivity attributable to offshoring in some selected countries, GDP per hour worked was used as an indicator of productivity (Dependent variable), while outward FDI's of all sectors of the economy in each country were considered as indicators of offshoring (Independent variables) as proposed by Olsen (2006).

Therefore**,** a database was built in the statistical software Statistica 8.0 using the reports of the Organization for Economic Co-operation and Development (OECD) on the data set of Foreign Direct Investment (FDI) flows by industry and GDP per hour worked. All countries that had reported any relevant information for Outward DFI for all major sectors of the economy between 2003 and 2012 were included in the analysis.

An exploratory statistical analysis, including the construction of box plots, was performed in order to identify errors and outliers. All outliers were then excluded, however, several countries such as Canada and United States, showed a high number of outliers and extreme values. Therefore, to identify if data was naturally formed by clusters, a Principal Components analysis was performed using this *original* database.

The Principal Components Analysis (PCA) identified 3 clusters, one of those clusters included the countries that showed high number of outliers and extreme values. Therefore, all countries whose data contained more than 25% of outliers or extreme values were totally excluded from the *original* database to be analyzed separately. The *main* database included, therefore, 22 countries.

A Multiple Regression Analysis was then performed on the *main* database using the GDP per hour worked (in millions of USD) as the dependent variable (Y), and the outward FDI (in millions of USD) of the sectors of the economy as independent variables. The proposed regression model is next:

$$\gamma = c + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3 + \beta_4\chi_4 + \beta_5\chi_5 + \beta_6\chi_6 + \beta_7\chi_7 + \varepsilon$$

… where…

Abbreviation	Variable	GDP & Sectors of the Economy
c	c	Constant of the model
□□□□□□	□□□□□□	Coefficients of the Independent variables
GDP	□	GDP per Hour Worked
AAF	χ_1	Outward FDI in the Agriculture and Fishing Sector
MAQ	χ_2	Outward FDI in the Mining and Quarrying Sector
MAN	χ_3	Outward FDI in the Manufacturing Sector
EAW	χ_4	Outward FDI in the Electricity and Water Sector
CON	χ_5	Outward FDI in the Construction Sector
TS	χ_6	Outward FDI in the Total Services Sector
UN	χ_7	Outward FDI in the Unallocated Sector
□	□	Statistical error of the model

All non-significant variables were excluded, and a new regression analysis was performed (Not shown). A Principal Component Analysis was developed with the *main* database.

Using the variables that were initially excluded due to their high number of outliers, a *secondary* database was built, and a second exploratory statistical analysis, including the construction of box plots, was performed to identify outliers. All values in this database from United States were identified as outliers and the whole information from this country was excluded from further analysis. A Multiple Regression Analysis was then performed with this *secondary* data base.

In order to visually compare the analyzed countries, means for all variables were calculated per country using the *original* data. To be able to visually compare all countries, data was standardized among both, cases and variables. Then, Chernoff faces were plotted by assigning the values of the analyzed variables to face features. In this

way, relative values of variables selected for the graph were represented by variations of specific facial features.

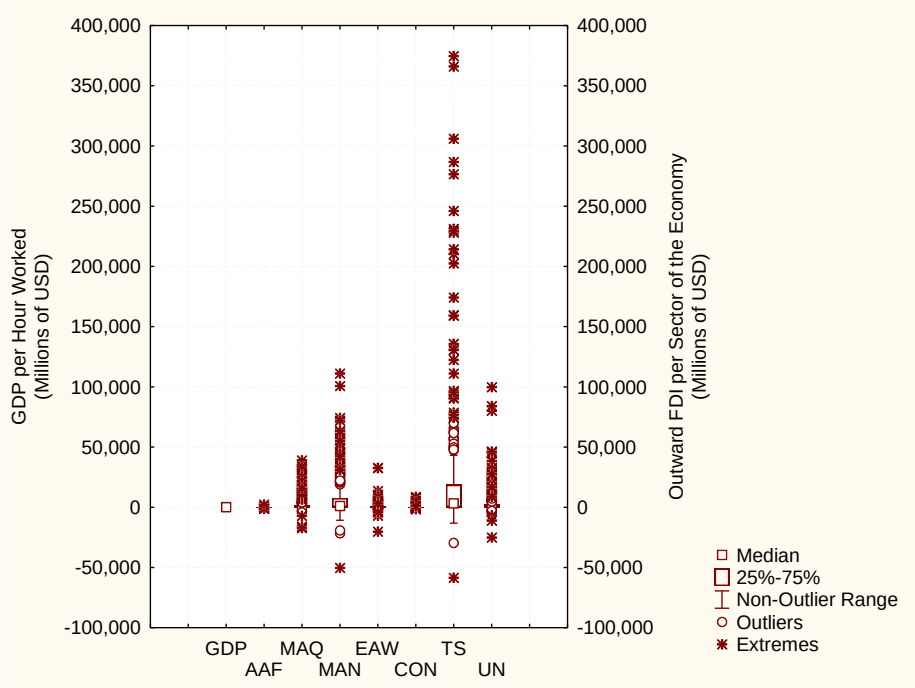
Similarly, to the Outward FDI, a database was built using the reports of the Organization for Economic Co-operation and Development (OECD) on the data set of Foreign Direct Investment (FDI) flows by industry and GDP per hour worked. All countries that had reported any relevant information for Inward DFI for all sectors of the economy between 2003 and 2012 were included.

An exploratory statistical analysis, including the construction of box plots, was again performed in to identify errors and outliers. All outliers were then excluded, and a Multiple Regression Analysis was performed using the GDP per hour worked (in millions of USD) as the dependent variable (Y), and the inward FDI (in millions of USD) of the sectors of the economy as independent variables. Finally, Chernoff faces were again plotted by assigning the means of the analyzed variables to face characteristics to visually compare the analyzed countries according to their Inward FDI variables. Inward-related data was also standardized among both, cases and variables before being plotted.

3. Results and Discussion

Figure 1 shows the box plot of the GDP per Hour Worked and the Outward FDI of the sectors of the economy. Outliers are shown as small circles, while extreme values are indicated with asterisks. Outliers are defined as those located between +/- 1.5 and 3 Standard Deviations beyond the second and fourth quartiles, while extreme values are beyond +/- 3 Standard Deviations of the second and fourth quartiles.

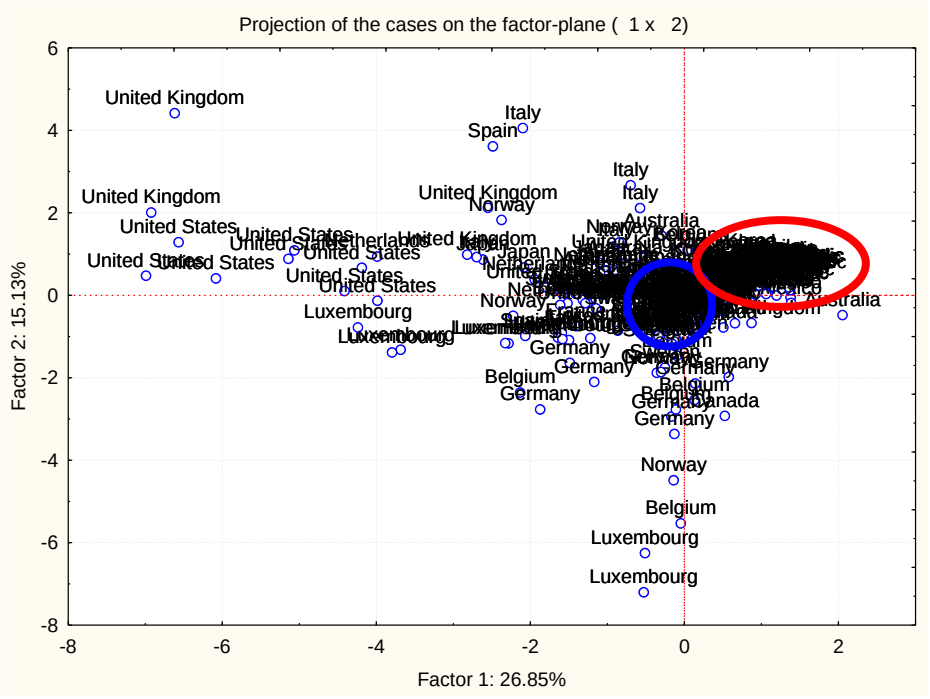
Figure 1. Box plot of the GDP per Hour Worked and the Outward FDI of the sectors of the economy.



As stated in the methodology, all outliers and extreme values were removed to perform the regression analysis, however, several countries such as Canada and United States, show a high number of outliers and extreme values. Therefore, to identify if the data was naturally formed by clusters, a Principal Components analysis was performed using this original data base.

The Principal Components Analysis is shown in Figure 2. Three basic clusters were identified and indicated in a red circle, in a blue circle, and the rest of cases that are not circled. The latter cluster included countries that showed high number of outliers and extreme values in the box plot. Therefore, all countries with more than 25% of outliers or extreme values were totally excluded from the *original* database to be analyzed separately. The *main* database included, therefore, 22 countries.

Figure 2. Principal Component analysis using the original database. Clusters are indicated inside a red circle, a blue circle and the rest that is not circled. Percentages that are shown besides each factor indicate the variance contribution of the variables that form that factor.



The included and excluded countries for the regression analysis are listed on Table No. 1. It is clear that the excluded countries correspond to open economies that have high GDP levels where offshoring might not be that significant when compared to the size of their economies. According to Cheung, Rossiter and Zheng (2008), benefits of offshoring differ from country to country.

Table 1. Included and excluded countries in the Regression Analysis

Included Countries in the Regression Analysis (The *main* database included information from these countries only)		**Excluded Countries**
Austria	Israel	Australia
Belgium	Korea	Canada
Chile	Luxembourg	France
Czech Republic	Mexico	Germany
Denmark	New Zealand	Italy
Estonia	Poland	Japan
Finland	Portugal	Netherlands
Greece	Slovak Republic	Norway
Hungary	Slovenia	Spain
Iceland	Sweden	Switzerland
Ireland	Turkey	United Kingdom
		United Stated

The Regression Analysis of the main database revealed four significant variables ($p<0.05$) besides the intercept. Non-significant variables were excluded, and the regression analysis was run again. Table 2 shows the regression analysis for the significant variables. Although the R^2 was significant, its value shows a relatively weak association between the significant variables and the GDP per Hour Worked, this might indicate that, although there is a relationship between Offshoring and the Productivity of a country, Offshoring is not really a factor that strongly affects the productivity of a country. However, according to Agnese and Ricart (2009), there is either a net or positive effect from offshoring in the long run, even when those effects are directly produced or as a spillover effect.

Table 2. Regression Summary for Dependent Variable: GDP (Outward DFI)

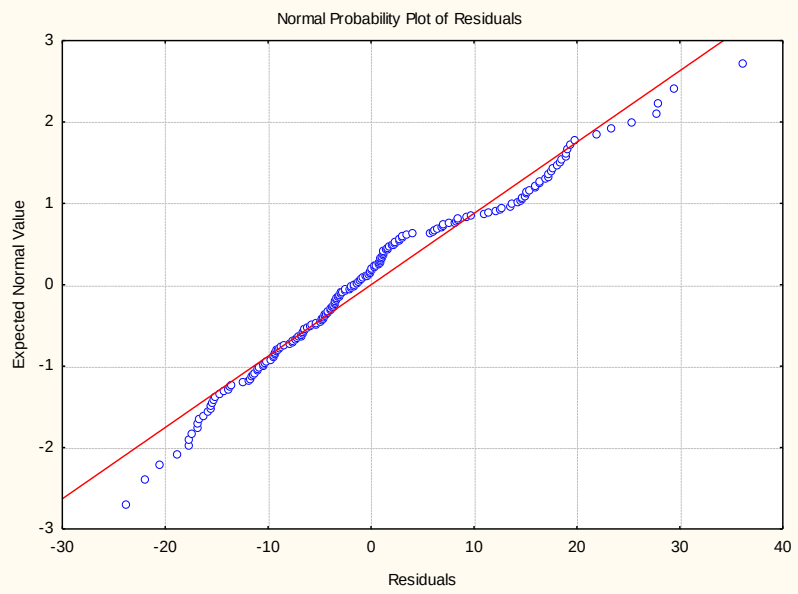
R= .61308510 R²= .37587333 Adjusted R²= .36307074 F(4,195)=29.359 p<0.05

	Beta	**Std.Err. – of Beta**	**B**	**Std.Err. – of B**	**t(195)**	**p-level**
Intercept			33.42708	0.943890	35.41418	0.000000
MAQ	-0.169530	0.060513	-0.00335	0.001197	-2.80156	0.005598
MAN	0.328823	0.060996	0.00152	0.000282	5.39093	0.000000
TS	0.370873	0.056900	0.00054	0.000083	6.51795	0.000000
UN	0.343966	0.057139	0.00041	0.000068	6.01976	0.000000

The analysis of residuals showed an almost normal distribution, which indicates that original variables did not need any transformation. Figure 3 shows the residuals distribution.

Using the variables of countries that were initially excluded due to their high number of outliers (*secondary* database), a Multiple Regression Analysis was also performed. All values in this database from United States were excluded due to being outliers. No variable was significant for the regression. All of these countries are too different in their economies, that trying to find a significant regression was not possible. It is important to say that countries that finance offshoring are usually develop countries, while host countries, are usually developing countries or countries with emerging economies, therefore, every develop country possibly has diverse products and services to offshore that might be different among them. In addition, offshoring countries may choose different host countries depending on the different elements that each host country can offer. Some of the characteristics a country may depend on include location factors, business and labor environment, talent availability as well as cost structure (Scasso, Ruiz and Kwacz, 2013).

Figure 3. Residuals Analysis: Normal Probability plot of Residuals.



The Principal Component Analysis was again performed on the *main* database (no outliers or extremes). Figure 4 shows the projection of the selected countries (cases) on the factor plane (1x2). The plot shows two main areas, one that includes some dispersed cases on the left, and a second one with a highly dense cases zone on the right.

A zoom close to the origin (0,0 intercept) is shown in Figure 5. Countries towards the negative x-axis correspond to developed countries with relatively strong economies of Western Europe (except for those countries with stronger economies that were excluded since the beginning) plus Korea that is slightly towards the negative y-axis. The cluster on the right is still very dense and difficult to see at this zoom level.

The highly-dense cluster of countries on previous graphs is again zoomed in Figure 6. Countries in this zone correspond to developed economies, including Eastern European Countries, Greece, Portugal, Israel, New Zealand as well as countries with developing and emerging economies such as Mexico, Chile and Turkey. Although some of these countries are considered developed economies, it is clear that most of them (if not all) have suffered from hyperinflation, high debt levels causing financial bailout, high poverty measures and/or income inequality. While countries with emerging and developing economies have similar concerns, they also face corruption, political uncertainty, high unemployment, shrinking GDP growth and high tariffs.

Figure 4. Projection of countries (cases) on the factor plane (1x2). Percentages that are shown besides each factor indicate the variance contribution of the variables that form that factor.

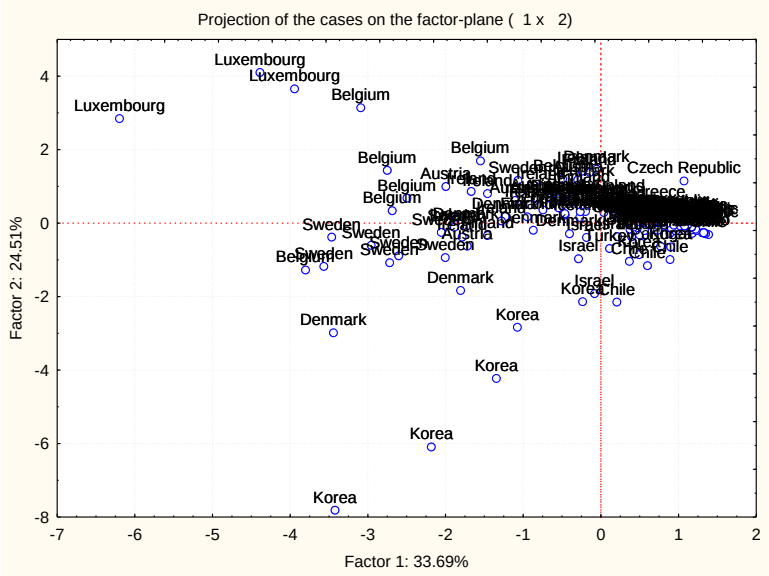


Figure 5. Zoom close to the origin (0,0 intercept) of the Projection of countries (cases) on the factor plane (1x2). Percentages that are shown besides each factor indicate the variance contribution of the variables that form that factor.

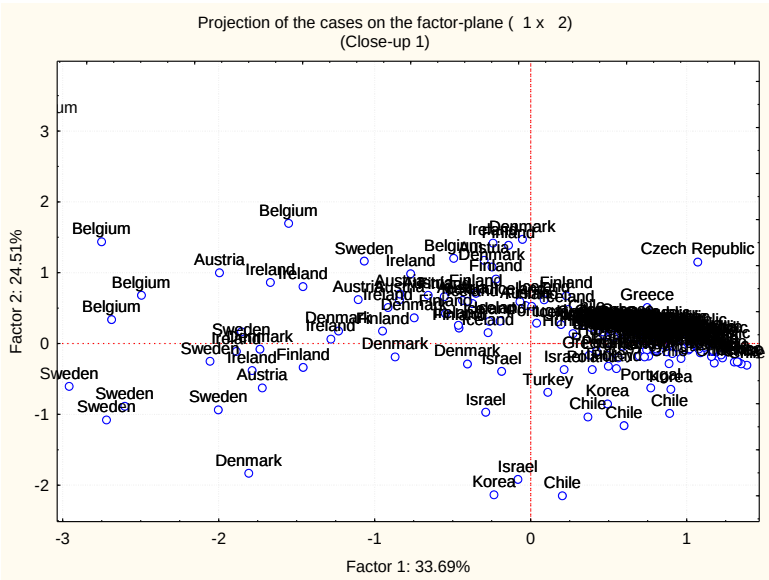
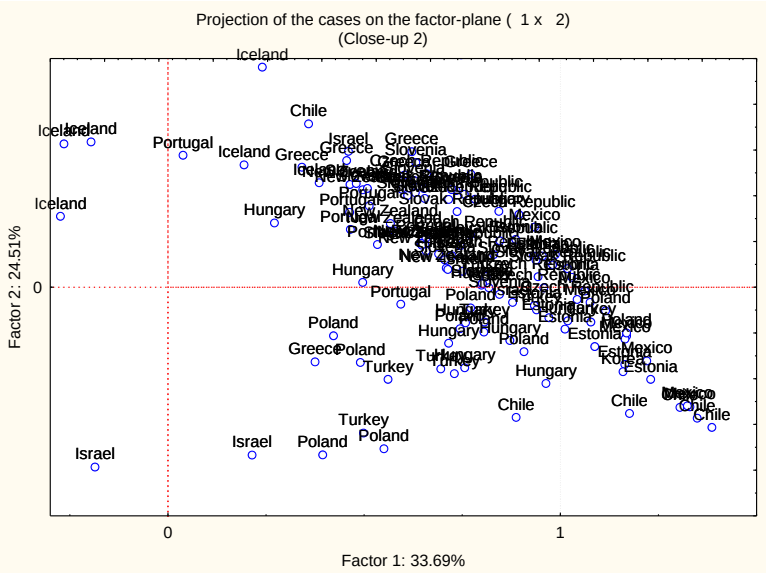


Figure 6. Double zoom of the highly-dense zone of the Projection of countries (cases) on the factor plane (1x2). Percentages that are shown besides each factor indicate the variance contribution of the variables that form that factor.



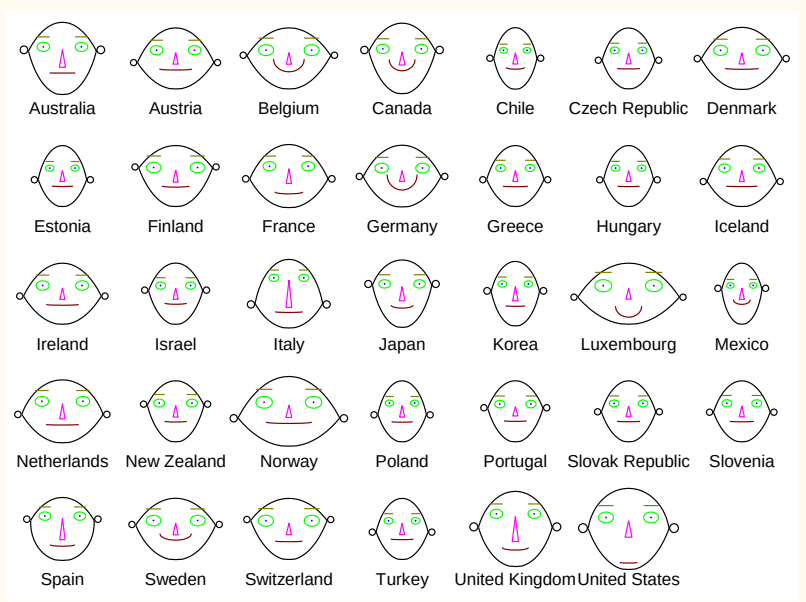
Chernoff faces for the GDP per Hour Worked and Outward DFI per sectors of the Economy variables are shown in Figure 7. Similar faces indicate similar mean values of the analyzed variables per country. For instance, Chernoff faces for Australia and Denmark are similar, which indicate similar mean values of their corresponding analyzed variables. As a whole, these Chernoff faces revealed four groups:

a. Western European countries with developed economies according to the International Monetary Fund (IMF) (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden and Switzerland).
b. Non-European countries with developed economies (Australia, Canada and Japan)
c. Eastern European countries (Czech Republic, Estonia, Hungary[1], Poland[1], Slovak Republic and Slovenia), Western European countries with that face economic problems (Greece, Iceland and Portugal), countries that are developing and emerging economies (Chile, Mexico and Turkey), as well as Israel, Korea and New Zealand.
d. Countries that do not look similar to any other (Italy, Luxembourg, Norway, Spain, United Kingdom and the United States)

[1]Hungry and Poland are also considered as emerging economies.

Most countries in groups No. 1 and No. 3 were members of the main database that was used to carried out the regression analysis. Groups No. 2 and No. 4 were those countries that showed most outliers and extreme values. The case of the United States is particularly different from the rest of the countries. This effect is perhaps due to its especially strong economy. According to the International Monetary Fund (IMF), the United States has the largest economy of the world with $21.48 trillion of USD in 2019. Countries such as Japan, Germany France, United Kingdom, Italy, Canada, Spain and Australia with a range of $5.22 to $1.46 trillion of USD in 2019.

Figure 7. Chernoff faces. All means of the GDP per Hour Worked and Outward DFI per sectors of the Economy variables per country were calculated and assigned to face characteristics. Cases are visualized by schematic faces such that relative values of variables selected for the graph are represented by variations of specific facial features.



Similarly, to the Outward FDI, an exploratory statistical analysis, including the construction of box plots, was performed for the Inward-related variables. All outliers were excluded, and a Multiple Regression Analysis was then performed using the GDP per hour worked (in millions of USD) as the dependent variable (Y), and the inward FDI (in millions of USD) of the sectors of the economy as independent variables (See Table 3). The intercept and the variable Inward FDI in the Electricity and Water Sector were significant in the regression only. It is not surprising that the electricity and water sector has a significant effect since it is common that countries with relatively weak economies get foreign investments for this sector of the economy. However, the R^2 was too low to try to use it as predictor.

Table 3. Regression Summary for Dependent Variable: GDP (Inward DFI)

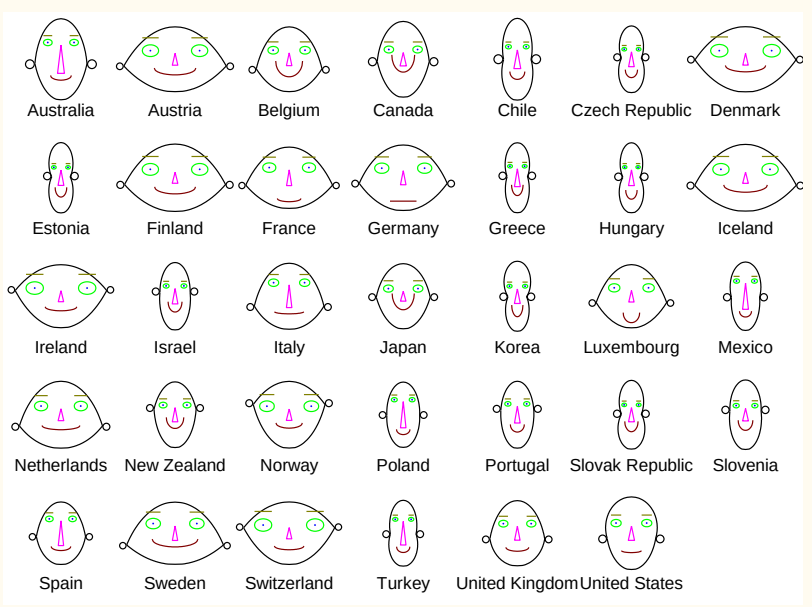
R= .12516722 R²= .01566683 Adjusted R²= .01199395 F(1,268)=4.2655

p <.03985 Std.Error of estimate: 15.727

	Beta	Std.Err. - of Beta	B	Std.Err. - of B	t(268)	p-level
Intercept			44.53702	1.108265	40.18625	0.000000
EAW	-0.125167	0.060604	-0.00908	0.004396	-2.06532	0.039854

Finally, Chernoff faces were again plotted by assigning the means of the analyzed variables to face characteristics to visually compare the analyzed countries according to their Inward FDI variables. Inward-related data was also standardized among both, cases and variables. Once again, similar groups of countries were identified when compared to the Outward DFI variables.

Figure 8. Chernoff faces. All means of the GDP per Hour Worked and Inward DFI per sectors of the Economy variables per country were calculated and assigned to face characteristics. Cases are visualized by schematic faces such that relative values of variables selected for the graph are represented by variations of specific facial features



4. Conclusion

Every country is unique in what it specialized and what their firms can offer as offshoring. This paper explored the relationship between productivity and offshoring in some selected countries. Although a significant regression coefficient was found, the relationship was relatively weak. The model revealed that the sectors of the economy that may be related to Productivity (GDP per hour worked), were the mining and quarrying sector, the manufacturing sector, the service sector and the unallocated sector. It is important to highlight that the Principal Component Analysis revealed that there are strong differences in productivity attributable to offshoring depending on how developed a country is. It was clear that the strongest economies that included the well-known G7 countries, besides Spain, Luxembourg and Australia, were significantly different from those Western European economies that also were significantly different to the Easter Europeans, some troubled Western European economies and emerging economies. It was particularly interesting the outstanding difference between the United States and the rest of countries. It seems that more studies should be performed by separating the different levels of the economy, as well as identifying those countries that practice offshoring and those that host it. Findings of this study confirm that offshoring does not strongly relate to productivity in a short-term period, and that offshoring tends to affect more the productivity of hosting countries (developing and emerging economies) than what it affects those countries that finance the offshoring (developed economies).

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STUDY OF A RELATIONAL-COGNITIVE NETWORK IN COSTA RICA: THE CASE OF THE SPECIAL ECONOMIC ZONE FOR MEDICAL DEVICES IN EL COYOL, COSTA RICA

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Abstract

The global medical device industry has been experiencing and is expected to experience an annual continuous growth of 5,6% in the 8 year period 2017 until 2024 (Evaluate, p. 10). This represents an amount in sales of approximately US$595,000. Costa Rica is not an exception to this medical device producers' expansion. As a result of the government's promotion of Special Economic Zones (SEZs) with interesting fiscal and corporate benefits for multinational (MT) firms since the early 1990´s, the country has become the ''second largest exporter of medical devices in Latin America'' (Coalición Costarricense de Iniciativas para el Desarrollo, 2019, para. 3) This paper's aim is to develop a relational economic geographic and cognoscitive geographical approach towards the analysis of how 'knowledge´ relational networks; formed by local universities and the medical device MT producers, can contribute to the creation of socio-spatial interactions aiming at concrete economic changes and outcomes. Such relational networks also experience a "multiplying cognitive process, that increases the size and quality of intellectual and social capital that is embedded in a particular place" (Rullani, p. 2). These would in turn be reflected in a harmonious and sustainable business relationship with the host country, and the local territory in which the SEZ is located. Informal institutional arrangements (actions and practices such as participation in job fairs and in conjunction with the local universities) are strong motivations for the medical MT firms in El Coyol, Costa Rica to maintain a harmonious and sustainable business relationship with the host territory.

***Keywords*:** Special Economic Zones, Clusters, Relational networks, Costa Rica

***JEL Classification*:** R12, P45, F23

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1. Introduction

Since 2017, the global medical devices industry has experienced continuous annual growth at a rate of 5.6%—a trend that is expected to persist until 2024 (Evaluate, p. 10), representing approximately US$ 595 billion in sales. Costa Rica is no exception to this expansion. In the early 90s, the government began fostering the establishment of Special Economic Zones (SEZs) by providing multinational (MTN) firms with attractive fiscal and corporate benefits; this, in turn, enabled the country to become the "second largest exporter of medical devices in Latin America" (Coalición Costarricense de Iniciativas para el Desarrollo, 2019, paragraph 3).

This paper will apply a relational economic-geographical and cognoscitive-geographical approach in order to analyze the manner in which 'knowledge' relational networks (formed by local universities and MTN producers of medical devices) could develop harmonious, sustainable relations with the host territory, and whether they could contribute to creating socio-spatial interactions that bring about concrete economic changes and outcomes. These relational networks experience a "multiplying cognitive process, that increases the size and quality of intellectual and social capital that is embedded in a particular place" (Rullani, 2003, p. 2), which would be reflected in a harmonious and sustainable business relationship with the host country and the local territory in which the SEZ is located. Consequently, the two main research questions that will guide this paper are as follows:

1.Do the relational and cognitive networks comprising local universities and MTN medical device firms, developed in El Coyol SEZ (Alajuela, Costa Rica), provide MTN medical device firms with a motivation to establish a harmonious and sustainable business relationship with the host territory and country?

2. Do the relational and cognitive networks comprising local universities and MTN medical device firms, developed in El Coyol SEZ (Alajuela, Costa Rica), provide MTN medical device firms with a motivation to create knowledge?

A mixed qualitative-quantitative methodology was applied to test these two research questions. Firstly, an exploratory study was carried out through the review of relevant bibliographical resources on relational economic and cognitive economic geographies. Two seminal papers serve as a theoretical foundation for this paper: a. "Rethinking relational economic geography," by Yeung (2005), and b. "The industrial district as a cognitive system," by Rullani (2003). Secondly, 20 closed-ended questionnaires were distributed to 20 business leaders from MTN medical device firms in El Coyol SEZ, between April and May of 2019, which allowed for collecting quantitative primary data. Thirdly, a logistic regression model was developed, in which the independent variable is of a binary nature, representing whether MTN firms have developed a relational network with local universities, and whether these firms are motivated to create knowledge as a result of these networks. The following aspects were considered as dependent variables: a. participation in job fairs at universities (years), b. relationship with employment offices that have ties to universities (years), c. internship relationship (years), and d. number of research initiatives developed. Although it is limited to only one SEZ in Costa Rica, this study focuses on the most important MTN medical device cluster in the country.

2. Theoretical Framework

The interaction between technology, organizations and territories (Storper, p. 39) at various geographical levels is the result of "socio-spatial" interactions between different actors (Yeung, p. 37), each of which manifests varying degrees of power. According to Allen (2003), power is "a relational effect of social interaction" (p. 2). Yeung (2005) further expands this concept by providing a more pragmatic and functional definition, stating that power represents the "relational effects of the capacity to influence and the exercise of this capacity through actor-specific practice" (Yeung, 2005, p. 44).

Relational geographies—which are socially constructed through the interrelation of economic actors and their "actor-specific" (Yeung, 2005, p. 44) practice and action—build institutions (norms, habits and cultural expressions) that control, regulate and establish boundaries for the relationality between them. Relational geography is also context-influenced, culturally-determined and power-derived in the form of networks. According to Yeung (2005), these relational geographies are neither actors (e.g. individuals and firms) nor structures (e.g. class, patriarchy and the State), but rather "configurations of relations between and among them–connecting actors and structures through horizontal and vertical power relations" (Yeung, 2005, p. 44).

Power relations are manifested through relationality, and this relationality facilitates power as an effective means for achieving results and outcomes, through the "emergent effects of social practice among actors" (Yeung, 2005, p. 45). This creates "spatial configurations" (Yeung, 2005, p. 37) that serve as foundations for "relational geographies" (Yeung, 2005, p. 37). Although actors and structures per se may not necessarily hold power, they may have demonstrated that they are capable of obtaining outcomes while interacting within professional networks. This facilitates the relationality between actors and structures of any network, since power can actually be distributed based on previous performance, rather than on a position or hierarchy. Depending on the reason for which a network is established, it is also important to consider power as a social construct that is constantly influenced by the organizational culture, the context in which it is embedded, as well as actor-specific practices and actions.

The reasons that motivate specialized firms to form clusters, industrial districts or agglomerations can be analyzed from a relational economic-geographical perspective. Under this lens, tensions, frictions and power relations between the relevant economic actors are studied and depicted "to incorporate actor-specific practice into our analysis of contemporary economic change" (Yeung, 2005 p. 44). For the purpose of this essay, it is interesting to consider the reasons for which specialized MTN firms, such as those in El Coyol, Costa Rica that develop medical supplies, have gathered in the corresponding geographical area. One the one hand, it could be due to the advantages afforded by their proximity to important urban centers and infrastructure. On the other hand, in terms of relational geography, proximity to local and regional universities could represent a strong enough incentive to continue doing business in the country and to attract new MTN firms to the country. According to Yeung (2005, p. 46) "the emergent power embedded in these relations provides a major force to drive association and interconnections and to produce socio-spatial outcomes." Regardless of how strong relational geographies are in a series of specialized firms, the 'learning' region and local embeddedness play an important role in prompting economic changes and outcomes.

The efficacy and efficiency of relationality is determined by the application of "emergent power" (Yeung, 2005, p. 46)—that is, the strong interconnections and associations of relational networks developed in business clusters. This relationality can capitalize on the learning that occurs in a place or context, as well as spatial trends, in order to generate concrete economic changes, mobilization and practice. This eventually can provide a very important catalyst for local and regional development. Marston describes it as "a complex mix that also includes space, place and environment–all of which interactively make the geographies we live in and study" (Marston, 2000, p. 221).

To be able to analyze how these 'knowledge' relational networks function, it is important to clarify two categories of power relations that Yeung (2005) utilizes to render this methodology functional: relational complementarity and relational specificity. The first one describes the manner in which firms and universities (the main actors of the 'knowledge' relational network described by this study) utilize their power relations to construct a spatial geometry "to benefit from each other's co-presence and engagement" (Yeung, 2005, p. 46). Through stronger co-presence and engagement from the network's actors, less friction and opposition will arise, given that the power relations are utilized to obtain "spatial change and outcomes" (Yeung, 2005, p. 46). In the case of this study, the MTN firms in El Coyol SEZ and local and regional universities may decide to cooperate with one another to take advantage of each other's complementary assets: the firms' labor market knowledge and the regional universities' competitive professional profiles. Although this complementarity may involve unequal power relations, cooperation agreements between the main actors will facilitate the process of applying actor-specific practices, actions and mobilizations through which economic changes and expected outcomes can be achieved.

Relational specificity is another type of power relation "in which dedicated commitment is enforced among constituents in dyadic and heterogeneous relations" (Yeung, 2005, p.46). The salient feature of this specificity is the manner in which the main actors of the relational network rely on and are attached to their "ongoing power relations" (Yeung, 2005, p. 47), which allows for enhancing their spatial configurations and, in turn, driving economic changes and outcomes. The topological characteristics of the relationality present in the specific geometrical network, like the university-firm networks at El Coyol SEZ, are shaped by these specific power relations. "Dedicated commitment" from each of the main actors of the relational network is necessary in order for this relational specificity to function effectively, without friction or resistance. This specificity can also be demonstrated through the analysis of actor-specific practices and actions, with the aim of achieving economic changes and outcomes, both at the local level and beyond the cluster. Based on Yeung's argument (2005, p. 46) regarding the emergent effects of complementarity and specificity, "the efficacy of such an emergent effect is contingent on the practice of a variety of actors such as firms, unions and agencies entering into all sorts of heterogenous relations—a relational practice that activates this emergent effect. In other words, the emergent nature of power is experienced through action and practice."

Organizations (firms and universities), interactions (practices and communication based on power structures), evolution (development path) and innovation (new ideas and knowledge creation) play an important role within a context of relational geometries. These elements, described by Bathelt and Glucker (2003, p. 117) as the "the four ions of

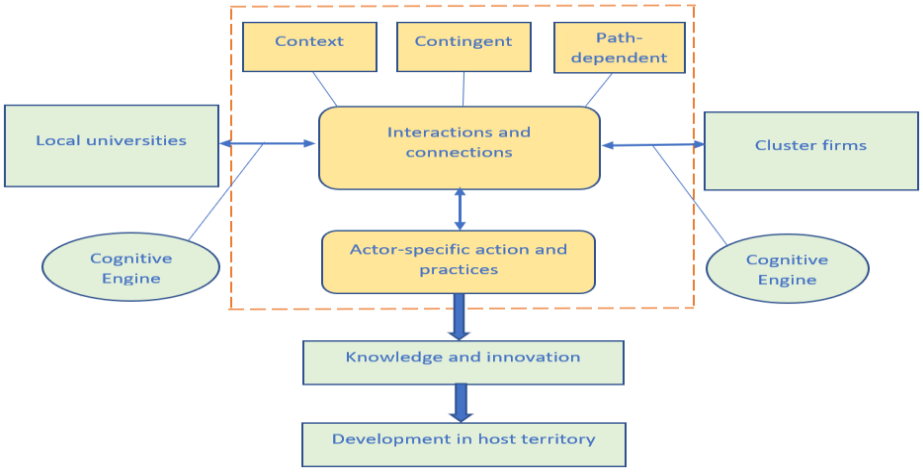
economic geography in a relational perspective," are contingent on a "multiplying cognitive process" (Rullani, 2003, p. 2). Consequently, this paper establishes a theoretical connection between Yeung's (2005) relational networks based on power relations and Rullani's (2003) cognitive multiplying process. This link will reinforce the idea that development in a territory can be enhanced by experienced, learned institutions that form part of these 'knowledge-based' networks and that generate economic changes and outcomes.

According to Rullani (2003), economic changes and outcomes are associated with a multiplying cognitive effect "that increases the size and quality of intellectual and social capital that is embedded in a particular place" (Rullani, 2003, p. 2); they are also the result of shared knowledge obtained through cooperation among relevant actors in the relational network. Rullani (2003) describes knowledge as being costlessly re-produced and re-created through "ideas, models, laws, etc." (Rullani, 2003, p. 2). According to Rullani, the territory is one of the elements required in order for the multiplying effect to function and to generate "unique, localized knowledge" in a specific territory. Nonetheless, Rullani does not include in his analysis the emergent effects that power relations have on the spatial configurations that shape relational geometries. On the other hand, Rullani (2003) considers territories to be "a depository of culture and habits [that] accumulates forms of tacit knowledge, and channels of communication . . . and they are embedded in the anthropological-social system grown up in each place" (Rullani, 2003, p. 3).

Rullani's depiction (2003) of the territory as a depository of culture, habits and tacit knowledge resulting from multiplying cognitive processes, allows for establishing linkages with Yeung's (2005) argument of relational networks based on emergent power relations. The relational network that Yeung (2005) proposes is dependent on power relations in which the various actors participate through experiences, thoughts and senses, which are basically cognitive processes. These power relations and their emergent effects are the result of interactions happening in the relation network, which are expected to create value and a 'knowledge' economy for the benefit of the firms and universities, thereby creating a new 'place' of shared knowledge and expected economic change. The interactions in the relational network include multiplying cognitive processes through which new ideas, creations, practices and, in general, new institutions are developed for the benefit of the spatial configurations where these firms and universities are located.

Bathelt and Glucker (2003) describe a relational perspective in which the relational action, from a spatial perspective, can result from the relationship between the organization, evolution, interaction and innovation. As noted by these authors, the idea behind these basic concepts is to understand how they "are being constructed and reconstructed" under the aegis of a relational perspective, with new input from the multiplying cognitive processes involved in their development and interaction (see Figure 1). This heuristic approach can be utilized to better understand the consequences of the relational perspective on each of these concepts: specifically, how they are influenced by the relationality of the network under analysis—with input from the cognitive process—and how they influence knowledge and value creation on behalf of the cluster or industrial districts—in this case, El Coyol SEZ.

Figure 1: Spatial relational network



The main organizational problem that characterizes the relational network comprising El Coyol firms and local universities is the coordination of the labor force. On the one hand, firms are constantly demanding labor from the Costa Rican and regional labor market; on the other hand, universities must incorporate recent graduates into the local job market.

The relational network, which comprises both firms and universities, is contingent on the power relations that each of the constituents engages in and commits to upon entering the network. Regardless of the types of actions and practices that the actors decide to undertake as part of their efforts to achieve economic changes and outcomes on behalf of their territory and cluster, "organizational structures are embedded in social, cultural and institutional structures and relations which cannot be separated from the economic sphere. The existence of accepted rules, habits, norms and other institutional arrangements creates a reliable environment for interactive learning" (Bathelt and Glucker, 2003, p. 133). These knowledge-based relational networks benefit from the cognitive engine that begins to operate under the conditions afforded by a stable relational network. For instance, the cognitive multiplying effect triggered by the various actors' practices and actions can enhance the interactions that commonly characterize the firm-university relationship, such as the organization of job fairs or collaboration through internships. This cognitive engine will generally "reduce information costs, generate information spillovers and enable for more efficient communication" (Bathelt and Glucker, 2003, p. 133).

With respect to its evolution, El Coyol SEZ is embedded in an anthropological, social and economic context that has changed over time. As economic and social processes have evolved in this territory, so has the relational network comprising firms in El Coyol and local universities. To quote Bathelt and Glucker (2003), the changes that have been implemented by this relational network are "path dependent in that they follow particular histories of decisions, actions and their consequences." Therefore, the firm-university relational network comprises a series of practices, actions and habits that shape its

institutional framework; these institutions, in turn, have emerged as a result of power relations and the use of their cognitive engine as a means of accelerating the creation of knowledge and innovation.

The evolution of the firm-university relational network in El Coyol is path dependent, but this does not mean that it is deterministic. This network's creation and re-creation of new knowledge, as well as its enhancement of social capital, is dynamic and characterized by topological features that are unique considering its socio-economic context, but it is "experience-based and develops over time from a historical process" (Bathelt and Glucker, 2003, p. 134). The effective application of power relations within the institutional context, with input from the cognitive engine, strengthens the creation of new knowledge. Eventually, the combination of these elements results in "future path-development and context-specific developments" (Bathelt and Glucker, 2003, p. 134). This network in particular specializes in the development and manufacturing of advanced medical devices, as a result of previous decisions made by MTN firms, universities and other relevant actors, such as government trade promotion agencies. The country's international trade strategy in recent years is reflected in the path-dependent decisions that have been made with respect to the labor market and the professional profile that MTN firms and universities aim for.

The other relevant dimension is innovation. The relational perspective applied in this research study allows for analyzing the power relations between the different constituents of the firm-university relationship, while also bearing in mind the goal of knowledge creation. The heuristic framework applied in this study views the cognitive engine as a catalyst for increasing and multiplying the effect of network linkages, especially with respect to the creation and re-creation of new knowledge and social capital. As stated by Bathelt and Glucker (2003), "the creation of new technologies is viewed as an interactive social process, characterized by a particular social division of labor within a firm and between firms of the value chain as well as between firms and universities" (p. 135).

Cognitive engines are extremely important when the relational network is implementing actor-specific practices, habits or actions. Cognitive processes are based on experience and interactive learning, as well as on innovation that depends on "continuous feedback from various stages in research, testing and production, reflexive patterns of economic behavior, and interactive learning between the agents involved" (Bathelt and Glucker, 2003, p. 135). Cognitive engines are motivated by the institutional framework represented in routines, heuristics and cognitive scripts (DiMaggio, 1997). The actions and practices undertaken by the constituents of the relational network, resulting from the power relations involved, serve as catalysts for economic change and outcomes; this, in turn, allows for achieving local territorial development.

Based on the three aforementioned dimensions—organization, evolution and innovation—interaction represents a binding element that facilitates continuous interconnection between relevant actors or the constituents of the relational network. According to Bathelt and Glucker (2003, p. 136), "the nature and extent of interaction changes over time in various workplaces, firms, and formal institutions and authorities." As a result of the cognitive engine and relationality in the network, there is a continuous process of interactive learning, creativity, as well as creation and re-creation of collective

intellectual and social capital, "which link the organization and innovation ions and generate an evolutionary dynamic" (Bathelt and Glucker, 2003, p. 136).

El Coyol SEZ firms and the local universities in their relational networks are able to develop spatial and organizational configurations at various levels thanks to their interactions, which enable the network constituents "to modify and refine heuristics and routines along existing trajectories or to develop new technologies towards new development paths" (Bathelt and Glucker, 2003, p. 136). Actor-specific actions, practices and routines, among others, become more sophisticated and complex as the cognitive engine and its multiplying effect retrieve information, in a prospective manner, from an institutional memory of successes and failures. Learning through interaction is experience-based, relationally-determined and path-dependent. Specialized industry clusters such as the one in El Coyol are characterized by "inter-firm interaction, proximity and learning. They enable efficient information and knowledge transfer" (Bathelt and Glucker, 2003, p. 136). Eventually, the outcomes achieved by the firm-university relational network are expected to produce a development path, both within and beyond the industrial district or cluster.

3. Origins of Special Economic Zones in Costa Rica

In the 1960s, 70s and early 80s, import substitution industrialization proved to be an ineffective way to drive development in Costa Rica; consequently, the country needed to find a new development model that could provide hope. The situation grew even more challenging in the 1980s due to the international debt crisis, macroeconomic management and the collapse of international commodity prices for products like coffee and bananas.

In search of a new economic development model, Costa Rica began to implement structural adjustment programs in the mid-1980s. This led to the intensification of economic liberalization as a means of attracting foreign direct investment and transnational capital. An attempt was made in 1981 to create the first SEZ through Law No. 6695 on Export Processing Zones and Industrial Parks (Exp. 7870, 1981, Tomo 2: 611), which sought to drive the development of specific regions of the country that were less developed (Puntarenas and Limón), boosting their capacity to export and re-export to third markets. However, there were geographical limitations, and the law provided limited fiscal benefits such as tax exemptions on raw materials, sales of exported goods, and capital.

In 1984, the country began the process of adapting the structural adjustment program under a new development model that focused on an export-led strategy. This required the initial law to be updated and adapted to the country's reality at that moment in time. Consequently, the country enacted Law No. 6951 on Special Economic Zones. In contrast to the geographical selectivity that characterized the 1981 law, the new law enabled SEZs to be established in other regions of the country, subject to the approval of Congress (Exp. 9304, 1984. Tomo 2: 591). Fiscal exemptions were expanded to a 100% exemption on a firm's corporate tax during the first six years of operations, and a 50% exemption for the following four years.

In 1990, Law No. 7210 was enacted with the aim of improving conditions for foreign and local firms that were willing to accept the conditions of working under a SEZ regime. The most important fiscal exemption improvements afforded by this law, which is still in effect today, are related to fiscal benefits. Corporate tax exemption, which was previously limited to a firm's first six years of operations (according to the 1984 law), was expanded to eight years for firms in SEZs of the Greater Metropolitan Area. The exemption for the following four years was maintained at 50%, as established in the 1984 law. Furthermore, the corporate tax benefit for less developed regions of the country (Enlarged Greater Metropolitan Area) was doubled, from the first six years of operations to the first twelve years of operations; however, the benefit for the following four years of operations remained unchanged at 50%, as established in the 1984 law.

The 1990 SEZ Law provided a very appealing package for attracting foreign direct investment as well as local investment. As previously mentioned, fiscal corporate profit exemption is one of its most attractive aspects; nonetheless, the fiscal benefits vary greatly, as shown in the following table:

Table:1

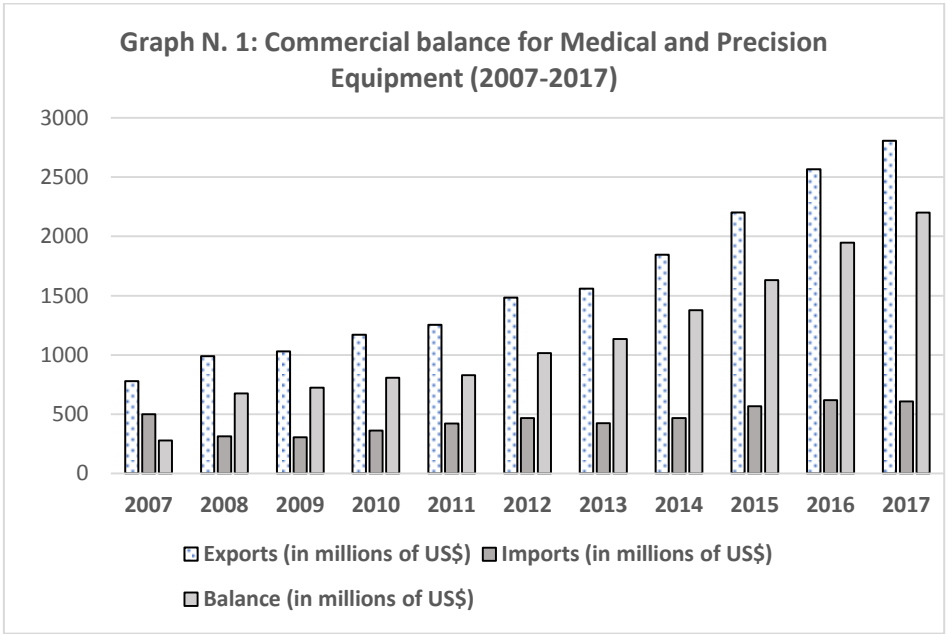
Exemptions of the 1990 SEZ Law	Description
Importing of goods necessary for the operation and management of the company	Machinery and equipment, semi-elaborated manufacturing products, other products necessary for operation, packaging materials, spare parts, components and parts.
Importing of vehicles with the following characteristics:	Chassis with cabins with one to two-ton load capacities, trucks or truck chassis, pickup trucks with one- or two-ton load capacities, vehicles with a minimum capacity of fifteen passengers.
Domestic purchases of goods and services	
Exports	
Conveyance of real estate	For a period of ten years
Municipal permits	For a period of ten years
Remittances	
Profits: This benefit is awarded in accordance with company's location and category	-Greater Metropolitan Area: No corporate tax during the first eight years of operations. For the remaining four years, there is a 50% exemption. -Enlarged Metropolitan Area: No corporate tax during the first twelve years of operations. For the remaining four years, there is a 50% exemption.

	This percentage depends on the firm's location and category, as well as its size.
Access to training and education programs	

Source: https://www.procomer.com/en/freetradezone-investor#2

4. The Medical Devices Sector as a Propeller of Economic Growth

Thanks to the creation of SEZs and industrial parks as part of an export-led growth strategy, as well as the implementation of Law No. 7210, specialized economic clusters have emerged and proven to be very important propellers of economic growth. The global medical devices industry is one of the most dynamic sectors of the global economy, and Costa Rica is reaping the economic benefits afforded by this positive trend. As shown in Graph 1, the commercial balance of the medical and precision equipment sector in Costa Rica (the name utilized by the Central Bank of Costa Rica to describe the medical supplies sector) has been very positive.



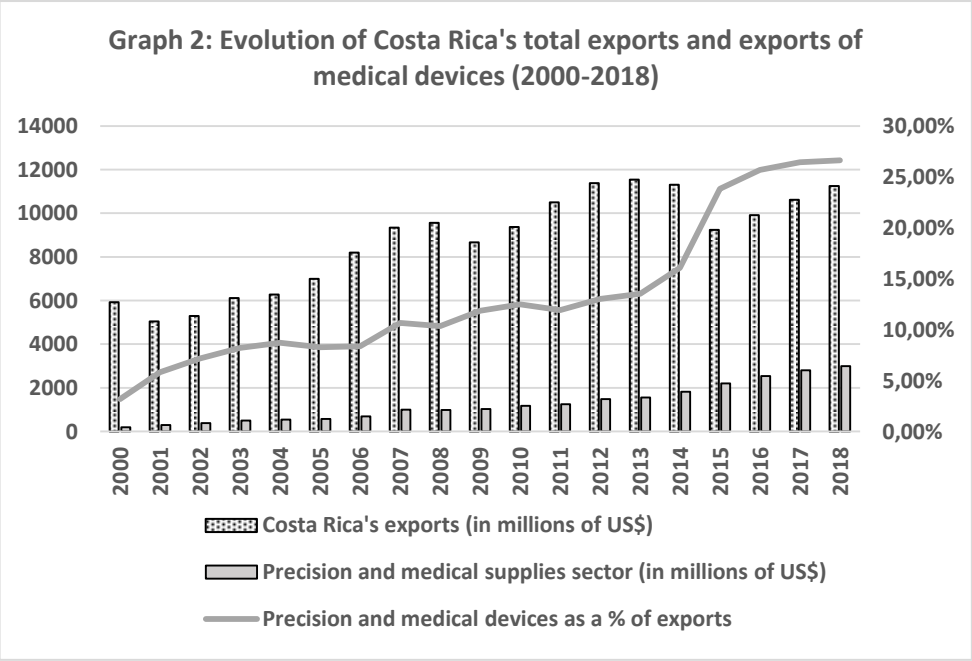
Source: By author with data from Anuarios Estadísticos, Procomer, 2008-2017.

In 2007, the commercial surplus of the medical supplies industry in Costa Rica was US$ 279 million. By 2017, this surplus had reached US$ 2200 million, representing an enormous increase of 873.18%.

It is worth noting that North America and the European Union are the two most important regions of the world that receive exports of medical supplies from Costa Rica. In 2008, North America received 83% of these exports, followed by the European Union, which received only 10%. Interestingly, this trend shifted slightly in 2017, when the European Union received a greater number of exports of medical supplies from Costa Rica, although North America remained the top destination of these exports. That year, North America and the European Union received 69% and 22% of exports of medical supplies from Costa Rica, respectively; while North America's participation in receiving exports decreased by 14%, that of the European Union increased by 14%.

The country that stands out as the most important buyer of medical supplies from Costa Rica is the United States. In 2007, the U.S. purchased US$ 498.1 million in medical supplies, representing 63.9% of the total exports of medical supplies; in 2017, the country purchased US$ 1884.70, representing 70.4% of the total exports. This represents an increase of 278.37% during the period analyzed.

Overall, the export industry for medical devices has become the most important sector of Costa Rica's economy. At present, the sector accounts for 26% of Costa Rica's total exports, as illustrated in Graph 2.



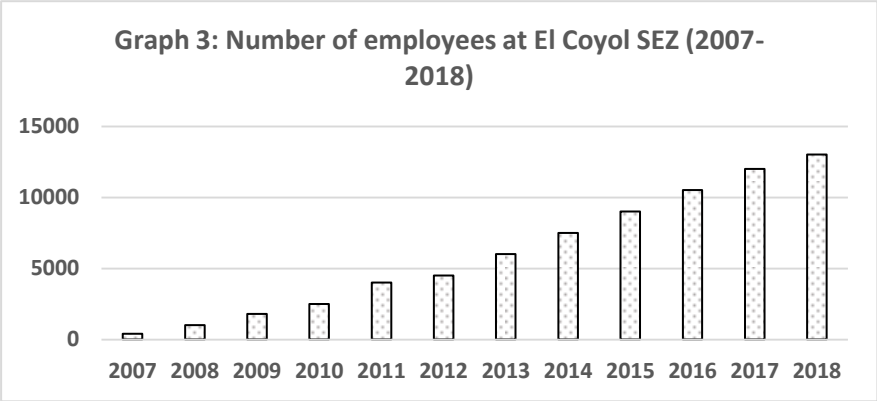
Source: By author with data from Central Bank of Costa Rica, 2000-2018.

Graph 2 analyzes exports of medical supplies as a percentage of Costa Rica's total exports during the 2000-2018 period. In the year 2000, the medical supplies sector contributed a modest US$ 3.19 million to the country through exports. By 2018, the sector's participation in Costa Rica's total exports had grown impressively, reaching 26.62%. The medical supplies sector is now Costa Rica's main exporting sector, and its participation in the economy is expected to continue increasing in the years ahead.

As a result of the incentives provided by Law No. 7210, as well as Costa Rica's locational, human capital, political and economic advantages, El Coyol SEZ began operating in 2007 in an area spanning 107 hectares in the province of Alajuela, Costa Rica (https://www.cinde.org/en/incentives/manufacturing-parks/coyol-free-zone-business-park). The SEZ began recruiting companies from the life sciences and advanced manufacturing industries, and Hollogic was the first to join, serving as an "anchor tenant" (https://www.cinde.org). El Coyol SEZ now hosts 24 MTN firms specializing in the advanced manufacturing of medical devices as well as research and development in this field. This SEZ is strategically located at a distance of 11 kilometers from Costa Rica's main international airport, and is only 56 kilometers away from the most important Pacific port.

As of December 2018, El Coyol SEZ produced and exported 63% of the total amount of medical devices produced in the country. This represents 1.2% of Costa Rica's Gross National Product (Revista Summa, May 8, 2019). The SEZ has also tripled its contribution to exports of medical devices, from "US$ 578 million in 2014" (Revista Summa, March 21, 2018) to "US$ 1976 million in 2018" (Revista Summa, May 8, 2019). In just 4 years, this single SEZ has increased its exports by 241.86%.

El Coyol SEZ employs more than 13,000 people, focusing on hiring talented personnel who have received higher education, which is one of the requirements within the life sciences and advanced manufacturing sector. The following graph illustrates the general employment trend in this SEZ:



Source: By author with data from Anuarios Estadísticos, Procomer, 2008-2017.

The employment outlook for the near future is very positive, given that El Coyol SEZ is currently at 60% of its hosting capacity. In 2018, SEZs in Costa Rica employed a total of

106,707 persons; El Coyol SEZ in particular employed 13,000 persons as of late 2018, accounting for approximately 12% of the total number of jobs generated by SEZs in Costa Rica.

5. Econometric Model

Two main research questions are tested by this study:

1.Do the relational and cognitive networks comprising local universities and MTN medical device firms, developed in El Coyol SEZ (Alajuela, Costa Rica), provide MTN medical device firms with a motivation to establish a harmonious and sustainable business relationship with the host territory and country?

2. Do the relational and cognitive networks comprising local universities and MTN medical device firms, developed in El Coyol SEZ (Alajuela, Costa Rica), provide MTN medical device firms with a motivation to create knowledge?

For the first research question, the following logistic econometric model is proposed:

$$\boldsymbol{L_{i-rel} = \ln \frac{Pi}{1-Pi} = \alpha + \beta X_1 + \beta X_2 + \beta X_3 + \beta X_4 + u_i,}$$

The model comprises the following variables:

L_{i-rel}: Is interaction with local universities key for a sustainable relationship with the territory?

X_1: Years participating in job fairs organized by local universities.

X_2: Years collaborating with local universities through internships.

X_3: Number of research initiatives undertaken with local universities since the start of operations.

X_4: Years coordinating with employment offices that have ties to local universities.

Binary logistic regression is based on having a dichotomous dependent variable, $\boldsymbol{L_{i-rel}}$; this conditional probability that $Y_i = 1$ is a non-linear function of the continuous explanatory variables. The basic idea behind this first version of the logistic model is predicting whether the interaction ($\boldsymbol{L_{i-rel} = 1}$) or lack thereof ($\boldsymbol{L_{i-rel} = 0}$) with local universities is key in order for the cluster of MTN medical supplies firms to achieve a sustainable relationship with the host territory. The following explanatory variables are included in the model: 1. number of years during which the MTN firms in this cluster have been participating in job fairs organized by local universities (X_1); 2. the amount of time, measured in years (X_2), during which the MTN medical supplies firms have been collaborating with local universities through internships; 3. the number of research initiatives (X_3) that have been undertaken with local universities since the start of operations of the medical supplies firms in El Coyol SEZ; and 4. the amount of time, measured in years (X_4), coordinating with employment offices that have ties to local universities.

For this purpose, we can analyze the likelihood ratio (LR) chi-square test, which basically tests whether the model containing our predictors represents a significant improvement in fit over a null model with no predictors (i.e. a model with only the

constant). In this particular case, this LR-chi-square test has 4 degrees of freedom and a table value (with a 0.05 margin of error) of 9.488. The computed value of LR-chi-square needs to be greater than the table value of 9.488 in order to be statistically significant. The specified model would be significantly better at predicting $\boldsymbol{L_{i-rel}}$ than a model without the predictors X_1, X_2, X_3 and X_4. Additionally, the p-value obtained should be less than 0.05 in order for the specified model to be statistically significant as well.

Once the LR-chi-square test and the p-value are calculated, and the model utilized demonstrates that the model that includes $\boldsymbol{L_{i-rel}}$ fits the data statistically and significantly better than the model without it, then each odds ratio can be interpreted. A one-unit change in the predictor variable L_{i-rel} will enable the odds ratio to achieve an expected change, with all other variables in the model held constant.

For the second research question, a second logistic econometric model is proposed, as follows:

$$\boldsymbol{L_{i-know} = \ln \frac{Pi}{1-Pi} = \alpha + \beta X_1 + \beta X_2 + \beta X_3 + \beta X_4 + u_i,}$$

The model is composed of the following binary dependent variable:

$\boldsymbol{L_{i-know}}$**:** This represents the interaction between MTN medical device firms in El Coyol SEZ and local universities, which is key for knowledge creation. The explanatory variables, X_1, X_2, X_3 and X_4, are the same ones utilized in the first logistic econometric model.

The criteria utilized to determine whether the model is statistically significant are the same as in the first logistic econometric model with the LR-chi-square test, the p-value, and the subsequent analysis of each odds ratio.

The following chart presents the results of the binary logistic regressions:

6. Analysis of the Econometric Results

Table:2

Model 1 results		**Interpretation**	**Model 2 results**		**Interpretation**
Binary variables			**Binary variables**		
$\boldsymbol{L_{i-rel}}$			$\boldsymbol{L_{i-know}}$		
$\boldsymbol{X_1}$ **- Odds ratio**	1.4747	A one-unit change in the predictor variable L_{i-rel} changes the odds ratio of X_1 by 1.4747	$\boldsymbol{X_1}$ **- Odds ratio**	1.1476	A one-unit change in the predictor variable L_{i-know} changes the odds ratio of X_1 by 1.1476
$\boldsymbol{X_2}$ **- Odds ratio**	7.8027	A one-unit change in the predictor variable L_{i-rel} changes the odds ratio of X_1 by 7.8027	$\boldsymbol{X_2}$ **- Odds ratio**	3.0704	A one-unit change in the predictor variable L_{i-know} changes the odds ratio of X_1 by 3.0704

X_3 - Odds ratio	1.7291	A one-unit change in the predictor variable L_{i-rel} changes the odds ratio of X_1 by 1.7291	**X_3 - Odds ratio**	0.3060	A one-unit change in the predictor variable L_{i-know} changes the odds ratio of X_1 by 0.3060
X_4 - Odds ratio	2.1313	A one-unit change in the predictor variable L_{i-rel} changes the odds ratio of X_1 by 2.1313	**X_4 - Odds ratio**	4.7554	A one-unit change in the predictor variable L_{i-know} changes the odds ratio of X_1 by 4.7554
Chi-square for model	0.0369	Model is statistically significant	**Chi-square for model**	0.0071	Model is statistically significant
Likelihood ratio chi-square	10.22	Model is statistically significant	**Likelihood ratio chi-square**	14.05	Model is statistically significant
Number of observations	20		**Number of observations**	20	

Source: By author with data obtained from questionnaires (March-April 2019)

Based on the results presented above, it is possible to conclude that both binary logistic regressions have statistically significant models, given that both the LR-chi-square test and the p-value meet the abovementioned criteria. This means that both models contain our predictors and represent a significant improvement in fit over a null model with no predictors. In the case of the first logistic regression (binary variable $\boldsymbol{L_{i-rel}}$), the LR-chi-square test obtains a value of 10.22, which is greater than the table value for 4 degrees of freedom and a margin of error of 0.05, which is 9.488. Additionally, in the case of the second logistic regression (binary variable $\boldsymbol{L_{i-know}}$), the LR-chi-square test obtains a value of 14.05. This is obviously greater than the previously mentioned table value of 9.488.

Given the fact that both models have proven to be statistically significant, it is possible to continue with the analysis by interpreting the odds ratio results.

For the first logistic regression model, the highest odds ratio is 7.8027 (predictor variable X_2). This means that the odds of MTN medical device firms having a harmonious and sustainable business relationship with the host territory increase by 7.8 times with every one-year increase in collaboration between MTN medical firms and local universities through internships, provided that all of the other variables in the model remain constant.

The first model also tests whether the MTN medical device firms can establish a harmonious and sustainable business relationship with the host territory by examining the effect of a one-year increase in coordination with employment offices that have ties to local universities (predictor variable X_4). This increases the odds of MTN medical device firms achieving a harmonious and sustainable business relationship with the host territory by 2.13 times.

The effect of two other predictor variables on the odds ratio for a harmonious and sustainable business relationship between the host territory and the MTN medical device firms is also examined; those variables are the number of research initiatives undertaken with local universities since the start of operations (predictor variable X_3), and the number of years participating in job fairs organized by local universities (predictor variable X_1). In the case of the first variable, an increase of one research initiative undertaken with a local university increases the odds of MTN medical device firms establishing a harmonious and sustainable business relationship with the host territory by 1.72 times. In the case of the second variable, an increase of one year of participation in job fairs organized by local universities, increases the odds of MTN medical device firms establishing a harmonious and sustainable business relationship with the host territory by 1.47 times.

Based on the results of the first logistic regression model, it is possible to assert that El Coyol SEZ and its MTN medical device firms, together with local universities, have constructed a 'knowledge' relational network that has driven the development of a spatial geometry based on their "associations and interconnections" (Yeung, p. 46). This relational network contributes to the achievement of a harmonious and sustainable business relationship with the host territory (El Coyol, Alajuela and Costa Rica) through "actor-specific practice" and action (Yeung, p. 44), such as commitment on the part of the MTN medical device firms to collaborate with local universities through internships, relations with employment offices, and, to a lesser extent, research initiatives and job fairs.

In the case of the second logistic regression model, the highest odds ratio is 4.77 (predictor variable X_4)**.** This means that the odds of MTN medical device firms creating knowledge in the host territory as a result of their interaction with local universities, increases by 4.77 times with every one-year increase in coordination with employment offices that have ties to local universities.

The second model also tests whether the MTN medical device firms are motivated to create knowledge in the host territory by analyzing the effect of one additional year of collaboration with local universities through internships (predictor variable X_2). In this regard, a one-year increase in this type of interaction with local universities increases the odds of the firms becoming motivated to create knowledge in the host territory by 3.07 times.

Two other predictor variables are taken into account to determine their effect on the odds ratio of creating knowledge in the host territory as a result of interaction with local universities: the number of years participating in job fairs organized by local universities (predictor variable X_1), and the number of research initiatives undertaken with local universities since the start of operations (predictor variable X_3). For each additional year participating in job fairs organized by local universities, the odds of MTN medical firms becoming motivated to create knowledge in the host territory as a result of interaction with local universities increases by 1.14 times. Conversely, for each additional research initiative undertaken with local universities since the start of operations, the odds of MTN medical firms becoming motivated to create knowledge in the host territory as a result of interaction with local universities decreases by 0.30 times.

Based on the findings yielded by the second logistic regression model, as well as the intellectual contributions provided by Rullani's (Bathelt and Glucker, 2003) cognitive engine, it is possible to assert that, together with the local universities, El Coyol SEZ and its MTN medical device firms have formed a 'knowledge' and 'learning' business cluster that has provided motivation to create knowledge and innovation. This relational network comprises a series of practices and actions that have shaped its institutional framework. As demonstrated by the results of the second regression model, the action-specific practices and actions that have contributed to the creation of knowledge and innovation are the different forms of collaboration between MTN medical producers and local universities, namely through employment offices, internships, and, to a lesser extent, job fairs and research initiatives.

7. Conclusion

El Coyol SEZ in Alajuela, Costa Rica, is contributing significantly to the Costa Rican economy and labor market. It has become an iconic representation of specialized industrial clusters comprising MTN medical device firms in the country. This raises interesting questions which this study has aimed to address, particularly regarding the ways in which a 'knowledge' relational network made up of local universities and MTN medical device firms could be contributing to the establishment of a harmonious and sustainable relationship with the host territory, as well as the ways in which this relational network is contributing to the creation of knowledge and innovation as a result of its interconnections and relationality.

These questions are answered by two binary logistic regression models, which result in two statistically significant models. The first logistic regression model with a binary dependent variable assesses whether the MTN medical device firms have achieved a harmonious and sustainable relationship with the host country. The results allow for concluding that interaction between the medical device firms and local universities via specific actors' actions and practices, such as collaboration through internships and coordination with employment offices, contribute to a greater probability in this regard. This, in turn, undoubtedly contributes to the achievement of outcomes and results on behalf of the host territory.

The second logistic regression model with a binary dependent variable assesses whether MTN medical device firms are motivated to create knowledge and innovation. Based on the results, it is possible to conclude that interaction between the medical device firms and local universities, through coordination with employment offices and collaboration through internships, has served as motivation in this sense.

These results allow for encouraging El Coyol SEZ and other SEZs in Costa Rica to develop 'knowledge' relational networks that can not only foster harmonious and sustainable business relations with organizations and actors in the host territory, but also accelerate the creation of knowledge and innovation. Not only does this yield benefits for specific network actors, but it also enhances the overall development of the host territory.

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THE EFFECTIVENESS OF MONETARY POLICY TRANSFORMATION IN PAKISTAN: EXPLORING MONETARY NEUTRALITY PROPOSITION

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Abstract

This study analyses the effectiveness of monetary policy innovations in Pakistan by price and quantity based monetary anchors. We hypothesize that state bank of Pakistan (SBP) cannot evaluate the unanticipated variations in inflation and output in the same year by applying a recursive limitation on structural vector autoregressive disturbances. The monetary policy is found partial in the short-term and rejects the impartiality condition. Whereas the monetary policy execution on price based tools has a robust effect on inflation and output level by rapid improvement. While transformation by quantity based policy, anchors has a mixed impact on economic activity. The effectiveness of policy innovations inclines more towards price anchors rather than quantity. The restricted SVAR suggest that the choice of policy and non-policy variables are essential for monetary policy operations. SBP policy transformation still has the potential to control economic fluctuations. Hence, we put forward the policy that SBP needs to concentrate on price based instruments for effective implementation and assessment of monetary policy.

Keywords: Monetary Policy Effectiveness South Asia Economic Activity SVAR Pakistan

JEL classification*:* E51; E52; E62; E44

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1. Introduction

This research study is motivated by monetary policy innovations and transmission mechanism adopted by the State Bank of Pakistan (SBP) in the last 28 years to up until now. The outlook of monetary policy effectiveness is very controversial regarding the fulfi**l**lment of anticipated targets in Pakistan Shahid et al. (2016, p.p.1-41). The inclination for selecting the economy of Pakistan is that, similar to developing counterparts, the South Asian countries have also undergone through extensive financial and monetary reforms from way back 1990 to up till now Hanif (2008, p.p.1-26). Notably, the assessment of monetary policy transmission has gained incredible attention and significance after preceding reforms Nawaz and Ahmed (2015, p.p.55-71). Likewise, the reliance of domestic state banks on premier central banks of the globe has considerably enhanced. Differences among economists and monetarists prevail on the impacts of money supply in the short and long-term Munir (2017, p.p.2-3).However, it is evident that prices exclusively deliver the long-run implications of the money supply.Moreover, the short-term effect of monetary drives on nominal factors is quite open to discussion (Walsh, 2010, p.55). The commonly argued controversy is amongst the Keynesians sticky price doctrine, monetarists and new classical dogma where monetary policy considered as a pillar of real economic activities, also the price elasticity of nominal economic fluctuations in which monetary mechanism is worthless for real economic growth. The monetarists and Keynesian mutually concede that monetary policy is neutral in a long period but contradict on the expansion of the short-term impacts on real economic growth Mankiw and Romer (1991, p.p.425-427). The enforcement of monetary policy is facing various problems such as incompetent quantity theory of money (QTM), lack of coordination of monetary and fiscal policy, discretionary monetary policy position adopted by the SBP. Lack of use of policy models (Taylor rule and DSGE) for the reliability of policy execution and outcomes, less responsive policy instruments, and less developed credit markets. Also,the lack of dominance of external capital flow and political influence and government intervention that is affecting the supremacy of SBP. As (Aleem and Lahiani, 2011, p.484) argued that by cause of external constraints, explicitly arising from the union of world financial markets, the state banks of South Asian economies urge to maintain exchange rate fluctuations along with prices and output differences. Munir and Qayyum (2014, p.p.843-864) suggested that comparatively, factor-augmented vector autoregressive (FAVAR) method is favorable to explain the effectiveness of the monetary mechanism and interest rate in Pakistan. All these issues are directly and indirectly influencing the stability of monetary innovations in the economy. In order to assess the real potential of monetary policy in Pakistan. Coherent to research problems, the existing literature on monetary policy stability in Pakistan highlighted similar issues as Omer and Saqib (2009, p.p.1-29**)** QTM is not sufficient to explain inflation. Shahid et al. (2016, p.p.1-41) fiscal coordination is crucial for the productive enforcement and performance of the monetary policy. Munir (2017,p.p.1-21) monetary policy has a differentiated impact on output and substantial influence in the short-term. Mangla and Hyder (2017, p.111) monetary policy remains an efficient instrument for stabilizing prices. The rise in oil prices bring in increasing policy rates, fall in REER (real exchange rate) and economic growth along with increasing inflation rate, Husain and Mahmood(1998, p.1155) reported a unidirectional relationship between money supply and inflation, also favoring monetarist's paradigm about the functions of money. Likewise, Choudri and Malik

(2012, p.p.1-34) exchange rate and credit markets conflicts are crippling the effectiveness of interest rate variations on prices and output by decreasing the efficiency of monetary policy. Malik (2007, p.p.2-29) the trade deficit has a robust impact on the operations of the central bank of Pakistan. Nawaz and Ahmad (2015, p.55) while exercising a discretionary posture the monetary policy is inefficient, partially due to lack of legal sovereignty of the central bank (SBP), (Khan & Ahmed, 2016, p. 161) the South Asian economies are paying more attention to external interest rate and fluctuations in real exchange rate to maintain consistency in monetary environment. The preliminary literature has various justifications from under-developed, and emerging economies attempted to investigate the influence of monetary policy innovations on the macroeconomic stability, i.e. Munir (2017, p.p.1-21); Bernanke et al. (2007, p.869); Berument (2007, p. 411);Yaaba (2012, p. 87). Even so, these studies came up with ambiguous results from rigorous estimation. Therefore, the majority of research regarding the effects of monetary policy changes on inflation and output have different results similarly Clarida and Gertler(1999, p.p.1661-1707) elaborated different aspects of monetary policy effectiveness firstly, the output/inflationary relationship is very responsive to both the level and attributes of constancy in prices. Secondly, reforms in the structure of the open economy give new intuition on the endorsement of alternative monetary policy; thirdly, the crucial point is to comprehend how state banks stabilize interest rate changes. Whereas, Christiano et al. (2004, p.64) in developing countries, the capacity for implementing monetary policy change to bring total economic impacts are vague. Our research study augments the existing literature by applying SVAR (structural vector autoregression technique) to estimate the absolute and nominal impacts of monetary policy changes in Pakistan. We execute the analysis by employing three frequently practiced monetary policy tools in Pakistan, which are broad monetary aggregate represented as (M2), the real effective exchange rate (REER), and minimum rediscount rate (MRR). The absolute economic impacts are estimated by the changes of RGDP (real gross domestic product) although the nominal economic impacts determined by CPI (consumer price index). Instead of all existing issues of monetary policy effectiveness mentioned earlier, we just focused on price and quantity perspectives of monetary operations for the sake of understanding the fundamental problem. Our research study addresses four critical issues. (i) Whether monetary policy in Pakistan pursues the neutrality proposition (ii) If not, what is the most dominant policy tool (iii) what is the velocity of improvement/stabilization after policy changes. (iv)What is the response of variables to short-term and long-term policy shocks?

2. Literature Review

Research conducted in various economies have different outcomes on monetary policy innovations, and effectiveness as Scott and Barari (2017, p.1-12) indicated a deviation in interest rate along with a decrease in housing bubbles. Similarly, Eickmeier et al. (2017, p.p. 12-14) the expansionary monetary policy are utterly inefficient in sustaining economy during higher volatility. As Chuku (2009, p.112) price based nominal variables, i.e. (MRR) minimum rediscount rate and (REER) real effective exchange rate does not have a consequent effect on economic growth, and the monetary policy jolts are the moderate operators of business revolution. Moreover, Boivin and Giannoni (2006, p.445) monetary policy sustained the economy very efficiently by recompensing actively

to inflation prospects in the post era, Carrillo and Elizondo (2015, p.p.1-34) sign constraints yield possible impulse responses, Gregorio(2000, p.p.1-21) the long-term neutrality of money reduces the timely evaluation of money supply components, it is better to target inflation directly instead of concentrating on variability of monetary aggregates, Yaaba (2012, p.87) central bank mostly focus on costs related to volatility of interest rate, Tan (2017, p.p.1-12) monetary policy is effective in economies having extended financial markets, competent banking industry, sound organizational and legal mechanism and overt central banking system, Haug et al. (2018, p.p.1-13) state that the predicted fiscal factors have no consequential influence, (Mahathanaseth & Tauer, 2018, p.p.14-32) bank loan advancing channels are crucial components for the effectiveness of monetary policy, Lombardi et al. (2018, p.61) external factors across the globe have a robust effect on monetary mechanism of emerging economies,(Afrin, 2017, p.60) money supply targeting mechanism is still efficient in controlling prices in underdeveloped economies, bank advancing channels are more effective than the exchange rate in the monetary transformation mechanism.

As Cespedes et al. (2008, p.123) the contractionary monetary policy always decreases the inflation level, Nguyen (2015, p.p.1-4) broad monetary aggregate (M2) has favorable effects on inflation, relatively budget shortage, government spending, and interest rate are the leading indicators of inflation. Pancrazi (2016, p.p.1-35) it is troublesome to maintain and stabilize the consistency of monetary policy in the short time span; the state banks are operating in a risky situation, Severe (2016, p.163) monetary policy easing has a more significant impact on the economic growth along with decreasing banks concentration consequently. Klenow and Malin (2009, p.p.2-59) the lowest interest rate has noticed to be persistent and reliable, Saxegaard (2006, p.1) the excessive liquidity declines the monetary policy execution system and the potential of central banks regulation to control the demand for money in the economy.

3. Theoretical Framework of the study

The hypothetical primary structure for measuring monetary policy impacts is the Keynesian investment-savings (IS) and liquidity money (LM) model overlapped with the Philips curve to estimate inflation. Therefore, the monetary system refers that alterations in monetary policy due to change in the external factors influence the supply of money, which deviate rate of interest to equalize the demand for money with the supply of money. The variations in the rate of interest afterward influence level of consumption and investment, which consequently bring fluctuations in the production and general prices. Current literature on the impacts of monetary policy such as Walsh (1998, p.p. 1-639); Goodfriend and King (1997, p.231) preferring a very comprehensive DSGE (dynamic stochastic general equilibrium model). Moreover, in this study, we followed a simple general equilibrium structure coherent to Clarida (2006, p.p. 1193-1224), however, is distinctive on the ground that we omitted the hypothesis of complete price elasticity and put forward the adhesive prices hypothesis. The empirical estimation starts by completely expressing the economy of Pakistan model, where the model components comprised of i) an affirmation of stakeholders escalating issues ii) a system of monetary non-partiality and iii) a mean of monetary changes transmitting on the country. The aim is to exhibit the SBP objective function in optimizing the value

creation of stakeholders by policy decisions. Instead of screening by the specifications of the mathematical lineage, which are promptly on record, Bernanke and Gertler (1995, p.27); Clarida and Gertler(1999, p.p. 1661-1703); Carlstrom and Fuerst (1998, p.10); Walsh (1998,p.p.1-639) we precisely interpret the specified accumulative relations. We suppose both the absolute and possible output level in natural log (Ln). So the distinction between the absolute and expected level of output is named as output gap, which is equal to x_t. Thus, the model is following

$$x_t = y_t \tag{1}$$

Moreover, let π_t is the inflation rate in time t, and presented as the percentage change in the general prices from t-1 to t and i_t is supposed to be the minimum rate interest. The variation from the long-term tendency represents every variable. Although it is easy to portray the basic model in equation form: similarly investment-savings (IS) concavity that associate output differences negatively to the real interest rate (RIR), Moreover Phillips curve that links inflation favorably to the output differences. Thus:

$$X_t = -\varphi[i_t - E_t\pi_{t+1}] + E_t x_{t+1} + \varepsilon_t \tag{2}$$

$$\pi_t = \theta_{xt} + \beta E_t\pi_{t+1}\mu_t \tag{3}$$

Here E_t is the expectations function, $E_t\pi_{t+1}$ represents future inflation anticipations, $E_t x_{t+1}$ indicate the future possibilities of output differences, $i_t - E_t\pi_{t+1}$ estimate the real interest rate, φ determines the interest flexibility in the investment savings curve and ε_t is an error term. Where equation (2) formulated by log specification of the consumption Euler equation that comes up with domestic rational savings decisions, after employing the equilibrium condition that output = consumption (C)+ government spending's (GS) for the complete mathematical proof view Walsh (1998, p.p. 1-639).

Eq. (2) Contradict with the classical investment savings curve specifically due to the dependency of present output on the actual future output and inflation-adjusted interest rate. The actual increasing output enhances the existing level of output. Therefore, logic is that consumers are adopting mild consumption possibilities of higher consumption in the coming year linked with increasing anticipated output, which induces their level of consumption to increase Clarida (2001, p.315). Therefore, the negative (-ve) indication of the reciprocal of the actual interest rate on the present output represents the unique (intertemporal choice) alternative of consumption. Thus, (-φ) is reciprocal it interprets unmatched flexibility of alternatives. The error term ε_t is the *f* (predicted variations in

the government spending corresponding to anticipated differences in the possible level of production. The shift in ε_t associates to the change in investment savings curve that can be attributed as demand shocks. Same is the case with investments and private consumption. So we formulated Eq. (2) to express the impact tendency of future possibilities in existing economic activity.

$$X_t = E_t \sum_{i=0}^{\infty} \{-\varphi[i_{t+1} - \pi_{t+1+i}] + g_{t+i}\} \tag{4}$$

Eq. 4 indicated that the optimum difference relying on the actual interest and demand shock, and also associated with the possible outcomes of both variables. It furthermore, pursue that the existing and future monetary policy (in this way estimated by variations in the interest ratio) may influence total demand. Moreover, the Phillips curve represented by Eq. (3) is ordinarily a log specified estimate of stable pricing decisions of single companies see Clarida and Gertler (1998, p.p.1033-1067) for derivation. The formulated eq. (3) is similar to the classical expectations-augmented Phillips curve elaborated by Blanchard and Katz (1997, p.51) due to its relationship with inflation, production differences, and anticipated prices. Therefore, it is divergent against the classical condition in that possible inflation, get in additionally as contrary to anticipated real inflation.

$$\pi_t = E_t \sum_{i=0}^{\infty} \beta[\theta x_{t+1} + \mu_{t+i}] \tag{5}$$

With Eq. (5) We examined that contrary to the classical Philips curve; the general price level relies exclusively on the present and future economic prospects relative to slacked possibilities of inflation. The variable take in the changes in marginal costs (MC) with fluctuations in increasing demand level. Comparatively, the extrinsic changes customarily specified as cost-push inflation seizes other factors that can influence anticipated minimal costs. By considering this theoretical roadmap and concentrating at an actual interest rate as the alternative factor of monetary policy, the structure above gives us a logical explanation of the state bank of Pakistan (SBP) inflation targeting mechanism and other execution strategies. Due to clinging prices the changes in the actual interest rate quickly influence the real interest rate that instigates stakeholders to accommodate their anticipations and procedures like that output and inflation controlled in the stated order of investment savings and liquidity money equations. To summarise the overall theoretical conceptualization, we precede here the state bank objective function that transforms the direction of target variables into a progress indicator to support the preference of policy framework and implementation decisions. Corresponding to the existing process, we simulated that the state banks main function is to control inflation and the level of output to balance the gap;

$$\max -\frac{1}{2} E_t \{ \sum_{i=0}^{\infty} \beta[\alpha x_{t+i}^2 + \sum_{t+i}^2 \} \tag{6}$$

The limitation α is an approximate weight attributed to variations in the output. Considering, $x_t=y_t-z_t$, so the objective function considers the possible production level of the country and z_t indicates the desired output and probably express 0 as the expected inflation rate.

4. Sample and Research Methodology

4.1. Research Design

Firstly, we begin by justifying the previous anticipation of our research model. Furthermore, we pursue the rationale undertaken in the Mundell-Fleming-Dornbush method concentrated that expansionary money policy decreases interest rate, shrink the real exchange rate (RER) and enhance inflation, the quantity of money and the ratio of absolute output level in the economy Rafiq and Mallick (2008, p.1756). To analyze the impact of monetary policy shocks in Pakistan, we employ the SVAR (structural vector autoregression) method with repetitive extraneous identifying constraints to fulfill the implicit hypothesis. We adopted the approach introduced by Sims (1980, p.31). Initially, we express reduced form vector auto-regression (VAR) and distinguish monetary policy shocks by the ascription of variables ordering. Mainly, the reduced form of the vector autoregression equation is;

$$y_t = \beta_0 + \beta_1 y_{t-1} + \ldots\ldots + \beta_k y_{t-k} + \mu_o \qquad (7)$$

Where y_t is a vector variable, βo represents constants, β_{t-j} is a matrix of coefficients on the variables lagged *j* periods, μ_o is a represents serially uncorrelated "disturbances" with zero mean and *k* represents some lags.

This condition enforces recursive constraints on the diminished from errors. These constraints assist in distinguishing and explaining the association between differences of the SVAR method and the prior transformations in the money policy indicators. The possibility is when the policy shocks appropriately investigated that the structural vector autoregression could be employed to measure impulse response functions that interpret the time-varying impacts of policy shocks on the non-policy factors. So, this procedure identified as Cholesky Decomposition condition of variables ordering. Explicitly, our condition infers that money policy shocks molded by the prior performance of non-policy variables, which are reacting to variability's in the policy variables with and without lags, the response can be inverse. SVAR method has multiple characteristics such as it give us a base for classifying the association between endogenous and exogenous variables. SVAR incorporates the economic policy with time series estimates to measure the dynamic reaction/ effect of economic variables on different disruptions McCoy and Mcmahon (2001, p.p. 1-32). Therefore, to accomplish the next research objective of our study that is the most effective monetary policy variable. We measure the structural vector autoregressive model comprising three standard indicators of money policy, such as (M_2) broad money supply, (MRR) minimum rediscount rate, (REER) real effective exchange rate and two non-policy measures particularly GDP (gross

domestic product proxy of output) and inflation estimated by using CPI (consumer price index).

The ordering of the variables is an essential component of SVAR analysis. So for the sake of integrated results, we ordered our non-policy variables first and policy variables afterward likewise output level is ordered first backed with the hypothesis that output always accommodates very slowly. This method of ordering variables is an abnormality from the regular placement of variables practiced in the most developed counties where the general price level is considered very slow and thus, included Starr (2005, p.441-461) preferably. However, by changing the direction of variables order in inverse is suitable for the economy of Pakistan. Where prices are elastic, and the output level is inelastic due to stringent methods of production and lack of modern production structure trigger output towards inflexibility. In the light of theoretical rationale of monetary policy, our study pursues Starr (2005, p.p.441-461) and Chuku (2009, p.p.112-129) Variables ordering hence, we order broad monetary aggregate (M2) first, ensured by MRR, and afterward the REER to express Endogeneity in the model. The lag length criteria estimation determines the maximum lag length.

4.2. Sampling and Data collection

We employed quarterly data from 1991(Q1) to 2018(Q4). The selection of 28 years (time span) has two main reasons firstly to spotlight the shift from traditional monetary mechanism to market-oriented policy stance and secondly to concentrate on the advance credit-oriented policy amendments and current situation of monetary policy effectiveness in Pakistan. The secondary data collected from the State Bank of Pakistan (SBP) economic data repository, published quarterly/ yearly statistical bulletins, and annual reports of SBP.

5. Empirical Results and Discussion

5.1. Preliminary Diagnostics

The primary objective/condition for employing the unrestricted VAR model is to ensure the stationary of all variables at the first difference (the variables need to be stationary 1(1)). As Canova and Pappa(2007, p.p.713-737) VAR is appropriate to apply if the variables are non-stationary. Similarly, Sims et al. (1990, p.p. 113-144) consistent variable estimates are obtained even if the unit roots are present in the variables. We employed the Augmented Dickey-Fuller (ADF) unit root test; all variables are stationary at first difference. Following Sims (1992, p.p. 975-1000) unit root test for all variables is a pre-requisite. For the sake of validity standard assumptions for asymptotic analysis, we used the remaining three unit root test, i.e., Phillips-Perron, Kwiatkowski-Phillips-Schmidt-Shin and Ng-Perron approach to testing the stationarity of the data. The estimated variables meet the assumption of stationarity at first-difference, and there is no unit root in the time series data shown in

Table.1 Results of Unit-root tests

_____Table_1_____
_____

	ADF		PP		
Variables	Level	1st diff	Level	1st diff	Remarks
CPI	-1.89	(-3.07)***	-1.37	(-5.15)*	1(1)
M2	1.05	(1.86)**	-1.74	(9.54)*	1(1)
RGDP	0.06	(4.04)*	0.97	(-5.28)*	1(1)
REER	(-2.82)**	(-8.58)*	(-4.13)*	(-11.98)*	1(0), 1(1)
MRR	-2.36	(0.44)*	0.47	(-14.58)*	1(1)

Note: ***,**,* indicates that the variables are significant at 1%, 5% and10%

5.2. Estimated Impacts of Monetary Policy Transformation / Shocks on Output and Inflation

The transformation in monetary policy has a significant influence on prices and production level. We measured the impacts of changes in monetary policy indicators on inflation and the level of output. The coefficients of our estimated model are in large quantity (55) and not smoothly intended to explain. Thus, we started our model interpretation by mainly concentrating on the impulse response functions induced from the recursive orthogonal structural vector autoregressive regression approximated residuals. Therefore, the impulse responses represent the direction of inflation and level of output during shift/changes in the individual policy determinants (variables).

The estimated impulse responses are shown in Figure 1a, divided into 5 sections by variables responses towards policy shocks in different years. Every section represents the reaction of the non-policy variables to one standard deviation change (equivalent to the favorable policy innovation). Moreover, the value 0 indicates that the monetary policy has no impact on the non-policy variables, and the respective variable is going in the interchangeable direction without having any policy effect. The +ve (positive) and –ve (negative) values represent the up and downward fluctuations in the variable from its direction due to changing impacts of the policy. The simple lines exhibit the anticipated effects, whereas the dotted lines represent the limits of a 95 percent confidence interval (CI). Section 1.1 of Figure 1 depicts the reaction of output (RGDP) to an extended shock in output level in the first five years. Although the output level increased quickly and efficiently in the five quarters, further decreased in the remaining quarters and hence unable tostabilize again to its previous position.

Moreover, the time divergences are shocking/alarming, specifically while we concentrate on the inelastic behavior of the production methods employed in the country. Generally, economic stakeholders are anticipated to accommodate their consumption and investment behavior smoothly and slowly corresponding to the increasing supply of money instead of quick response. Furthermore, the immediate reaction cannot influence and represent the regular additional improvements in the monetary policy transformations, although it estimates the simultaneity of sufficient alterations in production in the next year of monetary policy changes. These outcomes are coherent to Kahn et al. (2002, p.1493-1519).

Notably, section 1.2 of Figure 1 exhibits the response of RGDP to a contractionary shock in the output measured by CPI (consumer price index). In the first five quarters, the output level was constant after that the output level started decreasing and stabilizing again. The overall position of the output level is not stable and below the natural direction due to a change in the prices. Where (.00) indicates that the monetary policy changes have no significant impact on the output and prices here. Section 1.3 of Figure 1 represents the response of output to an increasing shock in the output level measured by M2. In the first four quarters, the output is increasing steadily, relatively from 4-6 quarter the output level remained stable (same direction), afterward due to change in policy it is decreasing slightly and regaining its stability in response to money supply changes. Thus, here the output is influenced by positive policy shocks. Section 1.4 of Figure 1 indicates the mixed reaction of output measured by the minimum rediscount rate (MRR). In the first 8 quarters, the level of output is increasing in response to changes in the MRR; afterward, the output is showing mixed behavior (decreasing and again stabilizing). Hence, the policy change has a significant effect on the output level here. Same is the case with section 1.5 of Fig.1 the response of output estimated by REER is increasing in the first quarter and then stabilized without any effects of policy innovations. Section 2 represents the responses of inflation (CPI) to output (policy variables). Here, Section 2.1 exhibits the response of inflation to output level without having any policy shocks. The variable is going in a similar direction on its natural path. The monetary policy shocks have no significant impact on the prices and output change here. Section 2.2 indicates the response of CPI to an expansionary shock measured by CPI. In the first 5 quarters, the prices are increasing in response to a policy change, and afterward, the variable is going down and exhibit unstable behavior.

Whereas, section 2.3 depicts the reaction of CPI to M2 smoothly. The prices are below the natural path and indicating a mixed response in the initial four quarters and preceding quarters. In the initial 2 quarters, the prices are increasing then decreasing slowly and then again in the same direction quite smoothly, later due to policy shocks the prices started rising at a slow pace and touching the natural path. It indicates that the monetary policy has a significant impact on normalizing price level to their original direction by changing the money supply. Likewise, Section 2.4 shows the responses of CPI to a smooth shock of MRR. The solid line exhibits an increasing trend till 6 quarter and then showing smooth behavior, which means that the variable is going in the same direction even after policy transformation in the preceding quarters.

Similarly, in section 2.5, the response of CPI to a contractionary shock measured by REER indicates a decline in the prices until 7 quarters. Then in the next quarter, the prices are showing stable and increasing behavior until quarter 10. It exhibits that the innovation in the monetary policy by REER has a significant effect in triggering the price divergence from below the natural path. Furthermore, section 3.1 of the Figure. 1a depicts the expansionary shock in M2 broad money supply measured by output level. In the first 6 quarters, the money supply is increasing and stable as compared to the remaining 4 quarters; the money supply is below the natural path due to a shift in the monetary policy innovations; the value -1 express adverse effect of monetary policy changes in the output level. Section 3.2 exhibits the responses of M2 to below the track and smooth flow measured by prices (CPI). Here the policy shocks have no significant effect on the money supply. Whereas, section 3.3 portrays the responses of M2 to an expansionary shock estimated by itself. The reaction of the money supply to change in M2 is favorable and increased from the first to last quarter, which indicates a significant effect of policy innovations. Section 3.4 represents the responses of policy variable to the policy variable. The response of M2 to contractionary shocks measured by MRR. Policy innovations have a negative impact on the money supply and MRR changes. Similarly, section 3.5 is showing the same effects of policy shocks on the responses of M2 measured by REER.

Furthermore, section 4.1 of the Figure. 1 exhibits responses of MRR to an expansionary shock measured by output. In the first quarter, the MRR was below the natural path; thus, after policy shocks, the policy variables are increasing and showing a rapid change. A positive shock in the MRR (such as an increase in the rate) enhances real output from the third quarter to the last quarter; it is increasing continuously. Moreover, it indicates that policy innovations have a significant impact on the policy variable. Whereas, section 4.2 of Figure. 1a represents the responses of MRR to CPI, which indicates that the CPI shocks have no significant effects on the prices and discount rate flow. The variables are going in the same direction. Section 4.3 depicts the responses of MRR to an increasing shock measured by M2. Hence, the variables are going in the same direction in the initial quarters. Moreover, section 4.4 shows the responses of MRR to an expansionary shock measured by MRR, which indicates that a definite shift in the minimum rate of return helps the discount rate to increase and stabilize the imbalances in response to policy innovations. Section 4.5 represents the reaction of MRR to rising shocks measured by REER. It shows that an increase in the real effective exchange rate directly passes to the continuous rise in the MRR.

Section 5.1 in Figure.1a portrays the responses of REER to an increasing shock estimated by output. Every increase in output level directly leads to a constant rise in REER. The change in the policy has significant effects on the policy and non-policy variables. Likewise, section 5.2 of Figure.1a represent responses of REER to inverse shock measured by CPI. It indicates that the policy shock does not affect the variable. The variable is going below its natural direction. The prices do not affect the real exchange rate. Section 5.3 portrays the responses of REER to an improved policy shock measured by M2. Here relative to the previous 4 quarters, the impact of policy innovations are showing remarkable effects. Any variation in broad money supply directly linked to a slow and steady change in the real exchange rate. Furthermore, section 5.4 represents the responses of REER to a contractionary shock measured by MRR. An increase in REER directly associated with a gradual and smooth increase in MRR.

Section 5.5 in Figure.1a shows the responses of REER to expansionary shocks measured by REER. The reaction of REER to REER is at the peak to 6 quarters, and afterward, the policy innovations are showing a moderate decline in the real exchange rate. For individual responses of output and inflation to monetary policy innovations (see Figure. 1b for different responses of variables to changes in the monetary policy). Moreover, see Figure2 and 3 for the graphical representation of variance decomposition and historical decomposition of all policy and non-policy variables.

Comparing our results, we find that they are not consistent with the findings of prior literature, which indicated a decline in the practical effectiveness of monetary policy, loopholes in its implementation mechanism, lack of standard models and rational selection of policy tools in developing economies. Although they estimated the effectiveness of policy for a specific period, it is not clear whether the estimated innovations are temporary or permanent nature. Therefore, the divergence of results takes place due to the selection of variables and policy instruments. If we use different variables, whether they are quantity money based or price based, the outcomes will be different. Somehow the choice of estimation model, recursive assumptions and methods also differentiate the results. Thus, the differences in sample selection, time, and target economy might drive the differences in the findings. Our study outcomes reveal different effects of monetary policy innovations on output and prices in Pakistan. On one side, that price based policy anchors have a significant impact on inflation and output level, and on the other hand, the quantity-based tools are not showing any stable change. Moreover, the policy is partial in both long and short-run.

The literature from developed economies portrays stable and effective monetary policies due to secure enforcement of laws. The scenario of underdeveloped economies like Pakistan is different from developed economies. Although, the growth of developed economies has considerable influence on the domestic and external economic cycle of underdeveloped countries. Any shock in the international money market triggers the local markets towards monetary trap. Notably, the economy of Pakistan needs more economic and financial stabilization to cope with the imbalances of fiscal and monetary distress. However, few studies justified the effectiveness of monetary policy by emphasizing the Taylor rule and DSGE models. In the case of less-developed economies, if we use all objectives of monetary policy in the Taylor rule, the outcomes will be ambiguous. The Taylor rule is valid only if we measure policy effectiveness by

focusing on a few nominal instruments of monetary policy. Whereas, the DSGE model can take into account all tools of policy stabilization to measure the effectiveness, but the credit markets of Pakistan are less developed, and the international capital flows are less dominant in the foreign exchange market.

6. Conclusion and policy implications

We used the SVAR method to analyze policy effectiveness under applied restrictions. Therefore, we assumed in the model that the state bank (SBP) could not evaluate the unpredictable variations in inflation and output during the policy year. The supposition applied recursive limitation on the outliers of structural vector-auto regression and enabled us to measure impulse responses that indicate the influence of monetary policy transformations on the general price level and output. However, our findings reveal that monetary policy changes have a significant impact on inflation and output level linked to the chosen variables for the measurement. The research outcomes revealed that by price indicators, i.e., MRR and REER has a significant impact on the real economic growth (RGDP)/ level of output.

Comparatively, the transformations in the "quantity supply measures" such as broad monetary aggregate (M2) influences the output level (RGDP) positively. An increase in the money supply have favorable effects on the output level and shows a slight decrease in the output after an extended period. It indicates that monetary innovations are significant operators of economic expansion and contraction in the economy of Pakistan. Secondly, the policy variables have a more substantial influence on the non-policy variables. The most influential policy variable is REER, and the least instrumental variable is MRR. Thirdly, the policy changes in the money supply (M2) has a mixed effect on the real economic activity in Pakistan. Fourthly, the monetary policy has the potential to control inflation and sustain the output level in the country. Therefore, the stabilization and efficacy of monetary policy also depend on the other domestic and external macroeconomic factors which needs to consider while measuring the effectiveness of monetary policy in Pakistan. All these factors are playing a crucial role in the effectiveness of the monetary policy. The research study has following contributions; firstly we employed a unique study approach by a combination of Keynesian IS-LM perspectives of monetary policy measurement with our hypothetical restriction and assessed effects of monetary innovations on output and inflation in Pakistan. Secondly, our study is portraying the differentiated reaction of both price and quantity money based anchors. Thirdly, our findings reject the so-called perception of monetary policy failure in Pakistan by characterizing a new justification for the effectiveness of price based anchors in the monetary transmission mechanism.

We put forward the following policy implications, which will support the SBP and policymakers to enhance the effectiveness of monetary policy in Pakistan. Our study will provide new indication to central bank of Pakistan to concentrate on the price based anchors (MRR, REER, interest rate, and deposit rates, loan advancing by banks, sale and purchase of securities, public debts, and private debts) for effective implementation of monetary policy, price stabilization and sustain economic growth in the country. Therefore, the SBP should concentrate less on the quantity based tools of monetary policy to control inflation in the economy. The quantity-based monetary policy tools are

prolonged and have intangible impacts on economic activity and unable to achieve the anticipated short-term monetary policy targets. Contrary to this, the SBP can also emphasize to select the combination of most influential variables from both price and quantity money perspectives. The ignorance of essential variables may change policy outcomes. Our study will be more helpful in policy reconsideration and provide indicative guidance to policymakers. Future research can be directed to assess the effects of fiscal policy instruments on monetary policy effectiveness and the economic factors affecting monetary policy transformation in the country.

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APPENDIX. A

Figure. 1a Response of output and inflation to MP

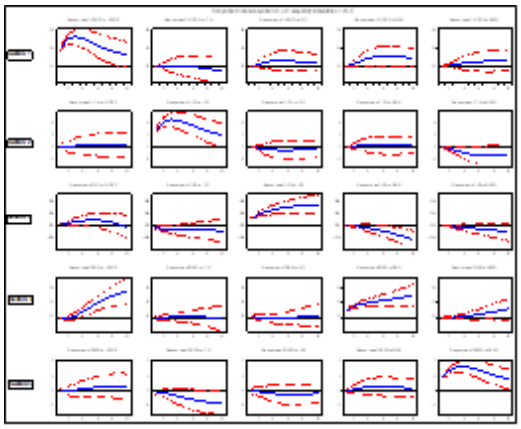

Figure. 1b Response of output and inflation to MP

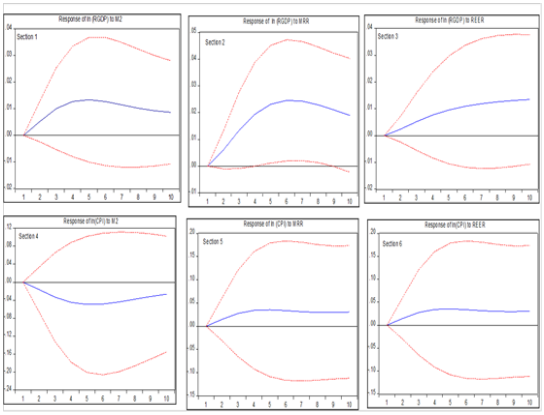

Figure.2 Estimated Structural Decomposition

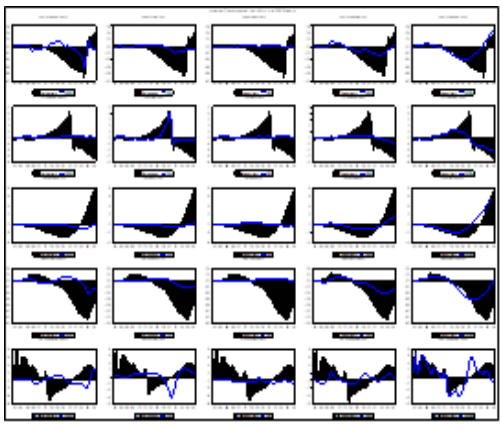

Figure.3 Estimated Historical Decomposition

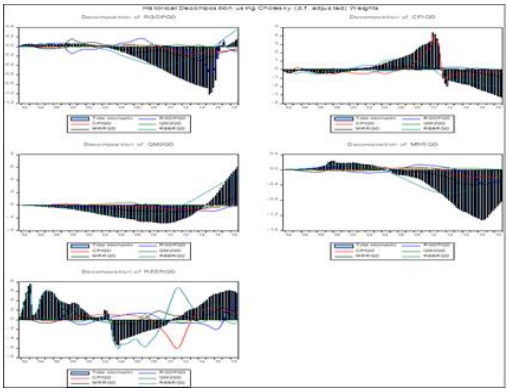

Table. 2 Definition of variables	
Variables	**Definition**
RGDP (Output)	The proxy variable used for real economic activity
CPI	Represents nominal price changes
M2	Proxy for the measurement of monetary policy in quantitative terms.
MRR	Minimum Rediscount Rate used as a proxy for the prices based monetary policy.
REER	The real effective exchange rate used as a proxy variable for a price based monetary policy.
Note: The variables RGDP, CPI, and M2 included in the model in their natural logs (ln).	