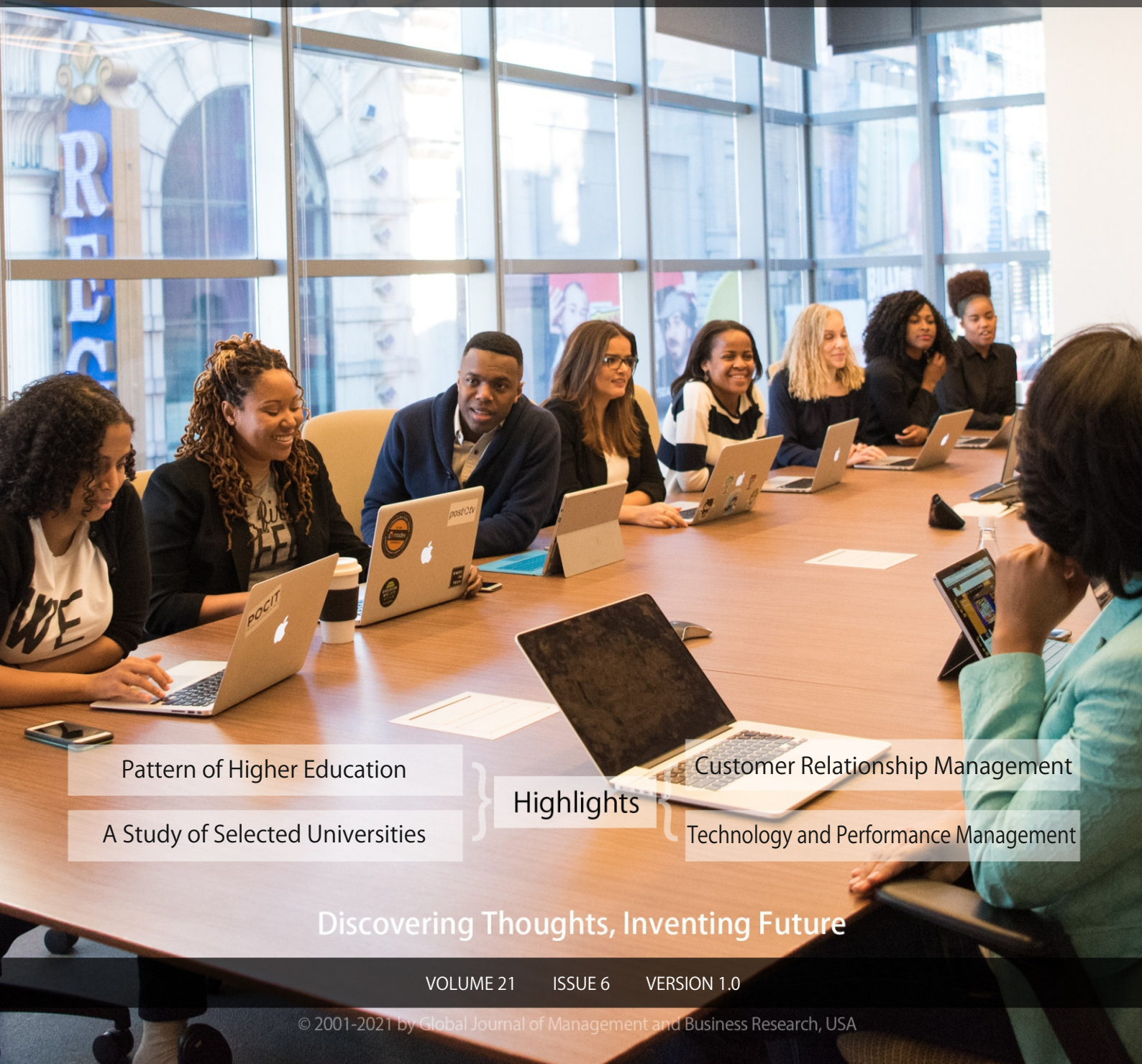


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How Does Diabetes Influence the Impact of Aging on the Probability of Employment?

By David Bernstein

Abstract- Objective: The purpose of this study is to evaluate how diabetes and complications from diabetes impact the relationship between age and attachment to the workforce for people nearing retirement age.

Research Design and Methods: The study uses data from the 2015 Medical Expenditures Panel Survey to examine how the relationship between age and attachment to the workforce differs across three health groups – (1) people without diabetes, (2) diabetics with no diabetic complications, and (3) diabetics with complications impacting either eyes or kidneys. The sample covers 3314 people between the age of 58 and 66. The dependent variable in the logistical regression models is whether a person was currently employed or attached to an employer during the survey period. The coefficients of the logistical regression models are used to obtain employment probabilities for a specific worker at ages ranging between the age of 58 and 66. These probability estimates allow us to examine how the impact of aging on employment probability is affected by diabetes and complications from diabetes.

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Results: The basic logistical regression model, estimated over the entire sample, reveals that diabetes and complications from diabetes lead to a substantial reduction in the likelihood a person nearing retirement age remains employed. Separate logistical regression models reveal people without diabetes are better able to remain in the workforce until they become eligible for Social Security at age 62 and to remain in workforce additional years to increase their monthly Social Security benefit. The tendency to exit the workforce early is especially pronounced for diabetics with complications. The employment probabilities for a white college educated male at age 58-59 are 83.6 % for the non-diabetic, 76.4 % for the diabetic with no complications, and 32.3 % for the diabetic with complications. Employment probabilities at age 65-66 for the college educated white male are 57.0 % for non-diabetics, 40.1 % for diabetics without complications, and 11.5 % for diabetics with complications.

Conclusions: Differences in how health conditions affect the impact of age on employment probability have important implications for the adequacy of retirement income and proposals to modify Social Security. Relatively few people who leave the workforce early delay claiming Social Security to increase retirement income. Any increase in the age of eligibility for Social Security benefits would have harmful financial impacts on diabetics who already have a greater tendency to leave the workforce prior to age 62. Medical expenditures that cure diabetes or reduce diabetes related complications would allow people to stay in the workforce longer and this expansion in workforce participation would stimulate economic growth. Perhaps proposals to expand spending for improvements in health care outcomes should be evaluated based on dynamic scoring techniques to account

for higher economic growth attributable to expanded workforce participation.

I. INTRODUCTION

Previous research indicates diabetes has a statistically significant impact on employment or other work related productivity measures (1-6). Diabetes is not the only disease associated with lower employment levels. A recent blog post presented preliminary results indicated several diseases (diabetes, complications from diabetes, complications for diabetes, stroke, arthritis, asthma coronary heart disease, emphysema and cancer) reduced the likelihood a person nearing retirement age would remain employed.

Previous research has not examined how diabetes affects the impact of age on employment probability. The exact age at which a person leaves the workforce has a large impact on household financial security, retirement income workforce participation and the Social Security system.

The financial incentives from Social Security on employment and on the decision of when to claim Social Security benefits are complex. The maximum Social Security benefit can only be received by workers with an income history of 35 years. 62 is the earliest age where workers can claim Social Security retirement benefits but some workers may be eligible for a disability benefit prior to age 62. The full Social Security retirement benefit for workers born between the years of 1943 and 1954 is 66 and workers who delay their retirement until 70 will further increase their retirement benefits.

Studies typically find that most people do not delay claiming Social Security after leaving work. One highly influential study found that around 10 percent of men who retired before their 62nd birthday delayed claiming Social Security (7).

The relatively small percentage of people who are can delay claiming Social Security benefits after leaving the workforce suggests that the ability of people to remain in the workforce may be the most important determinant of financial security during retirement. Furthermore, incentives designed to persuade people to work longer may be ineffective if a person is in poor health. The empirical work presented here attempts to provide insight on how diabetes and complications from diabetes impacts attachment to the workforce as people age.

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II. RESEARCH DESIGN AND METHODS

The study employs data from the 2015 Medical Expenditures Panel Survey (MEPS). The MEPS survey contains detailed information on a wide variety of health topics including insurance, expenditures, and diseases of respondents. Data from the survey can be used to obtain estimates of national totals and averages. The data can also be used to estimate relationships between economic variables and health variables.

The survey contains information on respondent employment status, whether the respondent has been diagnosed as having diabetes, whether diabetes has impacted eyes or kidneys, the respondent's age and respondent's education level.

The information on employment was obtained from questions EMPST53. The dependent variable was set to 1 if the person responded she was employed at the time (option 1), had a job to return to during the round (option 2), or had a job at some point during the round. This employment measure does not correspond to the concept of workforce participation used by labor economists. People who are unemployed but actively looking for a position are considered workforce participants.

The key health related variables used in this study were obtained from variables DIABDX, DSKIDN53, and DSEYPR53. DIABDX asks whether a person has been diagnosed as a diabetic. DSKIDN53 provides information about whether diabetes has ever caused kidney problems. DSEYPR53 provides information on whether diabetes has ever caused eye problems. The complications from diabetes variable used in this study is defined as having either kidney problems or eye problems caused by diabetes.

The MEPS database had a variable SEX used to create a dummy variable set to 1 if the respondent was male. The dummy variables *ba_deg* (has a BA degree or higher) and *no_college* (has not attended college) were created from responses to question EDUYRDG.

The first model considered in this paper involves using the entire sample to estimate the impact of diabetes and complications from diabetes on employment probability. This approach implicitly assumes that the impact of aging on employment probability does not depend on whether the respondent has or does not have diabetes or diabetic related complications.

The second model considered in this paper involves the estimation of logistical regression models for three samples – (1) people without diabetes, (2) people with diabetes but no complications, and (3) people with diabetic related complications. This approach allows us to contain separate estimates of the impact of age on employment probabilities for the three groups.

The regression coefficients obtained from logistical regression models can be used to examine the employment probability of an individual with specific characteristics at different age levels. These probability estimates are generated by the following formula.

$$P = \text{Exp}(XB) / (1 + \text{Exp}(XB))$$

In this formula X is the vector of variable values and B is the vector of coefficients.

This formula was used to estimate the employment probability for a specific individual (a white male with a college degree) at the five age groups (58-59, 60-61, 62, 63-64 65-66). These estimates provide insight on when people with and without diabetes with and without complications from diabetes tend to leave the workforce.

In this model, employment probability estimates for females and people with educational background different than college educated would simply be a shifted version of the results for males with a college degree. The model specification used here does not allow for the impact of age on employment to vary with gender or sex. The parsimonious model was selected due to the limited sample size in the MEPS database.

There is always room for additional sensitivity analysis of the model to alternative specification. Am happy to look at specific suggestions from reviewers.

III. RESULTS

Most of the previous research motivating this paper involved an examination of how a disease impacted employment variables over a sample covering people in an age range.

The results of this approach for a model on how diabetes and diabetes related complications impacted employment based on people between the age of 58 and 66 from the MEPS database is presented below.

The coefficient of the full-sample employment logit regression model reveal that both diabetes and complications from diabetes significantly decrease the likelihood that a person is employed. This is consistent with other literature on the relationship between disease and employment.

The reported coefficients on the age variables are reflective of the difference in employment at specified age and the base group, which is people who are 62 years old. The age coefficients for the model estimated with the full sample, people with and without diabetes, reveals that increases in age are generally but not always related to a decreased likelihood of being employed.

- At age 58-59 the employment probability is significantly higher than at age 62.
- At age 60-61 the difference in employment probabilities is not significant if one employs a one-tailed test with alpha equal to 0.05.

- At age 63-64 the difference between employment probability at age 62 is not significant with a one tailed test at alpha equal to 0.05.
- At age 65-66 the employment probability is significantly lower than at age 62.

The impact of age on the employment probability may differ for people with diabetes and for people without diabetes. Similarly, the impact of age on employment may differ between diabetics with no complications and diabetics with complications. This issue can be considered by comparing logistical regression models for the three groups. The results from the three logistical regressions are presented below.

The results presented here indicate that the impact of aging on employment probability differs sharply for the three groups of people.

The age 589 coefficient is a measure of differences between employment probability at age 58-59 and age 62. It is positive and significantly different from zero for people without diabetes but insignificantly different from zero for both diabetics with no complications and for diabetics with complications. The lesson here is that diabetics with or without complications tend to leave the workforce early, often before they are eligible for any retirement Social Security benefits.

The age6566 coefficient is a measure of differences between employment probability at age 65-66 and age 62. The point estimates are negative for all three groups. The difference is significant for people without diabetes and for diabetics without complications. The difference is not significant for people with diabetic related complications.

Aging is not a statistically significant explainer of the employment probability for diabetics with complications. None of the coefficients for the age variables are statistically different from zero (at alpha equal to zero) for the sample of 145 individuals with complications related to diabetes. This occurs partially because the smaller sample size reduces the power of the statistical tests and possible because the employment probability is already lower at an earlier age.

Economists and health professionals could also benefit from information on the magnitude of differences in employment probabilities at different ages for different health profiles.

Separate employment probability estimates are presented for a male with a college degree for the three health condition groups.

Results for a college-educated male. Estimates for females and people with different education backgrounds would be a shifted version of this chart.

The estimates reveal that employment probability at age 58-59 is 7 percentage points higher

for people without diabetes compared to people with diabetes and no complications. The employment probability gap between people without diabetes and people with diabetic related complications is over 51 percentage point at age 58-59.

The decrease in employment probability from age 58-59 to age 62 is 11.6% for people without diabetes, 6.2 percent for diabetics with no complications, and -0.9% for diabetics with complications. The lower decrease in employment probability for the two diabetic categories stems from the fact that many diabetics had already left the workforce at age 58-59.

The estimated employment probabilities at age 65-66 is 17 percentage points higher for people with no diabetes and diabetics with no complications. The employment probability gap between diabetics with no complications and diabetics with complications at age 65-66 is around 29 percentage points. Only 11.5% of diabetics with complications are employed at age 65-66.

The decrease in employment probability from age 62 to 65-66 is 22.9% for non-diabetics, 44.0% for diabetics with no complications, and -64.0 percent for diabetics with complications.

The examination of magnitudes in the shift of employment probability variable is especially important to better understand the diabetes with complications group. The age variables are not statistically significant. However, the age 65-66 employment probability is only 11.5 percent, very low compared to other groups at this age.

IV. CONCLUSIONS

Diabetes substantially reduces the ability of people to stay in the workforce as they age. The impacts of aging on employment are especially large for diabetics with complications impacting eyes or kidneys. A substantial number of diabetics especially those with complications leave the workforce before becoming eligible for Social Security Retirement benefits. Diabetics especially those with complications appear unable to prolong employment to increase their Social Security benefit.

Diabetes is not the only disease impacting the relationship between age and employment. A recent blog post using the same database employed in this paper found that a 10-factor disease index also affects the impact of aging on employment probability (7).

Many financial economists are fearful that improvements in health which increase life expectancy could worsen the finances of the Social Security system. The results presented here indicate that improved health could increase workforce participation and spur economic growth.

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The Impact of COVID-19 on the Pattern of Higher Education in Bangladesh: A Study of Selected Universities to Puzzle out the Challenges

By Md. Hasan Mia

University of Dhaka

Abstract- The COVID-19 has a drastic effect on every sphere of life. The main purpose of this paper is to analyze the impact of COVID-19 on the pattern of higher education in Bangladesh. The study tried to identify the prospects and challenges, scrutinize the impact on higher education, and sort out the digital solutions to overcome the challenges of virtual transition of the higher education system in Bangladesh based on the D& M model. In this mixed research approach, the data has been collected from WHO; UNESCO; IDCR, & 152 students of both the private and public universities of Bangladesh. The study revealed the most popular online platform, student readiness and access, problem & challenges, etc.; descriptive analysis has been conducted to compare the mean; a pair simple statistics to analyses the pre and post COVID situation in case of cyber security; to correlate the independent variables to the dependent variables and test the hypothesis a pears on correlation and simple linear regression has been conducted.

Keywords: COVID-19, pandemic, higher education, elearning, digitalization, bangladesh.

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Md. Hasan Mia

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Keywords: COVID-19, pandemic, higher education, e-learning, digitalization, bangladesh.

I. INTRODUCTION

The worldwide spreads of the Coronavirus have a tremendous impact on different sectors, including education, economic, political, and social life. All types of educational institutions, classes, and examinations remained closed and academic functions is suspended since March 17, 2020, in Bangladesh (Dutta, & Smita, 2020; Alam, 2020; Ramachandran, 2020). Still, this pandemic is on the geometric increase. COVID-19 posed challenges to Bangladesh as being an under developing country with inadequate infrastructure, funding, availing network, devices, and technical support, students' participation, hygiene, and safety measurement, training, and orientation conducting an examination, providing facilities and support, providing an atmosphere of teaching and learning ahead of all obstacles (Alamgir, 2020; Kandri, 2020; Christie, 2020). Since this pandemic seems not to be in control

overnights, we must find out alternatives to mitigate the losses.

The impact of COVID-19 refers to the positive and negative consequences in social, economic, health, education, etc. The worldwide spread of the Coronavirus is a threat to development, posing physical and psychological stress, especially to students pursuing higher education (Jayasree et al., 2020; Islam, 2020; S. Anwar, 2020). Undoubtedly, the entire education system has been collapsed by COVID-19. There are 155 private and public universities, and under these universities, there are 117 medical and dental colleges, according to a recent report of the University Grants Commission (UGC) and Bangladesh Medical Dental Council (BMDC). Due to closure, students are away from the regular curriculum, depending on a single device for online classes (UGC, 2020). The study intended to explore and address the factors, barriers, and challenges to capitalize on the benefits and ensure a proper transition of our traditional education system to virtual platforms and digitalization.

a) Research Objectives

The primary objective of the study is to assess the impact of COVID-19 on the pattern of higher education in Bangladesh. The specific objectives are to explore the factors that emerged in the new normal period for the COVID-19 pandemic in the pattern of higher education; to assess the level of impact (positive, negative, or neutral) of each factor on the pattern of higher education in Bangladesh; to figure out the challenges imposed by COVID-19 in the new normal era; to address the ways to puzzle out the challenges associated with COVID-19.

II. REVIEW OF RELATED LITERATURE

Researchers and academia proposed covid-19 has prolonged effects on the education system in Bangladesh, which may take several years to turn back the normal situation and start all academic activities in full swing after this new normal period (Uddin, 2020).

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a) *The COVID-19 & New Normal Period*

The first confirmed cases for Coronavirus (nCoV-2) were addressed in Wuhan, China, on 31st December 2019, and then it out-break throughout the world overnight (Kluge, 2020; Christie, 2020). Disease-associated this virus termed Corona Virus disease 2019 (COVID-19). WHO declared it as pandemic on 11 March 2020, and Bangladesh enter this new normal life with the identification of the first patient on 8 March 2020 (WHO, 2020; S. Anwar, 2020; Chaplin, 2020; Durrani, 2020).

A recent study addressed geometrical spreads have caused millions of affected, thousands of death with a negative consequence in every sphere of life such as social, economic, production, education, physical and psychological health, etc. (Li, 2020; Schaller et al., 2015). For the term impact, we refer to positive and negative effects, barriers, radical changes, obstacles, challenges, and limitations in higher education (Khan & Khan, 2019; Mohamed et al., 2020). *Global impact survey* found that only 1% functional institution has no special measures; 10% educational institutions are open with measures to avoid COVID-19; 30% institutions partially open; 59% remain completely closed. It seems COVID-19 is undergoing in second phases and prolong with more challenges and negative consequences (Nataliia & Anastasiia, 2020).

b) *The COVID-19 & Education Downturn in Bangladesh*

The first case of COVID-19 was reported on 1st December 2019 and hospital intake on 16th December of the same year at Wuhan, China (Huang et al., 2020). *Guarner et al. (2020)* argued that COVID-19 has only a 2% mortality rate compares to SARS (9.5%) & MERS (35%) pandemic. According to a report of the *World Bank (2020)*, about 150 countries declared closure and lockdown in mid-march 2020. To stop the radical outbreak, the lockdown was proclaimed to all types of activities, including closure to educational institutions across the world. Schools, colleges, and universities are kept close to reduce contact and save lives. In the first month, COVID-19 affected 370 million learners of 195 countries for hunger, nutritional deficiencies (UNESCO, 2020; Kluge, 2020; Redden, 2020). But long prevail and spread of the coronavirus and geometric increase deaths of people including the USA, UK, Brazil, Spain, Italy, India, and Bangladesh forced the policymaker to sort out the activity other than conventional way (Viscusi, 2020; Durrani, 2020). A published report of UNESCO found that all levels of education, teaching, learning, and training have been affected by COVID-19. More than 1.6 billion learners of 190 countries are directly affected by 40 million pre-school children at this disruption (UNESCO, 2020; Chaplin, 2020). More than 23.8 million students at pre-school to tertiary level may drop out at this prolonged pandemic. About 90% of institution faces financial & infrastructural challenges (Islam, 2020). Hence, digital platforms and online classes bridge a

lifeline in students' engagement, teaching, and learning solutions but unfortunately covers less than 2% of the 2.2 trillion higher education market. From a traditional point of view, online education is viewed as ineffective and a threat to learning (Kandri, 2020).

Another report by WHO (2020) found that about 1.3 billion learners are not able to attend schools, colleges, and universities, whereas 63 million teachers of 165 countries are directly affected by this pandemic (Amit et al., 2020). Expert and researcher speculate that the influence continues at the post-COVID-19 period in education and other sectors due to the community transmission of such pandemic (Preiser et al., 2020). To cope with such radical changes, the pattern of education is also required to reform with the help of emerging technology and resources available (Azorin, 2020). However, Joyce et al. (2020) argued that there are four reasons why information network and online education system necessary to enact meaningful changes right now, such as the physical appearance of classes is not feasible, self-isolation and quarantine to reduce the rate of transmission is required, necessary initiatives need to be taken to mitigate the losses in education, and to foster digitalization and technological advancement in all spheres.

c) *Education Transformation & Responses of Bangladesh to COVID-19*

All the countries across the world kept no stone unturned for adequate measures to prevent the spread of the coronavirus; Bangladesh is also following the same trend (Saeed et al., 2020; O'Neill et al., 2018). After confirmation first case on 8th March 2020, she started to take several measures such as lockdown, closure of the school, college, and universities, testing facilities, home quarantine and isolation facilities, raising awareness in all forms of media, availing amenities like a mask, gloves, personal protection equipment (PPE), hand-washing, postponed the Sheikh Mujib 100th birth anniversary celebration, banned all social, cultural, political gatherings, etc. (Saeed et al., 2020). But experts speculate that the coronavirus may spread the country quite earlier.

On 15th March 2020, Bangladesh banned all international flights. In the next 55 days, about 661 people entered the country from abroad, and the Institute of Epidemiology, Disease Control and Research (ICR) claimed every passenger to prevent and be continued until the pandemic is under control though a shortage of testing kits to control the spread (Harris, 2020; Chowdhury et al., 2020). Universities' academic activities are transforming and arranging camps, graduation ceremonies, meetings, and ancillary activities online. Different initiative have been taken to support the teacher and students. Already financial package is declared to support impoverished students until the pandemic is under control (Alamgir, 2020). The

government also started online classes, take-home assignments, and examinations to tackle the loss of the academic year and overcome the session gap. Besides, financial compensation to reduce disparity and availing devices; better network; data packages; training and development to conduct and participate in online class without interruption; addressing vulnerable groups; volunteer and other infrastructure are also provided (Saeed et al., 2020; Anwar, 2020).

d) *Impacts of COVID-19 on the Education System of Bangladesh*

Advanced and emergent digital technology has a tremendous impact on the pattern of teaching and learning. In the last two decades, the conventional teaching approaches have transformed into online, and COVID-19 has accelerated this adaptation more (Jena, 2020; Redden, 2020; Raj et al., 2020).

Bangladesh declared lockdown on 17th March 2020, and all educational institutions remained closed. Since then, all the teaching and learning activities are conducted online using different social platforms and video conferencing platforms. Mostly used and popular online platforms are ZOOM, Microsoft platform, Google Meet, Webex Blackboard, Google classroom, WhatsApp, Facebook live stream, video conferencing, etc. to fostering E-learning (Chen, 2010; Shereen, 2020; Ramachandran, 2020; Nataliaia & Anastasiia, 2020).

Though policymaker struggling to meet up losses by virtual meeting, online classes, and assessment but already there are session blockage, postponed public examination, indicating Bangladesh is not ready to tackle the challenges imposed by COVID-19 in new normal life with limited resource. The pattern of education is going through radical changes for the

long-lasting of COVID-19 (Harrison, 2020). Social distancing, lockdown, online office activities, and virtual teaching and learning, etc., have been taken as preventive measures of COVID-19 in Bangladesh (Jayasree et al., 2020). This poses challenges to the densely populated and lower-middle-income country like Bangladesh in a great deal. Bangladesh is lagging for proper quarantine, sanitization, hygiene, healthcare, the supply of gloves, and prevention measures to mitigate the pandemic and minimizes losses (Islam, 2020; Anwar, 2020). In this global lockdown, the pattern of the education system is crucially rebooted, with no traditional classroom and physical appearance to ensure social distance and health and hygiene codes designed by WHO during this pandemic. Research has found that the education system of more than 160 countries has come to a standstill (Harris, 2020).

A recent study by Pravat Kumar Jena (2020) has revealed the following impact of COVID-19 on higher education worldwide such as 1. The COVID-19 destabilizes all activities in the education sector, 2. Hampered academic research & development, 3. Adversely affected the assessment system, 4. Create uncertainty and stress to graduates reducing employment opportunities so far. According to Zimara and Linda (2020) career, financial concern, and uncertainty generates anxiety level at 74.4%; 93.6% somatic anxiety; and 65.4% of students are suffering from high stress due to COVID-19. Post pandemic schools, colleges, and universities have two possible ways, such as starting in traditional and transforming to another pattern of education using online and digital platforms (Azorin, 2020; Hargreaves, 2020).

Table 1: Barriers & Challenges

SL	Core Barriers & Challenges	Authors
1	Lack of clarity and direction in the online class	(Uddin, 2020; Jayasree et al., 2020; Saeed et al., 2020).
2	Lack of student engagement	
3	Concentration break	
4	Lesson ambiguity	
5	Poor participations	
6	Difficulty to use the online platform	
7	Disconnection during the class	
8	Network problem, Cyber harassments & Security concern	(Joshi et al., 2020; Uddin, 2020; Islam et al., 2020)
9	Lack of motivation & concentration break	
10	Communication problem	
11	Physical injury (loss of eye-sight; back-pain; technostress)	
12	Trouble to deal and feedback to many students online	

e) *Prospects & Opportunities Imposed by COVID-19*

Online classroom undoubtedly provides a wide platform within shortest time, and cost, instant feedback, and student commitment but physical and traditional methods help to clear doubts enabling direct interaction

with teachers and fellow students (O'Neill et al., 2014). There is no alternative other than online education in this neo-normal period to mitigate the losses in the education sector (Khan & Khan 2019).

According to Saeed et al. (2020), Bangladesh lags behind adequate testing and funding. Still, there is a shortage of testing kits, and no attempt has been successful in discovering coronavirus vaccine.

A recent survey by Dr. Islam et al. (2020) found that 55% of the students do not have an internet connection to avail themselves, online classes. About 77% show negligence in participation in online classes, 45% don't have devices (Islam, 2020). Alarming this study found about 87% of students negatively replied on the feasibility of online classes. Where job seekers and university students are going through financial, social pressure, and psychological stress need to be addressed and adjust as COVID-19 is prolonged. Moreover, a good number of students usually go abroad for higher education, but IELTS, GRE, TOEFL, G-MATT, Visa process, etc., all remained closed due to this pandemic (Redden, 2020; Durrani, 2020). Eventually, the students already admitted to universities abroad are not allowed to fly to attend classes and are bound to

attend class online. Thus, COVID-19 hinders higher education (Harrison, 2020; Inquirer, 2020; Redden, 2020).

Due to the pandemic, both the students and teachers are affected directly. But most of the study focuses on the students only. Some teachers are resisting changes and having a lack of expertise to conduct online classes in this subcontinent (Amit et al., 2020). Policymaker and educationalist think providing infrastructural facilities, coordination, funding, and financial support, and training to teachers, network, and devices to ensure 100% participation, ensuring proper accommodation, with hygiene and safety of teachers and students is a huge challenge for the developing country like Bangladesh (Uddin, 2020; Jayasree et al., 2020). This problem would be more acute if COVID-19 is prolonged to next year. Corona pandemic has posed lots of challenges in education like examination, assessment, software, internet connectivity, availing devices, etc. (Raj et al., 2020).

Table 2: Prospects & Opportunities

SL	Prospects & Opportunities	Authors
1	The vast scope of virtual training, development & certificate program	(Uddin, 2020; Jayasree et al., 2020; Islam et al., 2020)
2	Ubiquity	
3	Real-time collaboration	
4	Easy resource sharing	
5	Low cost & time saving	
6	Foster, digitalization on a virtual platform	Jena et al., 2020
7	Foster distance learning	
8	Require less manpower, infrastructure	
9	Technological literacy & expertise	Saeed et al., 2020
10	Easily connect expert from home & abroad	
11	Blended learning and virtual transformation	

f) Measures to Puzzle out Challenges by COVID-19

WHO proposed the Health, hygiene, and protection preventive measures such as social distancing (at least 3 feet), washing hands with sanitizer, avoiding touching nose, mouths, and eyes, keep informed health care provider, respiratory hygiene (using tissue, elbow while sneezing), having balanced and nutritious diet with regular check-up, etc. (Kluge, 2020; Ramachandran, 2020). Students get chances for an online course, workshop, and other learning opportunities. COVID accelerates the rate of a professional and non-professional online degree, which is estimated to grow 75 billion by 2025 (Islam, 2020). Moreover, recently University Grant Commission (UGC) undertakes a plan to sanction an interest-free loan of TK 20,000 for devices and the internet to increase the participation of students in classes at the university level (Alamgir, 2020; Majed, 2020). Networking, teacher-student collaboration, access resources, database, and communication in the online platform can lead to solving

the problems raised by COVID-19 (Reimers, 2020; Chew et al., 2020).

A recent study reveals that to improve and foster the teaching and to learn there must be ensured online teaching with home assessment setting, overcoming the shortcoming of online classes, reduction of external hustle during the class, providing training to teacher to make them capable for the online class and assessment properly (Amit et al., 2020). Available online resources, e-book; online teaching and learning materials; web and mobile technologies, etc., enhance flexibility and accessibility to education (Jena, 2020).

A study by Mohamed et al. (2020) found that the main challenges creating a bar in online education are scarcer sources; lack of ICT infrastructure; lack of expert instructor and guidance; insufficient devices for the students to attend class; the teacher and students are not used to such teaching and learning approach, etc. Educationist considers it is the right time to step towards an online platform, policy, facilities, training & online

orientation, motivation, network & utilities, flexibility, assessment and evaluation, psychological and financial support, etc. can ensure students engagement and collaboration (Majed, 2020; Christie, 2020).

g) Models for Effective E-learning at This Pandemic

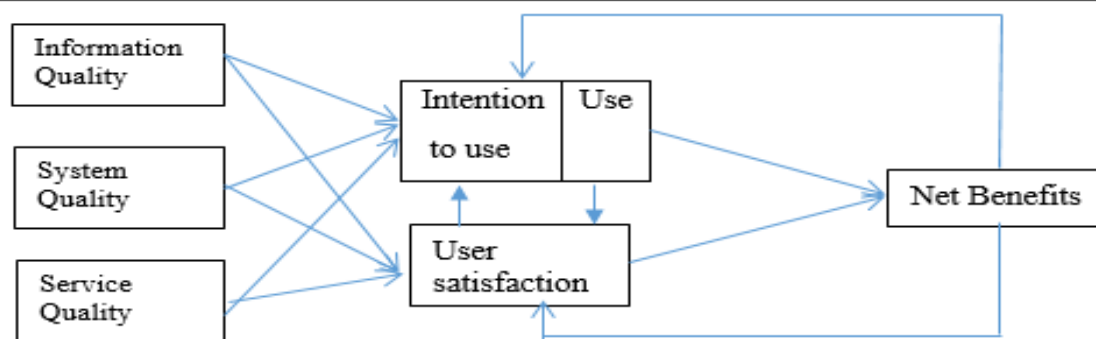
To mitigate the negative consequences of emergency in education, World Bank (2020) proposed a *Cyclic Model* including three steps, namely, prepare, cope & recover. Moreover, *World Bank (2020)* suggest several measurements as distance learning solutions such as preparedness, distance learning, educational resources, and infrastructure, etc. remote learning includes using technological solutions, inclusion distance learning tools (such as virtual, downloadable lesson, network, mobile phone, personal computer, radio and television program) using social media to engage students (i.e. Facebook, Whats App, Zoom, etc.), availability of devices, agreement with telecoms to reduce costs, data security & privacy, support for using a digital tool, self-regulation, communication, etc. (UNESCO, 2020; World Bank, 2020; Alon, 2020; Chen, 2016). Several online effective education models can be applied in the Bangladeshi perspective to mitigate the prolonged effects.

Instructional Design Model for Online Learning (IDOL), proposed by Roblyer (2015), can be helpful to

ensure participation, facilitates continual learning and engagement. This is derived from the ADDIE model includes three steps, namely analysis, strategy, and evaluation (Chen, 2016; Roblyer, 2015). The teaching pedagogy model includes intelligent (using most appropriate technology), distributed (engaging all stakeholders), engaging (methods and approach for active participation), agile (flexibility and customization), and situated (relevant and pragmatic learning) (IDEAS) is found most effective in virtual teaching (UOC, 2020; Nataliaia & Anastasiia, 2020).

h) Theoretical Framework

The entire study intended to assess the level of impact of COVID-19 on the pattern of higher education. Hence, De Lone & McLean IS Success Model (D & M model) p be used to introduce the most effective E-learning and address the challenges imposed by COVID-19 in higher education. This model was developed by De Lone & McLean (Arfan et al., 2020). This model includes three core levels (i.e., technical, sematic; & effectiveness) with six dimensions (i.e., quality of information; system quality; the system used; user satisfaction; organizational impact & net benefits) to foster effective communication and e-learning necessary in this new normal period (De Lone & McLean, 2016).



Source: (Arfan et al., 2020).

Figure 1: D & M Model for effective learning;

To overcome the challenges of online-based higher education, D & M model is used. For information quality, preparedness for online education from the perspective of teacher and students; reduction ambiguity and information discrepancy; collaboration; communication, and interactive learning must be ensured. As system quality, device, network; data, and bandwidth; infrastructural and technological expertise needed to ensure. They were focusing on the satisfaction of students and users with the service quality, such as data speed, the content of the lecture, evaluation methods, and assessment required to design (Mohammadi, 2015). Some researchers criticize D & M model and rewrite the dimension of 'user satisfaction' with suggestions with several aspects such as an e-learning portal and user-friendly interface to assess and

evaluate the students at the online platform in a new normal period (Petter et al., 2013).

i) Research Gap

To address the challenges of this pandemic and formulate strategies to overcome such challenges, it is required to properly understand such circumstances. Exploring the factors that emerged during this pandemic in higher education extends a hand to address the barriers associated with COVID-19. Assessing the degree of impact and challenges also give the edge to formulate appropriate strategies, action plan, necessary and adequate initiatives, and alternative teaching methods, etc. to overcome such challenges and minimize the long-term effects before it is too late Hence, from the perspective of Bangladesh there is no

available research on the changing pattern of education due to COVID-19. This study has attempted to understand the challenges imposed by COVID-19 on higher education, radical changes in the education pattern, sort out possible ways, solutions, and alternatives for better and effective teaching and learning. Thus, this study p give a hand to the concern to set out a policy, strategy and accelerate digitalization in education. Therefore, it is expected that this study p be able to add value to puzzle out the challenges and open a diverse horizon of future research.

j) Hypotheses

H_1 : COVID-19 has a significant positive impact on the pattern of higher education.

H_2 : COVID-19 has a significant negative impact on the pattern of higher education.

H_3 : The positive impact changes the pattern of education significantly.

H_4 : The negative impact significantly changes the pattern of education.

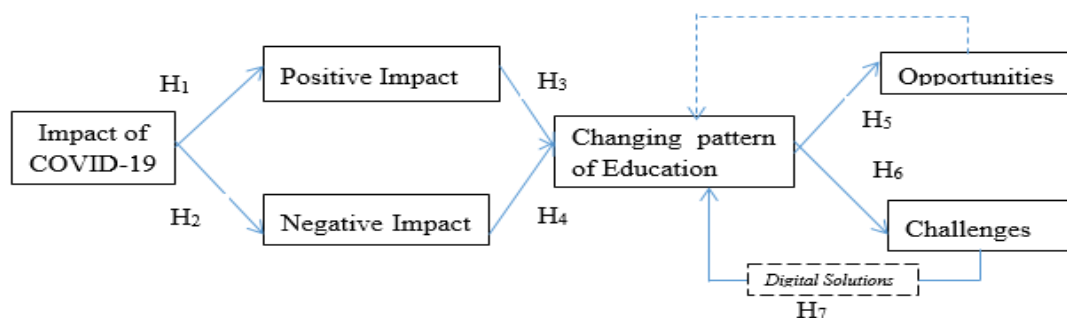
H_5 : Changing pattern of education reveals opportunities

H_6 : Changing pattern of education poses cyber challenges.

H_7 : Digital solutions and the use of technology significantly helps to puzzle out the challenges.

k) Conceptual Framework

The entire study tried to assess the positive-negative impact of COVID-19 on the pattern of higher education in Bangladesh. Besides, it also poses some challenges and opportunities. The conceptual framework below indicates how and what the study intends to find and its connection to each endeavor.



Source: Author (2020)

Figure 2: Conceptual Framework,

It is tried to identify the positive and negative impact of COVI-19 on the education system, and thus, it is tried to explore the overall impact in Bangladesh. Moreover, the study also intended to explore what radical changes are going on, such as virtual transformation, digitalization, etc. Appropriate digital solutions, planning, strategy formulation, and implication can extend a hand to overcome such devastating circumstances and mitigate the loss in the education sector in Bangladesh

III. METHODOLOGY OF THE STUDY

This is *applied* research. The study is based on both qualitative and quantitative analysis (*mixed approach*). The result and relationship of the different variables are shown with the help of numbers and appropriate descriptions. The study also tries to find out the *causal relationship* of dependent (Changing pattern of higher education) and independent variables (positive and negative impact of COVID-19), which indicates the study as causal research. There were 160,877 students of five selected universities (University of Dhaka, Jahangirnagar University, World University, Jagannath

University, East-west University, BRAC University) to represent the whole students pursuing higher education at present. Some previous study to assess the impact of COVID-19 on education uses population size between 1000-2000 participants (Islam et al., 2020; Mobasser, 2010). But this study was conducted on a small scale and intended to assess the degree of impact on the pattern of higher education in Bangladesh. A *purposive* sampling method was used in this regard. The primary data p be collected by questionnaire survey using *Google form*. To serve this purpose, a sample of 50 students of representative universities p be used. Since there is no budget source for such a survey and a convenient sampling method is not possible to conduct during this quarantine period, a purposive sampling method is used (Islam et al., 2020). During this pandemic, it is quite difficult to collect data from the respondents to ensure social distance and avoid hygiene and safety. Hence, the questionnaire was designed using Google Forms. Purposive sampling was designed to collect data from the respondents who seem most capable and readily available. To represent the entire population, the most renowned five

universities are selected to design a sampling frame. For the population of 160,877 students of undergraduate and postgraduate level, a sample of 152 (rounded up) was determined by using the following

formula, but 152 response were collected since the rest four people did not send a reply on google form (Annual Report of UGC, 2019; Zikmund et al., 2013; Bryman, & Bell, 2003).

Here,

$$n = \frac{N}{1 + N(e^2)}$$

n = Required Sample Size

N= Total Population

e² = Square of the maximum allowance of error is 8% at 95% confidence level.

The sampling frame and sample size University-wise are depicted in the following table with percentage

and sample size used in the survey. Most of the respondents are from Dhaka University.

Table 3: University-wise Sample Size,

Name of Universities	No. of Students	% of total Students	Sample size	
University of Dhaka	42005	26.1100	39.165	40
Jahangirnagar University	20178	12.5425	18.81375	19
Rajshahi University	38494	23.9276	35.8914	36
North-south university	22000	13.6750	20.5125	21
Brac university	11200	6.96184	10.44276	11
Jagannath University	27000	16.7830	25.1745	25
Total	= 1,60,877	= 100	= 152	= 152

Source: UGC, 2020

Respondents are asked both open-ended and Likert scale (rating highly agree=5; agree=4; neutral=3; disagree=2; highly disagree=1) questions. For collecting primary data and test the *Hypothesis*, a questionnaire containing twenty-four (24) questions was designed on a mixed approach. The first 12 questions were designed in category and ranking approach highlighting factors. In the second phase, rest 12

statements were asked on the *Likert scale*. The following variables were used in the questionnaire. The entire questionnaire covers the barriers, prospects, challenges, and impacts imposed by COVID-19, and Likert statements were formulated to assess the degree of impact on the pattern of higher education in Bangladesh. To assess the impact imposed by COVID-19, the following variables were used

Table 4: Independent & Dependent Variables

Dependent Variables	Code	Independent Variables
The Pattern of Higher Education (PE)	SR	Student Readiness
	FD	Scope for Foreign Degrees
	AH	Academic Hessel on a virtual class
	GM	Global Students mobility
	VP	Virtual Platform& Digitalization
	CT	Career Tension
	ET	Education Transformation
	PR	Participation Rate
	AE	Academic Effectiveness
	SD	Self-learning & Development
	SA	Stress Anxiety
	TS	Technical Solutions

The primary data was collected from the questionnaire survey and observation from a selected sample size of 152 students of the different universities of Bangladesh. Secondary data covered already published datasets on the various journal, books, articles, and newspapers to ensure reliable, realistic,

and authentic information. The secondary data was collected from the following sources:

Quantitative data was analyzed with the help of *correlation, paired-sample T-test, and multiple regression model* using SPSS software. By correlation and regression analysis, it is tried to find out the degree to

which dependent and independent variables correlate to each other and percentage independent variable can predict the dependent variables used in this study. Formula: Cohen's D = $(M_2 - M_1) / SD_{Pooled}$

$$SD^*_{pooled} = \sqrt{\frac{(n_1 - 1)SD_1^2 + (n_2 - 1)SD_2^2}{n_1 + n_2 - 2}}$$

Pearson correlations also showed a relationship among the independent variables of the study using following the formula-

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Here, r = correlation of co-efficient of dependent (Y= changing pattern of higher education) and independent (X= positive & negative impact of COVID-19) variables. The following formula was used for Simple Linear Regression Analysis

$$Y = A + B(x_1) + B(x_2) + B(x_3) + B(x_4) + \dots + B(x_n)$$

Here, Y= Dependent variables (changing pattern of higher education); A= Y intersect; B= Slope of the equation; X_n = Independent variables (positive & negative impact of COVID-19). The result was presented with the help of a diagram, pie chart, table, and histogram, and bar diagram. Qualitative data use is presented by an appropriate table and figure

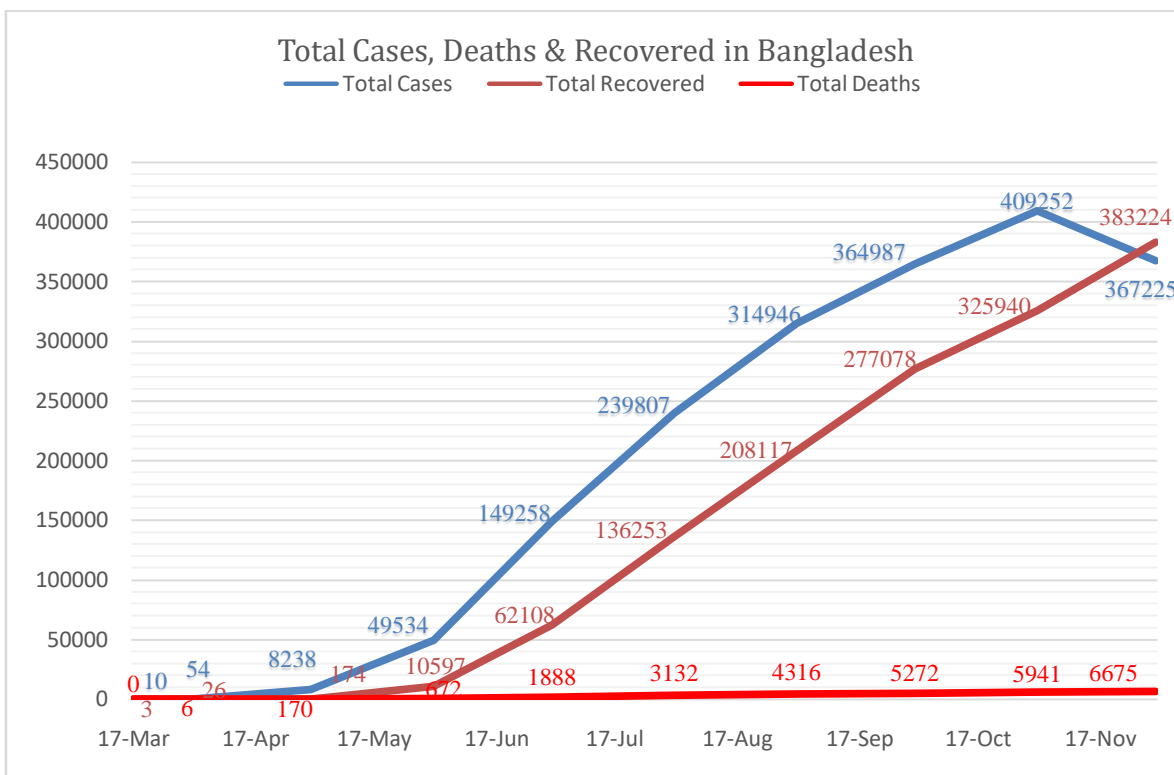
(Wiedermann et al., 2015). For paired samples Statistics, the following formula was used to determine Cohen's D value and standard deviation pooled value.

IV. OVERVIEW OF IMPACT & CHANGING PATTERN OF EDUCATION

The COVID-19 is increasing at a geometric and alarming rate. It is a matter of concern that within a few days and months, the number of affected and deaths is recorded. Due to the sudden outbreak and spread of the coronavirus, the entire activities of Bangladesh come to a standstill.

a) Bangladesh in New Normal Era (COVID-19)

After declaring closure on 17th March 2020, there is no sign to open the educational institutions since the geometric increment of affected and death is in progress until last December of 2020. In April, the infected, death, and the recovered number were just 54, 6, and 26, respectively. Last December 2020, the total affected was 383,224, death 6,675, and totally recovered was 409,252 respectively. This shows how severe it has spread throughout Bangladesh, with adverse impacts all over the country.



Source: WHO, 2020

Figure 3: Geometric Spread of COVID-19 in Bangladesh

b) COVID-19 & Changing Pattern of Education

With the outbreak of COVID-19, all the academic activities come to a standstill in different educational institutions in Bangladesh. The private and public universities of Bangladesh are the only means to pursue higher studies and degrees. As the pandemic situation is lengthened at the end of 2020, it is decided to conduct all academic activities via an online platform. The conventional pattern of education is no more in use during this new normal period to endure social distance, hygiene, and safety issue. Hence, after June, all educational institutes started online class, assignment,

examination, presentation, assessment, and evaluation using the different online platforms. Thus, the conventional pattern of the education system is going through radical changes and transforming into the virtual and online medium.

c) Virtual Platform & Academic Activities

Some of the most popular platforms mostly used and taken an active role in this transformation during this pandemic is depicted below (Dutta & Smita, 2020; Mohamed et al., 2020)-

Table 6: Comparative analysis of online education platform used in Bangladesh

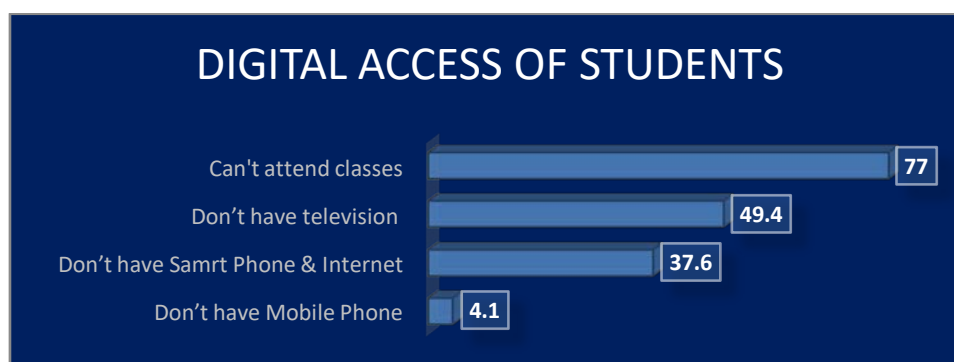
Platforms	Storage capacity	Participants (Free/Full)	Pricing	Exclusive features	Whiteboard
Zoom	1GB	100-500	\$15-20 Month	Online chat; classroom; video recording; webinars; dropbox, etc.	Yes
Google Meet	Drive cloud	100/100	\$6-25 Month	Email; chat; video & voice conferencing; docs; sheet; spreadsheet; slides; professional presentation and survey, etc.	No
Skype	30 days in Cloud	50	\$5-25 Month	Individual & group audio and video call; text and file transfer; conference & classroom, etc.	No
Shikhai. live	Drive cloud	100	Free	Online chat; classroom; Video-recording; webinars; sheet; spreadsheet; slides, etc.	No
Google classroom	Drive cloud	100/100	Free	Chat; video conferencing; docs; sheet; spreadsheet; slides, etc.	Yes

The closure of educational institutions interrupted daily routine, study and life; decreased overall study time; deteriorates motivation and concentration (McCoole et al., 2020). Students cannot use the library, books, and other resources to avoid public gatherings and community transmission. Hence, students were mostly relying on virtual books such as PDF, online portal, and published educational materials. This also has negative consequences on cognitive health and student performance (Kedra & Kaltsidis, 2020). It also disrupts social interaction, face to face contact, group studies to generate knowledge; students are wasting most of their time on social sites such as Facebook, Instagram, YouTube, WhatsApp, watching

TV, playing Game, etc. (Owusu-Fordjour et al., 2020; Al-Tammemi et al., 2020). Covid-19 also provides ample opportunities other than academic curriculum on a different online platform such as Course sera, edX, and Future learn, etc., to do courses, training, and self-development programs like a seminar, discussion, etc.

d) COVID-19 & the Impact on Education

However, a significant number do not have such digital access to education due to devices, networks, and financial crisis (Das, 2020). The internet speed in Bangladesh is 9.96 (smartphone); 24.31 (broadband) (Uddin, 2020). A recent study of MICS (2019) reveals.



Source: Uddin, 2020; MICS Survey, 2019

Figure 4: Digital Access of Students

COVID-19 has dramatically changed the pattern of the education system as we are familiar with creating a bar on proper completion of academic activities. Virtual education requires physical settings and affordability. It has almost become impossible for students from low earning families to pursue higher education online. Other immediate and drastic changes due to the COVID-19 outbreak is depicted below-

Irregular Attendance: A recent study of Bio TED on 2038 students found that most of them are unable to join online take part in online classes (77%). Students indicated the reason for not having devices, data bundle and broadband internet, network, financial inability, etc. this problem is acute to medicate, dental and engineering students (Islam et al., 2020).

Mental Inabilities & Physical injury: During this lockdown, students are confined indoors involving virtual class; social networking; away from social interaction and collaboration; pressure and harassment from society and family cause stress, anxiety, depression,

psychological disorder, and pressure driving them to commit suicide (Ashrafur et al., 2020). Several cases have recorded social harassment, bullying, and suicide, including students from public and private universities (Mamun et al., 2020).

Networking Problem: The speed of the internet is very slow; we have only 7.2 Mbps. On the other hand, the internet package is very expensive to the students, and the network is not stable at all. Hence, most of the students get disconnected while attending the online class (Ashrafur et al., 2020).

Technical & financial crisis: Most of the students lost their part-time job and tuition due to COVID-19. Many of them used to provide financial support to their family (Islam et al., 2020). But now, they are in an uncertain condition to support themselves and undergoing a financial crisis. 43% of families are under the poverty line (Halim, 2020). The total number of students below the poverty line is 16 million (Das, 2020).

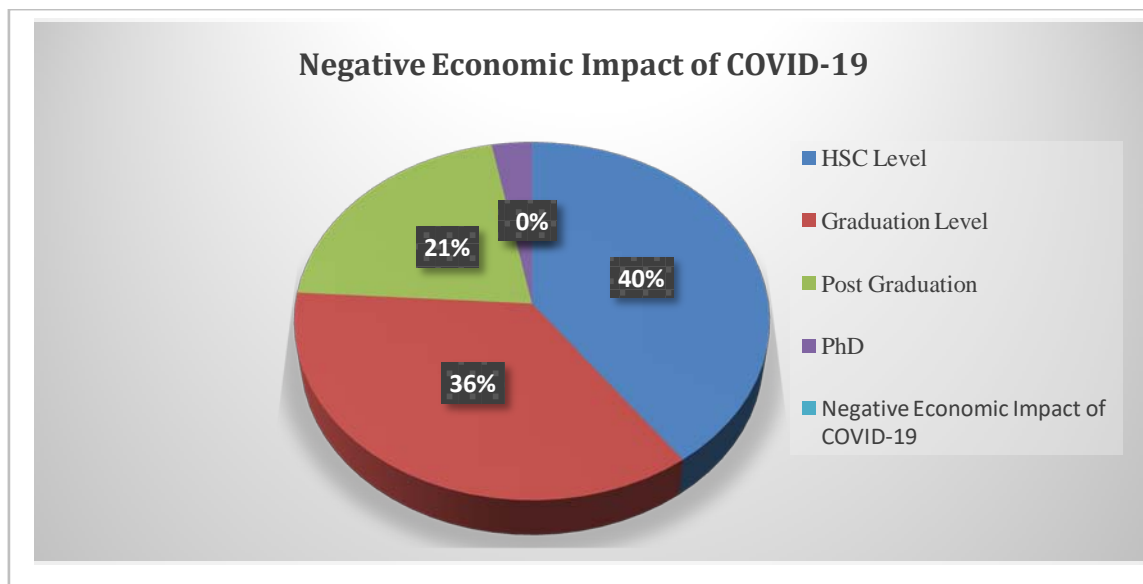


Figure 5: Negative economic impact, Source: (Das, 2020).

Accommodation problem: Many private and public universities were declared closed on 17th March 2020, and residential Halls, hostels also remain closed for an uncertain period (Ashrafur et al., 2020). Some managed to rent a house near their universities, whereas most of them settled in rural areas creating a bar to participate in an online class (Dhaka Tribune, 2020).

Social Disease Altering Academic Activities: Child marriage has increased at an alarming rate. A recent report of the Manusher Jonno Foundation (MJF) showed 462 cases of child marriage in June 2020. COVID-19 increase the level poverty and poverty-stricken family cannot afford the cost of education. As a result, child labor by 0.7% (Das, 2020). The number of students

drops out is increasing before completing their graduation

V. ANALYSIS & FINDINGS

a) Demographic Profile of Respondents

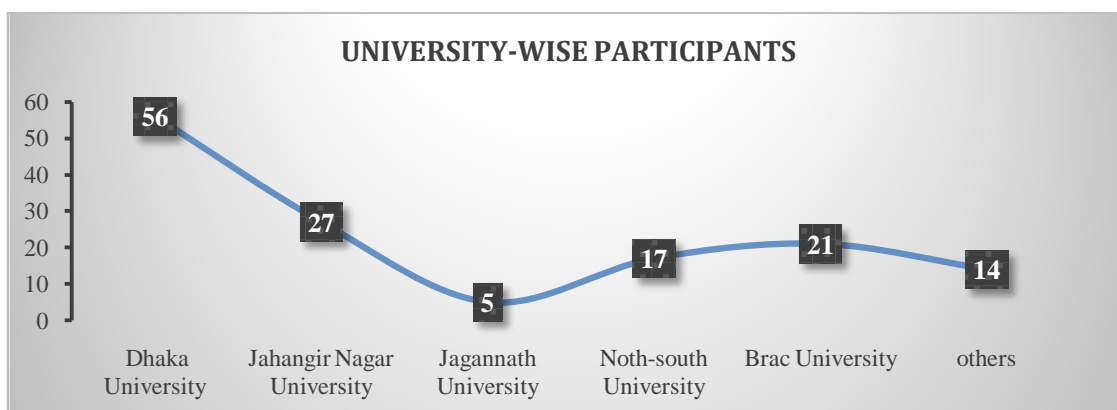
The respondents (aged 17-27 years) are the current students of undergraduate and post-graduate programs of different private and public universities in Bangladesh. They participated in different virtual academic activities online class, presentation, assessment, and evaluation, undergoing during this pandemic.

Table 7: Demographic Profiles of Respondents

Profile	Category	Respondents	Percentage	
Gender	Male	87	57%	100%
	Female	65	43%	
Qualification	Honors/ Equivalent	102	67%	100%
	Masters/ Equivalent	47	31%	
	MPhil	3	2%	
Online Academic Experience	0-1 Months	14	9%	100%
	1-3 Months	46	30%	
	3-more Months	92	61%	
Age	17-22 years	25	16%	100%
	22-25 years	119	78%	
	More than 25 years	8	6%	

All the respondents are aged between 17- 27 years. Among them, there is 57% male, and the rest are female students with 67% students from honors level, 31% from Masters and rest are from MPhil students.

Remarkably, 61% of students have more than three months of experience of academic activities using the online platform.



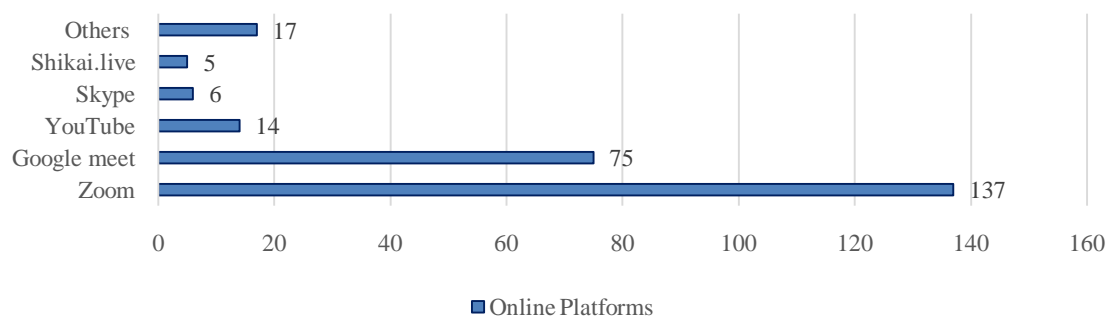
Source: Questionnaire survey 2020

Figure 6: University-wise respondents

Most of the students are from the University of Dhaka. Besides, the study covers participants from Jahangir Nagar University, North South University, Brac University, etc., to represent the entire students involving in higher education in this pandemic. Since conventional classroom, academic performance, and using physical infrastructure is not possible to use in this pandemic, and all transform into the online platform. To conduct

academic activities online, the following online platform and social media are found most popular among the students pursuing higher education in Bangladesh in this pandemic. It is found that Zoom (90%) and google meet (49%) are mostly used the platform to all. These digital means have made academic activities easier and within reach (Owusu-Fordjour et al., 2020; Al-Tammemi et al., 2020).

ONLINE PLATFORM USED



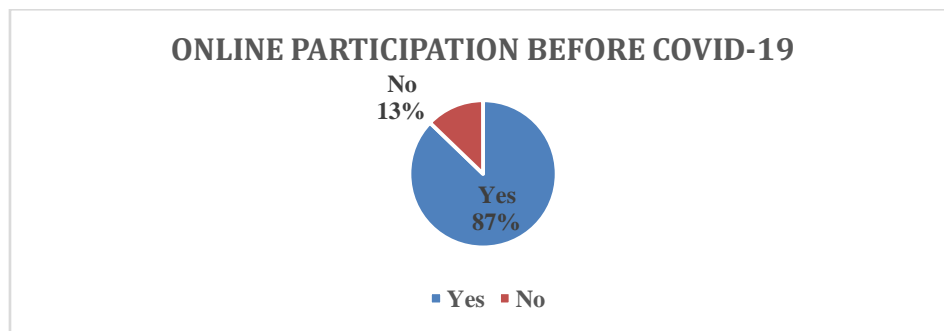
Source: Questionnaire survey 2020

Figure 7: Popular online platform

b) Factors Influencing the Pattern of Education

To explore the factors that emerged in the new normal period for the COVID-19 pandemic in the pattern of higher education, the following factors are found most prudent from the respondents in the questionnaire survey. Prior experience of online class before quarantine: The study reveals that most of the students have prior experience of online academic activities

before this pandemic. They used to take part in a conventional classroom, learning materials, teaching methods, and evaluation. However, virtual participations require no such instruments rather, and all are readily available at online sharing platforms (Google Drive, Gmail, zoom, google classroom, etc.) (Natalia & Anastasiia, 2020).

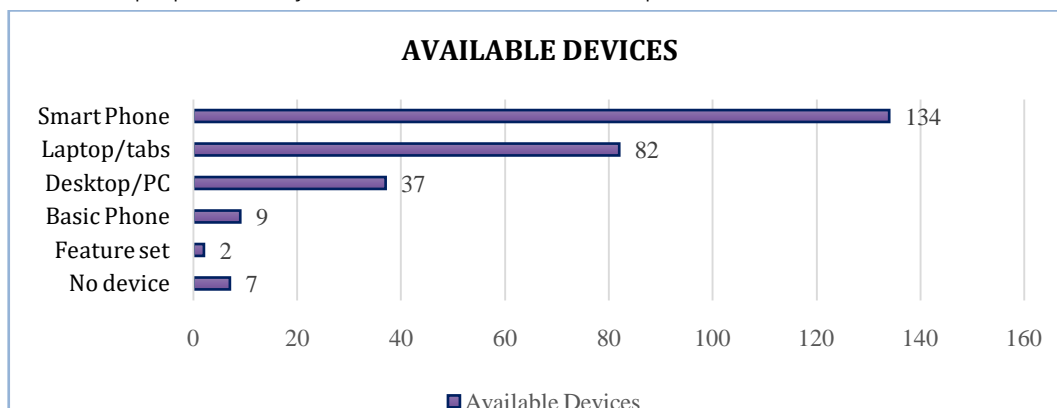


Source- Uddin, 2020.

Figure 8: Types of devices students have

Student Readiness: To assess the readiness of students on online academic activities, the following digital devices are available proportionately to each of them.

Alarming findings is that in this digitalization, some students are still not availing smart phone, laptops/ PC to take part in online academic activities.

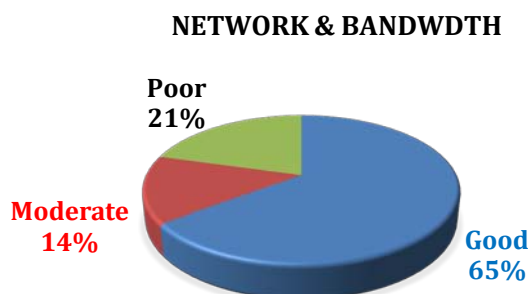


Source: Questionnaire survey 2020

Figure 9: Available Devices

Poor Internet Bandwidth/Network: Most of the students can't attend class and gets disconnected during the class due to network problem and poor bandwidth. The

survey data reveals, 21% of students are suffering from poor internet bandwidth and network, which hampers their academic involvement and activities drastically.

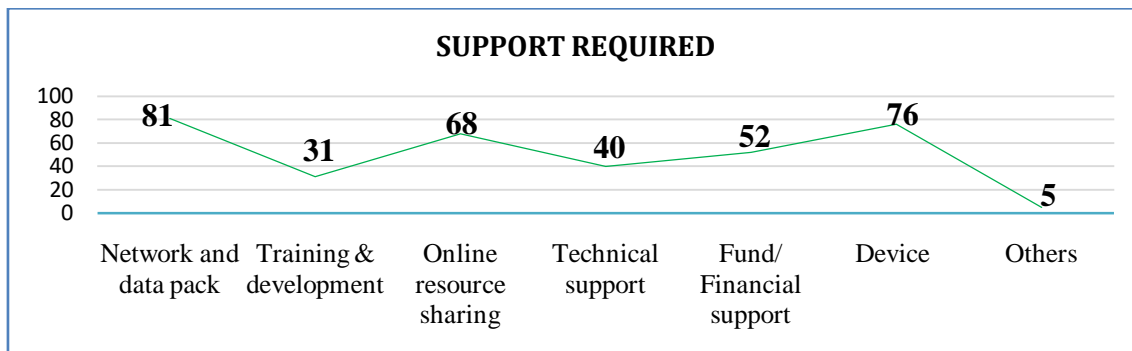


Source: Questionnaire survey 2020

Figure 10: Network & Bandwidth

Inadequate Technical, Infrastructural & Financial Support: The following figures indicate the nature of support students need for online smooth academic activities (Joshi et al., 2020). Unfortunately, Bangladesh does not have adequate infrastructure and information technology to tackle such challenges of the COVID-19 pandemic and run academic activities up to the mark.

Hence, most of the students are from a middle-class families and can not afford basic requirements and devices to participate in online classes. Among the financial and infrastructural problems, the network and bandwidth, devices and other resources, and technical support are found most acute necessary for most of the students who cannot afford them immediately.



Source: Questionnaire survey 2020

Figure 11: Required Support

During this pandemic, different universities raise funds to support the students so that they can participate in academic activities online. The following list includes the support that students get from their institutions, government, and other organization for

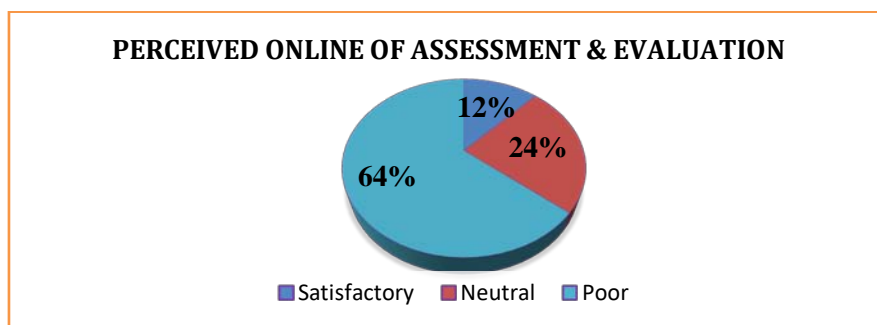
smooth educational activities. The table shows a very small amount of students who need support get the support. Without ensuring such arrangement and assistance, not all students can be involved to serve the purpose.

Table 8: Students Support Provided for Online Academic Activities

Available Support	Response	Percentage	Scenario
Fund/ Financial Support	52	14.6479	Poor
Device & Network	76	21.4085	Moderate
Technical Support	40	11.2676	Poor
Training & Development	31	08.7324	Poor
Resource Sharing (Virtual books, library)	68	19.1549	Moderate
Network & Data-pack	81	22.8169	Moderate
Others	7	01.9718	Poor
Total	355		

Student Assessment & Evaluation: To assess and evaluate the students, the online platform is found not so effective compared to the traditional classroom. It lacks direct contact and interaction with the teachers and assessors. Hence, some students may feel difficulties submitting their exam scripts, buffering due to network problems, lack of expertise often make prey to

negative evaluation and marking during the assessment and evaluation of the students. The survey also found that it is ineffective and prone to biases. Some students consider it as pure commercialization of education and available to those who can afford it (Joshi et al., 2020; Amit et al., 2020).



Source: Questionnaire survey 2020

Figure 12: Assessment & Evaluation

Prospects in higher education due to COVID-19 Vast scope of virtual training, development & certificate program; Ubiquity; Real-time; collaboration; Easy resource sharing; Low cost & time saving; Foster digitalization on the virtual platform; Foster distance learning; Require less manpower; Technological literacy & expertise; Easily connect expert from home & abroad using the virtual platform; Blended learning and virtual transformation (Uddin, 2020; Jayasree et al., 2020; Islam et al., 2020).

To assess the level of impact (positive, negative, or neutral) of each factor on the pattern of higher education in Bangladesh.

i. Academic Barriers

To assess the barriers and problems associated with online class, the descriptive analysis of the response of participants is showed in the following table (Joshi et al., 2020; Kapasia et al., 2020; Uddin, 2020; Jayasree et al., 2020).

c) The Impact on the Pattern of Higher Education

Table 9: Academic Barriers Associated with COVID-19

Descriptive Statistics					
Academic Barriers	N	Mean		Std. Deviation	Variance
	Statistic	Statistic	Std. Error	Statistic	Statistic
Lack of clarity and direction	152	4.09	.098	1.212	1.469
Difficulty to use the online platform	152	4.08	.060	.742	.550
Lack of student engagement	152	3.93	.093	1.146	1.313
Concentration break	152	3.92	.068	.834	.696
Don't understand the lesson	152	3.93	.059	.725	.525
Poor participations	152	3.83	.096	1.178	1.388
Disconnection during the class	152	4.47	.075	.920	.847
Network problem	152	3.68	.086	1.064	1.131
Lack of motivation & concentration break	152	3.76	.092	1.133	1.285
Communication problem	152	4.30	.037	.461	.212
Lack of expertise	152	4.30	.075	.921	.848
Physical injury & Techno stress	152	3.68	.093	1.148	1.317
Trouble to deal and feedback	152	3.91	.068	.833	.693
Valid N (List-wise)	152				

Source: Survey Data 2020

Hence, the response is evaluated on a scale of highly disagree (1); Disagree (2); Neutral (3); Agree (4), and Highly Agree (5). It is found that all the responses concentrated on a statistic mean of 3.83-4.30. Therefore, it can be decided that respondents agreed to most of the barriers and problems (negative impact) in the above table imposed by COVID-19, which hampered the academic activities, and we can reject H_1 and accept H_2 . This refers to the positive impact is not up to the mark, and there is an adverse negative impact in higher education due to COVID-19.

ii. Cyber Harassments & Security Concern

To identify the level of impact comparing prior COVID-19 and post COVID-19 situation, paired-samples statistics are conducted in the following table. Hence, the perceived cyber security hack was 36.8%. With the outbreak of COVID-19, different online academic activities have been introduced, and this threat has increased by 12%. The degree of increase according to Cohen's D value is 7.1%. (Joshi et al., 2020; Alon, 2020).

Table 10: Perceived Cyber Security (Paired Samples Statistics)

Category	Mean		Standard Deviation		Paired Difference		Sig. 2 Tailed	Cohen's D
	Start-up	Current	Start-up	Current	Mean	Standard Deviation		
Hack	0.368	0.48	0.484	0.501	0.112	0.243	0.48	0.071
Data Privacy	0.39	0.49	0.489	0.530	0.10	0.260	0.633	0.158
Information Misuse	0.38	0.47	0.391	0.460	0.09	0.182	0.12	0.379
Unauthorized Access	0.39	0.53	0.424	0.521	0.14	0.225	0.08	0.431
Bullying & Harassment	0.34	0.46	0.473	0.542	0.12	0.259	0.43	0.267

Similarly, Cohen's D value for data privacy (15.8%), information misuse (37.9%); unauthorized access (43.1%); bullying and harassment (26.7%) has

increased significantly. This indicates that the transition education system to a virtual platform such as ZOOM, Google Meet, Skype, and other platforms poses a great

cybersecurity threat in comparison to traditional classroom and academic activities. Therefore, the conclusion can be drawn that COVID-19 poses significant challenges in the case of cybersecurity, and thus, the H_6 can be accepted.

d) *Assessing Degree of Impact*

i. *Correlation Analysis*

From the above variables, the correlation and linear regression model analysis was conducted. Hence,

Table 12: Correlation Analysis

	PE	SR	FD	AH	GH	VP	CT	ET	PR	AE	SD	SA	TE
PE	1												
SR	.728**	1											
FD	.922*	.714**	1										
AH	.181	.156	.145	1									
GM	.084	.053	-.031	.609	1								
VP	-.114	-.083	-.070	.717	.721	1							
CT	.832	.602**	.746**	.149	.114	-.072	1						
ET	-.129	-.059	-.083	.747	.773**	.915**	-.125	1					
PR	.960**	.725	.882**	.171	-.086	-.101	.855	-.118	1				
AE	.231	.132	.239	.012	-.380	.114	.174	-.096	.171	1			
SD	.684**	.514	.670	.093	-.101	-.152	.559*	-.151	.655**	.108	1		
SA	.961**	.748*	.884**	.168	-.092	-.154	.797*	-.105	.922	.248	.652**	1	
TS	.749	.956**	.709	.158	.019**	-.097	.621**	-.086	.719	.158	.509	.769	1

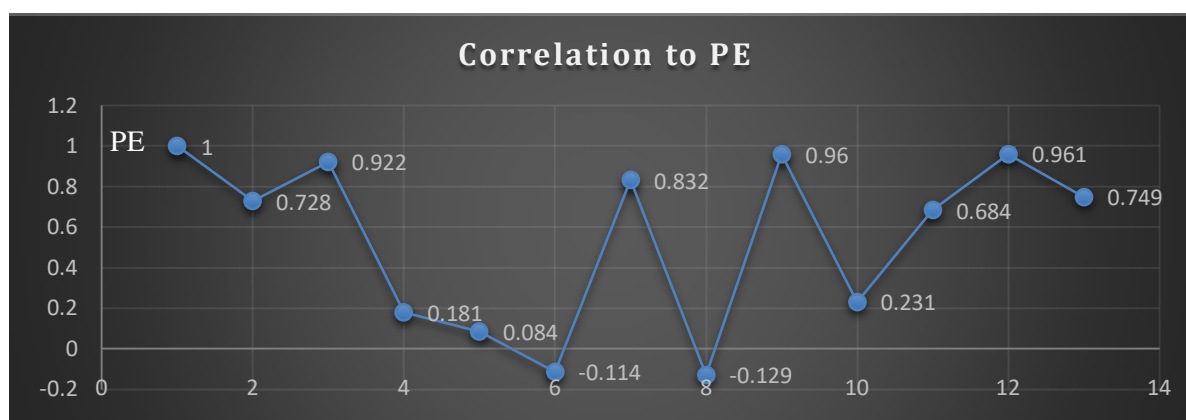
*Correlation is significant at the 0.01 level (2-Tailed)

**Correlation is significant at the 0.05 level (2-Tailed)

On the other hand, academic hassle (AH, 18.1%); academic effectiveness (AE, 23.1%) is found a low correlation to the pattern of Education (PE) in this pandemic and virtual transition of education. Other variables such as education transition (ET) and virtual

in the correlation, the pattern of education (PE) is found highly correlated to Student readiness (SR, 72.8%); Foreign degrees (FD, 92.2%); Career tension (CT, 83.2%); participation rate at online class (PR, 96%); self-learning and development (SD, 68.4%); perceived stress and anxiety (SA, 96.1%); and technical solutions (TS, 74.9%).

platform (VP) are found negatively correlated to the pattern of education. Hence, we can conclude that most of the above variables have a positive correlation to PE.



Source: Survey, 2020

Figure 13: Correlation of independent variables to dependent variables (PE)

ii. *Regression Analysis*

The regression model assesses the level of impact due to COVID-19 on the pattern of higher education in Bangladesh. The following regression predicts how much the independent variables can predict the dependent variables in this estimation. The

value of adjusted R^2 is 87.5%, which refers to the selected independent variables such as academic hassle, digital transformation; global student mobility; participation rate; readiness of students; the effectiveness of assessment and evaluation online; self-learning and development; career tension; stress;

anxiety; technostress; etc. can predict 87.5% of how much the pattern of education has been changed in this sudden outbreak of COVID-19 pandemic.

Table 13: Result of Multiple Linear Regression Analysis

Model Summary					Change Statistics	
Model	R	R Square	Adjusted R ²	Std. The error of the Estimate	F Change	Sig. of F Change _b
1	.936 ^a	.877	.875	.102	489.284	.000
a. Dependent Variable: Pattern of Education & Predictors: (Constant), Technical Solutions, Global Students mobility, Academic Effectiveness, Self-learning & Development, Academic Hessel, Career Tension, Virtual platform, Foreign degrees, Stress and anxiety, Education transformation, Participation Rate, Student Readiness						

Besides, the significant level is $0.00 < .05$ indicates the acceptability of the regression of prediction. The R^2 indicates the variation of dependent variables (PE) due to the changes of independent variables. Therefore, we can conclude that the COVID-19 has a tremendous and disastrous impact and changes the pattern of higher education to a transition in a take-home manner via virtual platforms digital technology.

Moreover, the coefficients table of the regression model refers to the contribution of each variable to the dependent variable (PE). The Y intersect -.039. The model indicates that each alteration of student readiness p adds a value (-.039) to the education pattern. Based on the beta value of the coefficient regression model, the following regression equation can be formulated:

$$Y = -.039 - .123x_1 + .186x_2 + .049x_3 + .028x_4 + .141x_5 - .004x_6 - .212x_7 + .364x_8 + .007x_9 + .024x_{10} + .451x_{11} + .101x_{12}$$

Here, Y= Changing Pattern of Education; A= Constant (Y intersect of the linear equation); $X_1 + X_2 + \dots + X_n$ = Independent variables of the study

Table 14: Coefficients of Regression Model

Model	Unstandardized Coefficients		Standardized Coefficients	t	Unstandardized Coefficients	Impact
	B	Std. Error	Beta		Sig. (p)	
(Constant)	-.039	.106		-.365	.716	
Student Readiness	-.123	.039	-.149	-3.113	.002	Significant
Foreign Degrees	.186	.032	.188	5.805	.000	Significant
Academic Hessel	.049	.020	.055	2.479	.014	Significant
Global Students mobility	.028	.019	.032	1.506	.134	Insignificant
Virtual Platform	.141	.038	.142	3.730	.000	Significant
Career Tension	-.004	.024	-.004	-.154	.878	Insignificant
Education Transformation	-.212	.042	-.212	-5.062	.000	Significant
Participation Rate	.364	.045	.359	8.067	.000	Significant
Academic Effectiveness	.007	.013	.007	.507	.613	Insignificant
Self-learning & Development	.024	.015	.028	1.579	.117	Insignificant
Stress & Anxiety	.451	.045	.458	9.964	.000	Significant
Technical Solutions	.101	.041	.121	2.470	.015	Significant
a. Dependent Variable: Pattern of Education @ 95% Confident Level						

However, the model indicates a significant relationship between the dependent and independent variables. The P-value indicates the acceptability of each variable in this relationship. Here, student mobility ($P=.134<.05$); career tension ($P=.878<.05$); academic effectiveness ($P=.613<.05$); Self-learning & Development ($P=.117<.05$) is found insignificant and low impact on the changing pattern of higher education. On the other hand, it is found that Student Readiness ($P=.002<.05$); Foreign Degree ($P=.000<.05$); Academic Hessel ($P=.014<.05$); Virtual Platform

($P=.000<.05$); Education Transformation ($P=.000<.05$); Participation Rate ($P=.000<.05$); Stress & Anxiety ($P=.000<.05$); Technical Solutions ($P=.015<.05$). They are found to have a significant impact and contribute to the change of the pattern of education in Bangladesh.

Therefore, we can accept H_2 ; H_4 ; H_5 , and H_7 , which indicates there is a significant impact, and digital solutions and technical advancement p extend a hand to sort out such challenges effectively.

e) Results of Hypothesis Test

Table 15: Hypotheses Test Results

SI	Hypotheses	Results
H_1	COVID-19 has a significant positive impact on the pattern of higher education	Not Supported
H_2	COVID-19 has a significant negative impact on the pattern of higher education	Supported
H_3	The positive impact changes the pattern of education significantly	Not Supported
H_4	The negative impact significantly changes the pattern of education	Supported
H_5	Changing pattern of education reveals opportunities	Supported
H_6	Changing pattern of education poses cybersecurity challenges	Supported
H_7	Digital solutions and the use of technology significantly helps to puzzle out the challenges imposed by COVID-19.	Supported

f) Results & Findings

1. The academic activities and the pattern of the education system in Bangladesh are transforming into a digital platform. It also changed the habit and concept of a conventional pattern of the education system other than the physical classroom and conventional manner.
2. The selected independent variables in the regression model can predict 87.5% of the impact of dependent variables (Pattern of Higher Education).
3. The correlation indicated that selected variables are interlinked, and paired sample T-test determined a significant impact and changes of the pattern of education during this pandemic compared to the conventional physical classroom.
4. About 87% of the students at the graduate and postgraduate level have prior experience of online academic activities. They consider virtual classrooms as an immediate solution to mitigate the loss due to COVID-19.
5. Online activities enhance the level of expertise on technical literacy, technical experience gaining, which paves the way to digitalization and education transformation.
6. About 64% of the respondents highlighted online academic activities as poor and ineffective.
7. However, the participation rate is not up to the mark because most of them are not ready with equipment and digital means (i.e., device, data pack, and network).
8. It is found students are not getting a proper environment during the class, since most of them

are connected from home, which creates external disturbance and noise. This also reduces the attention, involvement, and motivation towards class and lectures.

9. Active participation of all students can be ensured because some of them do not have devices, poor network, and data connection. Moreover, in this lockdown, most of the students are attending class from home in a rural area where network and internet connection is poor.
10. More than 57% of the students face hassle, ambiguity and do not understand the lesson online due to low concentration, poor network, and connectivity.
11. Anxiety, frustration, career tension, psycho-somatic disorder hampers mental and emotional health which leads to lack of commitment, enthusiasm, to academic activities and increase dropout, the commitment to suicide, etc.
12. E-learning is found as a temporary solution to minimize loss and continue academic activities on small scale during this pandemic. Academic activities online are found not fruitful and ineffective due to not having infrastructure, poor participation, lack of expertise to conduct the session, the physical injury made it troublesome, risky, and ineffective.
13. Students and Teachers are facing barriers and challenges like poor infrastructure, lack of prior experience, and inadequate training and development facilities to conduct such academic activities.

14. Students are not getting the right environment in online class; higher studies mostly research-based, which require collaboration, group discussion, sharing ideas and thoughts. But unfortunately, all these can not be possible on the virtual platform.
15. Social distance and confinement into a room have a negative impact and consequences on emotion, mental health, and psychology. Moreover, graduates are frustrated regarding a career in this devastating situation, which results in the commitment of suicide; dropout, etc.
16. Attending online classes forced students to be exposed to monitor, mobile for a long time and create a severe physical injury and techno stress, and emotional and psychological disorder in the long run. The study also reveals that teachers and students are cooperative and extending hands together to puzzle out the challenges.

VI. CONCLUSION

Undoubtedly, Coronavirus has been a curse to the world with its devastating negative consequences in all life spheres. World's giant countries, scientist, researchers, intellectuals keep no stone unturned, but still, this invisible virus is out of control and continue its catastrophe to break the backbone related to economics, social, education and personal affairs. It changes the way people are dealing with each other creating a long distance for safety, social space, and hygiene issues. It also changes the ways students are used to the academic activities in higher education. To cope with the transforming and evolving pattern of the education system is a challenge for the world. Hence, Bangladesh is far behind with the necessary weapons to face the threats.

a) Recommendations

Take home education strategy: Since educational institutions are closed and academic activities are conducted online, students can be trained and enabled to gain expertise on technology to perform and involve in virtual class properly. To capitalize on the transition of the education system, it is required to increase technological literacy, training, and development initiatives need to be arranged both for the students and teacher to arrange and handle online class properly.

Computerized evaluation & student assessment: the evaluation and assessment of students examination, performance is still in the manual form, which may be transformed into the digitalized platform using computer software for evaluation and assessment. The evaluation and assessment system needs to be changed using Artificial Intelligence (AI) technology. Such as *Flexi Quiz*, *Test Invite*; *Test Gorilla*; *Examsoft*; *Embase*, etc.

Provide resource & infrastructure: Students are required to provide resources, funds, platform, and access to the online class. Besides infrastructural competency, it is necessary to extend support to the students who do not afford devices, networks, and mobile data to attend the classes regularly. Hence, students may be drawn under loan facilities for availing such amities on easy terms and conditions.

Meditation and Counseling: Covid-19 forced students to be confined at home without direct interaction, communication, and collaboration with their fellows. This also has a negative impact and consequences on emotion, mental health, and psychology. Moreover, graduates are frustrated regarding a career in this devastating situation. Hence, the arrangement of medication, mentorship, and counseling can be helpful to overcome the problem. Moreover, job offers, internships, career counseling, and mentorship may heal such tension and frustration to the Graduates.

Cybersecurity & Protection: Cybersecurity and data protection mechanism needs to be improved to avoid bullying, vandalism, unauthorized access to confidential data, and information. Hence, to share resources, proper encryption, confidentiality, privacy, and security can be ensured to ensure cyber vandalism and unauthorized access.

Eliminating Barriers: Formulating an action plan and strategy by eliminating the barriers imposed by COVID-19 can make this digital transition a remarkable revolution in the education system in Bangladesh. Government, educational institutions can identify the barriers in the social, family, individual, infrastructural, and technical arena and take necessary initiatives to overcome them so that students can participate in an online class and other academic activities with commitment and enthusiasm. Student loans on easy terms and conditions to avail devices, technical training, improve technical expertise can be applied to overcome such barriers and problems.

Network, Data Pack, and Devices: due to the poor network, connectivity, and scarcity of devices, students can not be properly involved. Hence, the government can offer a data pack at a cheaper rate from students, special and promotional concessions for the online class, meetings, seminars, webinars, etc. Moreover, as a part of infrastructural development, the network of rural areas can be given priority to strengthening.

b) Avenue for Future Research

COVID-19 undoubtedly has a long-term impact and negative consequences on the education system in Bangladesh. To be benefitted from such an educational transition in this new normal period, there is no alternative to gain advancement in information systems and technology. Hence, the researcher can explore the arena of how information technology, artificial

intelligence (AI), can be applied effectively to formulate strategy and design a better education system by fostering digitalization.

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Embedded Neoliberalism: The Public Policy of the Inequality Regime

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Abstract- This manuscript presents an overview of Brazil's "embedded neoliberalism", a peculiar form of integration, mediated by the state, of a national economy to the global financial markets. The analysis highlights the policy making cases of worker's pension funds and affirmative action. In this effort, the manuscript provides a broader view on the role of discourse coalitions in policy making, arguing that overarching "cultural wars" are often framed as economic debates and their outcome can guide policy action in their aftermath. In this effort it is also proposed a theoretical bridge linking the literatures of public policy and economics, arguing that mainstream economic discourses influence the policy process in all policy subsystems.

Keywords: *embedded neoliberalism, policy process, economic discourse, inequality regime.*

GJMBR-A Classification: *JEL Code: M10*



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I. INTRODUCTION

Referring to the political-economic organization of the post-Bretton Woods agreements, David Harvey (2005) calls it "embedded liberalism". It was a polity framework where "market processes and entrepreneurial and corporate activities were surrounded by a web of social and political constraints and a regulatory environment that sometimes restrained but in other instances led the way in economic and industrial strategy" (Harvey, 2005, p. 11). This polity frame delivered satisfying economic outputs and maintained social tensions relatively under control during the 1950's and 1960's in the advanced capitalist countries, while much of the third world remained on the sidelines of economic, political and social developments.

In following decades, the neoliberal turn transformed the broader setting of politics and policymaking. Led by the US and UK, much of the globalized world engaged in political reforms and a broad reorientation of policy design that sought to turn the state into an entrepreneurial, market-enabling agent. These developments were - and still are - far reaching, with neoliberal reforms taking place across multiple decades and at distant places such as Chile and Iceland, Argentina and Iraq, Mexico and Thailand. The principles of free market capitalism and supply side

economics were turned into common sense to a point where even traditional social-democratic states and left-leaning governments were swept by the neoliberal tide. Among these, Brazil in the early twenty first century is an especially interesting case, with its paradoxical setup that enabled the parallel developments of integration - and submission - to global financial markets, and of a peculiar form of state bureaucracy that entangled social, labour and minorities participation in the web of financialization that is characteristic of contemporary neoliberal states. Therefore, in this manuscript I will present an overview of this form of "embedded neoliberalism" that was enacted in Brazil, highlighting the policy making cases of worker's pension funds and affirmative action. This effort will provide a broader view on the main theoretical dimensions that I seek to explore: The role of discourse coalitions in policy making, and the claim that overarching "cultural wars" are often framed as economic debates and their outcome can guide policy action in their aftermath. In this effort I also attempt to bridge the literatures of public policy and economics, arguing that mainstream economic discourses influence the policy process in all policy subsystems. Beyond this introduction, the manuscript is composed of: a summary of social processes and policy making cases that consolidated the model of embedded neoliberalism enacted in Brazil; a broader outlook on the cultural and political processes that constitute the complex scenario of contemporary politics, where conventional left-right electoral cleavages have been modified and the lines of traditional political ideologies have been blurred by the all-encompassing influence of the neoliberal rationale; a description of the influence of mainstream economic discourse in the policy process; and the following conclusions.

II. EMBEDDED NEOLIBERALISM: CONQUERING THE CULTURAL WARS

During the decades of successful embedded liberalism in the advanced capitalist countries, Brazil was in its third phase of integration to the global movements of capitalist accumulation. In the 1950's the conditions for accumulation in the centre were diminishing and Latin America was turned into a cherished new market for elite capitalists that looked for new spatial fixes for the crises of over accumulation. Due to its wide territorial dimension and massive

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population, Brazil was the paradigmatic case in this movement, which created opportunities for the national economy to gain autonomy by exploring the influx of resources from the centre. However, in 1964 a military coup reoriented the political sphere, and from the late 1960's on and especially in the early 1970's with the collapse of Bretton Woods, the economic sphere was subject to significant transformations as well, with the very early stages of the process that would come to be known as financialization (Paulani, 2012). Since then, accumulation processes have been guided by a financial framework, which is either fully embraced by center-right governments or covertly accepted by their left leaning counterparts. From 2003-2016 Brazil was governed by the Workers' Party ("*Partido dos Trabalhadores*", or "PT"), one of the biggest left-wing parties in the world. This would have been a time of great transformations, restoration of labour and social power, regulation of capital flows and overall retrenchment of neoliberal policies, right?

Wrong. The 2000's were the time of consolidation of Brazil's position in global financialized capitalism, with the PT administrations leading a peculiar form of "embedded neoliberalism", characterized by the inclusion of the national economy in the global market, with mediation by the state (Datz, 2014). In its tenure, PT recognized social movements and minorities' demands in a discursive dimension, with timid advancements in actual policy making, while it failed to produce relevant structural changes in the distributive dimension. The Brazilian case is singled out by Piketty (2020) as a specially interesting one, "(in which we see) a classist party system emerging in the period 1989–2018 with important consequences for redistribution and significant interactions with other parts of the world" (Piketty, 2020, p. 953). Piketty highlights PT's successful efforts in reducing inequality but stresses that this was accomplished fully at the expense of the middle class. Social tensions were kept relatively under control during three Presidential terms (2003-2014), however, with the close results of the 2014 presidential elections, disgruntled elite segments, with the backing of conservative politicians, especially congressmen connected to the evangelical and the agribusiness caucuses, and of a global network of libertarian and neoliberal institutes that supported and financed urban manifestations, started to undermine then-President Dilma Rousseff's administration.

Most analysts will agree that the decisive variable in Brazil's remarkable economic performance in the 2000's was external i.e. the Chinese commodity boom. However, PT's strategic handling of social tensions¹ was fundamental in the domestic front, where

the Workers' Party built a close relationship with international capital while upholding its front in identity politics and in policy efforts to tackle inequality and thus managed to maintain its distinctive blend of "embedded neoliberalism". Minorities stakeholders were kept at bay due to the recognition of their political demands, including creation of a Special Secretariat of Racial Equality Policies in the Executive and approval of relevant affirmative action laws in public universities and public tenders, while labour power and the middle class were persuaded into buying into the mantra of the "domestication of capitalism" through "socially responsible investments" backed by workers' pension funds. This was accomplished in a noteworthy process of conquest of ideological struggles, whose results defined the establishment and stabilization of the cultural framework that enabled embedded neoliberalism (Datz, 2014; Grun, 2013; Jardim, 2009).

The idea of "cultural wars" is more prominent in the United States and refers to broad, society-wide ideological disputes over culturally divisive, politically secondary issues (Hartman, 2015). In the US these disputes derived mainly from the polarization of the American multi party system into a strict head-to-head battle between Republican "conservatives" and Democrat "progressives". The term is not as widely applied in Brazil, however, it was utilized in the Economic Sociology field, especially by Grun (2003; 2005; 2010; 2013) in a series of articles where he argued that the stabilization of the hegemony of the financial market in Brazil was built from the conquest of cultural definitions about the role of finances in the daily life of the common citizen. Taking advantage of its organic, close ties to labour and unions, PT conquered the minds of union leaders and other labour representatives in the contest for the definition of the image of financial products and services towards working and middle classes. Most decisively, workers' pension funds were turned into agents of national development as a whole stratum of the population was convinced of the narrative of the "socially responsible" market applications backed by the massive funds of aggregated individual savings of unionized workers. Radical segments of the left and within PT, as well as critic scholars, voiced their concern and disappointment with the Workers' Party deference to the financial establishment (Dagnino, 2004; Paulani, 2008), however the notable results in reducing inequality, the massive popularity of President Lula (2003-2010) and his apparent success in avoiding short-term damage from the global financial crisis of 2008 provided PT with carte blanche to enact its singular blend of redistributive policy making, minorities recognition, financial global insertion and compliance to the interest of political, financial and agrarian elites. The cultural wars were won by convincing the common citizenry of their capacity and responsibility as individual players in finances and

¹ PT's handling of political tensions is a relevant part of this process as well, however it is not in the scope of this manuscript to approach it.

of the role of their aggregated pensions as collective players in national development.

Pension funds were constructed as financiers of large infrastructure governmental projects in enactment of PT's agenda and became participants of the process of "domestication of capitalism". These funds' structure in Brazil took a hybrid form, combining aspects of international corporate governance with characteristics of the public bureaucracy inherited from times that preceded the organization of domestic funds. This structure accommodates a gray area where representatives of the public and private sphere co-exist, and the funds performed a specific role in the cultural wars, underscoring their role in the argumentative struggle over the image of the financial market, in a setting where a political party organically linked to labour and unions navigates in a process that at the same times seeks to insert the national economy in the globalized market and to perform social inclusion through redistributive public policies. This intricate process underpins the resilience and adaptability of neoliberalism, always able to fluidly insert itself into different spatial, temporal, political and geographical settings, giving here, taking there, possibly and conveniently conceding space to recognition initiatives, in accordance to historical and political peculiarities of each locality, but always performing the most relevant prescriptions of its political-economic framework.

Economic Sociology scholars in Brazil have explored the intricacies and overall complexity of this scenario, especially in identifying the role of the pension funds in the national economy and the relevance of this theme to analyses about agency, cultural domination, participation and symbolic power, among others (Datz, 2013; 2014; Jardim, 2009; Magnani, Jardim & Silva, 2020). In this form of developmentalism, pension fund beneficiaries, most often middle class constituency, can afford to feel like agents of national development and simultaneously earn advantages over those fellow countrymen insured by the General Social Security System, a dynamic that greatly contributes to the erosion of the social solidarities that provide the rationality for redistributive public policies. In broader terms, the narrowing of the notion of sameness in contemporary societies is an effective strategy of attacks on the Welfare State, contributing to a general setting of competition among citizens, which is especially destructive in times of economic crises, when redistributive policies become easy targets. Disembedded from the broader debate about the capitalist social-economic order, identity politics becomes a site for a lose-lose game in which minorities, labour and other social movements fight for little pieces of pie, for being able to "lean in" into the capitalist order, without acting as a broader collectivity against the commercial, financial and political elites that draw the rules of the game in their own favor. Such a background

was imposed upon Brazilian policy making in the times of embedded neoliberalism, even in the cases of the necessary but insufficient affirmative action policies enacted by PT. While the pension funds setup was in part a small nod to the middle class in the realm of distribution, affirmative action policies in civil service jobs and in higher education were a great accomplishment for minorities in the realm of recognition. However, to better analyze and attempt to comprehend the role and effectiveness of affirmative action policies towards their stated societal goals, we must pay special attention to the analytical dimensions of distribution and recognition in public policy making.

Affirmative action policies in Brazil were constructed in a long term struggle of the black social movement, which managed for the first time to gain recognition of its historical demands in the Federal Constitution of 1988. However, it was only during the PT administration that ethnic-racial minorities were actually accepted into the government structure, most decisively with creation of the Special Secretariat of Racial Equality Policies in 2003. Starting in the early 2000's, different universities across the country started to create racial quota programs in their entrance systems, which sparked great national controversy. In this first stage of implementation, policies were autonomous and each university adopted its own criteria, all encountering harsh criticism from opponents who stressed three main arguments: criticism to focalized policies, arguing that the better response to inequality would be universal public policies in primary education; defense of the "racial democracy" narrative, arguing that due to the fluidity of racial mixes in Brazil and to the supposedly harmonic integration of different races to society, it would be impossible to identify the target population of affirmative action policies; defense of meritocracy, arguing that universities must be the locus of academic excellence and that granting special entrance criteria for a specific group would be unfair to other groups (Feres Jr., 2004). Eventually, in 2012 a federal law was approved instituting a broader affirmative action policy in all federal public universities for undergraduate application; in 2014, another federal law was approved, implementing affirmative action policy in civil service entrance examinations (i.e. "public tenders").

Both policies encounter significant constraints to their effectiveness in meeting their stated goal of attacking inequality. In the case of undergraduate applications, the law reserves at least 50% of entrances for students from public schools, with a secondary ethnic-racial cut to be defined in accordance to each region's census results, but in most cases the share of the secondary ethnic-racial cut is set at 50% of the initial socioeconomic cut. The policy design and the institutional void in which these policies are to be implemented, with several unregulated procedures and significant discretion at the local level, point to an

encompassing setting where recognition is granted to minorities in generic rhetoric, but specific means to meet their demands are approached in lackluster fashion. The design of the quotas program strategically included among beneficiaries the great mass of white poor that could oppose a racial policy, even though the decades-long struggle for affirmative action was always led by the black social movement. Specific measures to ensure access to the target population were allocated to the local level without regulation, therefore the specification of the policy design is left to each university, potentially constrained by specific local pressures and influences. In the first years of the programme, black students groups identified that the physical presence of black undergraduates remained scarce and upon investigation of public data, several accusations of frauds in the access to the racial quotas were filed to public law agencies. Only after these conflictive events, it became more widespread the institutionalization of hetero-identification committees where knowledgeable third parties perform identification of the racial condition declared by the candidates² (Maciel, Teixeira & Santos, 2019; Nunes, 2018; 2019; Passos, 2019). The activity of these committees and the playing up of controversies arousing from the few cases where racial identification is at the overlap between mixed races are objects of intense debates, often defined by subtle narratives emanating from economic discourse. Meritocracy and individual liberty are preferred themes of affirmative action opponents, including a Law Proposal currently in transit in Congress, which seeks to prohibit hetero-identification in universities.

As for the racial quotas in public tenders, the general outlook is similar. The law reserves at least 20% of entrances in all public tenders for jobs in the Public Administration for black candidates, however, due to the specifications of each hiring procedure, e.g. when different departments are hiring faculty with specific qualifications, both the minimum share of entrances and the several entry barriers along the process continue to restrain access to black applicants. Analyzing data from over three and a half years, totaling over 15,000 vacancies, Mello and Resende (2018) conclude that less than 5% are being allocated to black people. Corroborating this indicative, Batista and Mastrodi (2020) state that the law is timid in promoting access of black people to the ranks of Public Administration and that it remains insufficient against a broad setting of

structural racism and strict meritocracy standards in civil service exams.

III. JUSTIFYING INEQUALITY: THE POLITICS OF THE INEQUALITY REGIME

The case of affirmative action policies in Brazil is especially interesting in light of Piketty's (2020) recent argument about the development of parallel educational cleavages in political conflict across Western democracies. In lieu of the more common narrative that racial and identity cleavages rooted in the 1960's civil rights struggle determined the mass flight of low income³ whites from the ranks of the Democratic Party (DP), Piketty argues that rather an educational cleavage is the more determinant factor, with the DP since the 1950's turning from a strongly egalitarian platform into primarily "serving the interests of the winners in the educational competition" (Piketty, 2020, pp. 833). Piketty (2020) demonstrates that similar turns have occurred across most Western democracies, configuring a large scale reversal of the educational cleavage in politics: political coalitions associated with labour and low income classes in the post-war period became the parties of the highly educated in the late twentieth and early twenty-first centuries. At the same time, political participation among low income classes has dropped significantly, therefore their allegiance has not simply been reversed. Rather, as the interests of the highly educated and of the highly paid and wealthy have converged in social and fiscal policies, lower classes have been excluded from playing a significant role in political conflict. In times of irremediable crises such as in the aftermath of the 2008 financial crisis, their despair and hopelessness is then leveraged into playing up identity politics, which further explores their depoliticization and protects deeper debates about the capitalist order as a whole.

Piketty (2020) also analyzes new dimensions of political conflict in underdeveloped countries (India and Brazil), identifying somewhat different dynamics. In Brazil specifically, the slight majority of the lower classes have continued to vote left in the presidential elections of the most recent democratic era (1989-2018), however we must focus on the broader claim arguing that a similar movement across the Western world, cutting across different places with distinct individual historical contexts, points to a major, relevant historical trend: Left leaning political parties, loosely labeled here as "social-democrat coalitions", have failed to adapt to the demands and interests of their traditional constituencies, the lower income classes. Without political representation, significant shares of these classes -

² Unlike the "one drop rule" in the US, or the relatively more easily identifiable ethnic inheritance that characterizes identitarian issues in Europe, due to the fluidity of racial definitions in Brazil, the target population of racial-based affirmative action policies must be identified according to their standing in social relations. The most relevant variable in this definition is that of phenotype, due to the widely accepted interpretation that racism in Brazil is defined by the presence of visible racial features.

³ In order to avoid oversimplifications, it is worth clarifying that in this manuscript I adopt Piketty's (2020) definition of "low income" class as roughly the bottom 50% of the social hierarchy, including potentially different social groups.

composed in their majority by white working class people - have been duped into supporting national-populist coalitions that exploit ethnic and racial tensions and do not represent their interests in political conflict over decisive issues such as fiscal policy and labour regulation.

The exploitation of identity politics against the failure of contemporary capitalism constitutes the "identitarian trap" in political conflict. While the financialized global capitalist economy erodes the very background foundations - social reproduction, nature and public power - on which the economic order relies on to exist (Fraser, 2015), social-democratic coalitions across the globe have failed to redesign their redistributive thinking in order to meet contemporary challenges of the global economy. Lower class constituencies undermined by financial capitalism are thus left without political representation in the struggle for distribution and their support remains up for grabs in struggles for recognition. It is mostly by playing up nationalistic rhetoric (and variants of it) that right wing parties have gained low income classes support, while even redistributive initiatives such as affirmative action policies in Brazil, enacted by a social-democrat coalition not entirely concerned with promoting structural changes in distribution, come up short to produce relevant structural changes in distribution of resources and opportunities.

The common denominator that binds together the cases of pension fund developmentalism and affirmative action policies in Brazil is the backdrop of an all-encompassing political-economic discourse ruling over the policy process and guiding policy design and implementation against publicized public goals. This is allowed in part because political conflict in the last thirty years approximately has turned from a struggle of classes in the social-democracy era (roughly 1950-1980), to a struggle among elites in the hyper capitalist era (1990-2020) - the left leaning highly educated against the right leaning highly wealthy (Piketty, 2020). The collapse of working class support for left wing parties has been well documented, indicating the failure of social-democrats and their counterparts in continuing to represent those who most substantially filled their ranks in the post-war setting. The educational cleavage underscored by Piketty (2020) is a more comprehensive finding that indicates a general trend, which has been constant and well defined across different localities with distinctively different historical, political and social settings, over a remarkably long timeframe. It is argued here that these trends are coherent with the main claim presented in this manuscript: Besides specific neoliberal *policies*, a neoliberal *approach* to policy making influences policy formulation in all subsystems, independently of the ruling coalition, which, in part, accounts for the flight of underprivileged classes from left-wing parties. The inequality regime does not have to

rely on holding key governmental offices or on being represented by a specific coalition. Its economic discourse rules over democratic politics, which is most clearly represented by the global trend of providing "independence" to national central banks, which frees them from democratic controls, so they can be controlled by the market. The erosion of the traditional right-left ideological disputes in favor of a struggle among elites undermines resistance against this economic status quo.

To be clear: identity issues such as racial conflicts were not determinant causes of the reversal of the educational cleavage. These issues are, however, commonly exploited by political coalitions that endorse conservative rhetoric, in most cases strategically conflating the themes of free market, individual liberty and meritocracy - which are linked in political discourse to coalitions that reject egalitarianism - with nationalistic rhetoric. Piketty (2020) underscores that conservative parties do not necessarily always deny economic support to low income people, as is the case of the Justice Party in Poland or the conservative-nationalist Fidesz party in Hungary, both engaged in "social nativism" i.e. the "identitarian trap", and both having enacted redistributive fiscal and social policies in favor of low income families, unemployed labour and retirees. These national-populist parties are an expression of a relatively new phenomenon, unconnected to the reversal of the educational cleavage that has been ongoing for a much longer time. The unifying theme among those parties' strategies is the exploitation of ethnic tensions for political purposes, very often conflating the political demands of minorities with a "globalist" agenda that supposedly seeks to restrict the freedom and resources of the "common people" - most of them blue-collar, white labour - in favor of a cultural and political "elite" - among them, the highly educated that now constitute the bulk of the electorate of the left wing parties. Therefore, in the eyes of the working class, the perceived contenders that defy the corporate powers of globalization, which account for most of their struggles, are the national-populist parties that exploit social nativism.

The electoral effectiveness of the new national-populist coalitions can be attributed to the basic human need to justify social inequalities. With social-democrat coalitions failing to adapt to the late-twentieth century transformations in the global economy, those masses most affected by these changes were left without representation in political conflict and increasingly pushed to individualism by neoliberal rhetoric. Much of their allegiance has been then gained by national-populist coalitions that drum up cries of a "fight against the system", without engaging in actual efforts to change the status quo imposed by the commercial, financial and political elites. In some cases, Brazil one of the most notorious among them, the national-populist

coalition that emerged victorious from the 2018 Presidential elections included card-carrying neoliberals, however if one examines thoroughly the ideals and motivations of the national-populists engaged in social nativism and cultural struggles above all else, it is evident that they differ substantially from the rational-utilitarian ideology of the neoliberals⁴. Identifying these inner contradictions is key to building a viable political opposition, as well as it is relevant from an academic point of view, as to provide analytical tools to comprehend these political movements and place them under conceptual frames. While the claim of an all-encompassing influence of neoliberalism in policy making might lead to infer that the main argument here implies a sustained hegemony of the neoliberal rationale, I am most concerned with the influence of political-economic discourse on the policy process. Therefore, Piketty's definition of "inequality regime" fits into such reasoning: "a set of discourses and institutional arrangements intended to justify and structure the economic, social, and political inequalities of a given society" (Piketty, 2020, p. 2). Piketty's attention to and inclusion of discourses as a key element of an inequality regime helps drive home the point that political discourse plays a fundamental role in the politics of policy making.

Nancy Fraser (2015; 2017) has developed thorough analyses of contemporary capitalism and its influence on electoral politics, arguing that the current stage of capitalism in its economic dimension - financial capitalism - is destructive towards the background social conditions that sustain capitalism as an institutionalized social order. This fundamental contradiction has contributed to inciting an administration crisis that puts in jeopardy the hegemony of neoliberalism as a rationale, creating a hegemonic void that the political coalitions then attempt to fill. In this case, Fraser (2015) refers to hegemony in the gramscian sense, as in naturalizing a determined set of beliefs and ideas to the point where they are seen as common sense. In this manner, neoliberalism is widely criticized and may be substantially threatened; we are concerned here with the hegemony of neoliberalism as a specific mode of political-economic organization, which remains intact across the globalized world, for the time being⁵.

The rise of national-populist coalitions is a sign of the instability of the current political framework. The observation that these coalitions' romanticize traditional values and defer (most often in discourse only) to working classes victimized by the openness of global

markets, and thus do not fully share rationales with neoliberal theory, coupled with the observation that social-democrat coalitions have failed to adapt their policies and rhetoric to the current historical moment, adds complexity to the scenario. A potential contribution of the policy studies to provide comprehension of this setting could be the proposition of a systematic outlook on the role of economic discourse in the policy process, which could shed light on the influence that the field of economics and the actors emanating from it play on democracy. In the next section, I will attempt to wrap up the main argument of this manuscript, proposing a closer dialogue between economics and the policy studies.

IV. THE INEQUALITY REGIME AND THE POLICY PROCESS

The fields of economics and public policy share some common developments such as Aaron Wildavsky's lifelong work on national budgets, however, even though the policy sciences draw contributions from economics in their multidisciplinary approach, they have been largely developed outside of each other. Economics tends to view public policy as the result of a technical process, most often accruing from cost-benefit analysis. Public policy tends to view economics as a given framework, *after* which policy processes will play out, and whose conceptual and analytical tools are applied in policy analyses but are not questioned in terms of their normative value. In this subsection I will build the claim that the background defined by a certain economic discourse is often embedded in the pre-decisional stages of the policy process, subsequently affecting policy making in all fields.

An early outline of the policy process was the stages approach (de Leon, 1999), which focused on the policy cycle, a sequence of linear stages whose assessment and analysis would enable comprehension of the process. Although its effectiveness at accounting for the intricacies of the policy process has been criticized, and definition of the stages differ, most accounts concur that basic stages are formulation, implementation and evaluation. In a seminal article for the Brazilian public policy field, while acknowledging that these three "major" phases are the common base for the stages approach, Frey (2000) argues in favor of further sophistication, proposing that formulation comprehends different processes of problem definition, agenda setting and specification of alternatives of specific programs. It is in these sub stages that the confluence of broader economic discourse and policy making might occur with most relevant consequences.

The policy cycle is often theoretically connected to a positivist, technocratic orientation to policy analysis, however, if we acknowledge the strengths and weaknesses of the stages approach then we can draw

⁴ For a comprehensive work on the contradictions between the rationales involved in national-populist coalitions, see Brown (2006).

⁵ For a commentary on the possible demise of neoliberalism in face of current events such as the coronavirus pandemic, see Rugitsky (2020).

benefits from the growth of insight that can be accrued from analyses of the distinctive characteristics of each individual stage of the policy process. The cycle is most often depicted as the rough outline in Figure 1, with specification of the formulation stage in Figure 2. Because policy analysis is traditionally confined to a given subsystem, unless the subsystem analyzed is economics itself, inputs from economics are not strongly considered. The main argument proposed here is that the policy process is substantially influenced by economics when problem definition, agenda setting and specification of alternatives are narrowed down to a pre-defined set of policies and alternatives accepted by the financial market.

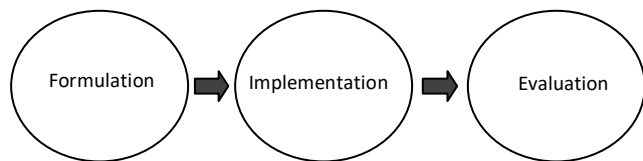


Figure 1: The conventional policy cycle.

One of the main proponents of an approximation between policy analysis and economics was Aaron Wildavsky, whose lifelong work on the study of budgetary process went a long way in shedding new lights on governmental budgets, how they are constructed, and how little of what is written in them is actually implemented in actual policies, thus showcasing an important restraint to rationality in policy making. Other relevant attempts at bridging the fields of economics and public policy have been made in Smith's (2006) and Wolff and Haubrich's (2006) chapters on Moran, Rein and Goodin's Oxford Handbook of Public Policy (2006). Wolff and Haubrich (2006) explore strengths and weaknesses of an economist approach to public policy making, describing common problems in integration of concepts of economics to the study of policy making, such as valuation, commensurability and the intrinsic value problems. Smith (2006) presents and describes conceptual and analytical tools from economics that are fundamental parts of the policy analyst repertoire.

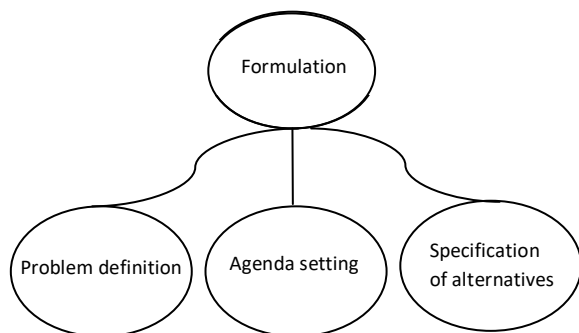


Figure 2: Specification of the formulation stage, with contributions from Frey (2000), Kingdon ([1984]2014) and Stone (1989).

An important constraint to a more thorough integration among these fields is that policy analysis holds an inherent concern with the intangible good of welfare. Application of cost-benefit analysis and variations of it are likely to encounter the problems of valuation, commensurability, and of assigning economic meaning to goods that hold intrinsic value, such as life or nature. The most basic problem is the valuation problem, which is the reduction of important values to societal well-being to a monetary metric. Several efforts have been made to address the issue of accurate estimation of the value of services that are not negotiated in a marketplace, with the "contingent valuation" (CV) approach being the most popular of these. CV techniques usually employ surveys that attempt to measure human preferences and behavior in experimental settings, seeking to identify the hypothetical price of a common good that is not traded as a commodity, however, conventional economic theories hold that these experiments are inherently flawed in trying to replicate market behavior, which can only be assessed with reliability in an actual marketplace (Wolff & Haubrich's, 2006).

If the value of intangible goods and specific economic behavior are unlikely to be accurately measured, the influence of a general economic framework in public policy can easily be felt. In one of the most influential works in the field of public policy, Kingdon ([1984]2014) argued that policy interventions are continuously discussed, over relatively long periods, in a "policy community" where "ideas float around". Different stakeholders such as elected politicians, policy makers, bureaucrats, scientists and scholars, journalists and all kinds of public personalities, all involved in a given policy area, present, discuss, test, combine and recombine their ideas and proposals, until the time when finally a viable policy proposal has been accepted within that community. This is the "policy stream" in Kingdon's Multiple Streams Approach. When events in the streams of perceived public problems and of politics converge, if there is a viable policy proposal developed in the policy stream, then it can be presented to a decision making body and possibly approved as a public policy. Among indicators of survival of a policy proposal within the community, Kingdon highlights the issue of the cost of the policy - whether it is a tolerable cost or not (Kingdon, 2014, pp. 137-138). "One of these tests is a budget constraint. Members of a policy community know that somewhere along the line a proposal must be shown to have a tolerable cost, at least a tolerable cost to the federal budget. So they spend untold hours costing out proposals, paring them down to manageable proportions, and floating the slimmed-down version again. If they cannot come up with a proposal that is financially acceptable, the idea may be dropped. (...) Some proposals never really see

the light of day because of anticipated cost" (Kingdon, 2014, p. 138).

Kingdon (2014) underscores the role of the mainstream thinking among the specialists of a given community and offers practical insight into the obvious relation between these values and the views emanating from them on concepts such as equity and efficiency and on the role of the public sector in providing social services. Writing originally in the mid-1980's, Kingdon underpinned the then-growing influence of economic thinking on the processes of agenda setting, especially a widespread concern with efficiency, as in whether the cost of a program fits into the available budget and whether the benefits accrued from it justify the financial cost. These concerns are obviously tied to and restrained by the political economic framework that orientates the broader inequality regime. Since the late 1970's with movements starting in the capitalist centre, which spilled to the most diverse localities, the hegemonic economic thinking is that arising out of neoliberalism, which, in a very simplified way of putting it, advocates the theory of instrumental rationality, according to which individuals are selfish in nature and thus collective interests cannot be accurately identified. Therefore the state is inherently inefficient at identifying and addressing public needs and thus the most efficient alternative is to distribute resources and opportunities through the market. This rationality obviously has implications towards the justification of the inequality regime, with consequences in the economic polity and in the definitions of the budgets that are constructed within economics and that constrain the processes across all policy communities.

One of the main innovations of Kingdon's Multiple Streams Approach was to acknowledge the role of ambiguity and uncertainty in a process that was supposed to be rational according to mainstream policy analysis, specifically shattering the notion of linearity in the policy process. He did, however, touch on the theme of the stages, in the first pages of his seminal "Agendas, alternatives and public policies" (1984). Outlining concepts and definitions utilized in the book, Kingdon defined public policy making as a "set of processes" (not necessarily a sequence of stages), including agenda setting and specification of alternatives from which a choice is to be made (pp. 2-3). He did not specify the process of problem definition, however his agenda setting approach is comprehensive enough to include what other authors refer to as problem definition, more specifically, Stone (1989), who cites Kingdon (1984) as an example of a study on "the conversion of difficulties into problems" (Stone, 1989, p. 281). Therefore, drawing contributions from different authors, in this manuscript I present a specified look on the formulation stage of the policy process, highlighting the influence of economic discourse (Figure 3).

Problem definition is a fundamental initial movement, when, out of all the issues that could be considered for a public policy, some are recognized as public problems amenable to intervention. This framing process is performed in narratives that highlight selected aspects of perceived reality and make them more salient than others, enticing a particular causal interpretation or a moral evaluation (Stone, 2012). For instance, the issue of inequality is often framed by conservatives as a natural condition emanating out of individual human aptitudes, while others define it as an unacceptable condition caused by the distribution of access to the means of production, among different definitions. In our current inequality regime dominated by a neoliberal political-economic framework, inequality is defined as a market problem. It is recognized as an unwanted condition, however, with the widespread impact of influential books such as "Losing Ground" by Charles Murray (1984) and "Wealth and Poverty" by George Gilder ([1981] 2012), inequality tends to be framed as an unintended consequence of welfare state policies that supposedly engrained in the poor a sense of entitlement to assistance and laziness to search for better alternatives in the marketplace. The storyline incites the causal mechanism of the inadvertent cause, which stresses that unintended consequences of purposeful actions might lead to a perverse effect: Welfare state policies that sought to attack the issue of poverty caused a worsening of the scenario of inequality, because the beneficiaries of these policies become accustomed to gain assistance from the government and lose motivation to act in the market. Inequality is justified by blaming the victims. Under this rationale, social policy initiatives are reduced to a narrowed set where assistance and welfare are restricted and several issues will be denied the status of recognized public problems, either because the issue itself is not considered important (e.g. the issue of homeless people tends to be ignored by most governments) or because there is not a viable solution in sight (e.g. Kingdon ([1984]2014) cites health care in the US as such a case; in other areas the influence is present as well, such as in the case of polluted rivers in underdeveloped localities: because trying to fix the problem is not considered a cost-efficient alternative, governments tend to give up on it).

The way a problem is defined will guide which policy community will address it and the policymaking process within that community will result in a list of subjects that might be considered by decision makers. It is worth underscoring that the definition of the problem will have by then excluded a wide set of possible initiatives that are not considered by the inequality regime. Within the policy community, researchers, congressional staffers, interest groups and several other stakeholders will float their ideas, draft papers, talk to the press, test new themes, discuss with politicians, in

the process that Kingdon (2014) relates to the biological process of the "primeval soup": "Ideas confront one another (much as molecules bumped into one another) and combine with one another in various ways" (p. 117). New proposals are tested and old ones are redrafted. Among the criteria for survival, financial acceptability and budget constraints are crucial. Here I refer to financial acceptability as the congruence of the proposal to the economic framework of the inequality regime. The government is considered inherently inefficient. Budgets are to be reduced at all costs. Indebted countries are shaken down by the financial markets and forced to "structural adjustments" where social policies are the first targets. In this setting, the list of subjects to which the government pays attention is restricted to the narrow set accepted by the market. In this setting, the definition of the problem and the inner works of the policy community converge to create a built-in mechanism where proposals that do not meet budget constraints will never even see the light of the day. Therefore, the governmental agenda will only include subjects that are in line with the economic discourse of the inequality regime.

Finally, when, out of the list of subjects that are considered, specific alternatives will be narrowed down to a possible decision and the final policy design will be defined, policy proposals that are not accepted by the inequality regime will have been long denied. Under specific historical conditions, whether because a radical party rose to power, or because a young democracy is eager for welfare policies, a "rogue" state might approve an unorthodox policy, but the checks and balances of the inequality regime and the wrath of the market are ubiquitous. The threat of the flight of capitals is constant. Exchange and interest rates are affected by global dynamics that cannot be controlled within the jurisdiction of a given democracy. Policy design tends to be defined by cost-benefit analyses, with the conversion of welfare needs into market goods and the concepts of "costs" and "benefits" defined by the market. Unemployment might not be such a high cost, because the market prioritizes "entrepreneurship". Even if welfare policies are considered, governmental outreach to the poor, for instance, is likely to be avoided. In the case of affirmative action policies in Brazil, social pressure apparently avoided the inequality regime across the policy process, however the policy design, the regulatory gaps, and the institutional racism restrain the fulfillment of the publicized goals, while in the case of the pension funds setup, the rationale of the inequality regime defined the unfolding of the whole process. Workers' funds were designed as market tools to enable the erosion of social solidarities, facilitating social security reforms (gradual reforms in social security policy have been made in Brazil since the early 2000's, with a more comprehensive reform being accomplished

in 2019), and to incorporate the ideal of corporate governance in the country.

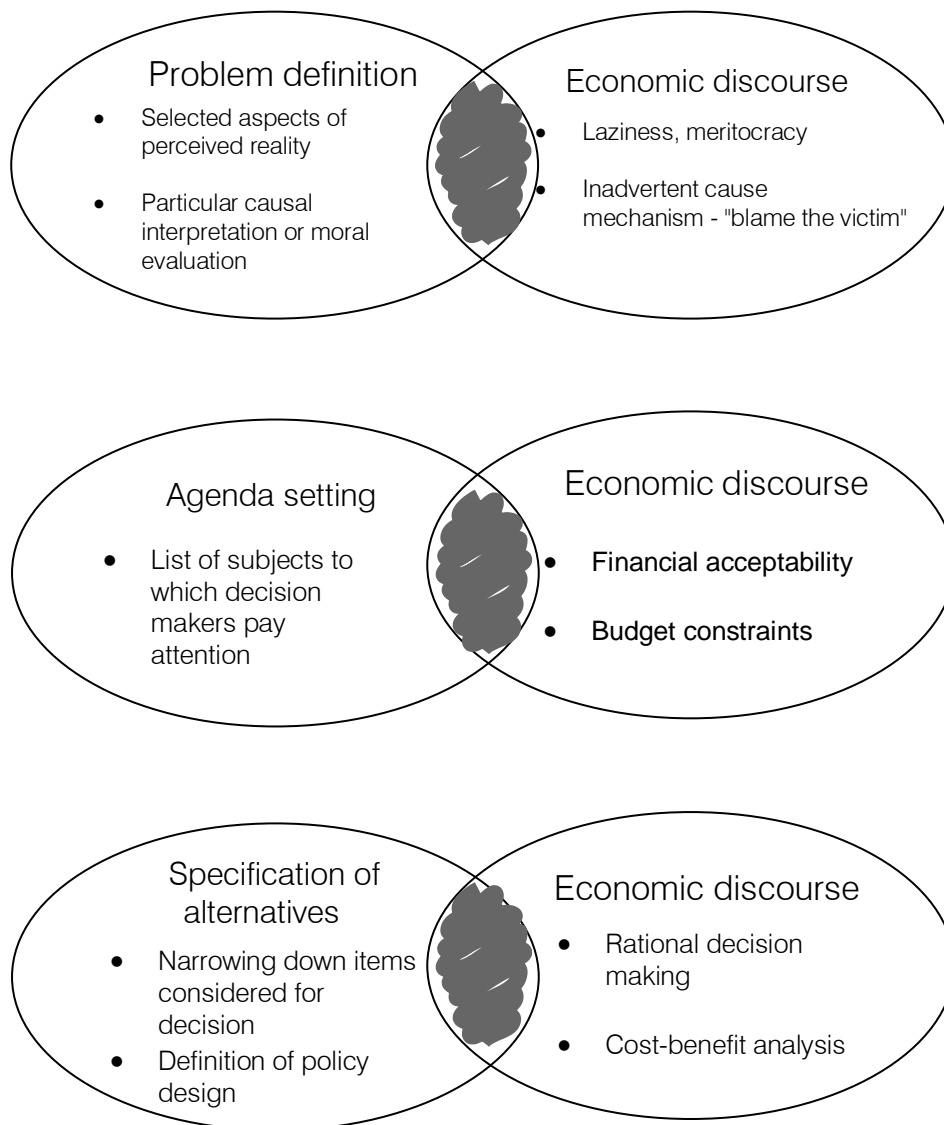


Figure 3: Zooming in on the formulation stage. The scribbled areas indicate the confluence between economic discourse and the policy process.

The role of the financial rationale in the discourse enacted in the definition of the pension funds problem in Brazil is especially remarkable to observe. Former President Lula himself, in his first years in office (2003-2004), engaged in persuading unionists "to embrace a fresh view of the market in the face of contemporary capitalist transformations" (Datz, 2014, p. 498). The narrative portrayed pension funds as enabling agents of national development and sustained that pension funds' investments were linked to "national interest" and offered "dignity to their participants" (Datz, 2014). Previously, in midst of a presidential race where the financial market grew tense with the prospects of former union-leader, "left wing radical" Lula winning, the then-candidate issued an "open letter to Brazilians" – it was actually a message to the market – in which he compromised into following obligations previously

accepted by President Fernando Henrique Cardoso towards financial markets and the IMF. Also during the campaign Lula visited the São Paulo stock market (BOVESPA) and advocated for the "popularization of the market", which was such a symbolic occasion, it was dubbed by the media "the fall of the Berlin Wall". The unifying conduit to these events was Lula and PT's project of appeasing the market, an inherently capital-friendly endeavor that was coloured with drops of social rhetoric that promised to include lower income constituency into the world of finances. It was the "domestication" or "moralization" of capitalism (Jardim, 2009).

The broader analytical backdrop highlighted here is the influence of economic discourse in policy making. Whether it is the definition of workers' pension funds' role in the national economy or the design of

affirmative action policies, a broader political-economic framework is embedded into the policy process and policy alternatives are narrowed to a set of possibilities defined by the outlook of the economic polity. The policy process itself is constrained by the politics of the inequality regime, which mobilizes transcendental themes, freedom and individual liberty above all, in persuading low income and middle classes into supporting policies that benefit the elites only.

V. CONCLUSION

The main theme of this manuscript was the role of an all-encompassing economic discourse in processes of policy making that are not clearly tied to economics at the outset, but that are influenced by definitions from economics. The case of Brazilian “embedded neoliberalism” was highlighted as a relevant example of the influence of a rationale defined by the financial market in contemporary political dynamics where traditional ideological conflicts are blurred and right-left cleavages are modified in favor of an elite-friendly political-economic framework. The processes of definition of this rationale constitute the enactment of “cultural wars” where financial products and services are framed as a favorable daily presence in the lives of the common citizen.

The economic discourse that justifies inequalities is strategically built, inciting causal mechanisms and moral evaluations that move public debates to culturally divisive, politically secondary issues, and away from the limitations of contemporary capitalism. In Brazil specifically, it is worth noting that the enactment of such discourse can be seen as a public policy in itself. In face of ubiquitous inequality and ongoing economic crises that have much to do with the role accepted by different national governments in the global market and with macroeconomic themes such as interest rates and fiscal policy, the main players of the inequality regime – elite politicians, market analysts and the media – often attribute the causes of the crises to conjunctural settings – a supposed failure to organize the national economy in acceptance to the market rationality; and affirm in unison that the solution is to enact “reforms”. Which reforms they talk about is never specified. Since approval of the 1988 Federal Constitution, market-friendly reforms in finances, social security, labour and administrative bureaucracy have been enacted, yet the recurrent crises insist to occur and the national economy fails to grow sustainably. Still, the inequality regime always refers to the much needed “reforms”. It is not a specific reform or a set of reforms that the regime advocates. The discourse in favor of proverbial market-friendly reforms is the public policy in itself.

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Does the Status Quo Affect the Private Equity Investment Decisions?

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Does the Status Quo Affect the Private Equity Investment Decisions?

Oumeima Toumia ^α & Sana El Harbi ^σ

Abstract- Despite the huge literature that has been carried to investigate the determinants of the private equity market, studies examining the extent of the SQB in the private equity investments' decisions are missing. Our regressions are based on a data set that covers 24 OECD members' countries from 2007 to 2015. We discovered the absence of a link between the SQB and the choice of private equity investments. However, the added value by activity, the private equity country attractiveness index, and the research & development expenditures have a significant impact on the choice of the investment sector. Thus, private equity investors are considered rational decision-makers compared to individuals. The crucial role of the status quo has been shown in many fields. Nevertheless, whether this bias affects the private equity investment decision at the country level remains unanswered by prior research.

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1. INTRODUCTION

Private equity (PE) investment had experienced a major boom in the nineties, (Gompers et al., 2016; Hung and Tsai, 2017). For instance, Hung and Tsai (2017) reported that private equity investment had grown rapidly¹ because of the boom of the venture capital in 1990, to the technology bust of 2000 to 2001, and the leveraged buyouts boom and bust in 2000. They also added that the resistance of lending standards in 2008 has caused the fall of the investments of the private equity industry. Nevertheless, it is well documented that private equity activity had a positive influence on economic development and entrepreneurship, (Bernoth and Colavecchio, 2014; Bernstein et al., 2016; Hellmann and Puri, 2000; Lerner, 2000). It positively affected the innovation by the introducing of new products, processes, or services on the market, the productivity and economic growth (i. e. to ensure the improvement of the production system, growth of high-tech start-up, development of skills that induce an effective use of existing knowledge), business dynamics and employment growth, (see, for instance, Belke et al., 2003; Engel and Keilbach, 2007; Gompers, 1994; Khan et al., 2018; Levine, 1997; Li et al., 2014;

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Milosevic, 2018; Ning et al., 2015; Puri and Zarutskie, 2012; Samila and Sorenson, 2011). Therefore, the determinants of private equity investment had received considerable attention (Bernoth and Colavecchio, 2014; Bernstein et al., 2016; Black and Gilson, 1998; Félix et al., 2013; Fenn et al., 1997; Gompers and Lerner, 1998; Precup, 2015) such as the real GDP growth, the market capitalization, the interest rate, the capital formation, the unemployment rate, the tax rate, the institutional and legal environment, the productivity index, the corruption index, the inflation rate, and the R&D expenditure.

Despite the existing literature, there is still no broad consensus on the influence of the status quo bias² on PE investments. It is important to mention that private equity investors are professionals who dedicate time to collect and analyze information before making an investment decision. For that reason, their decisions should be more rational (i.e. less affected by cognitive biases) than those of individuals. However, a review of studies undertaken looking at the existence of SQB at the institutional level (Elert et al., 2017; Freiburg and Grichnik, 2013; Fu and Li, 2014; Gaede and Meadowcroft, 2016; Kempf and Ruenzi, 2006; Kuran, 2009; Sandri et al., 2010; Tekçe et al., 2016) and the country level (Harbi and Toumia, 2020) had shown the vulnerable power of the status quo. We seek to develop a novel approach, to detect the SQB on the investment choice of PE investments across 24 countries for nine years (from 2007 to 2015) using the dynamic panel probit (respectively logit) model. In the present work, we extend the previous work of Harbi and Toumia (2020) in which they proved the existence of SQB in the venture capital industry at the country level. More precisely, we expect the presence of SQB in the private equity at the country level if the influence of the previous choice of the investment industry depends positively on the present one.

The rest of the paper is structured as follows. Section two is divided into two parts. The first part presents the determinants and criteria that influence the private equity industry. The second part investigates the impact of the status quo. Section three describes our empirical method. Section four presents the dataset and the main statistics. Section five sets out our results.

² Status quo, which is "doing nothing or maintaining one's current or previous decision" (Samuelson and Zeckhauser, 1988), caught the attention of researches in many fields (see for a review, Agnew et al., 2003; Kempf and Ruenzi, 2006; Tekçe et al., 2016)

¹ Ghai et al. (2014) stated that the private equity grew approximately 1.5% of global stock-market capitalization in 2000 compared to 3.9% in 2012.

Section six concludes the paper and explains its main implications.

II. LITERATURE REVIEW

To date, the bulk of the academic and practitioner literature focuses on the determinants of private equity decisions and their role in economic growth. Bernoth and Colavecchio (2014) affirmed that private equity includes five investment stages which are venture capital, growth capital, replacement capital, rescue/turnaround, and buyouts. The role of this mode of financing is not limited to provide financial resources, but they also added value to their companies by assisting with a variety of services. They helped in establishing strategies, providing technical and commercial advice, attracting key personnel, enhancing the design process, and developing the portfolio companies, (Bygrave and Timmons, 1992; De Clercq, et al., 2006; Gompers and Lerner, 2001; Gorman and Sahlman, 1989; Lerner, 1995; Sapienza, 1992; Schwenbacher, 2008). Bloom et al. (2015) added that private equity-owned firms have significantly welled management practices³ than other ownership groups (i. e. government, family, and privately-owned companies).

Understanding the factors which influence private equity has interested a lot of researchers. Among these factors, we state the real GDP growth, the market capitalization, the interest rate, the unemployment rate, the tax rate, and the R&D expenditure (Black and Gilson, 1998; Félix et al., 2013; Gompers and Lerner, 1998). Gompers and Lerner (1998) found that the GDP growth, interest, tax rate, and R&D expenditure are key factors in the evolution of venture capital; however, there is no relationship between the number of IPOs and the funds raised for the venture capital investments. In the same vein, Félix et al. (2013) investigated the determinants of the European private equity market for a group of 23 European countries for the period 1998-2003. They found that the GDP growth, market capitalization, the number of IPOs, the number of mergers and acquisitions (M&A), the interest, and the unemployment rate were considered as drivers of the private equity market in Europe. Contrary to Gompers and Lerner (1998), they found that R&D expenditure has no impact on private equity activity.

Given the fact that is not a broad consensus on the macroeconomic determinants of private equity investments in the Central and Eastern European countries, Bernoth and Colavecchio (2014) tried to fill this gap. They identified the determinants of private equity in Central and Eastern European and Western European countries from 2001 to 2011. They showed that economic activity, the inflation rate, equity market capitalization, unit labor costs, unemployment, the

institutional and legal environment influence the private equity activity. Precup (2015) extended previous literature by identifying the major determinants of the European private equity market. He used data on 27 European countries in his empirical panel analysis from 2000 to 2013. Among several determinants already tested in previous works (GDP growth, Market Capitalization, Interest rates, unemployment rate, Research & Development Expenditures), he included in his empirical model two variables which are productivity and corruption index. He found that the new determinants introduced in his model are relevant to explain the development of private equity in Europe. Bernstein et al., (2016) examined the impact of private equity investments on aggregate growth by using data from 20 industries in 26 nations between 1991 and 2009. They proved that total production, employment, and capital formation grow more quickly in the industries where private equity funds are active. They further added that these industries are less exposed to economic fluctuations. However, Kelly (2012) examined the drivers of private equity activity for 17 countries from 2003 to 2008 by employing a dynamic panel data framework. He distinguished between cyclical (GDP, GDP per capita, inflation rate) and structural factors (Entrepreneurial environment, Institutional environment, Taxation regimes, Labour market, Capital market) and he sheds light on the impact of both factors in spurring private equity investments.

To have an in-depth insight into the decisions of private equity firms, several researchers had analyzed the quasi-rational decision-making under risk and uncertainty by proposing several formal theories (e.g., prospect theory (Kahneman and Tversky, 1979) and regret theory (Bell, 1982)). Kahneman and Tversky (1979) had proposed the prospect theory, which is an alternative to the expected utility theory (also called Morgenstern-Von Neumann utility theory). It is a descriptive model of decision-making under risk by which the decisions made by individuals do not follow rational calculation. However, Bell's (1982) regret theory announced that an individual may recognize by observing the relevant outcomes that another alternative would have been preferable after deciding under uncertainty. This knowledge may yield a sense of loss or regret. Overall, the irrationality of the decision-maker has been analyzed in several types of research, and the explanations of this behavior have not gone unnoticed. From this perspective, many studies confirm the fact that both individuals and institutions do not behave rationally (Antonczyk and Salzmann, 2014; Barberis and Thaler, 2003; Elert et al., 2017; Gaede and Meadowcroft, 2016; Kahneman and Tversky, 1979; Tekçe et al., 2016) and may be affected by several biases such as status quo, loss aversion (i.e. people value loss deeper than gains), overconfidence, confirmation bias, an illusion of control, familiarity heuristic, (Burmeister and Schade,

³ Examples of management practices: hiring, firing, pay, promotions, lean manufacturing, continuous improvement, and monitoring.

2007; Hartman et al., 1991; Elert et al., 2017; Gaede and Meadowcroft, 2016; Kahneman and Tversky, 1979; Shefrin, 2001).

Many other contributions (Agnew et al., 2003; Kempf and Ruenzi, 2006; Samuelson and Zeckhauser, 1988; Tekçe et al., 2016) have focused on the impact of status quo in financial decisions. Among these studies, we find the work of Samuelson and Zeckhauser (1988). They demonstrated the presence of SQB when they examine the pension plans of Harvard employees. Indeed, it is well documented that mutual fund investors are subject to the status quo bias (Kempf and Ruenzi, 2006; Patel et al., 1991; Patel et al., 1994). In the same line, Agarwal et al., (2003) confirmed that hedge fund investors are influenced by the status quo bias. Barber et al., (2005) proved that investors have a great tendency to buy stocks they have already bought in the past. Agnew et al. (2003) found that U.S. investors prefer to maintain their initial asset allocation. Johnson et al. (1993) showed in their experimental study that the status quo intervenes in the choice of an insurance policy. Schweitzer (1995) addressed questionnaires to 400 staff at a large University. He found that status quo bias affects health care financing decisions. More concretely, individuals selected status quo alternatives more often than other alternatives. Madrian and Shea (2001) found a positive relationship between retirement savings and the status quo by using a database that contains information on 401(k) participation and savings behavior in the health care and insurance industry. Cronqvist and Thaler (2004) confirmed the consensus that inertia has also been found in U.S. 401(k) plans (Madrian and Shea, 2001; Samuelson and Zeckhauser, 1988). They found that recent returns influence the investments of participants. Indeed, the percentages of participants who remained with their portfolio during the three first years were 98.3, 97.3, and 96.9, respectively. Kempf and Ruenzi (2006) found strong evidence of the SQB by examining the U.S. equity mutual fund market. Moreover, Tekçe et al. (2016) argued that Turkish

individual stock investors are subject to the status quo bias. Furthermore, they found that gender affects the choice of status quo alternatives. More precisely, female investors are more biased toward the status quo more than male investors. Burmeister and Schade (2007) extended previous studies (Busenitz and Barney, 1997; Parlich and Bagby, 1995) in which it is shown that entrepreneurs exhibit cognitive biases and they are more affected by cognitive biases than other individuals. They used an experimental study to compare the decisions of entrepreneurs with those made by students and bankers in an experimental study. They found that the three categories (i.e. entrepreneurs, students, and bankers) are affected by the status quo. However, bankers are more affected by the status quo than both entrepreneurs and students. Harbi and Toumia (2020) reported the influence of status quo bias on the venture capital industry at the country level. They used a dynamic panel probit (respectively logit) model for 24 OECD member countries from 2007 to 2015.

III. EMPIRICAL MODEL

The main aim of our paper is to provide a deeper understanding of the influence of status quo bias in the private equity market. To do so, we look at the impact of the previous choice of the investment sector on the present ones. We follow the method used in the work of Harbi and Toumia (2020). More precisely, they expect the presence of SQB in the venture capital industry when there is a positive relationship between the actual choice of the investment industry and the present one. Table 1 shows the percentage of PE investment for Information & Communication Technology (ICT) and healthcare & life sciences (LS). A closer look at these percentages reveals a preference for both sectors. So, we construct a variable "*choice of PE investment sector*". It takes a value of 1 if the percentage of PE investment in ICT and "healthcare and LS" is the maximum and 0 otherwise.

Table 1: Percentage of PE investment in ICT and LS from 2007 to 2015

Year	Austria	Belgium	Denmark	Ukraine	Bulgaria	Germany
2007	22.8%	22.7%	42.4%	55.4%	66.4%	24.3%
2008	13.8%	15.1%	17.2%	18.8%	40.5%	21.1%
2009	47.9%	16.3%	65.2%	65%	83%	39.5%
2010	8.7%	21.6%	56%	36%	98.1%	40.7%
2011	28.6%	58.4%	28.3%	55.7%	88.9%	23.2%
2012	69.9%	21.3%	45.3%	86.2%	77.4%	37.6%
2013	24.6%	12.5%	45.7%	46%	14.4%	35%
2014	26%	13%	75.3%	55.7%	43.7%	37.1%
2015	15.5%	20.1%	22.1%	16.1%	62.6%	41.1%
	Spain	Sweden	Romania	Greece	Slovakia	Switzerland
2007	41%	42.6%	33%	0.2%	5.5%	20.4%
2008	37.1%	16.7%	29.7%	73.2%	7.6%	35.2%
2009	21.8%	25.2%	38.4%	68.6%	11.9%	59.9%
2010	28.5%	44.8%	45.3%	0%	1.4%	72.7%
2011	36.6%	50.4%	6.1%	2.9%	20.9%	18.1%

2012	31.3%	17.4%	14.3%	0%	79.1%	64%
2013	33.2%	37.8%	23.7%	84%	59.5%	59.6%
2014	29.5%	49.7%	34.3%	100%	5%	64.6%
2015	56.5%	21.1%	67.7%	100%	1.7%	39.1%
	Italy	Hungary	Portugal	Poland	Czech Republic	Luxembourg
2007	9.8%	15.3%	28.1%	21.9%	49.4%	11.8%
2008	28%	94.8%	6.1%	12.7%	75.1%	59.9%
2009	17.4%	95.1%	37.7%	55.1%	15.4%	80.2%
2010	39.9%	32.4%	5.7%	16.9%	45.1%	7.6%
2011	16.1%	17.4%	14.4%	45.8%	16.9%	16.9%
2012	31.7%	29%	10.7%	16.3%	85.7%	30.7%
2013	20.1%	16%	8.7%	23.7%	16.9%	12.9%
2014	5.7%	38.6%	22.8%	50.1%	76.1%	45.3%
2015	10.9%	6.6%	38.1%	12.1%	20.3%	0.6%
	Ireland	Netherlands	France	Finland	Norway	United Kingdom
2007	72.8%	30.8%	24.3%	43.9%	40.7%	29.7%
2008	36.1%	13.4%	37.2%	38.2%	27%	28.5%
2009	19.8%	34.8%	32.1%	44.5%	22.6%	30.1%
2010	31.7%	21.9%	35.5%	53.5%	65.4%	25.4%
2011	35.7%	12.5%	27.5%	54.6%	24.9%	42.7%
2012	35.7%	27.1%	17.4%	19.2%	40.7%	32.8%
2013	67.9%	34.8%	18.9%	75.8%	17%	28.2%
2014	93%	72.4%	39.9%	34.7%	34%	31.3%
2015	28.5%	23.6%	31.2%	16.1%	44.6%	25.8%

Nonetheless, we also include other variables such as the added value by activity, the private equity country attractiveness index, and the research & development expenditures (see for a review, Gompers and Lerner, 1998; Groh et al., 2010; Harbi and Toumia, 2020; Hellmann and Puri, 2000; Lahr and Mina, 2016).

So, our model is the following:

$$P(\text{choice}_{i,t} = 1 | \text{choice}_{i,t-1}, \text{choice}_{2007}, VA_{i,t}, PEindex_{i,t}, R\&D_{i,t}, c_i), t=2008, \dots, 2015 \quad (1)$$

$$== \phi(\gamma_1 VA_{i,t} + \gamma_2 PEindex_{i,t} + \gamma_3 R\&D_{i,t} + \rho_1 \text{choice}_{i,t-1} + c_i), t=2008, \dots, 2015 \quad (2)$$

Where the $\text{choice}_{i,t}$ is our binary dependent variable that equals 1 when the percentage of PE investment in ICT and "healthcare & LS" is the maximum and 0 otherwise., $\text{choice}_{i,t-1}$ is the main independent variable of interest which is the choice of PE investment sector in the previous, ρ_1 is the coefficient of the lagged dependent variable, $VA_{i,t}$ denotes the added value by the activity of PE investment sector in a year "t", $PE index_{i,t}$ denotes PE Country Attractiveness Index in a year "t", $R\&D_{i,t}$ represents the R&D expenditure of a country in a year "t", choice_{2007} is the initial choice in 2007 and c_i is the unobserved effect.

IV. DATA AND STATISTICS

The data used comes from many online databases that contain annual information: Invest Europe/ PEREP_Analytics, World Bank, OECD (Organization for Economic Co-operation and

Similar to Harbi and Toumia (2020), we use the conditional maximum likelihood (CML) estimator proposed by Wooldridge (2005). This estimator allows the estimation of the dynamic panel probit model for the balanced panel.

Development), and IESE Business School. In sum, we get a data set that covers 24⁴ European countries from 2007 to 2015. We are limited to this period because the reports provided by the Private Equity and Venture Capital association contain data only for the years 2007 to 2015. Table 2 presents the main variables and descriptive statistics. Table 3 presents the correlation matrix and the variance inflation factor (VIF).

⁴ Austria, Belgium, Bulgaria, Czech Republic, Denmark, Slovakia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Ukraine, United Kingdom.

Table 2: Descriptive statistics

Variable	Source	Descriptive statistics				
		N	Mean	SD	Min	Max
$choice_{i,t}$		216	0.514	0.501	0	1
$choice_{i,t-1}$		192	0.526	0.501	0	1
$choice_{2007}$		192	0.536	0.500	0	1
$VA_{i,t}$		216	3.513	8.611	-19.47	44.47
$PEindex_{i,t}$		216	30.041	18.934	2	90
$R\&D_{i,t}$		216	1.720	0.899	0.382	3.750

The Pearson correlation coefficients are not significant and low for most pairs of variables. Among all the correlation coefficients, the only highest one is

between the $PE\ index_{i,t}$ and the $R\ \&\ D_{i,t}$ (correlation = -0.7330). Thus, there isn't a multicollinearity problem.

Table 3: VIF and Correlation matrix

	VIF	$choice_{i,t}$	$choice_{i,t-1}$	$choice_{2007}$	$VA_{i,t}$	$PEindex_{i,t}$	$R\&D_{i,t}$
$choice_{i,t}$		1.0000					
$choice_{i,t-1}$	1.09	-0.0115	1.0000				
$choice_{2007}$	1.08	0.1134	0.2054*	1.0000			
$VA_{i,t}$	1.07	0.2648*	0.1403	-0.0716	1.0000		
$PEindex_{i,t}$	2.24	0.0963	0.0621	0.1818*	-0.1857*	1.0000	
$R\&D_{i,t}$	2.32	0.0126	0.0344	-0.1128	0.1163	-0.7330*	1.0000

Note: *denotes statistical significance at 5% level.

This ascertainment was further supported by the use of VIF. Kennedy (1992) and Marquardt (1970), revealed the existence of major multicollinearity when a VIF is greater than 10. In the same vein, O'Brien (2007) stated that high correlation may be problematic and should be treated with caution in the case where the VIFs are greater than 5 or 10 or 30. As shown in Table 3, the VIF is under 3, so there is a limited threat of multicollinearity. So, we may assume that the regression

coefficients are well-conditioned estimated and the multiple correlations with other variables aren't high.

V. ESTIMATIONS RESULTS

Table 4 presents the results of dynamic panel random probit (respectively logit) with the robust estimator of the variance. The results are similar for both models.

Table 4: Wooldridge's (2005) Dynamic Panel Random Probit/Logit for the Whole Sample (N=192)

	Wooldridge's (2005) Probit VCE robust		Wooldridge's (2005) Logit VCE robust	
	Estimates ($P > z $)	dy/dx	Estimates ($P > z $)	dy/dx
$choice_{i,t-1}$	-0.275 (0.182)	-0.100	-0.431 (0.191)	-0.096
$choice_{2007}$	0.344 (0.091)	0.125	0.571 (0.090)	0.127
$VA_{i,t}$	0.046** (0.009)	0.017	0.081* (0.014)	0.018
$PEindex_{i,t}$	0.019** (0.010)	0.0069	0.031* (0.011)	0.007
$R\&D_{i,t}$	0.302* (0.013)	0.110	0.482* (0.016)	0.107
Constant	-1.229** (0.006)		-2.024** (0.006)	
Number of observation	192		192	
Number of groups	24		24	
Log pseudo-likelihood	-122.4025		-122.1760	
Wald chi2(5)	20.04		18.30	
Prob>chi2	(0.0012)		0.0026	
LR chi2(5)	21.20		21.65	
Prob>chi2	0.0007		0.0006	
Sigma u	0.0017674		0.0047433	
Rho	3.12e ⁻⁰⁶		6.84e ⁻⁰⁶	
AIC	258.805		258.351	
BIC	281.607		281.154	

Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

As shown in table 4, we find that the previous choice of the PE investment sector is not significant. This result leads to the conclusion that private equity

investors are considered rational decision-makers compared to individuals. They analyze and collect the information of all available opportunities rather than

select the status quo option. This is an interesting finding, as it is contrary to what we know from the previous contribution of Harbi and Toumia (2020). There are two possible explanations: (1) there are many

differences between these two modes of funding (i.e. types of firms in which they invest, the level of capital invested, etc), and (2) the data set used in both studies are not totally similar.

Table 5: Wooldridge's (2005) Dynamic Panel Random Probit for ICT and LS

	ICT VCE Robust		LS VCE Robust	
	Estimates ($P > z $)	dy/dx	Estimates ($P > z $)	dy/dx
$choice_{i,t-1}$	-0.474 (0.098)	-0.141	-0.139 (0.730)	-0.029
$choice_{2007}$	0.219 (0.371)	0.0656	0.605 (0.096)	0.126
$VA_{i,t}$	0.031 (0.084)	0.0093	0.044** (0.010)	0.009
$PEindex_{i,t}$	0.0120 (0.255)	0.0036	0.0268** (0.002)	0.0055
$R\&D_{i,t}$	0.111 (0.563)	0.0333	0.312 (0.161)	0.0651
Constant	-1.2967* (0.046)		-2.599*** (0.000)	
Number of observation	192		192	
Number of groups	24		24	
Log pseudo-likelihood	-103.81708		-72.913689	
Wald chi2(5)	7.11		12.41	
Prob>chi2	0.2126		0.0296	
LR chi2(5)	8.26		13.64	
Prob>chi2	0.1425		0.0180	
Sigma u	0.293		0.0005	
Rho	0.079		2.55 e ⁻⁰⁷	
AIC	221.634		159.827	
BIC	244.436		182.629	

Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Also, the initial choice in 2007 ($choice_{2007}$) is not significant. Furthermore, we find that the added value by activity, the private equity country attractiveness index, and the research & development expenditures have a positive significant impact on the choice of the investment sector.

This finding is in line with previous studies (Gompers and Lerner, 1998; Groh et al., 2010; Harbi and Toumia, 2020; Hellmann and Puri, 2000; Lahr and Mina, 2016). The p-value of the Wald test and LR test are less than 5%, implying that the coefficients are not simultaneously equal to zero. Moreover, the rho differs from zero, concluding the difference between the panel estimator and the pooled estimator.

However, this finding suffers from a possible limitation notably related to the consideration of the regression results of a combined variable (ICT + healthcare & LS). These two sectors may have different economic drivers that may influence our results. For the sake of clarity and better analysis, we examined each PE investment sector as a separate dependent variable (see table 5). Column 2 in Table 5 presents the results of regression when the binary dependent variable is equal to 1 if the percentage of PE investment in ICT is the maximum and 0 otherwise. Column 4 in Table 5 presents the case when the dependent variable is 1 if the percentage of PE investment in healthcare & LS is the maximum and 0 otherwise. Similar to previous

results, we find that the previous choice of divestment is not significant for both models (see table 5).

VI. CONCLUSION

So far, there is a huge literature that enumerates the determinants of private equity activity because of its major impact on economic development and entrepreneurship, (Bonini and Alkan, 2012; Gompers and Lerner, 1998). Nevertheless, the influence of the status quo on the private equity investments' decision has never been discussed beforehand. Hence our contribution is unique in trying to filling the gap in the existing literature by investigating if private equity firms are subject to the status quo. Contrary to the work of Harbi and Toumia (2020), we find that the previous choice of the investment industry doesn't depend on the present one.

Although this study provided an empirical model to show how private equity firms make their decisions, it is essential to recognize the influence of other factors that do not change over time that may influence the decision of private equity firms. Thus we tried to control the influence of some variables which are recognized as determinants of the private equity market. Indeed, following previous contributions (Gompers and Lerner, 1998; Groh et al., 2010; Harbi and Toumia, 2020; Hellmann and Puri, 2000; Lahr and Mina, 2016), the added value by activity, the private equity country

attractiveness index, and the research & development expenditures have a significant and a positive impact on the choice of the investment sector.

For organizations, our findings can help to further understanding why the status quo occurs. Using the results of our research, private equity investors may better frame their decisions to overcome this bias. Moreover, the status quo is considered a critical barrier to organizational change and development. Investors may not recognize that they are too attached to their ideas, opinions, and decision-making. Thus they may interpret the status quo as signaling success and they feel no need to search for novel perspectives or ideas. Being aware of this limit, it would be advisable for managers to adopt a proactive behavior (Bindl and Parker, 2017; Bohlmann and Zacher, 2020; Cangiano, et al., 2019; Parker et al., 2010; Parker and Collins, 2010; Parker et al., 2006; Seibert et al., 2001; Thompson, 2005; Thomas et al., 2010). This behavior involves "taking action to change the status quo has great importance in the modern organization, (Bohlmann and Zacher, 2020).

Since we are entirely interested in our analysis on the impact of the status quo, we have not included other macroeconomic determinants of the private equity investment industry. We only include variables that measure economic activity. Hence, our contribution provides a better understanding of the behavior of private equity firms, however, our results may not be considered as definitive. Indeed our sample is composed of European countries; although we are not sure that our findings would also hold with, e.g., African countries, Asian countries, or American countries. So, we should not underestimate the relevance of country differences, that's why, we recommend performing other studies to confirm our result.

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Technology and Performance Management: Strategies in Quality Service Delivery

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Abstract- The objectives of the study were to establish the effect of technological innovations and performance management techniques on quality service delivery. Systems theory, SERQUAL mode and descriptive research design were used. The target population was 6,480 and the computed sample size of 98 was selected using stratified random sampling technique. Data was analyzed using descriptive, inferential statistics and content analysis. Content validity was determined and coefficient of reliability calculated. Technological innovations and performance management techniques had positive significant effect. In conclusion technological innovations improve communication and management of information. Technological automation reduces cost in terms of the number of staff, time, use of paper and increase accessibility to services. Integrated Development Plans and departmental strategic plans should be formulated. Staff performance should be monitored, managed and evaluated periodically to ensure conformity to the plans.

Keywords: *technology; performance management; strategies; service delivery.*

GJMBR-A Classification: *JEL Code: L25*



Strictly as per the compliance and regulations of:



Technology and Performance Management: Strategies in Quality Service Delivery

Dickens Ouma Mawere ^α & Dr. Kipkorir Sitienei Chris Simon ^σ

Abstract- The objectives of the study were to establish the effect of technological innovations and performance management techniques on quality service delivery. Systems theory, SERQUAL mode and descriptive research design were used. The target population was 6,480 and the computed sample size of 98 was selected using stratified random sampling technique. Data was analyzed using descriptive, inferential statistics and content analysis. Content validity was determined and coefficient of reliability calculated. Technological innovations and performance management techniques had positive significant effect. In conclusion technological innovations improve communication and management of information. Technological automation reduces cost in terms of the number of staff, time, use of paper and increase accessibility to services. Integrated Development Plans and departmental strategic plans should be formulated. Staff performance should be monitored, managed and evaluated periodically to ensure conformity to the plans. It was also concluded that Rapid Results Initiative be fully utilized during emergencies for quick results.

Keywords: *technology; performance management; strategies; service delivery.*

I. INTRODUCTION

Fox and Meyer (1995, cited in Kathuri, 2014), describe public service delivery as the provision of public amenities, activities, aid, and performance by the government or local authorities that fulfil the needs of citizens within their jurisdictions. Zeithaml, Bitner and Gremler (2018) define services as deeds, processes or performance provided by one party (person or group) to benefit another. The scholars perceive it as a set of activities performed by an organization that aims at creating value. Lynch (2002, cited in Kathuri, 2014) differentiated between the public and private sector institutions in service delivery. The author observes that in public sector profit motive is not the priority as in the private sector. For Baron and Armstrong (2005, cited in Kathuri, *ibid*) components affecting quality service delivery in the public sector include funding mechanisms and human competencies. Lockhart and Taitoko (2005, cited in Kathuri, *ibid*) examined what causes the collapse of quality service delivery in governments and found out that the problems are due to failure of proper management. According to Meadows (2009, cited in Kathuri, *ibid*) governance

structure is one of these components. Report of 2010 from Auditor General of Canada report (cited in Kathuri, *ibid*) showed that the public want and care about high-quality service from the government. For any government to achieve and maintain high-quality service, the report indicated that it is important to establish service standards for the employees' performance, monitoring performance. Therefore, governments are enabled to take appropriate action to improve service delivery whenever there is non-compliance with the set standards. In South Africa continuous protests against poor services have been one of the worst predicaments the government has faced (Mlambo, Zubane and Mlambo, 2020).

Public sector has been defined by Kilika (2013, cited in Korir, 2013) as part of the economy concerned with providing basic government services. Public sector was formed due to failure by the commercial sector in delivering adequate quality service in key sectors. The sector was deemed unprofitable thus necessitated the government to provide essential service in these sectors and for the wellbeing of the society. Ibrahim Index of African Governance report of 2018 showed that African continent achieved its highest overall governance score which impacted positively on service delivery over ten years from 2007-2016. However, the report showed that Africa's annual average rate of progress slowed down between 2011- 2016 as it was characterized by a number of problems. Public employees in Africa represent less than 12% of total employment, less than half the average level in Europe and Central Asia. Citizens have been dissatisfied with how governments were addressing educational and health needs over the last decade. Sub Saharan Africa has the second smallest public health expenditure of all regions, far below the world average. The five worst performing countries were Central African Republic, Chad, Nigeria, Sierra Leone and South Sudan. In Egypt, Liberia, Morocco, and Sudan, more than 40% of the population has difficulties obtaining medical care. The report indicated that more than 50% of people in 36 African countries reported difficulties getting assistance from the courts. African countries invest in public social protection less than in other regions. The school completion, enrolment and literacy have slowed down.

Governments all over the world are faced with the challenges of poor service delivery leading to dissatisfaction by citizens, necessitating application of

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series of management strategies in order to enhance quality services (Kalava, 2016). A report by Ibrahim African Governance Index of 2018 indicated that public service is a pillar of governance. Without strong public service and committed public servants there would be no efficient delivery of expected public goods and services. The report showed that many countries in sub-Saharan Africa are unable to provide adequate quality services because of economic factors and dwindling resources.

Public services are provided by the government to the citizens, either directly (through the public sector) or by financing the services (Korir, 2013). The author argues that public service delivery is a phrase used by the governments to describe the distribution of basic resources and services such as housing, water, education, electricity, sanitation and sewerage, infrastructure and security. Kenya, like other African countries, faces challenges of poor service delivery in the public sector. A major reform in the public service delivery in Kenya was the introduction of devolution in 2010. According to Article 174 of Constitution of Kenya one of the objectives of devolution was to promote social and economic development. It was also to facilitate the provision of proximate, easily accessible services throughout the country. The Fourth Schedule of the Constitution of Kenya 2010 spelt out the functions of national and county governments. Part 2 of the schedule outlines services and functions of County governments which include agriculture, health, control of pollution, cultural activities, transport, animal control, planning and development, public works, fire fighting and ensuring participation of communities in governance. Ngigi and Busolo (2019) argue that devolution enabled counties to identify problems, make policies, plan, collect revenue, promote public participation in decision-making, execute budget monitoring and evaluation. County governments were operationalised in 2013 when the first governors and Members of County Assemblies were elected. The governors established the county governments' management systems, structures and operational models in accordance with the Constitution of Kenya of 2010, County Government Act of 2012 and other relevant legislations. The counties establish County Public Service Boards, tasked with the role of appointing, dismissing, disciplining and remunerating county employees. These employees, based on their technical competencies and expertise, were deployed to various service departments. According to Wanjala (2019), devolution was to be a solution to problems like conflicts, corruption, inequalities, inefficient use of public resources, and economic stagnation. Despite expected benefits of devolution, county government of Kakamega has faced several challenges but the current study focused on service standards, consistency and handling of complaints which have greatly affected quality service delivery.

The current study therefore focused on technology and performance management and the emphasis was service standards, consistency and complaints handling as measures of quality service delivery.

II. OBJECTIVES

To establish the effect of technological innovations on quality service delivery in county government of Kakamega, Kenya.

To establish the effect of Performance management techniques on quality service delivery in county government of Kakamega, Kenya.

III. RESEARCH HYPOTHESES

Technological innovations have no significant effect on quality service delivery in county government of Kakamega, Kenya.

Performance management techniques have no significant effect on quality service delivery in county government of Kakamega, Kenya.

IV. LITERATURE REVIEW

SERVQUAL tool was proposed by Parasuraman, Zeithaml, and Berry in 1990. Studies have shown that there are several important components which affect quality service delivery. After research the three scholars found five dimensions considered by consumers in assessing quality service. Earlier the scholars identified ten criteria that consumers rely on while evaluating quality service. They include tangibles, reliability, responsiveness, competence, courtesy, credibility, security, access, communications and degree of customer understanding. Later, the researchers reduced them to five dimensions. The scholars renamed the survey instrument SERVQUAL tool with five quality service dimensions: tangibles, reliability, responsiveness, assurance and empathy. Services can be differentiated from products in five critical ways. These are, namely, higher intangibility, lack of ability to store them for future use, greater interaction between the customer and the service factory, greater variability among service customers' expectations and greater variability in service delivery. Public services fall under the services with high experience and credence qualities (Zeithaml and Bitner, 2000). It throws up more problems which require analysis of the (perceived) customer expectations and actual services delivered. It is believed that citizens who are consumers of public services have some basis of distinguishing between service attributes based on a value-percept (Awasthi, 2007). This premise has led several researchers to distinguish service attributes on various dimensions though not necessarily consumer-value focused; such as having either, mechanistic or humanistic qualities, as being visible or invisible indicators of quality, as being tangible or

intangible; having technical or functional quality and so on. However, using these existing bases researchers find it difficult to explain public perceptions on quality service quality. It is because all these classifications of service aspects are private sector strategy centric. The model was important in evaluating the quality service delivery in the county government of Kakamega in terms of service standards and degree of complaints handling.

Bureaucratic theory is one of the administrative theories of management. It was proposed by a German sociologist and political economist Max Weber in 1905 as one of the best organizational and management approaches. The term bureaucracy is defined as the "rule by desk or offices". This definition shows the impersonal feature of bureaucracy. The four main features of bureaucracy as outlined by Stewart are: specialization based on job specification; hierarchy of authority with clear lines of communication and superior-subordinate relationships; systems of rules calling for strict conformity and adherence; and impersonality in operations and decision-making. Robbins and Judge (2013) emphasized standardization as the key concept that underlies bureaucratic systems. The bureaucracy is characterized by highly routine operating tasks achieved through specialization, very formalized rules and regulations, tasks that are grouped into departments, centralized authority, narrow span of control, and decision making that follows a chain of command. The author of the theory argues that bureaucracy has a number of advantages over other management approaches. It is most efficient form for the management of institutions. It is an important strategy for the administrators when it gets to organizing large number of people to work together for a common goal. The approach is applicable both to the public and profit oriented sectors.

Bureaucracy as a management strategy has been subjected to severe criticism. It emphasizes strict conformity to the rules without considering beneficial outcomes. The approach has a lot of formalities and paper works that result into wastage of time,

duplications and higher costs. There are unnecessary delays in decision-making and action due many approvals needed. It does not reward dedication and commitment. It makes it difficult in coordinating and communicating because of strict adherence to formal authority and chain of command. Though it has faced criticism, given new forms of organizations and management systems which have emerged, bureaucracy is still relevant and applied to date. Bureaucratic theory is applicable to the study as it addressed performance management techniques. However, Bureaucratic theory has not postulated on technology innovations.

A German Biologist, Ludwig von Bertalanffy, is recognized as the founder of systems theory in 1951 (Mele, Pels and Polese, 2010). The author is recognized for devising a general systems theory that can be used to explain how an organism works. A system as an entity, which is a coherent whole such that a boundary is perceived around it in order to distinguish internal and external elements and to identify input and output relating to and emerging from the entity. A systems theory is hence a theoretical perspective that analyzes a phenomenon seen as a whole and not as simply the sum of elementary parts (Mele, Pels and Polese, *ibid*). Cole and Kelly (2015) defined systems theory as, "A collection of interrelated parts and components of an organization that form and function as whole – like human body".

The systems approach attempts to work mid-ground by reconciling the scientific approach of management proposed by Taylor, which was perceived to treat human beings as machines, and human relations approach which basically focused on leadership and motivation while ignoring other factors. The systems theory is a management approach that focuses on the organization as a whole. The management should focus on the totality of the organization in terms of how different components within the organization interact with one another and their external environment.

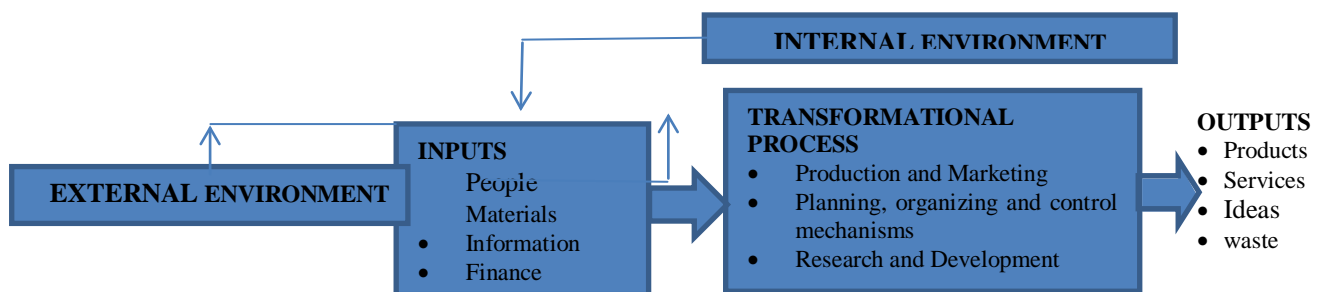


Figure 1: The Organization as an Open System. Adopted from Cole and Kelly (2015)

Organizations rely on the external environment upon which they obtain essential inputs (raw materials, financial and human resources) and discharge their outputs (end products). The three major characteristics of a system are: (i) they receive inputs or energies from the environment; (ii) convert the inputs to outputs through various processes; and (iii) they discharge the outputs into the environment. Most systems like organizations have their sub-systems as well. These sub-systems operate as the unified whole but within boundaries for smooth operations. County governments in Kenya operates as a system with many interrelated parts and sub-systems making systems theory to be relevant for current study. County government of Kakamega has departments which must conform to systems theory principle. The county government has inputs in terms of employees, information technology, funding from the national governments, legislation and policies, and information. All these undergo transformational processes to make them beneficial to citizens. The output from the system is quality service delivery. The theory was relevant to current study because of technology innovations in form of integrated information management systems.

Studies done in 2002 on importance of e-Government in South Africa by the Engineering News entitled National e-Government Strategy and Roadmap, indicated that technology is important in quality service delivery and has become vital aspect for every government. Governments should avail information to the citizens online through their websites and citizen portals. The *e-Government* (electronic government) is commonly used in reference to e-services offered by state ministries and departments. Ndou (2004) observed that flexibility, network organization, and speed up in service delivery are all supported by Information communication technology. Research done in Australia showed that more emphasis on service delivery was extended to indigenous families which were affected by a range of complex issues that impacted on their wellbeing (Kalava, 2016) Although the United States of America has advanced public service, its healthcare has faced many challenges according to Ministry of Health Survey of 2007 as cited in Kalava (ibid)

Menge (2009) established that the use of information communication technology is beneficial to the government institutions in terms of improved operational efficiency, reduced operating cost and providing great opportunities for improvements. Public Service Commission Evaluation Report for the Year 2015/2016 on Public Service Compliance with the Values and Principles in Articles 10 and 232 of the Constitution of Kenya, indicate that critical measure of quality service delivery was the automation of public services through electronic (e-citizen platform) services, business, employees and government. Therefore enhancing e-procurement services thus encouraging

public institutions to embrace Information Communication Technology resources in service delivery. Automation increases efficiency in service delivery by reducing time and cost of operations. However, the report didn't focus on the challenges faced when it comes to automation of services.

Studies done in South Africa showed that poor services in the public sector made the government to face severe criticism. There were complains that public sector is inefficient and ineffective as it was slow and bureaucratic (Mlambo, Zubane and Mlambo, 2020). It led to protests, violence, loss of lives and destruction of property due to citizens' dissatisfaction. The reasons for the protests were poor service in provision of water, sanitation, sewerage and electricity. Mbuthia (2013) revealed that the greatest challenge towards the provision of quality service in Kenya is shortage of funds and inadequate staff. Awosika (2014) researching on the phenomenon of low performance in the public service in West African countries established that Nigerian civil service which evolved from the colonial service was regarded as one of the best until the mid 1980s. Unfortunately from the mid 1980s, the Nigerian public service was riddled with inefficiency, ineffectiveness, mismanagement, corruption, and low productivity. According to Economic Commission for Africa report of 2010 Ghana civil service was described as a "moribund, paper-pushing institution as argued by Awosika (2014). The features of Ghana's civil service included overstaffing, low salaries, and lack of motivation and policy guidance.

In Nairobi County Kibanya (2015) found out that governance style negatively affected quality service delivery to a great extent. In addition, the scholar established that counties have done very little to develop the staff competence in terms of education, training and experience. Kalava (2016) concluded that technology increased quality service delivery due to speed of accessing and processing information. Kibanya and Moronge (2014) established that majority of employees of county governments in Kenya have not been trained on information communication technology. In Nepal, service delivery is affected by strong incentives for competing parties to gain access to state resources and entrench their positions (Kalava, 2016). Awino (2016) studied response strategies adopted by the ministry of health on challenges of devolved healthcare services and concluded that inadequate and delayed financial resources, poor human resource management, and overlap of resources and functions between the county and national governments are hampering quality service delivery under devolution.

Murage (2018) on assessing citizens' perception of quality Service at Huduma (service) Centres in Nairobi County, Kenya, found out that that Rapid Results Initiative has improved service delivery in

several areas of processing and issuance of passports, national identity cards and birth certificates. Other performance improvement technique according to Kenya School of Government report of 2018 include the Staff Performance Appraisal System which is the process of evaluating work which is carried out upon understanding the demonstrated ability of performance achieved in executing the duties of the position concerned. The study focused on how strategic planning, performance appraisals and rewards, and rapid results initiative have improved service delivery in the counties. Kerubo and Muturi (2018) established that most county governments have Information communication technology platform for the roll out of IFMIS in place. However, the scholars found out that there were no regular skills upgrading courses on IFMIS. They further established that there is no motivation to retain skilled personnel. The political class is not supportive of IFMIS, and the counties have not allocated

enough resources towards its implementation. They recommended that for Integrated Financial Management Information System (IFMIS) implementation to be effective in the county governments the National Treasury and the counties should organize regular skills upgrading courses on IFMIS and that counties should allocate more resources for implementation Information communication technology.

V. METHODOLOGY

In the current study descriptive research design was used, a target population of 6,480 comprising county government of Kakamega employees who had relevant information. The targeted population was drawn from all the departments/ service sections. The sample from the population was selected using Integrated Financial Management Information System g Yamane (1967) statistical formula as follows:

$$n = \frac{N}{1+N(e)^2} \quad \text{Substituting} \quad n = \frac{6450}{1+6450(0.1)^2} = 98:$$

Where; n : Sample size; N : Population under study; e : Margin error (0.1); and 1: Constant. In collection of primary data, the study used semi-structured questionnaire which was self-administered. For content validity of research instrument questionnaire was administered to a sample of 10 respondents from each service department for pilot study. The research instrument was reviewed and restructured to ensure content validity. Coefficient of reliability of research instrument was computed under Cronbach's Alpha method of 1951 with confidence level of 0.95. Statistical Package for Social Sciences version 20.0, was used to aid in the computation. Computed Cronbach's Alpha coefficient of reliability statistics for technological innovations and performance management techniques were 0.982 and 0.980 respectively. Descriptive statistics such as the means and standard deviations were used to analyse data. For the qualitative data content analysis was used. Prasad (2008) describes content analysis as data analysis technique that involves the study of the content of open-ended questions purposefully to establish meanings, situations and interpretations in the responses given. Inferential statistics such as analysis of variance (ANOVA) and Multiple Regression analysis were used to assess the relationship between the independent and the dependent variables. Confidentiality of information, anonymity of the respondents was considered and the identity of the respondents was protected. Permission and authorization from Kenyatta University, Ministry of Education, Science and Technology and National Commission for Science, Technology and Innovation (NACOSTI) was granted.

VI. RESULTS AND DISCUSSION

Out of the 98 questionnaires distributed, 92 were filled and returned. This gave a response rate of 93.88%. According to Mugenda and Mugenda (2003) the statistically significant response rate for research analysis should be at least 50%. The results indicate that the response rate was significant. According to Kothari (2004) a response rate of 50% or more is adequate for analysis. The respondents were asked to rate their responses based on Likert Scale Strongly Agree (5), Agree (4), moderate/Neutral (3), Disagreed (2) Strongly Disagree (1)

Table 1: Technological innovations and quality service delivery

Statements	SA(5)	A(4)	N(3)	D(2)	SD(1)	Mean	Std Dev
Kakamega County has automated services for easy access by clients	2931.87%	3841.76%	1213.19 %	66.59%	66.59%	3.828	1.135
Computers & technological equipment has improved quality service delivery	3740.66%	4347.25%	22.20%	77.69%	22.20%	4.165	0.958
County provides enough technological equipment for quality service delivery	1112.09%	1617.58%	1010.99 %	2830.77 %	2628.57 %	2.538	1.385
The County websites, online services & portals are effectively managed and updated for quality service delivery	2325.27%	4650.55%	88.79%	1112.09 %	33.30%	3.824	1.050
It is easier to access and perform activities online using county government websites and portals	3235.16%	4448.35%	88.79%	66.59%	11.10%	4.098	0.895
Integrated Human Resources and information management systems improve quality service delivery	3235.16%	3235.16%	1010.99 %	1112.09 %	55.49%	3.892	1.058
County's media of communication facilitate staff accessibility to clients and quality service delivery	2729.67%	4351.67%	88.79%	1010.99 %	33.30%	3.890	1.058
Aggregate						3.747	1.077

Source: Research data (2020)

Regarding the influence of automation of services for easy access by clients; 31.87% of respondents strongly agreed, 41.76% agreed, 6.09% disagreed and 6.09% strongly disagreed while 13.19% were neutral. The effect of automation of services for easy access by clients on quality service delivery was significant (mean of 3.858) with somehow insignificant variation (standard deviation of 1.135). The assertion that computers and technology improve quality service delivery to clients was strongly agreed by 40.66% of respondents, 47.25% agreed, 7.69% disagreed and 2.20% strongly disagreed with 2.20% being moderate/neutral. The role of technology on quality service delivery was greatly significant (mean of 4.165) whose variation was insignificant (standard deviation of 0.958). Majority of respondents (65%) agreed that they use computers for processing information and performing other functions. The rest (35%) indicated that information is processed both electronically and manually. On provision of enough technological equipment for quality service delivery 12.9% of respondents strongly agreed, 17.58% agreed, 10.99% were moderate/neutral, 30.77% disagreed and 28.57% strongly disagreed that offices were well equipped. The influence of technological equipment on quality service delivery was insignificant (mean 2.538) with somewhat significant variation (standard deviation 1.385).

On effective management and updated websites, portals and online services 25.27% of respondents strongly agreed, 50.55% agreed, 8.79% were moderate/neutral, 12.09% disagreed and 3.3% strongly disagreed that they have affected quality

service delivery. The influence of effective management and updating of websites, portals and online services on quality service delivery was just significant (mean of 3.842) with some variation (standard deviation of 1.050). Websites and online services has improved quality service delivery; 35.16% of respondents strongly agreed and 48.35% agreed, 8.79% were moderate/neutral, 6.59% disagreed and 1.1% strongly disagreed that it is easy to access and perform services online through websites and portals. Accessibility and performance of online services has significant influence on quality service delivery (mean of 4.089) with insignificant variation (standard deviation of 0.895). Regarding the role of integrated information management systems on quality service delivery 36.26% of respondents strongly agreed, 35.16% agreed, 12.09% disagreed, and 5.49% strongly disagreed while 10.99% were neutral. The effect of integrated information management systems on quality service delivery was somewhat significant (mean of 3.892) whose variation was fairly significant (standard deviation of 1.058). On media of communication facilitating staff accessibility to clients, 29.67% of respondents strongly agreed, 51.65% agreed, 10.99% were moderate/neutral while 4.3% disagreed and 3.2% strongly disagreed. Accessibility to clients has significantly improved quality service delivery (mean of 3.890) whose variation was somehow significant (standard deviation of 1.058). The aggregate mean of 3.747 indicate that technological innovations affect quality service delivery whose variation was somehow significant (standard deviation of 1.077).

With the advent of information revolution governments all over the world are embracing use of technology in quality service delivery through adoption of information and communication technology. Branscomb (2001 as cited in Menge, 2009) contends that governments are shifting focus to application of technological innovations to improve quality service delivery. In the National e-Government Strategy and Roadmap of 2002 Gartner describes e-Government as the continuous optimization of government services, constituent participation and governance by transporting internal and external relationships through technology, the internet and new media. It is the process of using technology to facilitate service delivery to the citizens. The governments are making much progress to ensure better and quicker access to government services through e-government platforms. While embracing e-government strategy the concerned must take into consideration three important elements; access to government information by the citizens and other stakeholders; financial sustainability of the e-government strategy and job creation opportunities. However, access to information by citizens and other agencies is the reason why e-Government strategy is adopted. Chonia (2002, cited in Korir, 2013), argues that the problems associated with information communication technology is inaccessibility by majority of the citizens. Botha (2002) argues that e-Government is important in public service

In National e-Government Strategy and Roadmap of 2002 Botha contends that e-Government is important in the quest for good governance. The scholar pointed out that there are a lot of changes in governance as a result of information and governance revolutions which brought radical gains in public service by ensuring that every citizen is accessible to government services physically or electronically. According to Sun and Shibo (2005, cited in Kibanya and Moronge, 2014) technology can revitalize or transform public sectors and enhance quality service delivery. Therefore lack of appropriate communication technology in the county negatively affect quality service delivery. Shah (2005, cited in Mbuthia, 2013) supports e-Government and opines that public sector should be oriented towards serving citizens by eliminating bureaucratic red tape and corruption. The scholar advocates for the need to ensure that judiciary enforces accountability through timely and fair decisions. Menge (2009) argue that use of Information communication technology is perceived to improve operational efficacy, reduces operating costs and provides great opportunities for doing better. Level of computer literacy inhibits use of the information communication technology (Korir, 2013). Digital Literacy in Kenya Report of 2017 show that low digital literacy in Kenya has locked out millions from reaping from the benefits of a robust technology (Mugo, 2017). There is a

problem with low use of technology that slows down the rate of quality service delivery in the county governments in Kenya (Awino, 2016). Though the county government in Kenya have put a number of channels to reach out to their clients, however, Kimani (2017) concluded that in the developing countries, Kenya included, there was inadequate infrastructure, shortage of skills, limited access to electricity and computers and other communication gadgets

According to Next Generation report of 2018, most African countries are still lagging behind in offering e-services to citizens. However, according to the report some African countries have advancing in the use of technology for public service. In Cape Verde citizens can get birth certificates online, and Rwanda has put its judicial system entirely online. Malawi has introduced in its high court an automated case management system for civil and criminal proceedings. In the report use of technology and innovation was advocated for quality service delivery. Kenya School of Government report of 2018 indicates that technology increases government transparency by reducing corruption cases. The report showed that to improve public administration, e-government administrative platforms, such as a computerized treasury, Integrated Financial Management Information Systems (IFMIS) and Government Human Resource Information Systems (GHRIS) were introduced to increase efficiency in public service. Range of information technologies by government agencies and counties transform government operations and service delivery. The technologies include use of government websites and portals, internet, mobile computing, integration of government management systems and use of toll free numbers. Ministry of Information and Communication report of 2019 highlighted challenges that have affected the sector of Information communication technology. They include lack of clear policy, legal and regulatory framework; the unaffordability and inaccessibility in some regions and populace. Other issues include privacy, e-security, cyber-crimes and ethical and moral conduct; inadequate research and development in the sector and inadequate Information communication technology infrastructure especially in the rural areas.

Table 2: Performance management techniques and quality service delivery

ITEM	SA(5)	A(4)	N(3)	D(2)	SD(1)	Mean	Std Dev
County staff is conversant with departmental strategic plans for quality service delivery	9 9.89%	12 13.19%	10 10.99%	37 40.46%	23 25.27%	2.406	1.267
Targets are guided by County Integrated Development Plan enhance quality service delivery	29 31.87%	43 47.25%	10 10.99%	6 6.59%	3 3.30%	4.011	0.901
Departmental targets are achievable within the set time affecting quality service delivery	29 31.87%	42 46.15%	13 14.29%	7 7.60%	0 0.00%	3.868	1.47
There are service charters to guide quality service delivery	39 42.86%	35 38.46%	10 10.99%	5 5.49%	2 2.20%	4.143	0.973
The county conducts appraisals to ensure targets are met	30 32.97%	35 38.46%	4 4.40%	14 15.38%	8 8.78%	3.736	1.324
Staff performance appraisals lead to reward and punishment	10 9.89%	17 18.68%	15 16.48%	27 29.67%	23 25.27%	2.582	1.317
Rewards for outstanding performance are adequate for quality service delivery	10 9.89%	19 20.88%	13 14.29%	27 29.67%	22 24.18%	2.648	1.345
Staff apply rapid results initiative for quality service delivery	7 7.69%	10 10.99%	7 7.69%	34 37.36%	32 35.14%	2.208	1.261
Rapid result initiative enhanced quality service delivery	6 6.59%	12 13.19%	11 12.09%	29 31.87%	33 36.26%	2.209	1.261
Aggregate						3.090	1.235

Source: Research data (2020)

Results show that in being conversant with departmental strategic plans, 9.89% of respondents strongly agreed and 13.19% agreed that they are conversant with the departmental strategic plans. 40.66% of respondents disagreed, 25.27% strongly disagreed and 9.89% were neutral. The influence of departmental strategic plans on quality service delivery was insignificant (mean of 2.406) with some significant variation (standard deviation of 1.267). Regarding departmental targets being achieved within set periods, 31.87% of respondents strongly agreed, 46.15% agreed, 14.29% were moderate/neutral while only 7.60% disagreed. Achieving departmental targets within set time had some significant influence on quality service delivery (mean of 3.868) which varied slightly (standard deviation of 1.47). To confirm the assertion that meeting set targets enhance service delivery, 31.87% of the respondents strongly agreed, 47.25% agreed while 10.99% were neutral. Those that disagreed were 6.59% and 3.30% strongly disagreed. Target setting greatly enhance quality service delivery (mean of 4.011) which in turn did not vary significantly (standard deviation of 0.901). Apart from setting the targets the offices have service charters to guide quality service delivery. Results indicate that 42.86% of respondents strongly agreed, 38.46% agreed, 5.49% disagreed and 2.20% strongly disagreed while 10.99% were moderate/neutral that there were service charters to guide in quality service delivery. The role of service charters in guiding quality service delivery was significant (mean of 4.143) though with insignificant variation (standard deviation of 0.973).

Staff performance appraisals have ensured that set targets are met; 32.97% strongly agreed, 38.46% agreed, 4.4% were neutral, 15.38% disagreed while 8.79% strongly disagreed. The influence of performance appraisal in quality service delivery was moderately significant (mean of 3.736) but variation in quality service delivery was somehow significant (1.324).

In terms of rewards and punishment, 9.89% strongly agreed, 18.68% agreed, 16.48% were neutral, 29.67% disagreed while 25.27% strongly disagreed that appraisals lead to rewards and punishments. The role of appraisals on quality service delivery was low (mean of 2.582) and its variation was somewhat significant (standard deviation of 1.317). Regarding the types of rewards for outstanding performance, 10.99% strongly agreed, 20.89% agreed, 29.67% strongly disagreed and 24.18% disagreed while 14.29% were moderate/neutral that the types of rewards for outstanding performance affect quality service delivery. The influence of types of reward for outstanding performance on quality service delivery was low (mean of 2.648) and there was little variation in quality service delivery (standard deviation of 1.325). Regarding the application of Rapid Results Initiative (RRI) to improve quality service delivery 7.67% of respondents strongly agreed, 10.99% agreed, 7.69% were neutral while 37.36% disagreed and 35.16% strongly disagreed that they apply the initiative to improve quality service delivery. The staff has not used more Rapid Results Initiative in service delivery as confirmed by low mean of 2.648 but somewhat significant variation in set targets (standard deviation of

1.345). Regarding whether Rapid Results Initiative targets have enhanced quality service delivery, the findings showed that as a performance management technique the initiative has not been utilized to improve service delivery. Only 6.65% of respondents strongly agreed, and 13.19% agreed while 12.09 were moderate/neutral. However, 36.26% of respondents strongly disagreed and 31.87% disagreed. The role of Rapid Results Initiative targets enhancing quality service delivery was insignificant (mean of 2.648) and variation was somehow significant (standard deviation of 1.345). The aggregate mean of 3.090 indicate that performance management determines quality service delivery. The influence of performance management techniques on quality service delivery has somewhat significant variation (standard deviation of 1.235).

Mc Bain and Smith (2010) have introduced new concepts which have changed the public sector in many ways. Strategic management has since been introduced in the public sector and has become a standard tool for government employees in enhancing quality service delivery. New management concepts and models such as Management By Objectives (MBO), Total Quality Management (TQM) and the Deming Cycle have been introduced in public service. Hope (2014) supports the introduction in order to better serve the needs of both government and the citizens concerning quality service delivery. Performance management systems is described by Korir, Rotich and Bengat (2015) as processes designed by management and imposed on employees in attempt to link performance to reward. In the study on Performance Management and Public Service Delivery in Kenya, the scholars found out that it is achieved through measuring individual performance against set goals or deliverables that are aligned to team and organizational goals. In practice, key performance areas are measured in terms of key performance indicators, and individual performance rating is used for incentives and promotions. The authors support the use of the service charter provides a great opportunity to ensure that services offered or required are appropriate and provided in a timely and efficient manner. However, Kibanya (2015) found out that 75% of county staff reported non-existence of service charters showing that the county governments need to expose their staff to importance of service charters.

Murage (2018) claims that Rapid Response Initiative has improved quality service delivery in processing of passports, national identity cards and birth certificates in Kenya. Kenya School of Government report of 2018 established that counties have not fully utilized performance management tools such as Annual Work Plans and Rapid Response Initiative. According to Kenya School of Government report of 2018, performance management aims at attaining operational effectiveness and allowing organizations to better utilize

resources. In improvement of programmes the governments restructuring efforts emphasized the need to introduce result or performance-based approach to management in the public sector. The report established that the public sector reform programmes in Kenya were initiated since 1993 with the initial civil service reforms geared towards cost containment through Structural Adjustment Programmes and ministerial rationalization. Reforms in Kenya evolved and culminated in New Public Management. It is a broad term symbolizing the aim of fostering a performance-oriented culture. The culture seeks to revamp the process through which public organizations operate in order to increase efficiency, effectiveness, and encompassing client-oriented, mission-driven, and quality-enhanced management. Performance management tools that were introduced in Kenya to improve quality service delivery were results based management, departmental service charters, individual work plans, performance contracts, performance appraisals and ministerial medium term strategic plans. Performance oriented culture was institutionalized in the civil service through introduction of an objective performance appraisal system, measuring and evaluating performance; linking reward to measurable performance and clarifying the obligations required of the government and its employees. In line with the public sector reforms the county governments in Kenya are required to apply these performance management techniques. The objective is to improve quality service delivery to the public by ensuring that top-level managers are accountable for results, and in turn hold those below them accountable. It is intended to reverse the decline in efficiency and ensuring that resources are prioritized for attainment of the key national priorities.

Table 3: Quality service delivery

Statement	SA (5)	A (4)	N (3)	D (2)	SD (1)	Mean	Std Dev
The county government of Kakamega has set standards for quality service delivery	27 29.67%	34 37.36%	10 10.99%	14 15.38%	6 6.59%	3.655	1.237
Standards for quality service delivery are achievable	30 32.97%	37 40.66%	8 8.78%	9 9.89%	7 7.69%	3.824	1.198
The county has clear processes to ensure quality service delivery	28 30.77%	43 47.25%	6 6.59%	8 8.79%	6 6.59%	3.868	1.147
The county staff spend quality time with clients	24 26.37%	35 38.46%	13 14.29%	13 14.29%	5 5.49%	3.633	0.735
The county has clear mechanisms for handling complains	26 28.57%	34 37.36%	11 12.09%	13 14.29%	7 7.69%	3.648	1.251
Complains received are effectively handled	28 30.77%	33 36.26%	13 14.29%	10 10.99%	7 7.69%	3.666	1.253
Aggregate						3.716	1.137

Source: Research data (2020)

The study established that 29.67% of respondents strongly agreed, 37.36% agreed, 15.38% disagreed, 6.59% strongly disagreed while 10.99% were moderate/neutral that county government of Kakamega has set standards for quality service delivery. The influence of standards on quality service delivery was moderate (mean of 3.655) whose variation was somewhat significant (1.237). It was established whether the staff usually achieves the set standards for quality service delivery, and 32.97% of respondents strongly agreed, 40.66% agreed, 9.89% disagreed, 7.69% strongly disagreed and 8.78% were neutral. Meeting set standards had some significant influence on quality service delivery (mean of 3.824) whose variation was significant (standard deviation of 1.198). The study focused on the measures put in place to attain standard services. There are service charters specifying the expectations, charges and timelines for services. Staff performance appraisals are done regularly to ensure standards and set targets are met. There is elaborate system for handling complains. Auditor General, Ethics and Anti-Corruption Commission (EACC) keep check to ensure the services meet the legislative and constitutional threshold and corruption cases are appropriately dealt with. Each department is guided by core values and standards. It was established that 30.77% of respondents strongly agreed, 47.25% agreed, 6.59% strongly disagreed and 8.79% disagreed while 6.59% were moderate/neutral that there are clear processes to ensure quality service delivery. The processes are somewhat important in determining quality service (mean of 3.868). The variation in quality service delivery was significant (standard deviation of 1.147). In terms of spending quality time with the clients, 26.37% of respondents strongly agreed, 38.46% agreed, 14.29% disagreed, 14.29% were moderate/neutral while 5.49% strongly disagreed. Spending quality time with clients moderately influence quality service delivery (mean of 3.633) which in turn did not vary significantly (standard deviation of 0.735).

In terms of effective handling of complaints received from clients on quality service, 28.57% strongly agreed, 37.36% agreed, 12.09% were moderate/neutral and 14.29% disagreed while 7.69% strongly disagreed. The handling of complaints received is somehow effective (mean of 3.648) but effectiveness varied significantly (standard deviation of 1.251). A number of factors were identified as affecting quality service delivery. These included corruption which prompted the governor to send some officers on compulsory leave in 2019. The infrastructure is deplorable in the rural where most of the roads are impassable. There is understaffing in some sections like the health sector. Most of the offices are under equipped thus slowing down quality service delivery. The health sector lack adequate supply of drugs and other equipment. Vital services like health should be provided for 24 hours as dispensaries close at night. Public is harassed by the county officers especially law enforcement officers. There is laxity of some officers as clients wait for long before they are served. Absenteeism from some of officers forces clients to visit the offices several times. Complaints that taxes/fees charged are high and that services like health should be free. Rampant strikes in the health sector leave patients hopeless with many losing their lives. The aggregate mean of 3.716 showed that service standards, consistency and complaints handling by county government of Kakamega determine quality service delivery and variation was somehow significant (standard deviation of 1.137).

Kenya introduced e-government in 2005 to ensure effective service delivery by facilitating efficient delivery of information and services to the citizens. It is made possible through use of government websites and portals, internet, mobile computing, integration of government management systems and use of toll free numbers.

Table 5: Analysis of Variance on technological innovations using SPSS version 20.0

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	132.026	7	18.861	273.118	.000 ^b
Residual	5.732	83	.069		
Total	137.758	90			

a. Dependent Variable: Quality Service Delivery

b. Predictors: (Constant), Technological Innovations

Source: Research data (2020)

Analysis of Variance generated F value of 273.118 whose P value is 0.000 and is less than 0.05. This shows that there is significant effect of technological innovations on quality service delivery.

The aggregate mean of 3.747 indicated that technological innovations have significant effect on quality service delivery whose variation is somehow significant (standard deviation of 1.077).

Table 6: Analysis of Variance on performance management techniques using SPSS version 20.0

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	113.035	9	12.559	188.993	.000 ^b
Residual	5.383	81	.066		
Total	118.418	90			

a. Dependent Variable: Quality Service Delivery

b. Predictors: (Constant), Performance Management Techniques

Source: Research data (2020)

Analysis of Variance indicated F value = 188.993 and the P value of 0.000 is less than 0.05

showing significant effect of performance management techniques on quality service delivery.

Table 7: Analysis of coefficient using SPSS version 20.0

		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	115	.090		-1.274	.206	-.295	.064
	Technological Innovations	1.116	.195	.989	5.719	.002	.728	1.504
	Performance Management Techniques	.755	.178	-.680	-4.244	.004	-1.109	-.402

Dependent Variable: Quality Service Delivery

Source: Research data (2020)

$$Y = 115 + 1.116X_2 + 0.755X_3$$

Analysis indicated that a unit change in technological innovations leads to 1.116 change in quality service delivery, the other factor held constant. The analysis also showed that a unit change in performance management techniques leads to 0.755 units change in quality service delivery; the other factor remaining the same. The P value = 0.002 < 0.05, therefore the first hypothesis that technological innovations have no significant effect on quality service delivery in county government of Kakamega was rejected. The P value = 0.004 < 0.05, therefore the second hypothesis that performance management techniques have no significant effect on quality service

delivery in county government of Kakamega was rejected.

VII. IMPLICATIONS AND CONSEQUENCES

The findings of the study would have implications on policy formulation by both the national and county governments regarding quality service. The findings help the management and leadership on various management strategies that would guide the county governments in quality service delivery. In the current study service was measured in terms of standards, processes and complains hence implication on SERQUAL model. The research findings form part of the existing body of knowledge. The study findings are reference materials in other researches. The

consequence of research findings is generation of debate by the academicians, county assemblies on issues of resource allocation, performance evaluation and automation of services. It has direct consequence on adopting appropriate technology hence quality service delivery.

VIII. CONCLUSION

It was concluded that technological innovations in form of automation of services reduces cost in terms of the number of staff, time, paper-works as well as increasing accessibility of the services to the residents even within the comforts of their homes. The county governments should put several measures to manage performance by formulating County Integrated Development Plans and departmental strategic plans with clear targets. The performance of the staff require periodic monitoring and evaluation and necessary corrective measures taken to ensure conformity with set targets and strategic plans. The county government of Kakamega has not extensively utilized Rapid Results Initiative to attain drastic results in short time. The public sector like the private sector should embrace technological innovations in quality service delivery. Technology should be used in human resource management activities such as recruitments; keeping employees' records and helping them access human resource services online. Technology should also be used in minimizing cases of corruption by eliminating cash transactions and paperwork. Integrated Financial Management Information System should help in tracking financial transactions, procurement process and for audit. Staff performance appraisal should be done regularly to evaluate how far set targets have been achieved and identify if there is the need for more resources and interventions. County governments should use Rapid Results Initiative to attain drastic results in areas where there is urgency.

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3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of management and business then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

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6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice. Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.



21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

INFORMAL GUIDELINES OF RESEARCH PAPER WRITING

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.



- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.



Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.



Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.



Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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	A-B	C-D	E-F
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<i>Introduction</i>	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
<i>Methods and Procedures</i>	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
<i>Result</i>	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
<i>Discussion</i>	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
<i>References</i>	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring



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