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Indexing

DRJI | Directory of Research Journals Indexing

ReseachBib – Academic Resource Index

ISI | International Scientific Indexing

RI-ROOTINDEXING

ESJI | Eurasian Scientific Journal Index

ICI Index Copernicus

General Impact Factor

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Dynamics of Fiscal Policy and National Development in Nigeria

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Abstract

The study was designed to explore the relationship between fiscal policy and national development. The exploratory research design was adopted in the investigation. Data were generated from both primary and secondary sources, which were found useful for the study. Fiscal policy is crucial in national development because manipulating revenue and expenditure means that government must reduce taxation to increase spending and vice-versa. In the public sector, the primary purpose of fiscal policy is ensuring that an agency operates within its budget limit. This means that public sector managers are charged with the oversight of government's revenues and expenditures, including budget management, corporate compliance, adherence to financial regulations, and plans. Data for the study were analyzed through the regression method, and the result showed positive association between fiscal policy and national development. Based on this finding, it was recommended among others that proper fiscal budgeting is essential for national development.

Keywords: Fiscal Discipline, Fiscal Adjustment, Budget Management, Accountability, Poverty Reduction.

1. INTRODUCTION

In attempts to drive national development governments all over the world deploy different policies and strategies to reduce spending at rates sufficient to maintain high levels of production and employment without inflation and widening the poverty gaps. Fiscal policy relates to measures designed by governments to regulate the magnitude and allocative efficiency of public revenue and public expenditure in a polity. Fiscal policy regulates public borrowing and transfers with the aim of ensuring equity, growth and stability, which are essential indicators of national development and sustainability. National development is about the people and improving critical infrastructure, it is therefore, largely a process, rather than a destination. For example, Nigeria's, fiscal policy often focuses on growth and development of the economy, continuous reduction in the rate of inflation, a realistic and appropriate monetary and credit policy stance, curtailment of extra-budgetary spending, and intensive revenue drive. According to Alli-Balogun (1997) fiscal policy in Nigeria also involves co-ordination of fiscal and monetary policy to ensure macroeconomic stability, curtailment of wasteful expenditure, and maintenance of general fiscal discipline, improvement of external value of the Naira, and fiscal transparency and comprehensiveness of the conceptualization of projects. In other words, fiscal policy helps to create stable macroeconomic environment and also checking fiscal austerity which may arise from late release of capital votes, which is often inimical to national development. To this extent, fiscal policy is an instrument for promoting development by sustaining aggregate demand and private sector incomes during economic depression and by

moderating economic activities in periods of strong economic growth. Fiscal policy in many respects therefore, becomes a measure of co-ordination between monetary and fiscal policies which are fundamental to blending macroeconomic priorities (Lucas, 2003, Romer, and Romer, 2002, Issing, 2002). To enhance the process of national development, fiscal policy encourages investment in productive channels which are considered to be socially, politically, and economically desirable. This means that fiscal policy often promotes investment in basic and capital goods' industries' as a measure of enhancing balanced development and accelerating the all-round development of the economy.In the circumstance, both Keynesian and non-Keynesian economists believe that taxation as a fiscal policy instrument is important to mobilize the resources for national development. Thus, progressive taxation on windfall gains, on unearned incomes, on capital gains, on consumption expenditure, and real estate can help in equitable distribution of national wealth in an economy. For national development to be feasible, the various tools of fiscal policy such as taxation, public borrowing, deficit budgeting, and surpluses from public enterprises should be applied in a combined transparent manner so that they do not negatively affect the production, distribution and consumption of wealth in an economy. For example, Kaliski (2001) explains that fiscal policy is manifested in a government's policy on taxation and expendituresand insists that to obtain funds for national development, government generally collects some form of taxes. The expenditure of these funds not only provides goods and services, but also has a directpositiveeffect on the economy (Ezu and Okoh, 2016, Isholeki, 2016, Jibao, and Prichard, 2015, Popoola, et al, 2017, Prichard, 2015, Tsindelianis, 2016, Zhang, et al, 2018, Lodge, and Hood, 2012, Rzonca and Cizkowicz, 2005).

Corruption is a major challenge of fiscal policy because it frustrates government efforts in achieving desirable outcomes. Mismanagement of government revenues as a result of public corruption makes it difficult, if not impossible, for governments to provide adequate infrastructure and other essential services for the people. In Nigeria today, the number of services which the governments at all levels provide have increased tremendously. Even with 36 states and the Federal Capital Territory (FCT) and 774 local governments, the responsibility of the governments to the people continues to increase. Such increase generally puts pressure on government revenues, which must now be more efficiently managed. This cannot be overemphasized because Nigeria with frequent budget deficits appears to be in dire lack of effective fiscal measures which often results to the volatility of public revenues from huge oil and gas resources. The frequent swings and fluctuations in public expenditures have negative effect on the impact of oil and gas revenue, and also on economic development, poverty reduction and national development. Cultivating fiscal rules characterized by good government budgets and management could mean a major factor in fiscal policy management,without which national development intentions will remain a day-dream in Nigeria (Baungaard, 2003, Ogundele, 2021, Chiejina and Ofkhenua, 2021, Apere, and Durojaiye, 2016, Ugoani, 2019).

The study was conducted to examine the relationship between fiscal policy and national development. The result of this study will help students, scholars, policymakers, and the general public in addressing the gaps between fiscal policy crafting and national development. To achieve the objective of the study, the following hypothesis was formulated and tested at 0.05 level of significance.

Ho: There is no relationship between fiscal policy and national development.

Hi: There is a relationship between fiscal policy and national development.

2. LITERATURE REVIEW

Fiscal policy instruments like budget, taxation, public expenditures, and public debt are crucial in maintaining full employment without the adverse effects of inflationary and deflationary

forces in a country. Taxation and public expenditure are also powerful fiscal policy instruments which can hugely influence changes in disposable income, consumption, investment and levels of poverty. Ezeokonkwo (1998) opines that fiscal policy means the use of government spending and revenue producing activities to achieve specific economic activities. Thus, the objective of the government fiscal policy in many countries has largely been the achievement of full employment and price stability. To this extent, fiscal policy involves the use of government income and expenditure instruments to regulate the economy. Although fiscal instruments are used as weapons of economic control, the field of fiscal policy is not very much differentiated from those of monetary policy and debt management. The principal reason for this assertion is that both monetary and fiscal policy instruments often deal with generally overlapping aspects of the economy. However, fiscal policy is strictly concerned with that part of government policy relating to the raising of revenue through taxation and other means, and deciding the level and pattern of expenditure for the purpose of influencing economic activities.Monetary policy on the other hand, refers to the combination of discretionary measures designed to regulate and control the money supply in an economy by the monetary authorities, with a view to achieving stated macroeconomic goals. According to Klugman (2002[a]) monetary policy is a tool of economic stabilization. According to him, the monetarists emphasize the role of money in explaining short-term changes in national income. This is based on their own believe that monetary policy is a more potent instrument of stabilization than fiscal policy. Issing (2005) emphasizes that fiscal stabilization and sustainability are actually fully compatible objectives. In which case, they are complementary aspects of a fiscal policy strategy aimed at maintaining medium-term budgetary positions close to balance or in surplus. He insists that by maintaining a stable macroeconomic environment, economic policy can contribute to economic growth and welfare. There is almost a chorus of agreement in the fiscal policy literature that fiscal policy is primarily aimed at achieving certain objectives which are useful to the economy. This is pertinent because it is recognized that fiscal policy is a potent tool in regulating the economy and protecting it from the adversity of market manipulations. Consequently, it is recognized that the government has a primary responsibility of helping the economy towards the appropriate level of stabilization. Believing that one important objective of fiscal policies in a developing country is to break the vicious circle of poverty, and to bring about rapid development, Gramlich (1971) recognizes the usefulness of monetary and fiscal policy as discretionary stabilization tools. Fiscal policy framework embraces the responsibilities of government to regulate spending and taxes in such a way that the supply of goods and services could be affected positively to improve national development (Nzotta, 2022). Njoku (2022) emphasizes that fiscal policy plays important role in economic development and crucial to stabilize the economy. He explains further that even though fiscal and monetary policies are two different instruments, but they are often adjusted and coordinated to complement each other in the process of stimulating the economy to stability and growth.

2.1 . Fiscal Policy and Poverty Reduction

Because poverty is largely a multidimensional phenomenon, fiscal policy includes comprehensive action plan that identifies priority sectoral policies to be pursued in support of poverty reduction, including in the areas of education, health, and rural infrastructure. Klugman (2002[b]) suggests that the first starting point in this direction will be to provide a full costing of the envisaged poverty reduction strategy. This could involve a comprehensive system for budget formulation and management of poverty reduction strategies required for the development of medium-term expenditure frameworks (MTEFs). This classic strategy is very important because it is capable of ensuring that poverty reduction strategy can be pursued and financed in a manner that does not jeopardize the government's macroeconomic stability,

growth and development goals. He insists on the need for a comprehensive assessment of domestic and external sources of budget finance. This would generally include a review of the existing tax and nontax revenue base, including the likely effect of any changes in the tax system, the scope for financing public spending through domestic borrowing, because of the need to maintain macroeconomic stability and to enhance economic growth, and the scope for external financing, in terms of grants, net external borrowing and sustainable debt relief or management. These steps reveal that fiscal policy can have a direct impact on poverty reduction both through the government's overall fiscal stance and through the distributional implications of tax policy and public spending. Consequently, structural fiscal reforms, in budget and treasury management, public administration, governance, transparency, and accountability can also be of immense benefit to the poor through more efficient use of public resources (Ugoani, 2017[a], 2017[b], 2017[c]).

2.2 . Fiscal Policy and Debt Management

Debt management like tax policyis another important instrument of fiscal policy. Debt management consists primarily of the manipulation of three aspects of outstanding debt; the level of interest rate, the pattern of ownership of debt, and the maturity schedule. According to Stiglitz (1996) government plays important role in economic development of any nation. Thus, a government's debt management policy may have a number of different objectives including the minimization of the interest burden of the debt, stabilization of the private sector, gradual reduction of the debt, and support of general growth policy. According to Iyoha (1997) debt management by government is a crucial approach toward economic growth. This is because the most significant role of debt management policy is in the area of stabilization in which the nature of the maturity of the debt is the most important factor. Therefore, fiscal policy is needed for stabilization since full employment and price stability do not come about automatically in a market economy but requires public policy direction. In this regard, the need for public policy direction cannot be overemphasized. For example, the primary objective of privatizing public enterprises in Nigeria was to shrink government's dominance and enlarging the size of the private sector. In order to enhance the prospects for better performance of private sector investment, the National Economic Empowerment and Development Strategy (NEEDS)enunciated various measures in its policy document. Under the NEEDS, the dominance of government in running business was reversed, and government would act as a facilitator of economic development by creating and maintaining an environment that enables Nigerians to implement livelihood strategies and achieving personal goals. To this extent, the government is expected to develop infrastructure, stimulate the growth of the private sector, and the nation as a whole (Akpokodje, 1998, Amos, et al, 2016, Onoh, 2013, Umaru and Zubairu, 2012).

3. RESEARCH METHODOLOGY

This study adopted the quantitative technique of the exploratory research design. The exploratory research design does not often require a structured questionnaire or a large sample. The population composed of all the levels of government in Nigeria, and the sample was selected through the judgmental method. The sample size was determined using the sample ratio concept. Data were generated through secondary sources, including websites, journal articles, books, newspapers, government documents, among other sources. Data collected were complemented, supplement and validated through each other. They were summarized, filtered and coded in readiness for analysis. Data were then analyzed using descriptive and regression techniques. The Ordinary Least Square (OLS) technique was used in the regression analysis based on a unique model specification (Cresswell, 2009).

3.1. Model Specification

Model specification is the expression of a relationship into precise mathematical form. According to Koutsoyiannis (1977) economic theory does not indicate the functional form of any relationship. This implies that economic theory does not state whether a relationship will be expressed in linear form, quadratic form or in a cubit form. On the basis of this it was decided to specify the relationship between National Development (ND) and Fiscal Policy (FP) as follows:

$$ND = F(GE, GR, PB) \quad \ldots\ldots (1)$$

From this functional relationship, the econometric model is specified below:

$$ND1 = b_0 + b_1GE, + b_2GR_3 + b_3GR_3 + b_4BM_1 + u \quad \ldots\ldots (2)$$

Where: ND = National Development
GE = Government Expenditure
GR = Government Revenue
PB = Public Borrowing
BM = Budget Management
b_0 = Constant term
b_1, b_2, b_3, b_4 = Coefficient attached to explanatory variable.
t = time period
u = Stochastic error term

3.2. Unit Root Test

The variables of interest were subjected to necessary unit root test before conducting the OLS analysis. This preliminary analysis was done to test for the presence of a unit root in the series.

3.3. Conceptual Framework

A conceptual framework describes the relationship between the major variables of a study and the research problem. It is usually reflected in a diagrammatic model. A model is useful in clarifying important points that would otherwise be buried in an excess of words and helps in promoting experiential learning. The model for this work is shown in figure 1

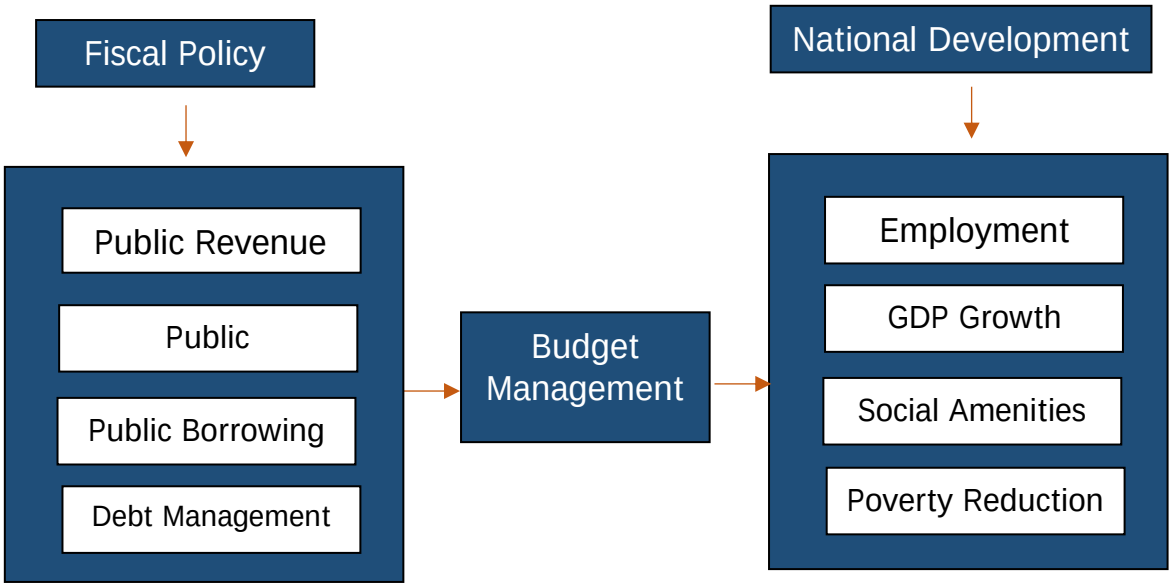

Figure 1: Fiscal Policy and National Development Model

As shown in this model, public revenues and expenditures have effect on national development, and it can be argued that government can reasonably manipulates its spending and revenue so as to produce the desired results, in terms of improving infrastructure, employment, and overall productivity through sound budget management. Basically, manipulating its spending and taxation simply means that using fiscal policy in deficit financing, government must reduce taxation and increase its spending. Also, in using fiscal policy to prevent inflation means that government must increase taxation and reduce its spending. Both imperatives in fiscal policy manipulation involve taxation, and to be successful, there must be sound fiscal management. Based on the classical economic view of fiscal policy and taxation, it is believed that increased government spending increases total national income, thereby generating a rise in consumption and investment. On the contrary, increased taxation lowers total national income, and forcing a decline in consumption and investment. Another task of fiscal policy manipulation in attempting to either prevent recession or inflation is to consider whether the public or the private sector of the economy should be stimulated. This is crucial because if the provision of social infrastructure is considered a priority, deficit could be achieved through an increase in government expenditures. But on the other hand, if private entrepreneurship and goods for personal consumption are taken as more important, decreased taxation should be used to achieve deficit. In other words, the language of macroeconomics is to fully understand the aggregates of the economy in terms of government affairs, entrepreneurship and business in total, as well as the overall patterns of individual consumption, to guarantee national development. For a developing country like Nigeria, fiscal policy would aim at poverty alleviation and for managing the external debt burden, which havedirect relationship between the balance of payment and foreign reserves (Cheeseman and Owen, 2017, Chigbu, and Njoku, 2015, NGF, 2017).

4. PRESENTATION OF RESULT

Table 1. Regression Analysis

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.754978	0.156320	-5.215709	0.0001
GE	0.006204	0.012809	0.370261	0.6117
GR	0.058308	0.021384	5.208217	0.0012
PB	-0.046207	0.012046	-2.304081	0.0214
BM	-0.024109	0.017276	-0.617068	0.4431
R.squared	0.749704	mean dependent variable		-0.704302
Adjusted R-squared	0.718402	S.D. dependent variable		0.038608
S.E. of regression	0.016305	Akaike info criterion		-3.184002
Sum squared resid.	0.006705	Schwazz criterion		-4.931703
Log likelihood	34.30742	Hannau-Quinu criterion		-5.007908
F-Statistic	11.05720	Durbin-Watson Statistic		1.920405
Prob (F-Statistic)	0.000000			

4.1. Discussion

The psychometric model in figure 1 was used to demonstrate that fiscal policy and its other components have positive relationship with national development. This descriptive outcome was complemented with quantitative analysis using the OLS technique; as in table 1. The R^2, value of 0.75 in this table showed that about 75 percent variability in the dependent variable is explained by the independent variable(s) and confirm that there is strong relationship between fiscal policy and national development. The goodness-of-fit test of the model is also good at the adjusted R^2, value of 0.72. The value of Durbin-Watson is 1.92 that lies within the range between

1.5 and 2.5 and it can be assumed that there is no autocorrelation among the independent variables. The F-test and t-statistic are significant at 0.05 level. This is the objective of the study. This result supports the finding of Njoku (2022) that fiscal policy is an instrument for resource allocation, employment creation, utilization and national development. Fiscal policy serves a major purpose of economic stability through the application of effective fiscal management. To this extent, policymakers often make effort to reduce inflation, using strong, sustained fiscal adjustment and other measures. This should be of concern to policymakers because a weak fiscal policy approach can put unnecessary upward pressure on the economy through the channels of aggregate demand, supply, and financing. Usually, a weak fiscal policy increases the demand for domestic goods, and this in the absence of corresponding increase in supply, puts upward pressure on prices. This can also increase demand for imports, thereby bringing downward pressure on the prices of imported goods or services. To enhance policy transparency and credibility, there is always need for sustained fiscal adjustment. Fiscal adjustment means the ability, to enhance transparency, accountability, credibility and efficiency in macroeconomic management. Fiscal reforms and management often use subsidies as fiscal equity instrument to cater for the needs of the majority in a country. To this extent, many developing countries, including Nigeria, devolve considerable national resources to subsidizing the capital and operating costs of products such as petroleum. However, research evidence suggests that the benefits of those subsidies go primarily to unscrupulous government officials and *big time oil merchants* and never to the consumers. The economic rationale for subsidies to offset market inefficiencies where prices fail to reflect significant external benefits supports their use, but mismanagement and corruption are the main obstacles. It is emphasized that crafting and implementing credible and comprehensive fiscal policy are essential ingredients for national development. This is centrally imperative to mitigate the adverse effects of corruption, poverty, frustration, aggression, and all forms of criminal activities largely associated with massive unemployment and underemployment in Nigeria.

4.2. Scope for Further Study

Nigeria frequently experiences budget deficits. To seek ways to address this situation, further study could examine the relationship between fiscal policy and fiscal discipline in Nigeria. This is also necessary to bridge the widening poverty levels.

4.3. Recommendations

i. The tax structure in Nigeria should be refashioned in such a way that it will encourage voluntary compliance in terms of tax payment to improve public revenue base.

ii. Proper fiscal budgeting is essential in PFM to ensure that government revenue is strictly applied towards government expenditure and national development.

iii. Anti-corruption war should be extended to revenue boards or authorities and government ministries to minimize the magnitude of government revenue ending up in private pockets of public officers.

iv. Subsidy as a fiscal policy instrument is grossly abused in Nigeria by people in the *corridors of political power*. Therefore, its efficacy as a fiscal management tool should be reviewed.

5. CONCLUSION

Fiscal policy as a tool of national development recognizes the need for proper fiscal budgeting, fiscal adjustment and fiscal discipline as success factors in the drive for national development. This is important because weak fiscal policy results to weak accountability and transparency

mechanisms which ultimately frustrate national aspirations. The exploratory research design was adopted in this study, and the result showed positive relationship between fiscal policy and national development. Fiscal policy represents policy thrusts under which the government deploys its expenditure and revenue programmes to produce desirable effects on the national income, production, and employment. Modern fiscal policy is now a technique for attaining and maintaining aggregate economic performance by manipulating public expenditure and revenue, and to regulate spending and taxes to control the supply of goods and services. The main goal of effective fiscal policy is to ensure that all necessary ingredients like; expenditure, tax revenue, debt management and others including subsidy are put under proper control for national development.

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Impact of Covid-19 Prevalence in Seoul on Subway Usage

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Abstract

This article shows that there is a negative impact of government's social distancing policy, daily COVID-19 confirmed cases, daily volume of new articles related to COVID-19, and a weekend dummy on subway ridership in Seoul, Korea. Multiple regression with OLS is applied to 289 daily data mostly collected from the Open Government Data Portal during the early stages of COVID-19 pandemic, from January 1 to October 30, 2020. The model is run separately for four subway station categories: commercial, office, residential, and other area. Different impacts of explanatory variables across different area have some policy and managerial implications. This study concludes with future research.

Keywords: COVID-19, Pandemic, Subway, Public Transportation, Ridership, Korea

1. INTRODUCTION

Since the COVID-19 pandemic, there have been many changes, large and small, in society as a whole, including lifestyles, working styles, and government policies (Echegaray, 2021; Zhang et al. 2021). Wearing a mask and disinfecting hands has become a daily routine, and it has become difficult to imagine life before pandemic. Many activities, such as shopping and leisure, have been replaced online, and more and more businesses are working from home. In Korea, restaurant business hours are limited due to social distancing measures, and transparent partitions are installed and operated for each table to prevent the spread of droplets. These changes are related to efforts to reduce human-to-human contact as much as possible, which has led to a decrease in overall population movement. In particular, there has been a phenomenon of reluctance to use public transportation, which is usually frequented by many people. Figure 1 by Ministry of Land, Infrastructure and Transport (2021) shows that the average daily usage of transportation cards decreased by an average of 27.0% nationwide, and by region, the Gwangju area decreased the most with 31.5%, followed by the Daegu area with 30.8%, the Daejeon area with 29.2%, and the metropolitan area with 26.9%. The deficit problem of bus companies and the Seoul subway is emerging as a social problem due to the restraint of public transport use and the reduction of night public transport operation to prevent the spread of COVID-19.

Despite a lot of interest, there are few empirical studies on the effect of COVID-19 on the number of subway users. In this study, it is assumed that the change in the number of subway users due to COVID-19 is affected by public anxiety and fear about COVID-19. Therefore, the effect of the spread of COVID-19 on the number of subway users was empirically analyzed using factors that could affect the formation of public anxiety and fear as variables. Also, we want to create a model that predicts the rate of change in the number of subway users in the future. We analyze changes

in subway users by region due to various factors, and suggest regional quarantine policies based on this. The time when the public most refrained from going out and using public transportation for fear of Corona 19 was the early stage of the outbreak of COVID-19 in 2000, and the first confirmed case of Corona 19 in Seoul was on January 24. Considering this, this study analyzed data from January 1 to October 30, 2020.

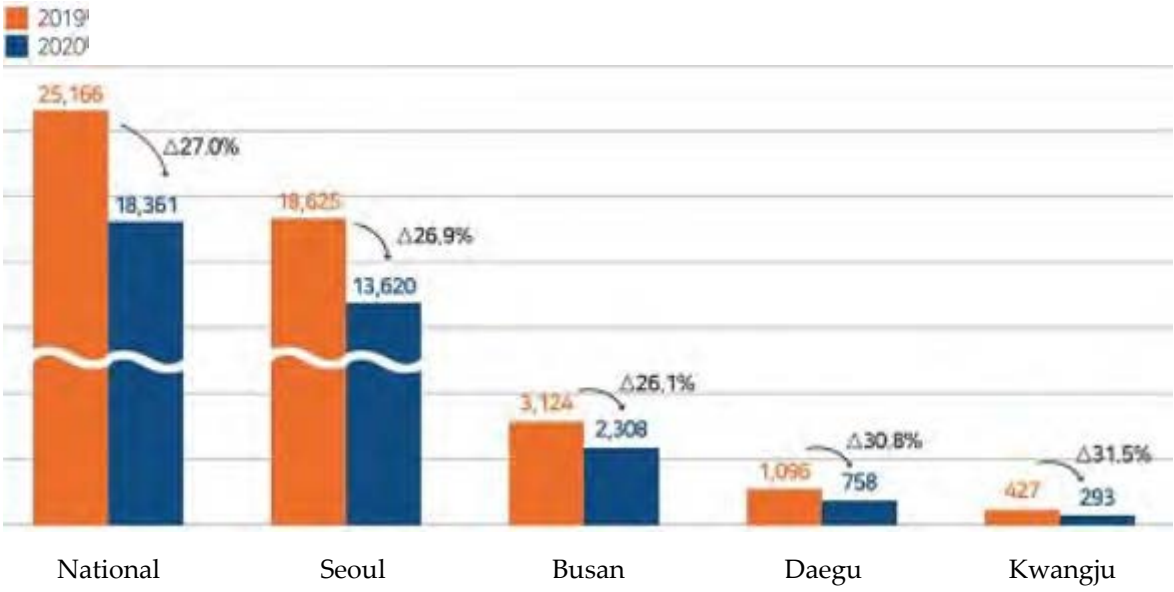

Figure 1. Changes in average daily traffic volume by region across the country

This paper aims to examine the impact of COVID-19 on the daily use of public subway in Korea during the 2020 pandemic. The rest of the paper is organized as follows. We review the prior literatures in the following section and then describe the methodology and dataset. In section four, we present and discuss the findings and results. We conclude the study with managerial implications and potential future research.

2. LITERATURE REVIEW

To the best of our knowledge, there are few empirical research on the impact of COVID-19 on the use of public transportation. Gkiotsalitis and Cats (2021) and Tirachini and Cats (2020) overview the literatures, issues and research needs associated with the pandemic crisis and public transport system. A study on the impact of covid-19 on public transportation was conducted in various countries based on different data and methodologies. Research on the impact of COVID-19 on public transport can be divided into two main research area: determinants of decrease in public transport use and socioeconomic disparities in public transport use.

2.1. Determinants and Impact of the Public Transport Use

A recent study found that public transport use has declined in a variety of countries since COVID-19 pandemic (Bureau of Transportation Statistics, 2022). Various reasons are identified as determinants of decline in public transportation use since COVID-19 pandemic through prior research. Using validated ticket and passenger volume data in Sweden, Jenelius and Cebecauer

(2020) find that the decline in public transport use is due to the fact that many travelers have switched from 30-day to one-time tickets and that short-term ticket sales are close to zero. Wielechowski et al. (2020) show that the Polish government's quarantine or social distancing

policy is a major factor influencing public transport use. Using the survival analysis approach, Murano et al. (2021) examine the effect of domestic travel restriction on the public transport use in Japan. In emerging economies such as Nigeria, Mogaji (2020) find that government policies such as lockdowns or movement restrictions do not have a significant impact on reducing public transport use due to lack of public transport infrastructure. Teixeira and Lopes (2020) show that in New York City, the bike share system (BSS) appears to be less affected by COVID-19 than the subway during 2020 pandemic. The decrease in BSS users (71%) was less than the decrease in subway use (90%), and the average BSS use time increased from 13 minutes to 19 minutes. They also prove that many users change their means of transportation from the subway to the BSS.

2.2. Socioeconomic Disparities in Public Transport Use

Hu and Chen (2021) analyze the 20 years daily transit ridership data from the Chicago area to examine if there is a difference in socioeconomic variables regarding the decrease in public transportation use due to the impact of COVID-19. They employ Bayesian structural time series model, controlling other possible confounding effects such as seasonality, weather, and holiday. They find that Passenger declines were most affected by white, educated, high-income, commercial land areas, with fewer declines in areas with more jobs in trade, transportation and utilities. Their research helps policy makers and transit agencies how to provide better public transport to different socioeconomic groups. Jenelius and Cebecauer (2020) find that there are regional differences in the extent of the decline in public transport users. The three most populous cities in Sweden were surveyed. In Stockholm, the number of users on public transport decreased by 60%, while in Västra and Götaland it decreased by 40%. Wilbur et al. perform a spatio-temporal analysis of public transport usage decline throughout Nashville and Chattanooga, Tennessee USA and show that There was a significant difference in rider decline between high and low income neighborhoods in Nashville (77% versus 58%). They explain this phenomenon as low-income families have fewer vehicles than high-income families, and there are many blue colors that require commuting to work rather than telecommuting. Tan and Ma (2021) employ a logistic regression to understand which socio-economic variables have an influence on the commuters' choice of rail transit using questionnaires data. They find that occupation, how they commuted before COVID-19, how long they walk to the nearest metro station from where they live, and their perception of the potential for infection on public transport have a huge impact on commuters' rail choices.

3. METHODOLOGY

3.1. Data

We obtained our primary data set of this study through the Open Government Data Portal, which provides APIs so that the public can use public data held by the government easily and conveniently. The Open Government Data Portal provides various types of data that the Korean government has. This applies to virtually every sector in which government is involved, including education, transport, construction, tourism, industrial employment, and health care etc.

For the data on the daily number of subway users, the number of daily users of each Seoul subway station provided by the Open Government Data Portal was used. Although this data provides information on subway users from 2015 to 2020, this study selected 2 years data set from January 1, 2019 to October 30, 2020 because we aim to analyze changes in subway users in 2019 and 2020, the year before the outbreak of COVID-19. In the raw data, data of passengers on board and getting off were separated, so one variable was created by summing the data of

passengers on board and getting off. In this study, since the decrease in subway users is of interest, the relative change in the number of passengers compared to the previous year was calculated and used as the focal variable instead of the absolute number.

This study adopts a multiple regression model with OLS to examine the impact of COVID-19 on public transportation usage, subway in Seoul, Korea. In this study, the 'total number of passengers' per day was calculated by adding the 'number of passengers' and 'number of departure passengers', which were separated in the raw data. Since the main concern of this study is the decrease in the number of subway users, the relative change in the number of daily users compared to the previous year was used as a focal variable.

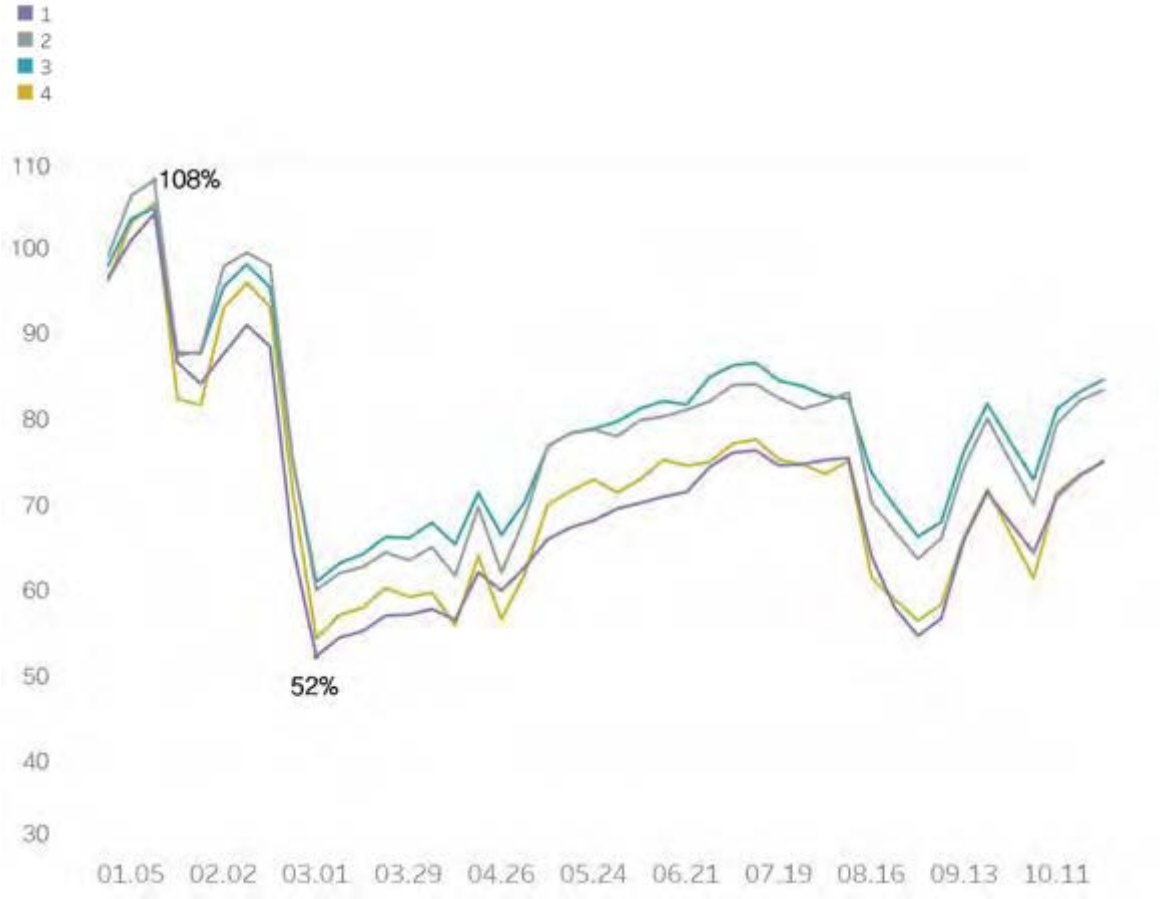

Figure 2. Average change in number of passengers per week by station group

The daily number of confirmed COVID-19 cases was calculated by adding up the number of confirmed cases in Seoul and Gyeonggi Province reported the previous day. Since the Seoul subway is used a lot by citizens commuting to and from the Seoul metropolitan area, the number

of confirmed cases in Gyeonggi-do as well as Seoul is included. The data was obtained from Seoul Open Data Portal and Gyeonggi-do public data portal.

Media reports related to COVID- 19 is considered that the news of the previous day have an effect on the movement of the day rather than the news of the day. The number of daily media articles related to COVID-19 was collected and calculated using the search term 'corona 19' in the Bickins News search and analysis program (Bickins, 2022).

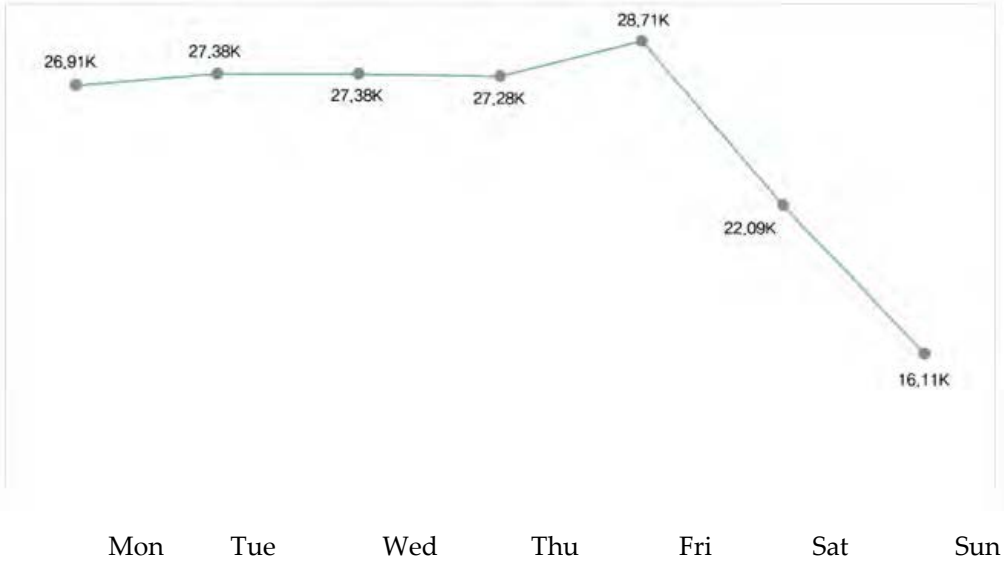

Figure 3. Average number of passengers per day

The government's social distancing policy is known to have affected the use of public transportation in 2020, the early stage of the COVID-19 outbreak (Jung, 2020). The data for steps 1, 2, and 2.5 of the distance measures implemented in Seoul from January to October 2020 were collected by date from the Center for Disease Control and Prevention website.

Using K-means clustering analysis, an unsupervised machine learning technique, Seoul subway stations are divided into four categories: "transfer or commercial area, business area, residential area, and other areas". The subway station variable was not used as an independent variable, but was used as a filter criterion for the dependent variable so that the model could be applied separately by station category. The graph of the weekly average passenger number change by station group in Figure 2 show that the trend of the change rate by station group is generally similar, but there is a difference in the decrease by more than about 10%. Group 3, that is, the residential area, has a small decrease in the number of passengers, and on the contrary, the decrease in the number of passengers in the commercial area (group 1) is the largest.

Figure 3 shows that the number of subway users by day of the week decreases significantly on weekends compared to weekdays. Weekend dummy variables (0 for weekdays and 1 for weekends) are used to control the effect of the number of subway users on weekdays and weekends. While in the case of weekdays, the decrease was expected to be low because there is a required amount of movement due to commuting to work and school, a large decrease was expected due to a decrease in leisure activities and events on weekends, as there were relatively few essential movements.

Table 1. Summary Statistics (N=289)

	Mean	Std	Min	Max
Passengers	75.444	15.343	35.836	119.223
Step 1	.446	.497	.000	1.000
Step 2	.097	.296	.000	1.000
Step 2.5	.270	.444	.000	1.000
COVID-19 Cases	38.156	53.028	.000	279
News Volume	3393.066	1980.357	.000	7355
Weekend	.280	.449	.000	1.000

Table 2. Correlations

	Pass	S1	S2	S2.5	COVID	News	Week
Passengers	1.000						
Step 1	.076	1.000					
Step 2	-.122	-.294	1.000				
Step 2.5	-.547	-.545	-.199	1.000			
COVID-19 Cases	-.285	-.131	.663	-.014	1.000		
News Volume	-.327	-.063	.075	.401	.193	1.000	
Weekend	-.419	-.017	.003	.037	-.007	-.397	1.000

Table 1 and 2 present summary statistics and correlations for each variable in our data set. Data collection process in 3.1. ends up with 289 daily data.

3.2. Empirical Model

To model the effects of government's social distancing policy, number of COVID-19 cases, media reports related to COVID-19, and weekend on the decrease of subway ridership, we fitted the multiple linear regression model as follows:

We fitted the multiple linear regression model as follows:

$$Passengers_t = \alpha_1 S1_t + \alpha_2 S2_t + \alpha_3 S2.5_t + \alpha_4 COVID19_t + \alpha_5 News_t + \alpha_6 Weekend_t + \epsilon_t \quad (1)$$

where *t* refer to daily time point. *S1*, *S2*, and *S2.5* are government's social distancing policy step 1, step 2, and step 2.5 respectively. *COVID19* is the daily COVID-19 cases, *News* is the number of daily media articles related to COVID-19, and *Weekend* is a weekend dummy variable (0 for weekdays and 1 for weekends). *Passengers* is the relative change in the number of daily passengers compared to the previous year. The parameter α_i is estimated using OLS regression. The ϵ_t term is independent and identically distributed with zero mean and a constant variance.

After fitting linear regressions for the entire data, linear regressions were again fitted for each of the four categories of data of subway stations: "transfer or commercial area(*D1*), office area(*D2*), residential area(*D3*), and other areas(*D4*)". VIF test result (Mansfield & Helms, 1982) indicates that there is no multicollinearity issue in our data.

4. EMPIRICAL RESULTS

The empirical results are partitioned into five estimation as presented and discussed as follows in Table3. OLS is run for all districts and the same work is repeated for each district: "transfer or commercial area(*D1*), office area(*D2*), residential area(*D3*), and other areas(*D4*)".

Results of Table 3 show that our explanatory variables predict a subway ridership very well. Adjusted r^2 for each model is quite high and all independent variables in the model are statistically significant. Next, we discuss in detail how each variable has an impact on subway ridership and if there is any difference of these impacts across each district.

Table 3. Model estimation results for all and each district

	All Districts	*D1*	*D2*	*D3*	*D4*
Step 1	-15.165**	-15.344**	-14.331**	-12.859**	-18.125**
Step 2	-17.670**	-16.811**	-17.380**	-15.220**	-21.269**
Step 2.5	-27.467**	-26.362**	-28.187**	-25.359**	-29.937**
COVID-19 Cases	-0.030**	-0.033**	-0.024*	-0.022*	-0.039*
News Volume	-0.001**	-0.002**	-0.001**	-0.001**	-0.001**
Weekend	-16.052**	-15.328**	-15.470**	-12.705**	-20.705**
AIC	8113	1909	1980	1917	1985
r^2	0.725	0.806	0.759	0.759	0.807
Adj. r^2	0.724	0.802	0.754	0.753	0.803

** = p<0.001, * = p<0.05

Parameter estimates of government's social distance policy variables (-15.165 for *Step 1*, -17.670 for *Step 2*, -27.467 for *Step 2.5*) show that the strengthened social distancing policy has the effect of further suppressing the number of subway passengers. Empirical results for all districts indicate that the government's strengthened social distance policy has the effect of curbing the number of subway ridership. That is, the results imply that the government's social distancing policy which tried to contain the spread of COVID-19 by restraining the movement of people was quite effective.

Parameter estimates for *COVID-19 Cases* and *News Volume* are statistically significant for all districts (-0.030 and -0.001 respectively). This suggests that the number of confirmed COVID-19 cases and the amount of media coverage related to COVID-19 had a negative impact on subway use. This is because the increase in the number of confirmed cases and related media reports may have the effect of limiting the use of public transportation by raising public fears in the early stages of the pandemic. The weekend coefficient (-16.052) indicates the weekend effect of the Seoul subway that there are fewer subway users than weekdays because they do not commute on weekends.

Comparing the impact of the government's social distancing policy on regions, it was found that the number of subway users decreased more in commercial areas than in residential areas as social distancing was strengthened, and this phenomenon was most pronounced in office areas. It is interpreted that this is because the use of public transportation in commercial and office areas is lower than in residential areas as more companies are working from home as social distancing is strengthened.

The effect of daily COVID-19 confirmed cases on the decrease in subway users was lowest in residential areas (-0.022) and highest in commercial areas (-0.033). It is interpreted that people react sensitively to the number of daily confirmed cases of COVID-19 in the early stages of the pandemic, and refrain from socializing activities that can be done in commercial facilities on days when there are many confirmed cases. The effect of the search volume for news articles on COVID-19 on the decrease in subway use also seems to have had the greatest impact on the decrease in subway users in commercial areas for reasons similar to the number of daily COVID-19 confirmed cases.

The weekend effect was greatest in office areas, where the amount of weekend public transport movement was bound to decrease because people do not commute to work (-15.470), and the lowest in residential areas (-12.705).

5. CONCLUSION AND FUTURE RESEARCH

This study examines the impact of government's social distancing policy, daily COVID-19 confirmed cases, daily volume of new articles related to COVID-19, and a weekend dummy on subway ridership in Seoul, Korea using multiple-regression during the early period of pandemic from January 1 to October 30, 2020. Findings reveal that our explanatory variables have a negative impact on the subway ridership in Seoul, Korea. Estimation and comparisons of four different area imply that government's social distancing policy works best in office area, daily COVID-19 confirmed cases and daily volume of news articles have a highest impact on the decrease of subway use in commercial area, and weekend effect is highest in office area.

Our findings have some policy and managerial implications. First, the government's social distancing policies actually affect people's use of public transport. If it becomes necessary to adjust the amount of public transportation as part of quarantine measures, it shows that social distancing policy can be one of the ways. Second, the subway operator should pay attention to the fact that the passenger reduction effect of each variable is different across the commercial area, office area, and residential area. A subway operator should establish a passenger attraction strategy and minimize customer decrease that takes into account regional characteristics.

There are some avenues for future research. Although our study aimed to investigate the impact of government social distancing policies, daily confirmed cases of COVID-19, daily volume of new articles related to COVID-19, and weekend dummy on subway passengers, the A study on how it affected the -19 cases will also be a meaningful study in establishing quarantine measures.

Methodologically, various non-linear machine learning techniques such as random forest and support vector regression (SVR) could be applied to the analysis of our dataset instead of linear regression.

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Influence of Social Media Usage and Work Performance on Organizational Performance: The Case of A Broadband Company in Oman

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Abstract

The objective of this study is to investigate the impact of social media usage on organizational performance in a Broadband Company in Oman. It also examines the influence of social media usage on employee work performance. The study utilized a quantitative research method. A sample of 108 employees was taken with purposive sampling, and analysis was carried out through the SPSS. Major findings showed that social media usage significantly influenced work performance. Moreover, applying the three models in determining the significant influence of social media usage and work performance on organizational performance: rapid adaptation, time to market, and cost reduction; findings revealed that social media usage and work performance significantly and positively impacts rapid adaptation, time to market, and cost reduction. Based on these outcomes, it is recommended that the use of social media can be integrated into the annual evaluation of employees as part of its criteria to ensure that social media has been utilized and improve the employee performance in terms of quantity and quality of the job.

Keywords: Social Media, Social Media Usage, Work Performance, SME, Organizational Performance.

1. INTRODUCTION

Recently, social media has become a vital part of people's daily activities. The use of different Social Media platforms impacted the economic, social, political, and environmental concerns of the world. It served as the main medium of communication and interactions among people globally. Businesses and marketers considered social media as a powerful and vital tool in marketing, and it helps to increase the brand value of the companies. Although there are some complexities in using social media as a tool for marketing, enterprises remain using it and keep

catering to the online community to make their market segments big. There was a survey conducted by Clutch and Smart Insights with 344 Social Marketers respondents globally and the result shows that enterprises around the world believe that social media increases their revenue and sales, and that trend will continue to evolve. It is because of its popularity that the consumers will depend on Social Media content as the basis of their purchasing decisions and those companies not utilizing the power of social media will lose their opportunities to get potential clients (Herhoid, 2017).

The year 2020 created many changes in life and the marketers need to adjust and intensify the online marketing of their enterprises through social media. The worldwide usage of social media increased this year and the marketers in the GCC regions need to approach Social Media marketing more localized considering how the different areas present their Social Media marketing based on the languages, contents, cultural expectations, and some barriers that the marketers need to overcome (Ntloko, 2020). Besides, the use of social media becomes very useful for organizations to achieve superior organizational performance not only in large-scale businesses but also in SMEs (Alawamleh & Murthy, 2020; Dodokh & Al Maaitah, 2019). However, the inconsistency of the result between these two is affirmed in the study of Ahmad et al. (2019) showing that there is no significant relationship between social media usage and organizational performance.

In the year 2017, the Mideastmedia survey result revealed that 8.5% or equivalents to 10 persons in the Middle East region are using the Internet. Similarly, in the Sultanate of Oman, most citizens use social media to communicate and bring their messages across the country and beyond. In the same year, there were 6.944 million mobile owners in Oman having an average of 1.5 mobile phones per individual. According to the research conducted by Statista, a German company based in Hamburg every person holding a mobile phone will not allow passing a few minutes without checking any message or notice from the different mobile applications on the phone. People are deeply attached to the different advantages and benefits that social media brought to their daily lives. Based on this fact, most people check their phones before sleeping and will put their phones beside their heads to easily check the messages on them. This kind of phenomenon has been extensively examined and discussed and generally disputed on the academic level.

Instagram is considered one of the most frequently visited Social Media platforms although it is not the first on the market. It gained its popularity among marketers because the user can send and accept messages and post their products and services easily in huge numbers of possible markets. According to the research of Baird et. al (2011), Instagram was concluded as the young Omanis' first preference in terms of Social Media platforms. The research also concluded that some adult people started to open their accounts on Instagram due to the useful information that they are getting from it. However, in the study by Garcia-Morales et al. (2018), it was concluded that the use of social media can give positive and negative outcomes to the enterprise. Those positive outcomes pertain to the factors of accuracy and reliability of the information, easy access, user-friendliness, and connectivity. For the negative results, the factors considered are privacy, security, dependency of the users, etc. In this study, the use of social media for marketing purposes will further be examined about its impact on SME performance.

As of 2016, Internet penetration in Gulf Cooperating Countries is growing together with the rate of subscriptions of mobile phones as well as the figures of the GCC Social Media users. It is given that the entrepreneurial activities in social media grow and increase because of the stated improvement of the technological progress in the GCC region. In the Middle East and North Africa (MENA) region, the penetration of the Internet grew by 27% from the year 2000 to the

year 2015. The trend was increased due to the developed nations located in the MENA region. This progress opened new opportunities and avenues for the enterprises to promote their brands and capture the online market in the GCC and MENA regions as well. GCC companies are aware of the use and maximization of online marketing. The companies are leveraging social media to attain their objective, growth, enhancement of their brand, and a great tool to market their offers and build long-time relationships with their clients. Those companies in retail, electronic, airline, foods, and e-commerce are considered as much engaged in terms of Social Media Usage. The Internet presence of GCC companies is becoming high. Twitter, Facebook, and LinkedIn are considered the famous Social Media platforms in GCC. The usage of Twitter in Saudi Arabia is higher in comparison to India, the UK, and Germany. In the5, LinkedIn researched 260 SMEs to check their Social Media presence. According to the result of the research 92% of the SME respondents already have Social Media accounts and were in the preparation of making their own. The SMEs preferred to use social media in terms of promoting their brands (Times of Oman, 2016).

In the year 2017, the penetration of social media in Oman increased by 43%. According to the study performed by Statista in the United Kingdom, some GCC countries like UAE, Qatar, Kuwait, and Bahrain ranges from 98 to 99% usage of search engine for online browsing. The use of Twitter in Oman generated 500000-600000 tweets daily and even some television channels in Oman used it to broadcast the activities of Oman's King- Majesty. Oman was recorded as the highest Twitter user in GCC countries and 90% accessed it using free mobile phones (Al Amri, 2017). Relative to this, the chosen organization in this study provides services to the SMEs in Oman including large enterprises and most of the businesses are classified as SMEs. The SME sector in Oman is considered savvy and used social media to promote their companies to create sales. There are 92% of SMEs in GCC promote their businesses on Instagram, Twitter Facebook, and other Social Media platforms. There was a report created by Orient Planet entitled social media as a Business Tool for SMEs in the Arab world that stated that there was a big growth of Arab people using the Internet in terms of communicating and connecting with their friends and families.

According to Khalid Al Haribi, Riyada CEO the authorized government agency for SME development in the country, 90% of businesses in Oman are considered SMEs. These businesses used social media platforms due to their cost-effectiveness and affordability since the SME budget is minimal. As applied in this study, the company is a government-owned institution that provides and maintains the broadband infrastructure for service providers who served the SMEs. Moreover, the company is assessing its own rate of social media usage and its effect on its employees' work performance and on organizational performance. Sub-objectives identified in this study are to determine the different social media platforms used by the company; to assess the extent of social media usage by the company and its impact on the work performance; and, to assess the influence of social media usage and work performance on organizational performance in terms of rapid adaptation, time to market, and cost reduction.

2. LITERATURE REVIEW

2.1. Businesses in the Social Media World

According to Aral et. al (2013), social media contributed big benefits to any type of enterprise activity. They also confirmed that the different platforms in social media are surfed by the consumers to get information about the products or services that they want to avail themselves and buy. The recommendations from those satisfied consumers of the products and services give a big contribution to the buying decisions of the consumers particularly if the recommendations came from their friends or family members. Many of them still use and surf

other platforms to collect and gather more feedback about the products and services that they are interested to buy or avail of.

In the real estate business, many of the clients will check and search the location of the property that they intended to buy. That is the reason why real estate companies are spending a big amount of money and budget to allocate for their online marketing. Those real estate companies are using special applications for multimedia in terms of promoting their products and services (Aral et. al., 2013).

2.2. Social Media Usage

According to Shah (2020), there are 3.5 billion people or half of the Earth's population are using social media daily. 73% of the world's marketers agreed that using different platforms in social media is beneficial to the marketing strategy of the business. There were 54% of clients used social media to research the products and services that they like to buy. The size of the company is not an issue in Social Media marketing, but it is very important to boost the brand promotion of any kind of business. Since the Covid-19 started, the use of social media as marketing become broad due to the limitation of the physical presence of the people and relying on many of the transactions online.

According to Hsu (2012), the usage of social media is considered the warehouse of a huge pool of consumers. It served as the storage of the consumers' information which served as the means of the source of the information about the web presence in the market. The concept and usefulness of social media are continuously changing and developing over the period. According to Kaplan et. al (2010), Social Media usage is composed of Internet-based tools that work on Web-based technology. This served as the ideological basis enabling the users to generate and create more contents to share with the end-users. According to the perception of the research conducted about the system-to-value sequence and downstream, social media also impacted the performance of the organization.

It is not a new thing that social media impacted the recent generation and has already been incorporated into the lifestyle of the people. It is not easy to neglect social media in the lives of many people and even in the business world all the professionals accepted its power in terms of making the business grow. Utilizing social media locally is very important in terms of promoting the Omani local businesses. It doesn't mean that by using Twitter or Facebook, the business will grow. It is also vital to learn and be knowledgeable on how to use the different platforms of social media wisely to attract followers, to know the right contents to be included in the post, and the tone of the Social Media platform that the company is using. The followers must be engaged, and a good technique is to ask their opinions and interactivity is a must. Then after engaging them, the business can promote its offers to the followers. Here are some suggestions on how to engage your audience on the Internet: **Facebook.** This platform is useful in terms of building loyalty to the brand and converting the page followers into potential customers. It is very easy to monitor the free competition and it is useful in terms of benchmarking the site performance over a while. It is good to post contents that will engage the followers and try paid advertising or to make partnerships with non-profit organizations to maximize the Internet presence. **Twitter.** Looking for the right person to follow is vital and familiarization with the management of the application to use it effectively. In the beginning, it is important to observe and study the tone of the people that you are following and their life interests and then start to tweet intelligently. Always start and initiate the conversation and give great customer service using Twitter to attract more viewers and followers. **LinkedIn.** This application is helpful for business owners in terms of expanding and increasing relationships with their friends and contacts. It is good to set up the LinkedIn page for the business and

ensure to tie with the local groups. Start posting useful content and blogging and leverage all the employees and your business potential. It is vital to make the business network grow to find the prospects and give them meaningful reasons to be connected and then start the intention of the business and do the action. **Instagram.** This is useful in terms of posting videos, blogs, and doing the hashtag which is useful in terms of searching. It is useful in terms of motivation and inspiring potential customers for the business**. YouTube.** Considered the world's famous and biggest tool for searching, this is very good in terms of brand promotion. There is a great chance to touch your target customers and get good sales after watching the business promotions and videos (Esadacom, 2016)

There are many Social Media applications and platforms that are widely used, and the role of the business is to maximize them and learn the proper way to use them. A successful campaign in the country particularly in Oman always required conversation that is interactive to know the needs and the likes of the clients (Esadacom, 2016).

2.3. Marketing Through Social Media

Social Media marketing pertains to the use of businesses or organizations on different platforms in social media to promote their services and products. It becomes popular since there are millions of Social Media users' interactions on Social Media networks every day. It is an ideal place to do the marketing for the enterprises to promote their brands. The top platforms in social media are Twitter, Instagram, YouTube, and Facebook to name a few. It also includes the marketing campaign management, scope setting, governance, and establishing the culture and tone of the Social Media account of the enterprise. One good strategy in Social Media marketing is the posting and creating of useful content for the followers and users of the Social Media network. This kind of strategy has similarities to word-mouth marketing the helps businesses increase their popularity on the Internet. Social Media Marketing is very important for the enterprise due to its cost-effectiveness in terms of brand promotion. It can easily fit all types of marketing budgets. Always remember that a successful campaign in marketing should reflect directly on the increase of the firm's revenue as well as the increase of the firm's popularity online to attract and reach more online customers and followers (Fawzi, 2020).

According to Zarella (2010), there are many types of online marketing strategies that can be done in social media such as blogging, microblogs, Social Media networking, sharing of sites, bookmarking, virtual world, sites for voting, forums, etc. The process of endorsing the firm's products and services through its website is called Social Media marketing. This is another way of marketing the firm's brand through online channels or mediums which is different from the traditional way of advertising or marketing (Weinberg, 2009). Moreover, Stileman (2009) and Mangold et, al. (2009), stated that social media helps to facilitate the customers' distribution of the brand information to their families, relatives, and associates. In terms of honesty in marketing the products, social media is considered more honest in terms of communicating with the clients because of the uncontrolled way of giving ideas and information to the clients about the products or services of the companies.

According to the result of the study by Ines (2016) entitled, social media as a Marketing Tool: Case of Small and Medium Enterprise in the Sultanate of Oman, there were no barriers in terms of technologies needed to use the Internet as a marketing tool in Oman because of the availability of the devices with applications for social media and the fast Internet line in the country. The usage of social media in marketing activities must be promoted in schools, universities; NGOs, and business organizations, and there must be a massive campaign in the country for the SMEs to attain higher profitability. The research concluded that there must be a guideline or policy for implementation to protect the SME sector in Oman from any

unscrupulous users and the government must give incentives to SMEs to encourage the use of social media as tools in their respective business activities.

2.4. Work Performance

Work performance was defined by Koopmans et al. (2011) as the behavior or actions of the employees that are consistent with the goals of the organization, and it can be measured by the amount of work, work quality, work result, behaviors or attitudes, presence, and cooperation (Etikawati & Udjang, 2016; Groen et al., 2017; Kallio et al., 2017; Simanjuntak & Hamali, 2016). Motowidlo & Van Scotter (1994) categorized work performance into task performance and contextual performance. Task performance encompasses the individual's ability to achieve his/her task while contextual performance implies how the performance is accomplished in the context of his job. In application to this study, the work performance was used utilizing both the task and contextual performance.

2.5. Relationship Between Social Media Usage and Work Performance

In the study of Cetinkaya & Rashid (2018), they found that social media usage in the workplace improves work performance in both task and contextual performance. They also stressed the importance of training the employees in social media usage to maximize their performance in the workplace. The use of social media networks helps establish good relationships between senior management and employees, which further helps enhance worker performance (Collins & Clark, 2003).

2.6. Organizational Performance

The performance of the organization or firm refers to the way the firm of attaining and reaching its financial goals following the requirements of the market (Li. et al., 2006). Haworth (2007) mentioned that the performance of the organization is the result of the firm's innovations, policies, and loyalty. Image, culture, and creativeness. Haworth (2007) also stated that an "organization's performance refers to the transformation inputs which turns and converted into useful outputs to attain a specific result or outcome. If the content is the basis of the performance of the firm, then it pertains to the economy of the organization having the least cost, it also refers to the relationship between the achieved effectiveness and the result of the cost referring to the efficiency and the relationship between the attained result or output which also refers to the effectiveness.

The performance of the organization covers three specific domains of the result in the organization such as the following: 1. Financial which includes the ROA, ROI, and income. 2. Market Performance of the product which covers the sales and the market share. 3. Return to the shareholders covering the added economic value and the total return to the shareholders. According to the result of the study of Ahmad, et. al (2019) entitled, "Social Media Adoption and its Impact on Firm's Performance in the Case of the UAE", the adoption of social media in marketing the business does not affect the performance of the firm. The output of the study can be used by the management in terms of deciding for the firm to be updated on the trends based on research on the technology and innovations particularly in social media to make the SMEs ubiquitous and get more benefits on the advantages of Social Media marketing. The study followed the multi-perspective framework that combined the environmental, organizational, and technological elements that affect the operations of the SMEs in the United Arab Emirates.

2.6.1. Rapid Adaptation

The organization must have a workforce that can deal and interact with the different challenges in the external and internal environments. For the organization to act and predict the vital

responses to the different changes that may happen regularly to the organization (Byham et. al, 2005).

2.6.2. Time to Market

Organizations are working hard to minimize the time they need to promote new products as the basis for their competitive advantage over their competitors. According to Vinerean et al. (2013), time to market refers to the tie span needed to create new or even fresh produce that comes from the initial idea of products to sell in the market. Alfonso et.al (2008) mentioned that it is considered one of the sources of enterprise advantage in the competition.

2.6.3. Cost Reduction

Cost reduction pertains to the actual lessening of the unit cost of the products in manufacturing or services given or offered in the marketing without affecting its suitability for intentional usage. Cost reduction is different from cost saving which is for short-term and only temporary processes and it happens due to the lessening of product quality. The reduction cost pertains to the vital characteristics and products or services quality perseveration (Barbole, 2013).

2.7. Impact of Social Media Usage and Work Performance on Organizational Performance

Vast studies have investigated the influence of social media, and its benefits on organizational performance. The study of Dodokh and Maaitah (2019) stressed that social media influence different variables on organizational performance, competitive advantage, brand loyalty, entrepreneurial orientation, customer relationship management, and consumer buying behavior. Moreover, Parveen et al. (2016) found that there is a very strong relationship between social media usage and organizational performance in terms of improved customer relations, accessibility of information, and cost reduction. The significant impact of social media on organizational performance was confirmed in the study of Moen et al. (2008) although they did identify which of the variables of social media significantly influence the organizational performance variables.

In the study of Kimani (2015), it was ironed out that, marketing using social media adds value in connecting clients at a faster pace specifically considering the different locations that do not need physical contacts and it practically enables the organization to engage in timely communication and address the needs of clients online. In addition, research conducted by Apigian et al. (2005) revealed that the utilization of social media through the internet increase profit, and enhances customer relationship management, time reduction, and cost reduction.

Singla & Durga (2015) also lamented that the concept of social media is not only all about likes and pictures but rather enhances acknowledgment for external users and customers like sales and marketing. Ferrer et al. (2013) studied the influence of social media technologies on organizational performance, and they found that these technologies impact social capital which in turn affects organizational performance.

2.8. Conceptual Framework of the Study

The conceptual framework of the study comprised of independent and dependent variables. Independent variables are Social Media Usage, Work Performance. The dependent variables are composed of factors on the enterprise organizational performance such as rapid adaptation, time to market, and cost reduction.

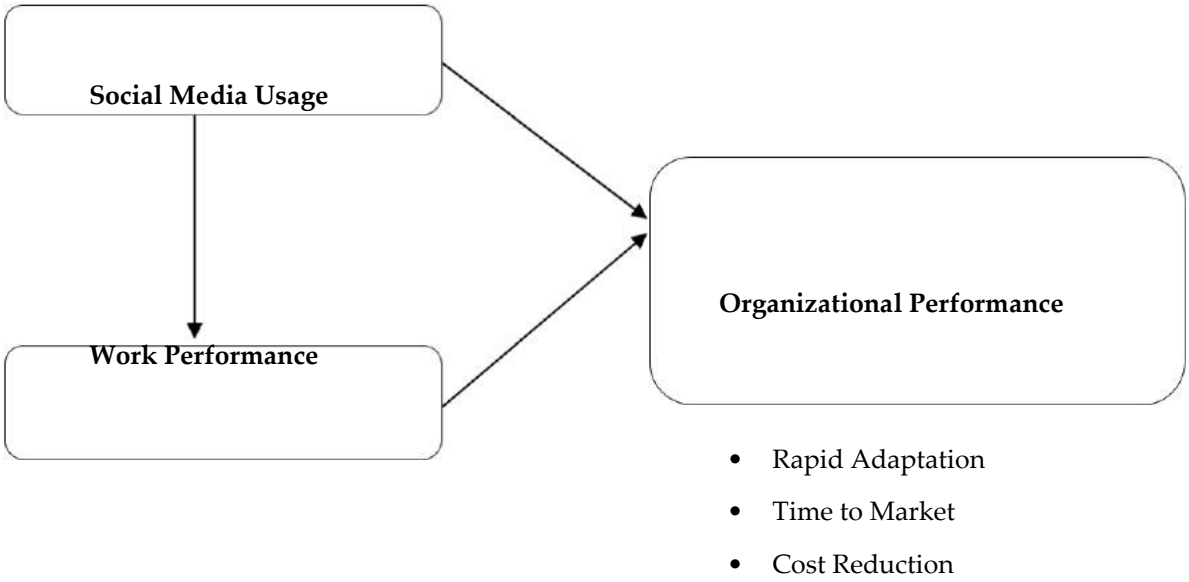

Figure 1. Conceptual Framework of the Study

In this study, the hypothetical assumptions are stated based on the researchers' objectives developed as presented.

H1. There is a significant relationship between social media usage and the work performance of employees in Oman Broadband Company.

H2. There is a significant relationship between social media usage and work performance on organizational performance-rapid adaptation.

H3. There is a significant relationship between social media usage and work performance on organizational performance-time to market.

H4. There is a significant relationship between social media usage and work performance on organizational performance-cost reduction.

3. RESEARCH METHODOLOGY

In this study, the quantitative research design was utilized. The emphasis of this study dealt with "what" rather than "why" and it aims to describe the population, subject, and phenomena. Moreover, a questionnaire survey was used to facilitate the collection of information to address the research objectives. Moreover, the survey research was utilized by the researchers considering that the nature of research is quantitative, and respondents' feedback is required to arrive at the achievement of the research objectives.

To get the sample, total population sampling was employed, considering that the total number of employees is only 146 distributed from all departments. However, out of the 146 questionnaires delivered to the respondents, only 108 filled questionnaires were retrieved, or a retrieval ratio of 74%. This ratio was because some employees were unwilling to give time to complete the questionnaires and were hesitant to voice their opinions on the subject matter.

Furthermore, primary data were utilized in this study and the main instrument is self-administered questionnaires comprised of two parts. The questionnaires were adopted and modified from Dodokh and Maaitah's (2019) study. The first part of the questionnaire focused

on describing the demographic profile of the respondents in terms of gender, education, age, income, and years of service. The second part consists of responses to the survey questions which are social media usage, work performance, organizational performance-rapid adaptation, organizational performance-time to market, and organizational performance-cost reduction. The questions on social media usage consist of five items; work performance, six items; organizational performance-rapid adaptation, five items; organizational performance-time to market, four items; and, organizational performance-cost reduction, five items. The 5-point Likert scale was utilized to assess the responses of these variables and coded with the following: 1=Strongly Disagree (SD); 2=Disagree (D); 3=Neutral (N); 4=Agree (A); 5=Strongly Agree (SA). Numerical values were also assigned to the responses and distributed as 1=SD (1.00-1.80); 2=D (1.81-2.60); 3=N (2.61-3.40); 4=A (3.41-4.20); SA (4.21-5.00).

To ensure that the research instrument attained validity, questionnaires were sent to experts to check the content validity and whether the items fairly represent the entire domain that ought to be measured. It has gone through face validity to ensure that the questionnaires measure what it claims to and its clarity. It also checked grammar, sentence construction, spelling, and others. The pre-testing was done for validity, reliability, and answerability of the questionnaire. On the other hand, a reliability test was undertaken for internal consistency. Based on the Cronbach Alpha value, the measurement of reliability shall be done to test the consistency of the instrument which according to the authors, a value of 0.700 and above is considered reliable (Nunally, 1978; Hair et al., 2010). Specifically, the reliability test was done on the study variables namely Social Media Usage, Work Performance, Organizational Performance-Rapid Adaptation, Organizational Performance-Time to Market, and Organizational Performance-Cost Reduction, and results revealed that its values are more than 0.900 which is more than the minimum value of 0.700 thus, internal consistency is achieved (See Table 1).

Table 1. Reliability Test of Variables Used

Variables	Code	N	Cronbach's Alpha
Social Media Usage	SMU	5	0.960
Work Performance	WP	6	0.931
Organizational Performance-Rapid Adaptation	OP_RA	5	0.929
Organizational Performance-Time to Market	OP_TTM	5	0.933
Organizational Performance-Cost Reduction	OP_CR	4	0.943

This finding also coincides with the study of Saunders et al. (2007) stressing the suitability of the Likert-scale measurement in testing the reliability and internal consistency of the study variables. Finally, the collected data were coded and analyzed using SPSS. The first part of the questionnaire was analyzed using tables and percentages to show the gender, education, age, income, and years of service. The second part of the questionnaire (social media usage, work performance, organizational performance-rapid adaptation, organizational performance-time to market, and organizational performance-cost reduction) was analyzed mean and standard deviation and ranked according to descending order from the highest mean rating to the lowest mean rating. Furthermore, a correlation matrix was employed to determine the relationship among the study variables (Independent and Dependent). And three models of regression analysis were performed to determine the individual impacts of independent variables on dependent variables based on the study hypotheses. Model 1 regression is between social media usage and work performance (independent variables) on organizational performance-rapid adaptation (dependent variable). Model 2 is a regression analysis between social media usage and work performance (independent variables) on organizational performance-time to market

(dependent variable). Finally, Model 3 is between social media usage and work performance (independent variables) on organizational performance-cost reduction (dependent variable).

4. RESULTS AND DISCUSSION

The data are coded and analyzed using the SPSS version 21 package. The analysis was divided into two parts: The first part for demographic profile and the second part dealt with the responses to the survey questions related to social media usage and organizational performance. Descriptive statistics were utilized in the demographic profile while the correlation was employed to determine the relationship between the independent variables and the dependent variable, organizational performance. Lastly, multiple regression was employed to determine which of the independent variables significantly influenced the dependent variable.

4.1. Profile of the Respondents

Based on the demographic profile, a summary of the findings depicts that majority of the respondents are female and have acquired bachelor's degrees. Furthermore, most of the employees are in their 20s and 30s of age and are earning a salary range of RO 500-999. In terms of employment, a combined majority of the respondents served the company for 1-5 years and 6-10 years respectively.

4.2. Correlation Coefficient of Hypothesized Variables

To analyze the relationship between the independent and dependent variables, correlation analysis was utilized. The correlation matrix was performed to indicate the correlation coefficient between variables as shown in Table 12.

Table 2. Correlation Matrix of Study Variables

Variables		SMU	OP_RA	OP_TMT	OP_CR	WP
SMU	Pearson Correlation	1	.830**	.812**	.852**	.760**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	108	108	108	108	108
OP_RA	Pearson Correlation	.830**	1	.845**	.859**	.805**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	108	108	108	108	108
OP_TMT	Pearson Correlation	.812**	.845**	1	.874**	.833**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	108	108	108	108	108
OP_CR	Pearson Correlation	.852**	.859**	.874**	1	.815**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	108	108	108	108	108
WP	Pearson Correlation	.760**	.805**	.833**	.815**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	108	108	108	108	108

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

Table 2 shows the correlation between the study variables used in this study. Specifically results revealed that there is significant relationship between social media usage (SMU) and working performance (WP), ($r = 0.760$, $p = 0.000<0.05$); a significant relationship between SMU on

Organizational Performance-Rapid Adaptation (OP_RA), (r = 0.830, p = 0.000<0.05); significant relationship between SMU and Organizational Performance-Time to Market (OP_TMT), (r = 0.812, p = 0.000<0.05); and a significant relationship between SMU and Organizational Performance-Cost Reduction (OP_CR), (r = 0.852, p = 0.000<0.05).
Further, the relationship between significant relationship between social media usage and work performance confirms the findings of Louie et al. (2016) and Wang et al. (2016) that social media tools such as blogs, WhatsApp, and social networking sites affect workers' performance at work. Liang et al. (2020) also added that the use of social media applies to both socially related (job satisfaction) and work-related (worker performance) purposes.

4.3. Regression Analysis of the Study Variables

To investigate the individual impacts of independent variables (Social Media Usage, Work Performance) on dependent variables (Organizational Performance-Rapid Adaptation, Time to Market, Cost Reduction), regression analysis will be performed with three regression models as stated: Model 1 on the individual impacts of Social Media Usage and Work Performance on Organizational Performance-Rapid Adaptation; Model 2 will be on the individual impacts of Social Media Usage and Work Performance on Organizational Performance-Time to Market; and, Model 3 which illustrates the individual impacts of Social Media Usage and Work Performance on Organizational Performance-Cost Reduction. The succeeding tables provide evidence of these relationships.

Table 3. Model Summary of Variables SMU, WP, & OP-RA

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.872[a]	.760	.756	.55066

a. Predictors: (Constant), SMU, WP

It can be summarized in Table 3 that the regression model shows R = 87.2%, R^2 = 76.0% and at a standard error of 0.55066. This result implies that 76.0% of the changes in the dependent variable (Operational Performance-Rapid Adaptation) can be explained by the independent variables (Social Media Usage and Work Pressure).

Table 4. ANOVA of the Model (SMU, WP, & OP_RA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	101.098	2	50.549	166.703	.000[b]
	Residual	31.839	105	.303		
	Total	132.937	107			

a. Dependent Variable: OP_RA
b. Predictors: (Constant), SMU, WP

Table 4 depicts the ANOVA of the model. It further revealed that the F-Value is 166.703 at the significant probability value of 0.000 indicating the appropriateness of the model. It also means that the regression model measures accurately the independent and dependent variables.

Table 5. Coefficients of Independent (SMU, WP) and dependent variable (OP_RA)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	.167	.168		.992	.323
	SMU	.484	.069	.516	7.012	.000
	WP	.404	.072	.413	5.622	.000

a. Dependent Variable: OP_RA

In investigating the individual relationship of independent and dependent variables, Table 5 depicts the significant positive relationship between social media usage on organizational performance-rapid adaptation (β = 0.516, $p<0.05$) and the positive significant relationship between work performance on organizational performance-rapid adaptation (β = 0.413, $p<0.05$).

Table 6. Model Summary of Variables SMU, WP, & OP-TTM

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.878[a]	.770	.766	.59504

a. Predictors: (Constant), SMU, WP

Table 6 reveals that the regression model shows R = 87.8%, R^2 = 77.0% and at a standard error of 0.59504. This finding indicates that 77.0% of the changes in the dependent variable (Operational Performance-Time to Market) can be explained by the independent variables (Social Media Usage and Work Pressure).

Table 7. ANOVA of the Model (SMU, WP, & OP_TTM)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	124.592	2	62.296	175.939	.000[b]
	Residual	37.178	105	.354		
	Total	161.770	107			

a. Dependent Variable: OP_TTM
b. Predictors: (Constant), SMU, WP

Table 7 depicts the ANOVA of the model. It further revealed that the F-Value is 175.939 at the significant probability value of 0.000 indicating the appropriateness of the model. It also means that the regression model measures accurately the independent and dependent variables.

Table 8. Coefficients of Independent (SMU, WP) and dependent variable (OP_TTM)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.014	.181		-.075	.941
	SMU	.438	.075	.424	5.883	.000
	WP	.552	.078	.511	7.100	.000

a. Dependent Variable: OP_TTM

In dealing with the individual relationship of independent and dependent variables, Table 8 depicts the significant positive relationship between social media usage on organizational performance-time to market (β = 0.424, $p<0.05$) and the positive significant relationship of work performance on organizational performance-time to market (β = 0.511, $p<0.05$).

Table 9. Model Summary of Variables SMU, WP, & OP-CR

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.890[a]	.792	.788	.52553

a. Predictors: (Constant), SMU, WP

Table 9 depicts that the regression model shows R = 89.0%, R^2 = 79.2% and at a standard error of 0.52553. This result implies that 77.0% of the changes in the dependent variable (Operational Performance-Cost Reduction) can be explained by the independent variables (Social Media Usage and Work Pressure).

Table 10. ANOVA of the Model (SMU, WP, & OP_CR)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	110.605	2	55.303	200.241	.000[b]
	Residual	28.999	105	.276		
	Total	139.604	107			

a. Dependent Variable: OP_CR
b. Predictors: (Constant), SMU, WP

Table 10 depicts the ANOVA of the model. It further revealed that the F-Value is 200.241 at the significant probability value of 0.000 indicating the appropriateness of the model. The regression model measures accurately the independent and dependent variables.

Table 11. Coefficients of Independent (SMU, WP) and dependent variable **(OP_CR)**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.139	.160		.867	.388
	SMU	.529	.066	.550	8.040	.000
	WP	.398	.069	.397	5.793	.000

a. Dependent Variable: OP_CR

Taking into consideration the individual relationship of independent and dependent variables, Table 11 displays the significant positive relationship between social media usage on organizational performance-cost reduction ($\beta = 0.550$, $p<0.05$) and the positive significant relationship between work performance on organizational performance-cost reduction ($\beta = 0.397$, $p<0.05$). The significant positive relationship between social media usage on organizational performance cost-reduction is consistent with the study of Parveen et.al. (2016) stating that there is a very strong relationship between social media usage and organizational performance in terms of cost reduction.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The study aimed at investigating the impact of social media usage and work performance on organizational performance in terms of rapid adaptability, time to market, and cost reduction.

Statistical data revealed that social media usage has a positive significant impact on work performance. Moreover, models 1 to 3 showed that there is a significant positive impact of social media usage and work performance on organizational performance-rapid adaptation, time to market, and cost reduction. The company responds quickly to the environmental changes (Internal and External) and therefore it has experienced rapid adaptation; has considered customers' feedback to determine the suitable time to market the products and has tried device means to cut costs. The result entails that social media usage significantly contributes to the work performance and organizational performance of the company in Oman. The company is also updated with the new social media networks to ensure that issues about work performance and organizational performance will be addressed accordingly.

Results from correlation analysis showed that there is significant relationship between social media usage (SMU) and work performance (WP), ($r = 0.760$, $p = 0.000<0.05$); a significant relationship between SMU on Organizational Performance-Rapid Adaptation (OP_RA), ($r = 0.830$, $p = 0.000<0.05$); significant relationship between SMU and Organizational Performance-Time to Market (OP_TMT), ($r = 0.812$, $p = 0.000<0.05$); and a significant relationship between SMU and Organizational Performance-Cost Reduction (OP_CR), ($r = 0.852$, $p = 0.000<0.05$). The relationship between social media usage and work performance as found in this study is consistent with studies that there is a significant positive relationship between these two constructs, which means that as social media usage increases, the work performance also increased (Cetinkaya & Rashid, 2018; Collins & Clark, 2003). Social media usage also positively impacts organizational performance particularly on rapid adaptation, time to market, and cost reduction as affirmed by previous studies (Dodokh & Maaitah, 2019; Ferrer et al., 2013; Kimani, 2015). However, Ahmad et al. (2019) finding contradicts the results as organizational performance is not affected by social media usage in the company. So, this inconsistency in the findings reflects that investigating social media usage is required continuously to determine its impact on organizational performance periodically.

And, in determining the individual impacts of independent variables on the dependent variables using three models, it can be summarized that there is a significant positive relationship between social media usage on organizational performance-rapid adaptation ($\beta = 0.516$, $p<0.05$) and a positive significant relationship of work performance on organizational performance-rapid adaptation ($\beta = 0.413$, $p<0.05$); a significant positive relationship of social media usage on organizational performance-time to market ($\beta = 0.424$, $p<0.05$) and positive significant relationship of work performance on organizational performance-time to market ($\beta = 0.511$, $p<0.05$); and, significant positive relationship of social media usage on organizational performance-cost reduction ($\beta = 0.550$, $p<0.05$) and positive significant relationship of work performance on organizational performance-cost reduction ($\beta = 0.397$, $p<0.05$).

5.2. Recommendations

Based on the study findings, the following recommendations can be proposed: First, the use of social media in the company can be intensified so that the awareness of its usage will be disseminated to all departments and companywide. The HR department may schedule the training that will focus on saturating the available social media networks used in the company and working hand in hand with the ICT department. Secondly, the use of social media can be integrated into the annual evaluation of employees as part of its criteria to ensure that social media has been utilized and thus, improve the employee performance in terms of quantity and quality of the job. Thirdly, to better serve the employees and customers, the entire management team should display knowledge and understanding in the utilization of social media platforms

so that clients who may contact any of the departments, positive responses shall be obtained, and service delivery can be done without any delay. Fourth, continuous upgrading of social media usage is required from time to time to ensure that the latest technological information is relayed to the employees and the customers. Finally, the management continues to give emphasis the use of social media as a platform to increase work performance and which will, in turn, increase organizational performance.

However, while the research achieves its objectives, it has also limitations that can be enumerated. The study is purely quantitative, so the responses and results are limited to scaled questions and are conclusive. Moreover, the sample is only 108 which is considered few to generalize the study findings. From these findings, it can be recommended that further similar studies shall be conducted to validate these findings and expand their methodologies to add interviews and focus groups to better understand social media usage and its impacts. More samples can be obtained to generalize the study findings.

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Impact of SPS Measures on the Import Quality of China's Agricultural Products

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Abstract

The paper is aimed to examine the role Sanitary and Phytosanitary (SPS) measures play in quality upgrading of China's imported agricultural products. Based on export data to China from UN Comtrade on agricultural products on the HS6-digit level from 156 countries in 2002-2017, this paper employed Proximity-to-the-Frontier Model to discover the upgrading effect SPS measures have after measuring the quality with Nested Logit Model. The study found that implementing SPS measures exerts a long-term positive effect on quality upgrading. Particularly, SPS measures tend to discourage bulk agricultural products close to world frontier from innovation and quality upgrading, exhibiting a more pronounced opposite of the escape-competition effect. Therefore, it is recommended that Chinese quarantine and market supervision departments should learn from the inspection processes of developed countries in relation to agricultural products and appropriately refine SPS measures to improve the quality of agricultural imports for the health and safety of domestic consumers.

Keywords: Agricultural Products, Import Quality, SPS, Proximity-to-the-Frontier Model

1. INTRODUCTION

China's agricultural import has gained rapid development since WTO accession, with a consistent and considerable expansion in the scale and volume. It grew from US$12.42 billion in 2002 to US$149.85 billion in 2019, with an average annual growth rate of 17.2%. China's agricultural products, on the other hand, are facing a massive trade deficit. The agriculture trade surplus was US$5.6 billion at the time of China's WTO accession, but the trade deficit began to manifest in 2004 and reached US$71.28 billion in 2019. As a result, there has been an influx of agricultural imports into the Chinese market to satisfy the diversified requirements for food products.

However, the increase in agricultural imports can also lead to higher risks of toxic and deadly germs, as well as foreign epidemics. To ensure the health of animal and plant and meet the increasingly urgent needs of consumers for food safety, governments around the globe have been enacting Sanitary and Phytosanitary (SPS) measures, which is one of the most widespread and frequently used trade measures in the post-tariff era. Since accession to the WTO, the use of SPS measures has been stepped up in China, based on the experience of other WTO members and the needs of China's agricultural import practices. For example, the number of SPS notifications increases from 15 in 2002 to a peak of 339 in 2015, with a total of 1121 in 2019.

SPS measures contribute to higher quality standards for China's agricultural products, laying a solid foundation for the health and safety of Chinese consumers. Therefore, this paper focuses on the following questions: What is the impact of SPS measures on the quality of China's agricultural imports? What are the implications for different importing countries and agricultural products?

2. LITERATURE REVIEW

The earliest study of product quality in economics can be traced back to Chamberlain (1933), who stated in the monopolistic competition model that producers would differentiate their products in the face of competition to become the price taker in the market. In contrast, Lancaster (1966, 1971, 1979) proposed the product characteristics approach, which brought the concept and indicator of product quality back into the mainstream model. He emphasized that product quality is unobservable and all goods possess characteristics or attributes that are demanded by the consumers, not the goods themselves.

Empirically, cross-country and time-series variations in product quality were linked to firms' exports (Brooks, 2006; Verhoogen, 2008), skill spillover (Verhoogen, 2008), import quantity restrictions (Aw & Robert, 1986; Feenstra, 1988), and trade patterns (Schott, 2004; Hallak, 2006). The contribution of quality upgrading to macroeconomic growth has also been verified theoretically and empirically by Grossman & Helpman (1991) and Hummels & Klenows (2005) respectively. The results of equilibrium analyses by Gervais (2009), Feenstra and Romalis (2012) and Crozet (2012) all suggested that export prices depend on productivity and quality. Chen and Xu (2018) used the back-induction method on product-level regression to measure the quality of China's imported agricultural products based on data from the China Customs in 2000-2013. Jiang and Yao (2019) concluded that the EU Maximal residual limits (MRLs) standard

not only significantly inhibits the speed of quality upgrading of imported fresh fruits, but also has a non-linear impact on quality upgrading.

In terms of research on the quality of China's agricultural products, Dong and Qiu (2014) identified Traceability, Transparency, and Assurance System of Quality Safety (TTA) as a proxy for the quality competitiveness of agricultural products. They pointed out that the level of TTA of Chinese pork was significantly and positively related to export performance. Yan and Qi (2016) noted that the exporting countries determines whether the growth of China's agricultural products is marginally quality-driven or quantity-driven. Liu and Dong (2019) found that the overall export quality of China's agricultural products demonstrates a fluctuating upward tendency in 2000-2017 and will become much more stable in 2018-2025.

However, there is still a lack of literature focusing on the impact of SPS measures on the quality of agricultural products. Bao and Yan (2014) explored the extent to which SPS measures affect China's agricultural exports based on gravity model and the measurement for binary margin. They found that the negative effect SPS measures have on the export is mainly reflective on the intensive margin, but has minimal impact on the extensive margin. Dong and Huang (2018) utilized distance-to-the-frontier model to examine the impact of Japan's SPS measures on the quality upgrading of agricultural products exported by each country and underscored that the increase in the standard of Japan's SPS measures contributed to the quality upgrading of agricultural products in each exporting country.

To sum up, most of the existing literatures as to SPS measures focus on the analysis of the impact on the scale of trade, but few concentrate on the impact on the quality of imported products. This paper adopts proximity-to-the-frontier model, in which SPS measure is deemed as competition measure while quality upgrading is a proxy for innovation. Constructing a relationship between competition and innovation helps explore the impact of SPS measures on the quality upgrading of agricultural imports, which can better examine agricultural production, trade policies as well as import market diversification strategies.

3. METHODOLOGY

3.1. Models, Variables and Data

Proximity-to-the-frontier model (ABGHP), developed by Aghion et al (2005, 2009), has been widely applied and extended to innovation, such as quality upgrading. The model was constructed based on the fact that the empirical evidence exhibits a nonmonotonic relationship between competition and innovation, which depends on whether a firm is close to world technology frontier. ABGHP underscores two forces between competition and innovation. First, for firms whose products approaching the quality frontier, the increase in competition will boost innovative activities in order to win over other competitors, which is referred to as escape-competition effect. Second, for firms far from the world frontier, increasing competition will reduce innovation on the grounds that these firms would not catch up other powerful competitors even though they strive for innovation, that is, discouragement effect.

A measure of distance to the quality frontier is the proximity to frontier (PF). The basic intuition is that the product is close to world frontier provided that PF value is close to 1, while the

product is far from the frontier if PF value is close to 0. In the measurement of PF, the quality frontier shall be first defined as the highest quality of the agricultural products at the HS6-digit level. To obtain a non-negative proximity to frontier, let λ_{iht}^{F}=exp (λ_{iht}), then PF is measured as the ratio of the quality to the highest quality of the HS6-digit agricultural products, i.e., $PF_{iht} = \lambda_{iht}^{F}/max_{i\in ht}(\lambda_{iht}^{F})$.

As is known to all, SPS measures will not be implemented immediately, but around three to six months after the notification. For instance, when the SPS measures are implemented, the exporting countries need to make corresponding improvements in technology to satisfy the inspection and quarantine requirements of the importing countries. However, it is difficult to determine the exact period of adjustment. As a result, the model does not include the number of notifications for the current year (Dong and Li, 2015), but instead treats the lagging years as the validity periods of the SPS measures. In addition, this paper regards the number of SPS notifications as a proxy variable for SPS measures considering data availability and introduces 3, 4 and 5-year lagged data respectively, to analyze the impact of the implementation of SPS measures on the quality upgrading of agricultural imports.

Besides, based on the studies of Chen and Xu (2016) as well as Xiong and Cheng (2018), the paper will include a number of control variables for quality upgrading of agricultural imports, such as GDP per capita (lnperGDP), value added in agriculture (lnAGR), degree of openness (lnopen) and the proportion of rural population (lnPOR) in the importing countries. Therefore, the model is obtained as follows.

$$\Delta ln\lambda_{iht}^{F} = \beta_1 PF_{ih,t-5} + \beta_2 SPS_{ih,t-k} + \beta_3\left(PF_{ih,t-5} \times SPS_{ih,t-k}\right) + lnperGDP + lnAGR + lnopen + lnPOR + \alpha_{ih} + \alpha_{ht} + \alpha_{it} + \varepsilon_{iht} \quad (1)$$

where $\Delta ln\lambda_{iht}^{F}$, as the explanatory variable, measures the magnitude of quality upgrading between year t and t-5. $PF_{ih,t-5}$ denotes the 5-year lagged proximity to frontier, i.e., the ratio of the quality of product h exported to China by country i in the year t to the highest quality of import h in the current year. $SPS_{ih,t-k}$ denotes the number of China's SPS notifications for k-year lags. According to the WTO's principle of transparency, the enactment or amendment of SPS measures must be notified to the SPS Committee. The number of notifications reflects the changes and escalation of a country's SPS measures. The higher the number of notifications is, the more stringent the SPS measures will be.$PF_{ih,t-5} \times SPS_{ih,t-k}$is the interaction term that takes into account the combined effect of the proximity to frontier and the number of SPS notifications for k-year lags. $lnperGDP$ measures the economic level of the exporting country, while $lnAGR$ measures the supply of agricultural products from exporting countries. $lnopen$ indicates the degree of openness of exporters, measured as the ratio of a country's total exports and imports to GDP for the year. $lnPOR$ stands for the share of the rural population in the total population of exporters, which measures the share of agriculture labor. α_{ih}、α_{ht}、α_{it} denote individual fixed effects, product-year fixed effects and country-year fixed effects, respectively. ε_{iht} is the error term.

This paper selects export data to China from UN Comtrade on agricultural products on the HS6-digit level from 156 countries in 2002-2017, including the import value and volume of agricultural products. SPS notifications are obtained from the China WTO/TBT-SPS Notification

Information Website. Data on control variables are obtained from the World Bank. After extreme values of the relative quality are excluded, descriptive statistics for each variable are shown in Table 1.

Table 1. Descriptive Statistics

Variables	Sample size	Average value	Standard deviation	Minimum	Maximum
Proximity to frontier with 5-year lag	59289	0.335	0.299	0.001	1
GDP per capita (US$)	59289	31085.55	21030.57	244.286	102913.5
Value added of agriculture (US$)	59289	4.46e+10	6.31e+10	2.14e+07	4.34e+11
Degree of openness	59289	0.9891297	0.9283933	0.0016742	4.4262
Share of rural population (%)	59289	28.20939	18.6358	2.039	89.085

Source: Based on Stata 14.

3.2. Measurement for Quality

To apply equation (1), this paper measures the import quality of China's agricultural products based on nested logit model. The assumption is that consumer preferences can be divided into horizontal and vertical components. The framework considers the market share of an export product in the target market as a function of the price, the horizontal preferences and the product quality (vertical preferences) (Wang, 2014). After removing the price factor from the market performance, the remaining part is the quality. The "quality" analyzed in this paper refers to as the vertical difference after excluding the price and horizontal difference of the same product. The equation is obtained as follows according to Khandelwal (2009).

$$\ln(s_{iht}) - \ln(s_{0t}) = \lambda_{1,ih} + \lambda_{2,t} - ap_{iht} + \sigma \ln(ns_{iht}) + \gamma lnMarket_{it} + \lambda_{3,iht} \quad (2)$$

where s_{iht} denotes the market share of product h imported from country i while s_{0t} denotes the domestic market share. On the right-hand side of the equation, $\lambda_{1,ih}$ is the individual fixed effect of country c's export product h that does not vary over time, excluding non-quality effects on the exporting country's product such as bilateral trade relations, trade barriers, etc. $\lambda_{2,t}$ is the time fixed effect and $\lambda_{3,iht}$ is the unobservable error term that includes deviations from the time and product fixed effects. ns_{iht} denotes the nested market share, while p_{iht} denotes the price level of product h imported from country i at time t. $Market_{it}$ means the market size of importing country i at time t. The measurement for quality can then be derived backwards as follows.

$$\lambda_{iht} \equiv \hat{\lambda}_{1,ih} + \hat{\lambda}_{2,t} + \hat{\lambda}_{3,iht} \quad (3)$$

4. RESULTS

4.1. Baseline Results

Based on equation (1), the impact of SPS measures on the quality of imported agricultural products was estimated by taking k as 3, 4 and 5 respectively, with different lags of SPS notifications and the interaction term $PF_{t-5} \times SPS_{t-5t-k}$. The results are presented in Table 2.

Table 2. Regression Results of Different Lag Periods

Variables	(1)	(2)	(3)
	3-year lag	4-year lag	5-year lag
$PF_{ih,t-5}$	-0.7979***	-0.7848***	-0.8042***
	(-30.73)	(-30.34)	(-33.13)
$SPS_{ih,t-3}$	0.0105***		
	(3.84)		
$PF_{ih,t-5} \times SPS_{ih,t-3}$	-0.0002		
	(-0.53)		
$SPS_{ih,t-4}$		0.0108***	
		(5.90)	
$PF_{ih,t-5} \times SPS_{ih,t-4}$		-0.0004	
		(-1.46)	
$SPS_{ih,t-5}$			0.0117***
			(13.59)
$PF_{ih,t-5} \times SPS_{ih,t-5}$			-0.0002*
			(-0.72)
lnperGDP	0. 2850***	0. 2701***	0. 2416***
	(8.71)	(8.47)	(8.00)
lnopen	0.0671***	0.0668***	0.0753***
	(6.58)	(6.57)	(7.43)
lnAGR	-0.0149**	-0.0155**	-0.0204***
	(-2.95)	(-3.09)	(-4.06)
lnPOR	0.0734***	0.0709***	0.0668***
	(6.44)	(6.24)	(5.58)
_cons	-0.3854**	-0.4409**	-0.6441***
	(-2.90)	(-3.32)	(-4.85)
R^2	0.2452	0.2781	0.2476
Obs	54001	54001	54001

t statistics in parentheses, $^{*}p< 0.1$, $^{**}p< 0.05$, $^{***}p< 0.01$

According to the regression results, the coefficient of PF is significantly negative at the 1% level in all the 3 models, indicating that proximity to frontier exerts a negative effect on the quality upgrading of imports. In other words, agricultural imports closer to the frontier experience slower quality upgrading. Countries far from the technology frontier are usually affected by discouragement effect and reluctant to innovate, but in this case, have more incentive to

innovate in a harsh and competitive trade environment, and thus are faster to achieve quality upgrading due to technology spillovers and the "learning by doing" effect. On the other hand, technologically-advanced countries have a considerable advantage over the quality of agricultural products. Therefore, these products close to quality frontier are more likely to meet market requirements and face a more relaxed competitive environment, which directly results in a slow quality upgrading.

The coefficients of the lagged SPS measures are significantly positive at the 1% level, demonstrating that the implementation of lagged SPS measures has a positive effect on the quality upgrading of China's agricultural products. For example, holding other variables in column (3) constant, each additional SPS measure implemented by China in year (t - 5) increases the absolute quality of imported agricultural products in year *t* by 0.0117.

The coefficient of the interaction term is negative but not significant in columns (1) and (2). However, the estimates in column (3) have been found that PF_{t-5} and SPS_{t-5} are significantly negative at the 10% level. This suggests that an increase in the 5-year lagged SPS measures reduces the quality upgrading of agricultural products close to the frontier (PF_{t-5}=1) by 0.0002, reflecting the opposite of the “escape-competition effect”. It means that higher quality products are less innovative when meeting market standards, compromising quality upgrading. On the whole, for agricultural imports close to the frontier, an increase in SPS measures leads to an increase of 0.0115 in quality upgrading.

Furthermore, an increase in the GDP per capita of exporting countries can also contribute to the improvement of import quality, with the absolute quality of China's agricultural imports increasing 0.24 for every 1% increase in the GDP per capita of exporting countries in the 5-year lagged SPS regression. The coefficient of lnopen is significantly positive at the 1% level in all lagged SPS regressions, indicating that the more open the agricultural exporting country is to the world, the greater the share of import and export trade in the national economy will be, and thus the higher the quality of agricultural products exported to China. The coefficients of value added of agri-food from exporting countries are all negative, but more statistically significant in column (3). The negative coefficient implies that increase in agricultural value added may boost the export to China, but will instead exert a negative effect on quality upgrading of agricultural products, on the grounds that exporting countries that rely on the agricultural economy may be lacking in technology and innovation capabilities. Finally, the coefficient of the share of rural population in the exporting country is significantly positive at the 1% level, suggesting that the input of the agricultural population in the exporting country has a positive effect on the quality of agricultural products to China.

4.2. Comparison between Developed and Developing Countries

In order to further examine the heterogeneity in the impact of China's SPS measures on agricultural products from countries at different levels of economic development, the paper categorizes 152 exporting countries into developed and developing countries according to the UN Human Development Index (HDI) and obtains the following results.

Table 3. Regression Results of Imported Agricultural Products from Different Countries

Variables	(1) All countries	(2) Developed countries	(3) Developing countries
$PF_{ih,t-5}$	-0.8042***	-0.8896***	-0.7596***
	(-33.13)	(-21.17)	(-25.41)
$SPS_{ih,t-5}$	0.0117***	0.0019***	0.0127***
	(13.59)	(11.11)	(18.02)
$PF_{ih,t-5}\times SPS_{ih,t-5}$	-0.0002*	-0.0006*	-0.0002*
	(-0.72)	(-1.84)	(-0.55)
lnperGDP	0. 2416***	0.1103***	0. 0664**
	(8.00)	(6.73)	(2.94)
lnopen	0.0753***	0.0227*	0.1022***
	(7.43)	(1.64)	(4.81)
lnAGR	-0.0204***	-0.0032	-0.0460**
	(-4.06)	(-0.48)	(-4.85)
lnPOR	0.0668***	0.1150***	0.1113***
	(5.58)	(8.84)	(4.35)
_cons	-1.9441***	-2.0706**	-1.5383**
	(-8.85)	(-8.06)	(-6.15)
R^2	0.2476	0.2430	0.2520
Obs	54001	33430	20571

t statistics in parentheses, p *< 0.1, ** p< 0.05, *** p< 0.01

In terms of regression results of developed and developing countries, it is found that the coefficient of proximity to frontier is both significantly negative at the 1% level. However, what makes it different is that the absolute magnitude of proximity to frontier coefficient is much larger for developed countries, suggesting that the agricultural exports from developed countries are superior in quality, but on the other hand, more difficult to improve than that those from developing countries.

In terms of the effect of 5-year lagged SPS measures, for each SPS measure notified, the quality of agricultural products from developed countries only improves 0.0019 after 5 years compared to 0.0127 in developing countries, if the effect of proximity to frontier is not taken into account. It demonstrates that SPS measures implemented in China will have a higher impact on quality upgrading of agricultural products from developing countries than developed countries.

The coefficient of the interaction term is significantly negative at the 10% level, but the negative effect from developed countries is much larger than developing countries. For high-quality agricultural products from developed countries with PF_{t-5} value close to 1, an increase in 5-year lagged SPS notifications is associated with an increase of 0.0013 in the quality upgrading of agricultural products in the current year. It suggests that, overall, an increase in SPS standards appears to have small escape-competition effect in developed countries. On the other hand, for agricultural products far from the frontier in developing countries, the quality of agricultural products increases 0.0125 for each additional 5-yaer lagged SPS notification. The escape competition effect seems to outweigh the discouragement effect mainly because of the non-marketization. The government may excessively intervene in the economy in relatively backward regions. For example, a large number of investment subsidies are likely to be

allocated to traditional agricultural enterprises to encourage innovative activities and technology development. Moreover, due to technological spillovers and latecomer advantages, the cost of innovation is lower in developing countries, providing more possibilities for quality upgrading (Acemoglu D et al, 2006).

4.3 Comparison between Different Types of Agricultural Products

Based on the USDA Global Trade System (GTS) classification criteria for agricultural products, this paper further explores the extent of the impact of 5-year lagged SPS measures on the quality upgrading for four major categories of agricultural products, i.e., intermediate agricultural products[1], consumer-oriented agricultural products[2], bulk agricultural products[3], and other related agricultural products[4] (Zhang et al, 2016)

Table 4. Regression Results of Four Main Categories of Imported Agricultural Products

Variables	(1) Intermediate agricultural products	(2) Consumer-oriented agricultural products	(3) Bulk agricultural products	(4) Other related agricultural products
$PF_{ih,t-5}$	-0.6930***	-0.9203***	-0.7916***	-1.220***
	(-10.63)	(20.74)	(-5.07)	(-16.18)
$SPS_{ih,t-5}$	0.0026***	0.0014***	0.0021**	0.0024***
	(9.00)	(7.96)	(3.03)	(7.07)
$PF_{ih,t-5}\times SPS_{ih,t-5}$	-0.0008*	0.0008	-0.0013*	-0.0012*
	(-0.95)	(1.50)	(-1.55)	(-2.28)
lnperGDP	0. 0250*	0.0833***	0.0645*	0. 0209*
	(1.84)	(4.33)	(0.84)	(1.57)
lnopen	0.1498**	0.0277*	0.4044*	0.3505**
	(2.91)	(0.77)	(4.84)	(6.90)
lnAGR	0.0241*	-0.0227*	-0.0983*	-0.2630*
	(1.90)	(-1.82)	(-2.85)	(-2.13)
lnPOR	0.1083***	0.1079***	0.2635**	0.1825***
	(2.08)	(3.18)	(2.66)	(2.34)
_cons	-0.2479*	-0.4704***	-1.1143**	-1.5383**
	(0.84)	(-2.39)	(-2.83)	(-6.15)
R^2	0.3655	0.3211	0.4641	0.5160
Obs	12284	25193	2553	9652

[1] Intermediate agricultural products refer to primary agricultural products and reprocessed agricultural products that continue to be put into the production process.

[2] Consumer oriented agricultural products refer to agricultural products with high price elasticity of demand such as fresh meat and eggs, dairy products, fresh vegetables and vegetable beverages, fruit juices, coffee, tea, liquor, beer, cocoa and chocolate.

[3] Bulk agricultural products refer to agricultural products that have a large weight in the structure of the commodity agricultural economy and are produced, consumed, traded and transported in large quantities.

[4] Other related agricultural products refer mainly to most fishery products and distilled spirits.

t statistics in parentheses, p *< 0.1, ** p< 0.05, *** p< 0.01

As shown in Table 4, the coefficients of PF_{t-5} are significantly negative at the 1% level in all four categories of agricultural products. More specifically, quality upgrading of other related agricultural products is most negatively affected by proximity to frontier. Quality of other related agricultural products with PF value close to 1 will be improved 1.220 less than the one close to 0. This is followed by consumer-directed agricultural products, for which 5-year lagged proximity to frontier also has a negative effect. Compared to the previous two, bulk and intermediate agricultural products are relatively less affected.

The SPS measures have a positive effect on the quality upgrading of all four categories of agricultural products in the long term. More importantly, stronger effect is shown on the quality upgrading of intermediate agricultural products, other related agricultural products, and bulk agricultural products. In view of the interaction term, the variable for consumer-oriented agricultural products differs from the other three categories in that the coefficient is not significant. It suggests that consumer-oriented agricultural products of high or low quality are not prone to have the escape-competition effect. In contrast, bulk agricultural products, which are close to the quality frontier, exhibit the opposite of the escape-competition effect.

5. DISCUSSION AND CONCLUSION

This paper uses proximity-to-the-frontier model to analyze the relationship between SPS measures and quality upgrading of China's agricultural imports. It is found that SPS measures have a significant positive impact on the quality of China's agricultural imports in the long run. However, the proximity to frontier is negatively correlated with quality upgrading. For agricultural products close to the frontier, quality upgrading is much slower. For low-quality products far away from the frontier, the quality upgrading is more obvious thanks to technological spillovers and latecomer advantages. The paper further shows that developed countries tend to exhibit a more pronounced opposite of escape-competition effect in the face of SPS measures, which means higher-quality products are less innovative in meeting stricter market standards. In contrast, quality upgrading of agricultural products is less subjected to the discouragement effect in developing countries. Interestingly, firms in developing countries are more willing to embrace innovation for quality escalating. At the product level, the quality of intermediate agricultural products is relatively insensitive to the proximity to frontier, whereas bulk agricultural products close to the frontier are more likely to depict the opposite of escape-competition effect.

Based on the above findings, there are a number of policy implications for the quality control of China’s agricultural imports and the implementation of SPS measures. First, the quality of Chinese agricultural imports should be strengthened. With the increasing demand for foreign high-quality agri-food, Chinese quarantine and market supervision authorities should take the responsibility of refining prosecution measures. It is also crucial to guide domestic enterprises to choose better agricultural imports. Second, the government is supposed to look for ways in which the implementation of SPS measures is improved to safeguard the health of domestic consumers. Relevant Chinese government departments shall also learn from the inspection

processes of developed countries in relation to agricultural products, introduce advanced quarantine techniques and improve quarantine standards for agricultural products so that the SPS measures can exert an incentive effect. Finally, relevant departments should also proactively disclose the terms and conditions of the SPS measures in a timely manner to create a good and fair environment for importing trade partners and to attract more quality trading partners.

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Economic Determinants of Applicant Screening Practices: Analysis of the Korean Human Capital Corporate Panel

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Abstract

This study reviews employers' existing recruiting practices and the environment in which these are deployed, and estimates their effect on the employers' and workers' outcomes. The Korean Human Capital Corporate Panel spanning years 2005–2013 is used to take stock of employers' screening of applicants' personal characteristics, and regressions with fixed effects link the screening practices to firms' skill needs, skill supply and labor-market constraints. Institutional and market constraints on employers' conduct are found to affect screening practices more than firms' skill needs. The existence of HR departments, worker unionization, and applicant pool size have systematic effects. Employers' skill needs and screening practices, in turn, affect the female share among new hires. HR departments, personnel committees on boards, and foreign management put a constraint on firms' hiring discrimination, effectively supporting women's cause.

Keywords: Recruitment, Applicant Screening, Employment Discrimination, Human Capital Corporate Panel

1. INTRODUCTION

It is a commonplace practice for East Asian employers to use an extensive job-applicant screening process, and to screen applicants' detailed personal characteristics. Firms survey applicants' family background, social and financial status, health, appearance, and various personal hobbies, affiliations and beliefs. Screening on these characteristics is inappropriate because it affects firms' treatment of applicants; the factors are not directly related to productivity; and they are correlated with applicants' characteristics protected by law. Such screening violates recruiting standards – legality of recruiting practices and information collected; procedural justice and objectivity; consistency and unbiasedness across decision-makers and subjects; review by multiple professional decision-makers; content-fairness and relevance to applicants' merit; job-relatedness; non-invasiveness; falsification-proneness; and outcome-fairness (Truxillo et al. 2004). Some characteristics screened by employers are banned from consideration by Korean laws, and factors unrelated to productivity are actively discouraged by National Human Rights Commission and Ministry of Employment and Labor guidelines (NHRC, 2003; MOEL, 2007).

This study focuses on Korean employers' choice over the screening of job applicants, and the ranking of applicants' personal characteristics among the criteria in the selection process. Economic determinants of firms' recruiting practices, and consequences of those practices for applicants' outcomes are assessed. The study uses the count of stages in firms' recruiting process to indicate the extent of applicant screening. The ranking of applicants' birthplace,

appearance and school name among criteria for selecting applicants is used to gauge firms' reliance on applicants' personal characteristics. Screening based on personal factors is thought to be gender-biased and to affect particularly female applicants, who are judged more extensively on their looks and backgrounds, and are potentially held back by discrimination in their upbringing. Women's share among firms' new hires is used as the best available measure of the effects of firms' recruiting practices on minority applicants' outcomes.

The consideration of applicants' birthplace and appearance in hiring decisions is inappropriate because they are highly correlated with applicants' ethnicity, belief system, and social status. Height and weight, typically used by employers as indicators of appearance, are correlated with health. Surveying of appearance also affects male and female applicants, and applicants of different ages differentially, explicitly violating gender and age-based equal-opportunity laws. The practice of sorting applicants by the name of their university has come under criticism for promoting *hakyon* casteism, elitism and extreme academic competition in the society. School name is not sufficiently predictive of productivity on the job, while it is highly correlated with applicants' socio-economic and residence status, as well as with parents' own academic history. Evidence from interviews suggests that employers prefer workers of pleasant appearance, from the same birthplace and academic background as themselves, for taste-based, bonding reasons. Employers counter that these factors improve harmony and productivity in work teams and in service occupations.

During 2004–2012, the timeframe of our analysis, the Korean labor market underwent various significant transofrmations. National antidiscrimination legislation, and labor laws pertaining to the hiring of regular and irregular workers strengthened. This section reviews these developments in relation to firms' recruiting practices.

Korea has a full set of anti-discrimination laws. In particular, the Equal Employment Opportunity Act (1987) prohibited discrimination and harassment on the basis of age, sex, marital status, pregnancy and childbirth. Article 7 prohibited employers from considering candidates' personal attributes, and prohibited disparate impact of intrusive employment practices on protected groups. The National Human Rights Commission Act of 2001 banned nineteen factors from consideration in employment, including health, appearance, family background, region of origin, ideology, social status, marital status and military experience.

One problem is that enforcement of these laws is lax, penalties are low, and additional areas of discrimination arise as the economy evolves. Enforcement and compliance are particularly weak in the 'secondary,' informal employment market (Schauer, 2018; Hlasny, 2021). Efforts to broaden and harmonize regulations, educate employers and hold employers accountable have been undertaken. New antidiscrimination laws were introduced in step with social developments and the public drive to assist vulnerable groups and to facilitate equal opportunities. Newly enacted were the Act on the Prohibition of Discrimination of Disabled Persons and Remedy against the Infringement of their Rights (2007, amended in 2011), the Ministry of Employment and Labor's guidelines for appropriate recruiting practices (MOEL, 2007), the Act on the Promotion of Economic Activities of Career-Interrupted Women (2008), and the Act on the Protection, etc., of Dispatched Workers (2012).

Beside antidiscrimination laws, labor laws regarding the hiring and treatment of irregular workers also changed with the passage of the Act on the Protection, etc. of Fixed-term and Part-time Employees in 2007. Between 2004 and 2007, the government also scaled up (re)training programs for job-seekers, irregular workers, workers of small-and-medium-size enterprises, female household heads, and other vulnerable groups (Ra and Shim, 2009). The Workers Vocational Skills Development Act (amended 2008) and the Promotion of Industrial Education

and Industrial Cooperation Act (amended 2013) enacting a Vocational Education System were signed.

The aim of this research is thus to take stock of employers' recruiting practices and the environment in which these operate, and understand their implications for the employers' and workers' outcomes. The research problem is to formulate predictions regarding the determinants of applicant screening used by firms in different labor-market circumstances, and regarding the effect of screening practices on firms' hiring choices, and to test them using representative, high-quality data. Estimable models are proposed for firms' extent of screening, firms' ranking of applicants' birthplace, appearance and school name among selection criteria, and gender ratio among firms' new hires. These models are estimated using panel-data methods applied to the Human Capital Corporate Panel (HCCP). We identify risk factors compelling firms to screen applicants' personal backgrounds, and consequences of the choice for applicants from protected groups. The use of a large panel dataset on firms' recruiting practices, and evaluation of how these practices affect firms' hiring of protected workers, represent significant contributions of this study to existing literature.

2. LITERATURE REVIEW

A series of recent academic studies have evaluated motives for employers in Northeast Asia to screen job applicants' personal characteristics. These studies have shown theoretically and empirically that the intrusive screening practices are systematically related to firms' intensity of skill needs, availability of skills in their applicant pools, cost of commitment to particular applicants, and expected costs of intrusive screening. Firms' economic circumstances, including tightness of labor supply, market position, or compensation and working conditions typical in the relevant market, help to explain the practices, particularly for general-interest characteristics such as appearance or family background.

Hlasny (2009, 2011, 2014) outlined Korean firms' problem of inferring job applicants' skills through screening, and estimated the probability of screening individual personal characteristics as a function of the features of job openings, companies and their owners. Applicants' characteristics appear to be screened in a hierarchical pattern whereby companies screen information in the diminishing order of their predictive power or increasing order of their cost.

Studies in other countries have similarly found that employers survey applicants' appearance, ethnicity and residence status, or health and family status, in violation of antidiscrimination laws. Employers screening applicants' resumes may also make discriminatory decisions inadvertently (Derous and Ryan, 2019). In China, a commonplace practice among employers is to screen gender, age, appearance and ethnicity. This practice is systematically related to employers' skill needs, unexpectedly persistent regardless of changing competitiveness in the labor market (Kuhn and Shen, 2013, 2015). Hlasny (2017) identified four motives of applicant screening: statistical, customer-taste, and employer-taste based discrimination, and compliance with local regulation.

Harcourt and Harcourt (2002), and Wallace et al. (2002) found that most employers in New Zealand and the United States also asked legally "inadvisable" questions about health, age and marital status for statistical reasons. Employers in different countries pay different attention to different factors, such as workers' health and current marital status *versus* their beliefs, religion and family history. However, the practice of considering personal factors by various employers is qualitatively similar across Western and East Asian countries.

In the context of human resource management in Korea, a broader literature has emphasized Korean firms' unique institutional circumstances, including management and ownership structure and social norms regarding firm hierarchy, and their persistence over time (Debroux et al. 2018; Froese et al. 2018; Cooke et al. 2020). Horak (2014, 2017) also discussed the role of informal networks (*yongo* in Korean) developed based on school affiliation (*hakyon*), family (*hyulyon*), and regional origin (*jiyon*).

These existing empirical studies have several limitations. They have only evaluated companies' screening practices, rather than their actual hiring choices or consequences of the screening practices on applicants' labor-market outcomes. Small sample and non-random sample selection restrict inference that can be drawn from them. Outliers may affect their findings systematically. Companies' screening can only partially be explained by economic considerations. Applicant screening is subject to non-economic reasons, a 2-3 year inertia, and economic considerations that would become relevant only if an applicant were actually hired. Some HR officers are unfamiliar with national anti-discrimination laws, or even with the reasons for their company's screening practices. Employers' screening sieves out protected workers without improving companies' performance (Hlasny and Jeung, 2014).

This study contributes by relying on a large panel dataset on firms' recruiting practices and labor-market conditions. By measuring firms' screening practices over time, and matching them with changing economic conditions in regression specifications with industry-group fixed effects, time-constant screening due to non-economic reasons or due to inertia is controlled away. A relevant set of appropriately-lagged controls is used to assess the role of employers' skill needs and constraints on employers' practices. Finally, this study uses information on firms' hiring choices to infer consequences of firms' screening practices for protected classes of job applicants including women, the elderly or disabled, or the ethnic minorities.

3. METHODOLOGY

Existing literature suggests several hypotheses about the role of firms' screening practices that can be evaluated using information in the HCCP. Firms' skill needs, constraints on their recruiting and screening practices, and supply of qualified workers in applicant pool are thought to affect the extent of screening of job applicants by firms (Wallace et al. 2002; Harcourt et al. 2005a; Kuhn and Shen, 2013, 2015). Accordingly, the profile of firms' new hires depends on firms' skill needs, the supply of qualified workers in firms' applicant pools, constraints on firms' hiring, and firms' screening practices. These hypotheses are formalized as hypotheses 1–7.

H1: The degree of skill intensity of production affects the extent of firms' applicant screening positively. Moreover, firms' need of skills predictable by applicants' socio-economic background including birthplace and *alma mater* (e.g., integrity, trustworthiness, self-confidence), and appearance (skills at public appearance, persuasion, and conveying of trust) affects positively the ranking of these factors among characteristics screened.

We should distinguish companies that require high levels of easy-to-evaluate hard skills (e.g., numerical, technical, analytical), and those requiring hard-to-evaluate soft skills (resourcefulness, complex problem solving, and capacity for self-development or comprehension of work organization). Employers using proprietary technologies or information are more likely to ask detailed personal questions than other for-profit employers, to gauge applicants' trustworthiness and expected turnover. Evidence from previous studies suggests that financial sector employers tend to enquire about personal information more than other for-profit employers. Employers in industries that require technical and creative reasoning are more likely to consider applicants' personality and professional background, and

less likely to consider applicants' physical background. Companies in team-service and sales industries also discriminate among applicants based on inferred preferences of their existing employees or typical customers. The type of typical customers also affects the relevant labor laws and the importance of public relations to a company. These curb recruiting practices of affected firms.

H2: Expected costs of incremental screening, including shadow costs under relevant labor laws and public relations considerations affect the extent of screening negatively.

The existence of formal, dedicated human resource (HR) departments or a personnel committees on companies' boards is expected to curb the ability of individual hiring managers to choose screening practices that are too intrusive or arbitrarily. The level of organization of workers also affects employers' ability to use discriminatory practices against workers and applicants (Chang and Chae, 2004; Harcourt et al. 2005a). However, unions also make it more costly to compensate workers and difficult to lay workers off, and thus more costly to make mistakes in hiring. Unions may also prop up traditional patriarchic practices at companies, thus allowing screening practices to survive (Lee et al. 2001). The direction of the effect of worker organization on recruiting practices and hiring choices is therefore unclear.

Hypotheses 1 and 2 are the central hypotheses of this study as they evaluate firms' internal skill-demand explanations justifying or curbing their screening practices. Another natural curb on firms' screening practices is facilitated by the supply of qualified workers in their applicant pools.

H3: Width of the distribution of skills available in the applicant pool for vacancies affects the extent of screening positively.

The availability of skills from which employers may choose is affected by the typical number of applicants per opening at a firm (positively) and tightness of local labor market (negatively).

Regarding firms' observed hiring choices between protected and non-protected applicants, several hypotheses can be tested. The share of women among new hires is thought to depend on employers' needs of male- vs. female-dominating skills, on the availability of qualified male applicants in applicant pool, on constraints on gender ratios among hires, and on the extent of screening of intrusive, gender-biased applicant characteristics.

H4: Firms' self-reported skill needs have bearing on the share of women among firms' new hires. Specifically, firms' need of interpersonal and communication skills affects the female share positively, while the need of numerical, technical and complex problem solving skills affects it negatively.

The expected signs of impacts of various skill needs come from employers' perception of the relative prevalence of those skills among male *versus* female applicants. Because skill needs are self-reported by employers, even if we find the expected coefficients on the corresponding skill needs, it will be unclear whether it represents a validation of employers' hiring decisions, employers' rationalization of the hiring decisions, or merely inference of applicants' skills based on perceived group characteristics even when in fact men and women have similar skills. A related hypothesis concerns the supply of qualified workers in firms' applicant pools.

H5: Supply of skills across applicants in firms' applicant pools affects female share of firms' new hires negatively.

The availability of qualified non-disadvantaged applicants in the applicant pool, the lesser need for firms to hire disadvantaged applicants. Firms' facing larger applicant pools per vacancy and firms hiring more workers than they previously planned to hire are expected to hire a lower

share of women. This is because the higher number of qualified applicants per effective hiring affords them an extra slack vis-à-vis general supply of skills, and induces them to replace female hires with newly-available qualified males. This corresponds to evidence that women are the last to be hired and first to be laid off (Lee et al. 2001). Similarly, hiring of more workers than planned affords firms slack with respect to anti-discrimination laws. After hiring a baseline number of women, firms continue hiring based on statistical and taste-based factors, and choose only men. Another argument for expecting a negative relationship is that it may be caused by firms' finding an unexpectedly high distribution of skills among their mostly-male applicants. That induces them to hire a lower share of women.

H6: The greater the institutional constraints on firms' choice over hiring – more formal corporate governance, greater worker organization or stricter legal jurisdiction – the higher the female share hired. Larger firms with professional management, formal HR department, or personnel committee on corporate board, and firms with larger HR departments are expected to recruit a higher share of women. Firms with foreign management or with operations overseas, and firms with stronger organization among their workforce, are similarly expected to hire more women.

The final hypothesis is that, the greater the extent of applicant screening based on gender-biased characteristics that firms practice, the more likely it is that personal biases interfere and firms – inadvertently or intentionally – hire an inadequate share of women.

H7: Taking firms' skill needs, skill availability, constraints on hiring and other characteristics as given, the more extensive the firms' screening process, and the more they are based on intrusive, gender-biased factors, the lower the expected share of women among new hires.

Hypothesis 7 is an important hypothesis in this study, as it evaluates the existence of an adverse impact of firms' practices for the career outcomes of protected classes of job applicants. Hypothesis 7 also follows a conjecture that the less transparent the screening processes at firms are, the worse impact they have on protected groups of workers. In relation to the screening practices evaluated here, firms' screening of appearance, birthplace and *alma mater* is thought to be gender-biased and to affect particularly adversely female applicants. This is because women are judged more extensively on their looks, are judged as harshly as men or more harshly on their upbringing, and are possibly held back by discrimination in their upbringing and schooling. Family background and birthplace may thus leave a more pronounced impacts on their career outcomes than on male candidates. The significant presence of women's-only secondary schools and universities in Korea also means that women's *alma mater* may inform employers about the job applicants' socio-economic background and experience with competition and teamwork in a unisex environment – to a greater degree than men's *alma mater*.

3.1. Estimable Model of Recruiting Practices and Implications for Workers

To evaluate the above hypotheses regarding the role of applicant screening in firms' recruitment, reduced-form economic models are used. These models allow us to estimate the determinants of the extent and form of screening at firms with different characteristics or in different circumstances, and evaluate the observed consequences for firms' hiring choices.

The extent of employer *i*'s screening of applicants' personal characteristics in a year is made a function of employers' self-reported skill needs, available measures of the costs and constraints on screening, and inferred distribution of skills in the applicant pool. These three factors jointly determine firms' expected benefits of screening and the chosen extent and form of screening. In addition to the economic factors modeled explicitly, employers may face non-economic factors, such as industry norms, secular nationwide trends, or idiosyncratic corporate-governance

structures that affect firms' recruiting practices. To account for such factors, industry-level time trends and selected observable characteristics of firms are controlled for (written jointly as x_{it}). Latent time-constant factors at the industry level, denoted for simplicity as μ_i, are accounted for using industry fixed effects. Finally, employers may also respond to economic factors with varying speed, or the dependent variable and some explanatory variables may be observed imprecisely. Screening practices are thus subject to time-varying firm-specific randomness, ε_{it}:

$$screen_{it} = f(skill\ needs_{it}, constraints_{it}, pool_{it}, x_{it}) + (\mu_i + \varepsilon_{it}) \quad [1]$$

Employers' ranking of applicants' personal characteristics – applicants' birthplace, appearance and school-name – among screening factors, and the count of stages in employers' recruiting process, will serve as alternative measures of the extent of employers' screening practices, and the dependent variables in models estimated below.

Among available explanatory variables, we may use employers' self-reported importance assigned to various skills in their workforce: interpersonal and communication skills; numerical and technical skills; resourcefulness, information processing and complex problem solving; and capacity for self-development and comprehension of work organization. Propensity to ask personal questions should also vary across industries that require different skill sets in their workforce, and across firms operating only domestically and those operating abroad.

Beside firms' skill needs, one must account for any costs or effective constraints on firms' recruiting practices. The existence of a formal, dedicated HR department and of a personnel committee on firms' board, and the level of organization of workers are used to proxy for the ability of individual hiring managers to use discriminatory practices. The availability of skills in firms' applicant pool is proxied for by the typical count of applicants per vacancy.

Other firm characteristics may also affect firms' benefits and costs of screening, as well as the information environment they face. Foreign management or operations abroad may help to proxy for constraints imposed by foreign legal norms (or even indicate different skill needs). Demographic profile of firms' existing workforce may help to account for employers' unobserved biases, employee discrimination, or employers' need for workforce cohesion. Firm size helps to account for other omitted institutional details regarding the determination of firms' recruiting process.

To evaluate the consequences of firms' chosen screening practices for protected applicants' outcomes, we also estimate a relationship between firms' screening practices and the demographic composition of their new hires. The share of protected workers (women) among new hires serves as the dependent variable. This is made a function of employers' skill needs, the availability of qualified non-protected applicants in firms' applicant pool, institutional constraints on firms' hiring, and the extent of firms' screening practices and of the gender-biased factors screened. In addition to these economic factors, unobserved or non-economic elements may taint firms' hiring choices. Industry norms, secular labor-market trends, or firms' existing labor composition and corporate governance may affect firms' hiring. Accounting for such factors are industry-level time trends and selected observable characteristics of firms (grouped as x_{it}). Latent time-constant norms at the industry-group level, denoted for simplicity as λ_i, are accounted for using industry-group fixed effects. Finally, randomness or measurement imprecision may also affect the observed hiring choices. As a result, $\%women_{it}$ is subject to firm-specific time-varying randomness, u_{it}:

$$\%women_{it} = f(skill\ needs_{it}, pool_{it}, constraints_{it}, screen_{it}, x_{it}) + (\lambda_i + u_{it}) \quad [2]$$

Firms' skill needs are measured using the importance they attribute to various worker skills, grouped into four categories. Our expectation of the effects of $skill\ needs_{it}$ corresponds to the

employer-perceived relative prevalence of those skills among male *versus* female applicants. Availability of qualified applicants is deduced from the number of applicants per vacancy and the number of actual-to-planned hires. Firms' constraints on hiring are gauged from the presence of professional management, formal HR department, size of firms' HR department, personnel committee on firms' corporate board, and firms' size. Presence of foreign management, operations overseas, and stronger organization among firms' workforce are also accounted for. Finally, the rankings of applicants' birthplace, appearance and school name among criteria for selecting applicants control for firms' intrusive, gender-biased screening practices.

3.2. Estimation Method

Linear regressions on pooled cross-sectional data and panel-data methods are used to test hypothesis formulated in previous sections. These methods are believed to produce robust and consistent estimates of the effects of interest, even if they may not be fully efficient due to the discrete nature of the dependent variable $screen_{it}$.[1] Panel structure of HCCP data helps to account for various estimation issues, including lagged effects among variables (from demographic profile of existing workforce, or unionization, to screening practices and hiring choices), possible bias and inefficiency due to unobserved industry-specific heterogeneity, and autocorrelation in errors. A number of explanatory variables will be used in their first-lag form (lagged by 2 years) to mirror the real-life lagged dynamics of their impact, and to ensure identification of a one-way, causal effect from them on the dependent variables.

Errors in equations 1 and 2 have two components, industry-level time-constant latent heterogeneity and time-varying idiosyncratic disturbance. Because the time-constant component may be correlated with explanatory variables, regressions with fixed effects at the level of six industry-groups (manufacturing; energy-related; information and telecommunications; finance and insurance; other services; and other industries) are used. The assumption is that much of the time-constant heterogeneity correlated with our variables of interest occurs at such industry-group level. Industry-group rather than industry- or firm-specific fixed effects are used because many variables in the model vary rarely or only modestly over time for individual firms, and industry demarcation changes over time.

For a number of reasons – including limited-value nature of the dependent variables, possible measurement errors in dependent and explanatory variables, firm-level heterogeneity and possible inertia in decision-making – model errors are corrected for heteroskedasticity and firm-level autocorrelation. The Breusch-Pagan and the Breusch-Godfrey tests reject homoskedasticity and no-autocorrelation in both equations 1 and 2.

3.3. Data

Data for this study come from the Human Capital Corporate Panel dataset managed by the Korea Research Institute for Vocational Education and Training (KRIVET). The panel contains 1,901 observations for 568 firms and five biannual time periods (2004–2012). Firms in the panel

[1] Ordered probit models and Poisson count-variable models were considered as potentially more efficient estimation techniques. However, they have drawbacks in regard to robustness. They rely on restrictive identification assumptions or distributional assumptions that are not satisfied in the data. Ordered probit is typically used for ordinal indicators for which assumptions have to be imposed on the relationship between individual values. In this study, the ranking variable has cardinal interpretation, so this step imposing a restrictive structure is unnecessary. Poisson models rely on the distribution of errors and their dispersion. These may affect adversely consistency and efficiency of estimates. In the available data, the distribution of screening stages does not follow Poisson distribution even approximately. Negative binomial distribution, is also not thought to produce an improvement over OLS. Linear OLS is more consistent and potentially more efficient when models must be augmented with fixed effects and corrections for error heteroskedasticity and autocorrelation.

have been selected randomly using stratification methods to facilitate comparison of the sample to the underlying population of employers.

Variables in the HCCP dataset include: the ranking of personal factors (birthplace, appearance, school-name) among all criteria for selecting applicants[2]; number of stages in firms' recruiting process; self-reported importance attributed to various worker skills (interpersonal and communication skills; numerical and technical skills; resourcefulness, information processing and complex problem solving; capacity for self-development and comprehension of work organization); applicants per vacancy; actual per planned hires; worker unionization and affiliation with the strong Minju trade-union umbrella; existence and size of HR departments; existence of personnel committees on corporate boards; foreign management; overseas operations; and composition of workforce (percent female, college-educated, or over 40 years old). (Refer to Table A1 in the Appendix.)

4. RESULTS

The economic model proposed in equation 1 includes three sets of variables of interest affecting firms' screening practices explicitly: firms' skill needs, constraints on screening, and availability of skills in firms' applicant pools. Table 1 shows the results of complete specifications of this model. Coefficients can be interpreted as the effects of a one-unit change in explanatory variables on firms' ranking of job-applicants' birthplace (columns 1–2), school-name (columns 3–4) or appearance (columns 5–6) among worker-selection criteria, or on the count of stages in firms' recruiting process (columns 7–10).

Rows 1–4 in table 1 show the estimates on measures of importance attributed by firms to applicants' various skills. While the estimated coefficients are insignificant individually or in most cases even jointly, they have the same signs across pairs of columns with the same dependent variables, and alternate in sign across models for different forms of screening. This suggests that firms with different skill needs rely on different forms of screening.

The effects of skill needs on the complexity of firms' recruiting process (rightmost four columns) are more significant. Firms relying on workers' numerical and technical skills, and on their capacity for self-development and comprehension of work organization among more senior-level workers are systematically predicted to subscribe to longer multi-stage recruiting processes. Firms relying on interpersonal and communication skills, and those relying on workers' resourcefulness and problem-solving skills have systematically shorter recruiting processes.

Rows 5–8 show that the available measures of constraints on employers' screening appear to explain applicant-screening practices better than employers' skill-needs. Among institutional constraints, operating overseas, existence of a dedicated HR department, and unionization of workers are associated with significantly more complex recruiting processes, but mostly a lower role of the screening of applicants' personal factors. These findings suggest that operating under foreign jurisdictions or under more formal norms of institutional governance forces hiring managers to rely on more objective but also more bureaucratic recruiting practices. Existence of a personnel committee on a firm's board is found to reduce the complexity of its recruiting processes slightly. One possible explanation lies in the interaction between firms' HR departments and personnel committees, such as executive board members' power to override HR managers' decisions.

[2] Among 13 criteria: school completion, specialization, grades, school name, career experience, certificates, integrity, experience with teamwork, job competency, future potential/foreign language fluency, birthplace, appearance, and other.

Row 9 reports on the effect of the applicant pool size per opening, indicating the available distribution of skills from which employers choose. This variable has an expected positive effect on the importance firms attribute to applicants' school name, as well as an expected effect on the complexity of firms' screening process.

Finally, rows 10–13 in table 1 control for companies' other characteristics. Demographic profile of firms' current workforce helps to explain firms' practices. Particularly worth mentioning, firms with more highly educated workforce place less emphasis on applicants' birthplace and appearance, and more emphasis on their *alma mater*. Rather than implying that school name is a valid signal of applicants' skills, this points to the prevalence of statistical and taste-based discrimination at professional firms (i.e., *hakyon* or elitism). This may reflect path dependence in firms' recruiting, whereby firms who have hired workers with specific skills tend to screen for workers with similar skills. This may be because of coworker discrimination or because of perceived complementarity in the productivity among workers with similar mindsets.

Firm size contributes significantly. Larger firms are less likely to screen personal information, but have by far more bureaucratic screening processes. Overall, regressions in table 1 explain a small share of variation in screening practices over time, 3 to 18 percent, evidenced by models' within R-squared. There are either many factors affecting the screening decisions that our specifications haven't controlled for, or firms' reports about the importance they attribute to applicants' personal characteristics are subject to heterogeneity across individuals and years. In any case, model F-statistics indicate that all models are statistically significant compared to models containing only industry-group fixed effects.

Table 2 reports the results of regressions estimating the share of women among firms' new hires using four sets of economic variables, in accordance with equation 2. Coefficients shown are the percentage-point effects of a unit change in explanatory variables on the proportion of women among firms' new hires. The first four columns report on models without any treatment of panel components except for autocorrelation in errors. The right half of the table reports on regressions using fixed effects at the level of industry groups.

The first set of controls in table 2 deal with firms' decisions made during recruiting regarding the importance assigned to applicants' birthplace, *alma mater* and appearance, and the count of stages in the recruiting process. These have little impact on the demographic profile of new hires. Our hypothesis – that firms' hiring practices and self-checks for the presence of incidental personal biases affect the composition of their hires – is not supported.

The second set of explanatory variables account for firms' skill-needs. If women are thought to have a different distribution of skills than men – or they actually do through a self-fulfillment prophecy – different employers will have different demand for female workers. Rows 5–8 in table 2 strongly support this. Firms' need of interpersonal and communication skills, and capacity for comprehension of work organization among their workers affect the female share in hiring positively, while the need of numerical and technical skills affects it negatively. The importance of resourcefulness and complex problem solving skills affects the female share weakly positively (insignificant).

The third set of variables, in rows 9–15, control for constraints on firms' hiring decisions imposed from outside. Since different employers have different stakeholders, and realize different implicit costs of violating equal-opportunity norms, they are expected to hire a different ratio of women to men. The results are mixed. The existence and size of an HR department, and the existence of a personnel committee on firms' boards have mostly positive effects as expected, but these are insignificant. Company management by professional managers, rather than by parties related to owners or founders, is associated weakly negatively

with the female share. Unionization of workers has a similar weak negative effect, corroborating evidence by Lee, Cho and Lee (2001) and others that unions may support patriarchic norms in organizations rather than counteracting them to promote fair hiring.

Foreign management is associated with a higher female share among hires, as expected if jurisdictions to which foreign managers answer have stricter equal-opportunity laws. Finally, firms operating overseas – through sales, production or R&D – are found to hire a lower ratio of women. This is counter to our intuition that firms facing multiple regulatory regimes should set their bar on equal-opportunity practices higher to comply with all the regimes. The strong negative effect presumably stems from the particular nature of firms selling, producing or innovating in foreign markets. Even after controlling for time-constant heterogeneity across industries, it is possible that as firms expand their operations abroad, they hire more men who are viewed as more loyal and flexible for travel and business meetings.

The next two variables test the role of the supply of qualified workers in firms' applicant pools. Applicants per vacancies, standing for the supply of skills or a slack in firms' choice over whom to hire, carry the expected negative but insignificant coefficients in columns 4 and 8. Actual to planned hires, proxying for firms' slack in hiring a particular share of women, carry the expected negative coefficients. When firms decide to hire more workers than planned, they are thought to have already met their plan on the number of female hires, and so the extra hires can be chosen with less regard for equal opportunity laws. Secondly, since firms face male-dominant pools of applicants, an unexpectedly high distribution of skills in the pool may induce them to hire more workers, and to simultaneously choose a lower ratio of women to men.[3]

Among the four hypotheses about the determinants of female hiring, table 2 points strongly to the importance of firms' skill needs, and partially to the importance of constraints on firms' recruitment and skill supply in firms' applicant pools. Firms' screening practices do not help to predict firms' hiring choice between men and women.

The final set of results in table 2 relate to firms' other characteristics. Larger firms and firms already employing more women hire a significantly higher share of women. Larger firms typically operate under greater external and internal scrutiny and have a greater absolute stake in good publicity. Firms employing fewer women may hire fewer women because of coworker discrimination or because of complementarity of productivity among workers of the same gender. Workers and their supervisors (or colleagues) may be more productive when both are of the same gender, leading to path dependence in hiring.

Regressions with fixed effects explain 9-17% of intertemporal variation in the share of women among firms' hires. Given the small number and narrowness of explanatory variables used, and heterogeneity of economic and legal conditions over time, this is quite successful. Firms' measurable skill-needs and screening practices explain only 9% of variation in the female-share hired, while institutional, regulatory and demographic constraints on firms' practices explain an additional 8%. Many firms, regardless of their HR needs, may have a similarly low demand for female labor, and they only increase their recruitment of women when institutional, regulatory or demographic forces nudge them.

[3] In this case, the coefficient on actual-to-planned hires does not have a causal interpretation, as it reflects the effect of exogenous shocks in the distribution of skills in firms' applicant pools. Actual-to-planned hires are potentially endogenous. It would be appropriate to use instrumental variables for them to capture only the causal relationship. Unfortunately, candidates that would be highly correlated with skill-supply shocks at the firm level, and uncorrelated with the female share among hires – such as mass layoffs (of male workers) at competitors – are unavailable empirically.

5. DISCUSSION AND CONCLUSION

This study was motivated by two unresolved questions: What economic factors affect firms' choice over how complex their recruiting processes are? And, what economic factors affect their practice of screening applicants' personal backgrounds? The study also investigated the implications of firms' screening practices for the employment of protected workers. The research questions asked, and the use of large, high-quality panel data to answer them represented significant contributions to existing literature. Because prior studies used other measures of recruiting practices and their consequences, and relied on less representative datasets, the results of this study serve to qualify our existing understanding of firms' recruiting practices and their settings.

The study confirms the broad findings in prior studies that firms' screening practices are partly due to institutional and regulatory constraints on firms' HR management, and the skill supply in firms' applicant pools (Mellow, 1982; Park, 1990; Harcourt et al. 2005a,b). Interestingly, the available measures of employers' skill needs do not explain applicant screening as much as constraints on those practices do, suggesting that firms choose extensive degree of screening by default unless stopped by equal-opportunity laws, regulations, or customer backlashes.

Among institutional constraints, operations abroad, existence of a dedicated HR department, and unionization make the structure of the recruiting process more complex, while diminishing the influence of applicants' individual personal factors. Firms' reliance on workers' numerical and technical skills, and on their capacity for self-development and comprehension of work organization makes them subscribe to more complex, multi-stage recruiting processes. Reliance on interpersonal and communication skills, and on workers' resourcefulness and problem-solving skills is conducive to systematically shorter recruiting processes.

Firms employing more educated workers have greater needs for careful screening and for the screening of applicants' educational history. This could be due to complementarities in the productivity of existing skilled workers and skilled hires, due to coworker discrimination, or due to other latent reasons. Size of the applicant pool, indicating the available distribution of skills from which employers choose also has an expected positive effect on screening.

Firms' reported skill needs have the expected effect on the proportion of women among new hires. The importance attributed to applicants' appearance, interpersonal and communication skills, and skills useful in hierarchical organizations favors female applicants, while the importance attributed to numerical and technical skills favors men. This may reflect on an actual differential in the skills of male and female applicants, or employers' group-based inferences of them. Gender composition of existing workforce, proxying for employers' latent biases or needs to hire male workers – to take advantage of complementarities across workers, or ensure workforce cohesion – contributes.

Greater company size and the presence of foreign management favor female applicants. Labor unionization disfavors female applicants, either because unions buttress patriarchic norms in firms' HR management, or because of a greater prevalence of unions in male-dominated sectors and earlier time periods. The size of applicant pool per opening works against female applicants. The more choice employers have over whom to hire, or the greater the availability of skills among predominantly-male applicants, the less likely employers are to hire women. If employers decide to hire more than the planned number of workers, a lower proportion of hires are women, suggesting that the decision to hire more workers provides a slack vis-à-vis firms' labor-regulation constraint, or itself comes from an unexpectedly high distribution of skills among predominantly-male applicants – nudging firms to select only men for the additional openings.

Many of these findings provide a plausible narrative regarding firms' choice over how to screen applicants and what demographic composition of workers to hire. The findings are consistent across the various models and the two sets of dependent variables (table 1 vs. 2), serving as robustness checks for one another.

With these findings in mind, a word of caution is warranted. Variables studied here are self-reported and are subject to recollection, self-affirmation and other biases. Employers may inadvertently misrepresent their skill needs, screening practices or hiring choices, and the biases across these sets of variables may be systematic. Moreover, practices investigated here do not cover all HR practices including the screening of other personal characteristics, screening after hiring is decided, or decisions about compensation and promotion. The true scope of the problem may be systematically greater at firms. Without information how the investigated practices fit into firms' larger HR management systems, and without any indication about the direction of additional biases, we may take the estimates as our best predictions about the variables' true effects on employers' overall practices.

Provided that employers' responses in the HCCP survey can be viewed as representative of their true practices, findings from this study should be useful to regulators and lawmakers who have the mandate and ability to mold the regulatory, institutional and legal environment in which employers operate. The study's main implications are that organizational and regulatory constraints are effective at shaping firms' practices, compared to, say, firms' own skill-needs motives. The study therefore advises policymakers to enforce rules that promote equitable recruitment. Harmonized recruitment practices, anonymized recruiting (Rinne, 2018), or automated hiring systems (Köchling and Wehner, 2020; Sánchez-Monedero et al. 2020) could be promoted to this end. These systems should govern the content of screening; procedures regarding the complexity of screening practices; timing when individual characteristics should be screened (at which stage of recruiting, or after hiring); rules how applicants' answers can be used by firms' HR systems; and options for applicants how to respond to intrusive questions. Public education campaigns regarding recruiting norms should be conducted. To ensure that recruiting practices do not harm protected applicants, adverse-impact laws should be synchronized with procedural recruiting rules.

The implications of firms' economic and regulatory environments for their screening practices and eventual hiring choices are important not only for policymakers but also for HR managers. This study provides information about norms at other firms, and feedback about inadvertent effects of firms' recruiting practices on the demographic composition of their hires. This is important because applicant-screening can result in legal liability or backlash from consumers, and is costly in terms of information collection and processing, while its effect on workforce productivity or profit is dubious.

This study corroborates previous findings that the human resource management at Korean firms is not transitioning toward merit and skill-based recruiting practices, and continues to rely on subjective factors (Hlasny, 2022). This has implications for workers and for policymakers in Korea and the wider East Asia region tasked with ushering in more inclusive, objective and meritocratic personnel management practices. Finally, this study sheds light on organizational structures that are more conducive to equitable recruiting practices than others. This can assist national and multinational firms, as well as policymakers worldwide, with identifying corporate-governance pitfalls, and structures most conducive to complying with equal-opportunity norms and best aligned with sustainable human resource management, without compromising their corporate objectives.

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Table 1. Results of Regressions Explaining Firms' Screening Practices

		Birthplace & background		School name		Appearance		Recruiting stages			
		(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(3)	(4)
Skill needs	Interpersonal & communic. skills	0.009	0.011	0.042	0.06	-0.007	-0.004	-0.025	-0.026	-0.037	-0.037
		(0.029)	(0.031)	(0.080)	(0.084)	(0.045)	(0.048)	(0.071)	(0.070)	(0.065)	(0.068)
	Numerical & technical. skills	0.018	0.018	-0.123	-0.103	-0.016	-0.024	0.161**	0.098	0.071	0.072
		(0.030)	(0.032)	(0.084)	(0.088)	(0.031)	(0.032)	(0.074)	(0.074)	(0.071)	(0.073)
	Resourcefulness & problem solving	-0.005	-0.007	-0.071	-0.094	0.069	0.068	-0.015	-0.019	-0.024	-0.014
		(0.029)	(0.031)	(0.095)	(0.099)	(0.049)	(0.051)	(0.097)	(0.099)	(0.097)	(0.100)
	Self-dev. & organ. comprehension	-0.022	-0.021	-0.037	-0.059	-0.014	-0.006	0.119*	0.130**	0.116*	0.103
		(0.024)	(0.026)	(0.068)	(0.069)	(0.024)	(0.025)	(0.068)	(0.066)	(0.065)	(0.068)
Screening constraints	Overseas operations	-0.082***	-0.087**	0.009	0.007	-0.024	-0.015		0.171***	0.112**	0.097*
		(0.032)	(0.035)	(0.068)	(0.071)	(0.025)	(0.026)		(0.053)	(0.053)	(0.055)
	Board personnel committee	0.011	0.013	0.063	0.034	-0.044	-0.047		-0.071	-0.088*	-0.091*
		(0.027)	(0.029)	(0.067)	(0.069)	(0.033)	(0.035)		(0.055)	(0.053)	(0.055)
	HR department	-0.025	-0.029	0.099	0.082	-0.057**	-0.054**		0.260***	0.208***	0.187***
		(0.031)	(0.033)	(0.065)	(0.067)	(0.025)	(0.025)		(0.055)	(0.055)	(0.057)
	Unionization of workers	-0.076*	-0.078*	0.052	0.061	-0.021	-0.028		0.181***	0.185***	0.157**
		(0.045)	(0.047)	(0.099)	(0.102)	(0.044)	(0.046)		(0.070)	(0.071)	(0.073)
Pool	Applicants / vacancies		-0.010		0.111***		-0.007				0.158**
			(0.009)		(0.037)		(0.007)				(0.073)
Firm type	Total workforce	-0.408	-0.436	0.780	1.227	-0.754**	-0.795**			4.464***	3.940**
		(0.277)	(0.315)	(0.897)	(1.219)	(0.306)	(0.336)			(1.627)	(1.565)
	% female workers	0.032	0.033	-0.274	-0.297	0.081	0.079			0.16	0.119
		(0.110)	(0.124)	(0.260)	(0.268)	(0.066)	(0.070)			(0.182)	(0.197)
	% college-educated workers	-0.166**	-0.198**	0.288*	0.274*	-0.182**	-0.170**			0.598***	0.563***
		(0.082)	(0.091)	(0.172)	(0.164)	(0.078)	(0.079)			(0.153)	(0.167)
	% over-40-yr workers	0.170*	0.169	0.062	0.091	0.086	0.077			-0.196	-0.193
		(0.103)	(0.113)	(0.182)	(0.191)	(0.102)	(0.104)			(0.156)	(0.170)
	Obs./Firms	1,720/454	1,604/448	1,719/453	1,603/446	1,719/454	1,602/447	930/465	849/450	848/449	790/440
	R^2*(within)*	0.030	0.034	0.028	0.038	0.038	0.033	0.090	0.143	0.180	0.177
	Model F-statistic	1.53*	1.52*	2.16***	2.68***	2.50***	2.17***	3.31***	5.20***	6.03***	5.58***

Linear time trends at industry-group level and constant terms are included. Unionization, total workforce, and % female, college-educated and 40+ year-old are lagged by 1 period (2 years) to capture their full effect. Fixed effects are for 6 industry groups: manufacturing, energy, information & telecom, finance & insurance, other services, and other industries. Effects significant at 1% (***), 5% (**), 10% (*), using standard errors robust to arbitrary heteroskedasticity and firm-level autocorrelation.

Table 2. Results of Regressions Explaining the Share of Women among Firms' New Hires

	Pooled OLS models				Models with industry-group fixed effects			
	Skill needs	+Hiring constraints	+Firm type	+Hiring process	Skill needs	+Hiring constraints	+Firm type	+Hiring process
Birthplace & background	2.790	2.618	2.622	2.625	2.702	2.641	2.558	2.551
	(1.853)	(1.800)	(1.803)	(1.825)	(1.880)	(1.813)	(1.809)	(1.835)
School-name	-0.039	0.351	0.344	0.437	-0.029	0.340	0.353	0.436
	(0.608)	(0.624)	(0.622)	(0.622)	(0.577)	(0.605)	(0.605)	(0.604)
Appearance	2.941**	2.012	2.012	1.925	2.776*	2.08	2.027	1.926
	(1.466)	(1.617)	(1.620)	(1.625)	(1.477)	(1.630)	(1.626)	(1.635)
Recruiting process stages			0.072	0.184			0.037	0.114
			(1.124)	(1.148)			(1.125)	(1.147)
Interpers. & comm. skills	2.808*	2.524	2.687*	2.735*	2.886*	2.551	2.617	2.717*
	(1.610)	(1.648)	(1.646)	(1.653)	(1.608)	(1.631)	(1.640)	(1.650)
Num. & tech. skills	-4.952***	-5.205***	-5.130***	-4.755***	-5.125***	-5.453***	-5.374***	-5.022***
	(1.743)	(1.584)	(1.585)	(1.601)	(1.755)	(1.590)	(1.596)	(1.608)
Resourceful. & prob.solv.	2.179	1.086	0.986	0.564	1.517	0.587	0.727	0.287
	(2.358)	(2.051)	(2.079)	(2.080)	(2.384)	(2.080)	(2.096)	(2.092)
Self-dev. & org.comprh.	0.584	2.937**	2.937*	2.837*	0.721	3.110**	3.096**	2.989**
	(1.715)	(1.494)	(1.495)	(1.517)	(1.709)	(1.476)	(1.484)	(1.505)
HR departmt.		0.232	0.212	0.284		0.052	0.163	0.187
		(1.570)	(1.559)	(1.591)		(1.578)	(1.568)	(1.600)
HR depart. size		-0.072	-0.074	-0.072		-0.069	-0.066	-0.062
		(0.052)	(0.053)	(0.055)		(0.052)	(0.053)	(0.054)
Professional management		-0.918	-0.945	-0.901		-1.061*	-1.052*	-0.997
		(0.617)	(0.618)	(0.628)		(0.621)	(0.618)	(0.628)
Board personnel committee		0.576	0.585	0.546		0.394	0.473	0.410
		(1.491)	(1.494)	(1.507)		(1.489)	(1.490)	(1.499)
Unionization of workers		-4.043*	-3.987*	-3.792*		-2.801	-3.048	-2.852
		(2.152)	(2.271)	(2.284)		(2.208)	(2.285)	(2.305)
Foreign management		5.825**	5.765**	6.121**		6.197**	6.190**	6.595**
		(2.719)	(2.732)	(2.825)		(2.713)	(2.703)	(2.798)
Overseas operations		-3.627***	-3.719***	-3.507**		-3.052**	-3.019**	-2.765**
		(1.412)	(1.418)	(1.462)		(1.414)	(1.409)	(1.440)
Applicants / vacancies				-0.944				-0.916
				(0.766)				(0.789)
Actual / planned hires				-0.982*				-0.936*
				(0.536)				(0.559)
Total workforce		51.454**	52.635**	53.351**		47.448**	43.652*	43.525*
		(24.738)	(25.435)	(27.204)		(22.837)	(23.308)	(24.749)
% female workers		38.615***	38.597***	38.087***		36.992***	36.571***	35.870***
		(5.218)	(5.265)	(5.335)		(5.158)	(5.236)	(5.285)
% college-ed.workers			0.399	0.335			-2.528	-2.460
			(3.918)	(4.015)			(4.107)	(4.226)
% over-40-yr workers			-1.084	-1.654			0.367	-0.481
			(4.197)	(4.239)			(4.187)	(4.220)
Obs./Firms	1,901	1,604	1,603	1,564	1,901	1,604	1,603	1,564
R^2*(within)*	0.072	0.159	0.160	0.157	0.093	0.172	0.173	0.171
Model F-stat.	7.35***	9.93***	9.11***	7.97***	2.06**	6.15***	5.40***	4.98***

Linear time trends at industry-group level and constant terms are included. Worker unionization, total workforce, percent of women in workforce, percent college-educated and percent 40+ years old are lagged by 1 period (2 years) to capture their full effect. Fixed effects are for 6 industry groups: manufacturing, energy, information & telecom, finance & insurance, other services, and other industries. Effects significant at 1% (***), 5% (**), 10% (*),using standard errors robust to heteroskedasticity & firm-level autocorrelation.

APPENDIX

Table A1. Definition of Variables Used in Regressions

Variable name	Definition [units]	Avg. (st. dev.)[iii]	Min.–max.
Birthplace	Ranking of applicants' region/origin in recruitment among top 5 factors[i] [scale 1–5, 0 if not among top 5 factors]	0.077 (0.435)	0–5
School name	Importance of applicants' school name in recruitment among top 5 factors[i] [scale 1–5, 0 if not among top 5 factors]	0.358 (1.034)	0–5
Appearance	Importance of applicants' appearance in recruitment among top 5 factors[i] [scale 1–5, 0 if not among top 5 factors]	0.084 (0.433)	0–5
Recruiting stages	Stages in recruiting process until job offer is made [count 1–5], for 1,644 observations	3.558 (0.722)	2–5
% women hired	Women among new hires [%]	30.057 (25.804)	0–100
Interpersonal & communic. skills	Importance of workers' interpersonal & communication skills, averaged between the 2 skills [scale 1–5]	3.106 (0.593)	1–5
Numeric & technical skills	Importance of workers' numeric & technical skills, averaged between the 2 skills [scale 1–5]	3.147 (0.566)	1.50–5
Resourcefulness & problem-solving	Importance of workers' resourcefulness, information processing & problem-solving, averaged between the 3 skills [scale 1–5]	3.042 (0.592)	1.33–5
Self-development & organiz. compreh.	Importance of workers' self-development & comprehension of work organization, averaged between the 2 skills [scale 1–5]	2.946 (0.649)	1–5
Overseas operations	Firm has some operations abroad [binary]	0.583 (0.493)	0–1
Personnel committee on the board	Board of directors includes a personnel board [binary], for 1,605 observations	0.664 (0.472)	0–1
Professional management	Level of professionalism of management [1 single owner…4 professional management without owner intervention]	2.246 (1.200)	1–4
Foreign	Management or technical supervision by	0.094 (0.292)	0–1

management	foreigners [binary]		
HR department	Firm has a dedicated HR department [binary]	0.666 (0.472)	0–1
HR department size	Staff in HR department [count], for 1,900 obs.	7.073 (12.535)	0–220
Unionization of workers	Workers are organized in a union [1], or have a labor council [0.5], or none [0], lagged by 1 time period[ii]	0.646 (0.382)	0–1
Minju union	Workers are organized under Minju trade-union umbrella [binary]	0.126 (0.332)	0–1
Total workforce	Firm workers, lagged by 1 time period[ii] [count/1,000]	0.009 (0.023)	0–0.341
% female workers	Female workers, lagged by 1 time period[ii] [%/100]	0.207 (0.169)	0–0.932
% college-educated	College-educated workers, lagged by 1 time period[ii] [%/100]	0.408 (0.237)	0–1
% over-40-yr old	Workers 40+ years old, lagged by 1 time period[ii] [%/100], for 1,900 observations	0.318 (0.187)	0–0.980
Applicants/vacancies	Applicants per opening [ratio/100], for 1,850 observations	0.304 (0.909)	0.005–18.67
Actual/planned hires	Actual per planned hires [ratio], for 1,881 observations	1.083 (0.697)	0.2–23.0

[i] In 2008–2012, evaluated among top 3 factors (coded as 5,4,3, and 0 if not among top 3 factors).

[ii] Lagged value for the first year (value of variables for '02) extrapolated as mean of '04–'12 values, deflated for monetary variables. For worker unionization, extrapolation using the minimum of '04–'12 values is used.

[iii] Unless noted, evaluated in an unbalanced panel of 1,901 observations, 568 firms and 5 biannual time periods, '02–'12.

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logical Innovativeness on Organisational Effectiveness of Deposit Money Bank in Akure Metropolis

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Abstract

The study determines impact of technological innovativeness on organisational effectiveness with reference to Akure Metropolis. A descriptive survey research design was adopted for the study. The population of the study comprised the unit managers of the entire deposit money bank in Akure metropolis. The study employed sample size of 48 through census sampling. Primary data used for the study were gathered through the administration of well structured questionnaire. Data gathered were analyzed using Pearson product moment correlation and regression analysis. The study found that Automated Teller Machine, Mobile Banking and Internet Banking positively and significantly affect organisational effectiveness. Thus, it concluded that organisational effectiveness is positively impacted by technological innovativeness.

Keyword: Effectiveness, Innovation, Organisation, Technology

1. INTRODUCTION

The effectiveness and success of any sensitive organization in recent global world depend mainly on its ability to strategically outsmart her competitors. The role of technological innovativeness plays in Nigeria banking industry cannot be underestimated as it ensures financial institutions flow or get along with global technological trend. Outsmart competitors is conversant by ability to deliver offering better than competitors in the service sector and this also depend on the ability to continually improve on the quality of services being offered to customers (Adeyeye, 2014). In view of this, Technological Innovation means developing new ideas, products, services, and processes which exploit technology.

Many Nigeria companies find it difficult to compete with their competitors, to a certain extent because of their inability to innovate while organisation who timely embraces technological innovativeness encourage all round business growth. Organisations that ignore technological innovativeness lack necessary ingredients such as effectiveness, proper resources utilisation, quality service delivery, innovation efficiency, become more flexible in responding to market changes and incentives to use existing and new technology. This implies that technological innovation critically affects organizational performance in the service oriented firm like banking sector particularly in Nigeria. Therefore, innovation capability is the skill and knowledge

needed to effectively absorb, master, improve existing technologies and create new ones (Guan and Ma, 2003).

Technological innovation is so imperative for an organization in a competitive and dynamic environment like Nigeria where there is intense competition among banking firm not only at local level but globally. Technology, as an intangible asset, has become a critical factor for the survival and competition among banking firms. Zahra and Bogner (2000) suggested that widespread application of technological innovation tends to have a meaningful impact on the industry's structure or competitive advantage, as well as being an important edge for a firm willing to challenge a well established competitor. Technological innovation can provide a sustainable competitive advantage for a company or even increase the profitability of all the companies within the industry (Akinde and Bako, 2020).

For any organisation to succeed, it should be able to compete within its industry or sector and attempt to rub shoulders with other competitors in the international frontiers. The organization must imbibe the culture of innovation because of its importance as confirmed in many studies (Bougrain and Haudeville, 2003; Daniels, 2002; Gelende and Fuente, 2003). Unfortunately, Nigerian service oriented business like banking sector found it difficult to stand against its competitors from both local and foreign countries. The local companies cannot compete with the foreign counterparts in terms of service quality delivery that could influence customer satisfaction and retention. Therefore, technological innovativeness as a contemporary concept have gained little or no attention from scholars in Nigeria particularly in the banking industry where technology usage is very vital for efficient improvement on customer service delivery.

2. LITERATURE REVIEW

2.1 Technology

Technology is a systematic application of physical forces for services delivery. The knowledge is used in practical ways in industry (Oxford 2005). It is the knowledge, process, tools, methods and systems employed in improving services. Technology is the result of man's learned and acquired knowledge or his technical skills regarding how to do things well (Khalil, 2000). Technology means the ability of humans to create things using hands or machines (Terziovski, 2010). It is the application of knowledge to the practical aims of human life or to changing and manipulating the human environment (William, 1998). Technology includes the use of materials, tools, techniques, and sources of power to make life bearable or more pleasant and work more productive. Patel and Pavitt (1997) described technology as one of the main sources of competitive advantage for a company. Within the same industry, companies with a technological edge tend to have better profitability as well as being faster in developing new product lines or other technological innovation.

2.2 Innovation

Innovation is an crucial element of competitiveness. Drucker (2013) defined innovation as a process involving equipping in new idea, improved capabilities or increased utility. Schumpeter (1939) described the different types of innovations as the introduction of new products, development of new methods of production, discovery of new sources of supply, discovery of new markets and new ways to organize organizations. Drucker (2013) noted that innovations provide firms with a strategic orientation to overcome the problems they encounter while they strive to attain sustainable competitive advantage. Innovation involves acting on the creative ideas to make some specific and tangible difference in the domain in which the innovation occurs (Davila, 2010). Innovation can be explained as both process and result of this process (Narayanan, 2000). Innovation can be both a response to changing environment and a

reason of change (Damanpour, 1996).This can be internal or external environment of firm. Both of them are effective in the development of innovation, in addition they are affected by results (Hult, Hurley & Knight, 2004).

2.3 Technological Innovativeness

Technological innovation provides the life-blood of economic activities. According to Adeyeye (2014), technological innovation is a tool for organisational growth, the application of those inventions to meet emerging business opportunities, meeting social needs, and environmental challenges. For any organization to be able to compete, it must be technologically innovative. Technological innovation and core competitiveness enjoy symbiotic relationship (Prhanlad & Hamel, 1990). Azubuike (2013) broadly described technological innovation as an essential component of competitiveness, rooted in the organizational structures, processes, products and services within a firm. Innovativeness is one of the essential strategies to enter new markets, increasing the existing market share and providing the company with a competitive edge. Guan, Yam, Mok and Ma (2006) sees technological innovation as the combination of knowledge techniques and management skills from different areas, that by strengthening these areas, the company can build its organizational competitiveness. Burgelman, Christensen and Wheelwright (2004) posited that technological innovation allocate the capability of an organization to choose, diffuse and then improve it technology. As such, it is a continuous process of experience gathering including the use of technology, the improvement and application of existing technology. Yam, Guan, Pun and Tang (2004) asserted that technological innovation is the skill involved in realizing and supporting a company's technological innovation strategy.

Some of the technological inventions are automated teller machine ATM, point of sales POS, mobile banking, internet banking among others which are used to provide banking services to customers (Worku, Tilahun and Tafa, 2016). Automated Teller Machine (ATM) is a machine where cash withdrawal can be made over the machine without going in to the banking hall. It also sells recharge cards, check account balance, transfer funds and perform other functions (Fenuga, 2010).

Internet banking allows customers of a financial institution to conduct financial transactions on a secure website operated by the institution, which can be a retail or virtual bank, credit union or society. It may include of any transactions related to online usage. Banks increasingly operate websites through which customers are able not only to inquire about account balances, interest and exchange rates but also to conduct a range of transactions (Timothy, 2012).

Point of sale (POS) also sometimes referred to as point of purchase (POP) or checkout is the location where a transaction occurs. A point of sale terminal manages the selling process by a salesperson accessible interface. The same system allows the creation and printing of the receipt. Point of sale system records sales for business and tax purposes (Olorunsegun, 2010).

Mobile banking also known as M-banking is a term used for performing balance checks, account transactions, payments, credit applications and other banking transactions through a mobile device such as a mobile phone or Personal Digital Assistant (PDA). The earliest mobile banking services were offered over SMS, a service known as SMS banking. Mobile banking is used in many parts of the world with little or no infrastructure, especially remote and rural areas.

2.4 Organisational Effectiveness

This study described organizational effectiveness as an organization's ability to survive in a competitive business environment through efficiency of operation, work quality delivery and

enhanced performance. Georgopoulos and Tannenbaum in Barinua and Ezeogu (2022) define organizational effectiveness as the extent to which an organization as a social system fulfils its objectives without in-capacitating its means and resources, and without placing undue tension upon its members.

Efficiency is the ratio between the quantity of input and output. In the same view, efficiency is the quantity of input and output that defines the best possible outcome of a firm in its industry (Daraio and Simar, 2007). Consequently, not all effectiveness equals efficiency, but all efficiency has to result in effectiveness. Effectiveness is important for better results and for effective performance, there is a need for clarity (Zheng, Yang and McLean, 2010). Therefore, effectiveness was seen in the perspective of efficiency, work quality and performance.

2.5 Theoretical Framework

Disruptive innovation theory as established by Christensen (1997), the theory posited that industry leaders are dislodge by new entrants especially when the new entrants initiate a disruptive innovation that the industry leaders are not able or willing to respond to. The theory further predicted that the industry leaders are relatively removed from the industry and the new entrants take over the market. Oslo Manual (2005) viewed disruptive innovation as an innovation that has a significant impact on a market and on the economic activity of firms in that market. Any type of innovation can be disruptive. Disruptive theory is much relevant to this study due to it describe the type of innovations banking sector adopt. Technological, marketing and management innovations are disruptive because they replace traditional banking through adoption of new technology to move with global trend and to achieve better service operation in this customer world. Therefore, the impact of technological innovation and organisational effectiveness is best described by disruptive innovative theory (Ndunga, Njati and Rukangu, 2016).

2.6 Review of Empirical Literature

Ndunga, Njati and Rukangu (2016) determined the influence of technological innovation on organization`s performance of commercial banks in Meru county. The study adopted a descriptive research design through questionnaire and a total population of 60 members of management staff. Census sample design was selected. Data was collected using a questionnaire. The study found that financial performance is positively influenced by innovation. From the study carried out by Adeyeye (2014) on impact of technological innovation on organisational performance. The study found that there is positive interaction between technological innovation and performance using survey research, Primary data with questionnaire and 137 employees of Nestle Foods Nigeria Plc. Also, Todorovic, Medic, Delic, Zivlak and Gracanin (2022) found technological innovation strongly mediate the impact of organizational factors on firm performance. The study focused relationship between organizational and technological innovations and firm performance adopting structural equation modelling using data from 240 Serbian manufacturing firms.

3. METHODOLOGY

Area of study: This study was carried out in Akure Metropolis.

Research Design: The research design adopted for this study is the descriptive survey research design. Survey as a research technique uses questionnaire to gather information from a sample of people. This study considered five point likert scale questionnaire to elicit information from target respondents.

Population of the study: The population of the study consisted the managers (Human Resources Manager, Customer Care Manager and Head of Operations) of sixteen deposit money banks in Akure metropolis. However, only these three managers in each selected bank in the head office constituted the target respondents due to most of the banking operation within their branch are handled and coordinated by them and they are much aware of the technological utilisation and its outcome. For the purpose of this study, the population is forty eight (48) staff.

Sample and Sampling Technique: The entire population of this study was employed, being the three managers of each deposit money banks in Akure metropolis. For the purpose of this study, forty eight (48) respondents were sampled. However, to determine the sample size, census sampling was employed which allows the researcher to select respondents who had the capacity to handle the issue being studied.

Method of Data Analysis: For the purpose of this study, inferential and descriptive statistics were employed. The descriptive statistic included percentages, tables and frequency distribution to describe the demographic variables of the respondents while inferential statistic was used to measure the effect of employee outsourcing on organisational performance through Pearson Product Moment Correlation and multiple regression analysis.

4. RESULTS

Descriptive statistic through frequency and percentages is used to analyse the demographic data of the respondents while inferential through multiple regression is used to test the study hypotheses. However, forty eight (48) questionnaires were administered, filled and submitted for analysis.

Table 1. Respondents Demographic Distribution

	Frequency	Percent	Cumulative Percent
Gender			
Male	26	54.2	54.2
Female	22	45.8	100.0
Total	**48**	**100.0**	
Marital Status			
Single	14	29.2	29.2
Married	34	70.8	100.0
Total	**48**	**100.0**	
Academic Qualifications			
HND	9	18.8	18.8
B.Sc	33	68.8	87.6
MBA	6	12.4	100.0
Total	**48**	**100.0**	

Source: Author's Field Survey, (2022)

Table 1 showed 54.2% (26) of the respondents are Male and 45.8% (22) of the respondents are Female which implies most of the respondents are Male. Moreso, 29.2% (14) of the respondents were single, 70.8% (34) of the respondents were married thus imply majority of the respondent were married. Furthermore, academic background distribution showed that 18.8% (9) of the respondents were HND holder, 68.8% (33) of the respondents were B.Sc holder while 12.4% (6) of the respondents were MBA holder implied that majority of the respondent were B.Sc holders.

ATM and Organisational Effectiveness

The adoption of automated teller machine has improved the effectiveness and efficiency of quality service delivery in the banking sector.

Table 2. ATM and Organisational Effectiveness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	8.3	8.3	8.3
	Disagree	4	8.3	8.3	16.6
	Undecided	2	4.2	4.2	20.8
	Agree	25	52.1	52.1	72.9
	Strongly Agree	13	27.1	27.1	100.0
	Total	48	100.0	100.0	

Source: Author's Field Survey, (2022)

Table 2 shows that 8.3% (4) of the respondents disagree and strongly disagree that adoption of automated teller machine has improved the effectiveness and efficiency of quality service delivery in the banking sector while 52.1% (25) and 27.1% (13) of the respondents agree and strongly agree that adoption of automated teller machine has improved the effectiveness and efficiency of quality service delivery in the banking sector which implied that most of the respondents consent that adoption of automated teller machine has improved the effectiveness and efficiency of quality service delivery in the banking sector .

Mobile Banking and Organisational Effectiveness

This bank recorded higher performance and have more advantage over competitors after embracing functional mobile banking.

Table 3. Mobile Banking and Organisational Effectiveness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	4.2	4.2	4.2
	Undecided	2	4.2	4.2	8.4
	Agree	17	35.4	35.4	43.8
	Strongly Agree	27	56.2	56.2	100.0
	Total	48	100.0	100.0	

Source: Author's Field Survey, (2022)

Table 3 showed that 4.2% (2) of the respondents disagree that mobile banking boost higher performance and competitive advantage over competitors while 35.4% (17) and 56.2% (27) of the respondents agree and strongly agree that mobile banking boost higher performance and competitive advantage over competitors thus implied that majority of the respondent strongly consent that adoption of mobile banking boost performance and increases competitive strength of banking firms.

Online Banking and Organisational Effectiveness

Online banking improves work quality and responsiveness to customer in the banking sector

Table 4. Online Banking and Organisational Effectiveness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	2.1	2.1	2.1
	Undecided	2	4.2	4.2	6.3
	Agree	22	45.8	45.8	52.1
	Strongly Agree	23	47.9	47.9	100.0
	Total	48	100.0	100.0	

Source: Author's Field Survey, (2022)

Table 4 showed that 2.1% (1) of the respondents disagree that online banking improves work quality and responsiveness to customer in the banking sector while 45.8% (22) and 47.9% (23) of the respondents agree and strongly agree that online banking improves work quality and responsiveness to customer in the banking sector thus implied that majority of the respondent agree that online banking improves work quality and responsiveness to customer in the banking sector

Relationship between Technological Innovativeness and Organisational Effectiveness

The study employed correlation in analysing this part. Therefore, technological innovativeness was subjected to Pearson Product Moment Correlation (PPMC) to test the relationship between the four variables (ATM, Mobile Banking, Internet Banking and Organisational Effectiveness).

Table 5. Correlation between Technological Innovativeness and Effectiveness

Variables		P-value
ATM	0.527	.003
Mobile Banking	0.598	.001
Internet Banking	0.507	.005

Source: Author's Field Survey, (2022)

Table 5 showed the relationship existing between technological innovativeness (ATM, Mobile banking and Internet Banking) and organisational effectiveness. The correlation coefficient value of technological innovativeness (ATM, Mobile banking and Internet Banking) are 0.527, 0.598, and 0.507 which showed a positive and strong relationship between technological innovativeness variables and organisational effectiveness. This relationship has been found to be significant at $p< 0.05$. The p-value is shown in the sig (2-tailed) row. Thus the study reject null hypothesis and therefore accept the alternate hypothesis. The result implied that there is significant relationship between technological innovativeness and organisational effectiveness using Pearson Product Moment Correlation.

Effect of Technological Innovativeness on Organisational Effectiveness

Technological innovativeness has no significant effect on organisational effectiveness of Deposit Money Bank in Akure Metropolis

Table 6 revealed that the regression co-efficient between organisational effectiveness and the explanatory variable on technological innovativeness showed a positive figure of 0.515, this indicates that technological innovativeness there has a strong and positive effect on

organisational effectiveness which implies that the explanatory variable has a positive effect on organisational effectiveness. The co-efficient of multiple determinant (R^2) with a co-efficient of 0.465 showed that the explanatory variable can explain 46.5% of the behaviour of organisational effectiveness while the remaining 53.5% can be explained by the stochastic variable or other variables that were not put into consideration. The adjusted R^2 further confirmed the result of the R^2 with a co-efficient of 0.461, which showed 46.1% explanation of the behaviour of the organisational effectiveness by the explanatory variables after adjustment while the remaining 53.9% is explained by the error term.

From the coefficient of the regression result of the ordinal least square using SPSS 20.0 software, it can be deduced that the value of constant parameter is given as 1.708 and internal recruitment construct value are ATM 0.406, Mobile banking 0.434 and Internet 0.369 respectively. The regression result showed that organisational effectiveness is constant at 1.708; this implies that if the explanatory variable is held constant, organisational effectiveness will increase by 1.708%.

Therefore, the regression line is stated below:

Organisational Effectiveness = 1.708 + 0.406x1+ 0.434x2 + 0.369x3

Table 6. Technological Innovativeness and Organisational Effectiveness

Variables		Beta	T-Statics	P-value	Ranking
Constant		1.708	5.991	.000	
ATM		.406	5.139	.000	2nd
Mobile Banking		.434	9.767	.000	1st
Internet Banking		.369	3.856	.002	3rd
R	**.515***				
R^2	**.465***				
R^2	**.461***				
F*	**36.474**				

Source: Author's Field Survey, (2022)

5. DISCUSSION AND CONCLUSION

The study findings showed that technological innovativeness is significant and positively related to organisational effectiveness of Deposit Money Banks in Akure metropolis. However, technological innovativeness scored on three variables which are: automated teller machine, mobile banking and internet banking. The unstandardized β co-efficient of automated teller machine gives a positive value of 0.406 with t= 5.139 and (P= 0.000 < 0.05). This showed that automated teller machine have no significant effect on organisational effectiveness. This means that respondents' reason for organisational effectiveness is not positively influenced by automated teller machine. Moreso, The unstandardized β co-efficient of mobile banking gives a positive value of 0.434 with t= 9.767 and (P= 0.000 < 0.05). This showed that mobile banking have a significant effect on organisational effectiveness. This means that respondents' reason for organisational effectiveness is positively influenced by mobile banking. Furthermore, the unstandardized β co-efficient of internet banking gives a positive value of 0.369 with t= 3.856 and (P= 0.002 < 0.05). This showed that internet banking has a significant effect on organisational effectiveness. This means that respondents' reason for organisational effectiveness is strongly and positively influenced by internet banking. In view of the above fact, this shows that the technological innovativeness is positively related to organisational

effectiveness and mobile banking has the highest significant value on organisational effectiveness among other technological innovations constructs. Therefore implies that an increase in technological innovativeness will result to increases in organisational effectiveness at 0.05 level of significance. Since the F-cal value 36.474 is found significant, therefore, we accept alternate hypothesis and reject otherwise. Hence technological innovativeness has significant effect on organisational effectiveness.

Based on the findings, automated teller machine, mobile banking and internet banking were used to proxy technology innovation. The entire construct showed a positive and significant effect on organisational effectiveness. Moreso, from the correlation result, there was positive and significant relationship between technological innovativeness measures and organisational effectiveness. In view of this and in accordance to the identified problems, that avoidance of technological innovativeness have negative implications on organisational effectiveness and ability to compete favourably. To this end, this study established that adoption and timely embracing technological innovations will enhance organisational effectiveness in the banking sector and also boost its capacity to compete globally. However, alternate hypothesis was accepted and the null hypothesis was rejected. The study findings is in similar to the study of Ndunga, Njati and Rukangu (2016) determined the influence of technological innovation on organization`s performance of commercial banks in Meru county, Kenya. The study found that financial performance is positively influenced by technology innovation. Hence it was concluded that technological innovativeness is positively related to organisational effectiveness among Deposit Money Banks in Akure Metropolis.

Therefore, the study recommends that deposit money bank management should timely embrace modern technology in order to boost their performance and efficiency of operation. Moreso, bank management should see the innovation as an opportunity to compete favourably in the banking sector and to move with global technological trend in delivering quality service to customers. Finally, management of banks should see beyond present and be proactive through embracing innovations that can support their daily operation.

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