recorded in the year 2020. The probability of the Jarque-Bera statistics (0.061361) shows that the data are normally distributed.

The average gross saving rate for the period under study was approximately 0.043904 The maximum and minimum dependency ratios are 2.786207 and -4.677963 respectively. The maximum value of the gross saving rate occurred in the year 2010 while the minimum value recorded in the year 1999. The probability of the Jarque-Bera statistics (0.000000) shows that the data are not normally distributed.

Unit Root Test

Table 4.2: Phillips-Perron Test Statistic

Variable	Levels	1st Difference	2nd Difference	Order of Integration
PPE	-2.943466	-7.9544994***	-	I (1)
	(-3.557759)	(-3.562882)		
TBR	-2.355430	-5.317948***	-	I (1)
	(-3.557759)	(-3.562882)		
AGE (15-64)	-1.783005	-1.556528	-11.20252***	I (2)
	(-3557759)	(-3.562882)	(-3.562882)	
AGE (65and ABOVE)	-1.330750	-4.004345**	-	I (1)
	(-3.557759)	(-3.562882)		
DEPR	-1.801632	-1.574356	-11.41012***	I (2)
	(-3.557759)	(-3.562882)		
GSR	-5.094643***	-	-	I (0)
	(3.557759)			

Source: Author's Computation from E-View 12 Software (*** represents 1% probability level and ** represent 5% probability level)

From table 4.2, the unit root tests at constant and linear trend measured the stationary state of the time series data in the study. Gross saving is stationary at level, price per equity, treasury bill rates, and age 65 and above are stationary at first difference, while age (15-64), and dependency ratios are stationary at second difference.

4.3 Johansen Co-integration Test

Given the non-stationarity of some of the variables in the two models, Johansen co-integration test was carried out for variables in model 1 and 2.

Table 4.3a: Johansen Co-integration result for Variables in Model 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.629709	96.52323	88.80380	0.0124
At most 1 *	0.509391	65.72576	63.87610	0.0347
At most 2 *	0.477648	43.65040	42.91525	0.0421
At most 3	0.362710	23.51859	25.87211	0.0955
At most 4	0.265183	9.552127	12.51798	0.1490

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.629709	30.79747	38.33101	0.2821
At most 1	0.509391	22.07536	32.11832	0.4875
At most 2	0.477648	20.13181	25.82321	0.2356
At most 3	0.362710	13.96646	19.38704	0.2564
At most 4	0.265183	9.552127	12.51798	0.1490

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's Computation from E-View 12 Software

Table 4.3b: Johansen Co-integration result for Variables in Model 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.646196	91.57981	88.80380	0.0310
At most 1	0.543167	59.37039	63.87610	0.1129
At most 2	0.384066	35.08385	42.91525	0.2416
At most 3	0.332766	20.06075	25.87211	0.2229
At most 4	0.215341	7.517689	12.51798	0.2936

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.646196	32.20942	38.33101	0.2133
At most 1	0.543167	24.28654	32.11832	0.3300
At most 2	0.384066	15.02310	25.82321	0.6324
At most 3	0.332766	12.54306	19.38704	0.3663
At most 4	0.215341	7.517689	12.51798	0.2936

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's Computation from E-View 12 Software

The results of the cointegration tests are presented in Table 4a for variables in the model 1 at their various levels of stationarity. The trace and maximum eigenvalues test statistics indicate that the hypothesis of no cointegration among the variables is rejected at the 5% significance level. From the result, Trace test indicates 3 cointegrating equations at the 0.05 level. While maximum engenvalue statistics indicates no cointegrating equation. Also, the results of cointegrating tests are presented in Table 4b for variables in the model 2 at their various level of stationarity. The trace and maximum eigenvalues test statistics indicate that the hypothesis of no cointegration among the variables is rejected at the 5% significance level. From the result, there are 1cointegrating equations based on trace test and no cointegrating equations based on maximum engenvalue statistics. The existence of a stable long-run equilibrium relationship among the variables in model 1b and 2b necessitates the use of the Error Correction Mechanism (ECM) for selected model. The Error Correction Mechanism will show the speed of adjustment and the average time it will take for short-run distortions in the relationship to be corrected.

4.4 Ordinary Least Square Results

Table 4.4a: Regression Analysis of Equation 1b with Price per Equity (PPE) as Dependent Variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	639706.3	655346.0	0.976135	0.3374
AGE_15_64_	-8063.425	8429.738	-0.956545	0.3470
AGE__65__	-6753.302	947.3545	-7.128591	0.0000
DEPR	-217579.9	235525.0	-0.923808	0.3635
GSR	-73.99585	32.55820	-2.272726	0.0309

R-squared	0.721651	Mean dependent var	388.4649
Adjusted R-squared	0.681887	S.D. dependent var	391.5551
S.E. of regression	220.8430	Akaike info criterion	13.77151
Sum squared resid	1365605.	Schwarz criterion	13.99825
Log likelihood	-222.2299	Hannan-Quinn criter.	13.84780
F-statistic	18.14829	Durbin-Watson stat	0.821271
Prob(F-statistic)	0.000000		

Source: Author's Computation from E-View 12 Software

Table 4.4a shows the regression analysis of the equation 1b with price per equity as dependent variable. The coefficient of determination (R-square) and adjusted R-square are 0.721651 and 0.681887 respectively. The foregoing result indicates that 72% of the

independent variables of this model explained the variations in the dependent variable. The F-statistic value is 18.14829 and significant at the probability level of 1%. – shows the best fits of the model.

The coefficient of age (15-64) is (-8063.425) and not significant. Thus the foregoing result implies that 1% increase in age (15-64) leads on average to 8063% decrease in price of equity in Nigeria within the period of study. There exists a negative relationship between price of equity and population percentage of age (15-64) which represents the working class of the population. Thus, this result indicates that working class within Nigeria economy have negative influence on the prices of equities in Nigeria capital market.

The coefficient of age (65 and above) is (-6753.302) and significant at 1% probability level. Thus the foregoing result implies that 1% increase in age (65 and above) leads on average to 6753% decrease in price of equity in Nigeria within the period of study. There exists a negative relationship between price of equity and population percentage of age (65 and above). The foregoing result shows that age (65 and above) in Nigeria have negative impacts on the prices of equities in Nigeria capital market.

The coefficient of dependency ratio is (-217579.9) and not significant. Thus the foregoing result implies that 1% increase in dependency ratio leads on average to 217580% decrease in price of equity in Nigeria within the period of study. There exists negative relationship between price of equity and dependency ratio. The foregoing result shows that dependency rates in Nigeria have negative impacts on the prices of equities in Nigeria capital market.

The coefficient of gross saving rates is (-73.99585) and significant at 5% probability level. Thus the foregoing result implies that 1% increase in gross saving rate leads on average to 74% decrease in price of equity in Nigeria within the period of study. There exists a negative relationship between price of equity and gross saving rate. This result implies that increase in gross saving rates have negative influence on the prices of equities in Nigeria capital market.

Table 4.4b: Regression Analysis of Equation 2b with Treasury Bill Rate as Dependent Variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3306.522	8332.100	0.396841	0.6945
AGE_15_64_	-44.27807	107.1761	-0.413134	0.6827
AGE__65__	70.53781	12.04471	5.856331	0.0000
DEPR	-1290.963	2994.476	-0.431115	0.6697
GSR	-0.369077	0.413946	-0.891606	0.3802

R-squared	0.681603	Mean dependent var	12.71667
Adjusted R-squared	0.636118	S.D. dependent var	4.654650
S.E. of regression	2.807808	Akaike info criterion	5.041412
Sum squared resid	220.7460	Schwarz criterion	5.268156
Log likelihood	-78.18330	Hannan-Quinn criter.	5.117705
F-statistic	14.98514	Durbin-Watson stat	1.006621
Prob(F-statistic)	0.000001		

Source: Author's Computation from E-View 12 Software

Table 4.4b shows the regression analysis of the equation 2b with treasury bill rates as dependent variable. The coefficient of determination (R-square) and adjusted R-square are 0.681603 and 0.636118 respectively. The foregoing result indicates that 68% of the independent variables of this model explained the variations in the dependent variable. The value F-statistic is 14.98514 and significant at 1% probability level – indicates the best fits of the model.

The coefficient of age (15-64) is (-44.27807) and not significant. Thus the foregoing result implies that 1% increase in age (15-64) leads on average to 44% decrease in treasury bill rate in Nigeria within the period of study. There exists a negative relationship between treasury bill rate and population percentage of age (15-64) which represents the working class of the population. Thus, this result indicates that working class within Nigeria economy have negative influence on the treasury bill rate in Nigeria capital market.

The coefficient of age (65 and above) is 70.53781 and significant at 1% probability level. Thus, the foregoing result implies that 1% increase in age (65 and above) leads on average to 71% increase in treasury bill rate in Nigeria within the period of study. There exists a positive relationship between treasury bill rate and population percentage of age (65 and above). The foregoing result shows that age (65 and above) in Nigeria have positive impacts on the treasury bill rate in Nigeria capital market.

The coefficient of dependency ratio is (-1290.963) and not significant. Thus the foregoing result implies that 1% increase in dependency ratio leads on average to 1291% decrease in treasury bill rate in Nigeria within the period of study. There exists negative relationship between treasury bill rate and dependency ratio. The foregoing result shows that dependency rates in Nigeria have negative impacts on the treasury bill rate in Nigeria capital market.

The coefficient of gross saving rates is (-0.369077) and not significant. Thus, the foregoing result implies that 1% increase in gross saving rate leads on average to 0.37% decrease in treasury bill rate in Nigeria within the period of study. There exists a negative relationship between treasury bill rate and gross saving rate. This result implies that gross saving rates have negative influence on the treasury bill rate in Nigeria capital market.

4.5 Discussion of Findings

Model 1:

There exists a negative relationship between price of equity and population percentage of age (15-64). Thus, the working class of Nigeria population contributed to decline in equity price. This findings support the work of Morin and Suarez (1983), which stated that age structure is observed to play a prominent role in influencing portfolio selection behaviour of an investor.

There exists a negative and significant relationship between price of equity and population percentage of age (65 and above). The foregoing result agreed with the works of Brooks, 2006; Davis and Li, 2003; Goyal, 2004; Park, 2010; Saita, Shimizu, and Watanabe (2016) that ageing population, could have a significant negative impact on financial asset prices, supporting the claim that demographic changes influence asset prices.

There exists negative relationship between price of equity and dependency ratio. The foregoing results agreed with the work of Poterba (2001) offered evidence of a weak influence of demographic variables on the returns on bonds and equities, thus weakening the claim of a significant role of demography in asset price determination.

There exists a negative and significant relationship between price of equity and gross saving rate. This is contrary to established literature that cash accumulated can be held as currency or bank deposits, or it can be put into investments (depending on various factors, such as the expected time until retirement) such as a money market fund, or a personal individual retirement account (IRA) composed of non-aggressive mutual funds, stocks, and bonds.

Model 2:

There exists a negative relationship between treasury bill rate and population percentage of age (15-64) which represents the working class of the population. The foregoing result agreed with the work of Brook (2006) which stated that real bond and Treasury Bill prices are

negatively and significantly related to the middle-aged cohorts (between ages 40-44 and 60-64).

There exists a positive and significant relationship between treasury bill rate and population percentage of age (65 and above). The foregoing result agreed with the work of Bakshi and Chen (1994) which stated that the risk behavior of financial market participants changes with age and they become more risk averse and prefer less risky assets as they grow older. In the same vein the result agreed with the work of Park (2007) which concluded that an increase in the population aged 65 and over increases the size of bond market. Since treasury bill is risk free, then the age (65 and above) investors in Nigeria prefer to invest in it. However, the result is contrary to the work of Arnott and Chaves (2012) which stated that large populations of retirees (65+) seem to erode the performance of financial markets as well as economic growth.

There exists negative relationship between treasury bill rate and dependency ratio. The foregoing result agreed with the work of Favero et al (2015) which predicts a negative correlation between the demographic variable and bond yields.

5.0 SUMMARY OF FINDINGS, CONCLUSION AND POLICY RECOMMENDATIONS

Summary of Findings

Having collected and analysed the data for this study, the following are findings: In model 1, there exists a negative relationship between price of equity and population percentage of age (15-64); there exists a negative and significant relationship between price of equity and population percentage of age (65 and above); there exists negative relationship between price of equity and dependency ratio; and there exists a negative and significant relationship between price of equity and gross saving rate. While in model 2, there exists a negative relationship between treasury bill rate and population percentage of age (15-64) which represents the working class of the population; there exists a positive and significant relationship between treasury bill rate and population percentage of age (65 and above); there exists negative relationship between treasury bill rate and dependency ratio; and there exists a negative relationship between treasury bill rate and gross saving rate.

Conclusion

The study attempts to examine the effect of working population on assets prices and macroeconomy and there was a negative effects between population percentage of age (15-64) which is the working population and asset prices for equity and treasury bills. This shows that working population within the Nigeria economy has contributed to decrease in prices of both equity and treasury bills in capital market. It therefore implies that Nigeria economy is not healthy. Also, the study investigated the relationship between the ageing population and assets price and there was a negative and significant relationship between population percentage of age (65 and above) and equity price while treasury bill recorded positive relationship with ageing population. The ageing population therefore prefer to invest in treasury bills than equity due to less risky feature of the former. Finally, the study adjudged the impact of dependency ratio on asset prices and there was negative impact for both equity price and treasury bill price on the dependency ratio. Thus dependency burden decline prices for both equity and treasury bills.

Policy Recommendations

The following policy recommendations emanated from the findings of this study.

i. That government needs to improve on working population conditions of service to encourage them to invest in both equity and treasury bills.
ii. That ageing population who are the risk averters should be encouraged by government through frequent issuing of treasury bills to raise funds for developmental objectives.
iii. That government should relief the working population of their dependency burden so that it will enhance them to invest more on equity and treasury bills

REFERENCES

Aaronson, D.; Hu, L.; Seifoddini, A.; and Sullivan, D. G. (2015) “Changing Labor Force Composition and the Natural Rate of Unemployment.” Federal Reserve Bank of Chicago, Chicago Fed Letter 338 (May 8).

Aaronson, S.; Cajner, T.; Fallick, B.; Galbis-Reig, F.; Smith, C.; and Wascher, W. (2014). “labor force participation: Recent developments and future prospects.” *Brookings Papers on Economic Activity*, 45 (2), 197–255.

Arnott, R. D. and Chaves, D. B. (2012). Demographic changes, financial markets, and the economy. *Financial Analysts Journal*, 61(1), 1-15.

Bean, C. R. (2004) “Overview.” In Proceedings of a Symposium Sponsored by the Federal Reserve Bank of Kansas City, 447–54. Paper presented at a symposium sponsored by the Federal Reserve Bank of Kansas City at Jackson Hole, Wy.

Bloom, D. E., and Canning, D. (2004). “Global Demographic Change: Dimensions and Economic Significance.” In Proceedings of a Symposium Sponsored by the Federal Reserve Bank of Kansas City, 9–56. Paper presented at a symposium sponsored by the Federal Reserve Bank of Kansas City at Jackson Hole, Wy.

Brook, R. (2006). Demographic Change and Asset Prices. In Christopher Kent, Anna Park, and Daniel Rees, editors, Demography and Financial Markets, RBA Annual Conference Volume. Reserve Bank of Australia, June 2006.

CBN (2021). Statistical bulletin

Davis. , E. P. (2006). How will ageing affect the structure of financial markets? In Christopher Kent, Anna Park, and Daniel Rees, editors, Demography and Financial Markets, RBA Annual Conference Volume. Reserve Bank of Australia, June 2006.

Favero, C. A., Gozluklu, A. E., and Yang, H. (2015). Demographics and the behavior of interest rates, http://dx.doi.org/10.2139/ssrn.2013023.

Goyal, A. (2004). Demographics, stock market flows, and stock returns. *Journal of Financial and Quantitative Analysis*, 39(3)115–142.

https://www.investopedia.com/terms/s/savings-rate.asp

Imam, P. (2013) “Shock from Graying: Is the Demographic Shift Weakening Monetary Policy Effectiveness?” IMF Working Paper No. 13–191.

IMF (2014). International Financial Statistics

IMF (2021). International Financial Statistics

Li Y. (1996). Impact of population size on market demand under a market economy. China Journal of Population Science, 8(2), 163-168. PMID: 12291968.

Mester, L. J. (2018). Demographics and their implications for the economy and policy. *Cato Journal*, 38 (2), 399-413.

Mullins, D. W. (1982). Does the Capital Asset Pricing Model Work? *Havard Business Review.*

Park D. and Rhee, C. (2007). Population aging and financial markets: A cross-country study. *Seoul Journal of Economics*, 20(3), 333– 354.

Peng, X. (2011). “China’s Demographic History and Future Challenges.” Science 333: 581–87.

Poterba, J. M. (2001). Demographic structure and asset returns. *Review of Economics and Statistics*, 83(4), 565–584.

Saita, Y., Shimizu, C. and Watanabe, T. (2016), "Aging and real estate prices: evidence from Japanese and US regional data". *International Journal of Housing Markets and Analysis*, 9(1), 66-87. https://doi.org/10.1108/IJHMA-11-2014-0053

Santacreu, M. (2016). "Long-Run Economic Effects of Changes in the Age Dependency Ratio". Economic Synopses. Federal Reserve Bank of St. Louis. 2016 (17). doi:10.20955/es.2016.17. S2CID 157614792. Retrieved September 2, 2016.

Todaro, M. P. and Smith S. C.(2011). *Economic Development*. Pearson Education limited, England, 801p.

United Nations (2017) World Population Prospects: The 2017 Revision. Vol. 2: Demographic Profiles. ST/ESA/SER.A/400. New York: United Nations, Department of Economic and Social Affairs, Population Division.

Worl Bank (2021). World Development Indicators

Yashiro, N. and Oishi A. S. (1996). Population Aging and the Saving s-Investment Balance in Japan in the Economic Effects of Aging in the United States and Japan by Hurd, M. D. and Yashiro, N. University of Chicago Press. SBN: 0-226-36100-4. URL: http://www.nber.org/books/hurd96-1 pp. 59-87

Yoon, J. W., Kim, J. and Lee, J. (2014). Impact of Demographic Changes on Inflation and the Macroeconomy.