e-ISSN 2667-5927

BİLTÜRK

Ekonomi ve İlişkili Çalışmalar Dergisi

Journal of Economics and Related Studies

Volume: 3 **April 2021** **Issue: 2**

Research Articles

Peer-reviewed International Journal

Turkish JournalPark ACADEMIC

BİLTÜRK Journal of Economics and Related Studies e-ISSN 2667-5927

Aims and Scopes

The Journal of Economics and Related Studies is a peer-reviewed journal that analyzes problems in all areas of the economy and related fields of economy. The Journal focuses on the publication of both theoretical and empirical publications in the field of economics and the related studies. BİLTÜRK Journal of Economics and Related Studies include but are not limited to the following subjects. Financial Economics, International Economics, Microeconomics, Welfare Economics, Economics of Education, Economic History, Economics of Law, Defense Economics, Industrial Organization, International Trade, Labor Economics, Money, Banking, Public Finance, Political Economy, Islamic Economics, Tourism Economics.

BİLTÜRK
Ekonomi ve İlişkili Çalışmalar Dergisi
Journal of Economics and Related Studies

e-ISSN 2667-5927

Contents
Research Articles

Abstracting & Indexing

Index Copernicus, CiteFactor, Road, Google Scholar, idealonline, Journal Factor, DRJI, Scientific Indexing Services, International Scientific Indexing, Eurasian Scientific Journal Index, infobase index, COSMOS IF, ResearchBib, Rootindexing, J-Gate, Asos Indeks.

BİL TÜRK Journal of Economics and Related Studies
BİL TÜRK Ekonomi ve İlişkili Çalışmalar Dergisi

Apple Doesn't Fall Far: Intergenerational Education Mobility in Turkey

Erkan Duman[a,]
[a] World Bank, Turkey, erduman@alumni.sabanciuniv.edu, https://orcid.org/ 0000-0002-6585-6665

ARTICLE INFO

Research Article

2021, Vol. 3(2), 51-65

e-ISSN 2667-5927

Article History:

Received: 12.06.2020
Revised: 20.02.2021
Accepted: 05.03.2021
Available Online: 30.04.2021

JEL Code: I21, J13, J24

Apple Doesn't Fall Far: Intergenerational Education Mobility in Turkey

Abstract

This study presents an in-depth review of the literature on intergenerational education mobility. The issues regarding consistent estimation of mobility coefficients as well the proposed solutions are elaborately discussed. In the light of the discussions, the strength of the intergenerational schooling association in Turkey is analyzed for father-son and father-daughter samples separately using a pooled sample of pairs living in the same household in any of the years between 2003 and 2011. The results suggest large persistence in intergenerational schooling—paternal and maternal correlation coefficients are 0.56 and 0.59 for sons, 0.63 and 0.73 for daughters—regardless of the gender of the child. The large mobility correlations may ask for the government to intervene in breaking the harmful schooling link across generations.

Keywords: *intergenerational mobility, education, human capital*

To cite this document: Duman, E. (2021). T Apple Doesn't Fall Far: Intergenerational Education Mobility in Turkey. BILTURK, The Journal of Economics and Related Studies, 3(2), 51-65.doi: 10.47103/bilturk.836623

1. Introduction

Johnson and Stafford (1973) and Leibowitz (1974) conclude that parental schooling has a positive causal impact on their children's educational attainment which implies that children who have high educated parents are more likely to acquire more years of schooling compared to children of low educated parents, holding all other things constant. In the version of human capital theory by Ben-Porath (1967), educational attainment plays an important role in determining individuals' lifetime earnings. In the light of this argument by Ben-Porath (1967), findings of Johnson and Stafford (1973) and Leibowitz (1974) can be interpreted as children of high educated parents have higher earnings potential due to their accomplishment of higher levels of schooling compared to children of low educated parents. Thus, lucky children of high educated parents—as a child cannot choose his/her parents among the available candidates—are more likely to live a prosperous life compared to those children of low educated parents. Long term consequences of a strong intergenerational schooling association may be devastating for the society and for economic growth. Therefore, it is important to quantify the strength of the intergenerational schooling link and to understand whether the intergenerational schooling relation is causal. If there is intergenerational persistence, governments may need to intervene in order to provide equality of opportunity and resultingly improve life standards of children of low educated parents by providing the families the means to make investments in their children's human capital or by investing directly to the targeted children in terms of schooling and other human capital inputs (Shea, 2000).

The intergenerational schooling correlation may be biased since the intergenerational schooling association may be partly driven by omitted variables like parents' income. High educated parents are more likely to be wealthier than low educated parents as they have accumulated more human capital which in turn pays higher rents in labor market, and those wealthy parents have more resources to invest in their children's human capital. High educated parents due to their higher income may provide a better environment for their children to be successful. Therefore, the educational inequality in children's generation which in turn results in income inequality in children's generation when they become adults may arise partly owing to the income inequality in parents' generation. Maybe parental schooling which is argued by Leibowitz (1974) to reflect parental skill in parenting, and parents' time allocation to their children does not matter for children's educational attainment as much as it is argued in the intergenerational schooling literature. Mayer (2010) surveys the literature on the relation between parental income and children's educational attainment and moreover, presents the findings of studies on the intergenerational income mobility. Mayer (2010) suggests that children from poor families compared to children from rich families are more likely to drop out of high school and those who achieve to graduate from high school are less likely to enroll in or graduate from college. In addition, the resulting

educational inequality between children from poor families and children from rich families may contribute to the income inequality when these children become adults and this hypothesis is consistent with the findings surveyed in Mayer (2010) that children from poor families are more likely to remain poor when they become adults compared to children from rich families. Concludingly, parental income may play an important role in children's schooling and in children's standard of living when they become adults. Mayer (2010) reviewing the literature concludes that a 10% increase in parental income results in 0.024 to 0.104 additional years of schooling for the child. Plus, a 10% increase in parental income is associated with a 2% increase in child's income when he/she becomes an adult. Mayer (2010) suggests that in order to prevent children of poor families to grow up poor, the society should provide education, training and services that maximize the employability of such children. Consistent with this idea, Sylwester (2000) using a cross section of countries concludes that increasing public education expenditures reduces income inequality within a country. It is most logical to agree with Shea (2000) that it is important to distinguish correlation from causality in intergenerational schooling and in intergenerational income mobility studies in order to assess the impact of policies that redistribute income among parents or invest in children's human capital directly.

This study presents an in-depth survey of the recent methodological advancements in consistent estimation of intergenerational education mobility. This article sheds light on an important issue that has long term consequences on the society and on income inequality and contributes to the scarce literature on intergenerational education mobility in Turkey by presenting regression coefficients that reveals the strength of association between parents' and their offspring's education using pooled Household Budget Surveys spanning years 2003-2011.

In the next section I overview the literature and discuss the issues of and proposed solutions to consistent estimation of intergenerational mobility coefficients. The rest of the paper follows as: in section 3, I describe the dataset used to estimate intergenerational education mobility coefficients in Turkey and present some descriptive statistics. In section 4, results are presented, and section 5 concludes.

2. Literature Review and Estimation Issues

Observing that higher educated parents have higher educated children, it is natural to ask, because of the reasons I explained before, whether this relation is causal. The literature is typically divided into two parts: studies that examine the intergenerational schooling association and studies that try to find causal relations.

The main problem in identifying causality is the ability bias. More able parents may obtain more schooling compared to less able parents and if earnings or schooling ability is genetically transmitted to their children, higher educated parents who are more able will be more likely to have more able children, who will eventually obtain more schooling. So, the intergenerational schooling association actually captures the impact of genetically transmitted ability. Secondly, among mothers with the same ability, those who have higher education may have children who have higher education due to assortative mating. This is an assumption that says people marry those who are more like them. So, under this assumption, more educated mothers will marry more educated fathers, who may be more able and again due to genetic transmission of ability, their children may be more able and obtain more schooling.

To identify the causal impact of parental schooling on children's educational attainment three methods are stressed in the literature. Firstly, a sample of monozygotic (identical) twins for fathers or mothers is used to control for the children's unobserved heritable endowments. It is assumed in the literature that a child's endowments are stochastically determined by his parents' endowments. So, children of monozygotic female twins inherit the same endowments from their mothers because their mothers are identical twins and it is assumed that identical twins have the same genetic codes and the same abilities. Similarly, the children of identical male twins inherit the same endowments from their fathers. Therefore, differencing identical female twins' children's educational attainment regression equations, we get rid of mother's heritable earnings (or schooling) endowments since in the literature the intergenerational schooling relation is assumed to be a linear one. Still, the father's heritable endowment biases the schooling coefficients of both parents.

$$S_{ij}^{c} = \gamma_0 + \gamma_1 S_{ij}^{p} + v_{ij}^{c} \qquad (1)$$

This is the OLS regression that is run to find the impact of parental schooling on children's educational attainment. S_ij^c represents child i's total years of schooling from family j and S_ij^p represents child i's parents' total years of schooling. In the literature, this equation is estimated using only one parent's years of schooling or simultaneously adding both parents' educational attainments separately into the equation or summing up the total years of schooling of parents and adding it to the equation as the variable of interest. Holmlund, Lindahl, and Plug (2011) review the literature on parental educational impact on children's educational attainment and state the pros and cons of introducing the parental education in one of these three methods to the equation. According to Holmlund, Lindahl and Plug (2011), introducing only one of the parent's years of schooling each time and estimating the intergenerational schooling link for father's and mother's one by one will cause biases in the estimates. Their argument is that if only one of the parent's schooling is introduced and the spouse's educational attainment matters for their children's

years of schooling, omitting the spouse's education due to assortative mating will bias the parent's (i.e., the one whose years of schooling is introduced to the equation) schooling estimate. Assortative mating assumption makes it clear that parents' years of schooling are correlated. So, the estimated parental education coefficient (i.e., only one of the parents) captures both the effect of the given parent's education and the spouse's education. Introducing both parents' schooling eliminates the bias due to assortative mating; however, because of the correlation between parents' schooling, multicollinearity makes it difficult to interpret the parents' schooling coefficients. To counteract the multicollinearity problem the literature proposes summing up the father's and mother's schooling and introducing it as the variable of interest which makes the assumption that father's and mother's schooling has the same partial effect on their children's education. Therefore, it is like adding father's and mother's schooling separately at the same time to the regression equation. So, assortative mating is accounted for. Furthermore, since the schooling of father and mother is not introduced separately at the same time, there will be no multicollinearity problem and the estimate will be more precise. Holmlund, Lindahl and Plug (2011) state that the studies covered in their paper which control for assortative mating (i.e., include both parents' schooling at the same time separately) except for Behrman and Rosenzweig (2002) study, find the same partial effect for father's and mother's schooling. Leibowitz (1974) in her study on top 1% scoring school children from Stanford-Binet or Terman IQ tests from grade 3 to grade 12 in California concludes that for the sample of boys, mother's and father's schooling has the same partial effect on their schooling, and for the sample of girls, mother's schooling seems to have a higher partial effect compared to father's schooling; however, this difference is not significant at 5% level. Her estimations control for assortative mating as well. The evidence provided makes it reasonable to introduce the summed-up schooling of the parents into the equation, still attention needs to be paid since it is not guaranteed that regardless of the differences in social norms and educational environments in various study contexts the partial effect of father's and mother's schooling will be the same.

In (1), if the intergenerational transmission of ability is not accounted for, then the intergenerational schooling link will be merely an association. Holmlund, Lindahl and Plug (2011) summarize the twin studies and when the unobservable heritable endowments are not accounted for, the estimated partial effects for father's and mother's schooling are both positive and significant regardless of whether assortative mating is accounted for or not. When unobserved ability of the children is accounted for by making use of twin fathers or twin mothers samples except for Behrman and Rosenzweig (2002) study, there seems to be a positive and significant effect of father's schooling whereas there is no effect of mother's schooling, again

regardless of whether assortative mating is accounted for or not. Behrman and Rosenzweig (2002) find a significant and positive impact for father's schooling and a significant and negative effect for mother's schooling regardless of the control status for assortative mating. In more recent cohorts, however, with the increase in females' educational attainment, mother's schooling seems to have a low but positive significant effect on their children's schooling. In the studies where the intergenerational ability transmission is accounted for, both father's and mother's schooling coefficients decrease, plus mother's schooling coefficient becomes insignificant. Therefore, heritable endowments seem to bias the intergenerational schooling coefficients upwards. This result is consistent with the expectation that heritable endowments of the children are positively correlated with those of their parents and children's schooling via this correlation in endowments is also positively correlated with their parents' schooling. Thus, heritable schooling endowments confound the intergenerational schooling link upwards.

The second method in the literature to correct for ability bias is to use the link between adoptive parents and adopted children. The identification in studies which use adoptive parents and adoptive children as their samples comes from the lack of the intergenerational ability transmission since the adoptive parents and the adopted children do not share common genes. It is natural to expect no correlation in abilities of adoptive parents and adopted children. (1) is run separately for adoptive parents and their own children (i.e., not adopted ones) and for adoptive parents and their adopted children. We expect to find upward biased intergenerational schooling estimates when the regression is run for adoptive parents and their own children due to the presence of intergenerational transmission of ability. However, as I explained before, the intergenerational schooling estimates will be ability bias free when the regression is run for adoptive parents and their adopted children. The intergenerational schooling estimates for adopted children are found in the literature to be less than the ones for own children (not adopted), thus justifying the upward bias generated by the confounder–genetically transmitted ability. Holmlund, Lindahl and Plug (2011) state that the unobserved heritable endowment biases the parental schooling estimate upward by a fraction of 50% of its actual value. When assortative mating is controlled for in adopted children studies, mother's schooling has a low but significant positive partial effect on their adopted children and father's schooling has a larger positive significant partial effect. The difference between twin parents and adopted children studies is that in twin studies mother's schooling is found to have no effect whereas in adopted children studies mother's schooling is found to have a low but positive significant effect on children's schooling.

Lastly, there are some IV studies that try to exploit an exogenous variation in the schooling of the parents to identify a casual intergenerational schooling effect. Since parental schooling is endogenous in child's educational attainment equation, an instrument is needed to capture the part of the variation in parent's schooling that is uncorrelated with his/her own heritable endowment (as mentioned before

the child's endowments are stochastically determined by his/her parents' endowments). In the literature, mostly the instrument used was a compulsory schooling reform that affects some cohorts and do not affect other cohorts or affects some regions earlier than the other regions. Black, Devereux and Salvanes (2008) use changes in compulsory schooling laws introduced in different Norwegian municipalities at different times with a span of 14 years from 1959 to 1973. The Norwegian schooling reform increased compulsory schooling from 7 years to 9 years. By means of this schooling reform instrument, Black, Devereux and Salvanes (2008) estimate the local average treatment effect on those children whose parents would not have increased their schooling if they would not be forced by the reform. Complying parents are similar to other parents on any other characteristics but their age, municipality of birth and of course extra two years of schooling thanks to the Norwegian schooling reform. However, it is important to stress that estimated LATE (local average treatment effect) is valid for compliers, whereas for always takers (who would have obtained higher education regardless of being affected by the reform or not) and never takers (who would not increase their schooling even in the presence of the enforcement of the reform) instrumental variable estimate would not reflect the true impact. Black, Devereux and Salvanez (2008) using the whole sample find imprecise and insignificant intergenerational schooling estimates. When they restrict their sample to those parents who do not have more than nine years of schooling, their results gain in precision. Of course, some of the parents who have more than nine years of schooling might not have achieved that if the reform was not biding, so restricting the sample to those parents with no more than nine years of schooling ignores some of the exogenous variation present in parental schooling that may be important in explaining children's schooling. Nevertheless, Black, Devereux and Salvanez (2008) assume that the instrument has little bite for those parents acquiring more than nine years of schooling. Black, Devereux and Salvanez (2008) find no effect for father's education but positive and low significant effect for mother's education. It is important to remember that these effects are averaged among low educated parents. Maybe parental schooling is transmitted differently and most likely better among higher educated parents. High educated parents and low educated parents may differ in their perceptions of education and in their expectations from education. High educated parents may value education more and therefore, stress the importance of education more in the home. Thus, some researchers investigate the parental schooling impact among high educated parents. Carneiro, Meghir and Parey (2013) focus on grade repetition as the outcome and use variation in higher education. They use tuition fees and college location in US to capture exogenous variation in schooling of those higher educated parents. Maurin and McNally (2008) also focus on grade repetition as outcome but use year-by-year change in the quality of university entrance exams in France to capture exogenous variation in schooling of higher educated parents.

Both studies suggest that higher parental education reduces the probability of grade repetition. However, Holmlund, Lindahl and Plug (2011) criticize these studies because of the weakness of the instruments (tuition fees and college location) or their too much dependence on year-by-year variation. Holmlund, Lindahl and Plug (2011) take the results of Black, Devereux and Salvanez (2008) most seriously.

Holmlund, Lindahl and Plug (2011) apply the procedures presented above to Swedish register data. For twin parents and adopted children, father's schooling has a positive and significant effect whereas mother's schooling has a lower positive significant effect. Their instrumental variables estimation results suggest no effect for father's schooling but a positive and significant effect for mother's schooling on compliers (those parents with no more than 9 years of schooling with the assumption that parents with more than nine years of schooling is less affected by the reform).

As a result of twin parents, adopted children and IV studies, it seems that a portion of intergenerational schooling link is established by causal parental schooling but whose education matters is a question. Twin parents and adopted children studies suggest that paternal education is more important whereas IV studies suggest that maternal education is more important.

3. Data and Descriptive Statistics

This paper uses data from cross-sectional household budget surveys, "Hanehalkı Bütçe Anketi" conducted by Turkey's national statistical agency (TÜİK). Nine waves of data from the household budget surveys are pooled together covering the years from 2003 to 2011 in order to increase variation. Each survey is representative at urban, rural and national levels. The surveys contain information on demographic characteristics including the last finished schooling level, current and previous employment status, wages earned in last 12 months, earnings both in cash and in-kind from last 12 months, expenditures and household asset ownership. The pooled cross-sectional data set contains information on 98,568 households.

Our purpose in this study is to investigate the education mobility in the population. To achieve our goal, parents and their children should be identified in the sample. Since the data used is not longitudinal, children who left a household and form their own households cannot be matched with their parents. However, the data set allows us to match parents and children if they live in the same household. Nevertheless, the sample constructed by choosing the households where parents and their children live together may be a highly selected sample and may not be representative of the population.

Table 1 gives the descriptive statistics for children who have non-missing information on last finished schooling level and who have fathers with non-missing information on last finished schooling level. The samples constitute of sons and daughters who are between ages 25 and 34. The descriptive statistics are given for

the oldest son or oldest daughter present in the household and their matched fathers. Choosing the oldest son or oldest daughter is to preserve independence across observations and to reduce potential life-cycle bias as individuals in their early ages may have less earnings or wages due to having less experience (Zimmerman, 1992). Annual wages and annual earnings are reported in December 2011 Turkish Lira.

Table 1: Descriptive Statistics

Variables	Sons Sample		Daughters Sample	
	Dads	**Sons**	**Dads**	**Girls**
Age	57.32	28.54	57.67	28.56
Annual wages	15,339	10,916	14,801	11,067
Annual earnings	16,350	10,720	16,770	10,136
Education[j]:				
No qualification	0.097	0.021	0.077	0.059
Low level	0.762	0.501	0.724	0.435
Middle level	0.085	0.32	0.118	0.268
High level	0.054	0.156	0.079	0.237
Occupation[k]:				
Top executive and managerial	0.163	0.069	0.180	0.039
Professional	0.020	0.053	0.029	0.152
Assistant professional	0.027	0.061	0.040	0.115
Clerical	0.022	0.058	0.032	0.196
Service and sales	0.058	0.155	0.069	0.113
Farmer and livestock workers	0.418	0.189	0.330	0.198
Craftsmen and foremen	0.100	0.179	0.123	0.055
Operatives	0.086	0.119	0.096	0.042
Unskilled labor	0.100	0.113	0.097	0.085
Married	0.97	0.45	0.97	0.10
No. Of siblings	-	2.25	-	2.39

Notes: The descriptive statistics are for sons and daughters who have non-missing education information and who have fathers with non-missing education information. (j) No qualification represents individuals who are illiterate. Low level represents individuals who are junior high school graduates or have less than junior high school level education. Middle level represents individuals who have high school diploma. High level represents individuals who have 2 year or 4 year university or master's or PhD diploma. (k) Professions are categorized according to ISCO 88. Sons sample consists of 8,046 father-son pairs. Daughters sample consists of 3,890 father-daughter pairs. The descriptive statistics for sons and girls are for the oldest son and oldest daughter in the household. Annual wages and earnings are in December 2011 Turkish Liras.

In both samples, the mean age for oldest sons and oldest daughters as well mean age of fathers seems to be similar. The mean annual wage for sons is slightly less than the mean annual wage for daughters. Fathers in daughters' sample earn less wages on average than fathers in sons' sample. It is interesting to observe the change in educational attainments across fathers' and sons' generations, similarly across fathers' and daughters' generations. In fathers-sons sample, fathers with lower secondary education or less than lower secondary education constitute 76% of all fathers. 8% of the fathers have high school education and only 5% have education level over high school. 10% of fathers do not know how to read and write. Illiteracy rate significantly decreases to 2.1% in sons' generation. The share of sons with lower secondary education or less than lower secondary education is significantly less than the corresponding figure for their fathers. The high school share increases from 8% to 32% moving from fathers' generation to sons' generation. Lastly, the share of high-level education tripled in sons' generation. Similar patterns arise for fathers-daughters sample with an important difference; fathers' in daughters' sample have lower share of illiteracy and low-level education and have higher shares of middle level and high-level education compared to fathers in sons' sample. In fathers-sons sample, 42% of all fathers work as a farmer or livestock worker which most likely implies that these families are located in rural areas. Corresponding figure for fathers-daughters sample is around 33%. Since the occupational opportunities in rural areas are not that much in number compared to urban areas and on average occupations in rural areas may pay less wage compared to occupations in urban areas, the fathers in fathers-sons sample have on average lower annual earnings compared to fathers in fathers-daughters sample. As expected, a low share of daughters is married in fathers-daughters sample.

4. Results

In this section I estimate the intergenerational education mobility coefficients using fathers-sons and fathers-daughters samples separately. Data limitations restrict me to run simple OLS regressions of child schooling attainment against paternal and maternal education and prevent me to apply robust methods explained in section 2. Therefore, the results presented in this section reveal intergenerational education mobility associations. The estimated regression equation is the following:

$$S_{ij}^{c} = \gamma_0 + \gamma_1 S_{ij}^{p} + \gamma_2 A_{ij}^{c} + v_{ij}^{c} \qquad (2)$$

This regression equation differs from (1) by adding the age of the child on the right-hand side. Since the sample includes father-child pairs in which the child is between 25 and 34, unobserved cohort differences may confound the intergenerational schooling link. The additional control for the child's age accounts for the cohort effects on intergenerational mobility.

Table 2 presents the intergenerational education mobility estimates for fathers-sons sample with both parties having non-missing information on their educational attainment. The educational attainment variable for both fathers and sons is an ordinal variable with 11 distinct values. Although the dependent variable (son's education) is not a continuous variable, OLS estimation method was used to estimate the intergenerational correlation in education. Ordered logit estimation method is another method commonly used to estimate treatment impacts when the dependent variable is an ordinal variable. However, in our context using ordered logit estimation method complicates interpreting the coefficients. First two columns add paternal and maternal schooling separately while the last column accounts for assortative mating by controlling both parents' schooling simultaneously. When assortative mating is not accounted for, the intergenerational correlation in education for fathers and sons is 0.56 and the intergenerational correlation in education for mothers and sons is 0.59. This result may suggest using the total of father's and mother's education as a suitable way to control for assortative mating and to avoid multicollinearity problem. However, educational attainment variable is an ordinal variable and summing father's and mother's corresponding educational attainment values do not have any meaning. When assortative mating is accounted for, father's education coefficient decreases to 0.42 and mother's education coefficient decreases to 0.26 which justifies that omitting spouse's educational attainment results in estimating upward biased intergenerational education mobility coefficients for the left behind parent. The estimated mobility correlations are in line with those national correlations found in Aydemir and Yazici (2019) [1].

Table 3 presents the intergenerational education mobility estimates for fathers-daughters sample with both parties having non-missing information on their educational attainments. The results are similar with the fathers-sons sample results presented in Table 2. The coefficient estimate for father's education in column (1) suggests large persistence in schooling across generations. Furthermore, daughters' educational attainment is found to have stronger correlation with their mothers' schooling in column (2). When assortative mating is accounted for, the partial effects of father's and mother's education are estimated

[1] The mobility correlation between father's (mother's) and their offspring's is estimated to be 0.564 (0.532) by Aydemir and Yazici (2019).

to be the same as in Holmlund, Lindahl and Plug (2011) and Leibowitz (1974). The coefficient estimates of both parents' drop significantly in column 3 and are in line with its counterparts from sons' education regressions. A comparison of sons' and daughters' education regressions implies that both paternal and maternal education is more strongly associated with their daughters' education compared to their sons' education.

In both samples the age of the child is inversely related with his/her highest achieved schooling. Besides coefficients of age, education mobility coefficients are highly statistically significant at 1% in both samples.

Table 2: Intergenerational education mobility estimates (sons)

	DEPENDENT VARIABLES		
	OLS results		
VARIABLES	**(1)**	**(2)**	**(3)**
	son's education	son's education	son's education
father's education	0.556***		0.424***
	(0.0120)		(0.0153)
son's age	-0.321***	-0.335***	-0.257***
	(0.0557)	(0.0593)	(0.0567)
mother's education		0.593***	0.267***
		(0.0160)	(0.0192)
Control for assortative mating	No	No	Yes
Observations	8,046	7,764	7,764
R-squared	0.219	0.158	0.234

Notes: Standard errors are in parentheses. *** p<0.01

Table 3: Intergenerational education mobility estimates (daughters)

	DEPENDENT VARIABLES		
	OLS results		
VARIABLES	**(1)**	**(2)**	**(3)**
	girl's education	**girl's education**	**girl's education**
father's education	0.630***		0.422***
	(0.0171)		(0.0211)
girl's age	-0.305***	-0.319***	-0.248***
	(0.0881)	(0.0921)	(0.0876)
mother's education		0.737***	0.422***
		(0.0220)	(0.0262)
Control for assortative mating	No	No	Yes
Observations	3,890	3,741	3,741
R-squared	0.264	0.237	0.310

Notes: Standard errors are in parentheses. *** p<0.01

5. Conclusion

This study presents an in-depth review of the literature on intergenerational education mobility. The issues regarding consistent estimation of mobility coefficients as well the proposed solutions are elaborately discussed. In the light of the discussions, the strength of the intergenerational schooling association in Turkey is analyzed for father-son and father-daughter samples separately. Pooled cross-sections of Household Budget Surveys (from 2003 to 2011) are used to create the sample of father-child pairs that live in the same household. For both samples three specifications are estimated: i) child's schooling is regressed on father's schooling, ii) child's schooling is regressed on mother's schooling, and iii) child's schooling is regressed on both parents' schooling. Each specification includes controls for cohort effects which may confound the intergenerational schooling association. The results suggest large persistence in intergenerational schooling regardless of gender of the child which compares to the national correlations found by Aydemir and Yazici (2019). A comparison of the results with mobility correlations from a large set of countries in Hertz et al. (2008) implies that educational attainment is less mobile across two generations in Turkey than most of the countries in their sample. The larger persistence in daughters sample may reflect segregation in parental attitudes towards their children's schooling based on the gender of the child. There may be large regional disparities in intergenerational schooling association in Turkey due to regional differences in social norms and attitudes towards acquiring schooling. Further work may address the presence and causes of regional disparities in intergenerational education mobility as well the drivers of national persistence in intergenerational schooling. The national correlations found in this study may require the government to intervene in breaking the harmful schooling link across generations by providing equality of opportunity. [2].

[2] In additional analysis, I show that parental income explains a large portion of the education mobility correlations which suggests that wealthy families may invest more in their children's schooling and may provide better opportunities compared to poorer families.

References

Acosta, P. (2006). Labor supply, school attendance, and remittances from international migration: the case of El Salvador. *World Bank Policy Research Working Paper,* No. 3903.

Aydemir, A. and Yazici, H. (2019). Intergenerational education mobility and the level of development, *European Economic Review, 116, issue C, p. 160-185.*

Behrman, J. R., and Rosenweig, M. R. (2002). Does Increasing Women's Schooling Raise the Schooling of the Next Generation? *The American Economic Review, 92(1): 323-334.*

Ben-Porath, Y. (1967). The Production of Human Capital and the Life Cycle of Earnings. *Journal of Political Economy, 75(4): 352-365.*

Black, S. E., Devereux, P. J., and Salvanes, K. G. (2008). Staying in the Clasroom and ut of the Maternity Ward? The Effect of Compulsory Schooling Laws on Teenage Births. *The Economic Journal, 118: 1025-1054*.

Carneiro, P.,Meghir, C., and Parey, M. (2013). Maternal Education, Home Environments, and the Developments of Children and Adolescents. *Journal of European Economic Association, 11: 123-160.*

Johnson, G. E., and Stafford, F. P. (1973). School Returns to Quantity and Quality of Schooling. *The Journal of Human Resources, 8(2): 139-155.*

Hertz, T., Jayasundera, T., Piraino, P., Selcuk, S., Smith, N. and Verashchagina, A. (2007). The Inheritance of Educational Inequality: International Comparisons and Fifty-Year Trends. *The B.E. Journal of Economic Analysis & Policy: Vol. 7: Iss. 2 (Advances), Article 10.*

Holmlund, H., Lindahl, M., and Plug, E. (2011). The Casual Effect of Parents' Schooling on Children's Schooling: A Comparison of Estimation Methods. *Journal of Economic Literature, 49(3): 615-651.*

Leibowitz, A. (1974). Home Investments in Children. NBER Chapters, in: Economics of the Family: Marriage, Children, and Human Capital. *National Bureau Researsch, 432-456.*

Maurin, E. and McNally, S. (2008). Lon-Term Educational Returns of 1968 to the Angry Students. *Journal of Labor Economics, 26(1): 1-33.*

Mayer, S. E. (2010). Revisiting an Old Question: How Much Does Parental Income Affect Child Outcomes? *Focus, 27(2): 21-26.*

Shea, J. (2000). Does Parents' Money Matters? *Journal of Public Economics, 77: 155-184.*

Sylwester, K. (2000). Income Inequality, Education Expenditures, and Growth. *Journal of Development Economics, 63(2): 379-398.*

Zimmerman, D. J. (1992). Regression Toward Mediocrity in Economic Stature. *The American Economic Review, 82(3): 409-429.*

BİL TÜRK Journal of Economics and Related Studies
BİL TÜRK Ekonomi ve İlişkili Çalışmalar Dergisi

Impact of Macroeconomic Variability on the Stock Market Volatility of Bangladesh

Mostafa Ali [a,]

[a] University of Chittagong, Bangladesh, mostafacu2000@gmail.com, https://orcid.org/ 0000-0003-2496-2960

ARTICLE INFO

Research Article

2021, Vol. 3(2), 66-86

e-ISSN 2667-5927

Article History:

Received: 12.08.2020
Revised: 30.12.2020
Accepted: 08.01.2021
Available Online: 30.04.2021

JEL Code: C32, C58, E44

Impact of Macroeconomic Variability on the Stock Market Volatility of Bangladesh

Abstract

This study investigates the impact of macroeconomic variability on stock market volatility in Bangladesh covering the data ranging from January 2005 to December 2018 by using three steps of analysis. Firstly, the univariate Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) model is employed to estimate the time-varying conditional variance series for stock return and macroeconomic fundamentals. In the second phase, the volatility effect of macroeconomic forces on stock return is estimated by using the most recent standardized squared residuals of macroeconomic fundamentals as exogenous variables in the conditional variance equation of stock returns. Finally, Vector Auto Regression (VAR) model is used to examine the possible interaction between macroeconomic forces and stock price. The findings of the study evidence that increased volatility in Consumer Price Index, Treasury Bill Rates, and inflow in Foreign Remittance increases the stock return volatility whilst fluctuations in IP leads to a decrease in stock return volatility. Therefore, the implication of these findings documents that both the stock market and macroeconomic forces becoming interdependent in Bangladesh.

Keywords: *macroeconomic variability, stock market volatility, egarch model, VAR model, bangladesh.*

To cite this document: Ali, M. (2021). Impact of Macroeconomic Variability on the Stock Market Volatility of Bangladesh. BILTURK, The Journal of Economics and Related Studies, 3(2), 66-86. doi: 10.47103/bilturk.837413

1. Introduction

Variability about the macroeconomic forces is momentous for the financial market volatility because it is evident from the existing literature that new information about the economy matters for the financial market. Therefore, volatility in the financial market should be connected to the uncertainty about the state of the economy. Moreover, stock pricing factors volatility is significantly related to macroeconomic volatility (Chen et al., 2017). Since, investors are risk-averse, excessive volatility, and hence riskiness erodes investors' confidence (Tokmakcioglu and Tas, 2014). It restricts the smooth functioning of the capital market and fair pricing of securities. It could give significant information to the market players in allocating their investment. Empirical studies such as Fama, 1981, 1990; Chen et al., 1986; Paye, 2012; Corradi et al. 2013; Kumari and Mahakud, 2015; Nikmanesh and Nor, 2016, among others have documented that volatility in the macroeconomic forces is the major determinant of the stock market volatility. Moreover, macroeconomic fundaments help to determine the cash flows and overall risk of the firm and therefore the stock price. Relevant financial and economic theories also suggest a close relation exists between stock market volatility and macroeconomic uncertainty. In a classical study, Schwert (1989) states that,

"If macroeconomic data provide information about the volatility of either future expected cash flows or future discount rates, they can help explain why stock return volatility changes over time."

An appropriate measure of future volatility is crucial for asset allocation and risk management (Asgharian et al., 2013). Macroeconomic information helps market participants and analysts to manage their portfolios properly (Adjasi, 2009). Chowdhury and Rahman (2004) pointed that innovation or shock in macroeconomic fundamentals will drive to increase the unsystematic and systematic risk of the market portfolio, it is no matter whether the portfolio is well diversified or not.

Studying the relations between stock market volatility and macroeconomic forces has some important implications for the investors and the policymakers. For investors, the knowledge of macroeconomic volatility and stock price volatility could help them to accurately predict stock price movements and better manage the investment portfolio. It also enables them to set up profit-maximizing investment and hedging strategies. Such information also assists policymakers to take appropriate policy action that promises macroeconomic and financial stability.

In the context of the explanatory ability of the macroeconomic fundamentals in determining the stock price volatility are mixed. One group of empirical works (for example, Roll, 1988; Cutler et al., 1989; Schwert, 1989; Zakaria and Shamsuddin,

2012) argues that the explanatory power is weak; whereas the other group (such as Corradi et al., 2013; Nikmanesh and Nor, 2016) suggests that it is strong. It is noted here that these empirical studies differ methodologically from each other. In the first group, Roll (1988) used the regression model, Cutler et al. (1989) and Schwert (1989) utilized Vector Autoregressions (VAR) model while Zakaria and Shamsuddin, (2012) employed two steps of analysis. In the first step, Zakaria and Shamsuddin, (2012) used the GARCH (1, 1) model to estimate the variance series of stock return and macroeconomic fundamentals and in the second phase, bivariate and multivariate VAR model is employed to uncover the linkage between stock market volatility and macroeconomic uncertainties. In the second group, Corradi et al. (2013) developed a no-arbitrage model whereas Nikmanesh and Nor (2016) used the GARCH family of models to estimate the variance series in the first step of analysis and then employed the Seemingly Unrelated Regression (SUR) methodology to detect whether there is an association between stock return variability and macroeconomic uncertainty.

Therefore, to contribute to the literature and this debate, this piece of work examines the influence of macroeconomic uncertainty on stock market volatility by using three steps of analysis. Firstly, the univariate EGARCH model is employed to estimate the time-varying conditional variance series for stock return and macroeconomic fundamentals. In the second phase, we use the methodology motivated by that of Hamao et al. (1990), Kanas and Kouretas (2001), Erdem et al. (2005, and Adjasi (2009) to test the effect of macroeconomic volatility on stock price volatility. In the third phase, Vector Auto Regression (VAR) model is used to examine the possible interaction between macroeconomic forces and stock price.

The structure of the remainder of the paper is as follows. Section 2 outlines the literature review of the study. Section 3 describes the relevant data and variables while Section 4 explains the methodology used in this study. The empirical results and analysis are presented in Section 5, and finally, Section 6 concludes the paper.

2. Literature Review

Prior studies used different macroeconomic factors to explain the stock price volatility. These macroeconomic variables are similar but segregated. Tangjitprom (2012) classified the macroeconomic variables used in prior studies into four groups. The first group includes variables related to general economic conditions, namely industrial production, employment level. The second group of variables involving interest rates and monetary policy, such as interest rates, term spread, and default spread. The third group of variables representing the price level, including consumer price index, crude oil price, gold price, and the final group focus on variables that explain global activities, such as exchange rate, international trade, and foreign direct investment.

Mittnik et al. (2015) employed component-wise boosting techniques to a wide range of potential risk drivers to detect the influence of S&P 500 returns volatility and documented that the selected risk drivers influence the future volatility in a nonlinear fashion. Beetsma and Giuliodori (2012) reported that macroeconomic response to stock market volatility shock changed significantly over time. Park et al. (2017) investigated the stock market returns and implied volatility of the Korean Stock Market by using VAR-DCC-MGARCH-class of models and reported that the Korean Won-US Dollar exchange rate has a substantial impact on the conditional correlation between stock return and volatility. Their empirical finding also revealed that the risk-free interest rate has a marginal effect on the conditional correlation between stock return and volatility.

Garza-Garcia and Yue (2010) documented that the macroeconomic environment of China can be better explained by the Shanghai Composite Index and that the US macroeconomic forces have a positive influence on Chinese stock indices. By using the canonical correlation analysis, Mazuruse (2014) also reported that the selected macroeconomic indicators significantly influence maximizing the Zimbabwean stock returns. Moreover, Kabir et al. (2014) found the existence of a significant relationship between Malaysian stock prices, exchange rates, and the S&P 500 index. Kan and Lim (2015) uncovered the impact of local and foreign indicators on Malaysian stock price. Their study evident that Malaysian stock prices increase with the increase of inflation and US stock price but it decreases with the increase of industrial production and money supply in the long-run. In the short-run, no macroeconomic indicators significantly influence Malaysian stock prices.

Hsing and Hsieh (2012) employed the GARCH or ARCH model to investigate the influences of macroeconomic fundamentals on Poland's stock market index. Their empirical study showed that a higher German or the US stock market index, an increase in industrial production or real GDP, less government borrowing, decrease in Treasury bill rate, depreciation in exchange rate, lower inflation, a lower euro area government bond yield, and decrease in M2/GDP ratio have positive influence on Poland stock market index. By using the same econometric methodology, Hsing (2011) also documented that the Bulgarian stock market rise with the increase in real GDP, higher M2/GDP ratio, a decrease in the interest rate or inflation rate, lower ratio of government deficit to GDP, the bullish trend in US stock market and decrease in the euro area government bond yield.

Kumari and Mahakud (2015) investigated whether there were any relations between the conditional volatility of domestic macroeconomic forces and stock market volatility in India and found a significant relationship between selected macroeconomic fundamentals and stock market volatility. The findings of the study also documented that financial markets and macroeconomic variables in India becoming more and more interdependent. Aliyu (2012) employed the quadratic

GARCH model to explore the asymmetric volatility effect in the Nigerian and Ghanaian stock market and evident that negative innovation has more impact on the stock market volatility than the positive shocks of equal magnitude in Nigeria while for Ghana, the opposite is true. Moreover, their empirical study reported that inflation is a significant determinant of stock market volatility in both countries. Jain and Biswal (2016) employed the DCC-GARCH class of models and non-linear causality test to uncover the relationship between global crude oil price, gold price, exchange rate, and Sensex. The empirical findings of the study disclosed that a decline in the global gold and crude oil prices lead to a depreciation in the Indian rupee and hence decrease the Sensex. By employing the EGARCH model, the study of Nguyen and Ngo (2014) found a stronger relationship between US macroeconomic conditions and Asian stock market returns and reported that changes in the US macroeconomic announcements influence in conditional mean and variance of the Asian stock market returns.

Abbas et al. (2019) found a strong linkage between the returns and volatilities of stock markets and selected macroeconomics variables in the G-7 economies. By using the VECM and EGARCH model, Fernando (2018) investigated the impact of macroeconomic uncertainty on stock market volatility in the Sri Lankan stock market and found a long run relationship between selected macroeconomic forces and stock returns. Moreover, the findings of the study evidence the existence of asymmetric volatility in the stock returns. The study also documented that interest rate and exchange rate volatility increase the stock returns volatility in Sri Lanka. Dayıoğlu and Aydın (2019) reported that exchange rate and industrial production index volatility significantly affect the Turkish stock market volatility. Baroian (2014) reported that exchange rate volatility significantly explains the stock market volatility of five selected Central and Eastern European economies. On the contrary, Karim et al. (2014) documented that stock market volatility leads to exchange rate volatility in Indonesia.

3. Data and Variables

The objective of this study is to explore the impact of macroeconomic variability on stock market volatility in Bangladesh by using monthly data from January 2005 to December 2018. Monthly closing prices of the DSE general index (DSEX) are used to measure the stock market returns of Bangladesh. Consulting with the existing literature, we choose a comprehensive set of macroeconomic variables like industrial production index (IP), consumer price index (CPI), broad money supply (M2), 91-day treasury bill rate (TB), treasury bond yield (GB), exchange rate (EX) and inflow of foreign remittance (RT).

By using the following technique, DSEX is converted into compounded monthly returns:

$$\mathbf{R}_{Mt} = \ln(\mathbf{P}_t) - \ln(\mathbf{P}_{t-1}) \quad (1)$$

Where RMt is the stock market return in month t, In is the natural logarithm, Pt is the ending value of DSEX at month t, Pt-1 is the Previous month's closing value of DSEX.

Same logarithmic transformation is employed to all other macroeconomic fundamentals to convert them into growth series. DSEX data series is collected from the official website of the Dhaka Stock Exchange (DSE) Limited. Data series of M2 and RT are collected from the different volumes of Monthly Economic Trends, a monthly bulletin published by the Statistic Department of Bangladesh Bank (BB). The rest of the data series namely IP, CPI, TB, GB are obtained from the International Financial Statistics (IFS) of the International Monetary Fund (IMF).

4. Methodology

This study attempts to explore the effect of macroeconomic variability on stock return volatility. Therefore, it is appropriate to use volatility models. The technique of analysis is in three phases. Firstly, the exponential generalized autoregressive conditional heteroskedasticity (EGARCH) model introduced by Nelson (1991) is applied to estimate the volatility of each of the variables of interest. This model is used because it can better capture the asymmetric effect of shocks on conditional volatility and to avoid imposing non-negativity restrictions on the GARCH parameters to be estimated. The conditional mean and variance specification of EGARCH (p, q) can be written as follows:

$$\mathbf{R}_t = \boldsymbol{\alpha}_0 + \sum_{i=1}^{r} \boldsymbol{\alpha}_1 \mathbf{R}_{t-i} + \boldsymbol{\epsilon}_t \quad \textbf{(2)}$$

$$\textbf{Where } \boldsymbol{\epsilon}_t \backslash \boldsymbol{\Omega}_{t-1} \sim \mathbf{N}(\mathbf{0}, \mathbf{h}_t) \textbf{ and}$$

$$\log(\mathbf{h}_t) = \alpha_0 + \sum_{i=1}^{p} \boldsymbol{\beta}_i \log(\mathbf{h}_{t-i}) + \sum_{i=1}^{q} \alpha_i \left[\left| \frac{\boldsymbol{\epsilon}_{t-i}}{\sqrt{\mathbf{h}_{t-i}}} - \mathbf{E}\left(\frac{\boldsymbol{\epsilon}_{t-i}}{\sqrt{\mathbf{h}_{t-i}}} \right) \right| \right] + \sum_{i=1}^{m} \boldsymbol{\gamma}_i \frac{\boldsymbol{\epsilon}_{t-i}}{\sqrt{\mathbf{h}_{t-i}}} \quad \textbf{(3)}$$

Where Rt represents the series of stock market returns and macroeconomic variables at time t, α0 is the mean value of series, ϵt denotes the stochastic error term which is conditional on a previous information set, Ωt-1, and is assumed to be normally distributed with a zero mean and variance ht.

In the conditional mean equation (equation 2), an autoregressive process of order r [i.e., AR(r)] is added in each series to whiten the error term (since Ljung-Box statistics of most of the series were statistically significant evidencing the existence of autocorrelation in the series).

The conditional variance equation (equation 3) presents the EGARCH (p, q) specification which states that conditional variance depends not only on standardized residuals but also on its own variance in the previous time periods. The persistence of volatility is measured by $\sum_{i=1}^{p} \beta_i < 1$. γ_i denotes asymmetric

coefficient and is also known as the leverage effect parameter. The impact is asymmetric if $\gamma \neq 0$. The existence of the leverage effect is tested by the hypothesis that $\gamma < 0$. When $\gamma < 0$ good news (positive shocks) produce less volatility than bad news (negative shocks). Likelihood ratio (LR) tests are employed to determine the lag truncation lengths for EGARCH models.

In the second phase, we follow the similar methodology used by Hamao et al. (1990), Kanas and Kouretas (2001), Erdem et al. (2005), Adjasi (2009) to test the volatility effect of macroeconomic forces on stock prices. These empirical studies utilized the most recent squared residuals as exogenous variables which were derived from the EGARCH models of macroeconomic fundamentals in the conditional variance equation of stock price. Therefore, to examine the volatility effect of macroeconomic variables on stock price, we introduce the squared residuals series of industrial production, consumer price index, money supply, Treasury bill, government bond, exchange rate, and foreign remittance as an exogenous variable in the conditional variance equation of DSEX. Thus, the conditional variance equation for DSEX takes the following form:

$$\log(\mathbf{h}_{DSEX,t}) = \alpha_0 + \boldsymbol{\beta_1}\log(\mathbf{h}_{DSEX,t-1}) + \alpha_1\left[\left|\frac{\boldsymbol{\varepsilon}_{DSEX,t-1}}{\sqrt{\mathbf{h}_{DSEX,t-1}}} - \mathbf{E}\left(\frac{\boldsymbol{\varepsilon}_{DSEX,t-1}}{\sqrt{\mathbf{h}_{DSEX,t-1}}}\right)\right|\right] + \boldsymbol{\gamma}\frac{\boldsymbol{\varepsilon}_{DSEX,t-1}}{\sqrt{\mathbf{h}_{DSEX,t-1}}} + \boldsymbol{\lambda_1}\log(\mathbf{U}_{ip,t}) + \boldsymbol{\lambda_2}\log(\mathbf{U}_{cpi,t}) + \boldsymbol{\lambda_3}\log(\mathbf{U}_{m2,t}) + \boldsymbol{\lambda_4}\log(\mathbf{U}_{tb,t}) + \boldsymbol{\lambda_5}\log(\mathbf{U}_{gb,t}) + \boldsymbol{\lambda_6}\log(\mathbf{U}_{ex,t}) + \boldsymbol{\lambda_7}\log(\mathbf{U}_{rt,t}) \quad \textbf{(4)}$$

Where $U_{ip,t}$, $U_{cip,t}$, $U_{m2,t}$, $U_{tb,t}$, $U_{gb,t}$, $U_{ex,t}$, $U_{rt,t}$ are the contemporaneous standardized squared residuals from the best-fitted EGARCH models for industrial production, consumer price index, money supply, treasury bill, government bond, exchange rate, and foreign remittance respectively, and $\frac{\varepsilon_{DSEX,t-1}}{\sqrt{h_{DSEX,t-1}}}$ is the lagged standardized residuals for DSEX. The presence of volatility effect from macroeconomic variables on stock price is estimated by the statistical significance of λ_1 through λ_7. Susmel and Engel (1994) reported that conventional standard errors of the parameters in the conditional variance equation tend to underestimate the true standard errors. Therefore, statistical inference regarding parameters (i.e., parameters λ_1 through λ_7) is based on GED robust standard errors of Bollerslev and Wooldridge (1992) to allow for probable violations of normality in the conditional errors.

Assuming conditional normality for price returns in each equation and applying the BHHH algorithm proposed by Berndt et al. (1974), the log-likelihood function for the EGARCH model is estimated by:

$$\boldsymbol{L(\Theta)} = \left(\frac{-T}{2}\right)\log(2\pi) - \mathbf{0.5}\sum_{t=1}^{T} log\ (\mathbf{h}_t) \quad \textbf{(5)}$$

Where Θ is the parameter vector (α_0, α_1, α_2, α_0, α_1, β_1, λ_1, λ_2, λ_3, λ_4, λ_5, λ_6, λ_7) and T is the sample observations. It is noted that the BHHH algorithm is utilized to maximize $L(\Theta)$.

In the third phase, this study employs a Vector Auto Regression (VAR) model proposed by Sims (1980). There are some advantages of using the VAR model. Firstly, it imposes a very minor restriction. Secondly, it is a simultaneous equation model having more than one dependent variable. Finally, discrimination is not made between endogenous and exogenous variables even though simultaneity is found among a number of variables.

The multivariate VAR model is articulated as follows:

$$\mathbf{hDSEX}_t = \mathbf{\Pi}_0 + \sum_{\mathbf{i=1}}^{\mathbf{p}} \boldsymbol{\vartheta}\, \mathbf{hDSEX}_{t-i} + \sum_{\mathbf{i=1}}^{\mathbf{p}} \boldsymbol{\rho}\, \mathbf{hmv}_{jt-i} + \boldsymbol{\varepsilon}_t \quad (6)$$

$$\mathbf{hmv}_t = \mathbf{\Gamma}_0 + \sum_{\mathbf{i=1}}^{\mathbf{p}} \boldsymbol{\omega}\, \mathbf{hmv}_{jt-i} + \sum_{\mathbf{i=1}}^{\mathbf{p}} \boldsymbol{\partial}\ \mathbf{hDSEX}_{t-i} + \boldsymbol{\varepsilon}_t \quad (7)$$

Where $hDSEX_t$ represents the conditional volatility of stock price at time *t*, hmv_t designates the conditional volatility of macroeconomic variable *j* at time *t*, *i* is the lag length. θ and ∂ denote the lagged values of the conditional volatility of DSEX whereas ρ and ω designate the coefficient of lagged values of the conditional volatility of macroeconomic variable *j*.

But, when a large number of coefficients involved, the use of the VAR structure creates a problem to interpret the results. To overcome this limitation, it is estimated by using a set of statistics such as block exogeneity, variance decompositions, and impulse response functions. In this study, we use variance decomposition and impulse response analysis along with the VAR model.

4.1. Variance Decomposition (VDC)

Variance decomposition is an appropriate tool to deal with the dynamic stochastic process under the VAR environment. It exhibits the proportion of movement in the dependent variable that is due to its own shocks as well as shocks for the other variables. Hence, an innovation to a particular variable (say ith variable) will directly influence that variable but it will also be transmitted to other variables in the system. In other words, it splits the forecast error variance for each variable into parts to ascertain the effect of exogeneity of variables involved in the system over the different period of time. Therefore, the degree of exogeneity of the variables can be determined by employing VDC techniques. Empirical studies suggest that most of the forecast error variance is explained by the own series innovations rather than the shocks from other series. Therefore, it is anticipated that conditional stock price (return) volatility will be elucidated by its own innovations rather than the shocks and innovation from other macroeconomic fundamentals.

4.2. Impulse Response Function (IRF)

The IRF explores the response of one-unit shock of a dependent variable to one standard error shock to each of the other variables in the VAR structure. We use

this technique in this study to capture the sign, magnitude, and persistence of responses of one market to shocks in another stock market. The IRF is estimated by using the Cholesky decomposition method since it does not require orthogonalization of innovations and does not differ with the ordering of variables in the VAR model.

5. Empirical Results and Analysis

Descriptive statistics for the stock return and growth series of macroeconomic variables are reported in Table 1. The measure of skewness exhibits that the growth series of DSEX, IP, TB, GB, and RT are negatively skewed while the rest of the variables are positively skewed. All of the variables are leptokurtic relative to the normal distribution. Normality is rejected in all the series except RT based on the Jarque-Bera (JB) test statistics. Significant autocorrelation is identified based on the LB test implies the volatility clustering in the growth series of the variables.

Table 1: Descriptive Statistics

	DSEX	IP	CPI	M2	TB	GB	EX	RT
Mean	0.007	0.010	0.005	0.014	-0.003	-0.002	0.002	0.009
Median	0.009	0.015	0.005	0.013	0.000	0.000	0.000	0.002
Maximum	0.264	0.201	0.043	0.049	0.958	0.187	0.047	0.462
Minimum	-0.351	-0.267	-0.014	-0.021	-1.141	-0.217	-0.026	-0.377
SD	0.078	0.079	0.009	0.011	0.163	0.049	0.009	0.136
Skewness	-0.693	-0.715	0.223	0.237	-0.508	-0.447	2.759	-0.056
Kurtosis	7.185	4.497	3.883	3.895	27.951	11.293	15.361	3.678
Jarque-Bera	118.643	27.391	9.743	10.019	3515.81	519.335	1079.11	3.975
Prob.	0.000	0.000	0.048	0.037	0.000	0.000	0.000	0.197
LB(10)	29.915	66.435	73.255	29.355	15.711	27.794	31.525	67.341
Prob.	0.000	0.000	0.000	0.002	0.275	0.017	0.021	0.000

Correlation between stock return and selected macroeconomic forces are reported in Table 2.

Table 2: Correlation Matrix of stock return and macroeconomic variables

	DSEX	IP	CPI	M2	TB	GB	EX	RT
DSEX	1.00							
IP	-0.01	1.00						
CPI	-0.08	-0.26**	1.00					
M2	0.29*	0.32*	0.01	1.00				
TB	-0.08	-0.07	0.14	-0.03	1.00			
GB	-0.12	0.02	-0.08	0.12	0.26*	1.00		
EX	-0.15***	0.12	-0.08	-0.05	0.18***	0.06	1.00	
RT	0.01	0.58*	-0.06	0.33*	-0.05	0.12	0.29*	1.00

*, ** & *** represent the t-test statistic is significant at 1%, 5% and 10% level respectively.

The correlation between IP, CPI, TB, GB, and EX are found to be negative but it is found positive for M2 and RT. Contrary to the economic theory and prior literature, the sign of correlation coefficient between stock return (DSEX) and IP as well as DSEX and CPI is negative whereas all other relations between stock return and macroeconomic forces are found consistent with existing literature and economic theory.

Because of the non-stationary nature of the time series data, it is important to examine the stationarity or otherwise of the data series. For this purpose, we employed the Augmented Dickey-Fuller (1981) (ADF) and Kwiatkowski, Phillips, Schmidt, and Shin (1992) (KPSS) stationarity test. ADF test hypothesized the existence of unit root whereas null of stationarity in the series were scrutinized by KPSS test. The result of the stationarity tests are reported in Table 3 and indicate that stock returns and growth series of selected macroeconomic fundamentals are stationary at level.

Table 3: Results of the Stationarity Test

Variables	**Augmented Dickey Fuller (ADF)Test Statistic**		**Kwiatkowski-Phillips-Schmidt-Shin(KPSS) Test Statistic**	
	Constant	Constant & Trend	Constant	Constant & Trend
DSEX	-12.792*	-12.778*	0.143	0.094
IP	-5.175*	-5.133*	0.113	0.099
CPI	-2.967**	-3.411***	0.151	0.075
M2	-4.059*	-4.738*	0.331	0.115
TB	-11.942*	-11.751*	0.109	0.061
GB	-4.927*	-4.967*	0.327	0.106
EX	-8.174*	-8.222*	0.207	0.088
RT	-14.762*	-8.751*	0.291	0.112
Critical values of test statistic				
At 1%	-3.477	-4.024	0.739	0.216
At 5%	-2.881	-3.442	0.463	0.146
At 10%	-2.578	-3.145	0.347	0.119

Lag length for ADF test statistic was determined by using AIC whereas the bandwidths for KPSS test statistic was selected by considering Newey-West automatic suggestion following Bartlett Kernel estimation. *, ** & *** designate acceptance of alternative hypothesis at 1%, 5% and 10% level respectively.

It was found that the error term of the mean equations of the series became uncorrelated after adding two autoregressive components in CPI, M2, GB series and one autoregressive term in the rest of the series. Moreover based on the minimum values of AIC and SIC, the significant value of the model parameters as well as the diagnostic test, the best-fit EGARCH models were determined which were reported in Table 4.

Table 4: Best-fit EGARCH model

Variable	Model
DSEX	AR(1)-EGARCH(1, 1)
IP	AR(1)-EGARCH(1, 1)
CPI	AR(2)-EGARCH(2, 2)
M2	AR(2)-EGARCH(1,2)
TB	AR(1)-EGARCH(1, 2)
GB	AR(2)-EGARCH(2, 2)
EX	AR(1)-EGARCH(2, 2)
RT	AR(1)-EGARCH(1, 1)

The estimates of the univariate AR (r)-EGARCH (p,q) models for each of the series are presented in Table 5. Volatility persistence as measured by βi is evidence in stock returns and all the growth series of macroeconomic variables except for IP and GB. The ARCH effect parameters (as measured by αi) are found significant in all the growth series of macroeconomic variables but it is insignificant in DSEX.

Table 5: Results of the AR(r)-EGARCH(p,q) model

Coefficient	DSEX(1,1)	IP (1, 1)	CPI (2, 2)	M2(1,2)	TB (1, 2)	GB (2, 2)	EX (2, 2)	RT (1, 1)
α_1	0.243***	-0.522*	0.388*	-0.550*	0.049*	0.059*	-0.153*	-0.296*
α_2	--	--	-0.189**	-0.062*	--	0.038*	--	--
Variance Equation								
α_0	-7.792	-6.380*	-23.514*	-5.532*	-0.200*	-6.802*	-9.891*	0.121
α_1	0.142	0.255	0.041	-1.151*	-0.650*	-1.229*	2.704*	0.222**
α_2	--	--	0.968**	--	--	-0.589*	3.453*	--
β_1	-0.473*	-0.208	-0.633*	0.766*	-0.056*	0.019	-0.206*	0.941
β_2	--	--	-0.735*	-0.430*	0.932*	0.051**	0.795*	--
γ	-0.280*	0.493*	0.353*	0.718*	-1.425*	-1.782*	0.577*	-0.109
LL	168.176	185.229	313.836	301.889	145.796	243.807	418.859	96.697
Diagnostic tests								
LB (10)	7.2449	92.731*	19.780**	9.119	9.320	7.138	12.036***	6.076
$LB^2(10)$	1.5826	4.8258	7.239	16.860***	6.162	2.298	14.027	13.228
JB	16.085*	6.292**	2.541	3.843	213.378*	588.849*	1.952	0.762
ARCH (10)	0.002	0.019	0.724	2.055**	0.462	0.173	1.196	1.148

Note: *, ** and *** represent the significance at 1%, 5% and 10% respectively. α_0 stands for the constant value of Variance equation, α, β and γ represent the ARCH term, GARCH term, and leverage term respectively. α + β indicate the stationary condition of the GARCH model, LL represents the Log-likelihood, LB(10) and $LB^2(10)$ indicate the Ljung-Box statistics for standardized residuals and squared standardized residuals using 10 lags respectively, JB denotes Jarque-Bera test statistic, ARCH represents the ARCH-LM test for heteroscedasticity.

The significant values of ARCH and GARCH terms imply that the lagged values of the error terms and the lagged values of conditional volatility can better capture the future volatility. The coefficient γ (asymmetric effect parameter) is significant in all the series except for RT. The signs of asymmetric effect parameter are negative for DSEX and for both interest rates which indicate that negative innovation has a higher impact on conditional volatility than those of the positive innovation of the equal magnitude. On the other hand, positive signs are evident for IP, CPI, M2, and EX suggesting the positive shock would lead to a higher next period conditional volatility than the negative shock of the same magnitude. Most of the post estimation test results such as LB (10), LB2 (10), Jarque-Bera (JB), and ARCH-LM (10) evidence that the EGARCH models are robustly specified in each of the series.

Table 6: Results of univariate AR (1)-EGARCH (1, 1) model of DSEX and volatility effect

Parameters	Coefficient	Standard error	Robust *t*-statistic	Probability
α	0.211	0.029	7.192	0.000
Variance Equation				
α_0	-10.101	0.324	-31.171	0.000
α_1	0.958	0.197	4.871	0.000
β_1	-0.562	0.051	-11.018	0.000
γ	-0.762	0.130	-5.879	0.000
IP	-0.198	0.078	-2.524	0.011
CPI	0.354	0.062	5.715	0.000
M2	0.018	0.073	0.251	0.802
TB	0.100	0.017	5.914	0.000
GB	0.057	0.056	1.027	0.305
EX	0.117	0.113	1.038	0.299
RT	0.130	0.051	2.533	0.011
LL	121.750			
AIC	-2.346			
SIC	-1.932			
Diagnostic tests on standardized and squared standardized residuals				
LB (10)	14.361 (0.073)			
$LB^2(10)$	7.174 (0.709)			
JB	5.097 (0.078)			
ARCH (10)	0.689 (0.732)			

Note: *, ** and *** represent the significance at 1%, 5% and 10% respectively. ω stands for the constant value of Variance equation, α, β and γ represent the ARCH term, GARCH term, and leverage term respectively. LL represents the Log-likelihood, LB(10) and $LB^2(10)$ indicate the Ljung-Box statistics for standardized residuals and squared standardized residuals using 10 lags respectively, ARCH represents the ARCH-LM test for heteroscedasticity, AIC and SIC are Akaike information Criteria and Schwarz information criteria respectively. Figures in the parenthesis indicate the probability of the test statistic.

Table 6 exhibits the results of the univariate EGARCH model for the volatility effect from macroeconomic variables to stock returns. A large and significant α1 (ARCH parameter) provides strong support for the presence of previous innovation on stock return volatility whereas a relatively smaller GARCH parameter indicates weak evidence of last period's shock. Concerning the macroeconomic volatility on stock return volatility, the coefficient of IP is found negative but statistically significant, implying that fluctuations in industrial production lead to a decrease in stock return volatility. On the other hand, the coefficients of CPI, TB, and RT are positive and statistically significant. These findings manifest that volatility in stock return will be increased when CPI, TB, and RT become more volatile. Finally, diagnostic tests on standardized and squared standardized residuals show a correctly specified EGARCH model.

Table 7: F-statistics from Multivariate VAR model

IP	CPI	M2	TB	GB	EX	RT
Panel A: Predictive power of stock return volatility						
2.12***	0.84	0.49	2.08***	1.11	1.79	0.76
Panel B: Predictive power of Macroeconomic volatility						
3.37**	1.27	0.44	3.00**	0.69	2.77**	1.11

** & *** represent the test statistics are significant at 5% and 10% respectively.

Conditional volatility series for stock returns and each of the macroeconomic variables are extracted from the best-fitted model of EGARCH and then multivariate VAR model is implemented on those conditional volatility series to explore the relations between stock return volatility and macroeconomic volatility. Table 7 exhibits the estimates of the multivariate VAR model. It is evident from Panel A of Table 7 that the volatility of IP and TB can influence the stock return volatility at a 10% level of significance. On the other hand, the variability of stock return is significant in explaining the volatility of IP, TB, and EX which is documented in Panel B of Table 7. So, this study finds a bidirectional causal relationship between DSEX and IP, and TB but a unidirectional causal relationship running from DSEX to EX.

Table 8: Variance Decomposition Analysis

Variance Decomposition of Stock returns

Period	SE	SR	IP	CPI	M2	TB	GB	EX	RT
1	0.0069	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.0114	63.18	4.60	1.47	3.67	4.37	12.39	8.93	1.39
12	0.0131	56.06	5.09	1.56	11.75	3.60	10.08	8.80	3.06
18	0.0146	48.82	6.59	2.60	9.76	3.21	8.80	14.48	5.74

Variance Decomposition of industrial production

Period	SE	SR	IP	CPI	M2	TB	GB	EX	RT
1	0.0012	31.64	68.36	0.00	0.00	0.00	0.00	0.00	0.00
6	0.0022	20.58	27.61	3.54	14.09	8.62	1.55	18.91	5.11
12	0.0027	22.73	20.63	4.68	12.61	8.69	4.59	19.62	6.45
18	0.0032	20.08	17.21	6.29	11.20	7.38	7.56	23.82	6.46

Variance Decomposition of consumer price index

Period	SE	SR	IP	CPI	M2	TB	GB	EX	RT
1	4.31E-05	8.03	3.41	88.56	0.00	0.00	0.00	0.00	0.00
6	7.26E-05	13.42	1.59	62.68	6.94	1.50	6.87	5.44	1.56
12	0.0001	16.96	3.33	36.33	17.82	2.16	13.75	5.23	4.41
18	0.0001	17.38	3.60	30.65	15.68	2.53	14.04	9.88	6.25

Variance Decomposition of money supply

Period	SE	SR	IP	CPI	M2	TB	GB	EX	RT
1	8.73E-05	0.36	1.36	6.58	91.70	0.00	0.00	0.00	0.00
6	0.0001	9.35	10.74	3.14	65.88	2.08	4.04	3.72	1.05
12	0.0002	9.55	11.31	7.72	57.58	3.04	4.09	4.67	2.04
18	0.0002	13.38	9.58	6.50	47.69	3.52	4.60	10.97	3.76

Variance Decomposition of Treasury bill

Period	SE	SR	IP	CPI	M2	TB	GB	EX	RT
1	0.0694	0.26	16.66	8.86	9.26	64.95	0.00	0.00	0.00
6	0.1284	3.59	11.34	18.35	13.55	33.65	8.33	8.75	2.43
12	0.2037	22.43	5.92	16.74	8.65	15.48	11.79	16.72	2.27
18	0.3236	22.85	8.63	13.38	3.71	15.07	5.74	27.68	2.74

Variance Decomposition of government bond

Period	SE	SR	IP	CPI	M2	TB	GB	EX	RT
1	0.0005	2.09	7.14	8.53	2.45	1.43	78.36	0.00	0.00
6	0.0011	2.55	6.18	5.35	22.02	9.75	38.76	5.89	9.51
12	0.0013	5.43	5.70	7.67	25.18	7.87	27.44	8.50	12.21
18	0.0016	15.50	3.85	7.63	16.75	5.04	17.79	20.81	12.63

Variance Decomposition of exchange rate

Period	SE	SR	IP	CPI	M2	TB	GB	EX	RT
1	0.0002	2.12	31.66	1.48	5.99	9.99	9.10	39.66	0.00
6	0.0004	9.12	15.56	9.86	13.72	16.66	8.78	21.57	4.74
12	0.0007	55.55	5.98	5.45	7.36	5.45	8.37	8.78	3.05
18	0.0009	36.74	8.36	7.78	6.24	5.90	10.32	18.44	6.23

Variance Decomposition of remittance

Period	SE	SR	IP	CPI	M2	TB	GB	EX	RT
1	0.0009	8.92	0.33	8.59	7.89	0.42	6.50	15.58	51.77
6	0.0022	12.79	1.13	30.26	2.50	1.21	5.52	5.37	41.22
12	0.0037	29.59	2.66	15.40	5.44	0.93	9.02	12.16	24.79
18	0.0046	21.50	2.11	11.45	9.43	1.22	7.55	21.17	25.67

Cholesky ordering: SR, IP,CPI,M2,TB,GB, EX, RT

5.1. Variance Decomposition Analysis

Having established the factors that significantly affect the stock return volatility as well as having identified the causal relationships, it is imperative to know what proportion of stock return volatility is explained by the conditional volatility of each of the individual macroeconomic forces and vice versa. To address this issue, 18-month variance decomposition is estimated by extracting the conditional variance from the best-fitted EGARCH model.

Variance decomposition functions split the forecast error variance for each of the individual variables into parts to uncover the effect and magnitude of exogeneity of the variables in the dynamic structure of VAR. It explains the percentage of stock return volatility due to the volatility of each of the individual macroeconomic variables and vice versa. The results of the variance decomposition are documented in Table 8 for four different time horizons. It is evident from Table 8 that the variation of stock returns volatility is mainly due to the volatility of macroeconomic variables. More particularly, almost 65 percent of the stock market volatility can be explained by the macroeconomic volatility. Table 8 shows that EX plays an important role as a dominant source of stock return volatility followed by GB and IP. On average, other macroeconomic variables namely CPI, M2, TB, and RT share equal contributions in explaining DSEX volatility. Therefore, these findings suggest that macroeconomic volatility plays a major role in detecting and forecasting future volatility of stock returns.

Variance decomposition can also explain the effect and extent of macroeconomic volatility resulting from the variability in the stock return volatility. This analysis suggests mixed results. The volatility of most of the selected macroeconomic variables except IP, TB, and GB is mainly influenced by the DSEX volatility. In the short run i.e., at the first and sixth month, a lion portion of the variability of macroeconomic variables is due to their own shocks whereas volatility of stock returns greatly influence the variability in the macroeconomic fundamentals in the long run (i.e., at 12th and 18th month ahead). These findings signify that influence of stock returns volatility increase on the macroeconomic volatility in the longer time horizon. Therefore, these findings imply that both stock returns and macroeconomic volatility influence each other to some extent.

5.2. Impulse Response Analysis

This study estimates 10-month impulse response functions (IRFs) which are depicted in Figure 1. The middle thick lines represent impulse response whilst standard error bands are shown by dotted lines. Figure 1 demonstrates that stock return is very much sensitive to one standard deviation shock to industrial production. It signifies that the economic activities of Bangladesh highly influence the stock market of Bangladesh. Similarly, responses of money supply and exchange rates are diverse in the volatility of the Bangladesh stock market. These findings imply that an increase in money supply and exchange rates create inflationary

pressure in the economy which ultimately influences the earnings and profitability of the firms. On the other hand, Treasury bill shock is found to be positive. This result implies that stock return volatility increases with the increase in the volatility of the Treasury bill. Therefore, macroeconomic shocks create risk and uncertainty in the economy which in turn increases the stock market volatility.

Figure 1: Impulse response Analysis

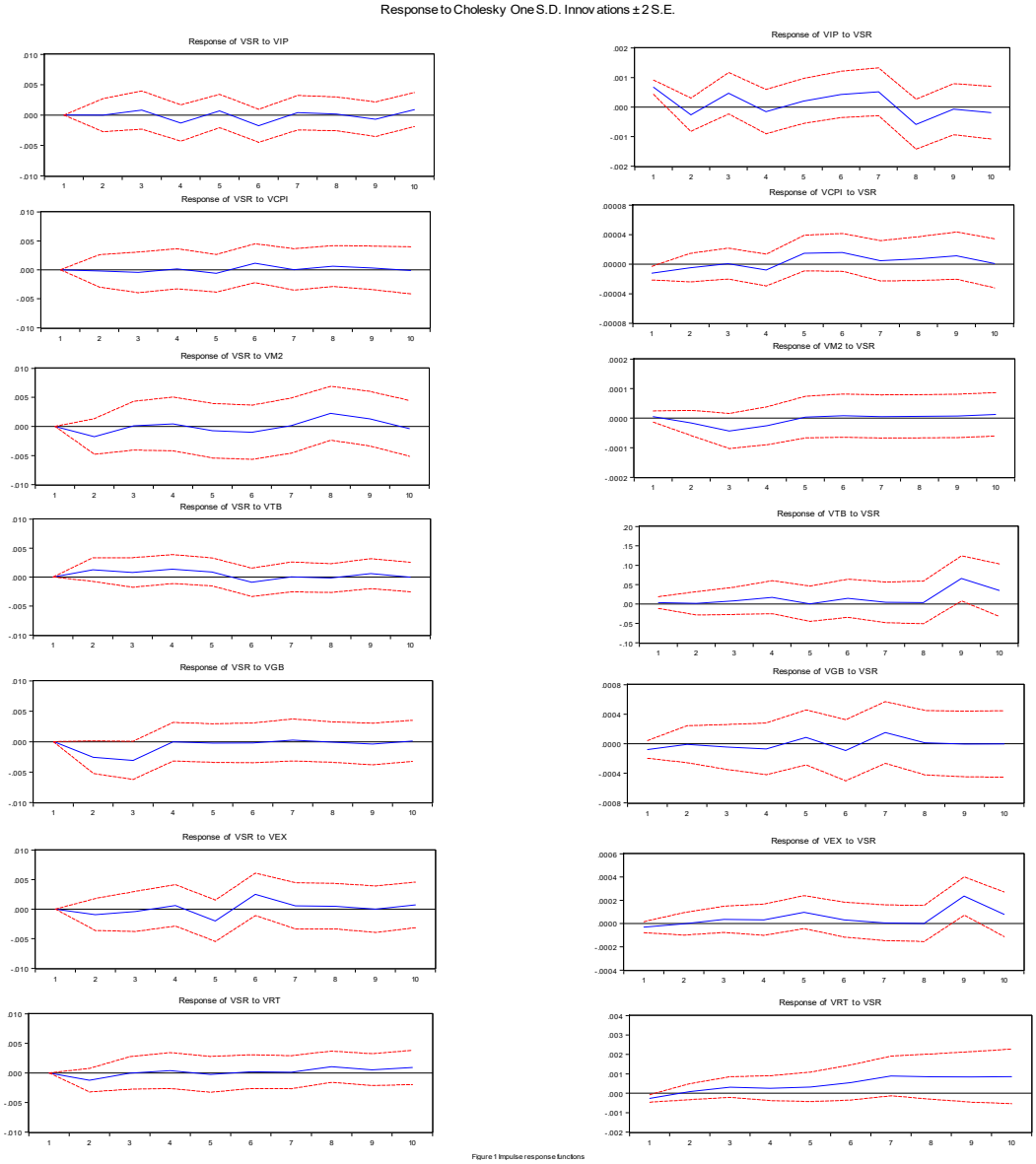

Figure 1 Impulse response functions

6. Conclusion

This study investigates the impact of macroeconomic variability on stock market volatility in Bangladesh by using three steps of analysis. At the first stage, we employed the EGARCH model and find volatility persistence in stock returns and all the growth series of macroeconomic variables except for IP and GB. In the second phase, the volatility effect of macroeconomic forces on stock return is estimated by using the most recent standardized squared residuals of macroeconomic fundamentals as exogenous variables in the conditional variance equation of stock returns. The results evident that volatility of the stock returns increases with the volatility increased in CPI, TB, and RT but fluctuations in IP lead to a decrease in stock return volatility. Further, the Multivariate Vector Auto Regression (VAR) model along with Variance Decomposition Analysis is used in the third stage to examine the possible interaction between macroeconomic forces and stock price. The results of the study report that the volatility of IP and TB can significantly influence the stock return volatility. Moreover, stock return volatility can significantly explain the volatility of IP, TB, and EX.

Results of this study have significant inference for the market analyst. Since there is an interconnection between the stock market and the macroeconomic environment of Bangladesh, market participants should closely monitor the macroeconomic environment in making investment decisions as well as formulating hedging and portfolio diversification strategies. Moreover, financial regulators and policymakers should consider macroeconomic fundamentals in modeling and executing the economic policy of Bangladesh.

References

Abbas, G., Hammoudeh, S., Shahzad, S. J. H., Wang, S., & Wei, Y. (2019.) Return and volatility connectedness between stock markets and macroeconomic factors in the G-7 countries. *Journal of Systems Science and Systems Engineering, 28*, 1–36.

Adjasi, C. K. D. (2009). Macroeconomic uncertainty and conditional stock-price volatility in frontier African Markets: Evidence from Ghana. *The Journal of Risk Finance, 10*(4), 333-349.

Aliyu, S. U. R. (2012). Does inflation have an impact on stock returns and volatility? Evidence from Nigeria and Ghana. *Applied Financial Economics, 22*, 427-435.

Asgharian, H., Hou, A. J., & Javed, F. (2013). The importance of the macroeconomic variables in forecasting stock return variance: A GARCH-MIDAS approach. *Journal of Forecasting, 32*, 600-612.

Baroian, E. (2014). Can macroeconomic volatility affect stock market volatility? The case of 5 central and eastern European countries. *Romanian Journal of Fiscal Policy, 5*(2), 41-55.

Beetsma, R., & Giuliodori, M. (2012). The changing macroeconomic response to stock market volatility shocks. *Journal of Macroeconomics. 34*(2), 281-293.

Berndt, E., Hall, B., Hall, R., & Hausman, J. (1974). Estimation and inference in nonlinear structural models. *Annals of Social Measurement, 3*, 653-665.

Bollerslev, T., & Wooldridge, J. M. (1992). Quasi-maximum likelihood estimation and inference in dynamic models with time-varying covariances. *Econometric Reviews, 11*(2), 143-172.

Chen, N., Roll, R., & Ross, S. A. (1986). Economic forces and the stock market. *Journal of Business, 59*, 383-403.

Chen, J., Xiong, X., Zhu, J., & Zhu, X. (2017). Asset prices and economic fluctuations: the Implications of stochastic volatility. *Economic Modelling, 64*, 128–140.

Chowdhury, S. S. H., & Rahman, M. A. (2004). On the empirical relation between macroeconomic volatility and stock market volatility of Bangladesh. *The Global Journal of Finance and Economics, 1*(2), 209-225.

Corradi, V., Distaso, W., & Mele, A. (2013). Macroeconomic determinants of stock volatility and volatility premiums. *Journal of Monetary Economics, 60*, 203-220.

Cutler, D. M., Poterba, J. M., & Summers, L. H. (1989). What moves stock prices? *Journal of Portfolio Management, 15*, 4-12.

Dayıoğlu, T., & Aydın, Y. (2019). Relationship between the Volatility of Stock Returns and the Volatility of Macroeconomic Variables: A Case of Turkey. *American Journal of Theoretical and Applied Business. 5* (2), 40-46.

Dickey, D. A., & Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica, 49*, 1057-1072.

Erdem, C., Arslan, C. K., & Erdem, M. S. (2005). Effects of macroeconomic variables on Istanbul stock exchange indexes. *Applied Financial Economics, 15*(14), 987-994.

Fama, E. F. (1981). Stock returns, real activity, inflation, and money. *American Economic Review, 71*(4), 545-565.

Fama, E. F. (1990). Stock returns, expected returns and real activity. *Journal of Finance, 45*(4), 1089-1108.

Fernando, A. (2018). Macroeconomic Impact on Stock Market Returns and Volatility: Evidence from Sri Lanka. *Business and Economics Journal, 9*(4),1-15. doi:10.4172/2151-6219.1000379

Garza-Garcia, J. G., & Yue, Y. (2010). International determinants of stock market performance in China: A cointegration approach. Working Paper Series (ISSN 2041-1596), Paper Number: 03/10, Centre for Global Finance, Bristol Business School, University of the West of England.

Hamao, Y., Masulis, R. W., & Ng, V. (1990). Correlations in price changes and volatility across international stock markets, *Review of Financial Studies, 3*, 281-307.

Hsing, Y. (2011). Impacts of Macroeconomic Variables on the Stock Market in Bulgaria and Policy Implications. *Journal of Economics and Business, 14*, 2, 41-53.

Hsing, Y., & Hsieh, W. (2012). Impacts of macroeconomic variables on the stock market index in Poland: new evidence. *Journal of Business Economics and Management, 13*(2), 334-343.

Jain, A., & Biswal, P. C. (2016). Dynamic linkages among oil price, gold price, exchange rate, and stock market in India. *Resource Policy, 49*, 179-185.

Kabir, S. H., Bashar, O. K. M. R., & Masih, M. M. (2014). Is domestic stock price cointegrated with exchange rate and foreign stock price? Evidence from Malaysia. *The Journal of Developing Areas, 48* (3), 285-302.

Kan, Y. Y. & Lim, G. C. (2015). Structural break and cointegration in Malaysian

stock market. *International Proceedings of Economics Development and Research, 84*, 25-42.

Kanas, A., & Kouretas, G. (2001). Volatility spillovers between black market and official markets for foreign currency in Greece, *Journal of Financial Research, 24*, 443-461.

Karim, B. A., Sea, L. P., & Karim, Z. A. (2014). The impact of macroeconomic volatility on the Indonesian stock market volatility. *International Journal of Business and Technopreneurship, 4*(3), 467-476.

Kumari, J., & Mahakud, J. (2015). Relationship between conditional volatility of domestic macroeconomic factors and conditional stock market volatility: Some further evidence from India. *Asia-Pacific Financial Markets, 22*, 87-111.

Kwiatkowski, D., Phillips, P. C. B., Schmidt, P., & Shin, Y. (1992). Testing the null hypothesis of trend stationanity. *Journal of Econometrics, 54*, 159-178.

Mazuruse, P. (2014). Canonical correlation analysis: Macroeconomic variables versus stock returns. *Journal of Financial Economic Policy, 6*(2), 179-196.

Mittnik, S., Robinzonov, N., & Spindler, M. (2015). Stock market volatility: Identifying major drivers and nature of their impact. *Journal of Banking and Finance, 58*, 1-14.

Nelson, D. B. (1991). Conditional heteroskedasticity in asset returns: A new approach. *Econometrica 59*(2), 347-370.

Nguyen, T. & Ngo, C. (2014). Impacts of the US macroeconomic news on Asian stock markets. *The Journal of Risk Finance, 15*(2), 149-179.

Nikmanesh, L. & Nor, A. H. S. M. (2016). Macroeconomic determinants of stock market volatility: An empirical study of Malaysia and Indonesia. *Asian Academy of Management Journal, 21*(1), 161-180.

Park, S. Y., Ryu, D. & Song, J. (2017). The dynamic conditional relationship between stock market returns and implied volatility. *Physica A, 482*, 638-648.

Paye, B. S. (2012). 'Deja Vol': Predictive regressions for aggregate stock market volatility using macroeconomic variables. *Journal of Financial Economics, 106*, 527-546

Roll, R. (1988). R^2. *Journal of Finance, 43*, 541-566.

Schwert, G. W. (1989). Why does stock market volatility change over time? *Journal of Finance, 44*, 1115-1153.

Sims, C. (1980). Macroeconomics and reality. *Econometrica, 48,* 1-48.

Susmel, R., & Engle, R. F. (1994). Hourly volatility spillovers between international equity markets, *Journal of International Money and Finance, 13*(1), 3-25.

Tangjitprom, N. (2012). The review of macroeconomic factors and stock returns. *International Business Research, 5*(8), 107-115.

Tokmakcioglu, K., & Tas, O. (2014). Stock market and macroeconomic volatility comparison: An US approach. *Quality and Quantity, 48*, 217-224.

Zakaria, Z., & Shamsuddin, S. (2012). Empirical evidence on the relationship between stock market volatility and Macroeconomic volatility in Malaysia. *Journal of Business Studies Quarterly, 4*(2), 61-71.

BİL TÜRK Journal of Economics and Related Studies
BİL TÜRK Ekonomi ve İlişkili Çalışmalar Dergisi

Ethnonationalist Capitalism & The Illegitimate Legacies of the Yugoslav Wars

Faruk Hadžić [a,]

[a] Independent Researcher, Bosnia and Herzegovina, faruk.hadzic01@gmail.com,

https://orcid.org/ 0000-0003-1158-7858

ARTICLE INFO

Research Article

2021, Vol. 3(2), 87-108

e-ISSN 2667-5927

Article History:

Received: 04.01.2021
Revised: 21.04.2021
Accepted: 28.04.2021
Available Online: 30.04.2021

JEL Code: F50, F51, F59

Keywords: political economic transition, ethnonationalism, illegitimate economy, capitalism, former Yugoslavia, Yugoslav wars

Ethnonationalist Capitalism & The Illegitimate Legacies of the Yugoslav Wars

Abstract

The author explores how the political and economic transition and the legacies of conflicts produced the states' criminalization and whether the more significant issues of these countries were nationalism or capitalist exploitation, or are these two categories in symbiosis? The presence of capitalism as the ruling model requires some form of nationalism and national identity- where a certain capitalist elite pragmatically chooses to build a nation-state, effectively mobilize and homogenize the rest of society on its platform. Ethnoational identities are formed as part of ethnonational-political projects, and national projects imply creating or completing nation-states that lead to the conflict. Local orders based on ethnic-violence turned into open war economies and entering into dynamic and symbiotic relations with illegal global markets and liberal market structures. The critical issue is the consolidation of mutual trust between the phenomena of "politicization of crime and criminalization of politics." Politically sensitive cases dealing with corruption, organized crime, or abuse of power are particularly vulnerable to various influences, and therefore it is vital to pass judgments to make existing records credible. Political and economic transformation cannot be fully accomplished due to disagreements between the economic and political spheres that would thwart the functioning of democratic institutions because the consolidation of the democratic order and the establishment of a market economy are in the balance of incompleteness. Re-establishing social structure and social ties, developing plurality and legality, is crucial as social security, once the most critical issues are met.

To cite this document: Hadžić F. (2021). Ethnonationalist Capitalism & The Illegitimate Legacies of the Yugoslav Wars. BILTURK, The Journal of Economics and Related Studies, 3(2), 87-108.doi: 10.47103/bilturk.853746

1. Introduction

There is no doubt that in the turbulent history of the Balkans, the war marked every turning point: the creation and disintegration of states, kingdoms, empires; emergence and disappearance of new ideologies and economies; cultural revival and decay; adoption and loss of religions, beliefs, and customs. In the former Yugoslavia, or a semantically neutral name, the Balkans, the ambitions of some, especially more abundant ethnic nationalisms, often stimulated the imagination to unite the whole area under one self-proclaimed people and denomination, which in turn would lead to war, ethnic cleansing and destruction. The fundamental core of the political order in the former Yugoslavia was the system of charismatic power and legitimacy. As Weber has shown in his systematic sociology of rule (Deflem, 2012) , this type of order carries more significant opportunities for self-destruction than political regimes based on traditional or rational authority. Yugoslav society was faced with a tendency to degrade authority, which was still carried out with the legitimation formula of the former ruler ("Even after Tito, Tito"). In the type of political regime in which Tito was the primary factor of stability and the figure around which the normative consents of members of the political community were formed, which essentially compensates for the active consent of the "repressed civil society," the degradation of a central government authority. This process opened and upset the dead balance between the inherited political oligarchy of the post-Tito regime, Serbian political leader Slobodan Milosevic. In this region, the figure of the "gang" leader sometimes coincided with the figure of a political leader. The connection between violence, politics, illegal economy and criminal activities given the historical facts is present from the routes of smuggling opiates, weapons, funds needed for frequent anti-Turkish riots, in which individuals often controlled parts of the territory. It opened a model that seems to last, such as the assassination of Serbian Prime Minister Z. Đinđić in 2003. If we accept, in part, some thesis about the crucial role of organized crime in the emergence of modern states, there is an intertwined complex of seemingly unrelated phenomena. All these components are in varying degrees of interaction: illegal economy and organized crime control part of the territory (Zemun clan[1])), the wars of the 1990s, and nationalist politics.

The fact is that after the Second World War, socialist Yugoslavia became a kind of European success story. Between 1960-1980, it had one of the highest economic growth rates in the world, a decent standard of living, free medical care and education, a guaranteed right to work, one of the most respected passports, one-month paid vacation, a literacy rate of over 90 percent, and a life expectancy of 73 years. In terms of living standards and freedoms ahead of most Eastern European countries and certain branches of the economy ahead of some Western European countries. After Tito's death, the biggest problem was that communism was not replaced by civil democracies, but ethnonational ones. The most obvious indicators

[1] The gang's power and influence peaked between 1999 -2003, and they were considered the most influential organizations in Southeast Europe.

of a serious economic crisis were inflation and huge external debt, exacerbated by a sharp jump in the value of the dollar. Thus, in the early 1980s, there were major disturbances in the economic life of the country. (Glavan, 2013) However, the contradictions between the political and economic spheres did not enable Yugoslavia's self-transformation to be carried out in a pacified manner. Under the onslaught of Ante Markovic's government's neoliberal reforms between 1989 and 1990, more than a thousand companies went bankrupt. It can be added that the dismantling of Yugoslavia as a structural possibility existed before, but the question of the modality of that event after Milosevic's appearance was brought to the surface with all its might. We are talking about violence as a form of the disintegration of Yugoslavia and its far-reaching consequences that can still be recognized today. Thus, the disintegration was not only the result of state failure, as the phenomenon is treated in the relevant theoretical literature, but an expression of a complex mix of exogenous and endogenous dynamics. (Milliken & Krause, 2002: 33) We can follow cumulative events that are retroactively linked into a causal sequence: „the first forms of manifestation of the crisis of ideological production of reality, signs of exhaustion of the different specifics of the Yugoslav path were the breaking of liberalization in the seventies (with the projection that national orientations can be pacified within a monolithic political structure), the dissolution of earlier economic opportunities conflicts between centripetal and centrifugal tendencies, which ended with the deconstruction of an increasingly empty central authority, the competitive "game" of national elites, the failure to integrate certain entities into the Yugoslav project (especially Albanians, which became explicit in the 1980s), division of space according to the constellation of power (inconsistent regionalization that fueled nationalism), mobilization of populist energies in the context of the late 1980s with reference to the war environment of the 1990s, "democratization" of nationalism by spilling ethnic codes from party structures into the streets.“ (Woodward, 1995) Moreover, most political leaders engaged individuals from dubious criminal status, openly known criminals, as their official security, and criminals were often part of political assemblies. Many war commanders emerged from the wars as national heroes, and in the post-war period, became known for illegal enrichment, closely related to power structures. (Čabaravdic, 2008) Many criminals were members of the secret services. These services gained sufficient power and knowledge for violent "crisis management". In parallel with the wars in the former Yugoslavia, which left behind hundreds of thousands of dead, wounded and displaced, excellent business cooperation flourished in which the state, military, intelligence, and criminal circles of the warring parties earned wealth.

The question arises, whether the more significant issue of these countries is ethnonationalism or capitalist exploitation? Or are these two categories in

symbiosis? In principle, the author argues that one arises from the other. The fact is that in post-socialist societies at the end of the 20th century, nationalism rose sharply - with the establishment of nation-states and the disintegration of all complex, non-nation-states - coincided with the rise of capitalism[2]. In both historical and social contexts, the ideology of nationalism served as a screen to legitimize the appropriation of most economic resources and the takeover of the entire state apparatus by one social class, the growing class of capitalists. Within this ideological construct, with the help of a simple logical trick, this social class's partial interests are a priori legitimized by being presented at the nominal level as the universal interests of the whole society. Thus, the state and its economic resources function at the nominal level as the sovereign possession of the personification called the "nation," while at the actual level, they function as the sovereign possession of the class that created it.

The most critical question is how all the ruling systems that have emerged on the scene are in their essence of ethnopolitics. The answer to that question lies in the constitutive role of war for every policy. The existence of more ethnic nations implies more narratives of power and circulation in public opinion. (Bhaba, 1990: 128)

Nationalism in non-Western European countries - which includes countries of the former Yugoslavia has some specific characteristics. Due to the prolonged presence of late feudal empires (Habsburg, Ottoman, and Romanov) in their territories, nationalism appeared relatively late. As such, nationalist discourse in non-Western countries has not been consolidated in daily-routine, non-excessive forms - just like capitalism, which generally remains at the level of excesses that characterize the so-called "initial accumulation of capital." Fear of losing identity within multinational communities, such as Yugoslavia, after disintegration led to the sudden "emergence" of antagonistic individual national identities, becoming indivisible, and exclusive. (Hadžić, 2020: 3) Thus, a specific (extremely negative) characteristic of the post-Yugoslav space is that religions are identified with nations (majority). National identities built and consolidated with the help of such confessional exclusivism (usually associated with ethnic) manifested themselves as extremely impermeable and inflexible, and the rivalry between their national umbrella projects as almost irreconcilable. Therefore, this form of nationalism maintained a firm position in these societies' political processes. After their return to the capitalist orbit, it occupied the very center of political events. However, nationalism is essentially a transclass ideology that originated in the 19th century (there were no real nations before that). Its function is to connect all people living in newly created nation-states, capitalist states into one "imaginary community" - both rich and poor, capitalists and workers. The reason is apparent - to prevent

[2] With the fall of the Berlin Wall and the universal spread of neoliberal capitalism in the countries of the former communist bloc, the non-national principle of state organization and the universal spread of the nation-state model were abandoned in this part of the world.

class struggle, i.e., the rebellion of the workers against capital, the rebellion of the poor against the rich, is an invented ideology that ostensibly connects the poor and the rich, labor and capital. Nationalism has, from the very beginning, served precisely to quell all social and class struggles for a better society." (Tijardevic, 2016) Besides, in addition to the interests of international financial institutions, there was another interest, and that was the interest of those who implemented the required measures and created economic policy. Thus, domestic economic policy was, in fact, between the pressure of capital and the interests of nationalist political structures. One of the consequences of this situation was corruption - systematic corruption.

Furthermore, the symbiosis of nationalism and capitalist exploitation is evident, not only on the example of observed transition states, but it is increasingly shown on a global scale, and some critical positions around the new neoliberal imperialism, especially around EU imperialism, are beginning to be articulated. According to the relevant authors is a new type of anti-business. The nationalization of states prepared the ground for the entry of capitalism - ethnonationalism and ethnoreligious violence played a crucial role, as a foundation for criminalization. Starting from the war accumulation of capital (profiteering), through the privatizations of the 1990s, to the formation of power within ethnopolitics (especially war parties. Ethnic-confessionally homogenized nations born on the ruins of the socialist Yugoslav federation were conceived in tribal hatred, crime, and the privatization of the vast wealth and resources of the socialist era created by tens of millions of people as social property. (Perica, 2018) Thus, countries in the region became "captured by private interests by confiscation of the cultural property and transfer of that property to the thin layer of war profiteers, the former technocratic layer of the ex-Yu, the domestic political elite and foreign tycoons.“ (Tabakovic, 2007) The black economy in all countries has left visible changes in the social structure of the population; contributed to the impoverishment of a large part of the population. Economic empires of war and post-war actors were created, which were mainly enriched by the smuggling of excise goods banned from trade. (Hadžić, 2020: 258) This situation resulted in the long-term disintegration of the social order and the erosion of the legitimacy of states.

This area is characterized by extreme fragmentation of states originating from the beginning of the crisis at the end of the last century within the historical reasons, geopolitical periphery, and "entities" defined in ethnoreligious conflicts. The tragic circumstance for all Balkan nations and states is that peace, more precisely non-warfare between them, now as in the past, is guaranteed only by the great powers. Today, ex-Yu countries show elements of "captured states" with interrelated negative influences on conflict, economic and sociopolitical transformations. The author suggests that the primary determinant of the captured state is corruption

and a dysfunctional government that cannot implement the reforms necessary for its functioning. In terms of corruption, at the highest levels of politics leads to the capture of institutions- "captured state," which, according to R. Karklins, is reflected in the entire state's takeover by cartels consisting of political elites and economic oligarchs. (Karklins, 2005: 219) They are captured and made politically expedient, but not socially influential, by legislative, executive, judicial instances, and regulatory agencies and prosecuting authorities which, depending on the political interest, abuse the principle of prosecution opportunism." (Stoljiković, 2013: 135) The European Commission, which usually uses diplomatic language, stated in 2018/2019 report, that the countries of the Western Balkans show clear elements of state capture, including links to organized crime and corruption at all levels of government and administration and a strong intertwining of public and private interests. Moreover, the assessment of these countries by the Freedom House organization (2018), Serbia, BiH, Kosovo, and North Macedonia are transitional, hybrid regimes; regimes that have elements of democracy but also authoritarianism, speaks enough about the fact that these countries face important issues, which diminishes political, social, and economic opportunities in the modern world.[3]. In the Serbia, the executive dominates all aspects of political life, ignores the constitution and laws, and plays with the legislature and the judiciary and newly established regulatory agencies. (Vladisavljevic, 2011: 205) Historical and political circumstances, primarily war events, have contributed to the Balkans, including Croatia, being defined as a "derailed transition," where the nation-state's formation took precedence over democratic change and the difficult legacy of communism and economic backwardness. M. Kasapović states that the war made the transition processes in the country second-rate because the formation and defense of the newly formed state gained a clear advantage over the transformation of political and social life and that Croatia often moved from transitional to war studies, where war not only significantly surpassed transition processes, rather than making them opaque. (Kasapovic, 2001: 17) The economic situation has only partially improved, thanks to EU funds, in Croatia. However, in the long run, the system has caused the largest exodus of the population, reducing the tax base and jeopardizing pension health systems. A recent survey (2018) in Croatia shows that the main reasons for mass emigration are "an unorganized and corrupt state." (Juric, 2018) Slovenia, the first ex-Yu EU member, since 2004, does not have a high level of corruption, widespread clientelism, partisanship, lack of strategic vision, and is evenly developed. Although the former Slovenian Prime Minister was convicted of

[3] See: Freedom House, 2018., 2017., 2016., Nation in Transit Bosnia and Herzegovina https://freedomhouse.org/report/nations-transit/2018/bosnia-and-herzegovina
Freedom House, 2018., 2017., 2016., Nation in Transit Croatia, https://freedomhouse.org/report/nations-transit/2018/croatia,
Freedom House, 2018., 2017., 2016., Nation in Transit Kosovo https://freedomhouse.org/report/nations-transit/2018/kosovo
Freedom House, 2018., 2017., 2016.,Nation in Transit Serbia https://freedomhouse.org/report/nations-transit/2018/

corruption, Slovenia has a perception of corruption of over 60%, while, say, Croatia, to 48% .[4].

2. Aim and Method

The multidisciplinary approach to critical analysis aim to provides insights into understanding how the political and economic transition and the legacies of conflicts produced the states' criminalization, and whether the more significant issues of these countries were nationalism or capitalist exploitation? Or are these two categories in symbiosis? The critical analysis provides insights into understanding the extent to which the study's topic and phenomena are addressed as an essential factor. The literature review highlights knowledge and research gaps and identifies relevant initiatives.

2.1. Economic and Political Transition of the Former Yugoslavia

In the history of Eastern and Central Europe in the nineteenth and early twentieth centuries, it has been observed that in each of the countries, individuals appeared who had a huge influence on the outcomes. It is possible to imagine different outcomes with different key political actors in leading roles in such a context. Furthermore, what was right for the nineteenth century, namely, that "in the Balkans, the introduction of the state according to the European model came in a social situation that was almost completely unprepared for it" (Stoke, 1986) , is equally valid and for the introduction of democratic institutions, rules and procedures at present. In most former republics, the state is still used by the main political protagonists more as a means of monopoly and less for a reasonable rule. "It is not surprising, therefore, that they are constantly interfering in the day-to-day functioning of politics, seeking to create personal regimes."(Stoke, 1986) E. Fraenkel (1952) used the theoretical construct of the dual state. However, when we study this model a little more thoroughly, we discover that behind this form, in essence, lies the regime of privatized power behind the facade of (non-existent) state. The dual Nazi state was a system of privatized power. Its essential mark was the dissolution of society's political fabric and the non-political nature of political processes. On the other hand, this dualism at the level of the constituent and formative principles of the order is expressed as a unique conflict between democratic legitimacy and facade legality in the former Yugoslavia. Moreover, this area is characterized by extreme fragmentation of states originating from the beginning of the crisis at the end of the last century within the historical reasons, geopolitical periphery, and "entities" defined in ethnoreligious conflicts. (Hadžić, 2020: 14)

[4] Transparency International corruption perception index 2018, https://www.transparency.hr/hr/clanak/indeks-percepcije-korupcije-2018-48-bodova-60.mjesto/718

The economic approach is not limited to explaining the behavior of those who have power and who are only interested in satisfying their interests (Lock, 2002) , but also indicates that when applied from a theoretical perspective, system, that civil wars are processes with their dynamics. Simultaneously, the critical moment is the ambiguity of the circumstances related to the relationship between the state and the war. This ambiguity cannot be removed, and it will be enough to look at, say, the situation in Serbia in the 1990s: the state becomes an instrument of ruling elites, there is a union of state and regime and constant interference of administration and state, expanded clientelism, Caesarist codes of government, financial oligarchy. It increasingly announces dissatisfaction at the end of the millennium) and the deterioration of the social fabric. Within the notion of "captured states," we can speak from the social property, which is privatized by post-war "tycoons;" supporting authoritarian rulers linked to kleptocracy as a strategy to maintain stability undermines the EU accession process. Taking active funds is possible due to legal omissions in the process of transition. Pavlović calls this type of devastation of the state "tunneling of resources from companies" (Pavlovic, 2006), where companies are devastated by the transfer of assets and profits in favor of the majority ownership that is already owned by a private company.

The leading politicians in the countries of the former Yugoslavia have repeated the mantra over the past three decades that not enough has been done, that reforms have been insufficient so far, and that only one more step needs to be taken to bring the Balkan periphery to that capitalism as we can observe in the countries of the center. Contrary to this highly idealistic and nearly utopian approach, according to which capitalism is seen as an ideal that must be realized in that pure form in order to, in fact, bring everything it is believed to bring, we will try to offer another approach in which capitalism is viewed as realistically existing capitalism. According to this understanding, the period characterized as transitional should be analyzed as a period in which capitalism is already there, being established by the abolition of social ownership, workers' self-government, and the state's withdrawal from the position of equal economic actor. Capitalism understood in this way does not bring the same positive results expected from it as an ideal model, but (necessarily) implies unequal development and existence of countries in which high unemployment, poverty, consumption, low wages, scarce or non-existent technology, almost complete absence industries, and a poorly skilled workforce, as well as many non-economic social problems.

We have already problematized the symbiosis of nationalism and capitalist exploitation in the introductory part. In the post-Yugoslav area, there is still a fascinating combination of privatization and so-called state-owned enterprises, among which there is no difference in terms of the nature of the capitalist structure of their activities. In this sense, there have even been attempts outside for some stumbled companies to return partly to state ownership, but this does not change their so-called capitalist structure. It is the classic capitalist structure of the

economy. It is about the character and very being of this neoliberal capitalist project with only one goal: profit for the vast minority and the impoverishment of the vast majority. In the case of Yugoslavia, this space was predetermined by a high degree of decentralization on the formal institutional level, never achieving social integration and nationalist policy in the institutional constitution of federal units and the informal political mobilization of support for rivals directly-post communist rule.

The nationalization of states prepared the ground for the entry of capitalism - ethnonationalism and ethnoreligious violence played a crucial role, as a foundation for criminalization. Starting from the war accumulation of capital (profiteering), through the privatizations of the 1990s, to the formation of power within ethnopolitics (especially war parties. The "nation" is conceived as a virtual sovereign, as personification that simulates the being of the whole society and through which that being is realized in the form of sovereignty, and thus the ultimate source of social and political legitimacy is placed in the "nation"; the capitalist class takes control of the state apparatus and ownership of economic resources, the state and its economic resources thus function at the nominal level as the sovereign possession of the personification called the "nation," while at the de facto level, they function as the sovereign possession of the class that created it. Besides, as an available place, former Yugoslavia societies carry the specificity that ethnic or national identity is most closely linked to religion. The basis for the conflict was effort to realize one national - political project to the detriment of another, that is, to complete one nation-state to the detriment of another. However, having once entered the phase of active struggle for territories, national-political projects, according to their internal logic, according to the system of connected vessels, can hardly give up the struggle to complete national territories and nation-states until they eventually experience a convincing defeat by other national projects. Such a mechanism is inevitable as long as nation-states represent an unquestionably given norm within the global capitalist system. Attempts to create nation-states have, as a rule, caused mutual violence between different national groups. Without imaginatively developed democracies with all their legal and political potential, the ethnic-religious construction of nations creates an environment for further destabilization of society and deepening conflicts among ethnic groups. (Smith, 1998: 22)

An enviable level of corruption developed since the 1990s. Thus, the well-known phrase bribery and corruption, which is an integral part of the Balkan reality, has paradoxically become an appropriate mythological image that delegitimizes the Balkan disordered or post-communist corrupt transitional collectivity. (Vujic, 2019) Apart from the interests of international financial institutions, there was another interest, and that was the interest of those who implemented the required

measures and created economic policy. Thus, domestic economic policy was, in fact, between the pressure of capital and the interests of political structures; one of the consequences of this situation was corruption. It is clear that it is a transitional structural phenomenon.

The point is that in the situation of introducing a capitalist economy of the most liberal type with intense competition, the group of individuals who carried out the liberalization itself had a favorable position to facilitate the entry of large capital. Given the poor prospects of the domestic economy and foreign players' strength, this proved to be the most rational way to acquire start-up capital with which these politicians could start their economic activity or at least provide themselves existentially. In that sense, the corruption of new political and economic structures proves to be a structural phenomenon in peripheral economies. Tocqueville, arguing with Montesquieu, claimed that the secret of despotism is in corruption, and not in fear. Tocqueville did not deny Montesquieu's allegations of fear as the "energy principle" of despotism but only warned that in the "new despotism," which relies less on direct repression and more on forms of manipulated support, the influence of despotism is more significant. Tocqueville will almost repeat Tacitus' great places that "corruption is the most serious disease of the state." It relies on money and sinecure for the stability of rule and power. Money takes the place of opinions and parts, Tacitus teaches, and Tocqueville renews. Tacitus' descriptions of how the rulers ruin the reputation and authority of respectable citizens are among the most beautiful aspects of the Annals. (Schaefer, 2010: 375) He teaches us not only the anatomy of order but reveals the power of moral attitude and civic virtues. A society of ruined virtues is a burdensome bed for both rulers and subjects. For example, Milosevic used this technique extensively, corrupting active and combative followers, and thus kept the rest of the population in complete obedience.

If we look at the Balkans in geographical form through the five former ex-Yu countries, except the Slovenia, it has become a frozen entity in history, due to prevailing ethnonational differences and circumstances between and within borders (nationalism, state sovereignty, and identities) opposing the wave of democratic peace. Political structures in the region are left or right-wing, sometimes opposing each other, and sometimes cooperating in networked systems of mutual support. However, very often, abuse by the government destroys the essence of democracy. Political elites, balancing international pressure, often try to weaken state functions in segments that are not important to the regime's survival, "while expressing actions when it comes to government interests." (Deudney, 2004) This claim is supported by the fact that most ex-Yu countries it has not been able to reach the level of development since the late 1980s, with an increased risk of losing the equity in interaction with other countries. Most countries depend on stand-by arrangements with the International monetary fond (IMF), and some have an Extended Fund Facility (EFF), differing in the extended repayment period. Countries are becoming constantly dependent on external factors, as weak,

unfinished, and undemocratic state formations that cannot achieve sufficient autonomous - economic, political, social, national and security capacities for progress. Meanwhile, states in the region have become "trapped" or "kidnapped" by private interests after controversial privatizations and the large influence of illegally enriched individuals. (Teokarevic, 2009) All of the above is contained in the fact that international support is given to "political pragmatists" who oppose "rigid legalists" throughout the Balkans, and pragmatism is in the process of political and social transformation of society.

The status quo and lack of qualitative changes maintenance political-interest structures, utterly independent of differences in their proclaimed political-ideological goals. Ethnonationalism does not bring political scenes a socio-economic system that would already be independently formed, with appropriate bearers of transformative interests and competing "projects" of the new order. Most often, society's strata have no interest in carrying out reforms and supporting political and economic transformation. Political and economic change cannot be fully accomplished due to disagreements between the economic and political spheres that would thwart democratic institutions' functioning because of the consolidation of the democratic order and the establishment. (Hadžić, 2020)

According to experts, if we take the example of Bosnia, it is a country with a favorable geographical position, right climatic conditions, an abundance of arable land, many watercourses and forest, ore, and other resources. How is it possible that such a country ranks last on the European scale of development? Professor E. Bajtal claims that he has been "drawing a sad parallel between a rich country and a poor country" such as Bosnia for years. "In such a complex, rich country, thanks to the absurdity of fraudulent ethno-logic and ethno-democracy, there is a state of poor citizens—a country of produced poverty. The law on the conversion of social property, passed in the middle of the war, provided an opportunity for its bearers to privatize the social, people's property; twenty years after the rule of self-proclaimed guardians of vital national interests, the country is drowning in misery, poverty and "legalized injustice." (Bajtal, 2015)

2.2. The Illegitimate Legacies of the Yugoslav Wars

A. Peter (2004) argued that war economies in places like the Balkans, the Caucasus, and Central Asia are criminalized because they rely on criminal actors and the black market as the primary source of funding and supply, within a close connection between conflict and crime, which gives these conflicts the form of criminalized conflicts. An important economic feature of the war in the former Yugoslavia is the explosion of so-called war profiteers. The judiciary, the laws of Yugoslav institutions, were transformed into the former Yugoslavia's newly established states. Chaos in Bosnia and Herzegovina is created by the JNA's (Yugoslav People's

Army) withdrawal, the storage of weapons from Slovenia and Croatia to Bosnia and Herzegovina. The diaries of JNA (Yugoslav peoples Army) General Ratko Mladic, which were seized in Belgrade, describe the details of meetings between representatives of the warring armies, who arrange and carry out millions of transactions. The testimonies of the accused witnesses in the Hague Tribunal (ICTY) investigations and trials further confirm the above.

Since every war is, by definition, a time of abnormal tendencies in all spheres of human life, the most drastic changes in the domain of economic efficiency have taken place. Thus, a unique economic feature and most significant impetus for strengthening criminal networks in the Balkans was the tremendous economic opportunity offered by weapons or other war goods, such as fuel, and appropriation of international humanitarian aid. At the same time, Western policy was based on a cynical view of the strategic loss of value of the Balkans after the Cold War. Despite the „Western neutrality" for material support to the parties in the struggle and thus the prolongation of the conflict, humanitarian aid that was salty was taken away during that period by many warlords, (Rieff, 2003), who did not differ, for example, from Somali factions. In the past, international humanitarian discourse from similar experiences in Somalia has not been sufficiently understood. Even in the case of the implosion of the earth, the trigger was a sudden "collapse of strategic value." On the example of the war in Somalia, J. Gundel proved that international food aid served to maintain structures ruled by violence and warlords and contribute to the maintenance of precisely those structures that led to the catastrophic famine. Within humanitarian discourse in former Yugoslavia, confiscation occurred on the mutually established war lines of the warring parties, or in the continuous practice that domestic humanitarian organizations mainly performed the organization of taking over and distribution of humanitarian goods. Moreover, in Sarajevo alone, each truckload of "imported," often smuggled excise goods meant close to millions, and it was not uncommon for goods to be of unknown origin and without proper production and trade documentation. Closely related interest groups of political-military-business individuals among all warring parties became multi-millionaires in less than four years of war, and several of them accumulated capital of up to a billion. (Basic, 2006: 138) On the example of the post-war situation in Bosnia and Herzegovina, M. Pugh showed how strongly political and economic interests are intertwined with controlling over trade and production. Bosnia and Herzegovina is also an excellent example of how the international embargo enabled the creation of many monopoly positions based on force and how, partly because of these monopolies, the economic structures of war greatly hinder the construction of a market order in the postwar period. (Pugh, 2002: 467) The conflict in Bosnia did not differentiate between political and criminal, and there is an interaction of political interests and the interests of the crime itself. (Peter, 2004: 3) In this respect, the legacy of the war economy had a profound effect on the post-war processes of social reconstruction. In general, only those who have funds, de facto, and not only formal

or institutional influence, weapons, de facto power, only these actors can "deliver results," and in former Yugoslavia, such actors are largely criminalized or are very close to a crime.

If we analyze at the material side of local wars, we see that they are intertwined with the global economy. It is especially noticeable in those areas that were the subject of Jean and Rufin's analysis5, namely the international embargo, the diaspora, international aid, and organized crime. At the center of that globalization in the shadows are mafia structures and "warlords". On the one hand, they are representatives of the ruthless and violent exploitation of people and resources in the territory under their rule. On the other hand, in that context, local military control in a given territory is combined with satisfying financial and political interests at the international level. Through the so-called mafia structures of the war economy, illegal markets are also integrated into the formal global economy. The "masters of war" play a dual role in this - they are both local commanders and global entrepreneurs, who invest their war profits in the formal economy. (Jung, 2003: 22) Thus, war economies are made up of dynamic forms of economic reproduction that range from survival through violence, through the financing of military expenditures, to the accumulation and new investment of capital in the world market.

Within the illegal economy, Montenegro's political elite has suffered numerous accusations from the international community of systematic tobacco smuggling, Kosovo and North Macedonia as a profile of hotspots drugs smuggling from Afghanistan through Turkey, and Serbia's political elite in 2001-2004 under "pro-European reform" ruled allegations of supporting Mafia in exchange for their support for "social reforms."6 At the same time, in these examples, we see that party elites are willing to tacitly or actively participate in these operations, retaining social power despite the impoverishment of society. In all of these cases, criminals have played a key role in strengthening political leaders in countries undergoing a difficult and, in part, unsuccessful "transition." (Köppel & Szekely, 2002: 6) The links between organized crime and the political top of "transitional democracies" can range from "constant looting," as some call it, "to the complete captivity of the state by organized crime." (Berdal & Serrano, 2002: 7) Transnational organized criminal networks (Kosovo-Serbia-BiH-Macedonia-Croatia) are a significant source of income and employment, and thus a threat to legitimate social orders. (Hadzovic

[5] A pioneering contribution to the paradigm shift, the transition from ethnicity to the economy, was given by a collection that appeared in 1996 under the title Economie des guerres civiles edited by Francois Jean and Jean-Christophe Rufin. It analyzes the participants' economic strategies and interests in the war in a series of well-researched cases and shows how both those strategies and those interests are firmly connected with global economic processes.

[6] These are flagrant examples of synergies between the political elite and organized crime because the police alone could never act like this.

& Airello, 2018) The damage that, say, Bosnia suffers from the illegal economy on an annual basis is estimated at "600 million dollars, which is approximately the same as the budget deficit." (Hadžić, 2020)

The protection of national interests is the safest and most profitable. For this to continue, it is essential to use its influence in the media and encourage a general social climate that will lead the citizens to seek security not in overcoming but, on the contrary, in maintaining ethnic divisions. (Mujkic, 2020) Moreover, the domestic ethnonationalism philosophies are not close to the EU principles and standards, maintaining the status quo in which crime and corruption progress. It is confirmed by the fact that, compared to a few years ago, EU membership is less attractive today for some countries in the Western Balkans, some of which are starting to turn their heads towards new partners, such as Russia. Countries like Bosnia and northern Macedonia, which rely on Russia for oil and gas, are particularly sensitive to Russian incitement to anti-Western and nationalist narratives.

The problems arising from the criminalization of the state arise mainly in environments characterized by the weakness of institutions and the moral crisis that usually accompanies weak institutions. Lawlessness - not only legal but also that embodied in irresponsible thinking - as a rule, suits the strong. Furthermore, the decline in non-thinking, among other things at the point of "self-understanding of war," is an ideal opportunity for not understanding what happened (reduced to war), but it also serves a great extent for its possible prolongation, or its socialization, domestication. , a priori acceptance. Moreover, it is the latter that seems to us to be the greatest danger. Fear and diffusion of insecurity, panic become the main drivers of individual and collective behavior. The values of trust and solidarity are destroyed, the unwritten social contract that shaped and connected the political community does not work, and a special kind of existential fear (fear of disorder) replaces all other types of behavior. In the former Yugoslavia political environment, politicians often act without moral responsibility, nor after the lawsuits against them, and the publicly announced crimes they committed as officials. There is almost no prominent politician in the region who has not been accused of abuse of power. Investigations are mostly not completed, and even if there is a trial, it ends with an acquittal. (Hadžić, 2020)

In one of the dozens of examples (scope of work does not allow detailed analysis), of all ex-Yu countries: the example of O. Ivanovic7, who in his last interview before he was killed, described the links between suspicious figures and local authorities in northern Kosovo, saying: the center of power is not inside the municipal building - because the municipal building belongs to this other, unofficial center of power." (Radonjic, 2018) This situation is not exclusively related to the northern part of

[7] Ivanović served as the State Secretary of the Ministry for Kosovo and Metohija from 2008 to 2012 and was also a member of the Coordination Center for Kosovo and Metohija from 2001 to 2008. He was assassinated by unknown perpetrators on 16 January 2018 in North Mitrovica.

Kosovo: criticism and accusations have long been leveled at former OVK (Kosovo Liberation Army- KLA) commanders who participated in organized crime and turned to politics.8 Although there are decent legal frameworks in most countries in the region, the prosecution is probably the weakest link in the criminal justice chain in the Balkans. As analysts Florian Bieber and Marko Kmezić (2017) pointed out: "Balkan courts are only independent and autonomous in the legal sense, while in practice the functions of the courts are limited by political influence, inefficiency, nepotism, chronicity, and corruption." The symbiotic relationship between political elites and criminal groups gives the following picture. Political elites provide various types of protection to criminal groups (which may include their family and friends) and their activities, while criminal groups help political elites get rich and gain and retain power. Once power is achieved, it creates an opportunity to improve the protection and legitimacy to cover other activities.

Three internal dimensions determine the space and chances for political corruption: the existence of privileges that politicians can distribute to small groups, the ability of the rich to legally achieve the benefits and longevity of these formed economic and political alliances. These three dimensions increase the willingness of politicians to receive illegal funds for their campaigns, i.e., the mood of tycoons for corrupt politicians. When this kind of cooperation between political elites and criminal organizations is further concretized and developed, then this synergy becomes an organized phenomenon of state crime, in the same way as during Gonzalez's Government in Spain, which was an act of organized state crime.

Most leaders of democratic forces engaged individuals from dubious criminal status, openly known criminals, as their official security, and criminals were often part of political assemblies (Arkan9). Many war commanders emerged from the wars as national heroes, and in the post-war period, became known for illegal enrichment, closely related to power structures. (Cabaravdic, 2008) Many of the war commanders were members of the secret services. Not only did they operate within all the institutions of the system, but they also networked the entire society, so that no actor or event could escape or miss them. (Žunec & Domisljanovic, 2000: 50) In the party-state, the Services, among other things, were the main selector and creator of the government's map and the certifier of the suitability of their

[8] See: Council of Europe, Parliamentary Assembly, Committee on Legal A airs and Human Rights, Inhuman treatment of people and illicit tra cking in human organs in Kosovo, 12. decembar 2010, http://www.assembly.coe.int/CommitteeDocs/2010/ajdoc462010prov.pdf.

[9] Serbian commander of a paramilitary force in the Yugoslav Wars, state agent and state assassin, war criminal, politician and president of the Obilić football club. He was on Interpol's most wanted list in the 1970s -1980s for robberies and murders committed in a number of countries across Europe, and was later indicted by the UN for crimes against humanity for his role during the wars. He was assassinated in 2000, before his trial could take place. Danas - Google Boeken,2009

holders.10 It is confirmed by reports of members of the intelligence and security forces with political connections who provide support and information to criminal groups to protect them. Thus, many criminals also took part in the war conflicts in the former Yugoslavia (1991-1995). Some of them put themselves at the head of volunteer paramilitary units, i.e., created their private armies, which operated under the command of the regular armed forces of the warring parties, or cooperated with them, or fought for their account and even came into conflict with by the regular police and the army of the states for whose interests those private armies allegedly fought. Due to criminals and others' participation, weakly dependent on the state, warlords, and their gangs in the last wars in the former Yugoslavia, these wars seem like an anachronistic phenomenon, closer to what wars were before the emergence of modern nations and their armies. At the same time, being largely a matter of private initiative, organized crime, the Balkan wars are a novelty, similar to other wars known as "low-intensity conflicts" that erupt after the end of the Cold War period over the past decade. They are a good example of the "postmodern conflicts" according to Swedish Historian P. Englund. These conflicts, in his opinion, have more in common with World War II. I. Čolovic states that regular armies rarely fight postmodern wars in our sense. Instead, cliques, gangs, clans, war hordes are at war." (Colovic, 2005) British historian Marko Hoare (2013) claims that many Bosnian politicians and military commanders were extraordinarily corrupt and emerged from the war as very wealthy.

N. Stjepanović (2017), a researcher at the Humanitarian Law Center, is not surprised by the cooperation between Arkan and Croatian intelligence services. As he claims, the cooperation of criminals from different Yugoslav republics has never stopped. The fact is that the most extreme market for violence is between members of paramilitary units. Moreover, "some of these top criminals maintained close ties with politicians in power and in the further development of these relations, it was sometimes difficult to distinguish who trolled whom." (Latal, 2018: 1) First and foremost, this all too often involves close relationships between political, business, and criminal elites. Furthermore, unlike some countries where criminal groups behave like parasites living at the host country's expense, in many Western Balkan countries, the relationship between state structures and criminal groups is more like a joint venture. (Petrucić, 2014) Power in the Balkans is often based on political clientelism, that is, on giving material goods or benefits in exchange for political support. In societies where the public sector is one of the largest employers, treasury management has a significant impact.11

[10] It is illustrated by the knowledge that, for example, the two most influential politicians in Slovenia, especially in its march towards independence, but also after that, Stane Dolanc and Milan Kučan, arrived in politics from the state security services.

[11] See: The Global Initiative Against Transnational Organized Crime, Geneva, p.32,2019

Moreover, security services can be used to advance the interests of those in power. It is far less common than during the 1990s, but some cases still exist.12 Furthermore, confirmation that clear connections have been established between the security services and criminal groups in Serbia in the past. (Stojarova, 2007: 10) Thus, political clientelism is spreading to the business world.

In such an environment, the boundaries between permitted and impermissible activities become blurred. It provides a favorable and lucrative climate for entrepreneurs who have high-ranking friends, euphemistically described as "controversial businessmen," who manage to evade justice always. Today's critical issue is the concolidation of mutual trust between the phenomena of "politicization of crime and criminalization of politics." (Hadžić, 2020)

3. Conclusion

The former Yugoslavia did not suddenly collapse amid the chaotic collapse of communism due to its systemic defects and the spontaneous eruption of ethnic and religious hatred, not because it was communist and authoritarian. In the crises concluded by wars, nationalist leaders who had authoritarian ambitions, and coveted illiberal states, created post-war criminal legacies, taking control of the state apparatus and ownership of economic resources. Ethnonational identities are formed as part of ethnonational-political projects, and national projects imply creating or completing nation-states that lead to the conflict. The presence of capitalism as the ruling model requires the presence of some form of nationalism and national identity– where a certain capitalist elite pragmatically chooses to build a nation-state, to effectively mobilize and homogenize the rest of society on its platform. Paradoxically, nationalist laders are often complicit in undermining their country's sovereignty from within or endangering the national interest for personal gain. Local orders based on ethnic-violence turned into open war economies and entering into dynamic and symbiotic relations with illegal global markets and liberal market structures. All the above was a suitable ground for the flourishing of corruption and business immorality, which was especially favored by the dense and strong ties of the military, political, criminal, commercial structures, and the foundation of the structural factors of the corruption, nepotism, and injustice. The issue is that the foundation grows further and becomes a magnetic element keeping the countries within the mutual consolidation of ethnonationalism, fear of others and national unfreedom.

The author suggests the essence of sometimes misunderstood national issues as a space in which multiple national interests conflict, within multiple national capitals

[12] See: European Commission, 'The former Yugoslav Republic of Macedonia: Recommendations of the Senior Experts' Group on systemic rule of law issues relating to the communications interception revealed in Spring 2015', Brisel, 2015.

representing ethnopolitics. In such an environment, the criminal justice system is too often used against those who try to change the status quo, maintaining political-interest structures, utterly independent of differences in their proclaimed political-ideological goals. Politically sensitive cases dealing with corruption, organized crime, or abuse of power are particularly vulnerable to various influences, and therefore it is vital to pass judgments to make existing records credible. In a illegitimate clientelistic ecosystem, institutions often protect those in power, not necessarily the rule of law. Given the actors' social status and power, it is clear that a lack of progressive economic and political transformations are reinforced precisely from the criminalization of the system. The distribution of power characterized by sociopolitical change processes has conditioned the synergy between phenomena and some transitional effects have become structural.

There is no doubt that the mafia participants in the wars were given the national heroes' role with their work and skills. Moreover, the secret services gained sufficient power and knowledge for violent "crisis management". Supporting political rulers linked to organized crime as a strategy to maintain stability undermines the EU accession process. It also discredits the values, credibility, image, and acquis of the EU. Meeting the criteria for EU membership should be seen as a transition goal, not just a condition for membership, which is why it is necessary to focus on the accession process as a key to (economic-political) transformation. The very transformation of all states, in most cases, depends on the social strata and actors of power within states. Most often, society's strata have no interest in carrying out reforms and supporting political and economic transformation. Political and economic transformation cannot be fully accomplished due to disagreements between the economic and political spheres that would thwart the functioning of democratic institutions because the consolidation of the democratic order and the establishment of a market economy are in the balance of incompleteness. Re-establishing social structure and social ties, developing plurality and legality, is crucial as social security, once the most critical issues are met.

All new states, except Slovenia, have found it difficult to decline economically and socially. The war abused the course of economic restructuring and the transition to a market economy. It has led to the widespread criminalization of economies at the heart of the war. Such a historical legacy has persisted and is detrimental to institutional relations and the consolidation of democratic institutions. The critical issue is the consolidation of mutual trust between the phenomena of "politicization of crime and criminalization of politics." When this mutual trust is undermined, more consequential initiatives against corruption can be expected.

References

Peter, A., (2004). Criminalized Conflict: The Political Economy of War in BiH, *International Studies Quarterly.*

Smith, A., (1998), *Nacionalni identitet, [National Identity],* Belgrade: Library XX. Century.

Tijardević, B., (2016). Kapitalizam, nacionalizam i religija, https://www.radnickafronta.hr/jos-clanaka/271-kapitalizam-nacionalizam-i-religija.

Council of Europe, Parliamentary Assembly, Committee on Legal Affairs and Human Rights, Inhuman treatment of people and illicit tra cking in human organs in Kosovo, (2010). http://www.assembly.coe.int/CommitteeDocs/2010/ajdoc462010prov.pdf.

Deudney,D.,(2004). *Bounding Power: Republican Security Theory from the Polis to the Global Village*, Princeton Press.

Rieff, D.,(2003). *Bed for night, Humanitarian paradox*, Rim, Carocci.

Schaefer, D.,(2010). *A Review of "Soft Despotism, Democracy's Drift: Montesquieu*, Rousseau, Tocqueville, and the Modern Prospect"Rahe, Paul. New Haven, Yale University Press.

Hadzovic,D & Aiello,A.,(2018). Western Balkans Serious Crime Initiative (WBCSCi) in the context of Integrated Internal Security Management (IISG Obstacles to implementation in BiH).

Jung, D.,(2003). *A Political Economy of Intera-State War: Confronting a Paradox Globalization, Ethnic Conflicts and New Wars, A Political Economy of Intra-State War*, London, 2003.

Fraenkel, E.,(1952). *Dual state*, New York.

European Commission, (2018). A credible enlargement perspective for and enhanced engagement with the Western Balkans, Strasbourg,https://ec.europa.eu/commission/sites/beta-political/files/communication-credible-enlargement-perspective-western-balkans_en.pdf.

European Commission, (2015). The former Yugoslav Republic of Macedonia: Recommendations of the Senior Experts Group on systemic rule of law issues relating to the communications interception, Brisel .

Hadžić,F.,(2020). Post-Yugoslav spaces between defective democracies, authoritarianism, and kleptocracies, *International Affairs and Global Strategy*, Vol 86, 10.7176/IAGS/86-04.

Hadžić, F., (2020). The Politicization of Religion and the Sacralized Balkan Nations Regarding Bosnia and Herzegovina, *Occasional Papers on Religion in Eastern Europe*: Vol. 40 : Iss. 7 , Article 8.

Hadžić, F. (2020). The political psychology of extremism; "naturalness" of the phenomenon in the Western Balkans. *Technium Social Sciences Journal*, *11*(1), 250-267. https://doi.org/10.47577/tssj.v11i1.1519.

Hadžić, F. (2020). The European Union (EU) Political Identity within the migrant crisis, and the Balkan – Bosnian route; xenophobia and religious identity. *Research, Society and Development*, *9*(10), e4809108685. https://doi.org/10.33448/rsd-v9i10.8685.

Freedom House, (2018., 2017., 2016). Nation in Transit Bosnia and Herzegovina https://freedomhouse.org/report/nations-transit/2018/bosnia-and-herzegovina.

Freedom House, (2018., 2017., 2016). Nation in Transit Croatia, https://freedomhouse.org/report/nations-transit/2018/croatia,

Freedom House, (2018., 2017., 2016). Nation in Transit Kosovo https://freedomhouse.org/report/nations-transit/2018/kosovo.

Freedom House, (2018., 2017., 2016). Nation in Transit Serbia https://freedomhouse.org/report/nations-transit/2018/.

Stokes, G., (1986). *The Social Origins of East European Politics, Eastern European politics and society*, https://doi.org/10.1177/088832548700100100 3,1986.

Bhabha, H., (1990). *Nation and Narration*, Routledge.

Interview with Srećko Latal, (2018). Oslobođenje, Sarajevo.

Colovic, I., (2005*). Le bordel des guerriers. Folklore, politique et guerre*, Munster, LIT

François, J. & Rufin, J.,(1996). *Économie des guerres civiles*, Hachette, Paris.

Milliken, J. & Krause,K.,(2002*). State Failure, State Collapse and State Reconstruction; Development and Change*, https://doi.org/10.1111/1467-7660.t01-1-00247.

Teokarević,J.,(2009). Democratization of the Balkan Postcommunist Political Systems, Milan Podunavac (ed), State and Democracy, *Službeni glasnik i Fakultet političkih nauka*, Beograd, ISBN 978-86-519-0949,2009

Jurić, T., (2018*). Emigration of Croats to Germany. Are we losing Croatia?,Školska knjiga.*

Köppel T. &,Szekely A., (2002). *Transnational organized crime and conflict in Balkan, Transnational Organized Crime and International Security: Business as Usual?,* Kumarian Press.

Kmezić, M. & Bieber, F., (ur.), (2017). The Crisis of Democracy in the Western Balkans. An Anatomy of Stabilitocracy and the Limits of EU Democracy Promotion, Balkans in Europe Policy Advisory Group Policy Study.

Glavan, M., (2013). *The Disintegration of the Socialist Federal Republic of Yugoslavia*, master thesis.

Deflem, M., (2012). *Max Weber on the rationalization of law,University of South Carolina*, Cambridge University Press

Bašić, M., (2006). Fundamentals of war economy - with a review of the war in BiH 1992-95. *UDC* 355.018 JEL

Pugh, M., (2002). Postwar Political Economy in Bosnia and Herzegovina, *The Global Governance*, Vol. 8, No. 4, Lynne Rienner Publishers

Patrucić, M.,2014). Montenegro: Prime minister's family bank catered to organized crime, *Organized Crime and Corruption Reporting Project*, https://www.reportingproject.net/unholyalliances/prime-ministers-family-bank-catered-to-organized-crime.html.,2014

Kasapović, M., (2001). Democratic Consolidation and Electoral Policy in Croatia 1990-2000, Croatian Politics

Vladisavljević, N., (2011). *Constitution and Democracy in the Process of Transformation, Chapter: Democracy, Consolidation of Democracy and the Example of Serbia,* University of Belgrade, Faculty of Political Science, Association for Political Science of Serbia

Žunec, O. & Domišljanović,D.,(2000). Obavještajno-sigurnosne službe Republike Hrvatske: Stanje i načela preustroja za razdoblje konsolidacije demokracije,*Polemos* 3, https://hrcak.srce.hr/202704

Karklins, R., (2005). *The system made me do it – corruption in post-communist societies*, M. E. Sharpe, New York

Tabaković, S., (2007). *Straight in the head*,Zagreb

Woodward, S., (1995). *Balkan Tragedy: Chaos and Dissolution After the Cold War,* Brookings Inst., Washington

The Global Initiative Against Transnational Organized Crime, (2019). Geneva, Switzerland, https://globalinitiative.net/

Transparency International corruption perception index, (2018). https://www.transparency.hr/hr/clanak/indeks-percepcije-korupcije-2018-48-bodova-60.mjesto/718

Stojarova, V., (2007). Organized crime in the Balkans, Institute for Comparative Political Research Working Paper for the European Consortium for Political Research Conference, *Faculty of Social Sciences*, Masaryk University

Vujič, J., (2019). Korijeni Hrvatske kleptokracije, https://projektvelebit.com/korijeni-hrvatske-kleptokracije/

Pavlović, V., (2006). *Civil Society and Democracy*, Official Gazette, Belgrade

Čabaravdic S., (2008). Od ratnih heroja do poslijeratnih junaka, https://www.slobodnaevropa.org/a/1329127.html

Perica, V., (2018). Patuljci pojma nemaju ili Balkanizacija nije nacionalizam, https://pescanik.net/patuljci-pojma-nemaju-ili-balkanizacija-nije-nacionalizam/

BİL TÜRK Journal of Economics and Related Studies
BİL TÜRK Ekonomi ve İlişkili Çalışmalar Dergisi

Innovation and Economic Growth: Does Internet Matter?[1]

Sayef Bakari [a]

[a] University of Tunis El Manar, Tunisia, bakari.sayef@yahoo.fr, https://orcid.org/0000-0002-5395-4348

ARTICLE INFO

Research Article

2021, Vol. 3(2), 109-116

e-ISSN 2667-5927

Article History:

Received: 19.03.2020
Revised: 21.03.2021
Accepted: 29.04.2021
Available Online: 30.04.2021

JEL Code: O1, O3, 031

Keywords: *innovation, economic growth, internet*

Innovation and Economic Growth: Does Internet Matter?

Abstract

We analyze the relationship between economic growth and innovation taking into consideration the importance of the internet. To do so, we use a panel ARDL model, with data on a sample of 76 developed and developing countries in different geographic regions for the 1995–2016 period. Our findings provide empirical evidence of the positive role of innovation and internet in economic growth and the positive role of economic growth and internet in innovation. From these results, we derive several basic policy conclusions.

To cite this document: Bakari, S. (2021 Innovation and Economic Growth: Does Internet Matter? BILTURK, The Journal of Economics and Related Studies, 3(2), 109-116. doi: 10.47103/bilturk.706165

[1] Acknowledgments: The author would like to thank Mediterranean Universities Union, coordinator of the Erasmus + project for their supports in providing all the necessary conditions to carry out this work.

1. Introduction

Since ancient times, humans tend to think of new and better ways of doing things and experimenting with them in practice. This phenomenon is called innovation. These include: inventing new ways to produce goods, discovering services that enhance productivity, create jobs, bring in new technologies, create new products that help meet global challenges, improve people's quality of life, and achieve economic growth {see Schumpeter (1932), Romer (1986, 1990) and Stokey (1995), hasan and Tucci (2010), Mabrouki (2018)}

The Internet is a comprehensive technology that supports the real economy by improving access to market information, facilitating business processes and creating new jobs, and enhancing the company's performance. All these benefits have made the Internet one of the cornerstones of economic growth {see Choi and Yi (2009), Tripathi and Inani (2016), Zaghdoudi (2017), Saidi and Mongi (2018)}.

For these reasons, we will empirically investigate the potential relationship between innovation, internet and economic growth by using a panel of data of 76 countries. The rest of the paper is organized as follows. Section 2 presents the methodology and data. Section 3 presents the main empirical results, followed by conclusions and policy analysis in section 4.

2. Data and Econometric Model

The data set used in this paper includes 76 developed and developing countries[2] for the period 1995 to 2016. The choice of the sample size and the period of study depend on the belief of data. All data are obtained and calculated from the World Bank database. We take real gross domestic product as proxy to express economic growth, patent applications (residents) as proxy to measure innovation and individuals using the internet to express the usage of internet.

Panel ARDL Model is used to explain the relationship between economic growth and innovation taking into consideration the importance of the internet. The long run relationship between innovation and economic growth could be in view by the following model:

$$\mathbf{Log(Y)_{it} = \delta_{1it} + \beta_{1i} Log(I)_{it} + \beta_{2i} Log(PI)_{it} + \varepsilon_{1it}} \quad \textbf{(1)}$$

[2] Algeria, Argentina, Armenia, Australia, Austria, Bangladesh, Belarus, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Croatia, Czech republic, Denmark, Ecuador, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Guatemala, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Jamaica, Japan, Kazakhstan, Kenya, Korea, Kyrgyz, Latvia, Lithuania, Luxembourg, Macedonia, Madagascar, Malaysia, Malta, Mexico, Moldova, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Romania, Russian, Saudi Arabia, Singapore, Slovak, South Africa, Spain, Sri Lanka, Sweden, Swiss, Thailand, Tunisia, Turkey, Ukraine, United Kingdom, United States, Uruguay, Uzbekistan, Viet Nam.

$$\mathbf{Log(I)_{it} = \delta_{2it} + \beta_{1i} Log(Y)_{it} + \beta_{2i} Log(PI)_{it} + \varepsilon_{2it}} \quad \textbf{(2)}$$

Where Log (Y) is natural logarithm of real gross domestic product (2010 constant US $), Log (I) is natural logarithm of Patent applications (residents), Log (PI) is natural logarithm of Individuals using the Internet (millions of inhabitants), δ is an intercept term, β1 and β2 are the long run elasticity estimates, 'ε' is the term error, 'i' is the individual dimension of the panel (the country) and't' is the temporal dimension.

3. Empirical Analysis

Before the proffer of the empirical outcomes, there is some pre-tests of data are mostly deemed very radical to furnish some prerequisites about the link of the attacked variables.

Table 1: Descriptive statistics

Variables	At level			At log level		
	Y	PI	I	LOG(Y)	LOG(PI)	LOG(I)
Mean	1.68E+16	16131338	14333.86	26.05773	14.52950	6.291015
Median	1.85E+11	3331488.	548.0000	25.94555	15.01893	6.306269
Maximum	1.69E+18	7.33E+08	1204981.	41.97246	20.41327	14.00197
Minimum	2.44E+09	75.19898	1.000000	21.61527	4.320138	0.000000
Std. Dev.	1.52E+17	51179250	67760.69	2.650799	2.567506	2.371794
Skewness	9.366229	8.395998	8.762379	3.079506	-0.937932	0.493995
Kurtosis	89.95609	92.18205	109.0698	18.77793	4.351394	3.394638
Jarque-Bera	551221.2	573733.5	805201.5	19985.72	372.3775	78.85320
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	1672	1672	1672	1672	1672	1672

Table 1 show that all variables have a probability of refusal less than 5%, which tick that they are all esteemed during the period of the study. Skewness and Kurtosis coefficients undergo variables that follow a normal distribution.

Here we explain the correlation between all the core variables of the study. Table 2 shows that economic growth (Y) correlates positively with innovation (I) and with internet (PI). Also innovation (I) correlates positively with internet (PI).

Table 2: Correlation matrix of variables

	Y	PI	I
Y	1		
PI	0.3664	1	
I	0.3284	0.7914	1

Before modeling, the LLC test (Levin et al., 2002), IPS test (Im et al., 2003), ADF (Maddala and Wu, 1999) and PP test (Maddala and Wu, 1999) are used to arbitrate whether the three variable log(Y), log(PI) and log(I) have the unit root or not.

Table 3: Panel unit root test results

Unit Root Test	**Y**		**PI**		**I**	
	C	CT	C	CT	C	CT
LLC	(3.01279)***	(14.8070)***	(500.414)***	(45.9574)***	(3.75976)***	(5.08084)***
	[20.9662]***	[20.5875]***	[37.8665]***	[14.3247]***	[34.4880]***	[29.9135]***
IPS	(3.06818)	(3.66616)***	(41.5605)***	(25.1022)***	(1.58880)*	(4.82744)***
	[18.5228]***	[15.0249]***	[21.7738]***	[17.3140]***	[32.1528]***	[28.0894]***
ADF	(175.635)*	(187.067)**	(2262.21)***	(666.439)***	(229.703)***	(273.358)***
	[618.750]***	[15.0249]***	[1200.36]***	[590.569]***	[1091.98]***	[867.084]***
PP	(241.916)***	(134.694)	(5655.65)***	(2901.68)***	(237.161)***	(262.181)***
	[1279.42]***	[500.414]***	[672.960]***	[1059.94]***	[2070.10]***	[2170.73]***
Decision	**I(1)**		**I(0)**		**I(0)**	

Note: ***, ** and * denote significances at 1% , 5% and 10% levels, respectively;

( ) denotes stationarity in level;

[ ] denotes stationarity in first difference;

'C' denotes Constant;

'CT' denotes Constant and Trend;

Table 3 reported the estimated results of unit root tests, including the LLC test, IPS test, ADF-F test including the LLC test, IPS test, ADF test and PP test. It is obvious from results that, some of the data sets are integrated of (I (0)) or (I (1)). Therefore, it is suitable to run out a cointegration test using these variables.

Different cointegration tests are used to determine cointegration among variables. We used the Kao (2007) panel cointegration test. This test can be used in cases of the existence variables integrated in different order.

Table 4: Cointegration test

Kao Residual Cointegration Test		
	t-Statistic	p-values
ADF	9.898751***	0.0000
Residual variance	3.431267	
HAC variance	0.124783	

Table 4 shows the results of the Kao (1990) panel cointegration test. The results denote that the variables in the model are cointegrated, because p-value is smaller than 0.01. Hence, a long-run equilibrium relationship occurs between log (Y), log (PI) and log (I).

We have estimated Equations (1) and (2) for panel ARDL estimation. The results of the panel ARDL tests are shown in Table 5 and Table 6.

Table 5: ARDL results when economic growth (Y) is the dependent variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
LOG(I)	0.000915**	0.000431	2.121690	0.0343
LOG(PI)	0.001638***	0.000246	6.663952	0.0000
Short Run Equation				
ECT	-1.205078***	0.141244	-8.531861	0.0000
DLOG(Y(-1),2)	0.383332	0.111870	3.426581	0.0007
DLOG(Y(-2),2)	0.099865	0.090280	1.106170	0.2691
DLOG(Y(-3),2)	0.079354	0.050295	1.577759	0.1151
DLOG(I)	0.456332	0.416889	1.094611	0.2741
DLOG(I(-1))	0.102952	0.240628	0.427849	0.6689
DLOG(I(-2))	0.556374*	0.291745	1.907053	0.0570
DLOG(I(-3))	0.391715	0.526913	0.743415	0.4575
DLOG(PI)	-0.638587	0.478591	-1.334307	0.1826
DLOG(PI(-1))	0.724769	0.580651	1.248202	0.2124
DLOG(PI(-2))	-0.920203	0.721665	-1.275110	0.2028
DLOG(PI(-3))	0.448220	0.502740	0.891554	0.3730
C	-0.004350***	0.028199	-0.154270	0.8774

Table 5 reports the output of ARDL estimation of Equation (1). Long run equation results shows that innovation log (I) and innovation log (PI) have a positive and significant impact on economic growth. The coefficient of innovation is 0.000915 which indicates that 1% increase in innovation leads 0.000915% increase in economic growth. The coefficient of internet is 0.001638 which denotes that 1% increase in internet leads 0.001638% increase in economic growth. The error

correction term (ECT) coefficient is -1.205078 which is negative and significant, which confirms that economic growth, innovation and internet are cointegrated at 1% level of significance. This suggests that innovation and internet strongly influences economic growth.

Table 6: ARDL results when innovation (I) is the dependent variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
LOG(PI)	0.088122***	0.001904	46.28584	0.0000
DLOG(Y)	3.916335***	0.287044	13.64367	0.0000
Short Run Equation				
ECT	-0.449765***	0.087898	-5.116897	0.0000
DLOG(I(-1))	-0.007382	0.092459	-0.079839	0.9364
DLOG(I(-2))	-0.093592	0.071390	-1.311006	0.1904
DLOG(I(-3))	0.088657	0.069435	1.276845	0.2021
DLOG(PI)	-0.053683	0.166358	-0.322697	0.7470
DLOG(PI(-1))	-0.020148	0.101025	-0.199436	0.8420
DLOG(PI(-2))	0.063307	0.107023	0.591526	0.5544
DLOG(PI(-3))	-0.095019	0.103187	-0.920841	0.3575
DLOG(Y,2)	-1.531637**	0.736368	-2.079987	0.0379
DLOG(Y(-1),2)	-2.132515***	0.800076	-2.665392	0.0079
DLOG(Y(-2),2)	-0.970261	0.624516	-1.553621	0.1208
DLOG(Y(-3),2)	-0.567672	0.627273	-0.904985	0.3658
C	1.852615***	0.368517	5.027222	0.0000

Table 6 states the results of ARDL estimation of Equation (2). Long run equation results shows that economic growth log (Y) and internet log (PI) have a positive and significant impact on innovation. The error correction term (ECT) coefficient is -0.449765 which is negative and significant, which confirms that economic growth, innovation and internet are cointegrated at 1% level of significance in equation (2). This suggests that economic growth and internet strongly influences innovation.

4. Conclusion

The main purpose of this paper has been to highlight the connection between innovation and economic growth taking into consideration the matter of internet in economic growth and innovation. We try to take global evidence from 76 developed and developing countries during the period 1995 - 2016. By using the Panel ARDL model, the empirical results indicate that there is a positive unidirectional long run relationship between innovation and economic growth.

Also, our estimation indicated that the internet has a positive effect on innovation and economic growth in the long run.

The clear inclusion of this investigation is that it supplies an authenticated search which could be valuable for policy makers, which should promote innovation and the use of internet as a strategic tool in various sectors, such as commerce, service, tourism, health, industry, education and agriculture to explore the role of the internet as a strategic tool in these sectors. We also propose to the countries of the world to develop procedures and strategies to facilitate access to more high-quality patents through the Internet through the expenditure on scientific research in various fields, in order to create many innovations and inventions through the rapid selection of patents aimed at achieving sophistication and sustainable development.

References

Choi, C. and M. H. Yi (2009). The effect of the Internet on economic growth: Evidence from cross-country panel data. Economics Letters, 105, 39-41.

Hasan, I. and Tucci, C.L (2010). The innovation-economic growth nexus: global evidence, *Research Policy, Vol. 39(10), 1264–1276.*

Im, K.S., Pesaran, M.H., Shin, Y (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics* 115, 53–74.

Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics*, 90, 1–44.

Levin, A., Lin, C. F. and Chu, C. S. J (2002). Unit root tests in panel data: asymptotic and finite sample properties, *Journal of Econometrics* 108, 1–24.

Mabrouki, M (2018). Supporting economic growth through innovation: How does human capital influence the rate of growth? *Economics Bulletin, AccessEcon*, vol. 38(2), *957-972.*

Maddala, G.S and Wu, S (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics* 61, 631–652.

Pesaran, M. H., Shin, Y., and Smith, R. P. (1999). Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. *Journal of the American Statistical Association*, *94(446), 621–634.*

Romer, P.M (1986). Increasing returns and long-run growth. *Journal of Political Economy 94 (5), 1001–1037*.

Romer, P.M (1990). Endogenous technological change. *Journal of Political Economy 98 (5), S71–S102.*

Schumpeter, J.A (1932). *Capitalism, Socialism, and Democracy*. Harper and Brothers, New York.

Saidi, K and Mongi, C (20.18). The Effect of Education, R&D and ICT on Economic Growth in High Income Countries, Economics Bulletin, AccessEcon, 38(2), 810-825.

Stokey, N.L (1995). R&D and economic growth. *Review of Economic Studies* 28 (4), *1661–1707.*

Tripathi, M and Inani, S.K (2016). Does internet affect economic growth in sub-Saharan Africa?', *Economics Bulletin, AccessEcon, 36 (4), 1993-2002.*

Zaghdoudi, T (2017). Internet usage, renewable energy, electricity consumption and economic growth: Evidence from developed countries, *Economics Bulletin, AccessEcon, Volume 37(3),1612-1619.*