Lead-lag between female employment and economic growth: evidence from Canada

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Abstract

Based on estimations by (Aguirre, Hoteit, Rupp, & Sabbagh, 2012) there are 865 million women who have the potential to participate in their countries economic development worldwide. Thus, it is a matter of concern to see the effect of their contribution to the economy and how this contribution can be enhanced. In the recent years, there have been numerous studies on the issue of women labor force participation in the economy and economic growth. however, there is a limited number of studies focusing on the casual relation between the mentioned variables. This article is looking into the issue of the causal relationship of women labor force participation in the economy, gender equality in education, and economic growth by using the standard time series techniques such as, VECM and VDC. The results of the paper tend to indicate that there is a bilateral causality between women employment and economic growth where in the short-run GDP is the leading variable but in the long-run it is women employment which is the leader.

Keywords: lead-lag, female employment, economic growth, VECM, VDC

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Introduction

Even though women have contributed to all stages of production for centuries, they first present their effort for a fee by the industrial revolution. During the first and second World Wars with the conscription of men, the labor force participation of women increased. Since the 1950s, where the structure of the work force of the economy has started to change from agricultural and industrial to that of service, an increase has occurred in the female labor force participation. Starting from the 1970s, the expansion of international trade and the shift of demand from standard products to the products with many features depending on the globalization have led countries to adopt a flexible mode of production. Flexible production system provided an important opportunity for the women who were unable to attend labor force due to family responsibilities and due to this opportunity in recent years, the female labor force participation in developed countries has continued its increasing trend.

Different studies have been conducted to find the relation between female labor force participation in the economy and its effect on economic growth. As an example (Loko & Diouf, 2009) showed that there can be significant macroeconomic gain by increasing women labor force participation in the economy. At the same time, they argued that they can increase the labor market production potential. Bearing this in mind the above mentioned issue (Aguirre et al., 2012) estimated that there are 865 million women worldwide who can contribute to their countries work force in which 812 million are living in emerging and developing countries.

Take into account what have been said it's really important to go deep into this issue. Another important aspect that can be looked at in regard to women employment and economic growth is how to increase participation of women labor force in the economy. Regarding this issue (Lahoti, 2013) finds out that increase in education level can lead to more participation of women labor force in the economy. (Löfström, 2010) also noted that gender equality in education has significant effect on women labor force participation in economy.

However, there are still gaps in the literature regarding the causal relationship between female labor force participation and economic growth. the same issue is also a matter of concern in regard to women education and its causal relationship with economic growth. as a matter of fact, most of the studies regarding this issue has been done on the absolute relationship not the casual relation.

This paper is trying to look at the casual relationship between women employment in different sectors which are industrial and service sector, government expenditure on education which is a proxy to more gender equality in education, and economic growth. This study tries to reduce the gap in the literature by finding the causality chain between the above mentioned variables.

Results of the study show that there is bilateral causal relationship between women employment in service sector and GDP where in short-run GDP is the leader variable and in the long run it is women employment which is leading the system. It is worth mentioning that the results are consistent with economic theory of employment and growth.

The paper is consists of 4 parts. First it goes through prior literature briefly. The next parts are the methodology which have been used to conduct the research. Part 3 is assigned to explain the data, empirical results and to discuss what have been found. The last part is the conclusion of the paper and policy implications.

Literature Review

In light of the introduction and role of women in the economy (Fehime & Ekrem, 2014) found out that female labor force participation in economy has significant positive effect on economic growth. (Löfström, 2010) also finds that much of the increase in GDP in OECD countries in the las 10 to 15 years is because of the women employment. In regard to developing countries (Verick, 2014) examined that female participation is an important driver of economy but at the same he shows that women participation in the economy is mostly due to shocks in the economy. however, he argued that in developing countries high female labor force participation is a result of extreme poverty. In the other hand, (Mammen & Paxson, 2000) take a look to the issue of women and economic growth from the other way around. They found that by increasing economic growth female participation in labor force decrease at the beginning and increase after that. They also argued that increased economic growth decrease the education gap between men and women. In the other hand, (Lahoti, 2013) argued that women participation in economy does not influence growth in the economy. He also finds out the other way round effect that shows that growth itself is not increasing women labor force participation in economy but it is the structure of growth and its dynamic which matter most. He concluded that it is just the women employment in service sector which is the leading factor in growth rate in the economy whereas

agricultural and industrial employment which are more labor based are not really affecting growth in the economy.

Another issue regarding women employment is women education level. As different paper find that higher education level comes with higher level of women employment. Among these paper (Löfström, 2010) found out that the higher the education level the more women employed in the economy. He also explained that increased cost of education reduces education level thus, reduce gender inequality and employment. Report by (OECD), 2014) shows that in order to increase economic growth gender inequality must be decreased and one of the way to do so is preparing equal education opportunities for women. In the other hand, (Ogus, 2013) argues that while increased education level increases the potential of women to be employed there is not much changes in employment of women based on changes in their education level in emerging countries in Asia. In another study in India by (Lahoti, 2013) it is stated that increased women education in first stages of development reduces labor force participation in the economy before it starts to rise again.

Methodology

Based on objective of the paper time series analysis (Engle-Granger and Johansen approaches) have been chosen to be implied on the data. Unit root tests of Augmented dickey fuller and Philips Perron has been implied on each variable's log form to find if the variables are non-stationary or not in the level form in order to meet the minimum requirement of time series analysis. First difference of log form of each variable has been taken and tested for stationarity by ADF and PP tests.

Multivariant unrestricted VAR has been used to find number of lags to be used in the next steps.

To find cointegration vectors two cointegration test of cointegration have been used. First Engle-Granger error term unit root test have been used to find stationarity in error term to find cointegration vector for all four variables. Johansen cointegration test has been applied to the variables by 2 orders of VAR. Long run structural modeling is the next step to impose restrictions on the system based on prior theories in the literature. Vector Error Correction Model test have been applied after over-identification to the model. It shows the absolute exogeneity/endogeneity and diagnosis of the model regarding auto-correlation, functional form, heteroskedasticity, and normality. Variance Decompositions is used in order to find causal chain

among variables. 24 horizons have been imposed from this step onward to VDC, IR, and PP. Relative exogeneity/endogeneity have been taken by comparing different variables explanation by their own. Both orthogonalized and generalized methods have been used in this step onward. Orthogonalized method deals with correlation and take into account the theoretical underpinning imposed by LRSM through exact and over identification. However, generalized method is more general and don't consider what have mentioned above. Impulse Response method has been used to show graphically the response of each variable on 1 standard deviation positive shock in a variable. The speed of adjustment is also shown in Impulse Response to explain after how many horizon the variable goes back to equilibrium. Persistence Profile is used to see the impact of a system wide shock on the whole system together and how long does it take for the system to go back to equilibrium.

Data, Empirical Results, and Discussion

Four variables have been used in this paper which are: GDP, Government expenditure on education (GE), Women employment in service sector (SVE), and Women employment in industrial sector (INE). The data have been collected from world bank covering 35 years starting from 1980.

Unit root test

ADF test has been used to test unit root of the variables. However, bearing in mind that ADF just deals with auto-correlation PP test has been used alongside ADF test to address auto-correlation and heteroskedasticity at the same time and see whether there is any difference or not. Table1 shows the results of two tests. At the same time, both tests have been applied for first difference of each variable to check if the first difference is stationary or not in order to proceed to the next step.

Based on the results from Table1 all variables are stationary in the level form while all variables after first difference become stationary thus, all the condition to go to the next steps are in place.

	ADF-Test			PP-Test		
	T-Statistic	Critical Value	Series Type	T-Statistic	Critical Value	Series Type
LGDP	-2.1991	-3.6428	Non-Stationary	-0.66346	-2.8811	Non-Stationary
LGE	-2.1657	-3.6428	Non-Stationary	-1.2463	-2.8811	Non-Stationary
LINE	-1.9585	-3.5631	Non-Stationary	-0.33313	-2.8811	Non-Stationary
LSVE	-2.324	-3.5631	Non-Stationary	-1.3751	-2.8811	Non-Stationary
DGDP	-3.3262	-2.8379	Stationary	-3.9557	-2.9308	Stationary
DGE	-3.0812	-2.8379	Stationary	-6.2031	-2.9308	Stationary
DINE	-3.0868	-2.9094	Stationary	-5.321	-2.9308	Stationary
DSVE	-3.0413	-2.9094	Stationary	-6.5251	-2.9308	Stationary

Table 1 Unit root test results

Order of VAR

Before going to cointegration test order of VAR or number of lags imposed should be determined. Based on two criteria of AIC and SBC 2nd order lag has been assigned as number of lags to be implied on cointegration tests.

Order	AIC	SBC	LR Test	Adjusted LR Test
2	332.3032	305.366	CHSQ(16)=34.3369[.005]	24.9723[.070]

Table 2 Multivariant unrestricted VAR results

Cointegration tests

For cointegration test Engle-Granger and Johansen tests have been used to find cointegration vectors among variables. Four models have been regressed to run E-G on their error terms in order to find cointegration vector. The models are as following:

$$lGDP = lINE + lSVE + lGE + e_1 \qquad \text{I}$$

$$lINE = lGDP + lSVE + lGE + e_2 \qquad \text{II}$$

$$lSVE = lGDP + lINE + lGE + e_3 \qquad \text{III}$$

$$lGE = lGDP + lINE + lSVE + e_4 \qquad \text{VI}$$

The results of E-G test on each error term has been shown in table3.

	I	II	III	VI
Test	ADF(1)	ADF(2)	ADF(1)	ADF(1)
Statistic	30.586	-1.6373	-1.1559	-2.2747
AIC	28.586	92.0899	162.1904	48.9164
SBC	27.1203	89.8913	160.7246	47.4507
DF Statistic	-4.4568	-4.4568	-4.4568	-4.4568

Table 3 E-G cointegration method (unit root test for error terms)

In order to have cointegration based on E-G test error terms of OLS regression should be stationary. Based on the results from E-G unit root test of residuals of each regression none of the error terms are stationary thus, based on E-G test there is no cointegration vector among these variables.

Johansen's cointegration test

Johansen's cointegration test has been applied with 2 lags determined by order of VAR and the results are as following.

Maximal Eigenvalue of the Stochastic Matrix				Trace of the Stochastic Matrix			
Null	Alternative	Statistic	Critical Value	Null	Alternative	Statistic	Critical Value
r=0	r=1	33.7364	31.79	r=0	r=1	75.5658	63
r<=1	r=2	19.4753	25.42	r<=1	r=2	41.8293	42.34

Table 4 Johansen's cointegration test

Based on the results from Johansen's cointegration test there is only one cointegration matrix among variables.

Long run structural modeling (LRSM)

To see whether cointegration vector is consistent with theoretical underpinning LRSM is applied to the variables. *lGDP* which is supposed to be influenced by other variables has been restricted in the exact identification. Where *lSVE*, *lINE*, and *lGE* have been restricted in the overidentification. The results are shownt in Table4.

	A1=1	A1=1, A4=0	A1=1, A4=0, A3=0	A1=1, A4=0, A3=0, A4=0
lGDP	1.0000	1	1	1
	(*NONE*)	(*NONE*)	(*NONE*)	(*NONE*)
lGE	-0.88228	-0.81135	-1.7104	0
	0.59855	0.50648	0.5802	(*NONE*)
lINE	1.6321	1.5031	0	0
	0.88401	0.68417	(*NONE*)	(*NONE*)
lSVE	2.3624	0	0	0
	10.2144	(*NONE*)	(*NONE*)	(*NONE*)
CHSQ(1)	NONE	.053797[.817]	3.8567[.145]	13.8802[.003]

Table 5 Exact and over identification of LRSM

VECM

To find out exogeneity/endogeneity of each variable error correction model has been applied to the variable based on exact and over identification done in LRSM step. The results are shown in Table5.

	lGDP	lGE	lINE	lSVE
	ecm1(-1)			
Coefficient	-0.24232	0.17359	-0.092949	0.0065994
T-Ratio[prob]	-2.4915[.019]	2.1678[.039]	-1.8768[.071]	.91968[.366]
Results	Endogenous	Endogenous	Endogenous	Exogenous
	Diagnostic Tests			
Serial Correlation	.68248[.409]	.39589[.529]	.74725[.387]	3.9733[.046]
Functional Form	.22961[.632]	4.6215[.032]	4.2162[.040]	2.0516[.152]
Normality	.0070248[.996]	.95356[.621]	.25430[.881]	4.6989[.095]
Heteroscedasticity	.38492[.535]	.21074[.646]	.029195[.864]	.35218[.553]

Table 6 VECM results with diagnostic

The results show that two of the variables which are GDP and Government Expenditure on Education are endogenous. In the other hand, women employment in industrial sector is endogenous in 90% significance level while it is exogenous with 95% significance level. Women employment in service sector is exogenous. The results are supporting theory and prior literature regarding the issue that women employment will results in changes in GDP. However, in this case it is expressed that in a lead-lag relationship women employment particularly employment in service sector is the leader in the long run. Whereas women employment in industrial sector exogeneity is to be fund in VDC step. GDP and government expenditure in education is seems to be following women employment in the service sector. s

Results can be explained based on the fact that women employment regardless of the sector is part of the total employment and it is well known that increase in employment could results in an increase in GDP. So, it is an obvious fact that women employment is the leader.

However, the potency of causality cannot be derived from VECM. Thus, VDC is needed in order to find relative causality.

VDC

To find relative exogeneity/endogeneity VDC has been applied to data. Both Orthogonalized and Generalized VDC been used in order to don't miss any important changes in results.

		lGDP	lGE	lINE	lSVE	Rank
Horizon 1	lGDP	87.57%	6.15%	2.66%	3.62%	1
	lGE	12.04%	75.72%	7.32%	4.92%	2
	lINE	0.78%	10.50%	46.91%	41.81%	4
	lSVE	1.62%	8.05%	42.81%	47.52%	3
Horizon 5	lGDP	69.37%	23.41%	5.71%	1.51%	1
	lGE	13.25%	65.90%	12.79%	8.06%	2
	lINE	0.64%	8.44%	44.78%	46.15%	4
	lSVE	1.06%	5.83%	40.22%	52.89%	3
Horizon 9	lGDP	59.02%	28.98%	10.03%	1.97%	2
	lGE	13.72%	59.98%	16.01%	10.30%	1
	lINE	0.71%	7.31%	42.24%	49.74%	4
	lSVE	1.17%	4.52%	37.17%	57.14%	3
Horizon 13	lGDP	55.09%	30.47%	12.02%	2.42%	3
	lGE	13.90%	57.13%	17.44%	11.52%	2
	lINE	0.75%	6.87%	40.76%	51.62%	4
	lSVE	1.26%	3.98%	35.41%	59.35%	1
Horizon 17	lGDP	53.20%	31.05%	13.04%	2.71%	3
	lGE	13.99%	55.61%	18.17%	12.23%	2
	lINE	0.78%	6.65%	39.91%	52.66%	4
	lSVE	1.31%	3.70%	34.40%	60.58%	1
Horizon 21	lGDP	52.14%	31.34%	13.63%	2.89%	3
	lGE	14.03%	54.70%	18.59%	12.67%	2
	lINE	0.80%	6.53%	39.38%	53.29%	4
	lSVE	1.35%	3.54%	33.77%	61.34%	1

Table 7 Orthogonalized VDC

		lGDP	lGE	lINE	lSVE	Rank
Horizon 1	lGDP	87.57%	6.15%	2.66%	3.62%	1
	lGE	12.04%	75.72%	7.32%	4.92%	2
	lINE	0.78%	10.50%	46.91%	41.81%	4
	lSVE	1.62%	8.05%	42.81%	47.52%	3
Horizon 5	lGDP	69.37%	23.41%	5.71%	1.51%	1
	lGE	13.25%	65.90%	12.79%	8.06%	2
	lINE	0.64%	8.44%	44.78%	46.15%	4
	lSVE	1.06%	5.83%	40.22%	52.89%	3
Horizon 9	lGDP	59.02%	28.98%	10.03%	1.97%	2
	lGE	13.72%	59.98%	16.01%	10.30%	1
	lINE	0.71%	7.31%	42.24%	49.74%	4
	lSVE	1.17%	4.52%	37.17%	57.14%	3
Horizon 13	lGDP	55.09%	30.47%	12.02%	2.42%	3
	lGE	13.90%	57.13%	17.44%	11.52%	2
	lINE	0.75%	6.87%	40.76%	51.62%	4
	lSVE	1.26%	3.98%	35.41%	59.35%	1
Horizon 17	lGDP	53.20%	31.05%	13.04%	2.71%	3
	lGE	13.99%	55.61%	18.17%	12.23%	2
	lINE	0.78%	6.65%	39.91%	52.66%	4
	lSVE	1.31%	3.70%	34.40%	60.58%	1
Horizon 21	lGDP	52.14%	31.34%	13.63%	2.89%	3
	lGE	14.03%	54.70%	18.59%	12.67%	2
	lINE	0.80%	6.53%	39.38%	53.29%	4
	lSVE	1.35%	3.54%	33.77%	61.34%	1

Table 8 Generalized VDC

In both cases the results for the 2nd and 4th ranks are the same. Government expenditure on education is the 2nd rank while women employment in industrial sector is 4th rank. However, the results for first and third ranks are more complex. Based on what was fund in VECM women employment in service sector is supposed to be exogenous and GDP is supposed to be endogenous. But, according to VDC results in both Orthogonalized and Generalized methods in SVE has 3rd rank in horizon 1,5, and 9 while it has 1st rank in horizon 13, 17, and 21. In the other hand, GDP got 1st rank in horizon 1 and 5, rank 2nd in horizon 9, and rank 3rd in horizon 13, 17, and 21.

Based on these results, it can be implied that women employment in service sector is more exogenous than GDP thus, it is the leader in a lead-lag relationship. However, it can also be discussed from time frame perspective where GDP is more exogenous in the short-run while SVE is more exogenous in the long-run. The casual chain in this case can be shown in three different way as it is expressed in the following lines. Another important inference that can be made by this results is that there is a bilateral causality between GDP and SVE. Where GDP changes GE and after that SVE in the short-run. While this changes in SVE in short run changes GDP through GE in the long run.

$GDP \rightarrow GE \rightarrow SVE \rightarrow INE$ Short-Run

$SVE \rightarrow GE \rightarrow GDP \rightarrow INE$ Long-Run

$SVE \rightarrow GE \rightarrow GDP \rightarrow INE$ Generally

The results are consistent with theory where employment is known to be one of the factors in which influence national income. However, the fact that in Canada more than 80% of the women are employed in service sector pushed INE to be endogenous where it follows other variables. At the same time, GDP in the short run is a stimulator for employment thus, in short run we have GDP to be the leader not SVE. Government expenditure on education is seems to be always the 2nd most exogenous variable where is short run it is influenced by GDP based on the increased national income and maybe political issues and it is affecting women employment while in the long-run its effected by SVE and it is affecting GDP. It is obvious that changing government expenditure results in changes in GDP however, it's hard to explain how women employment in service sector can affect government expenditure on education. One explanation could be that increased women employment increase government tax base thus, more funds for government to spend on education. The other explanation could be based on the proportion of this employed women working for government. increased SVE means increased women working for government thus, increased expenditure of government on education.

Impulse Response

In this step, each variable has been shocked and the effect of this shock on the other variables have been studied. Both Orthogonalized and Generalized approaches have been used to take account of different situations. Orthogonalized method deal with correlation at the same time it is taking into account the theoretical restriction in LRSM step. Whereas Generalized method do not deal with these issues. In both case 1 SD positive shock has been imposed to the focus variable and its response with others have been examined.

After a shock to SVE all variables come to equilibrium after horizon 24 however SVE itself has been already in equilibrium in horizon 12 based on Orthogonalized method. After the shock GDP and INE are going in the same way but GDP comes to its pervious equilibrium while INE goes to a new equilibrium. GE increases after the shock however, it decreases dramatically and comes to a new equilibrium under its pervious equilibrium.

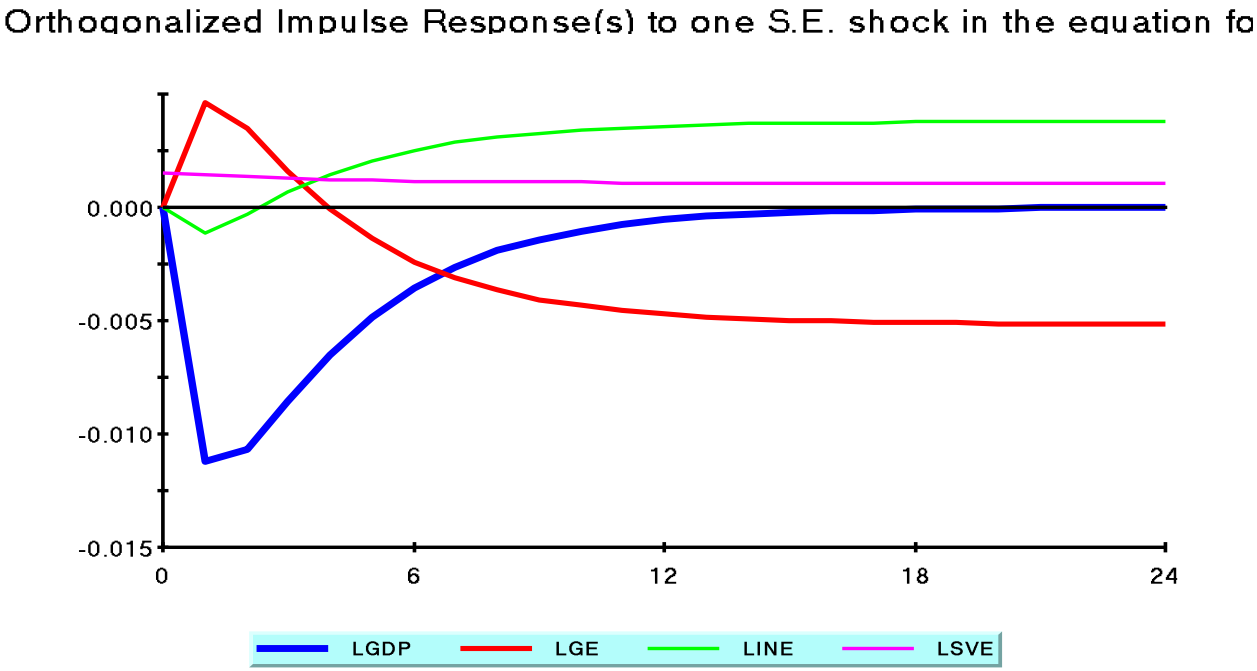


Figure 1 Orthogonalized impulse response (shock to ISVE)

Based on Generalized method the impact of the shock has been offset after horizon 12 however in contradiction with orthogonalized method this time LGE is coming back to its pervious equilibrium.

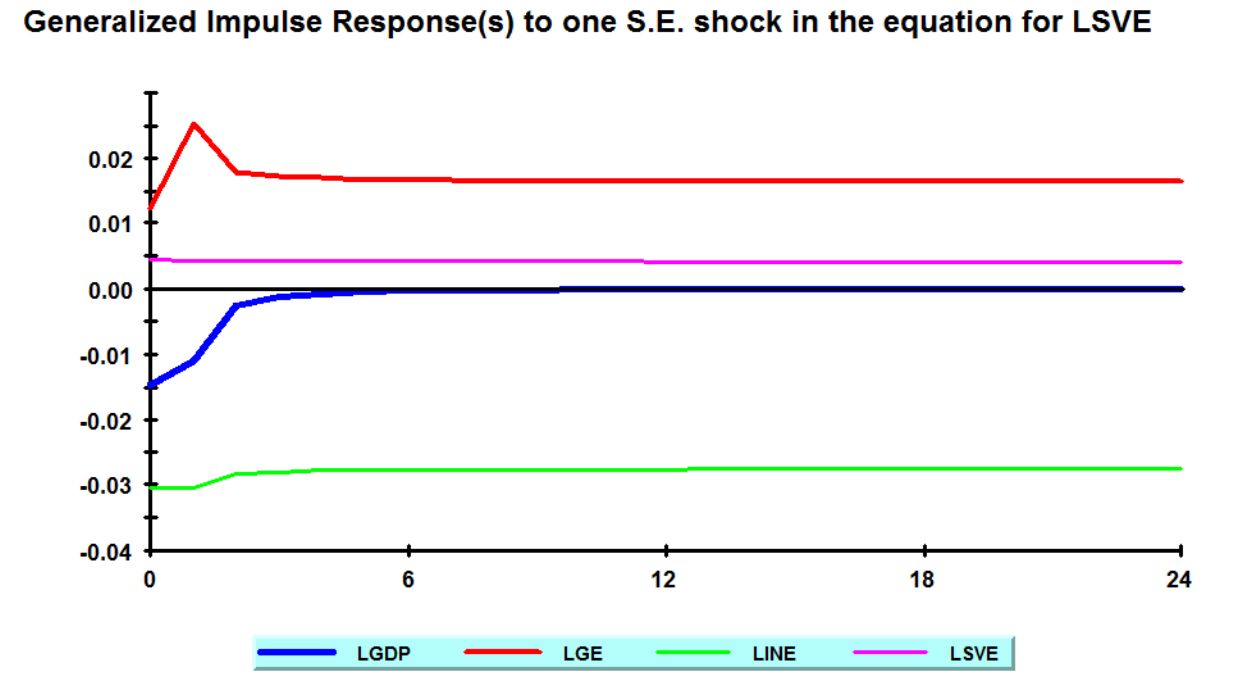


Figure 2 Generalized IR (shock to lSVE)

As it is shown in the graphs both orthogonalized and generalized impulse response are showing the same results. SVE is the most exogenous thus, it is the least affected by the shock. However, the impact of the shock to INE is identical to that of GDP but, the response of GE is identical in the opposite direction.

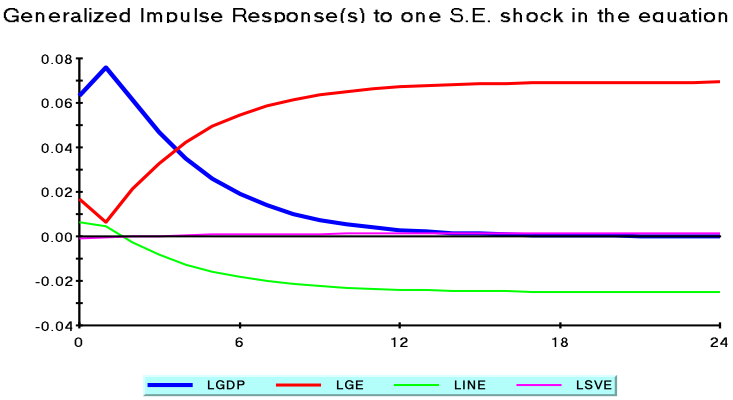


Figure 3 Generalized IR (shock to lGDP)

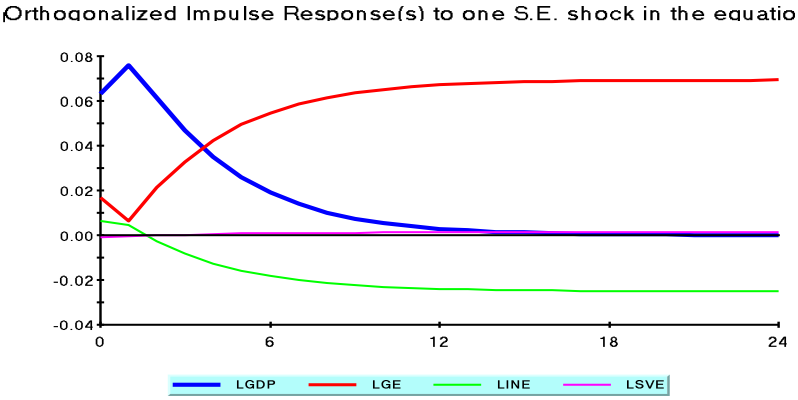


Figure 4 Orthogonalized IR (shock to lGDO)

Impulse response results of other variables are all identical to what has been explained before and it can be seen in the graphs

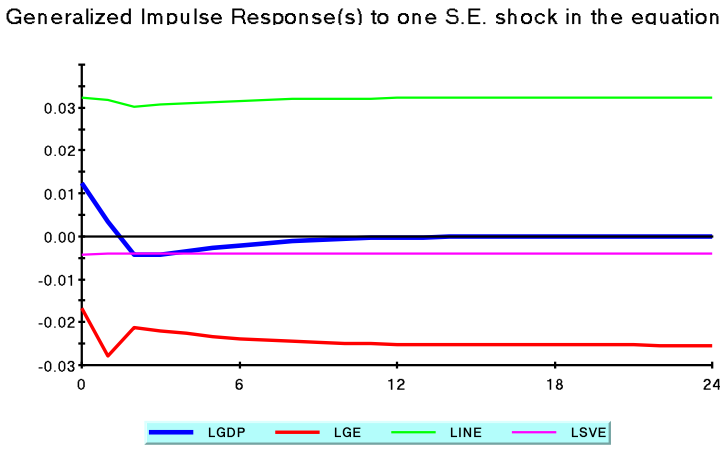


Figure 6 Generalized IR (shock to lINE)

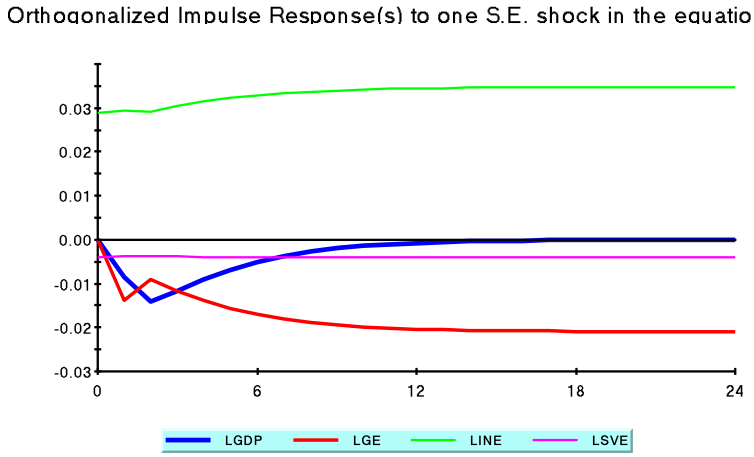
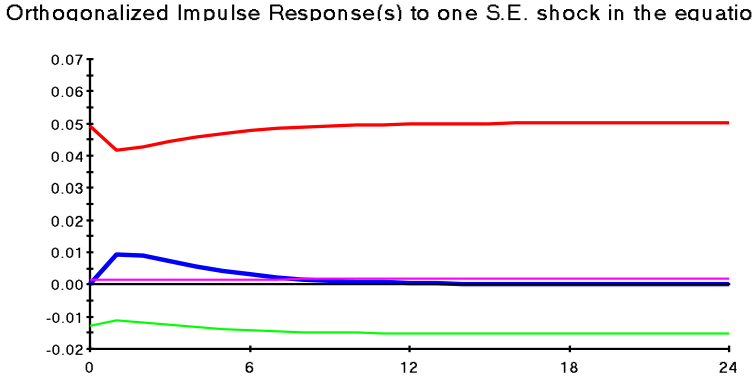
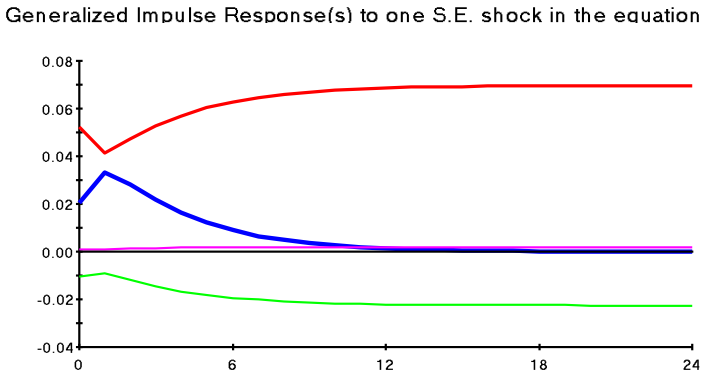


Figure 5 Orthogonalized IR (shock to lINE)





As a whole impulse response increased the confidence about results which presented SVE as the most exogenous variable. INE is the lease exogenous one and the important point is that by the time shocks reach INE the effect is the lowest among all other variables. It is also worth mentioning that responses to the shocks are identical in GDP and INE. GDP and GE are the intermediate variables where their response to the shocks are identical but in opposite direction.

Persistence Profile

In persistence profile the impact of a system wide shock on the variables and their response to the shock is examined. Based on what has been found in the results a wide system shock increases the outcome of the system in the first horizon by 1.5%. however, after that the system start to go back to equilibrium. Thus, after horizon 12 the system goes back to its equilibrium. The explanation that can be given regarding the increased after shock is that by looking at the results from impulse response graphs it is obvious that GDP has been always responded to the shocks positively just in the case of shocks in INE it has negative response and it is important to note that GDP response has been always the highest among other variables.

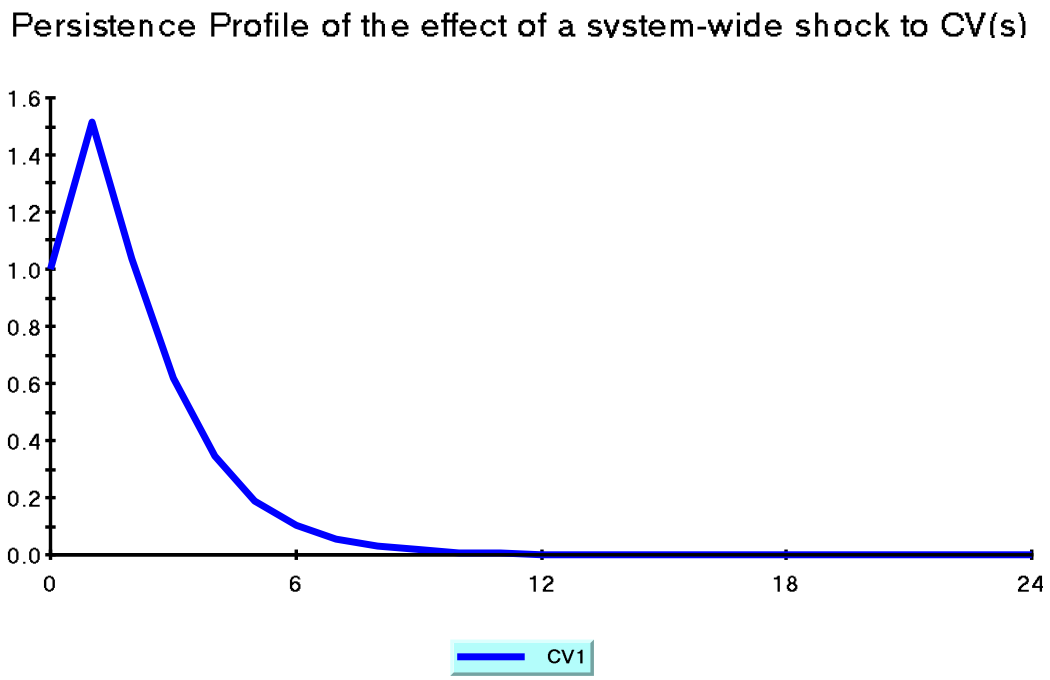


Figure 9 Persistence Profile

Conclusion and Policy Implication

The methods applied in this paper show that women employment in service sector is the leading factor of GDP, government expenditure on education and women employment in industrial sector. The results from Variance Decompositions also show that there is a bilateral causality between women employment in service sector and GDP. Indeed, in short-run GDP is the leader factor whereas in the long-run it is the women employment in service which is the leader. Government expenditure has been always the 2nd most exogenous variable in the system. Women employment in industrial sector is the least exogenous or the most endogenous variable in the system. However, women employment in industrial sector is the least affected variable after shocks to different variables whereas, GDP and government expenditure on education are the most volatile variables after shocks. They are identical in responses to the shock but in the opposite direction.

The findings by this paper have huge policy implications specially in developing countries where it is the question. Government can imply two different approaches in short-run and long-run. Where, they can try to increase GDP by different means where this increase lead to increase in government expenditure on education, and at the end women employment. However, at the long run this increased women employment specially that of service sector can lead to higher government expenditure on education and increased GDP.

There is still a gap in the literature that can be filled by the future researches in regard to women employment and income distribution in the economy and competitiveness in labor market.

References

Aguirre, D., Hoteit, L., Rupp, C., & Sabbagh, K. (2012). *Empowering the Third Billion: Women and the World of Work in 2012*, New York, Booz and Company.

Aterido, R. Thorsten, B. & Iacovone, L. (2011). Gender and Finance in Sub-Saharan Africa: Are Women Disadvantages, World Bank Policy Research Paper No. 5571.

Fehime, F., & Ekrem, A. (2014). The effect of women's employment on competitiveness and economic growth, *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 44, 59–71.

Kabeer, N. (2001). Conflicts over credit: Re-evaluating the empowerment potential of loans to women in rural Bangladesh, World Development, 29 (1), 63–84

Loko, B., & Diouf, M. A. (2009). Revisiting the Determinants of Productivity Growth: What's new? IMF working paper No: 225, International Monetary Fund, Washington.

Mammen, K., & Paxson, C. (2000). Women's Work and Economic Development. *The Journal of Economic Perspectives*, 14(4), 141–164.

OECD, International Monetary Fund, World Bank (2014), *Achieving stronger growth by promoting a more gender- balanced economy*, Report prepared for the G20 Labour and Employment Ministerial Meeting Melbourne, Australia, 10-11 September.

Pesaran, M.H. and Y. Shin (2002). Long Run Structural Modeling. Econometric Reviews, 21(1), 49-87.

Swamy, V. (2014). Financial Inclusion, Gender Dimension, and Economic Impact on Poor Households. World Development, 56, 1-15

Verick, S. (2018). Female labor force participation and development, IZA World of labor, Institute of labor Economics, 1 -87, December.