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## PATTERN ANALYSIS OF GOVERNMENT POLICIES EFFECT ON HOUSEHOLD SPENDING

**Dr. Thangjam Ravichandra**

Assistant Professor & Coordinator

Department of Professional Studies

Christ University, Bangalore, India

### **Abstract**

In this paper an attempt has been made to analyse the effect of government spending, government revenue and household spending on each. For this purpose of research, three OECD member countries have considered – France, Korea and USA. The government spending, government revenue and household spending have been analysed to establish a relationship and to see as to who the driver is and who is the driven. The driver and the driven here could either be one of the three variables i.e. government revenue, government spending or household spending. The results of Johansen Co-integration Test and Granger Causality Test will help us understand the sensitivity of household expenditure towards the changes in fiscal policies.

**Keywords:** *Fiscal consolidation, Fiscal consolidation episodes, Johansen Co-integration test, Granger Causality test, OECD countries.*

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## 1. INTRODUCTION

After a long period of recession or economic failures, governments generally do indulge in some or the other form of activities which include formulation of fiscal policies. The whole application of these fiscal policies is known as fiscal consolidation and the period in which these policies are applied are known as fiscal consolidation episodes. Fiscal policies can be done through three methods namely income method, expenditure method and the third being the combination of the first two methods. For the purpose of this study, three members of the OECD forum – France, Korea and USA have been taken up as the subjects. The OECD forum consists of 35 member countries, which is an intergovernmental economic organization, founded to stimulate economic progress and world trade. The basis for selection of these countries is to stimulate a worldwide economic conglomerate as these three countries are spread across three different continents. The government revenue, government spending and household spending are all taken up in terms of the GDP of that particular economy.

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## 2. REVIEW OF LITERATURE

- a) **Fiscal Consolidation: How Much, How Fast and by What Means?** : Douglas Sutherland, Peter Hoeller, Rossana Merola (2012)

This research study addresses the fact that a fiscal crisis is an inevitable event in a country's history. The authors have prepared this paper keeping in mind the fiscal crisis faced by the OECD countries. Further, it is said that in fiscal consolidation the major challenges faced are that of addressing the consequences of the crisis, its underlying weaknesses and also the pressures that are created on the future spending. In this crisis countries are faced with an array of choices as to when fiscal consolidation should be made, how much fiscal consolidation is needed and what are the best instruments which help in the process of fiscal consolidation. The results to the first problem i.e. the debt, suggests that a substantial and sustained fiscal tightening will be needed in almost all the countries. But given the condition of the global economy it is costly to implement fiscal tightening at such a large scale. Now addressing the problem as to which instrument to use, the authors suggest that the fiscal consolidation should be structured in such a way that initially instruments with low multiplier effect should be used and overtime the institutional framework should be enhanced this will further improve the commitment towards the fiscal consolidation. In doing so the governments will be able to minimise the trade-offs along with some growth in the short-run.

- b) **The Challenge of Debt Reduction during Fiscal Consolidation** : Luc Eyraud and Anky Weber (2013)

This paper analyzes the impact of fiscal consolidation on the debt proportion. It first evaluates the significance of the monetary multiplier suspicion in the nexus between financial combination, development, and obligation lessening. With multipliers close to 1 in the present environment, fiscal consolidation is probably going to bring the debt proportion up in the short-run in the most

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exceptional nations. The authors give their observational confirmation supporting this speculation. The moderate reaction of the debt proportion to monetary alteration could be an issue if money related markets concentrate on its fleeting behaviour. Their investigation recommends three principle operational conclusions, which are exceptionally significant for Europe today.

To start with, thinking little of financial multipliers may bring about repulsive shocks. Second, utilizing the obligation proportion as an operational monetary target presents dangers. Third, a proper plan of combination bundles can limit unfriendly circles including monetary fixing and here and now obligation flow.

**c) Fiscal Consolidation in India : Sanhita Sucharita (2012)**

This research study aims at understanding the motive of fiscal adjustment from the mainstream and political economy approaches and it also investigates the crowding-out effects of fiscal imbalance in India. Further, this paper also attempts to understand the effects of election on the fiscal imbalance in India. For this purpose, an OLS method is used to analyse the effect of elections on the fiscal deficit in India. The author examines the impact of election year on the fiscal deficit-to-GDP ratio by regressing gross fiscal deficit (combined government) to GDP ratio against growth rate, population growth, and elections. In the end the author has analysed the effectiveness of government effort to control the fiscal imbalances. The empirical findings suggests that there is crowding-out effect of public investment on private investment and that elections do not significantly affect the fiscal deficit in India.

**d) Distributional effects of fiscal consolidation : Laurence Ball, Davide Furceri, Daniel Leigh, Prakash Loungani (June, 2013)**

This paper throws light on the debt increase that peaked to almost 100% in countries during the 2007-2009 recessions. It attributes this debt increase to lesser generation of revenue and financial bailouts of global financial institutions like AIG. This paper is significantly different from the others by the fact that it uses a parameter called CAPB – Cyclically Adjusted Primary Balance. The new values of fiscal variables now obtained after cyclic adjustments should reflect on the government's decision to change tax rates and spending levels. The paper concludes that fiscal consolidation has resulted in a substantial increase in equalizing wage disparities and the share of wages in the income but also tends to increase long term unemployment. The distributional effects need to be balanced out against the long term effects. Also measures to unexpected events such as slower growth than expected in the plan need to be considered.

**e) Confidence Effects of Fiscal Consolidation: Roel Beetsma, Jacopo Cimadomo, Oana Furtuna, Massimo Giuliodori (March, 2015)**

The given paper explores how fiscal consolidation affects majorly the private sector confidence and also to an extent the consumer confidence which influence business cycle fluctuations and also in transmission of fiscal shocks to the real economy. Consolidations can be of two types, revenue consolidations or spending-based consolidations. A negative result is seen when it comes to revenue based consolidations especially during booms. However, during slump spending based consolidations tend to increase consumer confidence. There by in conclusion from the findings of this paper if confidence is important and unavoidable also if confidence needs to

be retained then a need for spending based consolidation is recommended even in periods of slumps. Also solid institutional arrangements in terms of tight fiscal rules and transparent budgets help in mitigating and reducing substantially the negative confidence effects.

### **3. RESEARCH DESIGN**

#### **Scope of Study:**

We have considered three OECD countries for the purpose of calculation:

- France
- Korea
- USA

A timeframe of 38 years (from 1978 to 2015) has been considered for France and 45 years (from 1970 to 2015) for Korea and USA.

#### **Statement of Problem:**

In our work we aim at examining the changes in household spending due to fiscal policies. For the purpose of our study, we have used the Johansen Co-integration and Granger Causality test which will help us in understanding as to what is the driving factor.

#### **Objective of study:**

To understand if the household spending is driven by government policies i.e. revenue & spending or not.

#### **Source of Data:**

We will take secondary data of the following in our research:

- Government Revenue
- Government Spending
- Household Spending
- GDP

#### **Links:**

<http://www.oecd-ilibrary.org> - For data regarding fiscal consolidation

<https://data.oecd.org/economy.htm> - For country specific data relating to its economy

<https://data.oecd.org/government.htm> - For data relating to the government's revenue and spending

#### **Limitations of the study:**

- a) The present study is restricted to the three members of the OECD forum
- b) The study covers the data from the period ranging from 1970 to 2015
- c) Results are subject to information on governments and households which may be misstated.

#### **4. METHODS & ANALYSIS**

##### **METHODS -**

- 1) Johansen Co-integration test** - The Johansen test, named after Søren Johansen, is a procedure for testing co-integration of several time series. There are two types of Johansen test, either with trace or with eigenvalue, and the inferences might be a little bit different. The null hypothesis for the trace test is that the number of co-integration vectors is  $r=r^*<k$ , vs. the alternative that  $r=k$ .
- 2) Granger Causality test** - Granger's Causality Test- Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another. Causality in economics could be tested for by measuring the ability to predict the future values of a time series using prior values of another time series. A time series X is said to Granger-cause Y if it can be shown, usually through a series of t-tests and F-tests on lagged values of X (and with lagged values of Y also included), that those X values provide statistically significant information about future values of Y.

##### **ANALYSIS – Johansen’s Co-Integration and Granger’s Causality test on the government revenue and household spending.**

###### **Case 1: Korea**

###### **Co-integration test:**

Date: 01/31/17 Time: 19:50

Sample (adjusted): 1972 2015

Included observations: 44 after adjustments

Trend assumption: Linear deterministic trend

Series: ABSOLUTE\_REVENUE ABSOLUTE\_SPENDING

Lags interval (in first differences): 1 to 1

###### **Unrestricted Cointegration Rank Test (Trace)**

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.231921	13.15580	15.49471	0.1092
At most 1	0.034523	1.545864	3.841466	0.2137

Trace test indicates no co-integration at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**Granger Causality test:**

Pairwise Granger Causality Tests

Date: 01/31/17 Time: 19:52

Sample: 1970 2015

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
ABSOLUTE_SPENDING does not Granger Cause ABSOLUTE_REVENUE	44	3.72983	0.0329
ABSOLUTE_REVENUE does not Granger Cause			
ABSOLUTE_SPENDING		2.68098	0.0811

**Case 2: France****Co-integration test**

Date: 01/31/17 Time: 19:58

Sample (adjusted): 1980 2015

Included observations: 36 after adjustments

Trend assumption: Linear deterministic trend

Series: ABSOLUTE\_REVENUE ABSOLUTE\_SPENDING

Lags interval (in first differences): 1 to 1

**Unrestricted Cointegration Rank Test (Trace)**

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.153040	6.685617	15.49471	0.6145
At most 1	0.019419	0.705959	3.841466	0.4008

Trace test indicates no cointegration at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**Granger causality test:**

Pairwise Granger Causality Tests

Date: 01/31/17 Time: 20:00

Sample: 1978 2015

Null Hypothesis:	Obs	F-Statistic	Prob.
ABSOLUTE_SPENDING does not Granger Cause ABSOLUTE_REVENUE	36	1.28489	0.2910
ABSOLUTE_REVENUE does not Granger Cause			
ABSOLUTE_SPENDING		0.29265	0.7483

### Case 3: USA

#### Co-integration test:

Date: 01/31/17 Time: 20:04

Sample (adjusted): 1972 2015

Included observations: 44 after adjustments

Trend assumption: Linear deterministic trend

Series: ABSOLUTE\_REVENUE ABSOLUTE\_SPENDING

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.263422	22.42728	15.49471	0.0038
At most 1 *	0.184514	8.974746	3.841466	0.0027

Trace test indicates 2 cointegratingeqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

#### Granger Causality test:

Pairwise Granger Causality Tests

Date: 01/31/17 Time: 20:05

Sample: 1970 2015

Null Hypothesis:	Obs	F-Statistic	Prob.
ABSOLUTE_SPENDING does not Granger Cause ABSOLUTE_REVENUE	44	5.10433	0.0107
ABSOLUTE_REVENUE does not Granger Cause			
ABSOLUTE_SPENDING		1.21223	0.3085

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**ANALYSIS - Johansen's Co-Integration and Granger's Causality test on the government spending and household spending.**

**Case 1: Korea**

**Co-integration test:**

Date: 01/31/17 Time: 20:13

Sample (adjusted): 1972 2014

Included observations: 43 after adjustments

Trend assumption: Linear deterministic trend

Series: ABSOLUTE\_GOVERNMENT\_SPEN

ABSOLUTE\_HOUSEHOLD\_SPEND

Lags interval (in first differences): 1 to 1

**Unrestricted Cointegration Rank Test (Trace)**

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.459896	26.90843	15.49471	0.0006
At most 1	0.009735	0.420676	3.841466	0.5166

Trace test indicates 1 cointegratingeqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**Granger Causality test:**

Pairwise Granger Causality Tests

Date: 01/31/17 Time: 20:14

Sample: 1970 2014

Lags: 2

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Null Hypothesis:				F-	
				Obs	Statistic Prob.
ABSOLUTE_HOUSEHOLD_SPEND	does	not	Granger	Cause	
ABSOLUTE_GOVERNMENT_SPEN				43	21.74945.E-07
ABSOLUTE_GOVERNMENT_SPEN	does	not	Granger	Cause	
ABSOLUTE_HOUSEHOLD_SPEND					1.018580.3708

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**Case 2: France****Co-integration test:**

Date: 01/31/17 Time: 20:17

Sample (adjusted): 1997 2014

Included observations: 18 after adjustments

Trend assumption: Linear deterministic trend

Series: ABSOLUTE\_GOVERNMENT\_SPEND

ABSOLUTE\_HOUSEHOLD\_SPEND

Lags interval (in first differences): 1 to 1

**Unrestricted Cointegration Rank Test (Trace)**

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.412201	10.10155	15.49471	0.2730
At most 1	0.029386	0.536879	3.841466	0.4637

Trace test indicates no cointegration at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

**Granger Causality test:**

Pairwise Granger Causality Tests

Date: 01/31/17 Time: 20:19

Sample: 1995 2014

Lags: 2

Null Hypothesis:				F-	
				Obs	Statistic Prob.
ABSOLUTE_HOUSEHOLD_SPEND	does	not	Granger	Cause	
ABSOLUTE_GOVERNMENT_SPEND				18	1.46012 0.2679
ABSOLUTE_GOVERNMENT_SPEND	does	not	Granger	Cause	
ABSOLUTE_HOUSEHOLD_SPEND				0.19482	0.8253

### **Case 3: USA**

#### **Co-integration test**

Date: 01/31/17 Time: 20:21

Sample (adjusted): 1972 2015

Included observations: 44 after adjustments

Trend assumption: Linear deterministic trend

Series: ABSOLUTE\_GOVERNMENT\_SPEN

ABSOLUTE\_HOUSEHOLD\_SPEND

Lags interval (in first differences): 1 to 1

#### **Unrestricted Cointegration Rank Test (Trace)**

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Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.515140	40.79259	15.49471	0.0000
At most 1 *	0.183892	8.941173	3.841466	0.0028

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Trace test indicates 2 cointegratingeqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

#### **Granger Causality test:**

Pairwise Granger Causality Tests

Date: 01/31/17 Time: 20:22

Sample: 1970 2015

Lags: 2

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Null Hypothesis:				F-	
				Obs	Statistic Prob.
ABSOLUTE_HOUSEHOLD_SPEND	does	not	Granger	Cause	
ABSOLUTE_GOVERNMENT_SPEND				44	26.12096.E-08
ABSOLUTE_GOVERNMENT_SPEND	does	not	Granger	Cause	
ABSOLUTE_HOUSEHOLD_SPEND				1.104720.3414	

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## 5. CONCLUSION

After analysing results from Johansen's co-integration test and granger's causality test the following could be concluded about each of the countries. In case of France with the help of co-integration test, it could be seen that there existed no significant co-integration between the government policies and the household expenditure. Furthermore, through the granger causality test it was revealed that only 70% of the time the change in government revenue or spending affects the household spending directly. This suggests that household expenditure is not as sensitive as compared to other countries in changes of government policies. It is also understood that France has a comparatively flexible fiscal policy which doesn't affect the spending of a household as much. Whereas, in case of Korea a significant co-integration existed between government spending and household spending, were as in second case the co-integration between government revenue and household spending was really less. Furthermore, the granger causality test revealed that almost 99% of times government revenue and spending affects the household spending directly. This suggests that household expenditure is sensitive to the changes of government policies and therefore has a fiscal policy which affects household spending directly. The same could be concluded for USA as it was for Korea where government spending and revenue are highly co-integrated with household spending. Even a minor fluctuation in fiscal policy affects household spending 99% of times.

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