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and economic growth in France  
(1990-2018)**

Amiri, Arshiya

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# Relationship between exports, imports, and economic growth in France (1990-2018)

Arshiya Amiri

## Abstract:

In this letter article, I tried to investigate the possible association between exports imports and GDP growth in France using the statistical technique of time series analysis. As exports and imports play a key role in the variation and the path of GDP theoretically, it is important for government to have a correct information of interaction between net expert and economic growth to reduce and prevent the financial burden of imports on the GDP growth of France. Results show that there is not any meaningful relationship between GDP and exports or imports in France in the period of 1990-2018.

*Keywords:* Exports; Imports; GDP; France

## **1. Introduction**

The potential association between net exports and economic growth has been verified by the famous theoretical and empirical literatures such as Michaely (1977), Feder (1982), Marin (1992), Thornton (1996). The proposed advance macroeconomic models by Grossman and Helpman (1991), Rivera-Batiz and Romer (1991), Romer (1990) argued that rising net exports associated with higher technology would prepare a fundamental situation of fastening economic growth of developed countries. Interestingly, research such as Buffie (1992) recommended the implementation of an export shock as a beneficial macroeconomic policy with the aim of increasing national income and wealth.

By contrast, there are other empirical researches that reject the association between these variables in long run using different observations and different statistical techniques in their estimations and analyses – see Oxley (1993).

Overall, there are empirical literatures which supported the existence of association and/or correlation between net exports and national income and there are other researches as well and they totally rejected the possible association and/or correlation between these variables empirically. The conclusion of previous study would be to test and analyze each case separately, using the latest observations and the most modified statistical techniques.

In this letter article, I tried to retest the association between exports, imports and GDP of France using the open access macroeconomic data for the latest years to find a conclusion about the interactions of these macroeconomic variables.

## **2. Data**

The observations of GDP, exports and imports of goods and services in the values of current US\$ were collected from World Bank Data as open access data resource from the latest period of 1990 to 2018. The logarithm amounts of all three indicators were used in data analysis. Below figures depict the frequency of GDP, exports and imports data in histogram analysis (Figs. 1, 2 and 3).

To have a better understanding about the interaction of GDP with exports and imports variables, the scatter graphs of these series are available in below figures using kernel fits and histograms (Figs. 4 and 5).

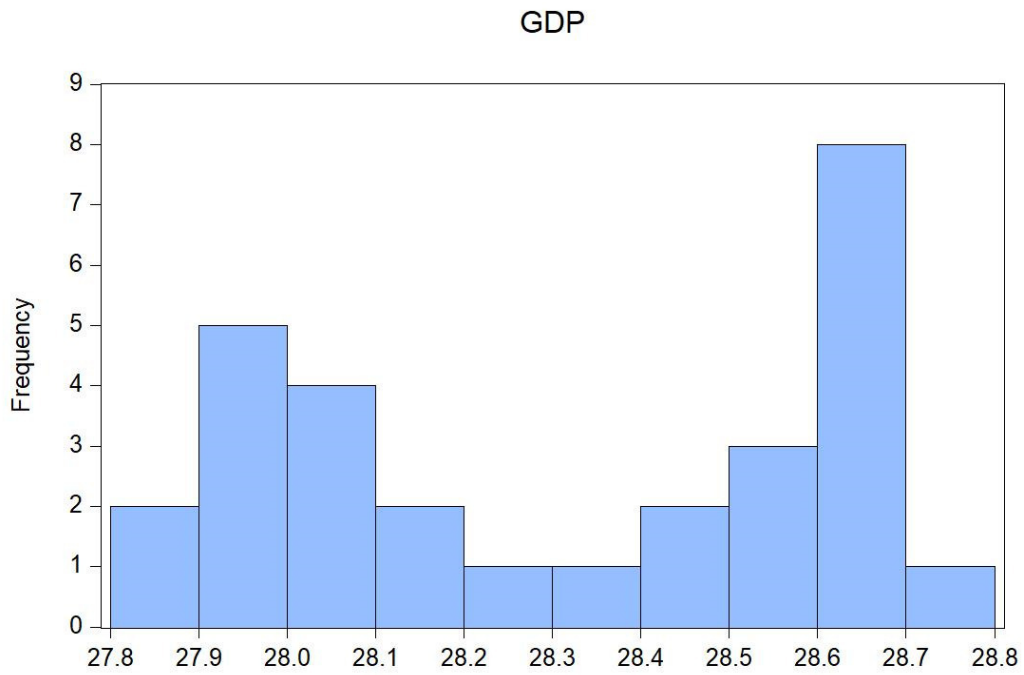


Fig. 1. Histogram of logarithm of GDP current US\$ 1990 to 2018

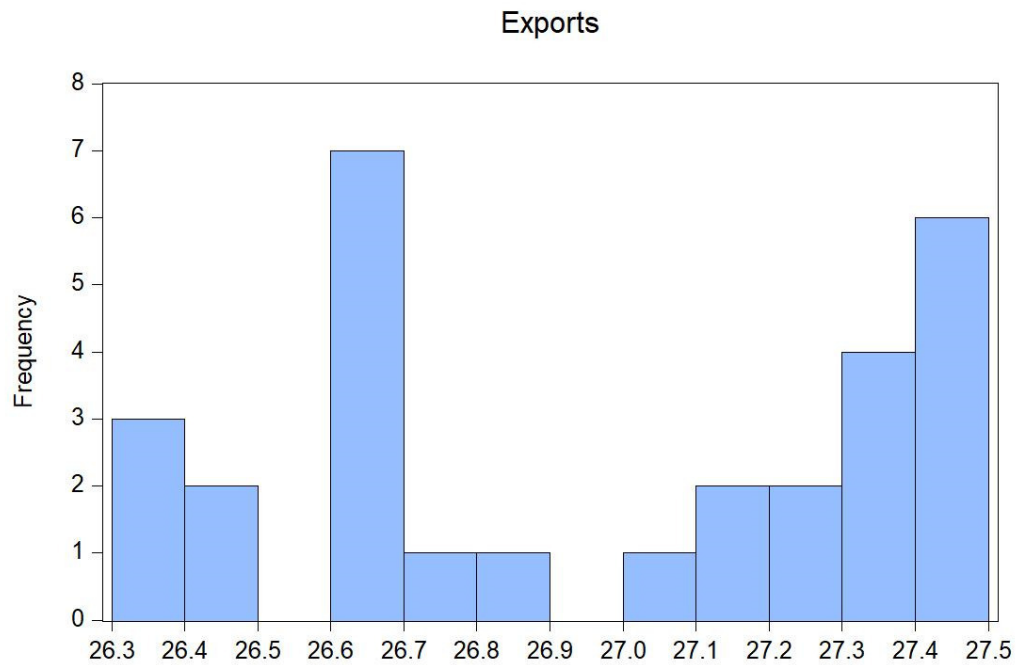


Fig. 2. Histogram of logarithm of exports current US\$ 1990 to 2018

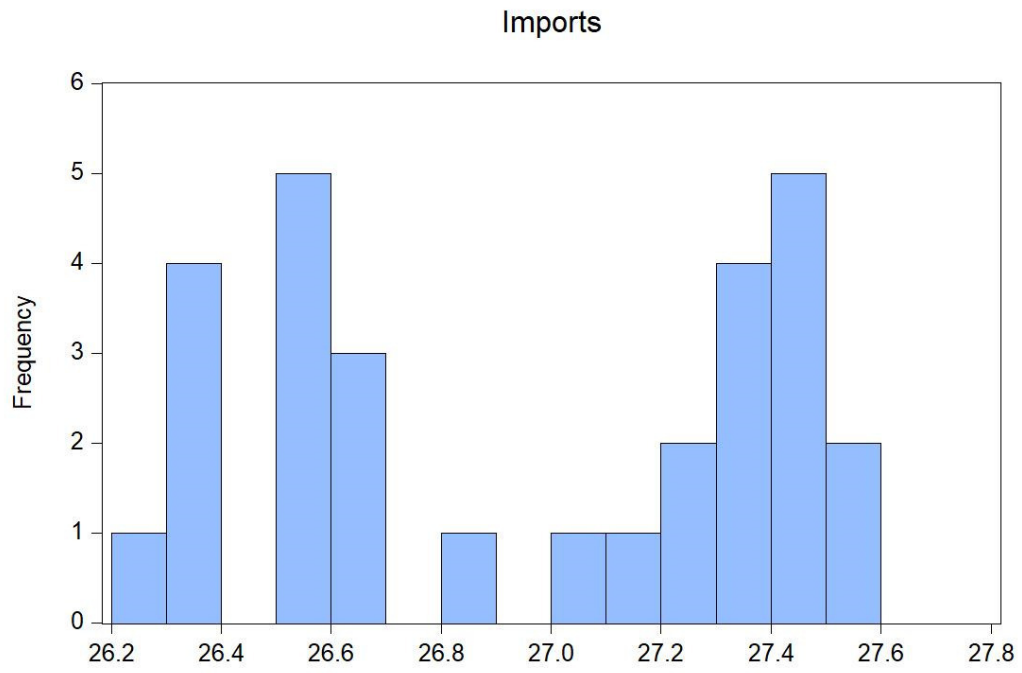


Fig. 3. Histogram of logarithm of exports current US\$ 1990 to 2018

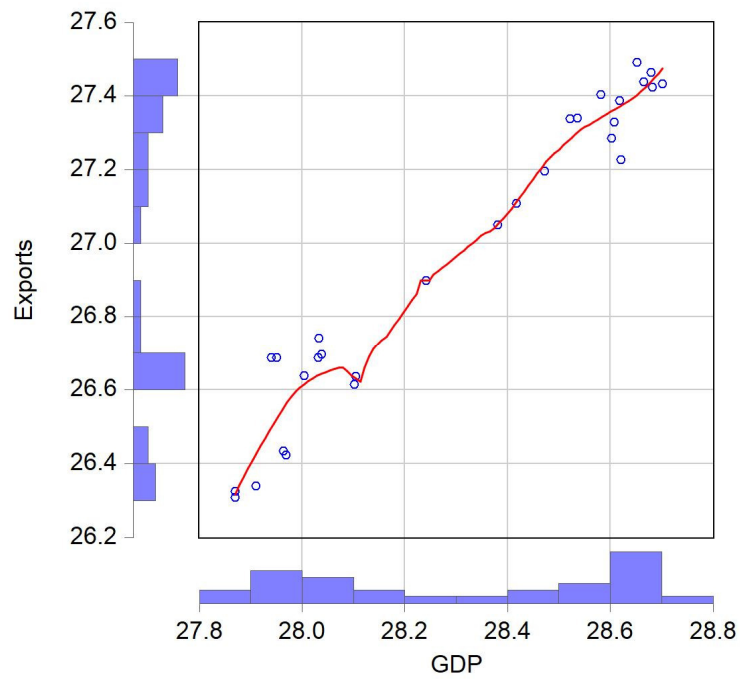


Fig. 4. Scatter graph of logarithm of GDP and exports using kernel fits and histograms 1990-2018

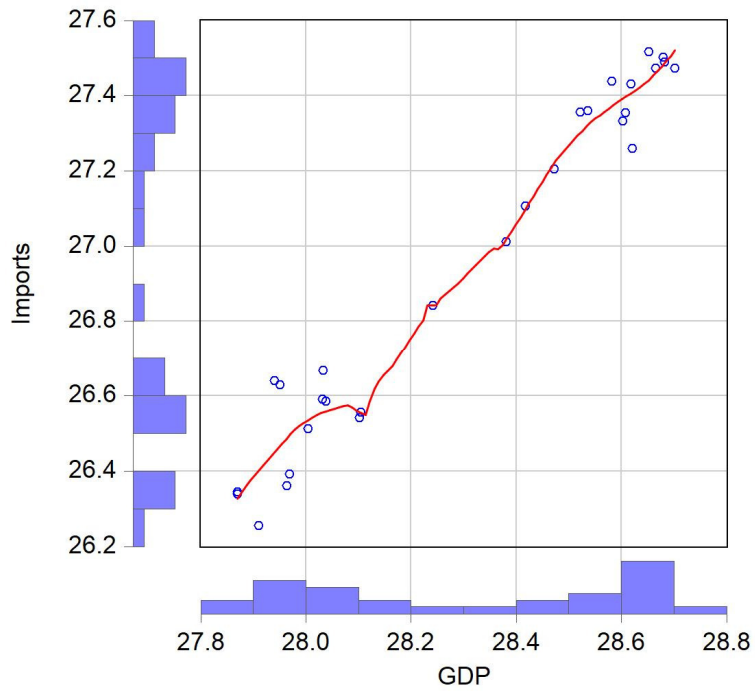


Fig.5. Scatter graph of logarithm of GDP and imports using kernel fits and histograms 1990-2018

### 3. Data Analysis and Results

#### 3.1 Unit root test

The first step is to test the effect of time on our series in the form of unit root test. Results of ADF test are presented in below tables (Tables 1, 2 and 3) and show that GDP, exports and imports series were integrated in order one. Hence, cointegration test should be the next step of our data analysis to find any association between our series.

Table 1

Unit root test				t-Statistic	Probability		
GDP	Level	Intercept	ADF statistic	-0.94624	0.7579		
			Test critical values:	1% level		-3.68919	
				5% level		-2.97185	
		10% level		-2.62512			
		Trend and intercept	ADF statistic	-2.51532		0.3185	
			Test critical values:	1% level			-4.37431
				5% level			-3.6032
		10% level		-3.23805			
		None	ADF statistic	1.77265		0.9788	
	Test critical values:		1% level	-2.65015			
			5% level	-1.95338			
		10% level	-1.6098				
	1st difference	Intercept	Intercept	ADF statistic	-4.15888	0.0033	
				Test critical values:	1% level		-3.69987
					5% level		-2.97626
10% level			-2.62742				
Trend and intercept			ADF statistic	-4.10193	0.0169		
			Test critical values:	1% level			-4.33933
				5% level			-3.58753
10% level				-3.22923			
None			ADF statistic	-3.83799	0.0004		
		Test critical values:	1% level	-2.6534			
			5% level	-1.95386			
10% level			-1.60957				

Table 2

Unit root test			t-Statistic	Probability		
Exports	Level	Intercept	ADF statistic	-1.00649	0.7369	
			Test critical values:	1% level		-3.68919
				5% level		-2.97185
		10% level		-2.62512		
		Trend and intercept	ADF statistic	-1.84246		0.6568
			Test critical values:	1% level		
	5% level			-3.58062		
	10% level	-3.22533				
	None	ADF statistic	2.58249	0.9966		
		Test critical values:	1% level		-2.65015	
			5% level		-1.95338	
	10% level		-1.6098			
1st difference	Intercept	Intercept	ADF statistic	-4.92719	0.0005	
			Test critical values:	1% level		-3.69987
				5% level		-2.97626
		10% level		-2.62742		
		Trend and intercept	ADF statistic	-4.90683		0.0027
			Test critical values:	1% level		
	5% level			-3.58753		
	10% level	-3.22923				
	None	ADF statistic	-4.07864	0.0002		
		Test critical values:	1% level		-2.6534	
			5% level		-1.95386	
	10% level		-1.60957			



Table 3

Unit root test				t-Statistic	Probability	
Imports	Level	Intercept	ADF statistic	-0.67105	0.8383	
			Test critical values:	1% level		-3.68919
				5% level		-2.97185
		10% level		-2.62512		
		Trend and intercept	ADF statistic	-1.84443		0.6558
			Test critical values:	1% level		
	5% level			-3.58062		
	10% level	-3.22533				
	None	ADF statistic	2.25392	0.9925		
			Test critical values:		1% level	-2.65015
					5% level	-1.95338
		10% level			-1.6098	
1st difference		Intercept	ADF statistic		-4.93149	0.0005
					Test critical values:	
	5% level			-2.97626		
	10% level		-2.62742			
	Trend and intercept		ADF statistic	-4.84957	0.0031	
			Test critical values:	1% level		
		5% level		-3.58753		
	10% level	-3.22923				
	None	ADF statistic	-4.24201	0.0001		
			Test critical values:		1% level	-2.6534
					5% level	-1.95386
		10% level			-1.60957	

### 3.2 Cointegration test

The next step is examine cointegration test and results of cointegration test are presented in below tables (Tables 4 and 5). The results of two different cointegration tests including Johansen system cointegration test as well as Engle Granger cointegration tests verified that there was no meaningful relationship between exports and GDP along with imports and GDP in long run.

Table 4

Johansen System Cointegration Test					
GDP & Exports	Unrestricted Cointegration Rank Test (Trace)				
	Hypothesized		Trace	0.05	
	No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.*
	None	0.153088	6.011251	15.49471	0.6942
	At most 1	0.054915	1.52498	3.841466	0.2169
	Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
	Hypothesized		Max-Eigen	0.05	
	No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.*
	None	0.153088	4.486271	14.2646	0.8048
	At most 1	0.054915	1.52498	3.841466	0.2169
GDP & Imports	Unrestricted Cointegration Rank Test (Trace)				
	Hypothesized		Trace	0.05	
	No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.*
	None	0.241741	8.038554	15.49471	0.4613
	At most 1	0.020775	0.566843	3.841466	0.4515
	Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
	Hypothesized		Max-Eigen	0.05	
	No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.*
	None	0.241741	7.471711	14.2646	0.4349
	At most 1	0.020775	0.566843	3.841466	0.4515

Notes: \* Probabilities were investigated using MacKinnon p-values.

Table 5

Engle Granger Cointegration Test					
	Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
	GDP	-1.76163	0.6524	-5.59077	0.6548
	Exports	-1.76749	0.6496	-5.46763	0.6663
GDP & Exports	Intermediate Results:			GDP	Exports
		Rho - 1		-0.19967	-0.19527
		Rho S.E.		0.113344	0.11048
		Residual variance		0.001595	0.002604
		Long-run residual variance		0.001595	0.002604
		Number of lags		0	0
		Number of observations		28	28
		Number of stochastic trends**		2	2
	Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
	GDP	-2.08885	0.4927	-7.86608	0.4504
	Imports	-1.98259	0.5453	-7.40353	0.4897
GDP & Imports	Intermediate Results:			GDP	Imports
		Rho - 1		-0.28093	-0.26441
		Rho S.E.		0.134491	0.133367
		Residual variance		0.001769	0.003625
		Long-run residual variance		0.001769	0.003625
		Number of lags		0	0
		Number of observations		28	28
		Number of stochastic trends**		2	2

Notes: \* Probabilities were investigated using MacKinnon p-values.

#### **4. Conclusion**

The aim of this letter article was to retest the possible association between GDP and exports, imports using the latest observation of France. The observations of these variables in current US\$ were collected from World Development Indicators provided by World Bank Data as an open access database during the period of 1990 to 2018. The statistical technique of time series analysis was applied to make a conclusion about the possible correlation and/or association between these macroeconomic variables in long run. Results of unit root tests verified that these series were integrated in order one and cointegration test are the useful statistical method for probing the association between them.

Results of two cointegration test confirmed the there was not any cointegrated relationship between GDP and exports / imports in the long run. Thus, our result supports the literature that did not find any correlation between national income and net exports in long run.

Overall, as GDP has been affected by many other factors in long run, there are other key factors which would be added to this kind of model analysis what I used here to find a more reliable result. Hence, my recommendation is using multivariate models in analyzing the relationship between economic growth and net exports and adding other control macroeconomic factors like the level of technology and investment etc.

## References

- Buffie E. On the condition for export-led growth. *Canadian Journal of Economics* 1992; 25; 211\_225.
- Feder G. On exports and economic growth. *Journal of Development Economics* 1982; 12; 59\_73.
- Grossman G, Helpman E. *Innovation and Growth in the Global Economy*. Cambridge, MA: MIT Press; 1991.
- Michaely M. Exports and growth: an empirical investigation. *Journal of Development Economics* 1977; 40; 49\_53.
- Marin D. Is the export-led growth hypothesis valid for industrialized countries? *Review of Economics and Statistics* 1992; 74; 678\_688.
- Oxley L. Cointegration, causality and export-led growth in Portugal, 1865\_1985. *Economic Letters* 1993; 43; 163\_166.
- Rivera-Batiz L, Romer P. Economic integration and endogenous growth. *Journal of Economics* 1991; 106; 531\_556.
- Romer P. Endogenous technological change. *Journal of Political Economics* 1990; 98; 71\_102.
- Thornton J. Cointegration, causality and export-led growth in Mexico. *Economic Letters* 1996; 50; 413\_416.