

# THE IMPACT OF MONETARY POLICY AND TAX REVENUES ON FOREIGN DIRECT INVESTMENT INFLOWS: AN EMPIRICAL STUDY ON JORDAN

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## Abstract

The study examines the impact of monetary policy (proxied by money supply and interest rate) and tax revenue on foreign direct investment (FDI) in Jordan employing time series data period from 1991 to 2017. The Vector Error Correction Model (VECM), the Canonical Cointegrating Regression (CCR) and the Fully Modified Ordinary Least Squares (FMOLS) methods are applied in empirical estimations. Estimation results reveal that money supply has a positive and statistically significant impact on the FDI while, tax revenue has a negative impact on FDI in Jordan. Also, we find that the impact of interest rate is statistically insignificant. The results of current study are useful for the policymakers to formulate appropriate policies and support the literature for further researches in the case of developing economies.

Keywords: Foreign Direct Investment (FDI), monetary policy, tax revenues, VECM, Jordan

## INTRODUCTION

The lack of investible funds is a big setback to economic growth and this is making it increasingly difficult to achieve the millennium development goals (MDGs) by 2015 as set by the United Nations. Foreign direct investment is seen as a major source of getting the required funds for investments hence most developing countries offer incentives to encourage FDI (United Nations, 2005).

Policymakers, especially in developing countries, have come to the conclusion that: foreign direct investment (FDI) is needed to boost the growth in their economy. It is claimed that FDI can create employment, increase technological development in the host country, and improve the economic condition of the country in general.

Financial and monetary policies are the basis for the government's work on macroeconomic management, sustainable development, and attraction of various foreign direct investments, where fiscal policy covers the government's work on public spending and taxes, and monetary policy in the regulation of money supply in order to stabilize the price level. In order to be able to carry out economic activities such as attracting foreign direct investment, monetary policy and fiscal policy work together. One of the most important tools of fiscal policy is tax revenues and one of the most important tools of monetary policy is money supply.

Tax revenues are a major source of funding for the state budget, contributing directly to public expenditure financing. Taxation is a tool for fiscal

policy that has a significant impact on the fiscal policies of many developed and developing countries alike. In the United States, tax revenues accounted for 92% of total revenue, and in South Africa 90%. In India, tax revenues accounted for 78% of total revenue (Al-Omar, 2002). In Jordan, the percentage of tax revenues in 2012 was 61% of total public revenues (Jordanian Ministry of Finance, 2012).

The Federal Reserve or the Central Bank uses monetary policy instruments to control the money supply, interest rates, credit terms in open market operations, reserve requirements, and discount rates. Thus, we can say that monetary policy is the policy of managing money supply in the country in order to achieve economic growth and sustainable development and provide the necessary funding for many of the development and investment projects.

Jordan's successive governments have worked to improve the investment climate through the process of modernizing and developing laws and regulations in order to attract foreign capital. A number of agreements have been signed and economic openness has been one of the most important issues. Jordan has also signed trade agreements with the United States, the European Union, and Arab countries. It also joined the World Trade Organization in 2000 and signed the Convention for the Establishment of a Qualified Industrial Zone in Jordan (Jordan Economic and Social Council, 2012). As Jordan strives to attract foreign direct investment flows, monetary policy (money supply and interest rate) and fiscal policy (tax revenues) are the most important determinants of the investment climate (Feverman, 1992). Therefore, this study seeks to examine the impact of monetary policy and tax revenues on foreign direct investment flows to Jordan.

Considering aforementioned facts, it is important to examine the impact of monetary policy (proxied by money supply and interest rate) and tax revenue on FDI in the case of Jordan making it a particular case for this paper. To the best of our knowledge, there is no research devoted to the relationship between money supply, interest rate, tax revenue and FDI for Jordan, employing time series data which allows to observe the country-specific characteristics of this relationship. Hence, the aim of this study is to fill in this gap by investigating the impact of money supply, interest rate and tax revenue on FDI in Jordan, which is one of the developing countries, making it a particular case for current study, applying the VECM, CCR and FMOLS methods. The results of the article are significant for policymakers to formulate appropriate policies in favor of attracting FDI to their countries.

This study is also important because the economies of developing countries suffer from structural economic imbalances, particularly in domestic investment spending and investment efficiency, owing to the lack of domestic finance, savings and waste abroad, and the bulk of these

savings are for consumption and recreation. These countries are moving towards external financing and attracting foreign direct investment. Here, the importance of fiscal and monetary policies is to improve the characteristics of the investment climate and attract foreign investment flows.

### Literature Review

FDI is a matter of interest to many governments, organizations, companies, and individuals. There is a debate about the feasibility of this type of investment and the burdens and benefits it entails, especially with regard to the motives of foreign companies to invest, the determinants of these foreign investments, and the methods of management and organization in foreign companies (Qahaf, 1991). In order to attract foreign investment flows, an appropriate investment climate must be provided. The investment climate can be defined as "a set of laws, policies, economic and political institutions that affect investor confidence and persuasion by directing investments to one country." The lack of internal and external political stability is a disincentive to foreign investments of all kinds, regardless of the opportunities and advantages of investment available (Sorensen, 2005). One of the most important determinants of the host country's investment climate is monetary policy (represented by money supply and interest rates) and fiscal policy (represented by tax revenues and government expenditure).

Several studies have been conducted to identify factors and determinants of the investment climate in host countries that have a significant role in attracting foreign direct investment (FDI). Among these studies: Bénassy-Quéré *et al.* (2001) studied the sensitivity of FDI from the tax rates for 11 OECD countries over the period of 1984–2000 and they concluded that tax rates play a significant role in investment location for FDI. Leibrecht and Bellak (2005) revealed that 1% decrease in the effective rate of corporate income tax may increase FDI inflows by 4.5%. Esteller-Moré *et al.* (2020) also, revealed a negative impact of corporate taxes on FDI for non-OECD countries. Abdioglu *et al.* (2016) explored the impact of corporate income tax rate on foreign direct investment level (FDI) in the OECD countries. For this purpose, they employed fixed effect panel estimation and GMM method. The estimation results indicated a negative relationship between tax rate and FDI level.

Bagebo (2012) examined the impact of fiscal policy on macroeconomic variables, which included GDP, the balance of payments and inflation in Nigeria for the period 1980–2011. The study showed that monetary policy played an important role in the Nigerian economy by regulating and stabilizing the volume of circulating funds used to create a secure investment environment that would promote economic development. The study used the ordinary least square method (OLS) and found

a positive relationship between monetary policy, GDP and foreign investment. Additionally, Rădulescu *et al.* (2012) explored the effect of monetary policy and tax revenues on FDI inflows in Romania during the period from 1995 to 2008 employed the Vector Auto Regressive approach (VAR). The findings confirmed that monetary policy (higher interest rate) played an important role in FDI attracting more than fiscal policy (higher tax revenues). Moreover, Rădulescu and Druica (2014) explored the effect of monetary and fiscal policy on FDI using over the period 2000–2007 for Romania and found similar results. In addition, Shafiq *et al.* (2015) evaluated the impact of money supply and GDP on FDI in the case of Pakistan employing Generalized Method of Moments (GMM) method to the annual data period of 1970–2013. The estimation results concluded a positive and statistically significant effect from money supply and GDP to FDI. Hina and Ullah (2019) examined the relationship between money supply and FDI for Pakistan during 1995–2017. The results showed that there is a positive impact of money supply on FDI.

Dornean and Oanea (2014) examined the impact of fiscal policy on FDI in the case of Central and Eastern European Countries for both crises and non-crises period. Their results revealed that expenditures have a has effect of FDI with negative sign while revenue has no significant effect. However, both tools of fiscal policy have strongly significant effect on FDI.

Boateng *et al.* (2015) investigated the effect of macroeconomic factors on foreign direct investment (FDI) inflows in Norway using Fully Modified Ordinary Least Square (FMOLS) and the vector autoregressive and error correction model (VAR/VECM). The study confirmed that money supply, inflation, unemployment and interest rate have significantly negative effects on FDI.

Al-Baaj (2014) examined the effect of tax exemptions on encouraging and attracting foreign investments in Iraq. The questionnaire was used and distributed to local and foreign investors. The results of the analysis showed that the role of tax exemptions is not clear in attracting foreign investments. The study recommended giving greater importance to investments that rely on high technical knowledge to raise the efficiency of the performance of Iraqi cadres.

The Agabeze *et al.* (2017) aimed to investigate the impact of the instability of fiscal policy in Nigeria on FDI inflows in the period 2000–2014. Data on GDP, government revenues, government spending, balance of payments and total government debt were used as representative variables of financial policy. Using the regression analysis technique to test the assumptions, the results showed that the instability of fiscal policy is an important indicator of foreign investment and that the fiscal policy measures of the federal government in Nigeria did not affect foreign direct investment. The study recommended the need to improve public financial operations to ensure a sound economic environment Investors.

Albulescu and Ionescu (2018) examined the long-run impact of monetary policy and banking stability on FDI inwards in 16 EU countries over the period 2001–2015. The paper used co integration techniques such as panel data FMOLS and DOLS. The result showed that there is a positive relationship between the monetary policy uncertainty and the FDI entrance.

Faroh and Shen (2015) analyzed the impact of interest rate on FDI flow in Sierra Leone utilizing Ordinary Least Squares (OLS) method to the data spanning from 1985 to 2012. The results confirmed that interest rate has insignificant effect on FDI flows. Also, Boateng *et al.* (2009) did not find any significant relationship between inward cross border investments and interest rates. In addition, Hung-Ju (2018) investigated the long-run impacts of monetary policy on FDI and found that nominal interest rate raises the rate of FDI.

Some studies have examined the impact of fiscal policy on foreign direct investment, while others have addressed the impact of monetary policy on foreign direct investment. Some have addressed the impact of some economic factors such as economic growth, balance of payments, public debt, production, and consumption on foreign direct investment. This study is consistent and complementary to these studies in terms of studying the factors and determinants of the investment climate.

As it can be seen from previous studies in the literature, there is no study investigating the impact of money supply, interest rate and tax revenue on FDI in the case of Jordan employing country-specific time series data. Taking into account these facts, the main aim of this study is to fill in this gap by using the Vector Error Correction (VECM), CCR and FMOLS techniques to observe the impact of monetary policy (measured by money supply and interest rate) and tax revenue on FDI. The main contribution of this study is to analyze the relationship between money supply, interest rate, tax revenue and FDI in Jordan, which has not been investigated and is a good representative for the similar developing countries.

## MATERIALS AND METHODS

We use annual data between 1991–2017 for empirical analysis. The data series included: Foreign Direct Investment inflows (*FDI*), Money Supply (*Ms*), Real Interest Rate (*INT*), and Tax revenues (*TR*). All data set have been collected from the World Development Indicators of World Bank and Central Bank of Jordan.

The functional specification used in the current study can be described as follow:

$$\ln FDI_{2t} = \beta_0 + \beta_1 \ln Ms_t + \beta_2 \ln INT_t + \beta_3 \ln TR_t + \varepsilon_t,$$

where, all the elements of model are in logarithmic forms, and  $FDI_t$  is real foreign direct investment flows (\$),  $Ms_t$  is real money supply (M1 plus

quasi-monetary) (\$),  $INT_t$  is real interest rates (% annual),  $TR_t$  is real tax revenues (\$),  $\varepsilon_t$  is an error term and  $t$  is time period.

For empirical estimation, we apply VECM, CCR and FMOLS techniques. Our empirical evaluation covers the following stages: First, unit root test is employed for checking non-stationarity of variables. The Augmented Dickey-Fuller (Dickey and Fuller, 1981, ADF) unit root test is applied for testing non-stationarity characteristics of variables.

Then, the Johansen cointegration test (Johansen, 1988) is utilized for testing the cointegration relationship between variables. Finally, the Vector Error Correction Method (VECM) is employed to estimate the long-run relationship among the variables, since it enables to evaluate the possibility of cointegration vectors among the variables in the case of more than two variables. Additionally, under the VECM framework, one can examine the relationship as a system, rather than a single equation. Also we use the Canonical Cointegrating Regression (CCR) and the Fully Modified Ordinary Least Squares (FMOLS) methods are utilized for the robustness check.

For saving space and not to bother the readers with econometric terms above-mentioned methods are not presented extensively in this study. Detailed information about these tests and models can be found in Dickey and Fuller (1981), Johansen (1988), Johansen and Juselius (1990), Park (1992) and so on.

## RESULTS AND DISCUSSION

As a starting point, we tested the variables for a unit root. For this purpose, the paper used the Augmented Dickey-Fuller (ADF) unit root test (Dickey and Fuller, 1981) and the obtained results are presented in Tab. I.

We found that the variables are non-stationary at their levels but they are stationary at first difference, being integrated of order one, I(1). We thus conclude that our variables are non-stationary in levels but

I: Results of ADF unit root test

Variable	Panel A:	Panel B:	Result
	Level	1 <sup>st</sup> difference	
	Actual value	Actual value	
FDI	-1.8871	-3.3331**	I(1)
Ms	0.0182	-3.5295**	I(1)
INT	-2.0328	-3.8785***	I(1)
TR	-1.3863	-7.5993***	I(1)

Notes: Maximum lag order is set to two and optimal lag order (k) is selected based on Schwarz criterion in the ADF test; \*, \*\* and \*\*\* accordingly indicates rejection of null hypothesis at 10%, 5% and 1% significance levels; critical values are taken from the table prepared by MacKinnon (1996). Time period: 1991–2017.

stationary in their first differences. In other words, they follow integrated of order one, I(1), processes. Our conclusion that the variables are I(1) allows us to proceed to the cointegration test.

As a next step, we tested the variables for cointegration relationship. The optimal lag number should first be chosen to apply the Johansen procedure. A Vector Auto Regressive (VAR) model was initially specified with the endogenous variables of *FDI*, *Ms*, *INT* and *TR*. A maximum of four lags was initially considered and both lag selection criteria and lag exclusion tests statistics suggested that indeed a lag of order four is optimal.

Panels A through D in Tab. III report that the VAR has good properties as it is stable, there is no serial correlation, and heteroscedasticity problems in the residuals and residuals are normally distributed. The Johansen cointegration test results from the transposed version of the VAR, which is the VECM with three lags, are presented in Panels E and F of Tab. III.

Both the trace and the max-eigenvalue test statistics indicate one cointegration relationship among the variables. Therefore, we conclude the presence of cointegration relationship among the variables.

II: Lag Interval Tests

Lag	Information Criteria					
	LogL	LR	FPE	AIC	SC	HQ
0	-51.88692	NA	0.001516	4.859732	5.057210	4.909397
1	35.16779	136.2596	3.23e-06	-1.318938	-0.331552	-1.070613
2	58.58282	28.50525	1.97e-06	-1.963723	-0.186428	-1.516739
3	85.14945	23.10142	1.20e-06	-2.882561	-0.315357	-2.236916
4	140.1306	28.68583*	1.19e-07*	-6.272228*	-2.915115*	-5.427924*

\* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

## III: VAR residual diagnostics, stability and cointegration tests results

Panel A: Serial Correlation LM Test <sup>a</sup>				
Lags	LM-Statistic		P-value	
1	14.89418		0.5324	
2	11.12840		0.8015	
3	18.56338		0.2920	

  

Panel B: Normality Test <sup>b</sup>			
Statistic	$\chi^2$	d.f.	P-value
Jarque-Bera	10.293	6	0.067

  

Panel C: Heteroscedasticity Test <sup>c</sup>			
White Statistic	$\chi^2$	d.f.	P-value
Statistic	316.83	300	0.243

  

Panel D: Stability Test <sup>d</sup>	
Modulus	Root
0.837321	0.8267 - 0.1328i
0.837321	0.8267 + 0.1328i
0.835770	0.6631 - 0.5086i
0.835770	0.6631 + 0.5086i

  

Panel E: Johansen Cointegration Rank Test (Trace)				
Null hypothesis	Eigenvalue	Trace statistics	0.05 Critical value	P-value
None *	0.750982	54.67385	40.17493	0.0010
At most 1	0.492965	21.30834	24.27596	0.1131
At most 2	0.186585	5.008150	12.32090	0.5664
At most	0.002157	0.051818	4.129906	0.8520

  

Panel F: Johansen Cointegration Rank Test (Maximum Eigenvalue)				
Null hypothesis	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	P-value
None *	0.750982	33.36551	24.15921	0.0022
At most 1	0.492965	16.30019	17.79730	0.0827
At most 2	0.186585	4.956332	11.22480	0.4835
At most 3	0.002157	0.051818	4.129906	0.8520

Notes: <sup>a</sup> The null hypothesis in the Serial Correlation LM Test is that there is no serial correlation at lag of order h of the residuals; <sup>b</sup> The Normality Test is the Urzua (1997) system normality test with the null hypothesis of the residuals are multivariate normal; <sup>c</sup> The White Heteroscedasticity Test takes the null hypothesis of no cross terms heteroscedasticity in the residuals; <sup>d</sup> VAR stability test results show that no roots of characteristic polynomial are outside the unit circle;  $\chi^2$  is the Chi-square distribution; d.f. stands for degree of freedom.

Finally, we use CCR and FMOLS methods as a further robustness check alongside the VECM in estimating the long-run coefficients. We bring together the estimated long-run coefficients from all the three different methods for the comparison purpose in Tab. IV.

As it can be seen from the Tab. IV the long-run coefficients from the VECM technique are statistically significant. Additionally, the residuals of the estimated specifications successfully pass the residuals diagnostics tests which is another indication of the robustness of the estimation results. We conclude that Ms2 has a positive and

statistically significant effect at 1% level on FDI. The results indicate that a 1% rise in money supply increases FDI by 4.75%. This result is in line with the logic of economic theory and the findings of Bagebo (2012), for Nigeria, Shafiq *et al.* (2015) for Pakistan, Hina and Ullah (2019) for Pakistan. From a theoretical viewpoint, a rise in money supply leads to higher national liquidity and in turn, it should attract further FDI inflows, given that the cost of financing in the host country is then expected to be cheaper. In addition, the impact of interest rate on FDI is statistically insignificant. This result is appropriate for Jordan. Because there is no

## IV: Long-run coefficients from the methods

Methods	Ms	INT	TR
	Coef. (Std. Er.)	Coef. (Std. Er.)	Coef. (Std. Er.)
VECM	4.75*** (0.47)	-0.61 (0.41)	-4.47*** (0.97)
CCR	1.12*** (0.28)	-0.09 (0.12)	-3.01** (1.43)
FMOLS	1.33*** (3.33)	-0.10 (0.10)	-3.09** (1.41)

Panel B: Residuals diagnostics tests results of VECM and Speed of Adjustment Coefficient

-0.7908 [0.007]
3.325 [0.189]
0.9493 [0.419]
0.014 [0.979]

Notes: The dependent variable is *FDI*; Coef and Std. Er. mean coefficient and standard error; \*, \*\* and \*\*\* show significance levels at 10% 5% and 1%. Probabilities are in brackets; *SoA* = Speed of adjustment;  $LM_{SC}$  = Lagrange multiplier statistic of serial correlation test;  $\chi^2_{HETR}$  = Chi-squared statistic for heteroscedasticity test;  $JB_N$  = Jarque-Bera statistic for testing normality.

developed financial system in Jordan. In addition, our findings coincide with results of Boateng *et al.* (2009) and Faroh and Shen (2015). We also find that, the effect of the tax revenues statistically significant with negative sign at 1% level, which is consistent with the economic theory and some studies such as, Leibrecht and Bellak (2005), Abdioglu *et al.* (2016) and Esteller-Moré *et al.* (2020). As the study of the Jordanian Strategy Forum (2017) showed the importance of tax revenues in increasing GDP, but

also showed the negative impact of tax revenues on foreign direct investment flows to Jordan.

In addition, Tab. IV shows that the error correction term coefficient (ECT) is negative and statistically significant at the 1% confidence level for Jordan. This value indicates that any deviation from the short-run disequilibrium among the variables is corrected in each period to return to the long-run equilibrium level.

## CONCLUSION

The main objective of this study was to examine the impact of Monetary Policy (represented by money supply and interest rate) and Tax Revenues on the foreign direct investment in Jordan for the period of 1991–2017 by using VECM, CCR and FMOLS. According to estimation results, there is a long-term common integrative relationship between variables. In addition, results of the estimation reveal that money supply has statistically significant and a positive impact on FDI while there is a negative impact of tax revenue on FDI. On the other hand, the effect of interest rate is found statistically insignificant.

The positive effect of the money supply on attracting foreign direct investment to Jordan is an indication for decision-makers of the role of expansionary monetary policy in increasing the demand for goods and services, thus increasing the demand for loans, which leads to an increase in investment, improving the investment climate and attracting more foreign investments. As for the insignificant relationship of the interest rate on foreign direct investments, this indicates the lack of development of the financial system in Jordan, and it shows the need to develop its mechanisms and tools. In addition, with regard to the negative impact of tax revenues on foreign direct investment, this leads to taking into account the economic feasibility of applying the tax and its impact that may attract or expel the investment as when imposing a tax on the investor, one must know the extent to which the country benefits from the economic return of investment, such as employment, economic revitalization of society, technology transfer from developed countries to the host country, and the rehabilitation of human capital.

Depending on the results of the study, some recommendations can be identified, including:

1. The government has to adopt a set of policies and measures to activate monetary policy in Jordan, remove obstacles that limit its effectiveness and develop monetary policy instruments that may contribute to attracting foreign direct investment inflows, including money supply, interest rates and inflation rates.
2. Maintaining good economic growth rates and low inflation rates to enhance the purchasing power of the Jordanian dinar and maintain the standard of living of the citizens, and work to

- reduce the interest rate (on the basis that the relationship between the interest rate and the size of foreign investment is inverse relation), thus encouraging the attraction of foreign investment.
3. The government should work to increase tax elasticity, where economic indicators suggest that this is possible by increasing the tax base and increasing the efficiency of tax collection and diversification of tax sources, so as to reduce dependence of taxes on foreign investment.

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