Empirical Investigation Of Capital Flight And Economic Growth In Jordan

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Abstract:

The study investigates the relationship between capital flight, illicit financial flows, and economic growth in Jordan over the period 2000 - 2014. Using the World Bank Residual Model, the results show that the total illicit financial flows are JD36.1 billion (or 16.2% of GDP). In addition, by applying the net errors and omissions method in the balance of payments, the capital flight is estimated at JD41.0 billion (or 18.9% of GDP). The Granger causality test shows that economic growth granger causes both the illicit financial flows and the capital flight. The study also found that there is a negative and significant relationship between economic growth and capital flight. Furthermore, there is a positive and significant relationship between illicit financial flows and capital flight.

Key words: illicit financial flows, capital flight, economic growth, Jordan.
I. INTRODUCTION
Illicit financial flows, refers to money earned illegally so that this money disappears from country records. Illicit financial flows can be detected in the national accounts and balance of payments, and can take different forms such as poor commercial pricing, cash movements in large quantities, and bank transfer transactions. For example, illicit financial flows may involve the transfer of money earned illegally through corruption and criminal activities or tax evasion. However, such flows may also comprise funds that were earned legally. In other words, if capital flows are unrecorded, such outflows are considered to be illicit for the purposes of this study. The problem of illicit financial flows appears more in the developing countries. It is the responsibility of the developing countries to address this problem. However, the expression of illicit financial flows does a better job of clarifying that this phenomenon is a two-way street.

Literature review shows that several economic models are used to estimate the size of illicit financial flows and capital flight. These models can be summarized as in the following:
First, The World Bank Residual Model (WBR): it measures the form of funds entering the country sources (capital flows) such as the increase in net external debt of the public sector and net foreign direct investment flows, and compare those sources with their uses (flows and / or capital expenses) such as the deficit in the account this which is funded by the capital account flows and additions to central bank reserves. If the financial resources more than its uses, it refers to the capital loss, which means the illicit financial flow.
Second, The Hot Money (Narrow) Model: This model estimates illicit financial flows by focusing strictly on the Net Errors and Omissions (NEO) line-item in a country’s external accounts. Thus, a persistently large and negative net errors and omissions figure is interpreted as an indication of illicit financial outflows.
Third, The Trade Mis invoicing Model: According to this model, a clear evidence of illicit financial flows can be detected by comparing the exports and imports of a country to and from the rest of the world where the country can over-invoicing its imports and under-invoicing its exports.

The aim of this study is to estimate the relationship between the illicit financial flows, capital flight, and economic growth in Jordan, over the period 2000-2014.
The rest of the paper is organized as follows: Section two presents literature review of estimating illicit financial flows and capital flight, while section three describes the data and the methodology used. Section four discusses the empirical results, and section five concludes the study and offers recommendations.

II. LITERATURE REVIEWS
In literature, Studies on capital flight and illicit financial flows are addressed under tow groups. The first studies group focused on the estimation of illicit financial flows such as:
Haq, (2015) show that over USD10 billion as escaping taxation and being siphoned off outside the country. Karand Spanjers, (2014) find that developing countries lost a
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While the second studies group dealt with the impact of illicit financial flows on macro-economic factors. The following is a detailed view of the most important studies:

Kar (2014), examined capital flight and illicit financial flows and its relation to macroeconomic problems in Brazil. The results showed that illicit financial flows is the motive behind the flight of capital causing macro-economic problems in the monetary policy and the terms of investment.

Kar (2012), investigated the total illicit financial flows from Mexico over the period 1970 -2010. The illicit financial flows estimated at USD$872 billion, with the volume of illicit outflows rising during the onset and post Mexico’s macroeconomic crises. Also, the researcher finds significant evidence that the underground economy in Mexico is mainly driven by illicit outflows and is related to the size of the underground economy in the previous time period.

Wahyudi and Maski (2012), investigated the causal relationship between capital flight and Indonesia's economic growth over the period 2000-2009. The results indicated that a high level of capital flight out of the country. Also, the causality test results show that the capital flight have impact on economic growth.

Khalaf (2011), examined the relationship between the financial and administrative corruption and fiscal policy in the case of Egypt during the period 1980 - 2008. The results show that the increase in public revenues by 1%, leads to a reduction of financial and administrative corruption by 87%.

Sugata and Kyriakos (2011), studied the effect of the financial and administrative corruption on fiscal policy. The result indicated that the financial and administrative corruption reduces tax revenues collected from families, and it reduces the productivity of government expenditures.

Bakare (2011), examined the extent and magnitude of contributions of external debt in Nigeria and corruption to capital flights plus other factors that have been examined in the literatures. The study found that the greatest shock to capital flight came from external debt and corruption. The findings of the study demonstrated that, capital flight limits growth potential, crowding-out investment, and worsening capital formation.
NjimantedForgha (2008), measured the impact of capital flight on the real economic growth in Cameroon. The study results reveal that, large capital outflows from Cameroon is due to the following: political instability, fiscal deficits, interest rate inflation differential, and external debt servicing to GDP ratio. Capital flight also has a negative impact on economic growth.
Quan&Meenakshi (2006), investigate the impact of corruption on capital flight. The results of study suggests that corruption had a positive and significant impact on capital flight, also capital flight and corruption are the main causes of poverty in the south.

III. DATA AND MOTHEDOLOGY
The study period 2000-2014 has been chosen to estimate the variables of the study because the Central Bank of Jordan has modified the account balance of payments ways depending on standard presentation as of 2000. To measure the relationship between illicit financial flows, capital flight and economic growth during the study period in Jordan, we adopt the following approaches:

1. Illicit Financial Flows
The World Bank residual method (World Bank, 1985) computes illicit financial flows, according to the following formula:

\[ WBR = \Delta EXD + NFDI - CAD - \Delta IR \] (1)

Where the sources of funds are given by the change in external debts (\( \Delta EXD \)) and the net foreign direct investment (NFDI), and the uses of funds are the current account deficit (CAD) and the change in international reserves (\( \Delta IR \)). If all transactions are reported appropriately, the double entry accounting practice should ensure that the uses of funds equal the sources of funds.
When the sources of funds are larger than the uses, the difference is interpreted as unreported illicit capital outflow. When capital is leaking from the economy, it reflects dislike of domestic assets and resources are leaving. When the sources of funds are less than the uses, foreign capital infiltrates into the domestic economy, and there is a relative preference for domestic assets. The current study uses data from the Central Bank of Jordan to construct the World Bank residual method.

2. Capital Flight
Following Claessens and Naude (1993), Deppler and Williamson (1987), and Schneider (2001), we adopt their method in measuring the relationship between the illicit flows and capital flight from the balance of payment. The following variables used in the equation (2) of the balance of payment: the current account balance (CAB), the net equity flows (EF), the other short term capital of other sectors (STC), the portfolio investments (PI), the change in deposits of foreign assets in banks (DMF), the change in central bank reserves (CR), the net errors and omissions (NEO), and the change in external debt (CED). Then, the balance of payments is:

\[ CAB + EF + STC + PI + DMB + CR + NEO + CED = 0 \]

Or, \( STC + PI + DMB + NEO = -(CAB + EF + CR + CED) \) ............ (2)
The (NEO) measured from the balance of payments identity quite as follows:

\[ NEO = - (CAB + EF + CR + CED) – STS – PI – DMB \]

Or, \( NEO = - (CAB + EF + CR + CED) – (STC + PI + DMB) \) ............ (3)

The difference between licit private capital flows and broad capital flight will represents the NEO.

3. Economic Growth

Real GDP is specified as a standard Cobb-Douglas production function, which links inputs; capital (K) and labor (L), and outputs. The formula is:

\[ GDP = P f (K, L) \] ........................................... (4)

The study focuses on the importance of illicit financial flows to explain the gap between the financial resources and their uses. We expect that illicit financial flows to affect investor confidence in the domestic economy and thus affect the economic growth rate.

4. The Complete Model

We model capital flight as follows:

\[ \ln\text{CapF}_t = h_0 + h_1 \ln \text{IFF}_t + h_2 \ln \text{RGDP}_t + \varepsilon_t \] ..............(5)

Where:

CapF: capital flight as estimated by equation 3.
IFF: illicit financial flows as estimated by equation 1.
RGDP: real gross domestic product as estimated by equation 4.

IV. EMPIRICAL RESULTS

1. Estimation of Capital Flight and Illicit Financial Flows

Table (1) show that the illicit financial flows during the period 2000-2014 using the World Bank residual model according to equation (1), and capital flight using the net error and omission according to equation (2).

Table (1) show that the total illicit financial flows JD36087 Million during the study period which are approximately JD 2406 Million a year, and the total capital flight JD 40987 Million which are approximately JD 2732 Million a year. These results can explain the theoretical relationship between capital flight, illicit financial flows, and economic growth, and draw our attention to study this relationship practically leading to strengthen the theoretical side of this study on the one hand, and the achievement of the objectives of this study, on the other hand.

The percentage rate of total illicit financial flows and total capital flight to the GDP during the study period were 16.2%, 18.9% respectively.
Table 1. Jordan: Broad Capital Flight and Illicit Financial Flows, 2000-2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Illicit Outflows JD Million</th>
<th>Financial Flows to GDP (%)</th>
<th>Broad Capital Flight JD Million</th>
<th>Illicit Flows to GDP (%)</th>
<th>Financial Flows to GDP (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>419.60</td>
<td>7.0</td>
<td>630.70</td>
<td>10.5</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>546.40</td>
<td>8.7</td>
<td>587.90</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>635.00</td>
<td>9.5</td>
<td>651.10</td>
<td>9.8</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>370.70</td>
<td>5.3</td>
<td>632.70</td>
<td>9.1</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>-317.20</td>
<td>-3.9</td>
<td>153.70</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>2481.40</td>
<td>27.8</td>
<td>3058.10</td>
<td>34.3</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>4507.20</td>
<td>43.4</td>
<td>4466.60</td>
<td>43.0</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>3113.00</td>
<td>25.8</td>
<td>4034.30</td>
<td>33.5</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>1701.90</td>
<td>11.3</td>
<td>2667.90</td>
<td>17.7</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>4992.80</td>
<td>29.5</td>
<td>5270.00</td>
<td>31.2</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>2051.50</td>
<td>10.9</td>
<td>2615.20</td>
<td>13.9</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>796.10</td>
<td>3.9</td>
<td>565.40</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>3696.90</td>
<td>16.8</td>
<td>3228.30</td>
<td>14.7</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>12018.80</td>
<td>50.4</td>
<td>12778.80</td>
<td>53.6</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>-927.20</td>
<td>-3.7</td>
<td>-354.10</td>
<td>-1.4</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>36086.90</td>
<td>40986.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>2405.79</td>
<td>2732.44</td>
<td>16.2</td>
<td>18.9</td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ calculation, using data from Central Bank of Jordan.

First of all, we will estimate the Cobb-Douglas equation, in order to show that if RGDP is sensitive more to labor or capital through their elasticity, α and β respectively. The Cobb-Douglas equation is:

\[ RGDP = f(L, K, T) \]

\[ RGDP = TL^αK^β \]

By taking Logarithm for both side, the equation will be:

\[ LRGDP = LT + αLL + βLK + ε \]

Where:


Productivity and technology are assumed to remain fixed. Both capital and labor were found to be significant at the 95% confidence interval.

Then we estimate the equation of Capital Flight according to equation (5).

\[ lnCapF = h_0 + h_1ln IFF + h_2ln RGDP + ε \]

2. Unit Root Test:

Before moving to the estimation process, the model variables were tested for unit root. The results indicated to non-stationary problem. All variables are not integrated at the Level, except Labor (LL) series is stationary at level when checked with intercept and trend at 5%. But when we take the first difference, all variables became integrated of order one I (1) as reported in table (2).
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Table 2. ADF Test with Intercept and Trend

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level</th>
<th>First Difference</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>CapF</td>
<td>0.88</td>
<td>4.14**</td>
<td>I(1)</td>
</tr>
<tr>
<td>RGDP</td>
<td>1.26</td>
<td>4.08**</td>
<td>I(1)</td>
</tr>
<tr>
<td>IFF</td>
<td>1.05</td>
<td>5.05*</td>
<td>I(1)</td>
</tr>
<tr>
<td>LL</td>
<td>4.18**</td>
<td>8.19*</td>
<td>I(0)</td>
</tr>
<tr>
<td>LK</td>
<td>0.099</td>
<td>3.99</td>
<td>I(1)</td>
</tr>
</tbody>
</table>

Source: Authors’ calculation using E-views 7

Note: *, ** and *** indicate the level of significant at 1%, 5% and 10%.

3. Cointegration Test:
According to results of cointegration test in table (3), which shows that there is one integrative vector at the level of 5%, this means accepting the alternative hypothesis (r = 1) and refusing the null hypothesis (r = 0), where r expresses the number of integrative vectors.

Table 3. Cointegration Test

<table>
<thead>
<tr>
<th>Hypothesized</th>
<th>Trace</th>
<th>0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of CE(s)</td>
<td>Eigenvalue</td>
<td>Statistic</td>
</tr>
<tr>
<td>None *</td>
<td>0.881641</td>
<td>47.18810</td>
</tr>
<tr>
<td>At most 1</td>
<td>0.728309</td>
<td>21.57973</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.390565</td>
<td>5.942670</td>
</tr>
</tbody>
</table>

Source: Authors’ calculation using E-views 7

4. Granger Causality Test
The causality test is one of the important statistical tests, to determine the direction of the relationship between economic variables, and to verify the direction of the relationship between the variables of time-series models. The idea of Granger Causality based on the assumption that the past can cause the present, but the future can’t affect the present or the past. Granger believes that the problem of autocorrelation is one of the inherited problems for the analysis of time series, which makes the process for determining the causal direction is difficult (Gujarati, 2003).

Table 4. Granger Causality Test

<table>
<thead>
<tr>
<th>Null Hypothesis:</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGDP does not Granger Cause LCAPF</td>
<td>13</td>
<td>9.30188</td>
<td>0.0082</td>
</tr>
<tr>
<td>LCAPF does not Granger Cause LGDP</td>
<td>0.02662</td>
<td>0.9738</td>
<td></td>
</tr>
<tr>
<td>LIIF does not Granger Cause LCAPF</td>
<td>13</td>
<td>1.31770</td>
<td>0.3201</td>
</tr>
<tr>
<td>LCAPF does not Granger Cause LIIF</td>
<td>1.09449</td>
<td>0.3800</td>
<td></td>
</tr>
<tr>
<td>LIIF does not Granger Cause LGDP</td>
<td>0.04982</td>
<td>0.9517</td>
<td></td>
</tr>
<tr>
<td>LGDP does not Granger Cause LIIF</td>
<td>12.2700</td>
<td>0.0037</td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ calculation using E-views 7
The results in table (4) indicate the rejection of the null hypothesis at the level of significance of 1%, which says that real GDP doesn’t explain changes in Capital Flight because that the value of F was (9. 30188) with probability (0. 0082). Also, we reject the null hypothesis at the level of significance of 1%, which says real GDP doesn’t explain changes in Illicit Financial Flows, because that the value of F was (12. 27) with probability (0. 0037).

5. Estimation of Cobb-Douglas
In case of cointegration, we can use Vector Error Correction Model, in order to estimate Cobb Douglas equation. Table (5) show the results, which indicate that there is a positive relationship between labor and capital on one side and real GDP on another hand. In addition, the results indicate that real GDP is more sensitive to labor than capital, and this result is logic, because Jordan is abundant of labor. The results of estimation of Cobb-Douglas reported as per the following equation:

\[ LGDP = 0. 068 + 1. 045 LL + 0. 223 LK \]

<table>
<thead>
<tr>
<th>CointegratingEq</th>
<th>CointEq1</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGDP(-1)</td>
<td>1. 000000</td>
</tr>
<tr>
<td>LL(-1)</td>
<td>-1. 045109</td>
</tr>
<tr>
<td></td>
<td>(0. 06777)</td>
</tr>
<tr>
<td></td>
<td>[-15. 4223]</td>
</tr>
<tr>
<td>LK(-1)</td>
<td>-0. 222759</td>
</tr>
<tr>
<td></td>
<td>(0. 01790)</td>
</tr>
<tr>
<td></td>
<td>[-12. 4479]</td>
</tr>
<tr>
<td>C</td>
<td>-0. 067678</td>
</tr>
</tbody>
</table>

Table 5. Cobb- Douglas Estimation

Source: Authors’ calculation using E-views 7
Standard errors in ( ) & t-statistics in [ ]

6. Capital Flight Estimation:
After verifying that the time series not stable at levels, Co-integration Test has been tested between the variables of the study. The results of the test indicate co-integration of the variables included in the model. In case of co-integration, we can use the regression of co-integration by OLS to determine the relationship between study variables in long run. Results of estimation are reported in table (6).
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Table 6. Estimation of Capital Flight by OLS in The Long Run

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>4.239888</td>
<td>1.781816</td>
<td>2.379531</td>
<td>0.0348</td>
</tr>
<tr>
<td>LGDP</td>
<td>-1.283355</td>
<td>0.512243</td>
<td>-2.505364</td>
<td>0.0276</td>
</tr>
<tr>
<td>LIFF</td>
<td>1.247530</td>
<td>0.116285</td>
<td>10.72824</td>
<td>0.0000</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.927145</td>
<td>Mean dependent var</td>
<td>3.172952</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.915003</td>
<td>S. D. dependent var</td>
<td>0.536548</td>
<td></td>
</tr>
<tr>
<td>S. E. of regression</td>
<td>0.156427</td>
<td>Akaike info criterion</td>
<td>-0.695598</td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>0.293633</td>
<td>Schwarz criterion</td>
<td>-0.553988</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>8.216984</td>
<td>Hannan-Quinn criter.</td>
<td>-0.697106</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>76.35540</td>
<td>Durbin-Watson stat</td>
<td>2.167602</td>
<td></td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ calculation using E-views 7

$\text{LCapF} = 4.24 - 1.28 \text{LGDP} + 1.25 \text{LIFF}$

According to the results in table (6), we can see that there is a negative and significant relationship between economic growth and capital flight. This means that if an economic growth increase by 1%, capital flight will decrease by 1.28%. Also, we find that there is a positive and significant relationship between illicit financial flows and capital flight. Indicating that if an illicit financial flows increase by 1%, capital flight will increase by 1.25%.

The adjusted R-squared is 0.92, which means 92% of changes in capital flight where tied to real GDP and illicit financial flows. Durbin-Watson value was 2.17, which means that there is no serial correlation between variables. F-Statistics is 76.36, which means that the model is suitable.

When we test the residual of this regression, we find that the value is 0.086 which is less than all critical values. So, we will accept the null hypothesis stating that the residuals is stationary at level. This result means that there is a long run relationship between the dependent variable and independent variable (see table 7).

Table 7. Testing Residuals by Kwiatkowski-Phillips-Schmidt-Shin

<table>
<thead>
<tr>
<th>Null Hypothesis: E is stationary</th>
<th>Exogenous: Constant</th>
<th>Bandwidth: 0 (Newey-West automatic) using Bartlett kernel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LM-Stat.</td>
<td></td>
</tr>
<tr>
<td>Kwiatkowski-Phillips-Schmidt-Shin test statistic</td>
<td>0.086414</td>
<td></td>
</tr>
</tbody>
</table>
| Asymptotic critical values*:
  1% level                        | 0.739000           | |
  5% level                        | 0.463000           | |
  10% level                       | 0.347000           | |

Source: Authors’ calculation using E-views 7
I. Conclusions and Recommendations

The study found that:

1. The total illicit financial flows estimated by JD 36087 Million during 2000-2014, are approximately JD 2406 Million a year. The percentage rate of total illicit financial flows to the GDP during the study period was 16.2%.

2. The total capital flight estimated by JD 40987 Million during study period 2000-2014, are approximately JD 2732 Million a year. The percentage rate of total capital flight to the GDP during the study period was 18.9%.

3. The real GDP explain changes in Capital Flight.

4. The real GDP explain changes in Illicit Financial Flows.

5. A positive relationship between labor and capital on one side and real GDP on another hand.

6. The real GDP is more sensitive for labor than capital

7. A long run relationship between the capital flight and GDP illicit financial flows.

8. A negative and significant relationship between economic growth and capital flight

9. A positive and significant relationship between illicit financial flows and capital flight.

The study recommend that:

1. To fight corruption in Jordan at all levels.

2. To encourage the return of capital flight funds back home

3. To reduce illicit financial flows.

4. To train the tax and tariff employees on the international accepted standards.

5. To reduce commercial mispricing Transfer.

REFERENCES:


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