JOINT ESTIMATION OF ECONOMIC GROWTH AND FDI IN UAE

Fahad Saif Harhara[1]

Brunel University, UK

Amer Al-Roubaie[2]

Al Ahlia University, Kingdom of Bahrain

Abstract

Purpose: The purpose of this study is to empirically examine the assertion that economic growth impacts the level of Foreign Direct Investment (FDI). At the same time the study tests the opposite relationship in that FDI impacts economic growth in the host country.

Design/methodology/approach: The standard Cobb–Douglas production function which shows the relationship between inputs and outputs is used to develop two models: one for economic growth and the other for FDI. Both models are then regressed concurrently using two-stage simultaneous regressions.

Findings: This study finds that economic growth and FDI are interrelated factors. Economic growth leads to positive news regarding the country, which prompts firms and investment houses to investigate opportunities in the host country. FDI can play an important role in filling the domestic gap in investment and spurring economic growth. The study finds a positive relationship between FDI and exports in that the greater the level of FDI, the higher the exports of the host country. The opposite relationship also exists in that FDI flows to locations which are export-intensive.

Originality/value: The key value of this study is to fill a gap in the current body of literature examining the attraction of FDI into emerging economies.

[1] Fahad Saif Harhara, Brunel Business School, Brunel University, Kingston Lane, Uxbridge, Middlesex UB8 3PH, UK, Email: fahadsaif@aol.com And: P.O. Box 25242, Abu Dhabi, UAE

[2] Dr Amer Al Roubaie, Al Ahlia Business School, Al Ahlia University, P.O. BOX 10878, Manama, KINGDOM OF BAHRAIN, Email: aalroubaie@ahlia.edu.bh

INTRODUCTION

The various strategic plans in the UAE such as the Dubai Strategic Plan 2015, Abu Dhabi Strategic Plan 2020, Al Ain Strategic Plan 2030 and the UAE Strategic Plan 2031 all call for an increase in economic growth as well as to improve the welfare of the population. These strategic plans appreciate the importance of economic growth in facilitating the delivery of greater economic prosperity and wellbeing for the country and its people. Of course, economic prosperity also has the supplementary benefit of greater human happiness. Foreign Direct Investment (FDI) is seen as one route to achieving the goal of economic growth because it can positively impact on the host country's production capacity, income, exports, human capital development, and so on. This paper empirically examines the assertion that economic growth impacts the level of FDI. At the same time, the paper tests the opposite relationship in that FDI impacts on economic growth in the host country. Our analysis appreciates that a concurrent relationship may exist between these two variables and hence we use a simultaneous regression to examine the possible bi-directional impact.

This paper is structured as follows: in the next section we develop our central question and supplementary hypotheses that are empirically tested. In developing our hypothesis we highlight the key gaps in the existing body of literature examining the relationship between FDI and economic growth. The importance of this section is so that the development of the central hypothesis can be placed in the light of the current body of knowledge as well as into a country-specific context. The paper then refers to the main findings from prior studies relating to the control variables that are used in the augmented version of the models. The succeeding section defines the variables used in the study. The penultimate section provides the results from the OLS regression so that we can examine the impact of GDP and FDI individually on each other as well as the impact of the control variables. We then carry out and report results for the simultaneous regression. Finally we discuss our results in the context of prior studies as well as the unique aspects of the UAE so as to arrive at appropriate policy actions for the country.

DEVELOPMENT OF TESTABLE HYPOTHESES

The relationship between FDI and economic growth is important for our study because if technology transfer does take place due to foreign inflows of capital, then it should lead to an increase in economic output. In this respect we first test for the existence of technology transfer from FDI before examining the other aspects such as the importance of clusters, exports or host country factors. This first set of questions can be developed into testable hypotheses for the UAE in the following manner first for the case of FD:

H^0_1: FDI flows have a positive impact on the level of Economic Growth
H^1_1: FDI flows do not have a positive impact on the level of Economic Growth

In the case of economic growth the following hypotheses are developed:

H^0_2: Economic Growth has a positive impact on the flows of FDI
H^1_2: Economic Growth does not have a positive impact on the flows of FDI

THE IMPACT OF GDP ON FDI STOCK

Although the two sets of hypotheses shown above are important in increasing our current knowledge of FDI and economic growth, they do not answer the central question of this study, namely, whether a simultaneous relationship between FDI and economic growth exists. Under the traditional Keynesian framework, economic output is impacted by investment which itself can be divided into domestic and foreign. This implies that there is most probably a simultaneous relationship between FDI and economic output.

Phi Lai (2006) found a direct and positive relationship between economic growth and FDI for Vietnam. Li and Liu (2005) examined a panel of data for 84 countries over a 30 year period ending 1999. The study found a statistically significant and positive relationship between FDI and economic growth, but only for the second half of the period in question. Li and Liu (2005) argued that FDI has two ways in which it can positively impact economic growth, namely itself and indirectly through factors such as improvement in human capital. Bende-Nabende *et al.* (2001) examined the ASEAN 5 economies between 1970 and 1996 and found that bi-directional linkages are most effective through human capital and by the learning by doing process. Sanchez-Robles (2003) examined 18 Latin American countries and found that FDI only

positively impacts economic growth when the host country has adequate human capital, economic stability and liberalized markets. Alfaro *et al.* (2004), Hermes and Lensink (2003) and Aghion *et al.* (2006) found that FDI is important when the host country has well developed financial markets in order to positively impact on economic growth.

Some studies have found that the bi-directional relationship between FDI and economic growth exists only for certain periods. A typical example of such studies is that of Li and Liu (2005), which examined 84 countries over the period 1970 to 1999 to find that only from the mid-1980s was the bi-directional relationship relevant. One possible reason for the lack of a bi-directional relationship during the earlier period is that countries needed to reach a threshold level of national income before FDI could positively impact on economic growth. Blomstrom *et al.* (1996) argued that only when countries reach a certain income level are they capable of absorbing new technologies and benefitting from its diffusion.

The inconclusive result and the time specific nature between FDI and economic growth implies that the current body of literature needs further country-specific studies to better understand the relationship. Based on prior studies and the focus of this research, we are able to develop the following hypothesis, which seeks to test the joint relationship between economic growth and FDI for the UAE.

H^0_3: Economic Growth and FDI are interrelated endogenous variables in the case of the UAE for the period 1980 to 2010

H^1_3: Economic Growth and FDI are not interrelated endogenous variables in the case of the UAE for the period 1980 to 2010

This can be restated as:

F1: Higher levels of economic output in a country will attract greater stocks of FDI
G1: Higher stock of foreign inward investment will lead to greater economic output

THE IMPACT OF TRADE OPENNESS ON FDI AND ECONOMIC OUTPUT

Lipsey (2000) found that trade openness was one of the most important determinants in attracting FDI. One can understand the rationale for

this as FDI may seek to service not only the host country demand but also that from the region through the avoidance of import duties (i.e. tariff jumping FDI). Therefore, the more open an economy, the more likely it is to obtain FDI. From a firm perspective an open economy is more likely to have infrastructure in place in order to support its exporting community. This infrastructure may not be limited purely to ports, roads etc., but could also include institutional aspects, such as being a signatory to free trade agreements, arbitration courts, well developed legal systems and so on. From a shareholder wealth maximization viewpoint, trade openness is extremely important because it allows resources to be employed in those activities which will provide long term enrichment for shareholders. Therefore, if a country is open to trade and offers the potential for a company to enhance its shareholder wealth, then it is more likely to be the beneficiary of greater FDI.

Based on the above discussion we can derive the following hypotheses:

F2: The more open the host country the more likely it is to experience technology transfer to host country firms
G5: The more open an economy the greater the level of FDI stock

THE IMPACT OF INFLATION ON FDI AND ECONOMIC GROWTH

Instability in the host country has shown that it deters FDI as it reduces the future viability and profitability of the project (see Erramilli and D'Souza, 1995). A number of proxies can be used for instability such, as the number of coup d'états, civil disturbances and riots, wars etc. However, by and large only a few countries suffer from such extreme forms of instability and more common is economic instability, which tends to take the form of high inflation. In this case low inflation is perceived as a sign of economic stability in the host country. On the other hand, high inflation is indicative of a government that is unable to control its economy and hence a failure of economic policy. In reality, a high level of inflation does not take place in a vacuum and actually affects other macroeconomic variables (Rogoff and Reinhart, 2002). Previous studies such as Glaister and Atanasova (1998) claimed that high inflation can significantly reduce the attractiveness of a host country to foreign investors. The same result also applies from the opposite direction, as Coskun (2001) argued: that lower inflation and interest rates can have a positive impact in attracting foreign investors. Similarly, Wint and Williams (2002) showed that a stable economy is far better at attracting FDI than an unstable economy.

Based on the above discussion we can derive the following hypothesis:

F3: A low inflation rate will induce greater stocks of FDI

THE IMPACT OF DOMESTIC SAVINGS ON FDI AND ECONOMIC OUTPUT

The relationship between savings and economic growth is central to Solow's Growth Model (1956) in that higher levels of savings precede economic growth. The Solow Growth model argues that countries that tend to have higher savings will grow faster through increased investment. Under this typical Keynesian framework, investment is equal to savings and hence is a source of capital accumulation in the economy. The life-cycle model argues the opposite in that as economic growth increases it impacts on the on the ability of the young population to save. Under this model it is assumed that the young save more than the old and hence total savings rates in the economy increase. Empirical studies such as Carroll and Weil (1994), which examined the relationship between domestic savings and economic growth for sixty-four countries, found that previous growth is a good predicator of future saving rates while the opposite is not the case. Similar results were reported by Gavin *et al.* (1997) for a sample of Latin American countries where higher growth was preceded by higher saving Interestingly, Gavin *et al.* (1997) found that the increase in savings takes place after a time lag. More recently, Katircioglu and Naraliyeva (2006) found that in the case of Kazakhstan, there is a long-run positive relationship between economic growth and domestic savings. The study also finds evidence to support the assertion that economic growth has a positive impact on FDI.

Based on the above discussion we can derive the following hypotheses:

F4: An increase in the domestic savings ratio will lead to higher levels of FDI stock
G2: Greater domestic savings leads to greater economic output

THE IMPACT OF PUBLIC SECTOR EXPENDITURE ON FDI AND ECONOMIC OUTPUT

Blankenau and Simpson (2004) have argued that an increase in public expenditure can have a positive impact on economic growth through not only a fiscal stimulus but also in building human capital, amongst other aspects. In developing countries public expenditure tends to be

largely focused on infrastructure projects. A higher level of infrastructure in the host country has been found to have a positive impact on FDI. However, there is no clear measure of public sector expenditure on infrastructure and hence previous studies have used various proxies. For instance, Hill and Munday (1992) used expenditure on road transport as a proxy for infrastructure, while Bengoa and Sanchez-Robles (2003) employed railroad construction measures and Glickman and Woodward (1998) used a general transportation and urbanization index. In general, these studies show a positive relationship between the infrastructure proxy in the host country and FDI.

Based on the above discussion we can derive the following hypotheses:

F5: Greater public sector expenditure leads to higher FDI stock
G8: Higher levels of government sector expenditure will leader to greater economic output

THE IMPACT OF DOMESTIC CAPITAL FORMATION ON FDI AND ECONOMIC OUTPUT

The empirical evidence examining domestic capital formation and FDI finds rather mixed results in that it can have both negative and positive directions. Bosworth and Collins (1999), and Hecht *et al.* (2002) examined different samples of developing countries and found a positive impact on domestic investment. However, other studies such as Borensztein *et al.* (1998) found that FDI inflow actually crowds in domestic investment. Similar results were reported by Agosin and Mayer (2000) when they formally investigated whether FDI inflows crowds in or crowds out domestic investment for the period 1970–1996. The study showed that the crowd in or crowd out effects are dependent on the country; the crowding-out effect dominates in Latin America while the crowding-in effect is the norm for Asia, and to some extent, Africa. Interestingly, the study did not mention the Middle East or GCC as a separate region. Using a slightly different methodology to earlier studies, Agosin and Machado (2005) examined the crowding-out or crowding-in effects for the period 1971–2000. This study found that FDI displaced domestic investment (crowding-out) in Latin America and that FDI led to one-to-one increase in total investment in Africa and Asia. In the case of transition countries, Misun and Tomšík (2002) examined Czech Republic, Hungary and Poland in the post-Soviet period of the 1990s. This study found that there was evidence of

a crowding-out effect in Poland, and a crowding-in effect in Hungary and the Czech Republic.

Based on our discussion above we can arrive at the following hypotheses:

F6: Increases in domestic capital formation encourages a higher level of FDI stock

G7: An increase in domestic investment will leader to greater economic output

THE IMPACT OF LABOUR SUPPLY/ SKILLS ON FDI AND ECONOMIC OUTPUT

Sonmez and Sener (2009) used a panel data of 10 developed and 10 developing countries to test the impact of human capital on the rate of economic growth. The results showed that human capital positively contributes to the economic growth in both developing and developed countries but with different rates. Pfefferman and Madarassy (1992) argued that the movement away from FDI in labour-intensive, low-cost, low-skill manufacturing towards more capital and knowledge intensive industries is a consequence of new technological advances that have led to the reduction in the need for labour. At the same time these technological advances imply that the labour which is employed needs to have a higher level of skills and knowledge. Therefore, the modern multinational firm values a well-educated and highly skilled labour force far more than an unskilled low paid one.

Based on the above discussion we can derive the following hypotheses:

F7: Better skilled workforce encourages a higher level of FDI stock

G4: An increase in the size of the labour force will increase economic output

THE IMPACT OF EXCHANGE RATES ON ECONOMIC OUTPUT

The basis of the relationship between the real exchange rate and economic growth stems from the view that for export-led growth to take place, the price of products for overseas markets needs to be competitive. At the same time the higher profitability in export-led activities implies that resources are shifted to cater for overseas markets. In theory this process can continue for a long period of time without encountering diminishing returns to scale

or being dependent on domestic demand. In this way production is not linked to consumption. The export earnings themselves become the fuel for further growth as it becomes possible to finance additional investment. More importantly, if knowledge spillovers take place and new players enter the activity, then exports can have an additional stimulus to the economy. Although this process can run into the long run, it is very rarely indefinite as it leads to political disagreements (as is the case with China and its huge trade balance with its trading partners). To a certain extent the empirical literature does tend to support the argument that a low real exchange rate can lead to economic growth. For instance, Dollar (1992) found a negative and statistically significant relationship between the real exchange rate and economic growth for a sample of 76 developing countries for the period 1976 to 1985. Similar results were found by Bosworth *et al.* (1995) and Hausmann *et al.* (1995), but for a different sample of countries and period. However, there have also been studies, such as Ghura and Grennes (1993) and Bleaney and Greenaway (2001), which found little if any evidence for a relationship between real exchange rates and economic growth.

Based on the above discussion we can derive the following hypothesis:

G3: Exchange rate depreciation will lead to higher levels of economic output

THE IMPACT OF OIL RENTS ON ECONOMIC OUTPUT

The natural resource curse or the puzzle as to why resource-rich countries have lower economic growth compared to those which do not (Sachs and Warner, 2001) has received considerable attention from prior research. It appears from the literature which was discussed at length in Chapter 2 that oil endowments are a double-edged sword in that they can be an unqualified blessing as well as a predictable curse. Some studies, such as Askari (2006), argue that it's not the natural resource which is a curse but how it is used. In other words, the political and institutional structure is still young and developing. Therefore, studies such as Bjorvatn and Selvik (2008) argue that the institutional systems are not homogeneous across the naturally resource-rich countries and hence the relationship with economic growth is country-specific.

Manzano and Rigobon (2001) argued that naturally resource-rich countries have low economic growth due to their debt overhang. Another strand of studies found that when resource-rich countries are compared with resource-poor ones, they tend to have higher economic growth.

**Joint
estimation
of economic
growth and
FDI in UAE**

156

Being resource-rich by itself does not lead to lower economic growth. Oil is of great importance to the economy of the UAE, contributing to 80% of the GDP; the inconclusive nature of previous studies is the reason for its inclusion in our study.

Based on the above discussion we can derive the following hypothesis:

G6: Higher oil rents allow for an increase in economic output

THE IMPACT OF MANUFACTURING VALUE ADD ON FDI

Prior studies have reported that manufacturing firms benefit from positive spillovers as a result of FDI inflows, which thereby increases the proportion of manufacturing value added in the country. The primary manner in which FDI can increase the manufacturing sector is through technology spillovers. FDI is seen as an important channel for transmitting technology to many developing countries. Multinational firms are usually at the technological frontier and have access to the latest and most advanced technologies. It is expected that as they invest in plants in developing countries they will, at the same time, transfer these high-level technologies to the host countries. It is also hoped that the technology that is embedded in the plants of multinational firms will spread to other plants in the countries. However, based on data from developed countries, van Pottelsberghe de la Potterie and Lichtenberg (2001) show that FDI in the form of technology transfer is only possible if the country invests in foreign countries that are intensively engaged in research and development (R&D). Inward FDI from R&D-intensive countries does not seem to increase productivity. This suggests that foreign firms invest abroad in order to exploit their technological advantage rather than to diffuse their technology.

Based on our discussion above we can develop the following hypothesis:

F8: Increases in manufacturing value added leads to higher levels of FDI

METHODOLOGICAL ISSUES

We study the impact of FDI on economic growth using the conventional growth accounting framework whereby the capital stock is assumed to consist of two components, namely domestic and foreign owned. This can be written as:

$$K_{total} = K_{foreign} + K_{domestic} \qquad (1)$$

We then adopt the standard Cobb–Douglas production function (Cobb and Douglas, 1928) which shows the relationship between inputs and outputs. The standard Cobb-Douglas production function is shown as follows:

$$Y = AL^{\alpha}K^{\beta} \qquad (2)$$

where:

Y = total production or output (this is essentially the monetary value of all goods produced in a year)

L = the level of labour (input)

K = the level of capital (input)

A = is the total factor productivity

α and β are the output elasticities of labour and capital, respectively. These values are assumed to be constant and determined by the level of technology at the time.

In our model we differentiate between domestic and foreign investment so that the Cobb-Douglas production function is written as:

$$Y = AL^{\alpha}Kd^{\beta 1}Kf^{\beta 2} \qquad (3)$$

Where:

Kd = domestic capital

Kf = foreign capital

We then augment the Cobb-Douglas production function so that output is a function of the stock of capital, labour, human capital and productivity in a similar manner to Mankiw *et al.* (1992) and is written as:

$$Y = A_{it} K^{\alpha}_{dit}, K^{\lambda}_{fit,} L^{\beta}_{it}, H^{\gamma}_{it} \qquad (4)$$

In Equation 4, output (i.e. Y) is a flow while the other terms namely domestic and foreign owned capital (i.e. K^{α}_{dit}, K^{λ}_{dit}) labour (i.e. L^{β}_{it}) and human skills (i.e. H^{γ}_{it}) are stocks while A is the total factor productivity.

Taking logs and differentiating Equation 4 with respect to time, one obtains the more standard economic growth model, which can be written as:

Joint
estimation
of economic
growth and
FDI in UAE

158

$$y = a_{it} + \alpha k_{dit} + \lambda k_{fit} + \beta l_{it} + \gamma h_{it} \qquad (5)$$

The lower case letters imply growth rates in output, domestic and foreign capital, labour and human capital. Due to the problems that are normally associated with the measurement of capital stock, prior literature has tended to use the ratio of domestic investment to GDP as a proxy for Kd and FDI to GDP ratio for Kf. As a result we substitute investment (i.e. I) instead of capital stock to arrive at the final form of the economic growth equation that is basis of our research in this chapter:

$$y_{it} = a_{it} + \alpha I_{dit} + \lambda I_{fit} + \beta l_{it} + \gamma h_{it} + \varepsilon_{it} \qquad (6)$$

In order to study the impact of FDI on economic growth and to arrive at the investment model, we start with the standard relationship as shown in Equation 7:

$$K_{it} = f (Y_{it}, R_{it}) \qquad (7)$$

Where K_{it} is the capital stock (it can also be thought of the desired stock) while Y_{it} is the output of the country and R_{it} is the real cost of capital. Under this relationship the capital stock can increase if the output of the economy rises or there is a reduction in the real cost of capital (of course, the opposite is also true). Interestingly, for foreign firms, additional factors such as pool of labour, market potential, infrastructure, trade openness etc., also become important as they are not the same in all countries. With these additional factors one can arrive at the augmented investment function, which is shown in Equation 8, and employs the same logic as that discussed in arriving at the economic growth model.

$$I_{fit} = a_{it} + \alpha y_{dit} + \lambda r_{dit} + \beta C_{it} + \varepsilon_{it} \qquad (8)$$

C in the above equation refers to a series of factors which have impact on the overseas investment (i.e. I_{fit}) taking place in the domestic economy. The exact nature of these factors depends on the type of investment as well as the benefits that the investors seek to derive from the domestic economy.

Equations 6 and 8 highlight the fact that there is a dependent or simultaneous relationship between FDI and economic growth. FDI in Equation 6 has an impact on the level of economic growth. At the same time, from Equation 8 it can be seen that the economic growth determines

the level of FDI that takes place in the domestic economy. The simultaneous relationship between economic growth and FDI imply that the standard ordinary least squares estimation process may be of limited use.

In developing our simultaneous relationship, we need to take into account the unique features of the UAE. At the same time, we have sought to align our expanded FDI and economic growth relations with prior research as well as seeking to incorporate the unique nature of the UAE. With these considerations, we arrive at an augmented FDI and economic growth model specifications as follows:

$$FDI_{it} = a_0 + a_1 GDP_{it} + a_2 EXPORTS_{it} + a_3 INF_{it} + a_4 DSR_{it} + a_5 PUBEXP_{it} + a_6 CAPFORM_{it} + a_7 SKILL_{it} + a_8 MFGADD_{it} + \varepsilon_{it}$$
(Equation 9)

$$GDP_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 GDS_{it} + \beta_3 RER_{it} + \beta_4 LABOUR_{it} + \beta_5 OPEN_{it} + \beta_6 OILRENT_{it} + \beta_7 DOMINVR_{it} + \beta_8 GOVEXPR_{it} + u_{it}$$
(Equation 10)

Based on the development of the augmented FDI and economic growth relationships, we now provide their formal definition[3].

GDP: Gross Domestic Product (GDP)
GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products

FDI Stock: Stock value of Foreign Direct Investment
FDI is calculated as the purchase/investment of 10% or more of the voting shares or voting power and is the level of ownership necessary for a direct investment interest to exist. This is calculated as the position at the end of the beginning of the period + FDI flows + exchange rate changes + other adjustments (such as reclassifications etc.)

EXPORTS: Exports of Goods and Services as a Percentage of GDP
Exports of goods and services represent the value of all goods and other market services provided to the rest of the world

[3] These definitions have been adapted from the World Bank Development Indicators publications.

**Joint
estimation
of economic
growth and
FDI in UAE**

160

INF: Inflation
Inflation as measured by the annual growth rate of the GDP implicit deflator, which shows the rate of price change in the economy as a whole

DSR: Domestic Savings Ratio
Gross domestic savings are calculated as GDP less final consumption expenditure (total consumption). The ratio is calculated as a percentage of GDP

PUBEXP: Public Expenditure
General government final consumption expenditure includes all government current expenditures for purchases of goods and services (including compensation of employees

CAPFORM: Domestic Capital Formation
Gross fixed capital formation includes land improvements (fences, ditches, drains, etc.); plant, machinery, and equipment purchases; and the construction of roads, railways, etc.

SKILL: Level of Skill
Skill level is proxied by the gross secondary school enrollment ratio.

MFGADD: Manufacturing Value Added
Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs

GDS: Gross Domestic Savings
Gross domestic savings are calculated as GDP less final consumption expenditure (total consumption). Data are in current US dollars

RER: Real Exchange Rate
Purchasing power parity conversion factor is the number of units of a country's currency required to buy the same amount of goods and services in the domestic market as a US dollar would buy in the United States

LABOUR: Labour Force
Total labour force comprises people aged 15 and older who meet the International Labour Organisation definition of the economically active population: all people who supply labour for the production of goods and services during a specified period

OPEN:	Openness Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product
OILRENT:	Oil Rent Oil rents are the difference between the value of crude oil production at world prices and total costs of production. Oil rent is measured as a percentage of GDP
DOMINVR:	Domestic Investment Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories
GOVEXPR:	Government Expenditure General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees)

The source of the data is the World Bank World Development Indicators (2011) except for FDI and trade balance data, which are from United Nations Committee on Trade and Development Statistics Centre (UNCTADstats, 2011).

DATA

We examine the joint relationship between FDI and economic growth using the 2SLQ method using data obtained from the UNCTADstat, and the World Development Indicators (2011). Our time frame for the data is from 1980 to 2010, i.e. 30 years of data. We feel that as the country was established in 1971 without any real collection of statistics, any attempt to study the period 1971 to 1979 will be of limited use. Table 1 provides the summary statistics for economic output, FDI and our control variables.

We calculate the Person correlation coefficients for the data, which is essentially a test to determine how well each pair of variables is related to each other. The Pearson correlation coefficients tend to range from -1.0 to +1.0 and the closer the value is to +/-1 the more related are the pair of variables to each other. A Pearson correlation coefficient value of 0 implies no relationship between the variables. A positive Pearson correlation coefficient value indicates that both variables move in the

Joint
estimation
of economic
growth and
FDI in UAE

162

	N	Minimum	Maximum	Mean	Std. Deviation
GDP	30	2.167E10	2.613E11	6.992E10	6.487E10
FDI Stock	31	392.29	76174.83	12553.425	23454.174
EXPORTS	28	47.63	92.64	71.04	11.56
INF	30	-11.27	21.82	4.437	8.113
DSR	28	27.99	71.81	42.45	10.02
PUBEXP	28	32.34E9	2.074E10	8.372E9	4.185E9
CAPFORM	28	5.531E9	4.043E10	1.331E10	8.479E9
SKILL	28	48.300	95.200	71.470	12.370
MFGADD	30	7.222E4	2.464E10	6.087E9	6.029E9
GDS	28	8.111E9	9.083E10	2.371E10	1.941E10
RER	30	0.427	0.991	0.567	0.133
LABOUR	30	5.480E5	2.884E6	1.478E6	7.669E5
OPEN	28	87.13	165.4	125.4	25.07
OILRENT	30	15.83	71.14	29.90	11.13
DOMINVR	28	19.20	30.97	24.78	3.535
GOVEXPR	28	9.996	22.09	16.58	3.301

Table 1. Descriptive statistics for economic growth and FDI characteristics

same direction while a negative value indicates an inverse relationship. It is important to note that the Pearson correlation coefficient only indicates the movement of the variables, not whether a change in one impacts the other.

RESULTS

We conducted simultaneous or two-stage least squares regressions (2SLQ) regressions. In order to check the 2SLQ results, we also conducted General Method of Movements (GMM) regressions. The results from the 2SLQ and GMM models are shown in Table 3. We find that GDP has an important impact on the level of FDI into a country. This result is consistent with our OLS regression, and in the case of the 2SLQ model, the coefficient is statistically significant at the 1% level. In this sense we find that the greater the levels of economic growth of a country, the greater will be the FDI level to the nation. In this respect our results tend to support both the neoclassical and Dunning's (1986) electric or OLI theory, which argues

		GDP	TB	INF	DSR	PUBEXP	CAPFORM	SKILL	MFGADD
GDP	Pearson Correlation	1	.764**	.408*	-.146	.968**	.988**	.812**	.668**
	Sig. (2-tailed)		.000	.025	.458	.000	.000	.000	.000
	N		28	30	28	28	28	28	29
EXPORTS	Pearson Correlation		1	.536**	-.109	.750**	.789**	.732**	.756**
	Sig. (2-tailed)			.003	.580	.000	.000	.000	.000
	N			28	28	28	28	27	28
INF	Pearson Correlation			1	.113	.589**	.604**	.175	.642**
	Sig. (2-tailed)				.568	.001	.001	.374	.000
	N				28	28	28	28	29
DSR	Pearson Correlation				1	-.306	-.183	-.612**	-.229
	Sig. (2-tailed)					.114	.351	.001	.241
	N					28	28	27	28
PUBEXP	Pearson Correlation					1	.976**	.851**	.989**
	Sig. (2-tailed)						.000	.000	.000
	N						28	27	28
CAPFORM	Pearson Correlation						1	.826**	.988**
	Sig. (2-tailed)							.000	.000
	N							27	28
SKILL	Pearson Correlation							1	.672**
	Sig. (2-tailed)								.000
	N								28
MFGADD	Pearson Correlation								1
	Sig. (2-tailed)								
	N								

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 2A.
Correlation
coefficient matrix
for the FDI model

		FDI Stock	GDS	RER	LABOUR	OPEN	OILRENT	DOMINVR	GOVEXPR
FDI Stock	Pearson Correlation	1	.967**	.916**	.772**	.531**	-.170	-.536**	-.710**
	Sig. (2-tailed)		.000	.000	.000	.004	.368	.003	.000
	N		28	30	30	28	30	28	28
GDS	Pearson Correlation		1	.870**	.786**	.575**	-.029	-.565**	-.811**
	Sig. (2-tailed)			.000	.000	.001	.885	.002	.000
	N			28	28	28	28	28	28
RER	Pearson Correlation			1	.615**	.217	.143	-.421*	-.686**
	Sig. (2-tailed)				.000	.267	.452	.026	.000
	N				30	28	30	28	28
LABOUR	Pearson Correlation				1	.843**	-.486**	-.550**	-.702**
	Sig. (2-tailed)					.000	.006	.002	.000
	N					28	30	28	28
OPEN	Pearson Correlation					1	-.353	-.313	-.689**
	Sig. (2-tailed)						.065	.105	.000
	N						28	28	28
OILRENT	Pearson Correlation						1	.062	-.220
	Sig. (2-tailed)							.755	.260
	N							28	28
DOMINVR	Pearson Correlation							1	.516**
	Sig. (2-tailed)								.005
	N								28
GOVEXPR	Pearson Correlation								1
	Sig. (2-tailed)								
	N								

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 2B.
Correlation coefficient matrix for the economic growth model

that FDI is an efficient mechanism by which to fill the savings–investment gap. This is more the case for developing countries, but is also relevant for developed countries, in particular during periods of economic recession.

Our results show that the importance of FDI on economic growth is to have at least assisted in filling the savings–investment gap, if not dramatically enhancing it. Similarly, the electric theory argues that location is advantageous for economic growth. Chakrabarti (2001), Asiedu (2002) and Zhao (2010) have all argued that higher economic growth positively impacts on FDI inflows and is a good measure of the level of attractiveness of the host country. Other studies, such as Moore (1993), Lucas (1993), and Cernat and Vranceanu (2002) claimed that once economic growth takes place, FDI inflows into the host country begin. The rationale for this is rather simple in that as economic growth takes place, economic analysts and commentators increase the frequency of their reporting regarding the country. In doing so the country receives a greater focus and it encourages corporates as well as investment houses to investigate possibilities in the nation. This in itself leads to greater publicity for the host country and a greater flow of funds. The opposite is also true whereby negative news from a country can lead to a mass exodus of funds.

We find exports to be an important factor in leading to greater FDI and this is consistent with our earlier discussion above, which argued that FDI into the UAE is largely for the motive of export. The UAE, with a population of eight million according to the last census, is not sufficiently large to warrant large scale investment. More importantly, of the eight million, a little over half are on a salary of less than US$500 per month. This implies that the effective population is only four million at best. In addition to this the investment that the government has made to make such emirates as Dubai into regional logistics hubs and the world's third largest re-export port is supportive of the idea that FDI for export seems to be the order of the day. The importance of exports in attracting FDI is also consistent with prior studies, which on the one hand argue that exports will increase as FDI seeks to capitalise on economies of scale through exports. Second, local firms will observe the actions of new firms and imitate them in exporting (see Haddad and Harrison, 1993). Hsiao and Hsiao (2006) also found that FDI has indirect benefits on FDI, and vice versa, in that FDI seeks to be attracted to locations which are export-intensive. We also find that trade openness has a statistically significant and positive impact on GDP. This result highlights the importance of a trade related growth theory.

**Joint
estimation
of economic
growth and
FDI in UAE**

166

Economic stability is a necessary prerequisite for FDI to flow into a host country. From a simple risk premium argument, the greater the level of economic instability the higher the required returns. In a globalised economy, a greater inflation may have higher economic instability but it is difficult for it to provide considerably greater returns. Therefore, given the choice of two locations, the electric (and finance) theory argues that FDI flows to the more economically stable location. In this chapter we measure economic stability using inflation. Therefore economic instability is argued to discourage inward FDI into the host country (Prüfer and Tondl, 2008; Jallab *et al.*, 2008). As we have argued above, inflation incorporates the risk premium of the country as well as near term economic expectations. The results show there to be a negative and statistically significant relationship between inflation and FDI. This result is consistent with prior studies and shows that FDI positively favours economic stability.

The traditional argument is that FDI can readdress the issue of a low domestic savings ratio. Under the Keynesian model, savings are equal to investment. If domestic savings are not available for some reason, then FDI can fill this vacuum. Our results show that there is a negative relationship between the domestic savings ratio and FDI. However, our result is not statistically significant. Nevertheless, it does show that the government has been attempting to supplement a low domestic savings ratio with FDI. Interestingly, when domestic savings are high, banks would naturally have a high level of liquidity and there has been less of a focus on FDI. We do however find a statistically significant and positive relationship between gross domestic savings and GDP. This is consistent with the argument of savings-led growth.

Public or government expenditure is important in not only attracting FDI but also leading to economic growth. In the case of the UAE, government expenditure forms over a half of total consumption. This is not unusual for an oil-rich developing country which needs to invest in building social as well as economic infrastructure. The Keynesian model demonstrates the importance of government expenditure in creating a government-led multiplier. We find a negative relationship between government expenditure and economic growth which is contrary to economic theory. One reason for this result could be that an increase in government expenditure can have a crowding-out effect in that prices increase and the private sector cannot justify the investment. In addition, government expenditure in some emirates, such as Dubai, has been carried

out through borrowing, which can have a debt overhang. Debt-financed government expenditure can negatively impact on economic growth, while the opposite can be true for tax-financed consumption. Third, government expenditure in the UAE is not transparent and we believe that a large proportion may have been utilised by government-related enterprises. Studies such as Bose *et al.* (2007) show that government expenditure and investment in education is the only factor that increases economic growth. We also find a negative and statistically significant impact of public expenditure on FDI inflows. We feel that a large public sector may compete with the private sector. In some cases this may create special privileges for the public sector organisations which may put off private sector competitors.

The study finds that capital formation is not statistically significant in leading to greater FDI. Nevertheless, the direction is positive in that higher domestic capital formation will spur greater FDI to take place. This result is in accordance with our expected signs as well as prior research. We do however find that manufacturing value addition actually has a statistically significant but negative impact on FDI. This may be reflective of the fact that any increase in manufacturing value by domestic firms reduces the probability of FDI in the same area. We feel that FDI may not wish to compete with domestic producers in the area of manufacturing products. Although we do not test this empirically, we feel that in the service sector, where there is greater ability to differentiate the output, FDI may not be as restricted. In other words, inward investment may feel that it can compete more effectively in the service sector rather than the manufacturing industries with domestic firms.

We find that the level of skills in the population has a positive impact on FDI; however, it is not statistically significant. This may seem odd as prior studies argue that a skilled workforce increases the attraction of a location. However, the UAE is rather unusual in that 90% of the population is expatriate. This implies that if a particular firm requires an employee with particular skills, they tend to recruit them overseas. In fact, the cost of the employee can also be controlled as the firm can recruit employees from low-cost countries. Although we do not test this, we nevertheless are led to believe that most FDI does not consider labour recruitment as an issue as they are not reliant on the domestic population. In the case of the labour force, we find that as the working population has increased largely through an increase in expatriates, it has had a positive impact on economic growth. Our result shows a statistically significant

and positive relationship with economic growth. This is consistent with the traditional Keynesian model, which shows that increase in personal sector consumption has a positive multiplier on the economy. Finally, we find that oil rents have a positive but not statistically significant impact on economic growth. It is more likely the case that in the early period, oil was important in spurring economic growth. More importantly, oil rents are observed through government expenditure.

POLICY ASPECTS

Our results also lead us to believe that if economic growth is to be sustained so as to ensure a long term growth trend, then it needs to focus on the export sector. As we explained above, the traditional Keynesian model has four key growth factors, namely: government, consumption, investment and the external sector (i.e. net of exports over imports).

	FDI and GDP Models		
Label	Variable	2SLS	T - stat
Intercept	Constant	17106.41	1.51
F1	GDP	7.43e-07 [a]	7.43
F2	EXPORTS	-166.3879 [b]	-2.43
F3	INF	-174.2618 [b]	-2.09
F4	DSR	-134.1032	-1.30
F5	PUBEXP	-2.82e-06 [a]	-3.22
F6	CAPFORM	2.60e-07	0.51
F7	SKILL	-70.63741	-0.51
F8	MFGADD	-1.54e-06 [c]	-1.75
G1	FDI Stock	1951042 [a]	25.02
G2	GDS	3.84e+08 [b]	2.34
G3	LABOUR	36334.72 [a]	12.12
G4	OPEN	-1.22e+08 [b]	-2.28
G5	OILRENT	3.12e+07	0.17
G6	GOVEXPR	-4.10e+08 [c]	-1.79

[a,b,c] refers to 1%, 5% and 10% significance levels.

Table 3.
Simultaneous model estimates

Of these government and domestic consumption have natural limits due to acceptable size of the public sector and size of the population respectively. Investment is very important. However, for it to achieve the desired rates of return, it needs to be export-focused. Therefore, we strongly believe that the government policy should be directed at creating an open economy that allows firms in the UAE to be able to benefit from the regional markets.

We find that that economic stability is extremely important for FDI inflows as well as economic growth and we believe that this should be a key economic priority. In terms of economic policy, the key aspects that we have found to be important include inflation and relative exchange rate. We believe that in both cases the current pegged exchange rate with the US dollar implies that the country is exposed to inflation and exchange rate risk. In recent years there has been evidence of imported inflation as a result of the pegged currency. More importantly, we believe that the pegged exchange rate gives the UAE little control over its monetary policy and ties the country to economic actions that are determined by the state of the US economy. We believe that economic stability can be maintained through a policy of portfolio exchange rates whereby the rate of the currency is determined by a basket of currencies based on the country's trading partners. We believe that such a policy will allow the country to maintain a level of control over the economy and not over-expose the exporters to currency fluctuations.

Our results show that public expenditure is important in the form of the provision of infrastructure spending. Under Dunning's OLI paradigm, the locational benefits are increased where a country has a higher level of infrastructure. We believe that public expenditure can play a pivotal role in this area so as to ensure that FDI continually flows into the country. In addition, public expenditure in infrastructure helps in retaining FDI. Prior studies in FDI show that FDI is not permanent in that it can flow out of a country into another that has a better set of features. As such we believe that the country should regularly review its OLI features, using Dunning's paradigm, to ensure that FDI that has flowed into the country does not then leave. Finally, we believe that the country needs to have a comprehensive policy to attract manufacturing FDI, as this increases the level of manufacturing value added in the country. Our results show that this has a positive impact on FDI stock as manufacturing investment is long term. More importantly, manufacturing investment attracts allied industries to establish close to the anchor investment. As such we

believe that manufacturing FDI has a higher impact on economic growth and FDI stock.

CONCLUSIONS

One clear conclusion that is born from this study is that economic growth and FDI are interrelated factors. Economic growth leads to positive news regarding the country, which prompts firms and investment houses to investigate opportunities in the host country. The study found that FDI can play an important role in filling the domestic gap in investment and spur economic growth. Our results, although very important, need to be extended in future research to look at the types of FDI that lead to the greatest impact on economic growth. Wang (2003) found that FDI in the manufacturing sector had a statistically significant and positive impact on economic growth for the host economies. However, the same was not true for FDI into non-manufacturing sectors. We believe that this result may be more reflective of the countries selected in the study, as there is sufficient evidence to suggest that FDI into the service sector can also spur economic growth. From a policy perspective, we believe that a country needs to initiate economic growth so as to be able to attract FDI. In doing so, the host country will be able to generate even greater economic growth.

The study finds a positive relationship between FDI and exports in that the greater the level of FDI, the higher the exports of the host country. We also believe (although do not test empirically) that the opposite relationship also exists in that FDI flows to locations which are export-intensive. The rationale for this is that export-intensive locations will have invested in the infrastructure to support exports as well as being active in signing free trade agreements, which seek to reduce tariffs. From a policy perspective, we believe that a host country needs to ensure that it has built export-friendly infrastructure in order to attract FDI. In addition, to spur the process of FDI, the host country would be wise in attracting export-focused FDI in the first instance rather than encouraging FDI to export. We believe that FDI that is focused towards exports will also spur economic growth through demonstrating its benefits to domestic firms. At the same time, in order to enhance economic growth, we feel that the country should pursue a more trade-open policy. To a certain extent the UAE is an open economy. However, the UAE has not capitalised on this through reciprocal arrangement typically found in free trade agreements. We

find that over half the products in the country are imported with no import duty and the rest typically charged 5%. However, the same is not true of the exports from the country and we feel that through negotiating more free trade agreements, exports from the country can receive the same treatment. We believe that the country should have a greater focus towards enhancing the competitiveness of its exports through a web of free trade agreements.

Economic instability is argued to discourage FDI into the host country, while the reverse is true in that it increases the attractiveness of a location. The study has found that economic stability measured by inflation has a negative relationship with FDI. This result is consistent with prior studies and supportive of the argument that governments need to have a holistic approach to FDI. Simply carrying out ad hoc investment promotional activities will have limited impact on the level of FDI. Corporates take a long term view and one very important consideration is economic stability, which impacts on the risk premium, and of course, the feasibility of a particular FDI related project. We believe that governments seeking to attract FDI need to ensure that they are mindful of the importance of economic stability (and of course political stability). As such we believe that appropriate economic tools needs to be implemented that create a profitable environment for business with predictability of economic policy and direction in the near term. We believe that the greater the levels of transparency in economic policy, the more comfortable businesses will become, and the greater the likelihood of further FDI.

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estimation
of economic
growth and
FDI in UAE

172

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**Joint
estimation
of economic
growth and
FDI in UAE**

176

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ABOUT THE AUTHORS

Fahad Saif Harhara is an Advisor in Business Development at Tawazun Economic Council. Fahad is a PhD student at Brunel University with a thesis in FDI & Technology transfer. He holds a Masters in Business Administration from the American University of Dubai, a Masters Diploma in Electricity Supply Management from Cambridge University, UK, and a Bachelor of Science in Electrical Engineering from Virginia Commonwealth University in the United States. Fahad worked for almost thirteen years in leading positions at prominent organizations both inside and outside the UAE including the Emirates Identity Authority, Abu Dhabi Distribution Company, Abu Dhabi Water & Electricity Authority, Thuraya Satellite Telecommunications Company and Virginia Micro Electronic Center, based in Richmond, Virginia, US.

Dr Amer Al-Roubaie is currently the Dean of the College of Business and Finance, Al Ahlia University, Bahrain. He obtained his PhD in Economics from McGill University in Montreal, Canada. He taught economics in Canada, the United States, Malaysia and the Middle East.

For several years, Dr Al-Roubaie worked as a Research Fellow at the International Institute of Islamic Thought and Civilization (ISTAC), Malaysia. Basically an economist, his experience includes international business, finance, globalisation, knowledge-based development, Islamic banking and finance and energy. He has participated in several conferences and attended seminars in many different countries. His publications include books, research reports and many articles which have appeared in a number of international journals.