An evaluation of the impact of foreign direct investment on Bahraini economy

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Abstract: In many economic studies, FDI is positively linked to economic growth of the host country. However, questions continue to linger and some authors contend that the relation between economic growth and FDI can be negative. Existing empirical findings for Bahrain based on traditional regression analysis show no conclusive results; and many voices, notably from the Bahrain Chamber of Commerce and Industry (BCCI), are urging the government to limit the advantages given to foreign investors. In this paper, we use the fuzzy screening methodology to assess the impact of FDI on Bahraini economy by aggregating the evaluations of a panel of experts from the academic and the investment fields on the basis of some set criteria. Results show an overall threshold positive effect of FDI on Bahraini economy.

Keywords: foreign direct investment; FDI; technological transfer; trade performance; employment; competition; fuzzy screening; Bahrain.


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1 Introduction

Foreign direct investment (FDI) is expected to promote sustainable growth in host countries, particularly the developing ones (Rugraff and Hansen, 2011), by augmenting the main generators of economic development, such as capital formation, competitiveness, technological improvement and innovation. According to the OECD (2002) report, FDI may also be an efficient way to modernise developing economies and to achieve higher growth rates. To reach these objectives, an increasing number of governments give special advantages to foreign firms to attract further inflows of FDI.

Bahrain is one of those countries which have given high importance to FDI. Among the most important measures taken by Bahrain to attract FDI, are, to name a few, the establishment of a one-stop shop to facilitate licensing procedures, the simplification of
rules permitting firms outside the GCC countries to own buildings and lease land and the permission of wholly foreign ownership in most businesses except in a limited number of strategic sectors (Hussein, 2009). Also, other measures have helped to create high liberalisation of the economy. The 2014 Index of Economic Freedom calculated by Heritage Foundation ranked Bahrain the 13th freest economy in the world, and the first in the Middle East and North Africa (MENA) region. The index highlighted Bahrain’s commitment to major reforms and trade freedom as the main factors that have enabled the country to become an important financial hub and a regional leader in matter of economic openness. These measures have caused an increase in FDI inflows to Bahrain, which reached $989 million in 2013, while accumulated FDI has so far exceeded $17.8 billion. Relative to the size of the economy, FDI inflows represent a significant amount; it is the highest score among GCC countries if taken as a percentage of nominal GDP (3.47%) and as a percentage of the GFCF (15.7%). However, the debate about FDI in Bahrain remains still controversial; and many voices, notably from the Bahrain Chamber of Commerce and Industry (BCCI), are urging the government to limit the advantages given to foreign investors.

Positive effects of FDI have been extensively shown for most countries in the literature (De Mello, 1999; Varamini and Vu, 2007; Salman and Feng, 2009; Choong et al., 2010). Questions still remain about its real impacts on the economy of a host country. Some authors indicate that this relation is to a high extent inconclusive and may even turn out to be negative (Durham, 2004; Lyroudi et al., 2004; Lipsey, 2006; Pessoa, 2007). To expound the ambiguity of FDI impacts, several explanations have been formed such as the type of variables used in empirical studies, and that can affect results (Bruno and Campos, 2013); the insufficient analysis of the specificities and characteristics of host economies (Lipsey and Sjöholm, 2005); the errors that may occur in empirical analyses, such as inappropriate choices of estimation methods (Carkovic and Levine, 2005) and the use of the total amount of FDI without a thorough analysis of its sectorial distribution (Wang, 2009).

Following the divergence of results related to FDI impacts, we apply in this study a different methodology. In order to assess the impacts of FDI on Bahraini economy, we use the fuzzy screening method. The proposed methodology allows us to get results free from the shortcomings of testing through regression models. This paper is structured as follows: Section 2 presents the variables used in our study in order to assess the effects of FDI; Section 3 presents the methodology used and explores the results of the study. Concluding remarks were made in Section 4.

2 Variables

2.1 FDI and technological transfer

Foreign firms are generally seen to be technologically advanced compared to local firms (Lin and Saggi, 2005). The technological transfer that accompanies FDI would increase the economic performance of host countries, notably the developing economies (Keller, 2010; Harding and Javorcik, 2013). In many cases, foreign firms get from local companies the raw materials and the intermediate products they need in producing their final goods. Therefore, they become often inclined to provide local firms all kinds of
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technical assistance to keep up the quality of their products. This would, in turn, improve the performance of local firms.

However, some economists consider that foreign firms generally do not take such an attitude. For instance, Sen (1998) notes that foreign firms are often interested in preserving their specific technological advantages. Therefore, they avoid transferring to local companies any kind of updated technology. Besides, Dahlman (2007) considers that, in the long run, technological transfer by foreign firms may induce an adverse selection to local companies through a decrease in their motivation to create new technologies. The consequence for the host country would be more dependence on foreign firms’ technologies.

2.2 FDI and the formation of human resources

An increase in human capital can result from increased FDI activities. According to the OECD (2002), foreign firms offer to their workers more training sessions than local firms. This is due to the fact that local workers need to absorb the new technologies and the organisation techniques used in the production process (Ozturk, 2007). In addition, according to Alfaro et al. (2004), an ‘informal’ training may occur from simple observation of new methods of production introduced by foreign firms.

The improvement in the formation of human resources can benefit the host country through various channels (Lim, 2001). Indeed, the requirement of a qualified labour force by foreign firms may push host governments to invest further in training. Also, the qualified workers can later be recruited by local firms, or they can make use of their qualifications to establish their own companies, creating more job opportunities and diffusing the spillovers of their knowledge in the local economy.

However, FDI can induce opposite effects. Host governments might reduce the spending on the formation of human capital because of the efforts made by foreign firms in this field (Ford et al., 2008; Yildirim and Tosuner, 2014). Host countries may also reduce their financial aid and support to local firms which may generate lower levels of R&D activities by local firms (Vissak and Roolah, 2005).

2.3 FDI and trade performance

A positive relation between FDI inflows and international trade activities is found in the literature (Wijeweera et al., 2010). Because foreign firms have higher levels of globalisation in their activities compared to local firms, they possess better network relations with other companies. If local companies manage to become suppliers of foreign firms, this would improve their possibilities to build more business relations or to export their products. Also, the presence of foreign firms will improve physical infrastructure by host governments. This may increase international commerce and help local firms build global networks (Minai, 2011).

However, FDI may result in negative effects on global international trade and on the balance of payments. This is the case when FDI is mainly destined to the local market rather than exports (Tran and Dinh, 2014). Besides, FDI may cause greater economic instability in countries from negative effects of events like financial crises and rapid movements in the global economy through openness of the economies.
2.4 FDI and increased competition

Following an increase in supply in host countries caused by the entry of foreign firms, local firms are expected to increase their competitiveness in order to preserve their shares in the different sectors of economic activity. Local firms are therefore expected to increase their productivity, to improve their relative prices and to conduct more efficient allocation of their scarce resources (Herman et al., 2004; Damijan et al., 2013; Merlevede et al., 2014).

The failure to compete with foreign firms and their specific advantages would, however, generate reciprocal effects (Ram and Zhang, 2002). It may shrink the activities of local firms or may even lead to higher concentration and less competition in some sectors of the economy.

2.5 FDI and employment

The establishment of new firms and the expansion of businesses can directly increase employment. Other channels may also operate. For example, the potential linkages with local firms can boost employment in these companies (Görg and Strobl, 2005). Besides, a diffusion of know-how, organisational expertise and other firm-specific advantages may also occur in local companies. This may lead to increased competitiveness and potentials to undertake further investments creating more employment and job opportunities (Habib and Sarwar, 2013; Ozughalu and Ogwumike, 2013).

Some theories however argue that the relation between FDI and employment might be negative. Better technologies introduced by foreign firms might increase the use of capital-intensive rather than labour-intensive production methods. The result may be an increase in employment of skilled workers at the expense of the employment of less skilled workers (Ekholm and Midelfart, 2005).

3 Methodology and results

Our analysis relies mainly on the procedure called the fuzzy screening method which was initially developed by Yager (1993). In this method, a non-numerical scale in the selection of alternatives is required to undertake the evaluation process. Information is provided using imprecise linguistic values’ evaluations. Therefore, this method takes into consideration the potential lack of detailed information associated with each scale, and allows experts to express their evaluations in a comfortable manner. In addition, this method provides requisite aggregations of all experts’ evaluations.

Two stages are generally undertaken when using the fuzzy screening method. In stage 1, an evaluation of alternatives is provided by individual experts. In stage 2, an aggregation of experts’ evaluations is conducted, and an overall value is obtained.

The process of evaluation contains three parts:

• a collection of choices or alternatives, \( A \)

\[
A = \{A_1, A_2, \ldots, A_h\}
\]  

(1)

with \( h \) the total number of possible alternatives.
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- a number of experts, \( E \)
  \[ E = \{ E_1, E_2, \ldots, E_r \} \]  
  with \( r \) the total number of experts whose choices are considered in the screening process.

- a number of variables or criteria, \( C \)
  \[ C = \{ C_1, C_2, \ldots, C_n \} \]  
  with \( n \) the number of selected criteria used by the group of experts in the evaluation of alternatives.

Each expert evaluates the degree of accordance of each criterion in the set \( C \) with respective alternatives. These alternatives are presented under linguistic terms as follows (Table 1).

<table>
<thead>
<tr>
<th>Alternatives’ classification</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Outstanding (OU)</td>
<td>( S^*_r )</td>
</tr>
<tr>
<td>Very high (VH)</td>
<td>( S^*_n )</td>
</tr>
<tr>
<td>High (H)</td>
<td>( S^*_5 )</td>
</tr>
<tr>
<td>Medium (M)</td>
<td>( S^*_4 )</td>
</tr>
<tr>
<td>Low (L)</td>
<td>( S^*_3 )</td>
</tr>
<tr>
<td>Very low (VL)</td>
<td>( S^*_2 )</td>
</tr>
<tr>
<td>None (N)</td>
<td>( S^*_1 )</td>
</tr>
</tbody>
</table>

The first step of our study was to design questions to measure the impact of FDI on Bahraini economy using the selected variables presented in Section 2. These questions were written to be answered by a panel of 74 experts from the academic and investment fields (\( r = 74 \)). Table 2 presents the set of questions used in this study to evaluate each variable.

<table>
<thead>
<tr>
<th>Evaluation form</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>( j )</td>
<td>Questions/criteria</td>
</tr>
<tr>
<td>1</td>
<td>Positive impacts of FDI on technological transfer are:</td>
</tr>
<tr>
<td>2</td>
<td>Positive impacts of FDI on the formation of human resources are:</td>
</tr>
<tr>
<td>3</td>
<td>Positive impacts of FDI on trade performance are:</td>
</tr>
<tr>
<td>4</td>
<td>Positive impacts of FDI on competition are:</td>
</tr>
<tr>
<td>5</td>
<td>Positive impacts of FDI on employment are:</td>
</tr>
</tbody>
</table>

Thus, an individual expert affords a series of \( n \) values, one in relation to each criterion:

\[ P = \{ P_1, P_2, \ldots, P_n \} \]  

(4)
with $P_j$ representing the expert’s preference, or the expert’s rating in relation to the $j^{th}$ criterion.

Besides his evaluation of the satisfaction of each criterion to possible alternatives, and by using the same scale, each expert gives a measure to the degree of importance of each criterion.

The next step is to derive an overall evaluation for individual experts. This procedure requires a negation of the degree of importance of each criterion. This negation can be expressed as follows:

$$\text{Neg}(S_j) = S_{h-i+1}$$  \hfill (5)

with $h$ the highest possible score.

In our scale (Table 1), the negation process leads to the results shown in Table 3.

<table>
<thead>
<tr>
<th>Negation (OU)</th>
<th>N</th>
</tr>
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<tbody>
<tr>
<td>Neg. (VH)</td>
<td>VL</td>
</tr>
<tr>
<td>Neg. (H)</td>
<td>L</td>
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<tr>
<td>Neg. (M)</td>
<td>M</td>
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<tr>
<td>Neg. (L)</td>
<td>H</td>
</tr>
<tr>
<td>Neg. (VL)</td>
<td>VH</td>
</tr>
<tr>
<td>Neg. (N)</td>
<td>OU</td>
</tr>
</tbody>
</table>

**Table 3** Negation results

The expert’s evaluation score in relation to available alternatives, written as $A_{ik}$ is given by the following equation.

$$A_{ik} = \min_j \left[ \text{Neg}(I_j) \lor P_j \right]$$  \hfill (6)

with $\lor$ referring to a maximum operation, and $I_j$ referring to the degree of importance of the $j^{th}$ criterion. The formulation in equation (6) relates the individual expert’s score to the degree of importance of each criterion.

At the end of stage 1, we have a series of $r$ evaluations, one for each expert.

$$\{A_{i1}, A_{i2}, \ldots, A_{ir}\}$$  \hfill (7)

where $A_{ik}$ represents the evaluation of the $i^{th}$ alternative by the $k^{th}$ expert.

Stage 2 consists of using an ordered weighted averaging (OWA) operator to combine the rating of each alternative by all experts. This allows us to deduce for each alternative a corresponding general evaluation.

From the experts’ evaluations, we derive an aggregation function, $Q(i)$. This function represents the degree of the agreement of experts for an alternative to pass the screening process.

In other words, the value $Q(i)$, where $i = 1$ to $r$, indicates how satisfied are $i$ experts, out of a total number $r$, in passing an alternative. The value $Q(i)$ is an element in the scale $S = \{S_1, S_2, \ldots, S_h\}$. $Q(i)$ has the following characteristics.

- as more experts agree, confidence in the decision increases: $Q(i) \geq Q(j)$, $i > j$
- if there is a consensus among experts, confidence in the decision is the highest: $Q(r)$ maximum.
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The function $Q$ can take different forms depending on the importance given to the number of experts that must first agree before an alternative is accepted. A function that represents the average can be written as $Q_{av}$ and for all $i = 0, 1, \ldots, r$, it is defined as:

$$Q_{av}(k) = S_i(k)$$

With:

$$b(k) = \text{Int} \left[ 1 + \left( k \times (h-1)/r \right) \right]$$

where $h$ is the total number of points on the scale $S$; $k = 0, 1, \ldots, r$; and $\text{Int}$ is an operator reflecting the integer value that is nearest to the float number in the square bracket in equation (9).

After selection of function $Q$, we can use the OWA method to aggregate experts’ opinions. The first step in the OWA procedure is to order $A_{ik}$ in a descending order. This can be denoted as $B_j$ that represents the $j$th top score among experts for the $i$th alternative.

Then, for the $i$th alternative, the overall evaluation is calculated using the following equation.

$$A_i = \text{Max}_j \left[ Q(j) \vee B_j \right]$$

where $\vee$ denotes here the minimum operation. In the above formulation, $B_j$ is regarded as the worst of the $j$th best scores and $Q(j)$ indicates how important the user feels about the support of at least $j$ experts.

When we apply this methodology to our analysis, we obtain the following result: $A_i = L$, which indicates that the overall effect of FDI in Bahrain is positive, but with low effect. This result is not surprising and can be seen as acceptable since no previous analysis showed that the effects of FDI in Bahrain could be either very positive or very negative, especially if we take into consideration the overall effect on the five variables mentioned in Section 2.

Even though the fuzzy screening method is a comprehensive method that enables us to take into consideration the aggregated impact of FDI on different criteria such as employment, competition, technological transfer, trade performance and human capital, it seems clear from the response of experts that they considered positive impacts to be higher regarding employment and technological transfer.

Concerning employment, this can be explained by the fact that FDI in Bahrain consists almost entirely of Greenfield investment as opposed to mergers and acquisitions (M&As). The ratio of M&As to FDI is very low in Bahrain and historically never exceeded 5.84% in the late 1990s (Harms and Méon, 2013). Greenfield FDI, which is mostly done through the establishment of new enterprises, is likely to create more employment opportunities (UNCTAD, 2003).

The positive impacts on technological transfer can be explained by the fact that FDI flows into Bahrain do not rely on low cost labour. They are concentrated in sectors of relatively high technology and know-how, such as banking, finance, communications and transportation. Such sectors are likely to create more technological transfer than low value-added sectors.

In contrast to the effects on employment and technology transfer, positive effects of FDI on the other three criteria, namely human capital, trade performance and competition do not seem to be significant. Results related to the effects on competition illustrate the
difficulties that domestic firms have in competing with foreign firms. As for trade performance, even though FDI in Bahrain is likely to induce an increase in exports, it seems to have triggered strong import dynamics. Since FDI is mostly Greenfield, foreign firms need raw materials and intermediate goods which are often unavailable in the country because of the small size of the economy. Indeed, capital imports including machinery and transportation equipment represent a significant relative importance of the total imports in Bahrain (EDB, 2013). Finally, concerning impacts on human capital, insignificant effects of FDI can be explained by the fact that FDI in Bahrain is concentrated in relatively advanced sectors in which the labour force is already skilled and well-educated.

4 Conclusions

This paper applies a fuzzy screening methodology to assess the impact of FDI on Bahraini economy. The proposed methodology seems capable of shedding more light on analyses related to this subject and appears susceptible of providing sound results that are free from the shortcomings of testing through regression models. Results show that the effects of FDI on Bahraini economy are rather positive in general, and more specifically in relation to the levels of employment and technological transfer in the country. The methodology presented in this paper can be extended to analyse the impacts of FDI in other countries and regions.

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