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Does Foreign Direct Investment Improve Welfare in North African Countries?

Abstract

This paper examines the relationship between FDI inflows and welfare improvement in North African countries. Using net per capita FDI inflows and the UNDP's HDI as the principal variables, our analyses confirm the positive and strongly significant relationship between net FDI inflows and welfare improvement in North Africa, although we do find significant differences among the countries in the region. This relationship holds even after we control for government size, country indebtedness, macroeconomic instability, infrastructural development, institutional quality, political risk, openness to trade, education and financial market development. Hence, at the aggregate level, FDI contributes to economic growth in North Africa, in turn generating additional revenues for governments and populations in the region through fiscal policies and jobs creation. It is therefore essential for governments in the region to continue investing in social infrastructures while improving the quality of their institutions and their governance; doing so will help avoid the type of unrest we have witnessed recently.

We also found that FDI received by countries in the region are mainly concentrated in very few industries (particularly extractive petroleum, services and tourism, construction and utilities); relatively fewer of these investments are directed toward the non-extractive primary industries, which are pro-poor sectors and highly labor intensive, or the manufacturing sector, with a high potential for spillover effects in the economy. This lack of diversification of FDI received in the region's economies in part explains the differences observed in the link between FDI and welfare in these countries.

Three main policy recommendations are formulated. First, in terms of reducing differences in average welfare between countries in the region, policies to attract FDI should be carefully

designed to direct those investments toward the most productive sectors of the economy, namely the manufacturing sector. Second, in terms of reducing inequalities within a country, sufficient incentives should be provided to encourage foreign investments in labor-intensive and pro-poor sectors such as agriculture, fishing, education, health and infrastructural development. And lastly, in order to better redistribute wealth within the region, reduce poverty and improve human development, governments in the region need to improve the quality of their institutions and their governance.

JEL classification code: O1, R1, F3

Keywords: FDI, foreign direct investment, economic growth, North Africa, welfare.

I. Introduction

The United Nations' Millennium Declaration of 2000 outlines eight Millennium Development Goals (MDGs) for 2015[1]. Each of these eight goals aims to accelerate human development and reduce poverty in developing nations. Unfortunately, at present, most African countries are not on track to reach these goals. To redress the situation, considerable capital investments are required. An important source of capital investments in African countries is foreign direct investment (FDI). The private sector is recognized as a principal driver of growth in most countries on the continent. Hence, FDI is crucial for achievement of the MDGs. The persistence of the financial and economic crises, however, have led most developed countries to design economic and fiscal policies to keep capital at home, placing achievement of the MDGs in even greater jeopardy[2].

As is the case for many emerging economies, the level of development among North African countries implies a need for continuous foreign investments to stimulate their economies and trigger poverty reduction. As shown in Figure 1, FDI flowing into North Africa has risen in recent decades, whether considered on a per capita basis or as a share of gross domestic product (GDP) (UNCTAD, 2010); the last five years have been an exception to this rule, in that FDI has been declining due to the financial crisis and the Arab Spring. Real per capita GDP and the Human Development Index (HDI)[3] have both been improving during this timeframe (UNDP, 2010). More FDI thus appears to be linked to improved welfare[4].

Figure 1: Evolution of FDI, the HDI and per capita GDP in North Africa
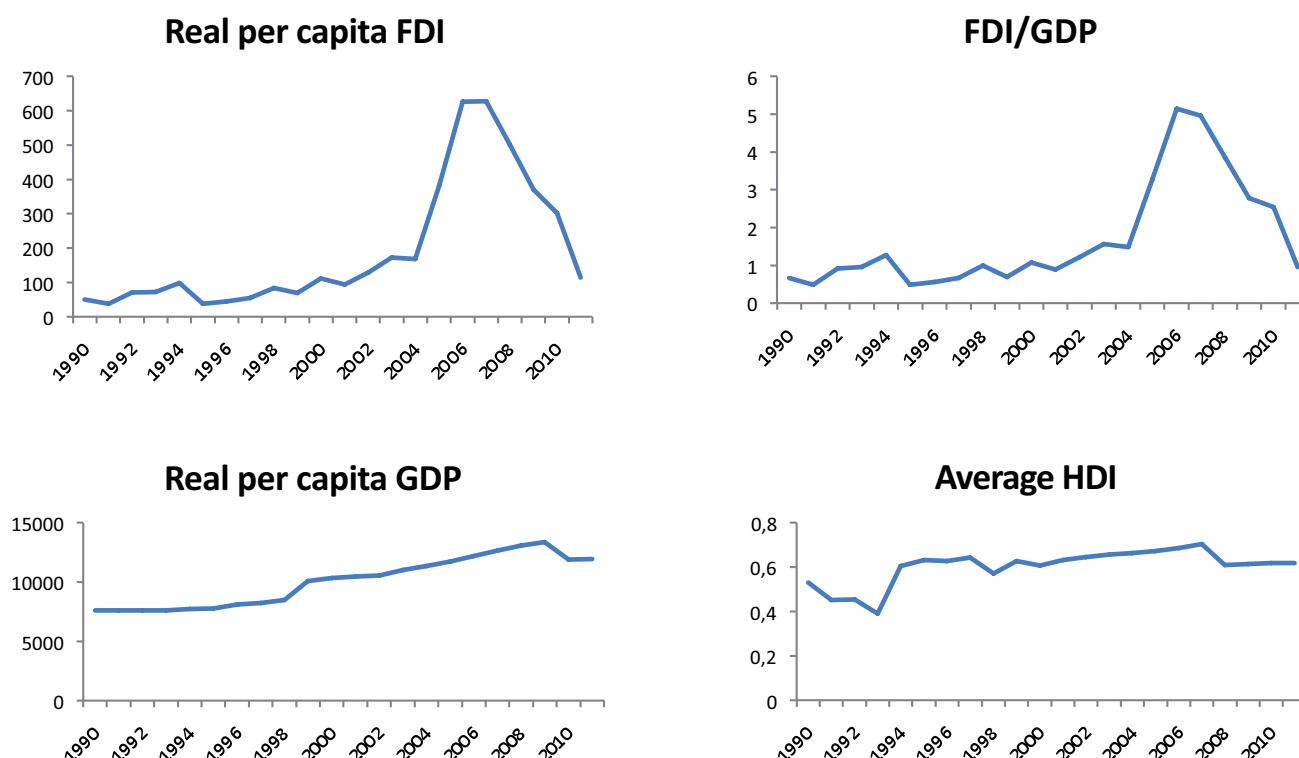
[1] For details, visit the MDG website at www.un.org/millenniumgoals/.
[2] See, for example, the February 7, 2009 issue of The Economist on "The return of economic nationalism" (www.economist.com).
[3] As computed by the UNDP
[4] The HDI is more closely related to welfare, a broader concept than typical measures of poverty. However, to link our paper to the MDGs and for ease of understanding, we will use "poverty reduction" for "welfare" throughout the paper when necessary.

This paper studies the relationship between net FDI inflows and welfare improvements in North African countries. More specifically, we: (i) explore whether FDI contributes to improved welfare in the North Africa region; (ii) examine whether FDI has greater welfare-improving impacts in some North African countries than in others; and (iii) draw policy recommendations from our findings. As far as capturing levels of human development is concerned, we use the HDI as our key indicator to measure welfare improvements. As a check and to ensure robustness, we also use an alternate welfare measure common to the literature: real GDP per capita. To measure FDI, we use net per capita FDI inflows. Our alternative measure is the net FDI inflows-to-GDP ratio.

This study is particularly relevant for the North Africa region following recent political unrest and social tensions in many of these countries. Foreign direct investments which were supposed to contribute to economic growth, and therefore lead to a more equal distribution of wealth among the population, may have instead contributed to rising social disparities, contributing to subsequent social tensions in the region.

A wealth of literature analyzes the causality of the relationship between FDI and economic growth (e.g., Alfaro (2003), Alfaro et al. (2004, 2010), Apergis et al. (2008), Carkovic and Levine (2005), Chowdhury and Mavrotas (2006) and Hansen and Rand (2006)). These studies analyze the overall impact of FDI on economic growth under the assumption of a perfect positive correlation between economic growth and welfare. However, this assumption has been questioned (e.g., Anand and Sen (2000)). Indeed, unequally distributed economic growth may be associated with an unchanging or rising level of poverty in a country. More specifically, even if economic growth has been found to be a prerequisite to improved well-being, economic growth which is not pro-poor (i.e., not redistributive) may create inequality and could negatively impact actual welfare (Ravallion, 2007).

At the same time, the literature on the topic has been limited due to challenges in the measurement of welfare and economic development. Two popular indicators here are per capita GDP and poverty incidence[5]. The first indicator is widely used and is available annually for all countries, but only measures one dimension of development. The second is a

good measure of overall wellbeing, but data is not available for all countries, and even when data is available countries tend to measure poverty differently. Over the last three decades, the United Nations Development Program's (UNDP) HDI has become the (nearly) universally accepted measure of human development. The HDI is now readily available for all countries. Nonetheless, the few researchers who have used the HDI to analyze the direct impact of FDI on welfare have focused on Asia or on low- and middle-income countries (Sharma and Gani, 2004), with the exception of Gohou and Soumaré (2012) who focus on Africa. To the best of our knowledge, no study has analyzed the impact of FDI on the HDI for the particular case of North African countries.

This paper's contribution to the literature is threefold. First, we believe that this study is the first to analyze the extent to which FDI contributes to welfare improvement in North Africa. Second, in terms of policy implications, the outcome of this research will guide policy makers in designing policies aimed at better directing external capital, such as FDI, toward sectors with the highest impact on welfare. Third, for governments and policy makers, having a better understanding of the characteristics of FDI and how they are linked to welfare improvement is key when designing sound policies to attract more "quality" foreign investments and to direct them toward appropriate sectors of the economy in a manner which improves the wellbeing of populations.

We conduct both univariate and multivariate analyses on panel data. Using the Granger causality test, we find a unidirectional causality from FDI to HDI for the entire region. However, when real per capita GDP is used as a welfare variable, we find bidirectional causality between FDI and real per capita GDP. Moreover, our dynamic panel regression analyses indicate that FDI positively and significantly impacts welfare in North Africa, although this relationship differs between countries in the region. Overall, FDI contributes to economic growth in North Africa, which in turn generates additional revenues for governments and populations in the region through fiscal policies and jobs creation. Additionally, we found that government spending, infrastructure development, institutional quality and better governance tend to amplify the positive effects of FDI on welfare in the region. It is therefore essential for the region's governments to continue investing in social infrastructures while improving the quality of their institutions and their governance; doing so will help avoid the type of unrest we have witnessed recently.

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[5] Poverty incidence is an indicator of poverty from household surveys. An estimate of the international poverty incidence is performed by the World Bank (see PovNet). The accuracy of the data underlying this international poverty incidence has been challenged recently. For instance, the World Bank has reviewed the bases of the 2009 estimate; following that review, the indicator data has changed drastically. Moreover, data is not available for every year. Here, the poverty incidence refers to the one calculated using household surveys. This poverty incidence is more accurate but also has several drawbacks, such as availability, comparability across countries, etc.

The explanation for the differences in the links between FDI and welfare across countries may partly lie in the concentration of FDI received in very few industries, along with the potential in these industries for spillover effects in the economy and on the populations' well-being. Indeed, during the 2008-2010 period, in Egypt, Libya and Mauritania, FDI was mainly directed into petroleum extraction industries; in Morocco, FDI inflows were essentially in the services and tourism industries (finance, business activities, restaurants and hotel industries). Almost no FDI went to the primary sector in Morocco and very few into the manufacturing sector. FDI received by Algeria was concentrated in the construction and "unspecified" secondary sectors, and less FDI went into the tertiary and agricultural sectors. In Tunisia, the main beneficiary industries of FDI inflows were the utilities sector, i.e. the electricity, gas and water industries. In light of these observations, in most of the countries of the region, it is essential to implement policies aimed at diversifying FDI, especially to direct more FDI toward the non-extractive primary industries

(such as agriculture and hunting, forestry and fishing…), which are more labor intensive, and the manufacturing sector, which has the highest spillover effect (e.g. Alfaro (2003)). For many of these countries, given the high concentration of FDI in a few industries, the impact of FDI on welfare will depend a lot on the fiscal and redistributive policies in place, especially for the extractive natural resources sectors. Additionally, more diversification of FDI across industries in the region could have a greater impact on poverty reduction and reduce income inequalities within countries.

The rest of the paper is organized as follows. Section 2 reviews the literature on the relationship between FDI and economic growth and between FDI and welfare. Section 3 and 4 present and discuss the empirical results of our analysis of the relationship between FDI and welfare, respectively, at the aggregate level and at the country level. Section 5 concludes and formulates policy recommendations.

II. Review of the Literature on FDI and Welfare

Numerous studies have analyzed the relationship between FDI and economic growth to determine the extent to which, if any, FDI impacts economic development. The assumption common to these studies is that economic growth improves welfare. The results have been mixed, but most research finds that FDI stimulates economic growth. The differences in the findings may arise from a number of methodological and conceptual factors such as the lack of a comprehensive, harmonized dataset, differing definitions of FDI, differing econometric specifications, etc.

This section begins by reviewing the theory on the transmission mechanisms between FDI and welfare. It then discusses the nature of the causal link between FDI and economic growth and reviews recent findings in that regard.

II.1. Theoretical arguments: The link between FDI and welfare

Since World War II (WWII), two trends have characterized the evolution of FDI in developing countries. First, from the end of WWII to the end of the Cold War in the early 1990s, FDI flows and stocks increased worldwide, especially in developing countries. During this period, FDI flows were mainly driven by political rather than economic motives. Second, since the 1990s, FDI has been concentrated in countries offering fiscal benefits, subsidies and other incentives.

The impact of FDI on human development can be analyzed from at least two viewpoints. On the social side, reducing poverty and improving welfare are the priorities of the governments of developing countries. Foreign investment can help achieve these goals because investments create jobs, develop local skills and stimulate technological progress. On the economic side, recent literature on endogenous growth suggests that human capital may be the principal contributor to self-sustaining per capita GDP growth[6]. One of the main contributors to human capital is human development. It is thus of prime interest to assess how FDI impacts human development.

FDI can impact welfare through both direct and indirect channels[7]. A direct channel consists of spillovers to the private sector (upstream and downstream linkages). Spillovers can take place if FDI creates positive vertical spillover effects with local suppliers (upstream linkages) and through local sourcing and firms (downstream linkages). FDI may also create positive horizontal spillovers by promoting and enhancing competition and causing new technologies to be implemented. In addition to these positive spillovers to local firms, FDI can impact welfare directly by creating jobs for new workers. For this channel to be efficient, the number of jobs created must be greater than the number of jobs lost as a result of FDI-related activities – layoffs pursuant to mergers and acquisitions, the closing of local firms, etc. FDI in a labor-intensive, pro-poor sector such as agriculture is thus likely to have the greatest impact on welfare.

FDI's indirect impacts on welfare occur at the macroeconomic level. If a country's overall net transfer of revenues is positive[8], it is likely that FDI will increase a country's total investments. This is assumed to increase economic growth. In this case, however, the link to welfare is not direct.

We see, from this discussion, that the FDI policy regime and the type of FDI are of crucial importance to FDI's ability to improve welfare. If FDI is only used to purchase raw materials for a firm outside the host country, then the scope for job creation and spillovers is limited. If, in contrast, FDI targets access to a specific domestic market, then its impact on jobs and its upstream and downstream linkages are likely to be high.

II.2. Tests of the direct relationship between FDI and economic growth

Much research has used econometric techniques such as the Granger causality test and the Toda-Yamamoto test to study the direction of the causal link between FDI and economic growth. The findings are mixed. Recently, Chowdhury and Mavrotas (2006) used the Toda-Yamamoto method to test the direction of causality between FDI and GDP growth

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[6] This differs from the initial studies on economic growth that had recognized that technological progress is the main driver of sustainable growth (Solow, 1956).
[7] See Sumner (2005) for a detailed discussion of various channels.
[8] This requires repatriation of profits and royalties to be less than FDI inflows. Moreover, the taxes paid in relation to FDI must be higher than subsidies and fiscal relief (Sumner, 2005).

for three major FDI recipients (Chile, Malaysia and Thailand) over 1969-2000. Their empirical findings suggest that GDP growth in Chile caused net FDI inflows and not vice versa. In Malaysia and Thailand, the authors found strong evidence of bidirectional causality between GDP growth and FDI inflows. In another study, Hansen and Rand (2006) examined the causal links between FDI and economic growth in 31 developing countries over 1970-2000. They used bivariate vector autoregressive models for GDP and FDI ratios and found a strong causal link between FDI and GDP, even over the long run. Finally, Carkovic and Levine (2005) studied the relationship between FDI and economic growth across 72 countries and found no support for the claim that FDI accelerates economic growth. This finding stands in contrast with the findings of the two other papers cited here.

Confronted with these mixed results on the general causal link between FDI and economic growth, some researchers have analyzed the link in specific economic sectors or particular regions. For example, Alfaro (2003) examined how FDI affected growth in the primary, manufacturing and services sectors and found that the results vary to a significant degree. Using cross-country data covering 1981-1999, Alfaro's findings suggest that the effect of FDI on growth is ambiguous, given that its effects in the primary sector are negative, its effects in the manufacturing sector are positive and its effects in the services sector are unclear.

As for regional analyses, Apergis et al. (2008) examined the impact of FDI on economic growth using a panel dataset of transitional European economies between 1991 and 2004. Their empirical findings indicate that FDI and economic growth are significantly and positively related, at least in transitional countries with high levels of income and successful privatization programs.

Several other authors have found similar results using different databases and methodologies. A good example is Alfaro and Charlton (2007), who distinguished between different "qualities"[9] of FDI to reexamine the relationship between FDI and growth. Exploiting a new, comprehensive, industry-level dataset covering 29 countries over 1985-2000, the authors found that the growth effects of FDI increase when analyses account for the quality of FDI. After controlling for industry characteristics and time effects, the authors found that the relation between FDI and economic growth was no longer ambiguous but, rather, positive and significant.

More recently, El-Wassal (2012) investigates the relationship between FDI and economic growth in a panel of 16 Arab countries from 1970-2008. The author found a positive significant impact of FDI on economic growth in these countries, but qualified this impact as limited or negligible. According to the author, the sectoral composition of FDI plays a critical role in garnering growth benefits from FDI, possibly making sectoral considerations a "necessary" precondition for FDI to promote economic growth, whereas other factors such as financial development, trade openness, human capital and infrastructure quality could be seen as sufficient preconditions to reap FDI growth dividends. The author then recommends that economic policies and investment incentive programs should focus not only on FDI "quantity" but also on FDI "quality" by directing FDI inflows to dynamic sectors with high potential for beneficial spillovers contributing to growth, such as the manufacturing sector.

II.3. Tests of the direct relationship between FDI and welfare

Research examining the relationship between FDI and economic growth using FDI and GDP growth variables has mixed results. Furthermore, while the literature on the impact of FDI on economic growth is pervasive, the literature on the impact of FDI on welfare is limited. Basically, most studies have assumed that economic growth and welfare are perfectly and positively correlated and have thus used GDP growth as a proxy for welfare. This assumption has recently been challenged, and evidence from several sources now indicates that GDP can grow even as poverty is on the rise.

To overcome this limitation, a small number of papers have analyzed the direct relationship between FDI and welfare. Of the few authors to have used the HDI as a measure of welfare, Sharma and Gani (2004) found that FDI positively affected the HDI of middle- and low-income countries over 1975-1999[10]. Using net per capita FDI inflows and the UNDP's HDI as the principal variables, Gohou and Soumaré (2012) found a positive relationship between net FDI inflows and welfare in Africa, albeit with significant differences among African subregions. They also found that FDI has a greater impact on welfare in poorer countries than it does in wealthier countries.

Table 1 summarizes the variables commonly used in the literature and the direction of their impact on economic growth. We see that the overall relationship between FDI and economic growth is ambiguous.

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[9] In their study, "quality" refers to the effect of a unit of FDI on economic growth.
[10] Sharma and Gani's measure of FDI is net FDI inflows as a percentage of GDP.

Table 1: Review of the Literature on the Sign of Variables Used to Explain the Impact of FDI on Economic Growth or Welfare

EXPLANATORY VARIABLE	Causality test on the impact of FDI on economic growth			Welfare (HDI)	Real per capita GDP growth rate			
	Kholdy & Sohrabian (2005)	Hansen & Rand (2006)	Chowdhury & Mavrotas (2006)	Sharma & Gani (2004)	Apergis et al. (2008)	Alfaro et al. (2004)	Alfaro (2003)	Carkovic & Levine (2005)
FDI/GDP	NO IMPACT	YES IMPACT	NO/YES	+	+	+/-NS	+	+/-NS
Economic and policy								
Government spending				+		+/-NS	-NS	-
Economic growth				+/-NS				
Infant mortality				-				
Schooling					+	+/-NS	+NS	+/-NS
Population growth						-		
Inflation						-NS	-	+/-NS
Log (initial GDP)						-	-	-
Openness							-NS	+
Investment (GCF/GDP)							+	
Business environment & institutional								
Black market premium						-		-
Financial market development						-/+NS	+	+
Institutional quality						+	+	
Political risk (Freedom status)				+/-NS				

Notes: FDI = foreign direct investment; GCF = gross capital formation; GDP = gross domestic product; the + sign = a positive coefficient; the – sign = a negative coefficient; NS = a non-significant coefficient; +NS = a positive but non-significant coefficient; -NS = a negative but non-significant coefficient.

III. Does FDI Improve Welfare in North Africa?

The aim of this section is to assess the impact of FDI on welfare in North Africa. For that purpose, we first define our FDI and welfare variables, and after we conduct univariate as well as multivariate analyses to gauge the impact of FDI on welfare in North Africa as a whole.

III.1. Key FDI and welfare variables

The main variables we use for FDI and welfare are net FDI flows, the HDI, and real GDP per capita.

Foreign direct investment (FDI): FDI is measured by net FDI inflows[11], i.e., the sum of equity capital, reinvested earnings, long-term capital and short-term capital, as shown in the balance of payments. We use three FDI variables:

(i)   Real per capita net FDI inflows (REALFDIPOP);
(ii) The net FDI inflows-to-GDP ratio (FDIGDP); and
(iii) The net FDI inflows-to-gross capital formation (GCF) ratio (FDIGCF)[12].

These variables are obtained from the World Development Indicators and Global Development Finance databases of the World Bank.

Welfare variables: The literature has used several measures to assess countries' progress toward improved welfare, including GDP per capita and poverty incidence. GDP per capita only captures the monetary aspects of welfare. This is a problem as development is a multidimensional phenomenon, and welfare depends not only on strictly monetary factors but also on health care, education and other factors. In contrast, poverty incidence is a comprehensive measure of a country's well-being, as it compares all aspects of individuals' living conditions (health, education, access to basic services, nutrition, etc.) to some threshold of requirements for a decent standard of living. Nevertheless,

this incidence is not recorded annually, and indicators and thresholds are too country-specific to be aggregated across countries. These limitations make it difficult to use in empirical studies. It must be noted that an international poverty incidence is calculated on the basis of a U.S. $1.25 or $2 a day poverty line. However, we did not use this data here in this part of our empirical analysis because data was not available for a number of years and because the data are too general. Later, in the country specific analysis section, we analyze the relationship between these poverty incidence measures and FDI.

There is also the Gini index which measures the extent to which the distribution of income or consumption expenditures among individuals or households within an economy deviates from a perfectly equal distribution. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality. Unfortunately, this coefficient is not readily available for every year in the study period for the countries under study. We will use this variable later when we conduct the country specific analysis.

For these reasons, the main population welfare measure used in this paper is the HDI. Defined by the UNDP, the HDI is an index that measures a country's average achievements in three basic aspects of human development: health, knowledge and standard of living. Health is measured by life expectancy at birth. Knowledge is measured as a composite of the adult literacy rate and the combined primary, secondary and tertiary gross enrollment ratio. The standard of living is defined as gross national income (GNI) per capita (purchasing power parity in $US) (UNDP, 2010)[13]. The HDI, while imperfect, is the most universally accepted measure of a country's human development. To compare our results with those of the literature and to check their robustness, we use real GDP per capita (REALGDPPOP) as an alternative welfare measure.

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[11] Here we use net FDI inflows instead of either total FDI inflows or total FDI outflows, since we would like to account for the combined effects of inward and outward FDI flows on welfare. In doing so, we assume implicitly that inward and outward FDI flows have similar (absolute) marginal effects on welfare, or that outward FDI has a negligible impact on welfare. For the countries under study here, the main impact of FDI on welfare will come essentially from inward FDI flows, since over the period 1990-2012, total outward FDI stock was less than 10% of total inward FDI stock for all the countries of the region, the exception being Libya. The same holds for total FDI flows, where total FDI outflows represent less than 10% of total FDI inflows into these countries, except Morocco (12%) and Libya (97%). We can therefore assume, without loss of generality, that the main impact on welfare will come from inward FDI in all these countries (except maybe in Libya). However, the exceptional case of Libya has less impact on the results since in the analysis Libya has many missing data, and is even excluded in some parts of the analysis. It will be interesting in future studies to explore the welfare implications of both inward and outward FDI flows taken separately.

[12] To avoid redundancy, we drop this last variable later as it yields the same results as FDI/GDP.

[13] For details on how to calculate the HDI, refer to the technical note of the Human Development Report available in UNDP (2010).

Our sample is comprised of the six (6) countries in the North Africa region over 1990-2011. These six countries are: Algeria (DZA), Egypt (EGY), Libya (LBY), Morocco (MAR), Mauritania (MRT) and Tunisia (TUN).

Table 2 provides descriptive statistics for welfare variables (HDI and real per capita GDP) and FDI variables in North Africa, both as an aggregate and for each country in the region. We observe considerable differences in the distribution and flow of FDI, real per capita GDP and the HDI across countries. The gap between the countries in the region is even larger when considering real per capita FDI. This underscores the importance of choosing the best variable for the problem at hand. We mainly use real per capita FDI because it gives the best measure of the distribution of FDI at the individual level, an important indication of the impact of FDI on welfare.

Table 2: Average HDI, FDI and Per Capita GDP for North Africa, 1990-2011

	Variables	1990-1995	1996-2000	2001-2005	2006-2011	Overall
North Africa	Weighted HDI [a]	0.51	0.62	0.66	0.64	0.61
	Real per capita GDP	1283.25	1508.62	1834.78	2086.72	1678.95
	Real per capita FDI	12.98	13.61	32.23	76.55	34.84
	FDI/GDP	0.01	0.01	0.02	0.03	0.02
	FDI/GCF	0.05	0.04	0.07	0.12	0.07
DZA	HDI	0.54	0.64	0.70	0.71	0.65
	Real per capita GDP	1720.03	1743.37	1963.50	2188.24	1903.78
	Real per capita FDI	0.52	12.16	27.04	34.91	18.65
	FDI/GDP	0.00	0.01	0.01	0.02	0.01
	FDI/GCF	0.00	0.03	0.05	0.04	0.03
EGY	HDI	0.48	0.62	0.65	0.66	0.60
	Real per capita GDP	1186.68	1379.16	1539.32	1861.74	1491.72
	Real per capita FDI	15.80	15.98	28.81	90.50	37.77
	FDI/GDP	0.01	0.01	0.02	0.05	0.02
	FDI/GCF	0.06	0.06	0.10	0.25	0.12
LBY	HDI	0,70	0.79	0.77	0.79	0.76
	Real per capita GDP		6423.06	6476.50	7736.51	6878.67
	Real per capita FDI		0.11	58.98	324.39	127.83
	FDI/GDP	0,00	0,00	0.01	0.05	0.01
	FDI/GCF	0.01	-0.03	0.08	0.20	0.06
MAR	HDI	0.48	0.57	0.61	0.51	0.54
	Real per capita GDP	1186.06	1267.10	1461.16	1790.66	1426.25
	Real per capita FDI	14.28	2.18	28.12	48.07	23.16
	FDI/GDP	0.01	0,00	0.02	0.03	0.01
	FDI/GCF	0.05	0.01	0.07	0.08	0.05
MRT	HDI	0.22	0.39	0.45	0.47	0.39
	Real per capita GDP	483.58	492.97	496.50	611.23	521.07
	Real per capita FDI	2.66	3.87	78.10	24.00	27.16
	FDI/GDP	0.01	0.01	0.15	0.04	0.05
	FDI/GCF	0.03	0.04	0.38	0.12	0.14
TUN	HDI	0.66	0.72	0.73	0.72	0.71
	Real per capita GDP	1762.52	2088.28	2472.04	3007.06	2332.48
	Real per capita FDI	38.83	46.03	56.78	130.82	68.11
	FDI/GDP	0.02	0.02	0.02	0.04	0.03
	FDI/GCF	0.08	0.09	0.1	0.18	0.11

Notes: a Weighted HDI is average HDI weighted by country population size. FDI = foreign direct investment; GCF = gross capital formation; GDP = gross domestic product; HDI = human development index. DZA = Algeria; EGY = Egypt; LBY = Libya; MAR = Morocco; MRT = Mauritania; TUN = Tunisia.
The averages over the sub-periods are arithmetic means.
GDP and FDI for the region are obtained as the sum of the countries' GDP and FDI. These aggregated values are then used to compute the needed ratios.

The results of Table 2 show that Algeria, Libya and Tunisia exceed the regional average for the HDI and real per capita GDP. As for per capita FDI, Libya and Tunisia are far above the other countries of the region. It looks like countries with the highest HDI also have the highest real per capita FDI. A different trend is observed when we consider FDI/GDP and FDI/GCF, where Mauritania has the highest values, probably due to the small size of its economy. With respect to these last two variables, Algeria, Morocco and Libya fall below the regional average because of the size of their economies.

III.2. Unit root and Granger causality tests

We conducted the Granger causality test on panel data between our welfare variables (HDI and real per capita GDP) and FDI variables (real per capita FDI and FDI/GDP). To conduct the Granger causality test, we first tested the stationarity of the variables. Since we had panel data, we use the Levin, Lin and Chu (2002) and Im, Pesaran and Shin (2003) stationarity tests, hereafter referred to as LLC and IPS, to test for the existence of a unit root in the HDI data series, along with real per capita FDI (REALFDIPOP), FDI/GDP (FDIGDP) and real per capita GDP (REALGDPPOP). Adding lags to the LLC unit root test yields the augmented Dickey-Fuller unit root test. We also use the augmented Dickey-Fuller and Phillips-Perron tests. The Levin, Lin and Chu (2002)

unit root test uses the following equation:

$$\Delta y_{i,t} = \alpha_i + \rho y_{i,t-1} + \sum_{s=1}^{p_i} \qquad , \text{ for } i=1, ..., N \text{ and } t=1, ..., T, \qquad (1)$$

where $y_{i,t}$ is the variable to be tested for unit roots, i is for the country, t for the time, J_{it} follows a normal distribution $N\ (0, O^2_{jt})$, ϵ_i is the constant and nt is for the time trend. The null hypothesis for the test is $\Xi = 0$. The Im, Pesaran and Shin (2003) unit root test assumes heterogeneity of the autoregressive unit root coefficient (Ξ_{ij} for $i \neq j$) as follows:

$$\Delta y_{i,t} = \alpha_i + \rho y_{i,t-1} + \sum_{s=1}^{p_i} \qquad (2)$$

Table 3 presents the unit root tests results on the level variables and the first difference. For the level variables REALGDPOP, REALFDIPOP and FDIGDP, we cannot reject the presence of a unit root with at least three of the tests. The Im, Pesaran and Shin (2003) and Phillips-Perron tests show the presence of a unit root for all variables including the HDI. With the first difference, however, we reject the presence of unit roots according to at least two of the tests for all variables; hence, we can assume that the first differences are all stationary. Note that there are two parts to the test for the HDI, one for the presence and one for the absence of a unit root, causing the results to be mixed for this variable.

Table 3: Stationarity (Unit root tests)

Method	Model (or lag)	HDI	REALGDPPOP	REALFDI-POP	FDIGDP
Level Panel Data					
Levin, Lin and Chi (LLC)	With constant & trend	**-2.54*****	**-4.58*****	**-2.74*****	**-2.24*****
	With constant & no trend	**-0.21*****	-0.65	-0.76	**-2.95*****
	No constant & no trend	-0.56	3.795	-1.13	**-4.21*****
Im, Pesaran and Shin (IPS)	With constant & trend	0.443	-1.26	-0.39	-0.009
	With constant & no trend	1.374	1.461	0.544	-1.85
Augmented Dickey-Fuller	0	-1.82	-0.49	-1.30	-1.49
	1	-2.24	-0.47	-2.3	-2.30
	2	**-2.89****	-0.97	-1.81	-1.88
	3	**-4.80*****	-1.87	-1.84	-1.74
Phillips-Perron	2	-1.76	-0.47	-1.62	-1.77
Period of unbalanced time series		2001-2011	2000-2009	1999-2009	1996-2009
Nb. Obs.		66	60	66	84
First Difference Panel Data					
Levin, Lin and Chi (LLC)	With constant & trend	**-1.90****	**-17.37*****	-0.49	**-6.35*****
	With constant & no trend	**-2.77*****	**-7.79*****	**-2.08****	**-6.52*****
	No constant & no trend	**-5.41*****	**-3.76*****	**-4.66*****	**-9.29*****
Im, Pesaran and Shin (IPS)	With constant & trend	0.34	**-6.26*****	0.49	**-3.51*****
	With constant & no trend	-1.41	**-4.42*****	**-1.77****	**-4.71*****
Augmented Dickey-Fuller	0	**-5.61*****	**-5.13*****	-2.08	**-2.61***
	1	**-3.34****	-2.04	-2.23	-2.47
	2	**-3.20****	-1.83	-1.63	-1.96
	3	**-4.04*****	-2.03	-1.37	-1.3
Phillips-Perron	2	**-5.73*****	**-5.10*****	-2.15	**-2.62***
Period of unbalanced time series		2001-2011	2000-2009	1999-2009	1996-2009
Nb. Obs.		60	54	60	78

Notes: 1- The Levin, Lin and Chu (LLC) procedure tests the null hypothesis of the presence of unit root for each time series in the panel against the alternative hypothesis of stationarity of each time series in the panel.

2 -The Im, Pesaran and Shin procedure (IPS) tests the null hypothesis of the existence of unit root for all individuals against the alternative hpothesis of unit root for some (but not all) individuals. It takes into account heterogeneity in the unit root process.

3- Both LLC and IPS test are augmented Dicky Fuller test , since the chosen lag order is 1. I may choose different lag value depending on BIC and AIC criteria, but it is simple and easier to have the same lag for all the tests.

4- The period for the test varies because of gaps in the panel. These tests do not accept gaps. To use maximum of available data , it is better to consider for each test period where the sample has no gaps, instead of considering a fixed period which reduces the size of sample.

Having conducted the unit root tests, we now proceed to the Granger causality tests between our FDI (real per capita FDI and FDI/GDP) and welfare (HDI and real per capita GDP) variables for the North Africa region. We use the following standard equation for the Granger causality test between our variables:

$$y_{it} = \alpha + \sum_{k=1}^{qp} \beta_k y_{it-k} + \sum x_{it-k} + \varepsilon_{it} \qquad (3)$$

where x and y are two stationary variables, i is for the country and k for the time lag.

Table 4 presents the results of the Granger causality tests for the North Africa region. It shows a unidirectional causality from FDI to HDI for the entire region. However, when real per capita GDP is used as a welfare variable, we find bidirectional causality between FDI and real per capita GDP.

Table 4: Granger Causality Test Between FDI and Welfare Variables, North Africa Region

	Wald Chi2 Statistics			
FDI does not cause HDI	Lag=2	Lag=3	Lag=4	Lag=5
D.REALFDIPOP does not cause LOG(HDI)	1.126	9.218**	7.051	24.610***
D.FDIGDP does not cause LOG(HDI)	1.011	8.291**	6.317	20.884***
D.LOG(REALFDIPOP) does not cause LOG(HDI)	1.972	6.084	5.215	18.746***
D.LOG(FDIGDP) does not cause LOG(HDI)	2.189	5.780	5.147	22.416***
D.REALFDIPOP does not cause D.HDI	1.588	1.789	11.709**	19.839***
D.FDIGDP does not cause D.HDI	1.293	1.424	8.469*	15.918***
HDI does not cause FDI	Lag=2	Lag=3	Lag=4	Lag=5
D.HDI does not cause D.REALFDIPOP	0.274	0.984	1.938	2.714
D.HDI does not cause D.FDIGDP	0.337	1.193	2.627	4.242
FDI does not cause Real Per Capita GDP	Lag=2	Lag=3	Lag=4	Lag=5
D.REALFDIPOP does not cause LOG(REALGDPPOP)	1.988	4.728	18.094***	136.3***
D.FDIGDP does not cause LOG(REALGDPPOP)	1.378	4.266	18.021***	115.49***
D.LOG(REALFDIPOP) does not cause LOG(REALGDPPOP)	0.436	2.443	8.792*	75.056***
D.LOG(FDIGDP) does not cause LOG(REALGDPPOP)	0.249	2.102	8.801*	77.031***
D.LOG(REALFDIPOP) does not cause D.LOG(REALGDPPOP)	1.028	1.299	14.113***	30.527***
D.REALFDIPOP does not cause D.LOG(REALGDPPOP)	2.037	2.815	20.980***	58.968***
D.FDIGDP does not cause D.LOG(REALGDPPOP)	1.904	2.815	24.308***	53.838***
D.FDIGDP does not cause D.REALGDPPOP	3.377	5.328	27.921***	76.968***
Real Per Capita GDP does not cause FDI	Lag=2	Lag=3	Lag=4	Lag=5
D.LOG(REALGDPPOP) does not cause D.LOG(REALFDIPOP)	6.872**	12.294***	24.992***	27.991***
D.LOG(REALGDPPOP) does not cause D.REALFDIPOP	1.927	3.495	6.936	9.568*
D.LOG(REALGDPPOP) does not cause D.FDIGDP	2.363	4.451	8.881*	10.739*
D.REALGDPPOP does not cause D.FDIGDP	2.468	5.533	9.543*	10.266*

*** 1% significance level; ** 5% significance level; * 10% significance level.*

Having examined the causal nature of the relationship between FDI and our welfare variables, the next part of our analysis uses multivariate regressions to control for other factors relating to welfare and attractiveness of FDI.

III.3. Regression model specification

To further study the impact of FDI on welfare in the region, we run the following regression:

$$\text{Welfare} = c + \beta \times FDI + \sum \gamma_i \times \text{Control Variables}_i + \varepsilon \,, \tag{4}$$

where welfare is measured by the HDI or real per capita GDP, FDI is measured by real per capita FDI or the FDI-to-GDP ratio or the FDI-to-GCF ratio, and the control variables are the economic and policy variables and the institutional quality and political risk variables.

Economic and policy variables

- total debt ratio (DEBTGDP), measured as total outstanding debt / GDP;
- government spending ratio (GOVSPEND), measured as total

government consumption / GDP (also used to capture government size);
- inflation (INFLATION), measured as the percentage change in the GDP deflator;
- kilometers of paved road per 100 inhabitants (ROADPAVED), our infrastructure development variable;
- education (EDUCATION), measured as the gross enrollment ratio (GER) across all levels of education (used as a control variable when real per capita GDP is used as a welfare variable);
- degree of openness (OPENNESS), measured as (total imports plus exports) / GDP.

Institutional quality and political risk variables

- total credit by financial intermediaries to the private sector / GDP (CREDIT) measures a country's level of financial intermediation and is used as proxy for financial market development;
- political rights rating (POLRIGHTS), which measures freedom for political activism;
- civil liberties rating (CIVILLIB), which measures latitude for the exercise of civil freedoms.

Table 5 lists these variables and identifies the sources of data for each.

Table 5: Description of Variables and Sources of Data

VARIABLE	DESCRIPTION	SOURCE OF DATA
Welfare		
HDI	Human Development Index	The Human Development Reports of the United Nations Development Programme
REALGDPPOP	Real per capita gross domestic product (GDP)	The World Bank's World Development Indicators (WDIs)
Foreign direct investment		
REALFDIPOP [a]	Real per capita foreign direct investment (FDI)	WDIs and the World Bank's Global Development Finance (GDF) database
FDIGDP	FDI / GDP	WDIs and GDF
FDIGCF	FDI / gross capital formation (GCF)	
Economic and policy		
DEBTGDP	Total debt / GDP	WDIs and the World Bank's African Development Indicators (ADIs)
GOVSPEND	Government consumption / GDP	WDIs and ADIs
INFLATION	Percentage change in GDP deflator	WDIs and ADIs
ROADPAVED	Km of paved road per 100 inhabitants	WDIs and ADIs
OPENNESS	(Imports + exports) / GDP	WDIs and ADIs
EDUCATION	Gross enrolment ratio for all levels of education	The UNESCO database
Institutional quality and political risk		
CREDIT	Credit by financial intermediaries to private sector / GDP	GDF and New World Bank database on financial development and structure [b]
POLRIGHTS	Political rights rating [c]	Freedom House
CIVILLIB	Civil liberties rating [d]	Freedom House

[a] We adjust FDI inflows into constant (current) prices using the GDP(constant price)/GDP(current price) ratio.
[b] Obtained from
http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:20696167~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html.
[c] POLRIGHTS assigns a value of 1 to countries with the most political rights and a value of 7 to countries with the least of such rights.
[d] CIVILLIB assigns a value of 1 to countries with the most civil freedoms and a value of 7 to countries with the least of such freedoms.

Insofar as the control variables are concerned, we expect government spending to improve welfare because the HDI measures the fruit of developing countries' investments in education and health as well as countries' economic performances, all of which mainly stem from government spending and/or FDI. Especially in developing countries, citizens' basic needs are principally ensured by government spending. At the same time, a large portion of government financing comes from debt.

For this reason, we introduce the debt ratio as a control variable to account for governments' financial constraints; the debt ratio is expected to negatively impact welfare, as the government's capacity to respond to the basic needs of the population becomes more constrained as its level of indebtedness rises. Inflation is introduced to capture macroeconomic instability. Inflation is expected to negatively impact welfare, as high inflation increases the price of basic goods and directly impacts the poor.

The development of infrastructure contributes to better living conditions and is expected to positively impact welfare. We consider the number of kilometers of paved road per 100 inhabitants as our infrastructure development variable. The openness-to-trade indicator, another control variable, shows how open a country is to FDI. This indicator is measured as the sum of exports and imports, divided by GDP. A population's education level indicates the quality of the country's human capital. Measured as the gross enrollment ratio across all levels of education[14], the education indicator is only used as a control variable in regressions where real per capita GDP is used as the dependent welfare variable. We expect openness and education to positively impact welfare. Finally, African countries are generally characterized by low levels of institutional efficiency and an underdeveloped business environment, both of which negatively impact FDI. We control for these effects with variables relating to the business environment, the quality of institutions and political risks.

We use the Arellano-Bond dynamic panel data approach as our main estimation technique to overcome some of the limitations of cross-sectional estimators when dealing with biases in omitted variables, country-specific effects, endogeneity problems, and use of lagged dependent variables in regressions encountered with panel data regressions (e.g. Levine et al. (2000)). The proposed dynamic model uses the lag of the dependent variables as explanatory variables. In that case, the residuals are correlated with the lagged variables and the standard OLS estimators can no longer be used. The estimation is then performed with generalized method of moments (GMM) estimators.

The dynamic model has the following general form:

$$y_{it} = \beta_0 + \beta_1 y_{it-1} + \beta_2 x_{it} + \mu_i + \varepsilon_{it} \tag{5}$$

To eliminate country-specific effects, we take the first difference of this equation which yields:

$$y_{it} - y_{it-1} = \beta_1(y_{it-1} - y_{it-2}) + \beta_2(x_{it} - x_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1}) \tag{6}$$

This first difference, however, does not eliminate the correlation between the error term and the lagged variables, since   and remain correlated. The model is thus estimated with the GMM estimation technique using lagged values of the explanatory variables as instruments. In our study, it is appropriate to use this dynamic estimation technique given that our causality tests yielded bidirectional or unidirectional causality between FDI and welfare variables in the region. We also have country-specific effects.

III.4. Descriptive statistics and correlation between variables

Table 6 presents the descriptive statistics for all our variables. It provides the number of observations, the mean, the standard deviation, the minimum and the maximum values for each variable. All variables other than EDUCATION and ROADPAVED have at least 100 country-year observations.

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[14] Because HDI includes education, in order to avoid spurious regressions, we do not include education in the regressions which consider the HDI as a dependent variable.

Table 6: Descriptive Statistics for North Africa, 1990-2011

Variables	N	Mean	Std Dev	Min	Max
Welfare					
HDI	127	0.61	0.15	0.14	0.82
LOG(HDI)	127	-0.54	0.33	-1.97	-0.20
REALGDPPOP	121	2028.75	1694.8	464.42	7885.47
LOG(REALGDPPOP)	121	7.36	0.70	6.14	8.97
Foreign Direct Investment					
REALFDIPOP	118	46.51	72.63	-28.47	505.33
LOG(REALFDIPOP)	112	2.96	1.79	-4.62	6.23
FDIGDP	127	0.02	0.04	-0.005	0.37
LOG(FDIGDP)	116	-4.46	1.59	-12.13	-0.99
FDIGCF	125	0.09	0.11	-0.04	0.61
LOG(FDIGCF)	114	-3.03	1.58	-10.88	-0.50
Economic and Policy					
DEBTGDP	110	0.65	0.47	0.03	2.07
GOVSPEND	127	0.16	0.04	0.09	0.29
INFLATION	120	8.78	10.63	-32.81	53.79
ROADPAVED	76	64.17	13.07	26.85	89.36
EDUCATION	81	59.22	15.56	24.79	93.13
OPENNESS	128	0.72	0.23	0.38	1.55
Institutional Quality and Political Risk					
CREDIT	100	36.67	20.74	4.15	74.52
POLRIGHTS	132	5.96	0.81	3	7
CIVILLIB	132	5.37	0.94	4	7

Note: For an explanation of abbreviations, see Table 5.

Table 7 presents the correlation matrix of the variables in the North Africa region, calculated using annual country level data. Three areas of this matrix are of interest to us. The first is the upper left shaded area, which corresponds to correlations between welfare variables (HDI and real per capita GDP) and FDI variables. The second is the middle shaded area, which shows correlations between the economic and policy variables.

Table 7: Correlation Matrix for North African Countries, 1990-2011

	HDI	REALGDPPOP	REALFDIPOP	FDIGDP	FDIGCF	DEBTGDP	INFLATION	ROADPAVED	EDUCATION	REALGDPPOP	OPENNESS	CREDIT	POLRIGHTS	CIVILLIB
IDH	1													
REALGDPPOP	0.6	1												
REALFDIPOP	0.32	0.7	1											
FDIGDP	0.28	0.62	0.72	1										
FDIGCF	0.4	0.67	0.75	0.98	1									
DEBTGDP	0.04	-0.13	-0.23	-0.46	-0.39	1								
GOVSPEND	-0.05	-0.04	0.12	0.05	-0.05	-0.3	1							
INFLATION	-0.06	-0.06	-0.15	-0.07	-0.03	0.35	-0.59	1						
ROADPAVED	0.52	0.51	0.24	0.32	0.4	-0.15	-0.56	0.3	1					
EDUCATION	0.67	0.83	0.48	0.55	0.64	-0.27	-0.38	0.06	0.78	1				
OPENNESS	0.57	0.79	0.58	0.55	0.55	-0.05	0.16	-0.03	0.46	0.59	1			
CREDIT	0.39	0.54	0.31	0.38	0.36	-0.58	0.15	-0.25	0.56	0.62	0.57	1		
POLRIGHTS	0.72	0.84	0.6	0.45	0.57	-0.09	-0.33	0.08	0.7	0.88	0.59	0.53	1	
CIVILLIB	0.61	0.43	0.36	0.12	0.25	0.16	-0.22	-0.03	0.33	0.52	0.24	0.26	0.67	1

Note: For an explanation of abbreviations, see Table 5.

The first area of the matrix shows that the two welfare variables, HDI and real per capita GDP, have a high correlation of approximately 60%. The missing 40% supports the claim that economic growth does not translate directly into better welfare. For the FDI variables, we observe that the FDI/GDP and FDI/GCF ratios are highly correlated (98%), but their correlation with real per capita FDI is comparatively low (between 72% and 75%). In the remaining analyses, we keep real per capita FDI and FDI/GDP and drop FDI/GCF because it yields the same results as FDI/GDP.

In the second area of the matrix, we see that EDUCATION is highly correlated with the HDI (67%) and real per capita GDP (83%). This was expected, as education and GDP are components of HDI. We also observe that EDUCATION is highly correlated with the infrastructure variable ROADPAVED (78%).

The third area showcases the correlations between the business environment variables, the institutional quality variables and the political risk variables. The two political risk variables (POLRIGHTS and CIVILLIB) are highly correlated 67%. POLRIGHTS has a correlation of 53% with CREDIT. Therefore, we retained CIVILLIB and dropped POLRIGHTS.

III.5. Empirical regression results of the impact of FDI on welfare in North Africa

Table 8 presents the regression results when we use the HDI as the dependent variable for welfare. Since the relationship between welfare and FDI may be nonlinear, we run our regressions using the log of FDI and/or the log of the HDI. The results show that FDI positively impacts welfare at a 1% significance level in North Africa, and the relationship appears to be non-linear[15]. When we use an alternative FDI variable (FDIGDP), the regression coefficient remains significant as well.

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[15] This is slightly different from the findings in Gohou and Soumaré (2012) for North Africa, where they found the relationship between FDI and the HDI to be non-significant. This may be explained, first by the fact that they do not consider the non-linearity of the relationship. Indeed, in column 3 of Table 8 where we do not take the log of REALFDIPOP, the coefficient is not significant, as in Gohou and Soumaré (2012). But when we introduce the non-linearity by taking the log, the coefficient becomes significant. Also, note that here we are using per capita FDI in real terms, whereas Gohou and Soumaré (2012) use current FDI prices divided by population size. Finally, we perform our estimations using the dynamic panel Arellano-Bond estimation technique rather than the Robust Newey-West estimation technique.

Table 8: Arellano-Bond Dynamic Panel Regression Results for the Impact of FDI on HDI for North Africa with Controls, 1990-2011

Dependent variable	HDI				LOG(HDI)		
	1	2	3	4	5	6	7
INTERCEPT	-0.0076***	-0.0094***	-0.0090***	-0.0090***	-0.0119***	-0.0132***	-0.0135***
	(-3.65)	(-5.67)	(-4.22)	(-3.97)	(-4.64)	(-7.47)	(-5.11)
FDIGDP	0.0088**				0.0200***		
	(2.26)				(3.26)		
LOG(FDIGDP)		0.0016				0.0069*	
		(0.84)				(1.92)	
REALFDIPOP			0 .00008				
			(0.55)				
LOG(REALFDIPOP)				0.0110***			0.0150***
				(6.34)			(8.25)
LAG1(D.HDI)	0.2063**	0.1950	0.1802*	0.2041**	0.2441**	0.1965**	0.1853**
	(2.18)	(1.73)	(1.85)	(2.27)	(2.67)	(2.35)	(2.40)
LAG2(D.HDI)	0.0229	-0.0359	-0.0521	-0.0746	0.0466	0.0747	0.0056
	(0.19)	(-0.27)	(-0.40)	(-0.54)	(0.38)	(0.63)	(0.05)
LAG3(D.HDI)	-1.93	0.0546	0.0319	0.0209	-0.0187	-0.0170	-0.0246
	(-0.05)	(0.88)	(0.55)	(0.38)	(-0.72)	(-0.27)	(-0.50)
LAG4(D.HDI)	0.0157	0.0430	0.0299	0.0057	0.0499	0.0961	0.0564
	(0.18)	(0.43)	(0.43)	(0.06)	(0.89)	(1.44)	(0.95)
DEBTGDP	-0.0064	-0.0761*	-0.1100***	-0.1259***	0.1098	-0.0015	-0.1260***
	(-0.11)	(-1.92)	(-8.88)	(-9.34)	(1.14)	(-0.02)	(-5.05)
GOVSPEND	4.8077***	3.9675***	3.8847***	3.7156***	8.3759***	8.0128***	7.4303***
	(10.52)	(8.87)	(6.66)	(8.30)	(5.76)	(9.42)	(7.99)
INFLATION	-0.0004	-0.0017***	-0.0017***	-0.0015***	-0.0013	-0.0013	-0.0018
	(-0.37)	(-2.97)	(-3.35)	(-3.31)	(-0.44)	(-0.81)	(-1.35)
ROADPAVED	0.0016***	0.0024	0.0022**	0.0022**	0.0026**	0.0031	0.0021
	(4.13)	(1.60)	(2.18)	(2.49)	(2.17)	(1.27)	(0.31)
CIVILLIB	-0.0174***	-0.0151**	-0.0156***	-0.0181***	-0.0271***	-0.0263***	-0.0263***
	(-9.00)	(-2.66)	(-4.94)	(-3.39)	(-7.96)	(-2.98)	(-4.57)
OPENNESS	0.00031	0.00103	0.00092	0.00057	0.00034	0.0020*	0.0015
	(0.68)	(1.67)	(1.61)	(0.79)	(0.38)	(1.88)	(1.25)
CREDIT	-0.0028**	-0.0036**	-0.0037***	-0.0035***	-0.0054***	-0.0073**	-0.0067**
	(-2.91)	(-2.64)	(-3.09)	(-3.19)	(-3.47)	(-2.95)	(-2.88)
Arellano-Bond test for no autocorrelation of order 1	-0.89	-0.9	-0.0090	-0.91	-0.91	-0.86	-0.85
P- value for AR(1)	0.3733	0.3704	0.3896	0.3653	0.3631	0.3923	0.3942
Arellano-Bond test for no autocorrelation of order 2	-1.3	-1.16	-1.24	-1.25	-1.4	-1.18	-1.22
P- value for AR(2)	0.1922	0.2467	0.2157	0.2099	0.1625	0.2394	0.2214
Nb. Obs.	29	29	29	29	29	29	29
F-Stat	68.70***	38.64***	71.95***	43.32***	17.91***	50.38***	43.04***

*** = 1% significance level; ** = 5% significance level; *= 10% significance level. For an explanation of abbreviations, see Table 5.

Our regression results also confirm our expectations regarding the sign of the control variables. To start with, a country's debt burden (DEBTGDP) negatively impacts welfare. As we argued earlier, the more indebted a country, the more likely it is to experience financial distress as a result of its debt servicing obligations, and the harder it is for the government to access financial resources for social spending. The impacts, on welfare, of macroeconomic instability (INFLATION) and the size of the government (GOVSPEND) are respectively negative and positive. Infrastructure development (measured as the number of kilometers of paved roads per 100 inhabitants, ROADPAVED) has a significant and positive impact on welfare. This can be explained by the fact that new infrastructure improves the standard of living and contributes to the overall sense of well-being. Furthermore, it was determined that openness to trade positively impacts welfare while CREDIT negatively impacts welfare[16]. For the political risk effect, we observe that civil liberties (CIVILLIB) significantly and negatively impact welfare. The CIVILLIB indicator awards high scores to countries where residents are less free and low scores to countries with freer environments. The negative impact of civil liberties on welfare is thus consistent with our expectation that greater freedom contributes to wellbeing. As shown in Table 7 and discussed earlier, civil liberties (CIVILLIB) and political rights (POLRIGHTS) are highly correlated. Each provides some measure of institutional quality, as stronger individual rights and democracy lead to a better judicial system, which goes hand-in-hand with less corruption.

Furthermore, we run our panel regression using an alternative measure of welfare: real per capita GDP (REALGDPPOP). The results presented in Table 9 indicate that the impact of FDI (real per capita FDI and FDI/GDP) on welfare, as measured by real per capita GDP, is positive and significant in all regressions. EDUCATION has a significant positive impact on welfare[17].

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[16] There are several evidences in the literature that openness-to-trade and financial market development are strong determinants of a country's attractiveness to FDI. Moreover, the literature has sometimes found a threshold level with regards to the role played by financial markets in the linkage between FDI and economic growth. Indeed, it has been argued that countries should reach some level of financial market development in order to enjoy the benefits of FDI spillover effects. Since these are not the main issues of our paper, we do not explore them deeply, however, in future studies, it will be interesting to explore thoroughly the role played by these non-negligible variables, trade-openness and financial market development, in the linkages between FDI and welfare.

[17] This positive impact of human capital on growth may be non-linear as argued by some researchers in the literature. Future studies could have a closer look at this possible non-linear relationship between FDI, human capital and growth in this region.

Table 9: Arellano-Bond Dynamic Panel Regression Results for the Impact of FDI on Real Per Capita GDP for North Africa with Controls, 1990-2011

Dependant variable	LOG(REALGDPPOP)				
	1	2	3	4	5
INTERCEPT	0.0120***	0.0130***	0.0189**	0.0168***	0.0178***
	(3.36)	(4.42)	(2.61)	(3.96)	(3.35)
REALFDIPOP	0.0005***	0.0485***			
	(11.44)	(10.00)			
LOG(REALFDIPOP)			0.0259***		
			(7.34)		
REALFDIPOP$_{t-1}$		0.0031			
		(0.64)			
REALFDIPOP$_{t-2}$		-0.0301***			
		(-8.53)			
FDIGDP				0.0037***	0.0115***
				(5.67)	(6.28)
FDIGDP$_{t-1}$					0.0013***
					(4.02)
LOG(REALGDPPOP$_{t-1}$)	0.0793	0.1773***	0.0359	0.3185	0.3439***
	(1.04)	(9.10)	(0.58)	(1.51)	(9.48)
LOG(REALGDPPOP$_{t-2}$)	0.4455***	0.2014***	0.3951***		
	(11.26)	(7.27)	(12.88)		
DEBTGDP	-0.1250***	-0,0009	-0.1020**	-0.1480**	0.0849
	(-3.50)	(-0.01)	(-2.17)	(-2.76)	(1.57)
GOVSPEND	-2.3879***	-3.7013***	-2.3671***	-3.4954 ***	-2.8863***
	(-5.24)	(-15.25)	(-3.20)	(-4.02)	(-12.29)
INFLATION	0.0010	-0.0002	0.0010	0.00005	-0.00070
	(0.69)	(-0.31)	(0.58)	(0.00)	(-0.74)
ROADPAVED	-0.00004	0.0025***	0.00030	0.0011	0.00014
	(-0.04)	(16.11)	(0.23)	(0.89)	(0.61)
CIVILLIB	-0.0053	-0.0237**	-0.0036	-0.0038	-0.0249**
	(-0.68)	(-2.13)	(-0.38)	(-0.51)	(-2.78)
EDUCATION	0.00320	0.0094**	0.0008	0.0035***	0.0050
	(0.79)	(2.69)	(0.13)	(3.35)	(0.97)
OPENNESS	-0.00153***	-0.00129**	-0.00115	-0.00010**	-0.0009***
	(-5.27)	(-2.91)	(-1.73)	(-2.66)	(-4.08)
OPENNESS$_{t-1}$		0.00108**			0.0029***
		(2.28)			(4.28)
OPENNESS$_{t-2}$		-0.00113			
		(-1.60)			
CREDIT	-0,00025	-0.0030***	-0.0011	-0.0017**	-0.0031***
	(-0.37)	(-6.98)	(-1.35)	(-2.24)	(-6.36)
CREDITt-1		0.0013***			-0.0007616
		(3.39)			(-1.76)
Arellano-Bond test for no autocorrelation of order 1	-1.28	-1.40	-1.27	-1.32	-1.30
P-value for AR(1)	0.2016	0.1625	0.2053	0.1874	0.1925
Arellano-Bond test for no autocorrelation of order 2	1.12	0.60	1.21	-0.85	-0.78
P-value for AR(2)	0.2644	0.5495	0.2270	0.3953	0.4381
Nb. Obs.	31	27	27	30	29
F-Stat	11.15***	271.22***	12.20***	1885.46***	274041.2***

*** 1% significance level; ** 5% significance level; * 10% significance level. For explanation of abbreviations, see Table 5.

Since we have six countries comprising this region, it is worth exploring how each country has contributed to regional welfare improvements. For that purpose, we consider the following regression equation:

$$\text{Welfare} = c + \beta_1 \times FDI \times \text{dummy}_{DZA} + \beta_2 \times FDI \times \text{dummy}_{EGY}$$
$$+ \beta_3 \times FDI \times \text{dummy}_{LBY} + \beta_4 \times FDI \times \text{dummy}_{MAR} \qquad (7)$$
$$+ \beta_5 \times FDI \times \text{dummy}_{MRT} + \beta_6 \times FDI \times \text{dummy}_{TUN} + \text{control variables}$$

where the dummy variables represent each of the six countries in North Africa: Algeria (DZA), Egypt (EGY), Libya (LBY), Morocco (MAR), Mauritania (MRT) and Tunisia (TUN). The control variables are as described above.

Columns 1-4 of Table 10 present the regression results when the HDI is used as a dependent variable. We observe that the coefficients for the Egypt and Morocco dummies multiplied by FDI are significant and positive, but the coefficients are not significant for the other countries. When real per capita GDP is used as a welfare variable (columns 5 and 6), as is typical in this type of study, the coefficients for Tunisia and Libya become positive and significant in the regression with FDI/GDP, while the coefficient for Mauritania turns out to be negative and significant with real per capita FDI. The coefficient for Morocco remains positive in all regressions. Thus, including the country dummies shows that the contribution of FDI to regional welfare improvement has country-specific characteristics. For instance, while FDI inflows toward Libya and Tunisia seem to contribute more to the per capita GDP increase in the region, FDI into Egypt and Morocco seem to have a greater impact on the region's human development.

Table 10: Arellano-Bond Dynamic Panel Regression Results for the Impact of FDI on Welfare for North Africa with Controls and Country Dummies, 1990-2011

Dependent variable	HDI		LOG(HDI)		LOG(REALGDPPOP)	
	1	2	3	4	5	6
INTERCEPT	0.0027	0.0044	0.0035	0.0068	**0.0292*****	**0.0188*****
	(0.68)	(0.78)	(0.46)	(0.65)	(8.58)	(8.98)
DZA*FDIGDP	-0.0217		-0,0235		-0,0138	
	(-1.05)		**(-0.58)**		(-1.09)	
EGY*FDIGDP	**0.0183*****		**0.0332*****		0.00104	
	(3.85)		(3.63)		(0.36)	
LBY*FDIGDP	0.0044		0.0041		**0.0087*****	
	(1.25)		(0.50)		(3.15)	
MAR*FDIGDP	**0.01538*****		**0.0232*****		**0.010*****	
	(5.34)		(4.85)		(3.75)	
MRT*FDIGDP	0.00007		0.00052		-0.0012	
	(0.03)		(0.14)		(-1.25)	
TUN*FDIGDP	-0.00056		-0.0058		**0.0021***	
	(-0.10)		(-0.43)		(1.91)	
DZA*LOG(REALFDIPOP)		-0.0453		-0.0792		-0.0101
		(-0.87)		(-0.80)		(-1.09)
EGY*LOG(REALFDIPOP)		**0.0976*****		**0.1770*****		0.0044
		(3.07)		(2.82)		(0.75)
LBY*LOG(REALFDIPOP)		0.0139		0.0040		0.0017439
		(0.61)		(0.09)		(0.15)
MAR*LOG(REALFDIPOP)		**0.0407*****		**0.0711*****		**0.0107*****
		(3.82)		(3.52)		(4.98)
MRT*LOG(REALFDIPOP)		0.0021		0.0031		**-0.0382****
		(0.05)		(0.04)		(-2.66)
TUN*LOG(REALFDIPOP)		-0.0089		-0.0198		0.009319
		(-0.29)		(-0.35)		(1.00)
LAG1(D.HDI)	0.0474659	0.08382	0.0366	0.0703		
	(0.21)	(0.38)	(0.18)	(0.34)		
LAG2(D.HDI)	0.0143	0.0188	0.0580	0.0615		
	(0.21)	(0.21)	(1.08)	(0.82)		
LAG3(D.HDI)	-0.0811	-0.1455	-0.0310	-0.1215		
	(-0.62)	(-0.94)	(-0.25)	(-0.79)		
LAG4(D.HDI)	**-0.1865***	**-0.2382****	-0.1223	-0.2053		
	(-1.93)	(-2.07)	(-1.09)	(-1.46)		
LOG(REALGDPPOP$_{t-1}$)					-0.2321	0.0250524
					(-1.90)	(0.30)
LOG(REALGDPPOP$_{t-2}$)					0 .07892	**0.3776*****
					(1.24)	(5.47)
LOG(REALGDPPOP$_{t-3}$)					0.1321	
					(0.65)	
GOVSPEND	-1.812	-1.8360	-3.8113	-3.6871	**-1.4487****	-0.3858
	(-1.04)	(-0.97)	(-1.15)	(-1.03)	(-2.32)	(-0.58)
INFLATION	-0.00034	-0.00024	0.00010	0.00004	-0.0004	0.00041
	(-0.42)	(-0.46)	(0.01)	(0.05)	(-0.95)	(0.73)
CIVILLIB	**-0.0276*****	**-0.0368*****	**-0.0391****	**-0.0646*****	**-0.0163****	-0.004722
	(-3.05)	(-2.87)	(-2.08)	(-2.76)	(-2.01)	(-0.57)
OPENNESS	-0.0007	-0.0070	-0.0015	-0.0011	-0.0004	-0.0007
	(-0.77)	(-0.55)	(-0.70)	(-0.46)	(-0.72)	(-1.45)
CREDIT	-0.0024	-0.0023	-0.0052	-0.0047	-0.0012	-0.0008
	(-0.90)	(-0.76)	(-1.05)	(-0.80)	(-1.22)	(-0.81)
Arellano-Bond test for no autocorrelation of order 1	-1.41	-1.52	-1.29	-1.48	-0.58	-1.08
P-value for AR(1)	0.1571	0.1273	0.1960	0.1391	0.5637	0.2819
Arellano-Bond test for no autocorrelation of order 2	1.06	0.92	1.41	1.11	1.29	0.99
P-value for AR(2)	0.2901	0.3597	0.1594	0.2675	0.1956	0.3228
Nb. Obs.	60	59	60	59	74	74
F-Stat	1.07e+09***	3.05e+08***	19.77***	1.09e+08***	3.47***	55.53***

*** 1% significance level; ** 5% significance level; * 10% significance level. For an explanation of abbreviations, see Table 5. DZA = Algeria; EGY = Egypt; LBY = Libya; MAR = Morocco; MRT = Mauritania; TUN = Tunisia.

From the above analyses, FDI has fostered growth in North Africa, which in turn has generated additional revenues for the region's governments and populations through fiscal policies and jobs creation. There is clearly a positive impact of government spending on welfare improvement in the region as well as on infrastructure development such as building roads. Additionally, institutional quality and better governance tend to amplify the positive effects of FDI on welfare in the region. It is therefore essential for the region's governments to continue to invest in social infrastructures while improving the quality of their institutions and their governance; doing so will help avoid the type of unrest witnessed in 2010-2012.

In sum, our results support the hypothesis of a significant and positive impact of FDI on welfare in North Africa; in other words, FDI improves welfare in North African countries at the aggregate level. The remaining question is whether this effect is uniform across countries in the region, given that the processes linking FDI and welfare appear to differ among the national economies in the region.

IV. Does FDI Improve Welfare by More in Some North African Countries than in Others?

To assess the real impact of FDI on welfare in each country of the region, one should consider the characteristics of the main sectors or industries attracting FDI and the potential spillover effects in the economy and on the populations' well-being. Indeed, Alfaro (2003) investigates the effect of FDI on growth by sector and finds a negative FDI effect in the primary sector, a positive FDI effect in the manufacturing sector and an ambiguous FDI effect in the services sector. Nunnenkamp and Spatz (2004) examine the role of industry characteristics on the growth impacts of FDI. Their finding indicates that host country and industry characteristics as well as the interaction between these two sets of characteristics play important roles in the growth impacts of FDI in developing countries.

Hence, the impacts of FDI on welfare in the region may also differ by the type of FDI the country received. The positive impact found for the whole region might be a consequence of economic growth through better job creation for the poor, human capital accumulation and increased fiscal revenue for governments to finance development programs. Although for some countries of the region, this impact may be totally negative, or negative in the short-run but positive in the long-run, or the inverse.

Therefore, to draw sound policy recommendations, we need to conduct a deep analysis of the characteristics of FDI received by countries in the region. In the following sections, we will analyze the industry concentration of FDI inflows by country, the relationship between FDI and poverty incidence and inequality measures for each country.

IV.1. Granger causality and VAR regressions by country

To address our second research question, of whether FDI improves welfare by more in some North African countries than in others, we first conduct a Granger causality test between FDI and welfare in each country.

Table 11 presents the Granger causality results for the countries in the region. We observe that the results are not homogenous across countries. Indeed, when the first difference of the variables is used, in Algeria there is bidirectional causality between real per capita FDI and the HDI. In Egypt, Mauritania, Morocco and Tunisia, real per capital FDI seems to Granger-cause HDI, but not the other way around. However, when the same analysis is conducted using the log of the level variables, there seems to be bi-directional causality between the two variables in these last four countries. There is, however, bidirectional causality between real per capita GDP and real per capita FDI in all countries (whether considering the first differences of the variables or the log of the level variables) with the exception of Libya, where the bidirectional causality is only found for the log of the level variables.

Table 11: Granger Causality Test between FDI and Welfare variables for North Africa Countries

Panel A: Granger Causality test between FDI and HDI for North Africa countries

Country code	D.REALFDIPOP does not cause D.HDI		D.HDI does not cause D.REALFDIPOP		LOG(REALFDIPOP) does not cause LOG (HDI)		LOG(HDI) does not cause LOG (REALFDIPOP)	
	Lag order	Wald Chi 2 stat	Lag order	Wald Chi 2 stat	Lag order	Wald Chi 2 stat	Lag order	Wald Chi 2 stat
DZA	5	71.60 ***	5	12.11**	4	4.15	4	12.22 **
EGY	4	14.48***	4	1.97	4	33.92***	4	33.40***
LBY	1	1.56	1	1.01	1	1.31	1	0.25
MAR	6	102.67***	6	8.94	6	18.20***	6	30.02***
MRT	6	713.64***	6	9.00	3	38.03***	3	13.96***
TUN	6	147.04***	6	3.10	6	55.79***	6	14.79**

Country code	D.FDIGDP does not cause D.HDI		D.HDI does not cause D.FDIGDP		LOG(FDIGDP) does not cause LOG(HDI)		LOG(HDI) does not cause LOG(FDIGDP)	
	Lag order	Wald Chi 2 stat	Lag order	Wald Chi 2 stat	Lag order	Wald Chi 2 stat	Lag order	Wald Chi 2 stat
DZA	4	3.50	4	69.82***	4	3.68	4	10.58**
EGY	4	45.02***	4	14.24***	4	32.73***	4	44.09***
LBY	1	2.25	1	0.16	1	0.56	1	5.44**
MAR	6	144.39***	6	16.85**	6	9.37	6	2810.1***
MRT	5	177.87***	5	1,07	3	43.27***	3	31.29***
TUN	6	123.3 ***	6	2,72	6	82.33***	6	27.28***

Panel B: Granger Causality test between FDI and real per capita GDP for North Africa countries

Country code	D.REALFDIPOP does not cause D.REALGDPPOP		D.REALGDPPOPdoes not cause D.REALFDIPOP		LOG(REALFDIPOP) does not cause LOG(REALGDPPOP)		LOG(REALGDPPOP) does not cause LOG(REALFDIPOP)	
	Lag order	Wald Chi 2 stat	Lag order	Wald Chi 2 stat	Lag order	Wald Chi 2 stat	Lag order	Wald Chi 2 stat
DZA	6	80.77***	6	15.82**	4	280.73***	4	79.68***
EGY	6	79.68***	6	31.85***	6	57.04***	6	281.8***
LBY	1	0.92	1	0.38	1	7.81***	1	6.10**
MAR	6	34.94***	6	44.04***	6	184.76***	6	45.36***
MRT	6	154.44***	6	100.49***	3	6.43*	3	26.93***
TUN	6	68.87***	6	17.21***	6	51.63***	6	17.36***

Country code	D.FDIGDP does not cause D.REALGDPPOP		D.REALGDPPOP does not cause D.FDIGDP		LOG(FDIGDP) does not cause LOG(REALGDPPOP)		LOG(REALGDPPOP) does not cause LOG(FDIGDP)	
	Lag order	Wald Chi 2 stat	Lag order	Wald Chi 2 stat	Lag order	Wald Chi 2 stat	Lag order	Wald Chi 2 stat
DZA	4	28.60***	4	69.82***	4	192.5***	4	45.34***
EGY	6	47.41***	6	14.24***	6	67.84***	6	142.71***
LBY	1	0.01	1	0.16	1	5.83**	1	1.06
MAR	6	125.02***	6	16.85**	6	129.9***	6	129.9***
MRT	5	16.2***	5	1.07	3	10.38**	3	3.53
TUN	6	8.73	6	2.72	6	51.52***	6	25.75***

*** 1% significance level; ** 5% significance level; * 10% significance level. DZA=Algeria; EGY=Egypt; LBY=Libya; MAR=Morocco; MRT=Mauritania; TUN=Tunisia.

In sum, with the exception of Libya, real per capita FDI Granger-causes HDI and real per capita GDP. In Libya, real per capita FDI and the HDI do not appear to be causally related, but there is bi-directional causality between the log of real per capita FDI and the log of real per capita GDP[18]. This non-homogeneity of the relationship between FDI and welfare among these countries is basically confirmed when we use an alternative measure of FDI: FDI/GDP.

Next, we run a vector autoregressive (VAR) model for each country. Depending on the availability of the data for the country, we drop some explanatory variables and run either a VAR(1) or a VAR(2) model to obtain sound estimates. Tables 12 and 13 present the VAR estimates when the HDI and real per capita GDP are used as dependent variables. We observe that in Algeria, Egypt and Tunisia, FDI varies positively with HDI, although to differing extents. In Mauritania, the HDI has a delayed response to positive variations in FDI. The results are inconclusive for Libya and Morocco. When we use real per capita GDP to measure welfare, positive variations in FDI seem to positively impact changes in welfare in each country, with the coefficients being significant for both real per capita FDI and FDI/GDP in Morocco and in Egypt. In Egypt, however, the impact is delayed by one period. In Libya, positive variations in real per capita FDI positively and significantly impact changes in real per capita GDP. In Mauritania and Tunisia, only FDI/GDP positively impacts real per capita GDP. In Algeria, the coefficients are not significant.

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[18] This may be because much data is missing for Libya.

Table 12: VAR Regression Results for the Impact of FDI on HDI for each North African Country with Controls, 1990-2011

	DZA		EGY		LBY		MAR		MRT		TUN	
	VAR(2) with HDI		VAR(2) with HDI		VAR(1) with HDI		VAR(2) with HDI		VAR(2) with HDI		VAR(2) with HDI	
INTERCEPT	0.64387***	0.56599***	-1.1177	0.645	1.334***	0.1356	0.732	0.1461	0.1797***	1.0465***	-2.508**	-2.282*
	(20.58)	(23.12)	(-1.17)	(0.51)	(2.90)	(0.90)	(1.19)	(0.26)	(4.35)	(5.61)	(-2.15)	(-1.92)
HDI_{t-1}	0.08346***	0.0799***	-0.1032	-0.1965	-0.707	0.830***	-0.463***	-0.449***	0.1358747	0.459***	-0.6986	-0.8717*
	(4.27)	(4.96)	(-0.58)	(-0.84)	(-1.20)	(4.27)	(-3.49)	(-3.03)	(0.51)	(4.70)	(-1.52)	(-1.88)
HDI_{t-2}	0.0358**	0.0382***	0.571***	0.6613***			0.166	0.3233*	0.4835**	-0.0539	0.0662	0.026
	(2.08)	(2.85)	(4.45)	(3.88)			(0.82)	(1.72)	(2.09)	(-0.38)	(0.40)	(0.18)
$D.LOG(REALFDIPOP)_{t-1}$	0.02141***		0.0263***		0.045*		-0.0194		-0.0174		0.0332**	
	(6.25)		(3.35)		(1.89)		(-1.50)		(-1.15)		(2.38)	
$D.LOG(REALFDIPOP)_{t-2}$	0.0006		0.0331***			-0.0075	-0.0256**		0.0403***		0.028*	
	(0.27)		(7.92)			(-1.12)	(-2.63)		(3.63)		(1.84)	
$D.FDIGDP_{t-1}$		0.0188***		0.01279***				-0.0024		-0.0003551		0.0083***
		(7.77)		(4.35)				(-0.61)		(-0.50)		(3.00)
$D.FDIGDP_{t-2}$		-0.00031		0.0027112				-0.0020		0.00154**		0.0076**
		(-0.22)		(1.26)				(-0.59)		(2.01)		(2.29)
$DEBTGDP_{t-1}$	-0.5708***	-0.51563***					1.070***	0.7472***		-0.140*	-0.4018	-0.4518
	(-14.95)	(-17.03)					(4.43)	(3.69)		(-1.79)	(-1.19)	(-1.42)
$DEBTGDP_{t-2}$	0.5092***	0.4969***					-1.380***	-0.9715***		0.078	-0.3753	-0.2730
	(18.05)	(20.86)					(-3.93)	(-3.26)		(1.01)	(-1.25)	(-0.98)
$GOVSPEND_{t-1}$							-1.510	0.8882		-0.353	12.30***	13.13***
							(-0.74)	(0.45)		(-1.39)	(2.68)	(2.97)
$GOVSPEND_{t-2}$							6.354***	6.218		-0.896***	3.628	2.149
							(3.32)	(3.30)		(-3.32)	(0.68)	(0.41)
$INFLATION_{t-1}$	-0.00188***	-0.0017****	-0.0107**	-0.02161***			0.0005713	0.00048		-0.000316	0.0005	-0.0014
	(-5.08)	(-6.00)	(-2.06)	(-3.13)			(0.28)	(0.20)		(-0.25)	(0.07)	(-0.23)
$INFLATION_{t-2}$	-0.0022***	-0.00250***	-0.0062**	-0.00455			-0.001329	0.0022		-0.0062***	0.0024	0.0032
	(-8.43)	(-10.37)	(-2.05)	(-1.15)			(-0.57)	(1.02)		(-5.20)	(0.55)	(0.79)
$CIVILLIB_{t-1}$			0.0265	-0.0777333			-0.0194327	-0.00927		-0.0421**		
			(0.49)	(-1.16)			(-1.05)	(-0.48)		(-2.40)		
$CIVILLIB_{t-2}$			0.1682***	0.11916***			0.0125	0.0167		0.0156		
			(5.34)	(2.95)			(0.54)	(0.95)		(0.299)		
$OPENNESS_{t-1}$	0.00103*	0.0011**	0.0022**	0.00478***			-0.0029	-0.0041		-0.00152**	0.0015	0.0024
	(1.68)	(2.26)	(2.09)	(3.49)			(-1.15)	(-1.62)		(-2.45)	(1.03)	(1.64)
$OPENNESS_{t-2}$	-0.0010129	0.000024	0.0078	-0.0035			-0.0093***	-0.0064**		0.0150	-0.00007	-0.00037
	(-1.56)	(0.04)	(1.61)	(-0.54)			(-2.97)	(-2.04)		(1.04)	(-0.08)	(-0.45)
$CREDIT_{t-1}$			-0.00615	-0.02302**			-0.0142**	-0.01073**			-0.0023	-0.0040
			(-0.77)	(-2.14)			(-2.21)	(-2.51)			(-0.39)	(-0.71)
$CREDIT_{t-2}$			0.0057	0.01486***			0.015**	0.0109**			0.0255***	0.027***
			(1.41)	(2.78)			(2.27)	(2.19)			(2.57)	(2.84)
Nb. Obs.	12	12	15	15	6	13	18	18	10	19	18	18
R^2	0.986	0.99	0.991	0.9865	0.3831	0.5992	0.968	0.9526	0.8892	0.9591	0.733	0.7673
Chi^2	842.45***	1186.41***	1785.341***	1100.09***	3.73	19.43***	542.76***	361.75***	80.26***	445.90***	49.42***	59.36***

*** 1% significance level; ** 5% significance level; * 10% significance level. For an explanation of abbreviations, see Table 2. DZA=Algeria; EGY=Egypt; LBY=Libya; MAR=Morocco; MRT=Mauritania; TUN=Tunisia.

Table 13: VAR Regression Results for the Impact of FDI on Real Per Capita GDP for each North African Country with Controls, 1990-2011

	DZA		EGY		LBY		MAR		MRT		TUN	
	VAR(2) with D.LO (REALGDPPOP)		VAR(2) with D.LOG (REALGDPPOP)		VAR(1) with D.LOG (REALGDPPOP)		VAR(2) with D.LOG (REALGDPPOP)		VAR(2) with D.LOG (REALGDPPOP)		VAR(2) with D.LOG (REALGDPPOP)	
INTERCEPT	0.0044	0.0030	0.0137**	0.0209***	0.0256*	0.0161	0.0671***	0.0941***	0.0185	0.0126***	0.07248***	0.0653***
	(0.63)	(0.41)	(1.98)	(3.46)	(1.96)	(0.92)	(6.47)	(14.16)	(0.88)	(3.14)	(4.61)	(5.84)
D.LOG(REALGDPPOP)$_{t-1}$	0.5038**	0.586**	0.4629**	0.3074	-0.0955	0.0249	-3.0081***	-3.0000***	-0.1477	0.4729*	-1.4726*	-1.9417***
	(2.24)	(2.51)	(2.37)	(1.44)	(-0.44)	(0.08)	(-5.73)	(-11.07)	(-0.46)	(1.86)	(-1.65)	(-3.71)
D.LOG(REALGDPPOP)$_{t-2}$	0.1212**	0.1192	-0.0079	-0.0527			1.7526***	2.0789***	0.3444	0.7170***	0.24671	1.0026*
	(0.54)	(0.52)	(-0.03)	(-0.27)			(4.44)	(8.70)	(0.77)	(4.34)	(0.35)	(1.94)
D.LOG(REALFDIPOP)$_{t-1}$	0.0105***		0.0015		0.0343**		0.02474**		0.0066		0.0200	
	(1.63)		(0.46)		(2.27)		(2.50)		(0.37)		(1.55)	
D.LOG(REALFDIPOP)$_{t-2}$	0.0084		0.0137**			0.0095	0.0009		0.0156		0.0175	
	(1.36)		(2.59)			(0.83)	(0.11)		(0.77)		(1.21)	
D.FDIGDP$_{t-1}$		0.00911		0.0017				0.0082**		0.0026***		0.00788***
		(1.61)		(0.83)				(9.15)		(2.87)		(4.00)
D.FDIGDP$_{t-2}$		0.0076		0.0038*				0.0010		0.0033***		0.00815***
		(1.28)		(1.95)				(0.95)		(4.75)		(3.40)
D.DEBTGDP$_{t-1}$							-0.5862***	-0.16292***		0.0068	-0.4018	-0.1651*
							(-3.13)	(-3.15)		(0.12)	(-1.19)	(-1.91)
D.DEBTGDP$_{t-2}$							1.1604***	1.41033***		0.0045	-0.3753	0.5131***
							(5.12)	(10.29)		(0.09)	(-1.25)	(3.84)
D.GOVSPEND$_{t-1}$							0.5690677	0.898*		0.3521**	12.30***	-6.0905**
							(0.61)	(1.70)		(2.08)	(2.68)	(-2.50)
D.GOVSPEND$_{t-2}$							-3.1512***	-6.1341***		0.1918	3.628	-0.6497
							(-3.43)	(-11.64)		(1.11)	(0.68)	(-0.45)
D.INFLATION$_{t-1}$			0.0016	0.00024			-0.02102***	-0.0223***		0.0023***	0.0005	-0.0039***
			(1.42)	(0.32)			(-4.39)	(-8.74)		(3.42)	(0.07)	(-2.91)
D.INFLATION$_{t-2}$			0.0015*	0.0011			0.0010	0.00101***		0.0033***	0.0024	-0.0035***
			(1.66)	(1.57)			(1.44)	(2.61)		(4.61)	(0.55)	(-4.20)
D.CIVILLIB$_{t-1}$			-0.0130***	-0.0121***			-0.1295***	-0.1231***		0.0157		
			(-2.66)	(-3.18)			(-5.45)	(-10.36)		(0.88)		
D.CIVILLIB$_{t-2}$			0.0054	-0.0049			0.0369***	0.01421***		0.0914***		
			(0.71)	(-1.07)			(4.03)	(3.40)		(5.63)		
D.OPENNESS$_{t-1}$			-0.0014**	-0.0014***			0.0092***	0.0128***		-0.000	-0.0008	-0.0017**
			(-2.22)	(-2.78)			(5.42)	(11.70)		(-0.00)	(-0.76)	(-2.41)
D.OPENNESS$_{t-2}$			0.0005	0.0002			0.0311***	0.030***		-0.0005	0.0001	-0.0035
			(0.68)	(0.31)			(7.25)	(14.49)		(-1.26)	(0.09)	(-0.08)
D.CREDIT$_{t-1}$			0.0014	0.0005			-0.0323***	-0.0465***			-0.0086**	-0.0083***
			(0.91)	(0.35)			(-4.03)	(-9.05)			(-2.13)	(-4.91)
D.CREDIT$_{t-2}$			-0.0006	-0.0009			0.0074*	0.01689***			-0.0041**	-0.0031**
			(-0.39)	(-0.73)			(1.73)	(5.96)			(-2.37)	(-2.27)
Nb. Obs.	13	13	18	18	6	9	18	18	10	19	18	18
R^2	0.3866	0.3797	0.7197	0.9865	0.4669	0.0781	0.9768	0.992	0.0731	0.8982	0.6598	0.7937
Chi^2	8.193*	7.958*	46.208***	1100.09***	5.254*	0.762	757.367***	2356.78***	0.78832	167.659***	34.917***	69.234***

*** 1% significance level; ** 5% significance level; * 10% significance level. For an explanation of abbreviations, see Table 2. DZA=Algeria; EGY=Egypt; LBY=Libya; MAR=Morocco; MRT=Mauritania; TUN=Tunisia.

Overall, we can conclude that the impact of FDI on welfare varies substantially from country to country. Thus, a natural question to ask is: why do we observe these differences in FDI linkages from one country to another one? The answers to this question may in part lie in the characteristics of FDI received. We explore this below.

IV.2. Sectoral concentration of FDI inflows in North Africa Countries

From Figure 1, FDI in North Africa region reached a peak in 2008 before declining due to the 2007-2009 financial crisis and the Arab Spring unrest from 2010 to 2012. Despite the overall increase in FDI before 2008, its sectoral concentration in the region varies widely from one country to another. As shown in Figure 2, in Egypt, Libya and Mauritania, FDI inflow mainly went to the petroleum extraction industries; in Morocco, FDI mainly went into the services and tourism industries (finance, business activities, restaurants and hotel industries). Almost no FDI went into the primary sector in Morocco and very little FDI went into the manufacturing sector. FDI received by Algeria is concentrated in the construction and "unspecified" secondary sectors. Only limited FDI entered the tertiary and agricultural sectors. In Tunisia, the main beneficiary of FDI inflows was the utilities sector, i.e. the electricity, gas and water industries. Algeria,

Mauritania and Morocco are least diversified countries in terms of industry concentration. FDI is relatively well diversified in Egypt (when excluding the petroleum extraction sector) and Tunisia (when excluding utilities) compared to other countries in the region.

In most countries in the region, it is essential to implement policies which target diversification of FDI, especially to direct more FDI toward primary sector industries (other than natural resources), such as agriculture and hunting, forestry and fishing, etc. which are more labor intensive[19]. For Algeria, although investments in the construction industry have helped improve infrastructure such as roads and housing, a better distribution of FDI among the three sectors (primary, secondary and tertiary) will improve the benefits of FDI flowing into the country and will contribute more to poverty reduction. The same holds for Tunisia, where FDI is essentially in the utilities sector. For Egypt, Libya and Mauritania, the impact of FDI on welfare will depend a lot on the fiscal and redistributive policies of the government relative to the petroleum sector. In Morocco, directing more FDI toward the primary and the manufacturing sectors will be beneficial for wealth distribution. Overall, in the region, agriculture and hunting and forestry and fishing receive very little FDI, although these industries are perceived as labor intensive and pro-poor sectors in developing economies.

Figure 2: FDI inflows by country and industry

FDI inflow in Algeria by industry (2008, US $ million)
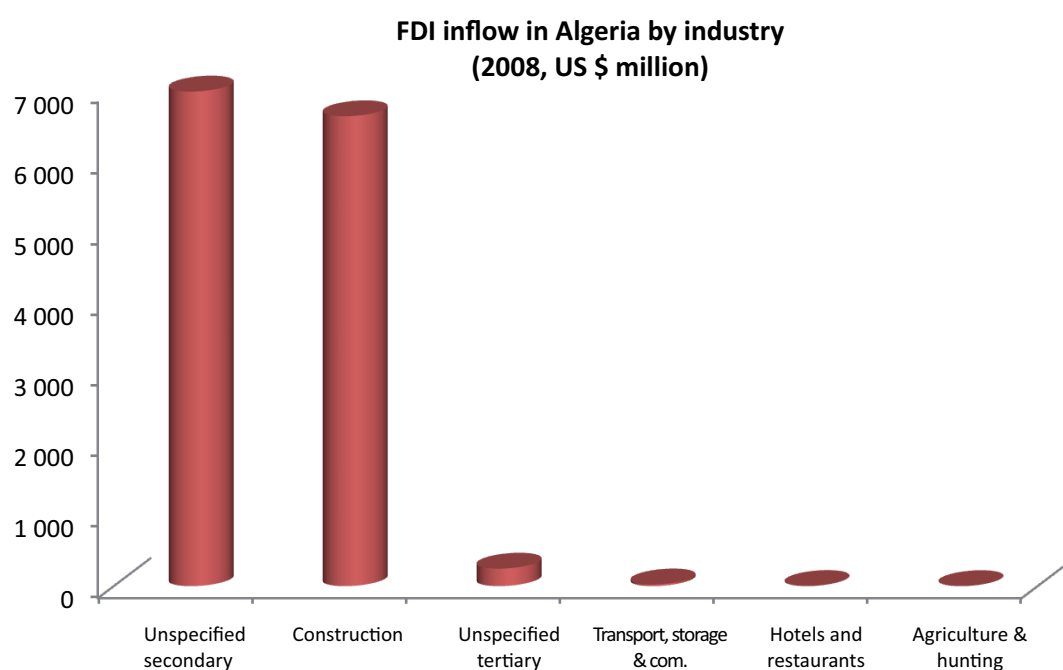
[19] Appendix A provides some background information on the regulatory changes that affect foreign investments in the region.

**FDI Inflow in Egypt by industry
(2008 and 2009, US $ million)**

■ FDI Inflow in 2008   ■ FDI Inflow in 2009

**FDI Inflow in Mauritania by industry
2008 and 2001, US $ million**

■ FDI Inflow in 2008   ■ FDI Inflow in 2009   ■ FDI Inflow in 2010   ■ FDI Inflow in 2011

FDI Inflow in Morroco by industry
2008 and 2001, US $ million

■ FDI inflow in 2008   ■ FDI inflow in 2009

FDI Inflow in Tunisia by industry
(2008 and 2009, US $ million)

■ FDI Inflow in 2008   ■ FDI Inflow in 2009   ■ FDI Inflow in 2010

Source of data: International Trade Center (www.intracen.org/policy/foreign-direct-investment-data/)

IV.3.   FDI and human development

As we mentioned above, the UNDP's Human Development Index (HDI) is the commonly used measure to capture human development. It

consists of three main components:

• Health measured by life expectancy at birth;
• Living standards measured by gross national income (GNI) per capita;

• Education measured by mean years of schooling at birth and the expected years of schooling for adults.

According to our above analysis, the link between FDI and HDI is bidirectional. Indeed, on the one hand, human capital, which is related to health and education, is perceived as essential in attracting FDI and gaining from it (e.g., Alsan et al. (2006), Herzer and Nunnenkamp (2012)). On the other hand, FDI may affect the living standards component of HDI through its spillover effects (labor intensive, allocation of fiscal revenue, technology transfer…).

Figure 3 below presents the annual variations of FDI and the three components of HDI (life expectancy, living standards and education). Variations in FDI seem to be positively associated with variations in life expectancy in Algeria and Libya. FDI variations are positively related to annual variations in the living standards indicators of Egypt, Mauritania and Tunisia. Gains from investments in the petroleum sector in Egypt and Mauritania and in the utilities sector in Tunisia contribute positively to the total wealth of these countries; they are in turn used to improve the populations' wellbeing through investments in education and health facilities. The negative correlation between variations in FDI and per capita GNI in Morocco, although weak, confirms our previous results on the non-conclusive relationship between FDI and welfare, although the impact on per capita GDP is positive. For Algeria, since FDI inflows go to the construction and other "unspecified" secondary sectors, one may assume that these investments contribute to the development of infrastructure and create jobs in the manufacturing industry, essential for the wellbeing of the populations.

Figure 3: FDI and Human Development

Panel A: FDI/GDP and HDI Components
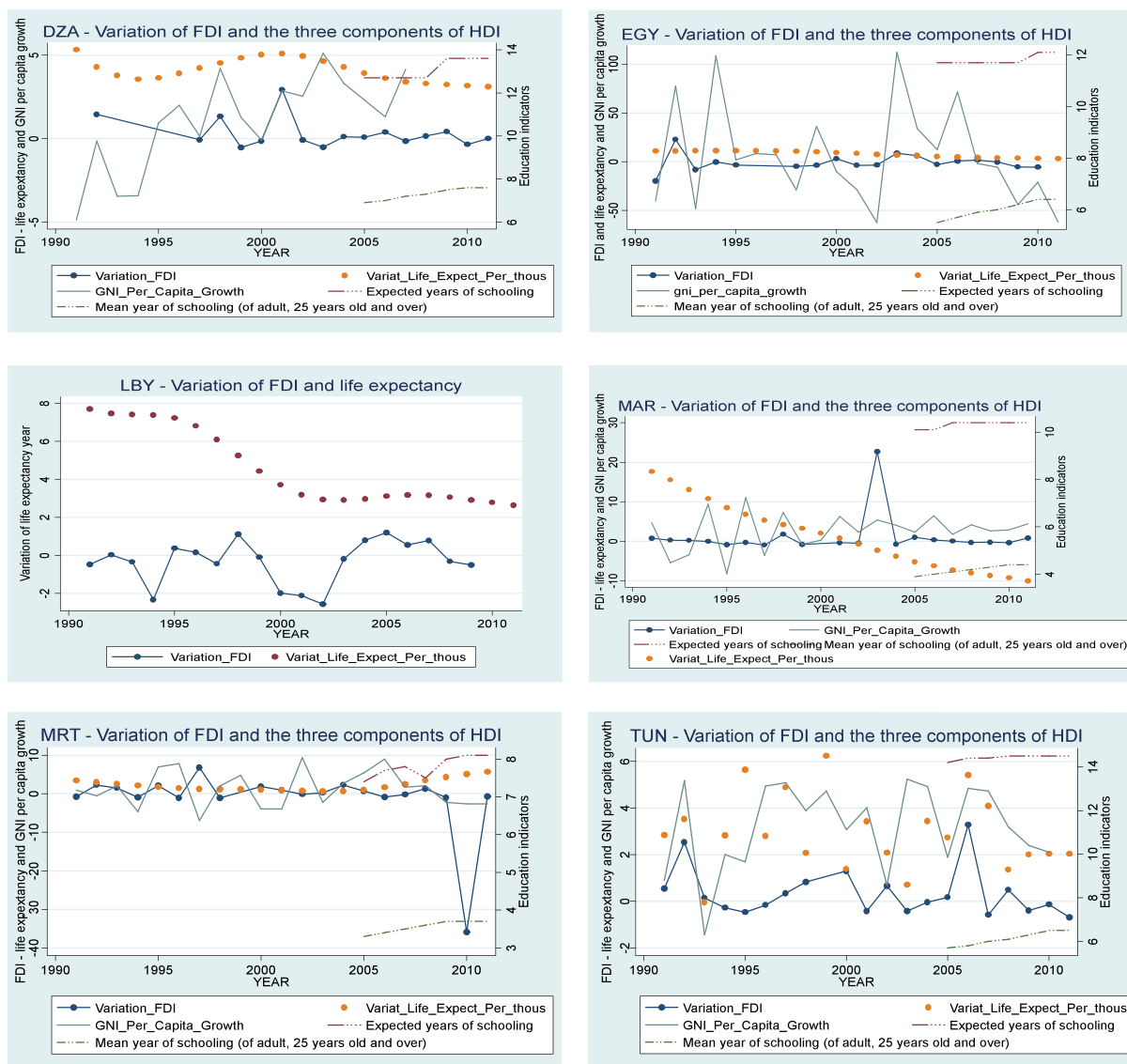
Panel B: Real Per Capita FDI and HDI Components

DZA - Variation of FDI Per Capita and the three components of HDI

EGY - Variation of FDI Per Capita and the three components of HDI

LBY - Variation of FDI Per Capita and the three components of HDI

MAR - Variation of FDI Per Capita and the three components of HDI

MRT - Variation of FDI Per Capita and the three components of HDI

TUN - Variation of FDI Per Capita and the three components of HDI

IV.3.   FDI and poverty reduction

Klein et al. (2001) examine the relationship between FDI and poverty reduction, and argue that since economic growth is a key factor for poverty reduction, FDI may be beneficial for the poor if it stimulates economic growth. There are at least three ways for FDI to trigger poverty reduction: through labor intensiveness, through transfer of technology and knowledge, and through the allocation of fiscal revenue generated by the presence of foreign investors. For a study specifically related to North Africa, Salem (2011) investigates the issue of FDI and technology transfer in a comparative study of Libya and Egypt and concludes that

FDI is the main channel of technology transfer in both countries.

As we mentioned above, few researches have studied the direct relationship between FDI and poverty reduction, and this is in part due to the lack of comprehensive and consistent data on poverty measures and indicators across countries. Here we provide further analysis with the few dataset available on the North African countries in the WDI database.

Figure 4 plots the evolution of FDI and the poverty incidence measures, i.e., the poverty gap at $2 a day, the poverty gap at $1.25 a day, the

poverty headcount ratio at $2 and the poverty headcount ratio at $1.25, for four countries for which we have the data (Egypt, Mauritania, Morocco and Tunisia). It appears that the evolution of FDI is negatively associated with the poverty indicators for Egypt and Morocco, meaning that greater FDI inflows are associated with less poverty. However, for Morocco, this association disappears when real per capita FDI is used instead of FDI/GDP. For Tunisia, the relationship was negative before 2000, but after 2000, it became ambiguous. For Mauritania, FDI does not seem to induce poverty reduction. In Egypt, we can therefore conclude that, all other factors being equal in the economy, FDI inflows appear to reduce the depth and incidence of poverty, as well as the rate of the population living on less than $2 or $1.25. The results obtained here may be explained by the structure of the FDI received in each country. For instance, in Mauritania, FDI was concentrated in the petroleum sector. The impact of FDI on poverty reduction will largely depend on the redistribution and fiscal policies of the government. In Morocco and Tunisia, FDI inflows were less diversified among the industries, which may explain some of our findings on these countries. Hence, more diversified FDI across industries could have had a greater impact on poverty reduction.

Figure 4: FDI and Poverty Incidence

Panel A: FDI/GDP and Poverty Indicators
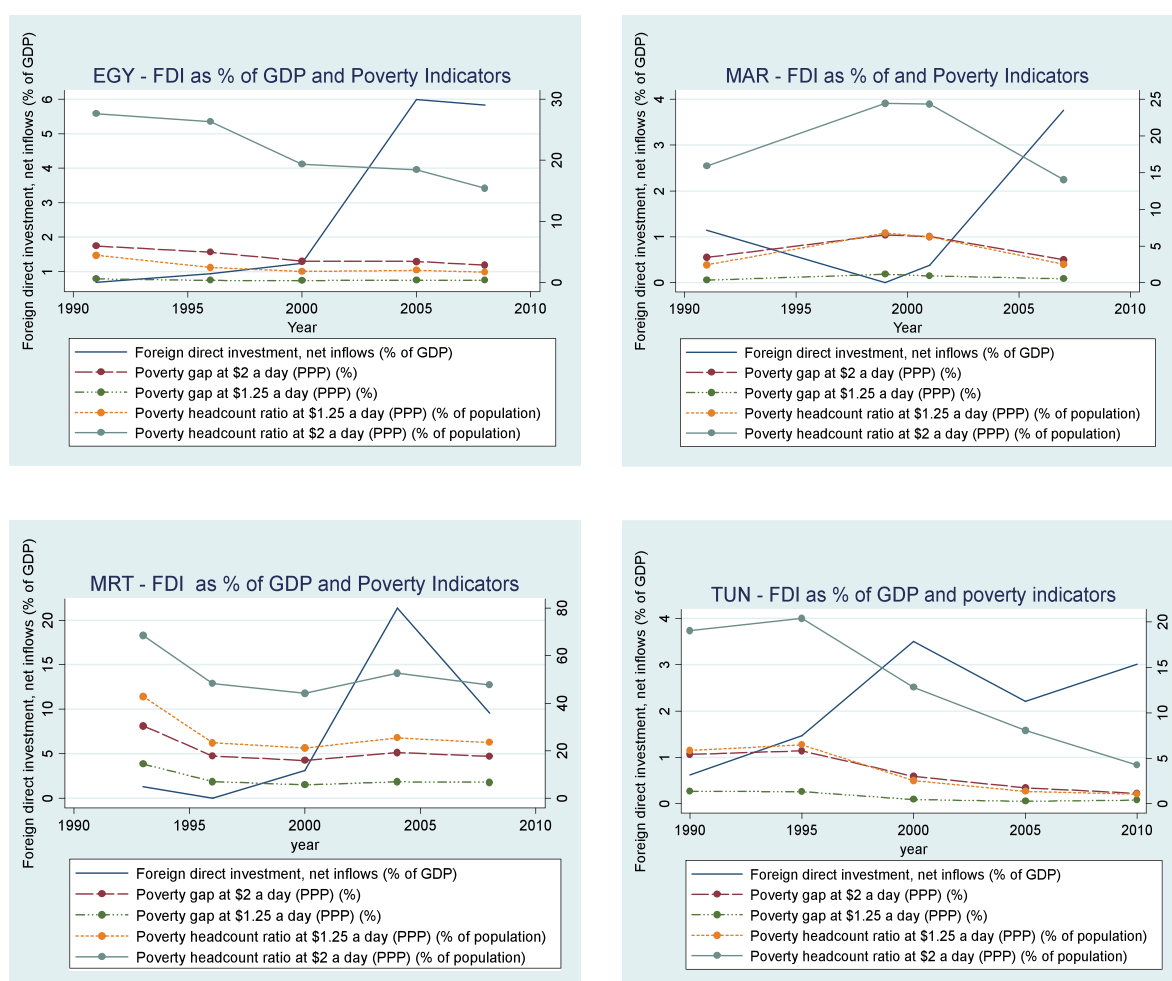
Panel B: Real Per Capita FDI and Poverty Indicators
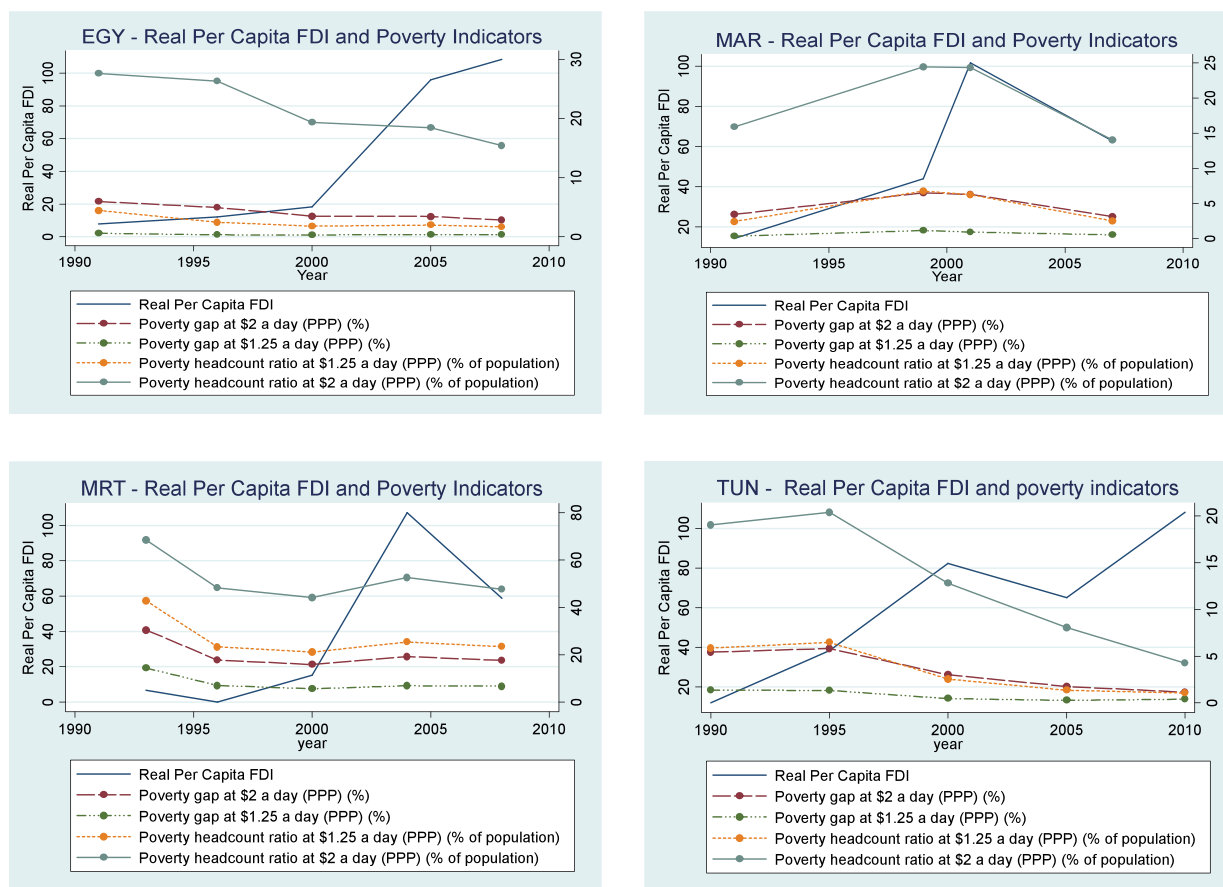
IV.4.   FDI and income inequality

Even if FDI stimulates economic growth, if it does not create suitable employment for the poor, income inequality or the wage gap may widen. Jensen and Rosas (2007) examine the impact of FDI on income inequality in Mexico. They find that FDI reduced income inequality in thirty-two states in Mexico. In contrast, Herzer et al. (2012) find that FDI inflows contributed to a wider income gap among households in Bolivia, Chile, Columbia and Mexico. Herzer and Nunnenkamp (2013) find a long-run negative effect and a short-term positive effect of FDI inflows on income inequality in Europe. Thus, FDI may either reduce or widen income inequality depending on the characteristics of FDI received and the policies established to benefit from these investments.

We use the Gini index to measure inequality in the North Africa countries. The Gini index measures the extent to which the distribution of income or of consumption expenditures among individuals or households within an economy deviates from a perfectly equal distribution. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

Figure 5 presents the evolution of FDI inflow and the Gini index of North Africa countries. It suggests a negative correlation between the Gini index and FDI in Tunisia and a positive correlation in Morocco. In Egypt, the correlation seems to be weakly negative and ambiguous in Mauritania. These observations seem to suggest that FDI widens income inequality in Morocco and Mauritania, and reduces the income gap in Tunisia and Egypt. These discrepancies are certainly due to the sectorial concentration of FDI in each country. Recall, in the sectoral distribution of FDI, FDI into Morocco was concentrated in the tertiary sector; in Tunisia, it was in the utilities (or secondary) sector. In Egypt and Mauritania, FDI was generally directed to the primary sector: the petroleum extractive industries. However, for the case of Egypt, although the petroleum industries account for almost 75% of the total FDI inflows, the rest was distributed somewhat equally among the remaining sectors (secondary and tertiary). This was also the case for Tunisia when excluding the utilities sector. These findings are somewhat consistent with our previous findings on the relationship between FDI and either poverty reduction or human development in these countries.
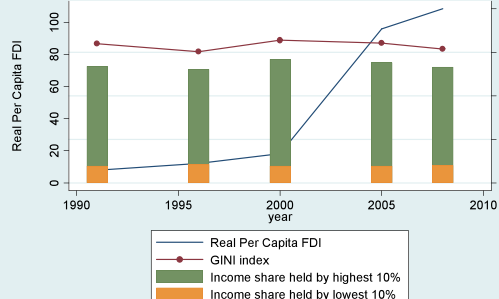
Figure 5: FDI and Income Inequality

Panel A: FDI/GDP and Income Inequality
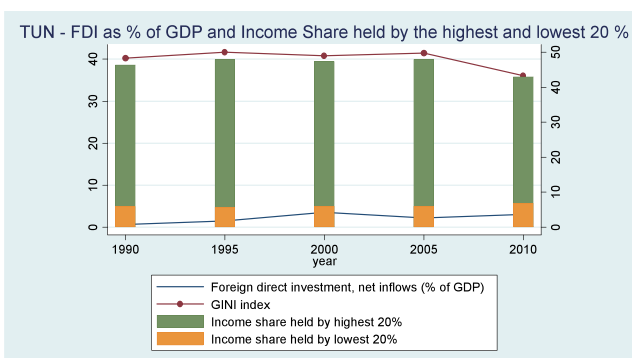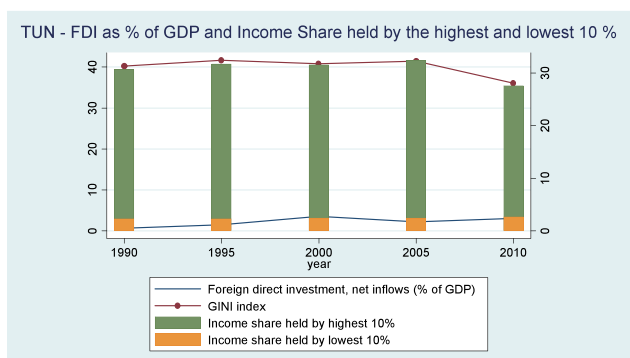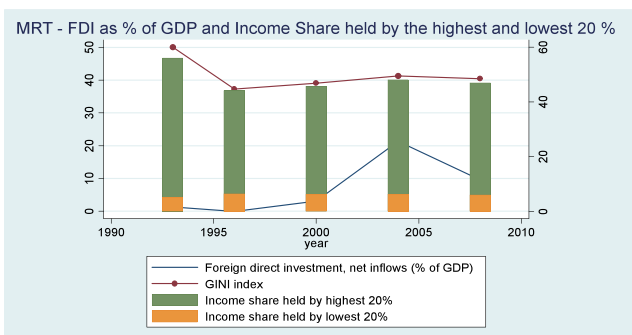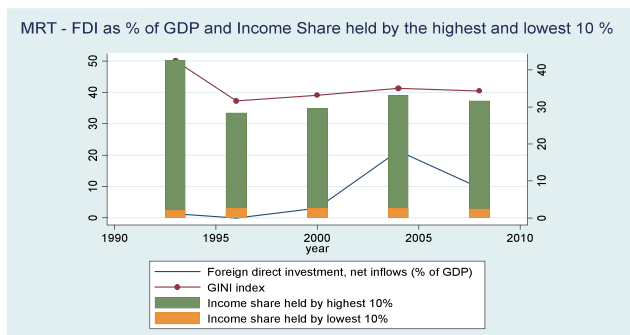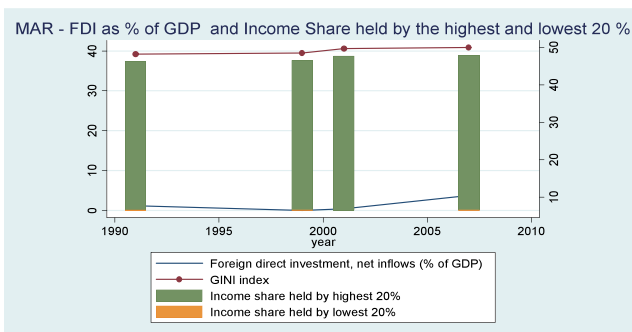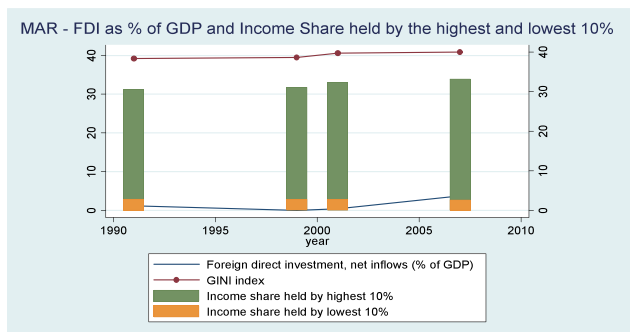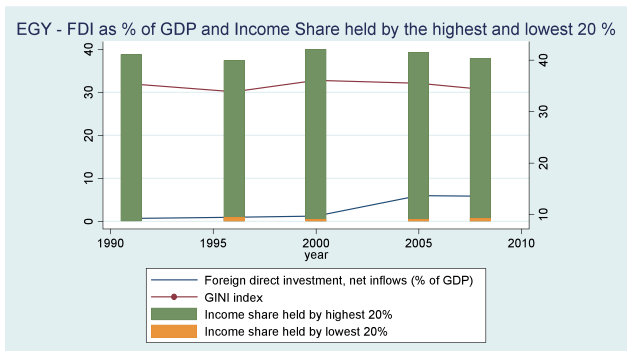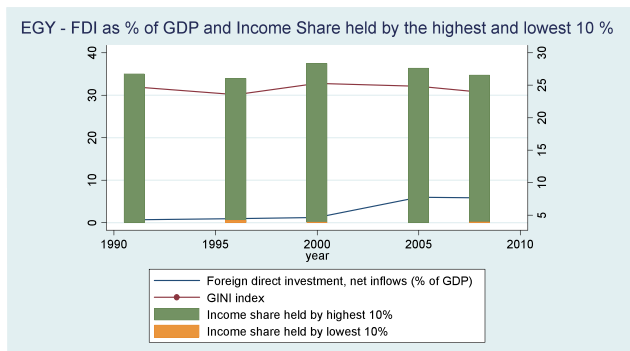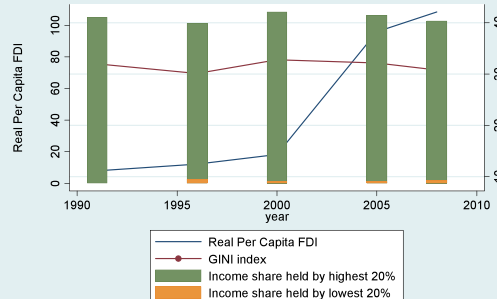
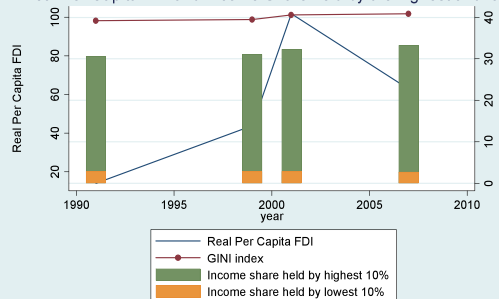## Panel B: Real Per Capita FDI and Income Inequality

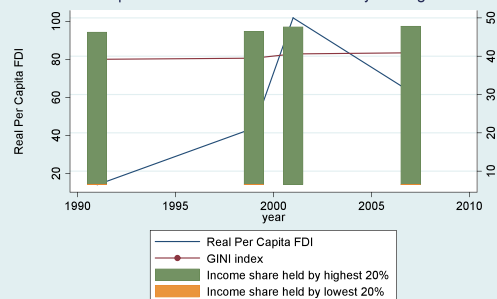EGY - Per Capita FDI and Income Share held by the highest and lowest 10%

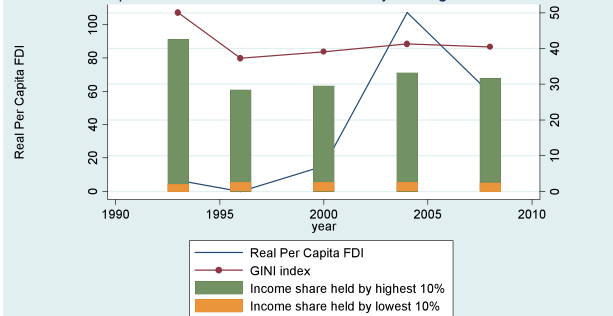EGY - Per Capita FDI and Income Share held by the highest and lowest 20%

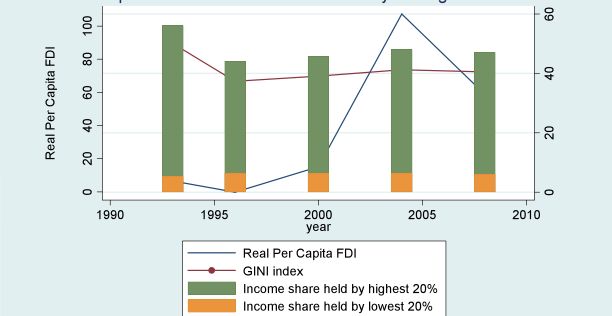MAR - Real Per Capita FDI and Income Share held by the highest and lowest 10 %

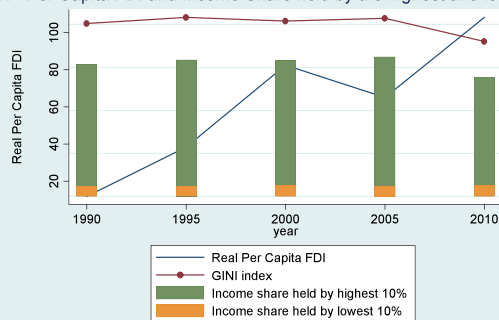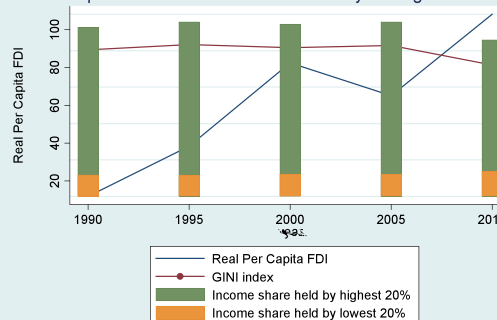MAR - Real Per Capita FDI and Income Share held by the highest and lowest 20 %

MRT - Per Capita FDI and Income Share held by the highest and lowest 10%

MRT - Per Capita FDI and Income Share held by the highest and lowest 20%

TUN - Per Capita FDI and Income Share held by the highest and lowest 10%

TUN - Per Capita FDI and Income Share held by the highest and lowest 20%

V. Conclusion and Policy Recommendations

This paper assesses the impact of FDI on welfare in the North Africa region using the HDI and real per capita GDP as welfare measures. To measure FDI, we used net per capita FDI inflows, net FDI inflows as a share of GDP and net FDI inflows as a share of gross capital formation (GCF). As was done in other studies, we controlled for phenomena affecting welfare and economic growth: economic and policy factors, the business environment, and the quality of institutions and political risks.

On this basis, we find a strongly positive relationship between FDI and welfare improvements at the level of North Africa as a whole. This relationship holds even after we control for government size, country indebtedness, macroeconomic instability, infrastructural development, institutional quality, political risk, openness to trade, education and financial market development. We also find that FDI has varying impacts on welfare across the region. At the aggregate level, FDI contribute to economic growth in North Africa, which in turn generates additional revenues for governments and populations in the region through fiscal policies and job creation. Additionally, government spending, infrastructure development, institutional quality and better governance tend to amplify the positive effects of FDI on welfare in the region. It is therefore essential for the region's governments to continue investing in social infrastructures while improving the quality of their institutions and their governance; doing so will help avoid the type of unrest we have witnessed recently.

The concentration of FDI in a few industries with differing spillover effects within the economy and on the wellbeing of populations seems to be part of the explanation of the differences in FDI-welfare linkages in these North Africa economies. Indeed, incoming FDI was concentrated in either in the extractive petroleum industries, the services and tourism sector or the utilities sector, and much less FDI appears to be directed toward non-extractive primary industries (such as agriculture and hunting, or forestry and fishing), which are labor intensive and pro-poor, or the manufacturing sector, the sector with a high potential for spillover effects in the economy (e.g. Alfaro (2003)). These characteristics of FDI limit their potential impact on poverty reduction and income distribution given that these countries have relatively lower quality institutions as well as governance, both of which are challenges for efficient redistribution of wealth.

Three main policy recommendations can be drawn from our findings. First, in terms of reducing differences in average welfare between countries in the region, policies to attract FDI should be carefully designed to direct those investments toward the most productive sectors of the economy, namely the manufacturing sector. Indeed, these investments will create jobs, develop local skills and stimulate technological progress, thus reducing poverty and improving welfare across the region. Second, in terms of reducing inequalities within a country, sufficient incentives should be provided to encourage foreign investments in labor-intensive and pro-poor sectors such as agriculture and hunting, forestry and fishing, education, health and infrastructural development. Several methods exist to identify these priority sectors. One of them is the growth diagnostic framework that international development agencies have recently begun to implement. Of course, the political, social and economic context of host countries will influence the choices to be made in terms of incentive policies and sectors to be prioritized. Therefore, the third recommendation concerns the improvement of the institutional quality and governance in the host countries in order to better redistribute wealth within each country and hence reduce poverty; as we argue above, better institutions and reduced political risks will make it easier to draw benefits from FDI[20].

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[20] It has to be noted that the lack of detailed and micro level data on FDI sectorial distribution limits our ability to formulate some specific recommendations supported by the analyses. In addition, in future researches, it would be interesting to explore the impact of FDI on the environment (hence, the welfare of the local communities), especially for foreign investments in environmentally-sensitive sectors.

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Appendix

Appendix A

Overview on Investment Policies and Regulations in North Africa countries

Algeria

According to the National Agency of Investment Development of Algeria[21] and the UNCTAD 2004 report on investment policy[22], Algeria adopted several rules during the late 1990s to attract FDI and protect foreign investors. These rules consisted of an investment code in 1993, trade liberalization in 1993-1994, investment regulatory framework reform which led to the creation of the *"Agence de Promotion, de Soutien et de Suivi de l'Investissement"* (APSI). As argued by De Bock and Gijon (2011)[23], a priori the reforms aimed at boosting the economy growth through FDI and diversification. But unfortunately, they failed to have significant positive impact on the national economy because the FDI inflows were weakly diversified. As a matter of fact, as reported by UNCTAD in 2004, FDI flows to Algeria were mainly concentrated on hydrocarbon, IT, steel and chemical industries.

In 2001, Algeria adopted new regulations; known as *"Ordonnance n° 01-03 relative au development de l'investissement de 2001"*. According to the 2004 UNCTAD report on investment policy in Algeria, the objectives of these new regulations were to complete the investment code of 1993, address the weakness of the 1990s' reforms, improve the business climate and increase the economy competitiveness. In the same way, another regulation was adopted in 2006 (called *"Ordonnance n° 06-08 modifiant et complétant l'ordonnance 01-03 de 2006"*), to improve the previous laws. In addition, the "Agence Nationale de Developpement de l'Investissement" (ANDI) was created to replace the APSI, in order to better promote investment and make procedures easier for investors.

Furthermore, according to De Bock and Gijon (2011), Algerian private investment necessary to stimulate economic growth was very low with investments in hydrocarbon sector representing 98% of total exports. In fact, although different policies implemented at the beginning of the 2000s by Algeria had encouraged FDI inflows, they also created unexpected adverse effects on domestic private investment and had weakly impacted the global economy. To support domestic investment and improve the national production, new fiscal policies for foreign investors and regulations on import of goods and services were introduced (*"Ordonnance n° 09-01 du 22 juillet 2009 portant loi de finances complémentaire pour 2009"[24] and "Ordonnance n° 08-02 du 24 juillet 2008 portant loi de finances complémentaire pour 2008"[25]*). Under these laws, foreign investors or companies benefiting from tax privileges or any forms of financial incentives are required to reinvest an amount which is at least equal to that of the privileges or incentives granted (see Chapter 2, section I, article 4 of *the Ordinance Relating to Complementary Finance Law for 2008*). Regarding the import of goods and services, new companies involved in these activities are required to maintain at least 30% Algerian ownership, and are subject to barriers on the amount of foreign currency invested in imports (see Chapter 3, section II, article 58 of *the Ordinance Relating to Complementary Finance Law for 2009*).

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Egypt

According to the 2009 UNCTAD review on the investment policy in Egypt[26], prior to 1997 the investment regulatory framework had a plethora of laws which, in some way, represents significant barriers to FDI attractiveness. But the adoption of the Investment Law N0 8 in 1997 and the removal of the 49% ceiling on foreign ownership in 1998 were perceived as an improvement of FDI attractiveness and national treatment for foreign investors. According to the same report, under that law, many investment sectors; which include but not limited to infrastructure, finance, oil and gas were open to foreign investors. In addition, hundred percent of foreign ownership is allowed under this law, in other words, the presence of Egyptians in the ownership is no longer a requirement to undertake foreign investment projects in the liberalized fields.

Finally, Egypt signed the OECD Declaration on International Investment and Multinational Enterprises in 2007[27]. According to the commitments stated in this declaration, Egypt has officially strengthened its willingness to provide national treatment to foreign investors and to promote responsible investment.

Morocco

According to the 2008 UNCTAD review on investment policy in Morocco[28], the country has adopted in 2007 a set of rules to support investors, promote FDI and make easier administrative procedures for new investors. According to the 2009 OECD Investment Policy Review, Morocco has joined the Declaration on International Investment and Multinational Enterprises in 2009[29].

Tunisia

Tunisia's investment code of 1993 allowed different fiscal incentives to attract investment in many sectors (cf. Tunisian Industry Portal)[30]. However, this code contains some barriers which discourage foreign investment in some sectors. After an amendment in 2009, the code is currently under reforms.

According to the 2013 report of the Bureau of Economic and Business Affairs of the U.S. Department of State on Tunisia[31], these reforms are expected to stimulate job creation, boost development and remove some constraints on foreign investment. Moreover, to enhance its attractiveness and guarantee national treatment to foreign investors, Tunisia has also signed the OECD Declaration on International Investment and Multinational Enterprises, as reported in the 2012 OECD Investment Policy Reviews report[32].

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