

ECONOMIC
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2012

working paper series

**THE DETERMINANTS OF MENA EXPORT
DIVERSIFICATION: AN EMPIRICAL ANALYSIS**

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Working Paper No. 709

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September 2012

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First published in 2012 by
The Economic Research Forum (ERF)
21 Al-Sad Al-Aaly Street
Dokki, Giza
Egypt
www.erf.org.eg

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Abstract

The aim of this paper is to study driving forces behind export diversification in Middle East and North Africa. We run an empirical model by using panel data for 12 MENA countries over the period 1984-2009 to detect the key factors of export diversification. To deal with the potential endogeneity problem of explanatory variables (feedback effects) we use instrumental variables. We find an inverted U-shape relationship between economic development and diversification. Moreover, estimation results show that the endowment of natural resources explains the export concentration in this region. By contrast, openness and accumulation of physical capital (foreign and domestic) lead to more export diversification.

JEL Classifications: F10, F19, C51.

Keywords: Export diversification, Two Stages General Least Square Estimation, MENA countries.

ملخص

الهدف من هذه الورقة هو دراسة القوى المحركة وراء تنوع الصادرات في منطقة الشرق الأوسط وشمال أفريقيا. نقوم بتشغيل نموذج تجريبي باستخدام لوحة البيانات لاثني عشر دولة من دول المنطقة خلال الفترة 1984-2009 للكشف عن العوامل الرئيسية لتنوع الصادرات. وللتعامل مع هذه المشكلة المحتملة للجوانب الداخلية من المتغيرات التفسيرية (آثار التغذية الراجعة)، نستخدم المتغيرات الأساسية. نجد ان شكل العلاقة بين التنمية الاقتصادية والتنوع على شكل مقلوب U. وعلاوة على ذلك، يتبين من نتائج التقدير للموارد الطبيعية ما يفسر تركيز الصادرات في هذه المنطقة. وبشكل متباين، فان الانفتاح وتراكم رأس المال المادي (الخارجي والداخلي) يؤدي إلى تنوع أكثر في الصادرات.

1. Introduction

The question of economic diversification dates back to 1930 when Mac Laughlin published his pioneering work on this issue. Subsequent literature developed steadily in the 1940s and 1950s. By the end of the 1970s—after the failure of import substitution strategy—economic diversification had become one of the main topics to reflect upon. Today this subject still arouses the curiosity of many scholars in disparate fields of research.

Export diversification occurs when there is: (1) growth in existing export products (traditional products) that are already being exported to traditional old markets (growth in the intensive margin of exports); and (2) growth in exports resulting from export flows to new markets and new products (the extensive margin of trade). Thus changes in export diversification in a country or a region reflect the introduction (or disappearance) of new export product varieties (changes in the extensive margin) or changes in traditional exports (changes in the intensive margin) (Amurgo-Pacheco and Pierola 2007; Brenton and Newfarmer 2007; Baldwin and Di Nino 2006)

Policy makers in MENA countries are now conscious of the need for a structural change to boost growth and trade. Limiting their reliance on natural resources is also a priority. They strongly believe in export-led growth and outward orientation. Export diversification can be a useful tool for this approach since it is widely viewed as a positive trade tool for sustaining economic growth. MENA countries face several economic and social challenges: accelerating growth, boosting employment and ensuring socioeconomic stability. Export diversification can be very useful for this region. Yet a range of empirical works have shown that growth and/or total factor productivity are spurred by economic diversification. This latter (economic diversification) can play an important role both in creating and diffusing different kinds of positive spillovers.

According to the World Bank (2007, 5) “MENA countries find themselves squeezed between low-wage competitors in poor countries who dominate mature industries and innovators in rich countries, who dominate industries undergoing rapid technological change. Exploiting unused potential for export growth and finding new export opportunities is therefore critical for MENA countries to reposition on world markets in areas in which they can build up comparative advantages.” In fact, MENA countries’ exports are concentrated in a few products, often commodities, with very volatile demand. This implies high income instability, which in turn leads to high growth volatility.

The reliance on a limited number of goods that are subject to major price and volume fluctuations (agriculture, oil, minerals, etc.), exposes a country to different shocks including a drop of its exports and a decline in terms of trade. Prebisch (1959) advocates that in terms of trade for natural resource exporters would experience an ineluctable deterioration relative to those of manufacture exporters. Thus in order to: reduce swings in foreign exchange revenues and therefore export earnings, foster income growth and upgrade value added by moving away from raw materials and increasing the quality of manufactured exports, developing nations have to increase the range of their export basket. Therefore export diversification becomes unavoidable.

2. Stylized Facts: What We Can Learn from the MENA Experience?

Figure 1 provides a snapshot of export concentration measured by the Herfindahl-Hirschmann Index (HHI) in 2009 for the MENA region and comparators. The HHI shows a relatively high level of export concentration in MENA countries. Extreme concentration values are reached by oil-rich countries such as Algeria, Saudi Arabia, Oman, Qatar and Kuwait (the HHI ranges between 0.5 and 0.85). Non-oil countries like Lebanon, Morocco, Tunisia, Egypt and Jordan are in the intermediate position ($0.10 < \text{HHI} < 0.16$). Syria and the

United Arab Emirates (UAE) present a relatively high level of export concentration (the HHI is respectively equal to 0.35 and 0.24). The most diversified exports structure is offered by European countries (except Norway). The HHI of Asian and Latin America countries oscillates between widely disparate values (Venezuela presents the highest level of export concentration). As a first observation we can presume that oil endowment leads to more concentration of exports. This statement is not only true for the MENA region but can also be maintained for non-MENA countries like Norway and Venezuela.

The sample average of HHI in the 12 MENA countries included in this study (MENA12) over the period 1984-2006 is equal to 0.32, and if calculations are only limited to countries rich in natural resources (Algeria, Saudi Arabia, Oman, Qatar, UAE and Kuwait) the HHI is significantly higher and reaches a value of 0.51. As a first observation we can say that exports in the MENA region are relatively concentrated. Most of these countries rely on a few export commodities that are generally unsophisticated and diversification levels are lower than in other regions.

Other measures of export diversification like the share (of total exports) of the top ten exported products confirm this statement (see appendix1). A higher ratio means higher export concentration. For example this ratio ranges between 93% and 97% for Algeria, Saudi Arabia, Qatar, Oman and it is around 85% for Syria and the UAE. Certainly the dependence of these countries on oil resources rightly explains this strong concentration of exports. For instance fuel exports explain 96.7% of total Algerian exports. For Oman, Qatar, Saudi Arabia and the UAE the ratio of fuel exports to total exports is respectively equal to 92.57%, 87.81%, 88.72% and 77.40%. This share varies between 2% and 13% for resource-poor and labor abundant countries (Jordan, Lebanon, Morocco and Tunisia).

Figure 2 illustrates HHI values for individual countries over the period 1984-2009. We can see that the evolution of export diversification is far from being regular. Yet several peaks were observed during the period studied and it is not easy to detect a clear trend over time due to the disparate diversification paths of MENA countries.

Intuitively, we can state that in spite of being members of the same geographic zone, country-specific characteristics play a significant role in the diversification process. However a convergence process of the evolution of HHI can be observed in subgroups. The convergence trend seems to be related to the countries endowment in natural resources or labor abundance. (see Figures 3, 4 and 5). The first group (Figure 3) includes Syria, UAE, Oman and Qatar which have started to diversify their exports in the last years.

Figure 4 reveals an upward trend in export concentration (especially in the last decade) for Algeria, Saudi Arabia and Kuwait. Figure 5 exhibits a steady trend of HHI for Lebanon, Morocco, Tunisia and Jordan (since 2000). In Egypt, the evolution of the HHI is quite irregular along the whole period.

3. Brief Analysis of the Main Determinants of Export Diversification

“We only have little understanding of the driving forces behind the export diversification, and especially of what might lead to the emergence of new products and services in export-orientated economies,” (World Bank 2007, 5). Vis-à-vis the consensus on the beneficial effects of export diversification, it is surprising that only a few studies were conducted to explain this issue. In fact we know little about the determinants of export diversification and previous works have generally been empirical without a specific theoretical framework. With regard to the importance of export diversification (and consequently policy recommendations related to it) more attention must be given to this field of research. Particularly we lack theoretical models which might be very useful both for policy makers and empirical studies.

3.1 The Diversification Development Path

Like many preceding studies we try to detect key factors of export diversification by building an econometric model. We especially draw particular attention to the most cited determinants of export diversification in the literature. For example, the GDP per capita is usually included in empirical studies as a proxy of the level of economic development. In their established paper, Imbs and Wacziarg (2003) show that per capita income and concentration follow a U-shaped relationship: countries first diversify, in the sense that economic activity is spread more equally across sectors, but there exists, relatively late in the development process, a point at which they start specializing again¹. Berthémely (2005) finds similar results by using panel data for 41 countries including OECD, transition countries and LDCs.

The study showed an inverted-U shape relation between economic development (measured by GDP per capita) and diversification, which means that economic development is associated with increasing diversification rather than specialization².

Using highly disaggregated data to investigate geographic and product diversification across a group of developing countries between 1990 and 2005, Amurgo-Pacheco and Pierlo (2007) confirm also that the relationship between sectoral diversification and per capita income is not linear. A country's export basket becomes more diversified as income rises until a relatively high level, at which point the process reverses itself and specialization occurs. The same relationship was observed by Cadot et al. (2007): countries diversify their export bases as they grow from low income economies to middle income ones, but then begin concentrating their exports after reaching a high income level.

3.2 FDI and diversification: the spillovers channels

Several empirical studies highlighted the export diversifying impact of FDI. Indeed, thanks to the spread of spillover effects by foreign firms in the host country, FDI may boost export diversification. According to Banga (2003), FDI may support export diversification by acting on the export intensity of the non-traditional export sector (the direct effect). Furthermore, FDI may promote export diversification indirectly by increasing the export intensity of domestic firms in the non-traditional export sector through spillover channels (for example by lowering the fixed cost of introducing the products of this sector in the international market and when the indigenous firms learn from the export behavior of foreign affiliates and become more reactive to international markets). Crespo and Fontoura (2007) explain how local firms may learn about overseas markets by observing and imitating foreign affiliates or collaborating with them. This can allow local firms to export by surpassing some specific barriers to entry like costs of forming distribution networks, and learning about consumers' tastes and preferences and regulatory conditions. The diffusion of such market access spillovers can be enhanced if the domestic firms are located in proximity to foreign affiliates of multinational firms (Aitken et al. 1997).

In a recent paper Gourdon (2009) constructed a model for a large sample of 127 countries (including MENA countries) over the period 1988-2006. The author used three dependent variables (Herfindal, Theil, and Gini indexes). Results show that, for the whole sample, FDI significantly decreases concentration as measured by the Gini index (but results for the Herfindahl and Theil indexes are not significant). Also, Gourdon (2009) finds that trade barriers (measured by the share of import duties on total imports) increases the export concentration. For MENA countries (results obtained by including interacted regional dummies), estimation results confirm that FDI reduces export concentration (measured by

¹The transition point found by Imbs and Wacziarg (2003) is \$13,000 per capita based on purchasing power parity (PPP).

²In the study Berthémely (2005), the transition point lies between \$19,000 and \$24,000 per capita based on PPP.

Theil index) for all subgroups of the MENA region (Gulf Cooperation Council; resource-rich, labor-abundant countries; resource-poor, labor-abundant countries). Jayaweera (2009) built an econometric model using instrumental variables to estimate the relationship between FDI and export diversification. The sample contained a panel of 29 low income nations spanning the period 1990-2006.

The author found a positive impact of FDI on export diversification and highlighted spillovers mechanisms to explain this result. Econometric results also show that this effect is inverted for nations which export a high proportion of oil and natural resources, i.e. FDI causes more concentration.

3.3 The resource curse dogma

A relatively recent strand of literature has focused on the so-called resource curse, a concept revealed by the pioneering work of Sachs and Warner (1995). It points out that resource-rich economies tend to grow more slowly than resource-poor economies. Several factors were put forward to explain why a large endowment of natural resources may be unfavorable for economic growth. Empirical evidence shows that great natural resource wealth slows down economic growth and impedes both export diversification and the accumulation of human and physical capital. Industrial activities are crowded out by the more lucrative resource extraction. According to Sachs and Warner (2000) large natural endowments may induce a shift in the fraction of human capital working in the industrial sector by pulling them toward the natural resources sector. As a consequence, the diffusion of industrial positive spillovers (including learning induced growth and backward linkages) into the economy will be limited.

Gylfason (2001, 3) argues that “natural resource abundance often results in overvaluation of national currency. This is the symptom of Dutch disease: a natural resource boom and the associated surge in raw-material exports drive up the real exchange rate (or real wages), thus hurting other exports. Moreover, recurrent booms tend to increase exchange rate volatility. Sometimes this is enough to reduce total exports.”

According to Bonaglia and Kiichiro (2003, 3) “natural resource-abundant countries would have a weaker incentive to industrialize, since they can easily earn the foreign exchange needed to finance their imports without industrializing.” While the resource sectors tend to generate large financial revenues, they often grant few jobs both directly and indirectly given their intensive capital nature and their enclave behavior. In effect, extractive activities are likely to operate as enclaves and generally make few forward and backward linkages with the rest of the economy. Consequently, intersectoral positive spillovers will be limited and productivity gains will be too. Of course, this is detrimental for the country's competitiveness and restraints opportunities for domestic firms to export and to expand abroad. “Concentration of export revenues reduces growth by hampering productivity, and it is this overreliance on a few products, rather than natural resources per se, that drives Sachs and Vial's (2001) finding of a negative impact of natural resource exports on total exports,” (Lederman and Maloney 2009, 39).

Gylfason (2001) indicates an inverse relationship between resource intensity and education (approximated by three different measures). The author argues that natural resource-based economies might neglect education and not have the incentives to invest heavily in human capital accumulation i.e. natural capital tends to crowd out human capital. “Nations that are confident that their natural resources are their most important asset may inadvertently—and perhaps deliberately—neglect the development of their human resources, by devoting inadequate attention and expenditure to education,” (Gylfason, 2001, 3-4).

Given the advanced arguments concerning the resource curse paradox, it is not surprising that many empirical studies advocate the negative link between resource endowments and export diversification. For example, Bebczuk and Berrettoni (2006) find that fuel exports to total exports (a proxy of natural resources) negatively affect export diversification (measured by the HHI) in a sample of 56 countries between 1970 and 2002. Osakwe (2007) arrives at the same result in a study including 22 African countries and using unbalanced panel data over the period 1985-2002. Osakwe (2007) concludes that oil has a negative effect on diversification (measured by the share of manufactures in total exports) supporting therefore the popular view that resource abundance can have a negative impact on diversification.

Bebczuk and Berrettoni (2006) also include the share of fuel exports as an independent variable for a large sample covering the period 1970-2002. Explanatory variables are one-year-lag values under the assumption of delayed impact on diversification (measured by the HHI). They find that oil amplifies the export concentration because fuel exporters enjoy substantial rents that may lessen the long-run benefits of export diversification (the Dutch disease syndrome). Sachs and Warner (2000) reach a similar conclusion. While they underlay the crowding out of the human capital working in the industrial sector by the natural resources sector as the main disadvantages of large natural endowments. When this occurs the spread of spillover effects through backward linkages is substantially inhibited.

4. The Empirical Analysis

4.1 Estimation of the diversification development path

In order to test the link between economic development and diversification in the context of 12 MENA countries³ we use panel data over the period 1984-2009 (the period was chosen to supply balanced data). We estimate the following simple equation:

$$HHI = \beta_0 + \beta_1(GDPCAP) + \beta_2(GDPCAPSQ) \quad [\text{Eq.1}]$$

Where:

- *HHI* is the dependent variable measured by the Hirschman-Herfindahl index (computed at 4 digit level).
- *GDPCAP* and *GDPCAPSQ* are respectively the GDP per capita and squared GDP per capita in current U.S. dollars. Both variables are computed in first difference because they have unit roots⁴ (but are stationary in first difference).

The HHI is a measure of the degree of concentration (often applied to measure industry concentration). It has been normalized to have values ranking between 0 and 1. When the index value approaches one it means that a country has a greater reliance on a limited group of exports, while a value closer to zero represents a higher degree of export diversification. It can be described by the following formula:

$$H_j = \frac{\sqrt{\sum_{i=1}^n \left(\frac{x_i}{X} \right)^2} - \sqrt{\frac{1}{n}}}{1 - \sqrt{\frac{1}{n}}}$$

Where:

H_j = country or country group index

³ Countries included in the empirical study are: Algeria, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Syria, Saudi Arabia, Tunisia, and United Arab Emirates.

⁴ Results of stationarity test are reported in the appendix.

x_i = value of exports of product i

$$X = \sum_{i=1}^n x_i \text{ and } n = \text{number of products (at Standard International Trade Classification (SITC)}$$

Revision 4, 4-digit group level).

First we estimate equation (1) before adding other controls and using instrument variables techniques. We rely on a fixed effect model (a random effect specification was rejected by Hausman test), and regressions are estimated with a weighted least-squares procedure, employing a White correction for heteroskedasticity (cross-section weights) to ensure heteroskedasticity-consistent standard errors.

Results are shown in table 1. The two variables (GDP per capita and squared GDP per capita) capture the relationship between economic development and concentration. The coefficients of these variables have the hypothesized signs and are respectively significant at 5% and 10%. Their signs indicate that in the case of our sample the relationship between export concentration and development follows a U-shaped pattern, declining first as a function of GDP per capita and rising afterward. This finding matches findings in the existing literature. However, it must be taken with caution because of the large omitted variables bias and potential endogeneity problems. This may perhaps explain the weak significance of squared GDP per capita.

Statistics of the fixed effects show that export diversification depends on idiosyncratic national factors. In effect, fixed effects of the scarce natural resources and labor-abundant countries (Egypt, Jordan, Lebanon, Morocco, and Tunisia) have a negative sign which means that these countries have an inclination towards export diversification. For oil countries (Kuwait, Qatar, Oman, Saudi Arabia and UAE), fixed effects have a positive sign. Such results confirm the resource curse thesis: to be wealthy endowed in natural resources results in more export concentration.

4.2 Testing the determinants of export diversification

After the exploration of the relationship between export diversification and economic development, we focus on determinants of diversification *per se*. Hence we built a benchmark model including some key factors of export diversification. The model is described by equation (2) and includes 11 explanatory variables. The dependent variable is the HHI (computed at 4 digit level). We will also use three alternative measures of concentration⁵ which will be regressed on the same explanatory variables described in equation (2). In sum four regressions will be performed.

$$HHI = f(GDPCAP, GDPCAPSQ, FDI, outFDI, DI, DXR, Re sEndw, FuelExp, HighTech, OPEN, DemocA)$$

[Eq (2)]

Where:

The dependent variables are:

HHI: Herfindahl-Hirschmann Index (a measure of export concentration).

FiveLarg: five largest products exported (share of total exports).

TenLarg: ten largest products exported (share of total exports).

- *Primary*: primary products (share of total exports).

⁵These variables are: five largest products exported (% total exports), ten largest products exported (% total exports) and primary products (% total exports).

The explanatory variables are:

- *GDP**CAP*: is the GDP per capita in current U.S. dollars.
- *GDP**CAPSQ*: squared GDP per capita in current U.S.
- *FDI*: foreign direct investment net inflows as a percent of GDP. Thanks to spillovers effects channels, FDI can be an engine of export diversification. Thus the sign expected for this variable is negative.
- *OutFDI*: is the outward direct investment as a percent of GDP. The outward direct investment can be a driver of export diversification by diffusing export spillovers (especially in the form of information externalities about the global market) to firms in the home country. In addition outward FDI can be interpreted as the overall level of the competitive advantages of domestic firms which allow them to invest abroad. So, the anticipated sign of outward FDI is negative.
- *DI* (domestic investment): approximated by gross fixed capital formation as a percent of GDP. We suppose that domestic investment affect countries' export structure due to a cause and effect relationship between what countries produce and what they export. Thus investment may be a determining factor of diversification by contributing to create a growth process and increasing the productivity of the new economic sectors. Diversifying the export basket of a country requires the emergence of new activities i.e. additional investments. Hence, economies which invest little or not at all are unlikely to be able to diversify. The historical experience of developing countries shows that a rise in investments contributes to the diversification of the productive process. We expect a positive effect for domestic investment on the development of export diversification. For example in an empirical study of 127 countries covering the period 1988-2006 Gourdan (2009) found that the increase of domestic investment reduces export concentration by expanding exports of non-traditional products.
- *DXR*: is depreciation of local currency calculated as the rate of change of the exchange rate (the exchange rate is defined as local currency units relative to the U.S. dollar). Using the simplistic dichotomy (lower price/best quality), international price competitiveness of a country can be determined by the evolution of its market shares and the level of the real effective exchange rate. Thus, we would expect that an appreciation of an exchange rate will cause a decline in the international competitiveness of a country (which could affect export diversification). For instance “an appreciated real exchange rate in particular would favor exporters with a higher import ratio, such as exporters of capital-intensive or high-tech products. In contrast, exporters of labor-intensive products often face aggressive competition on their product markets. A loss in competitiveness would hit them harder than exporters in (higher technology) product markets,” (World Bank 2007,36). According to Sorsa (1999) depreciation of the real exchange rate could lead to diversification of exports. In a study on ten Latin American countries over the period 1985-1998 and using GMM estimations, Estevadeordal and Martincus(2006) find that the higher the most favored nation tariffs and real exchange rates are the greater the absolute manufacturing specialization will be. The expected sign of the DXR coefficient is negative.
- *ResEndow*: this variable measures the natural resource endowments of a country. It is approximated by energy production⁶ (Kt of oil equivalent). If we take into account the

⁶Energy production refers to forms of primary energy—petroleum (crude oil, natural gas liquids, and oil from non-conventional sources), natural gas, solid fuels (coal, lignite, and other derived fuels), and combustible renewables, waste and primary electricity, all converted into oil equivalents.

resource curse thesis we expect that resource endowment would increase the export concentration. So we anticipate a positive sign of this variable.

- *FuelExp*: fuel exports as a percent of merchandise exports (fuels comprise SITC section 3: mineral fuels). Since this variable is defined as the ratio of fuel exports to merchandise exports we can consider it a measure of dependence on natural resource (rather than a measure of abundance). The nominator explicitly measures the magnitude of fuel in the export basket of a country. The expected sign of the coefficient of this variable is positive.
- *OPEN*: is trade openness approximated by the sum of merchandise exports and imports divided by the value of GDP. A first step in building a competitive capacity for trade is to eliminate principal domestic barriers to international business development and to improve local conditions for business. These barriers include government policy constraints (e.g. high tariff trade protection systems which represent a tax on exports by raising input costs), financial market constraints (e.g. limited provision of export credit and insurance), poor infrastructure (e.g. high transport costs) and administrative constraints (e.g. bureaucratic red tape). All these constraints imply transactions costs on exports which consequently lead to a decline in export competitiveness and a decrease in diversification. In effect, according to Faini (2004) the decline in export profitability (due to tariff barriers and associated transaction costs) will allow only a relatively limited number of firms to reach export markets. In some activities, firms may find it unprofitable to export abroad or they may only export to a few foreign markets. Thus trade openness can play a paramount role in the diversification process. Therefore the expected sign of this variable is negative. For example, in an empirical study of 127 countries Gourdon (2009) found that trade barriers (measured by the share of import duties on total imports) raised export concentration. The author argued that trade barriers elevate export concentration by slowing the development of new products and markets rather than by equalizing the shares of traditional exports.
- *Hightech*: refers to high-technology exports (as a percent of total exports) which are R&D- intensive products (such as computers, pharmaceuticals, scientific instruments, and electrical machinery). In the context of globalization, the competitiveness of the country exports depends more on the technological contents of the goods being exported rather than of the natural resources endowment. According to the trade theory, the country's export structure should reflect its endowment and its technological capacity. Competitiveness of a product can be enhanced by raising the technology content. As a consequence this facilitates the access of the improved product to overseas markets. This in turn can contribute to a more balanced export basket for the country, especially if the share of this product in exports was primarily low. Technology intensive export activities have a higher learning-by-doing and learning-by-exporting potential than primary commodities (Herzer and Nowak-Lehmann 2006) and provide more opportunities for the diffusion of export spillovers. In a study of 19 developed and developing countries Kassicieh (2002) finds that countries with technology-intensive export structures observe higher levels of competitiveness (measured by the stability of export earnings). We expect a negative sign for high-technology exports.
- *DemocA* (democratic accountability): is a proxy of the quality of governance and institutions. Democratic accountability is a measure of how responsive a government is to its people, on the basis that the less responsive it is, the more likely it is that the government will fall, peacefully in a democratic society, but possibly violently in a non-democratic one. Empirical results advocate that the resource curse depends on a country's level of institutions: countries with bad institutions suffer a negative impact from

resources, whereas countries with solid institutions do not (Damania and Bulte 2005; Mehlum et al. 2006; Brunnschweiler and Bulte 2008). We expect a positive sign of democratic accountability.

To run our regressions we choose the fixed effect specification (F-test rejects the null hypothesis stipulating that all the fixed effects are equal to zero). Furthermore, to deal with the potential endogeneity problem of explanatory variables (feedback effects) we use instrumental variables. The use of instruments is always advisable to avoid any suspicion of endogeneity. Moreover, tests of endogeneity and validity of instruments are carried out before regressions. We use the Davidson and MacKinnon⁷ endogeneity test to detect if there is reverse causation between the dependent and explanatory variables. In addition, we run the Sargan-Hansen⁸ test of over identifying to scrutinize the validity of instruments.

The instruments included in the regression are : variables indicating governance and risk score [*BUREAU* (bureaucracy), *IntLiq*(international liquidity risk), *XRSTAB* (exchange rate stability), *Corrup* (corruption), *Law* (law and order), *ForDebt* (risk points for foreign debt as a percent of GDP), *DemocA*(democratic accountability)]; one year lagged explanatory variables: [*FDI(-1)* and *FuelExp(-1)*] and finally other economic variables: [*TEL* (the number of telephone subscribers per 100 persons), *POP* (*total population*), *Credit* (domestic credit provided by banking sector % of GDP), *Infla*(the annual inflation rate), *URBAN* (the degree of urbanization measured by the urban population as a percent of the total population), *MANU* (manufactured exports as a percent of total exports), *CurrAccB* (current account balance as a percent of GDP), *Gr* (Annual percentage growth rate of GDP)].

To avoid the risk of fallacious regressions between dependent and explanatory variables, the Augmented Dickey-Fuller (ADF) was applied to all variables of the model⁹. These tests show that except for *HHI*, *Outfdi*, *DXR*, *Xrstab*, *CREDIT*, *INFLA*, *Gr*, *CurrAccB*, *Bureau*, *Urban* and *MANU*, all the other variables (*GDDPCAP*, *GDDPCAPSQ*, *FDI*, *DI*, *ResEndw*, *OPEN*, *FuelExp*, *HighTech*, *IntLiq*, *Corrup*, *TEL*, *POP*, *Law*, *DemocA*, *ForDeb*) have a unit root but are stationary in first difference. Therefore, in the regressions, all variables that have a unit root were computed in first difference while the stationary variables remain in level. Moreover, the matrix of partial correlations (see appendix 3) indicates that there are no serious problems of multicollinearity between the explanatory variables included in the regressions.

4.3 Estimation results

Regarding the results of the benchmark model (specification (1)) we can highlight that there is some path dependence between the export diversification process and the level of development in the region. In effect, the GDP per capita and squared GDP per capita are both statically significant at 1% and have the correct sign. This finding is in line with the predictions of theoretical models that support the famous U-shaped relationship between economic development and export concentration. Moreover, inward and outward FDI flows have the expected negative sign but are weakly significant at the conventional level of 10%. In other words, the potential for diversification of FDI is real, but it seems to be under-exploited. In effect, the MENA region is still attracting a limited amount of FDI. Furthermore, these inflows are oriented towards labor-intensive activities (for example garment and textile) or towards capital intensive sectors with few linkages with the rest of the economy (like the oil sector or the off shore industry). It is undoubtedly much more difficult to benefit from foreign investors than to convince them to come and settle in a host country. Certainly, “there may be some tension between the interests of the host country and that of

⁷ Test results are reported in table 2.

⁸ Results of the Sargan-Hansen⁸ test are reported in table 2.

⁹ Results of the stationarity test are reported in appendix 2.

the Transnational Corporation (TNC) with regard to knowledge spillovers. While the former would seek to maximize the knowledge diffusion to other firms in the economy, the TNC often may want to minimize leakages,” (UNCTAD 2005, 186). The MENA region’s outgoing FDI is mostly carried out by oil-rich countries through the petrodollar. Generally, these countries invest abroad to diversify their financial resources or to circumvent the liquidity excess problems of their economies. Thus their motivations don’t really reflect a wish of exploiting the competitive advantages of their domestic firms (if they exist) but they fundamentally follow financial considerations. This kind of outward direct investment is called passive FDI because “the ‘foreign-ness’ impact on the use of the assets acquired may be very limited”, (Dunning 1993, 62). Most of MENA’s outgoing direct investment is of this kind (for example real estate investment). In this case the created opportunities of export diversification are somewhat limited compared to other kinds of FDI (running into global production chains and involving activities with permanent flows of imports and exports).

Turning to the regression estimates, the resource endowments and fuel exports are statically significant at 1% and have the expected positive sign. This finding supports the common view that resource abundance can be detrimental for export diversification: natural resource exporters may enjoy substantial rents that potentially lower the long-run benefits of export diversification. Econometric results show also that the depreciation of the exchange rate is advantageous for export diversification (the exchange rate has the negative appropriate sign and is significant at 5%). This means that an appreciated exchange rate could depress export profitability forcing some firms to leave export markets. In that case the result will be a decrease in the country’s export basket and an increase in export concentration.

Econometric results show that domestic investment is significant at 5% and supports export diversification. A similar result was found by an empirical study (Ben Hammouda et al. 2009) for North Africa countries (Algeria, Egypt, Morocco and Tunisia) over the period 1996-2002. Ben Hammouda et al. (2009) prove that private investment as well as public investment act positively on export diversification (both variables have the expected negative impact on the HHI).

By investigating the extent of export diversification and specialization in South Africa over the period 1962-2000, Naudé and Rossouw (2008) conclude that diversifying the production structure of the domestic economy may be a prerequisite for export diversification and later for export specialization. This contrasts with the results of Bebczuk and Berrettoni (2006) on 56 countries between 1970 and 2002. Bebczuk and Berrettoni (2006) found that domestic investment acts in favor of more export concentration (measured by HHI). Bebczuk and Berrettoni (2006) argue that domestic firms focus more in order to take advantages of specialization-based economies of scale rather than returns from exports diversifications.

Hypothetically, openness promotes export diversification by lowering transaction costs and improving the competitiveness of domestic firms¹⁰. Broadly speaking, the decline in trade barriers positively impact export diversification by allowing more firms to enter foreign markets. This assumption was confirmed by our econometric regressions: trade openness has a negative sign and is statically significant at 1%.

Theoretically unsophisticated goods without value added impede the competitiveness of firms. As a consequence export diversification could be hampered. The variable indicating export of high-technology products has an unexpected sign but it is not statically significant. The idea is that despite the important potential effect of high technology exports on

¹⁰However, this is not always the case. For example, a recent study (Estevadeordal and Martincus 2006) including ten Latin American countries over the period 1985-1998 suggests that reducing tariff protection is associated with increasing manufacturing production specialization.

diversification, this variable does not seem to be a key factor impacting diversification for our sample group. This result can be explained by the weak share of high technology products in total exports in this region (see appendix 1). For example, the sample average of high technology exports (% of total exports) over the period 1984-2006 is around 2%. In addition, this ratio does not exceed 1% for Egypt, Algeria, Saudi Arabia, Oman, Qatar and Syria and the highest recorded value is for Jordan (7.62%).

The proxy of governance is significant at 1%. Good governance generally means a good business climate leading therefore (under certain conditions) to increased exports and investments. Finally, econometric results remain valuable for specification (2), (3) and (4) and do not diverge much from those of the benchmark model except that FDI and democratic accountability are not significant at any statistical conventional level.

5. Conclusion and Policy Recommendations

The objective of this paper is to study the key factors that drive export diversification in MENA countries. There is no simple and unique response to this challenging query. However, following econometric results we can argue that endowments of natural resources lead to more export concentration while openness, depreciation of the exchange rate, democratic accountability and accumulation of physical capital (foreign and domestic) lead to more export diversification. Findings also reveal that export diversification is closely related to the economic development path.

The empirical analysis clearly shows that the diversification process is not only exogenous; it is also to a large extent of an endogenous nature. In other words, the rate of diversification in one given country may be under the influence of government actions and may depend on idiosyncratic national factors and domestic economic performance. However, the dependence of an economy on a limited number of products is not unavoidable. The question which arises then is how to start an export diversification recovery strategy and how to support it through time.

Lederman and Maloney (2009, 51) emphasize that “there is no “resource curse,” but there is a curse of export concentration, the implication is that policy makers should strive to provide a policy framework conducive to product and market diversification - but not necessarily one that promotes, through subsidies and incentives, diversification away from natural resource areas into manufactures.” Indeed, “resource dependence is likely to be endogenous to a country’s overall political and economic development trajectory. Careful attention therefore needs to be paid to how prevailing institutional arrangements interact with resource endowments, and how this might affect prospective reform trajectories,” (Ross et al. 2011, 1).

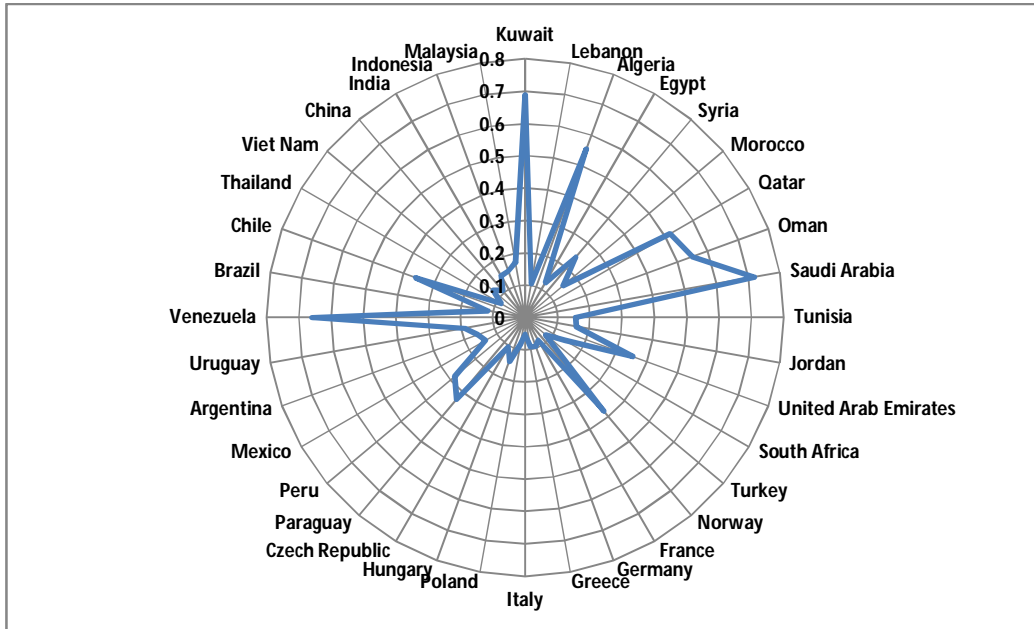
Thus the problem is not resource wealth per se, but rather the way in which they are managed. This is especially true for resource-rich MENA countries that need to release themselves from the dependence on natural resource rents. For resource-scarce countries the main issue is to improve their competitiveness in the global market. The question that needs both a reply and an adequate long-term strategy is how to move from producing and exporting low-skill-based products to manufacturing sophisticated products and exporting goods with high technology content. Also, emergency measures (fighting corruption, identifying particular failures in access to export finance or access to overseas market information, providing a favorable business climate to boost national investment and to attract high-quality FDI, etc.) must be taken into account. While the diversification process is complex and quite difficult, the benefits however may be substantial.

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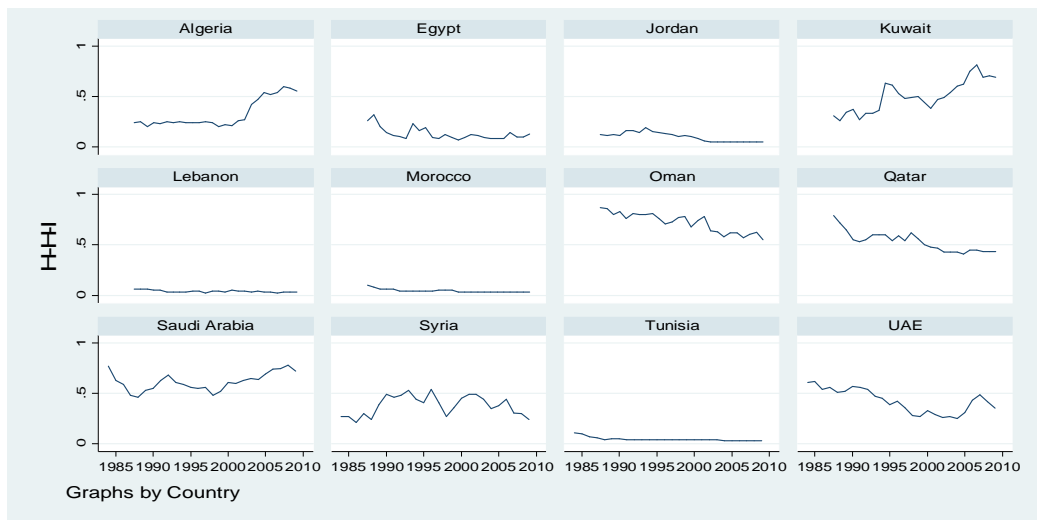
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Figure 1: Export Concentration in MENA Region and in Other Comparator Countries (HHI, 2009)



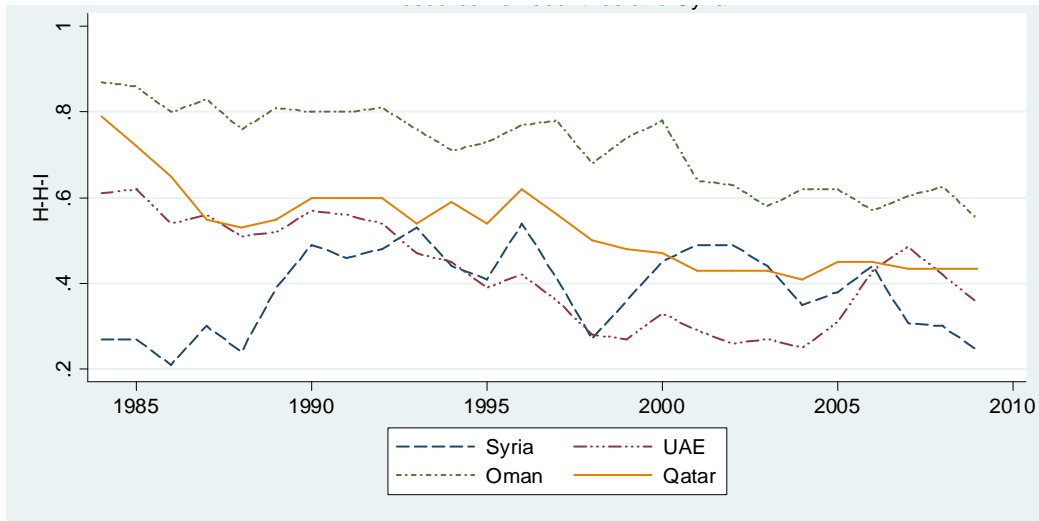
Source: Author's calculations using Economic Diversification and Growth in Developing Countries database online, World Bank, 2011.

Figure 2: Trends of Herfindahl-Hirshmann-Index: MENA 12



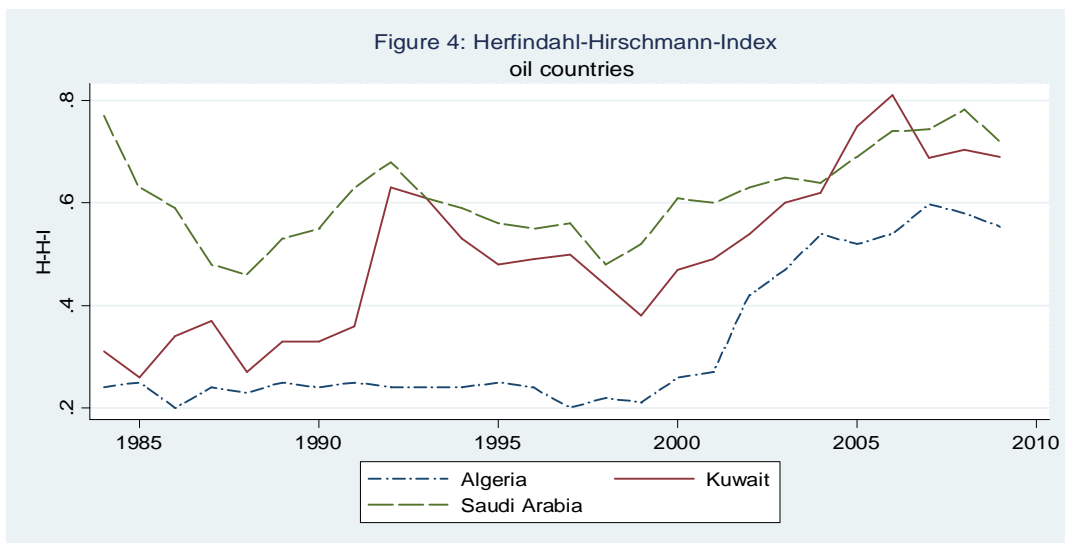
Source: Author's calculations using Economic Diversification and Growth in Developing Countries database online, World Bank, 2011.

Figure 3: Herfindahl-Hirshmann-Index: Resource Rich Countries and Syria



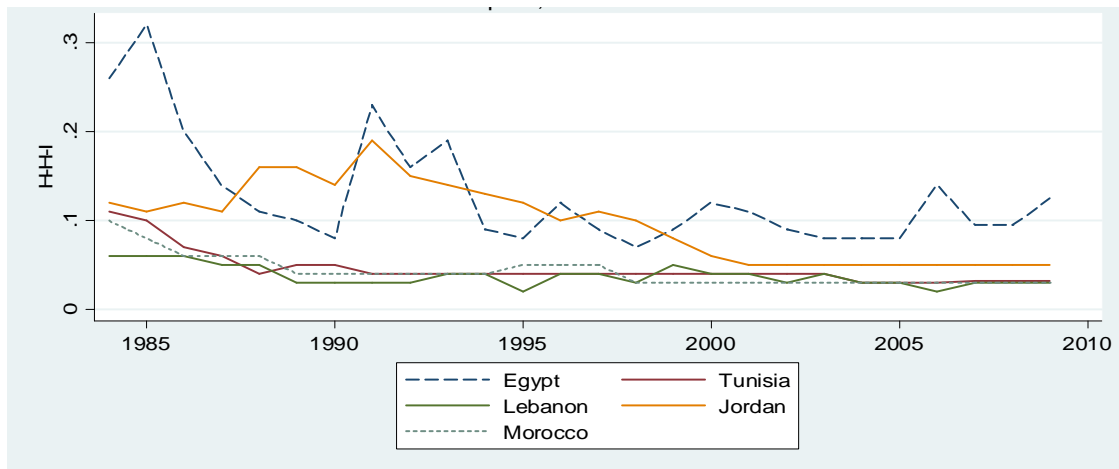
Source: Author's calculations using Economic Diversification and Growth in Developing Countries database online, World Bank, 2011.

Figure 4: Herfindahl-Hirshmann-Index: Oil Countries



Source: Author's calculations using Economic Diversification and Growth in Developing Countries database online, World Bank, 2011.

Figure 5: Herfindahl-Hirshmann-Index: Resource Poor, Labor Abundant Countries



Source: Author's calculations using Economic Diversification and Growth in Developing Countries database online, World Bank, 2011.

Table 1: Stages of Export Diversification/Concentration (Country FEs estimation; data from 1984-2009)

Dependent variable: HHI	
GDPCAP	-8.46E-06 (2.10)**
GDPCAPSQ	6.23E-11 (1.77)*
Fixed Effects:	
_Algeria	0.0095
_Egypt	-0.197
_Jordan	-0.223
_Kuwait	0.192
_Lebanon	-0.282
_Morocco	-0.279
_Oman	0.396
_Qatar	0.204
_Saudi Arabia	0.289
_Syria	0.066
_Tunisia	-0.276
_UAE	0.099

Notes: Number of countries =12; Number of observation = 3600 ; R2 =0.77, $F^{***}(2,286) = 80.54$, Hausman test: $X^2(7)^{***} = 91.33$, F test that all $u_i=0$ (all fixed effects): $F(11, 286)^{***} = 182.14$. Heteroscedasticity consistent P-values are in parenthesis. ***, **, * represent statistical significance at 1, 5 and 10% level.

Table 2: Fixed Effects Regression – Two Stages General Least Square Estimation (EGLS) – White Cross-Section Standard Errors & Covariance

Dependent Variable:	Specification (1)	Specification (2)	Specification (3)	Specification (4)
	HHI	Five largest products exported (share of total exports)	Ten largest products exported (share of total exports)	Primary Products (share of total exports)
Variable	Coefficient	Coefficient	Coefficient	Coefficient
C	1.09 (3.29)***	144.79 (4.81)***	138.73 (5.74)***	124.39 (3.38)***
GDP CAP	-0.000165 (2.05)***	-0.014 (1.95)**	-0.012 (2.18)***	-0.018 (2.03)**
GDP CAP SQ	2.90E-09 (2.67)***	2.65E-07 (2.69)***	2.32E-07 (2.93)***	3.79E-07 (3.15)***
OutFDI	-0.050 (-1.70)*	-4.85 (1.80)*	-3.96 (1.82)*	-9.97 (3.02)***
FDI	-0.068 (1.66)*	-5.33 (1.43)	-4.01 (1.33)	-4.08 (0.89)
DI	-0.032 (2.31)**	-3.11 (2.45)***	-2.50 (2.44)***	-2.63 (1.69)*
DXR	-0.129 (2.22)**	-13.21 (2.50)***	-11.84 (2.79)***	-15.64 (2.42)***
ResEndw	2.37E-05 (3.17)***	0.00169 (2.50)***	0.0013 (2.42)***	0.0014 (1.76)*
Open	-0.0741 (3.62)***	-5.89 (3.18)***	-4.73 (3.17)***	-5.51 (2.43)***
FUELExp	0.060 (6.78)***	5.87 (7.25)***	4.60 (7.07)***	7.20 (7.28)***
HighTech	0.040 (0.97)	0.45 (0.12)	0.15 (0.053)	-4.25 (0.93)
DemocA	-0.039 (0.72)***	-5.21 (1.04)	-4.04 (1.00)	-8.86 (1.45)
Sample	1984-2009	1984-2009	1984-2009	1984-2009
No of observation	3456	3456	3456	3456
No of cross-section	12	12	12	12
Adj. R ²	0.66	0.75	0.72	0.78
F test that all u _i =0	F(11,265)*** = 41.47	F(11,265)*** = 73.33	F(11,265)*** = 124.41	F(11,265)*** = 59.30
Sargan statistic	Sarganstatistic = 5.82	Sarganstatistic = 3.30	Sarganstatistic = 3.70	Sarganstatistic = 4.80
	Chi-sq(5) P-val = 0.32	Chi-sq(5) P-val = 0.65	Chi-sq(5) P-val = 0.59	Chi-sq(5) P-val = 0.44
Davidson-MacKinnon test of exogeneity	F(9,255) = 5.53 P-value = 5.7E-07	F(10,255) = 4.07 P-value = 3.2E-05	F(10,255) = 2.82 P-value = 0.0024	F(10,255) = 9.55 P-value = 1.7E-13

Appendix 1

	Average : 1984-2006										
	Algeria	Egypt	Jordan	Lebanon	Morocco	Oman	Qatar	Saudi Arabia	Syria	Tunisia	UAE
Five largest products exported (share of total exports)	91.60	63.13	58.26	43.46	38.72	94.25	91.31	89.42	80.92	38.43	79.59
Herfindahl Index 4-Digit	0.29	0.15	0.11	0.07	0.05	0.74	0.55	0.60	0.38	0.05	0.44
Ten largest products exported (share of total exports)	97.50	74.32	72.30	55.84	53.99	95.93	96.58	93.63	86.50	53.11	83.82
Twenty largest products exported (share of total exports)	98.91	82.40	82.17	68.22	70.10	97.46	98.86	95.92	91.34	70.61	87.02
Fuel exports (share of total exports)	96.70	43.72	1.57	9.44	2.62	92.57	87.81	88.72	69.58	13.11	77.40
Manufactured exports (share of total exports)	2.22	32.15	61.86	58.66	55.07	5.32	11.77	9.68	8.88	74.17	15.11
Mineral exports (share of total exports)	0.70	6.47	25.23	10.55	14.66	0.76	0.27	0.69	1.78	2.11	3.16
High tech (share of total exports)	0.18	0.97	7.62	3.32	3.54	0.94	0.17	0.55	0.39	2.91	2.09
Low tech (share of total exports)	0.35	24.76	12.96	30.42	28.19	1.91	3.34	1.09	6.47	48.14	4.78
Medium tech (share of total exports)	1.08	4.58	32.82	15.31	11.92	2.24	5.89	5.88	1.89	15.81	5.79
Primary products (share of total exports)	73.36	44.87	32.05	27.83	29.81	90.65	84.55	82.56	78.74	18.14	73.92
Resourced based (share of total exports)	25.03	24.82	14.54	23.11	26.55	4.26	6.05	9.91	12.51	15.00	13.42

Source: Author's calculations using Economic Diversification and Growth in Developing Countries database online, World Bank, 2011.

Appendix 2: Unit Root Tests

Variables	Levels	First Differences
<i>UREAU</i>	(44.78)***	
<i>CORRUP</i>	20.38	(68.68)***
<i>CREDIT</i>	(71.69)***	
<i>Gr</i>	(98.66)***	
<i>DI</i>	(38.51)**	
<i>FDI</i>	31.70	(86.30)***
<i>FiveLarg</i>	(54.46)***	
<i>FuelExp</i>	(52.20)***	
<i>HHI</i>	(58.10)***	
<i>HighTech</i>	32.23	(153.34)***
<i>ResEndw</i>	22.48	(73.07)***
<i>INFLA</i>	(32.91)*	
<i>LAW</i>	10.80	(85.93)***
<i>IntLiq</i>	31.62	(90.22)***
<i>OPEN</i>	(54.82)***	
<i>outFDI</i>	(33.25)*	
<i>POP</i>	28.02	(47.45)***
<i>Primary</i>	(40.20)***	
<i>scour</i>	(43.38)***	
<i>TEL</i>	14.10	(35.80)***
<i>TENLarg</i>	(45.94)***	
<i>urban</i>	22.64	(50.71)***
<i>DXR</i>	(86.15)***	
<i>Xrstab</i>	19.55	(87.74)***
<i>MANU</i>	(41.76)***	
<i>GDPCAP</i>	8.53	(44.04)***
<i>GDPCAPSQ</i>	3.06	(39.38)***
<i>DeemocA</i>	18.35	(59.90)***
<i>ForDebt</i>	15.71	(75.69)***

Notes: ***, **, *: denote significance at 1%, 5% and 10%, respectively

Appendix 3: Correlation Matrix

	GDPCAP	GDPCAPS Q	OutFDI	FDI	DI	DXR	ResEndw	OPEN	FuelExp	HighTech	XRSTAB	IntLiq	CORRUP	TEL	CREDIT	INFLA	Gr	CurrAccBal	BUREAU	POP	URBAN	MANU	LAW	ForDebt	DemocA
GDPCAP	1.00																								
GDPCAPSQ	0.55	1.00																							
OutFDI	0.02	-0.04	1.00																						
FDI	-0.05	-0.09	0.04	1.00																					
DI	0.02	0.05	0.05	0.07	1.00																				
DXR	0.15	0.12	-0.01	-0.02	-0.04	1.00																			
ResEndw	0.24	0.16	-0.01	0.06	-0.10	-0.01	1.00																		
OPEN	0.23	0.15	-0.05	0.11	-0.01	0.06	0.17	1.00																	
FuelExp	0.07	0.04	-0.05	-0.02	-0.03	0.04	-0.07	0.02	1.00																
HighTech	0.13	0.11	0.17	0.04	0.08	0.00	-0.07	0.09	-0.05	1.00															
XRSTAB	0.06	0.01	-0.13	0.02	0.03	-0.06	0.11	0.01	-0.08	-0.01	1.00														
IntLiq	-0.12	-0.08	-0.12	-0.01	-0.02	-0.05	-0.09	-0.04	-0.04	-0.09	0.06	1.00													
CORRUP	0.07	0.04	0.06	-0.02	0.04	0.01	0.06	0.00	0.00	-0.07	0.08	-0.02	1.00												
TEL	-0.15	-0.15	-0.25	0.08	-0.08	-0.05	0.03	0.07	0.05	0.04	0.04	0.01	-0.08	1.00											
CREDIT	-0.06	-0.07	0.09	0.04	0.10	0.04	-0.10	-0.02	-0.07	0.10	0.02	-0.02	0.00	-0.03	1.00										
INFLA	0.00	0.02	-0.01	-0.02	-0.02	0.95	-0.03	0.00	-0.01	-0.01	-0.07	-0.01	0.00	-0.04	0.06	1.00									
Gr	0.38	0.22	0.06	0.00	0.04	0.02	0.37	0.07	-0.04	-0.05	0.28	-0.09	0.27	-0.08	-0.01	0.01	1.00								
CurrAccBal	0.22	0.15	0.22	0.00	-0.25	-0.07	0.17	0.08	0.07	-0.13	-0.04	0.01	0.14	-0.11	-0.32	-0.12	0.22	1.00							
BUREAU	0.06	0.03	0.13	-0.03	0.00	-0.26	0.15	0.05	0.00	-0.01	-0.01	-0.05	0.09	-0.09	-0.12	-0.29	0.10	0.15	1.00						
POP	-0.06	-0.05	-0.10	-0.02	-0.08	-0.03	0.00	-0.01	-0.05	-0.07	0.00	0.05	0.06	0.05	-0.03	-0.05	0.05	0.07	0.02	1.00					
URBAN	0.16	0.11	0.19	0.05	-0.05	0.02	0.08	-0.03	0.04	0.03	-0.02	-0.10	-0.04	-0.12	0.10	0.02	0.07	0.13	0.06	-0.61	1.00				
MANU	-0.11	-0.08	-0.02	0.02	0.08	0.12	-0.14	-0.04	-0.12	0.09	0.03	0.03	-0.03	0.04	0.49	0.15	-0.01	-0.26	-0.14	-0.11	-0.09	1.00			
LAW	0.04	-0.01	-0.06	-0.01	0.01	0.01	0.01	-0.05	-0.08	-0.05	0.23	0.07	0.16	0.06	0.01	0.01	0.13	-0.11	-0.10	-0.01	-0.01	0.04	1.00		
ForDebt	0.02	-0.01	-0.06	-0.06	0.07	0.00	0.12	0.02	-0.01	-0.10	0.28	-0.04	0.13	-0.04	-0.08	-0.02	0.18	0.01	-0.02	0.08	-0.07	-0.01	0.15	1.00	
DemocA	0.05	0.02	-0.01	0.06	0.06	0.04	0.04	0.05	0.09	-0.01	-0.06	0.01	0.23	0.03	0.05	0.01	0.10	-0.0	0.05	-0.03	0.02	0.00	0.07	0.12	1.00

Appendix 4: Data Sources

Variables	Sources
Outward direct investment (% GDP) foreign direct investment (% GDP)	United Nations Conference on Trade and Development, UNCTAD Statistics database online, 2011.
Current account balance (% GDP) Inflation, consumer prices (annual %)	International Monetary Fund, World Economic Outlook database online, September 2011.
Telephone lines (per 100 people) Population, total Annual percentage growth rate of GDP at market prices GDP per capita (current US\$) Urban population (% of total)	World Bank, World Development Indicators database online, 2011.
Herfindahl-Hirschmann index 4-Digit High tech (share of total exports) Ten largest products exported (share of total exports) Fuel exports (share of total exports) Manufactured exports (share of total exports) Primary Products (share of total exports) Domestic credit provided by banking sector (% of GDP)	World Bank, Economic Diversification and Growth in Developing Countries database online, 2011.

-**Bureau:** describes the institutional strength and quality of bureaucracy. High points (the highest score is equal to 4 points and the worst score is equal to 0) are given to countries where bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services.

- **International Liquidity Risk:** is the net international liquidity as months of import cover (the total estimated official reserves for a given year, converted into US dollars at the average exchange rate for that year). Values range from 0 to 5 (higher values correspond to better cover).

- **Exchange Rate Stability:** this variable indicates the exchange rate stability (the appreciation or depreciation of a currency against the US dollar) elaborated by ICRG. Values range from 0 to 10 (higher values correspond to better stability).

- **Corruption:** This is an assessment of corruption within the political system. A score of 6 points equates to very low risk and a score of 0 points to very high risk.

- **Law and Order:** law and order are assessed separately, with each sub-component comprising zero to three points. The law sub-component is an assessment of the strength and impartiality of the legal system, while the order sub-component is an assessment of popular observance of the law. Thus, a country can enjoy a high rating of 3 in terms of its judicial system, but a low rating of 1 if it suffers from a very high crime rate or if the law is routinely ignored without effective sanction (for example, widespread illegal strikes).

- **Foreign Debt as a % of GDP:** the estimated gross foreign debt in a given year, converted into US dollars at the average exchange rate for that year, is expressed as a percentage of the gross domestic product converted into US dollars at the average exchange rate for that year. The highest score is equal to 10 points and the worst score is equal to 0.

Democratic Accountability: This is a measure of how responsive a government is to its people, on the basis that the less responsive it is, the more likely it is that the government will fall, peacefully in a democratic society, but possibly violently in a non-democratic one. The score range between 0 and 6. The highest number of risk points (lowest risk) is assigned to Alternating Democracies, while the lowest number of risk points (highest risk) is assigned to autarchies.

International Country Risk Guide (ICRG), [The PRS Group, Inc.](#) 2010.