Does MENA's Governance lead to Spatial Agglomeration and Disparities?

by
Abdoul’ Ganiou Mijiyawa
African Centre for Economic Transformation, ACET

Alexander Kremer
World Bank

Loïc Whitmore
World Bank
Does MENA’s Governance lead to Spatial Agglomeration and Disparities?\(^1\)

by

Abdoul’ Ganiou Mijiyawa\(^2\)
African Centre for Economic Transformation, ACET

Alexander Kremer
World Bank

Loïc Whitmore
World Bank

April 2011

---

1 This paper is a by-product of the World Bank flagship report, *Poor Places, Thriving People: How the Middle East and North Africa Can Rise Above Spatial Disparities*. The paper was written before the region’s political changes of early 2011, but deals with issues that are clearly relevant to them. All errors and inaccuracies are those of the authors. The views expressed in this paper are those of the authors and not of their respective affiliated institutions.

2 Comments and suggestions are welcome and should be sent at the corresponding author at: amijiyawa@acetforafrica.org.
TABLE OF CONTENTS

ABSTRACT ...........................................................................................................................................1

1. INTRODUCTION ..........................................................................................................................1

2. STATISTICAL ANALYSIS .............................................................................................................3
   Comparison of political governance between MENA and other world countries................3
   Comparison of political rights between MENA and other world countries...........................5
   Comparison of political stability between MENA and other world countries.......................6
   Comparison of spatial imbalances between MENA and other world countries.............7

3. ECONOMETRIC ANALYSIS .......................................................................................................11
   Background: Model of Ades and Glaeser (1995) .................................................................11
   Empirical Strategy ....................................................................................................................11
   Econometric specification, data and sources of data ..........................................................13

4. BASIC RESULTS ..........................................................................................................................16
   Robustness Checks ..................................................................................................................19

5. CONCLUSION ..............................................................................................................................21

REFERENCES .....................................................................................................................................30

FIGURES
   Figure 1. Political rights in MENA and other world countries ..............................................5
   Figure 2. Political stability in MENA and other world countries ...........................................6
   Figure 3. Urban-rural consumption ratio in each of MENA country and other world countries.10

TABLES
   Table 1. Comparison of political governance between MENA countries and three other groups of countries ..........................................................4
   Table 2. Unconditional differences of agglomeration rate between MENA and other countries ........................................................................9
   Table 3. Basic Results ................................................................................................................18

APPENDIX TABLES
   Table A.1. Description of Main Variables ..............................................................................23
   Table A.2. Robustness check with the Polity 2 index .............................................................24
   Table A.3. Robustness check with the voice and accountability index ................................25
   Table A.4. Robustness check with coup d’état index ...............................................................26
   Table A.5. Robustness check with GDP per capita data from Pen World Table 6.2 ..........27
   Table A.6. Robustness check with data over the period 1970-2007 ....................................28
   Table A.7. Robustness check with urbanization data .............................................................29
**ABSTRACT**

In this paper we analyse the link between spatial agglomeration, spatial disparities and political governance with an emphasis on the MENA region. The agglomeration index and the urban-rural consumption ratio are used respectively as a measurement of spatial agglomeration and spatial disparities. We distinguish two aspects of political governance: political rights and political stability. Statistically, we find that agglomeration rate is higher in MENA, whereas the indexes of political rights and political stability are lower in MENA compared to the rest of the world and other lower middle income countries.

When running the regressions, the data better fit the agglomeration model than the urban-rural consumption ratio model. Using cross-sectional data for 182 countries around the world, we find that the political rights index is negatively and significantly linked to the agglomeration rate. Our results suggest that an improvement in MENA countries’ level of political rights to the average of the rest of the world would be associated with agglomeration rate 4 percentage points lower than its average level in the region. The data also reveal an inverted-U relationship between the agglomeration rate and GDP per capita, and a negative relationship between trade openness and the agglomeration rate.

**Keywords:** Spatial disparities, Agglomeration rate, Urban-rural consumption ratio, MENA  
**JEL Classification:** R12, R15, R19
خلاصة

في هذه الورقة، نقوم بتحليل الصلة بين التجمع المكاني والتبادلات المكانية والنظموسياسة لإدارة الحكم، مع التركيز على منطقة الشرق الأوسط وشمال أفريقيا. واستخدمنا هذا مؤشر التجمع ونسبة الاستهلاك في الريف والحضر على التوالي كمقياس للتجمع المكاني والتبادلات المكانية. وتتميز الورقة بين جانبين من جوانب النظم السياسية لإدارة الحكم، هما: الحقوق السياسية والاستقرار السياسي، وإحصائيا، نلاحظ ارتفاع معدل التجمع في منطقة الشرق الأوسط وشمال أفريقيا، بينما يخفض مؤشر الحقوق السياسية والاستقرار السياسي، مقارنة بباقي بلدان العالم والبلدان الأخرى بالشريحة الدنيا من البلدان متوسطة الدخل.

وعند استخدام التحليل الإحصائي، نلاحظ أن البيانات تناسب درجة أفضل نموذج التجمع مقارنة بنموذج نسبة الاستهلاك في الريف والحضر. وباستخدام البيانات المسترضة لنحو 182 بلدًا في ثلاثة أنحاء العالم، نجد أن هناك ارتباطًا سليباً وذا دلالة إحصائية بين مؤشر الحقوق السياسية ومعدل التجمع. وتشير النتائج التي خلصنا إليها إلى أن تحقيق تحسن في مستوى الحقوق السياسية يentials المنطقة بحيث يصل إلى المتوسط السائد في بقية بلدان العالم سيساهم في انخفاض نسبة 4 نقاط مئوية في معدل التجمع مقارنة بمتوسط المستوى السائد في المنطقة حالياً، وتكشف البيانات أيضاً أن هناك علاقة في شكل خط منحنى معكس (Inverted U-Curve) بين معدل التجمع ونصيب الفرد من إجمالي الناتج المحلي، وعلاقة سلبية بين انفتاح التجارة ومعدل التجمع.

كلمات أساسية: تبادلات مكانيّة، معدل التجمع، نسبة الاستهلاك في الريف والحضر، منطقة الشرق الأوسط وشمال أفريقيا

JEL Classification: R12, R15, R19
Résumé

Dans ce document, nous analysons le lien entre l’agglomération spatiale, les disparités spatiales et la gouvernance politique, en prêtant une attention particulière à la région MENA. L’indice de l’agglomération et le ratio de consommation urbaine/rurale sont respectivement utilisés comme mesures de l’agglomération spatiale et des disparités spatiales. Nous distinguons deux aspects de la gouvernance politique : les droits politiques et la stabilité politique. Sur le plan statistique, nous observons que le taux d’agglomération est supérieur dans la région MENA, alors que les indices des droits politiques et de la stabilité politique y sont plus bas par rapport au reste du monde et aux autres pays à revenu intermédiaire de la tranche inférieure.

Lors de la modélisation des régressions, les données conviennent mieux au modèle d’agglomération qu’au modèle du ratio de consommation urbaine/rurale. Nous appuyant sur des données intersectorielles portant sur 182 pays à travers le monde, nous observons que l’indice des droits politiques présente une corrélation négative et manifeste avec le taux d’agglomération. Nos résultats donnent à penser qu’une amélioration du niveau des droits politiques dans les pays de la région MENA visant à atteindre la moyenne du reste du monde serait associée à un taux d’agglomération de 4 points de pourcentage inférieur au niveau moyen dans la région. Les données révèlent également une relation en U inversé entre le taux d’agglomération et le PIB par habitant, ainsi qu’une relation négative entre l’ouverture en matière commerciale et le taux d’agglomération.

Mots clés : disparités spatiales, taux d’agglomération, ratio de consommation urbaine/rurale, MENA
JEL Classification: R12, R15, R19
1. Introduction

In 1999, His Majesty King Mohamed VI of Morocco opened his first Revolution Day speech by asking how rural development can stem rural-urban migration. In Iran, President Ahmadinejad stated that 40 percent of the 2008 fiscal year budget would be spent in rural areas (Christian Science Monitor, 2007). Countries like Brazil and India dedicate a significant share of their budgets to investments intended to ease regional imbalances. In recent years, the World Bank has increased its focus on regional disparities and the economic opportunities and challenges that they may present. The effort of the Bank in understanding spatial imbalances issues culminated in the 2009 World Development Report. Though a certain amount of spatial imbalances may be beneficial because of spill-over effects of economic activities agglomeration, countries around the world are concerned about spatial imbalances. This concern is legitimate since the internal stability and the long-run development of countries depend upon the ability of governments to assure inclusive development to all regions and all people, whichever their living place.

However, dealing with spatial imbalances requires a good understanding of their causes. Indeed, governments cannot implement appropriate policies to dampen spatial imbalances if they do not have a clear understanding of the reasons behind such disparities. This is where this paper seeks to make a contribution. Before going further in our analysis, it is important to clarify two spatial imbalance concepts: spatial agglomeration is the tight concentration of business in a certain area; spatial disparities are gaps in living standards between people in different places.

Political-economy factors have increasingly been highlighted as relevant determinants of spatial imbalances. For instance, in their seminal paper, Ades and Glaeser (1995) showed that dictator countries and politically unstable countries have, on average, higher level of urban concentration – an element of spatial agglomeration – compared to democratic and more stable countries. Along the same line, Kim (2008a) stresses the need to consider governance and institutional factors in explaining spatial inequality across countries. Moreover, regional differences in the quality of institutions have been highlighted as relevant explanatory factors of spatial imbalances (Banerjee and Iyer, 2005; Kapur and Kim, 2006; Kim, 2007; and Bruhn and Gallego, 2007). Political institutions that determine the

---

3 Speech of H.M. King Mohamed VI of Morocco on the occasion of the 46th anniversary of the Revolution.
distribution of power between federal State and local governments have also been considered as determinants of spatial inequality (Henderso, 2002; Sokoloff and Zolt, 2006; Kim, 2008b; Rodriguez-Pose and Ezcurra, 2010; 2009a,b). Thus, scholars increasingly see political governance as an explaining factor of spatial imbalances.

Political governance is relatively weak in MENA countries. For instance, it has been shown that the quality of political governance – level of external accountability – is weaker in the MENA region compared with the rest of the world (World Bank, 2003). Given the results of the aforementioned papers about the role of political governance in explaining spatial imbalances, one could thus assume that the MENA region may be one of the regions with the highest spatial imbalances. However, little is known as regards: (a) the degree of political governance weakness in MENA countries compared to other world countries, (b) the degree of spatial imbalances in the MENA region compared to the rest of the world, (c) the characteristics of the link between political governance and spatial imbalances in MENA.

In this paper we pursue three main objectives. Firstly, we seek to quantify the gap in political governance between MENA countries and other world countries. Secondly, based on statistical and cross-sectional analyses, we try to quantify the degree of spatial imbalances in MENA countries compared to other countries. And thirdly, inspired by the paper of Ades and Glaeser (1995), we estimate a model of the determinants of spatial imbalances and use the results of this model to quantify the potential gains for MENA countries, in terms of a reduction in spatial imbalances, if these countries were to improve the quality of political governance to the level of their counterparts. To the best of our knowledge, this is the first paper to analyse the patterns of spatial imbalances, and the link between political governance and spatial imbalances with an emphasis on MENA countries.

Our statistical analysis shows that MENA countries lag behind other world countries, both in terms of political rights and political stability. The degree of economic agglomeration is higher in MENA compared to the rest of the world. The results of our econometric analysis indicate that, an increase in political rights is negatively and significantly related to the agglomeration rate. More interestingly, our results suggest that an improvement in MENA countries’ level of political rights to the average of the rest of the world would be associated with agglomeration rate 4 percentage points lower than its average level in the region. The data also reveal an inverted-U relationship between the agglomeration rate and GDP per capita, and a negative relationship between trade openness and the agglomeration rate.
The rest of the paper is organized as follows. In the next section we perform a statistical analysis of the gap in terms of political governance and spatial imbalances between MENA countries and other groups of countries. In the third section we carry out an econometric analysis. The fourth section is devoted to the presentation of the results of the analysis. The last section presents our conclusions and related policy implications.

2. Statistical analysis

2.1 Comparison of political governance between MENA and other world countries

When we talk about political governance, two key aspects must be distinguished: political rights and political stability. In this paper, we distinguish both these aspects of political governance, using the index of political rights from the Freedom House (2009) (henceforth FH index) and the index of political stability from Kaufman, Kraay and Mastruzzi (2009) (henceforth KKM index).

Political rights characterize the participation of people in political processes in a country. According to the Freedom House, political rights enable people to participate freely in the political process, including the rights to vote for distinct alternatives in legitimate elections, compete for public office, join political parties and organizations, and elect representatives who have a distinctive impact on public policies and are accountable to the electorate. The FH index ranges between 1 and 7, the higher the value of the index the lower the level of political rights in a country. The index is computed annually from 1972 to 2008. For the purposes of our analyses, we calculate the average value of the FH index for each country over the period 1972-2008, and take the reverse of this average, so that higher values are assigned to countries where people enjoy better political rights.

The KKM index measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. It was computed every two years from 1996 to 2000 and annually over the period 2002-08. The index ranges between -2.5 and +2.5, with high values.

---

4 The data from the Freedom House are free of access and can be downloaded at: www.freedomhouse.org/template. The data from Kaufmann et al. are also free of access and are available at: www.govindicators.org. The Kaufman et al. data set is a product of the World Bank governance project.
Table 1: Comparison of political governance between MENA countries and three other groups of countries

<table>
<thead>
<tr>
<th>(1) MENA vs Rest of The World</th>
<th>(2) MENA vs other Developing Countries</th>
<th>(3) MENA vs other lower middle income countries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MENA (^2)</td>
<td>ROW (^3)</td>
</tr>
<tr>
<td>Political Rights (FH index)</td>
<td>0.18</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>#observations</td>
<td>12</td>
<td>158</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(1) MENA vs Rest of The World</th>
<th>(2) MENA vs other Developing Countries</th>
<th>(3) MENA vs other lower middle income countries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MENA</td>
<td>ROW</td>
</tr>
<tr>
<td>Political Stability (KKM index)</td>
<td>-0.90</td>
<td>-0.09</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>#observations</td>
<td>13</td>
<td>168</td>
</tr>
</tbody>
</table>

Note: 1/ This table reports the mean values of political rights and political stability index for different groups of countries over the period 1972-2008 for political rights and over the period 1996-2008 for political stability index. Table 1 also contains the results of test of differences of mean values of political rights and political stability indexes between MENA countries and three other groups of countries.
2/ Stand for Middle East and North Africa countries.
3/ Stand for rest of the world.
4/ This is the result of the test of equal mean values for governance indicators between MENA countries and other groups of countries. The figures in parentheses are t-student associated with the differences between different mean values. ***, ** respectively denote significant differences in the mean values at the thresholds of 1% and 5%.
5/ Stand for developing countries from other regions of the world, i.e. not from MENA region.
6/ Denote other lower middle income counties, a group of countries to which are belonged 10 of the 13 of MENA countries according to the 2009 World Bank country classification.
corresponding to countries with increased political stability. For each country, we compute
the average value of the KKM index over the period 1996-2008.

2.1.1 Comparison of political rights between MENA and other world countries

We compare the level of the political rights index in MENA with that of three other
country groups: the rest of the world, other developing countries and countries with a level of
income similar to the MENA region. Throughout the paper, when we talk about MENA
countries, we do not refer to the 21 countries of the region, but 13 of them.  

**Figure 1:** Political rights in MENA and other world countries

<table>
<thead>
<tr>
<th>Country Group</th>
<th>Political Rights Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other lower middle income countries</td>
<td>0.26</td>
</tr>
<tr>
<td>Other developing countries</td>
<td>0.31</td>
</tr>
<tr>
<td>Rest of the world</td>
<td>0.4</td>
</tr>
<tr>
<td>MENA</td>
<td>0.18</td>
</tr>
</tbody>
</table>

**Notes:** MENA corresponds to 13 MENA countries, excluding the GCC.
“Other developing countries” are low income countries not from MENA region.
“Other lower middle income countries” are no MENA lower middle income countries according to the
World Bank country classification.
**Sources:** Authors’ calculations based on the Freedom House’s index of political rights.

Table 1 displays the results of the test of differences between MENA countries and the
three other groups of countries, using both the FH index and KKM index. According to the
results shown in Table 1, political rights are weaker in MENA than in any of the comparator
country groups considered. Based on the FH index, the level of political rights in MENA

---

5 Our group of MENA countries includes: Algeria, Djibouti, Egypt, Iran, Iraq, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia, West Bank Gaza and Yemen. Because their geography and economic characteristics are so different from the rest of the region, we exclude the 8 following countries: Bahrain, Israel, Kuwait, Malta, Oman, Qatar, Saudi Arabia and United Arab Emirates.
countries is 0.22 point lower than in the rest of the world and 0.13 point lower than in other developing countries. These results are significant at 1 percent level.

We also compare the MENA region with countries with a similar level of income per capita, i.e. other lower-middle income countries according to the World Bank 2009 countries classification. From Table 1, we can see that the level of political rights in other lower-middle income countries is 0.08 point higher than the level of political rights in MENA.

Figure 1 illustrates how, based on the FH index, MENA is lagging behind other country groups and the rest of the world, in terms of political rights.

2.1.2 Comparison of political stability between MENA and other world countries

We now compare the average performance of MENA countries in terms of political stability with the performances of the same three groups of countries (rest of the world, countries from other developing regions and countries with a level of GNI per capita similar to the MENA region).

**Figure 2:** Political stability in MENA, other countries groups and the rest of the world

<table>
<thead>
<tr>
<th>Country Group</th>
<th>Political Stability Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>MENA, 13 countries excluding 8 richest countries</td>
<td>-0.9</td>
</tr>
<tr>
<td>Other developing countries, 32 countries</td>
<td>-0.39</td>
</tr>
<tr>
<td>Other lower middle income countries, 105 countries</td>
<td>-0.53</td>
</tr>
<tr>
<td>Rest of the world, 188 countries</td>
<td>-0.09</td>
</tr>
</tbody>
</table>

**Notes:** MENA corresponds to 13 MENA countries excluding the 8 region’s richest countries. Other developing countries are low income countries not from MENA region. Other lower middle income countries are no MENA lower middle income countries according to the World Bank country classification. Sources: Authors’ calculations based on the index of political rights from Kaufmann et al. data set.

---

6 According to the World Bank 2009 classification, lower middle income countries are those whose 2008 GNI per capita ranges between $976 and $3,855. 10 of the 13 MENA countries fall within this category.
Our results are presented in Table 1. In terms of political stability, the rest of the world performs better than MENA by 0.82 point. This difference is significant at 1 percent level and close to the standard deviation of the KKM index in our sample (0.94, see appendix). When we compare the KKM index in MENA with other developing countries, we also find a gap to the detriment of the MENA region. Compared to countries with a similar level of income, the KKM index shows that MENA is lagging behind by 0.29 point; however this difference is not statistically significant.  

Figure 2 illustrates the differences in political stability between MENA countries and each of the three other country groups.

The analyses above suggest that MENA countries lag behind other world countries both in terms of political stability as well as in terms of political rights. Our statistical analyses show that in terms of the quality of political governance, the highest gaps are found when we compare MENA with the rest of the world, and the lowest gaps are between the MENA region and other lower middle income countries.

### 2.2 Comparison of spatial imbalances between MENA and other world countries

Spatial imbalances can characterize two different aspects of inequality: the concentration of production or the divergence in living standards across space (2009 World Development Report, henceforth 2009 WDR). The divergence in living standards across space can be measured by the ratio of urban-rural consumption or by access to public services. The concentration of production can be measured by either the agglomeration index or the urbanization rate (2009 WDR).

The agglomeration index is a relatively new indicator of the concentration of economic activity, proposed by the team of 2009 WDR. It is calculated on the basis of three criteria: (i) minimum population size to define a sizable settlement; (ii) minimum population density; and, (iii) maximum travel time, by road, to a sizable settlement. More specifically, to be considered as urban or dense or agglomerated, an area must satisfy the following criteria:

- The area density population exceeds a threshold of 150 persons per square kilometre;
- The area has access to a sizable settlement within some reasonable travel time (60 minutes by road);

---

7 It is not easy to establish a statistically significant difference of governance indexes across countries when one uses the KKM index. This is a fact that the authors of the data themselves highlight in Kaufmann et al. (2008).
• The settlement the area has access is large, i.e. the settlement has a minimum of 50,000 inhabitants.

The agglomeration index ranges between 0 and 100 and is thus expressed as a percentage. Its concept is analogous to that of urban population, in the sense that it is a summary measure of the proportion of a country’s population living in areas of high density. We obtain data on the agglomeration index from Table A2 of the 2009 WDR.

Compared to other indicators of economic concentration (e.g. urbanization rate, primacy index), the first and biggest advantage of the agglomeration index is its comparability across countries. In fact, the agglomeration index, differently from the traditional urbanization rate, is not based on national definitions of urban area, which differ from one country to another and make international comparisons difficult. Compared to the primacy index, which is based on the population size of the main city in a country, the agglomeration index appears more reliable, as the definition of the geographical delimitation of a country’s main city is quite often problematic.

In addition to its relative advantages vis-à-vis the other indicators, the fact that the agglomeration index is a new indicator makes it more attractive for analytical purposes. Moreover, the agglomeration index is available for almost all the world countries. Thus, for international comparisons of the degree of economic activities concentration, we use the agglomeration index. Data are available for the year 2000 and 182 countries around the world, including both developed and developing countries.

Table 2 presents the results of test of differences in agglomeration rate between MENA countries and other country groups. As we can see from Table 2, the agglomeration index is higher in MENA compared to other country groups. Compared to the rest of the world, the agglomeration index in MENA is 11.7 percentage points higher. This result is statistically significant. The gap is much higher when we compare the agglomeration index of MENA countries with other developing countries: the agglomeration index in MENA is 18.8 percentage points higher relative to other developing countries. When we compare the agglomeration rate in MENA countries with countries having a similar level of income per capita, the data suggest a gap of 17 percentage points in favor of the MENA region.
## Table 2: Unconditional differences of agglomeration rate between MENA and other countries

<table>
<thead>
<tr>
<th></th>
<th>(1) MENA vs. rest of the world</th>
<th>(2) MENA vs. other Developing Countries</th>
<th>(3) MENA vs. other lower middle income countries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MENA²</td>
<td>DC⁵</td>
<td>MENA⁶</td>
</tr>
<tr>
<td>Agglomeration Index (in %)</td>
<td>61.35</td>
<td>61.35</td>
<td>61.35</td>
</tr>
<tr>
<td></td>
<td>ROW³</td>
<td>49.65</td>
<td>42.57</td>
</tr>
<tr>
<td></td>
<td>Diff¹</td>
<td>-11.70</td>
<td>-18.77</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>(-2.17)**</td>
<td>(-3.47)***</td>
</tr>
<tr>
<td></td>
<td>#observations</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>169</td>
<td>128</td>
</tr>
</tbody>
</table>

Note: 1/ This table reports values of agglomeration index for different groups of countries. Table 2 also contains the results of test of differences of mean values of agglomeration index between MENA countries and three other groups of countries.
2/ Stands for Middle East and North Africa countries.
3/ Stands for rest of the world.
4/ This is the result of the test of equal mean values of agglomeration index between MENA countries and other groups of countries. The figures in parentheses are t-student associated with the differences between different mean values. ***, ** respectively denote significant differences in the mean values at the thresholds of 1% and 5%.
5/ Stands for developing countries from other regions of the world, i.e. not from MENA region.
6/ Denotes other lower middle income counties, a group of countries to which are belonged 10 of the 13 of MENA countries according to the 2009 World Bank country classification.
Data on per capita urban and rural consumption are available for 77 countries. We use these data to calculate the ratio of urban-rural consumption; this ratio is an indicator of livings standard disparities between urban and rural populations within a country. The consumption data are available for only 6 of the 13 MENA countries. Therefore, we do not compare the mean value of the consumption ratio of the MENA region with the other country groups, as we did with the agglomeration data, but we compare each MENA country with the average of the rest of countries for which we have data on rural and urban consumption.

As we can see from figure 3, the data show that Morocco has the highest urban-rural consumption ratio, followed by Egypt and Djibouti. Jordan has the lowest ratio of urban-rural consumption compared to the other countries of the MENA region, and the rest of the sample. The data suggest that 4 of the 6 MENA countries have an urban-rural consumption ratio that is lower than the rest of world countries.

**Figure 3:** Urban-rural consumption ratio in each of MENA country and other world countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Urban-rural Consumption Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other countries</td>
<td>1.93</td>
</tr>
<tr>
<td>Djibouti</td>
<td>1.7</td>
</tr>
<tr>
<td>Egypt</td>
<td>1.92</td>
</tr>
<tr>
<td>Jordan</td>
<td>1.32</td>
</tr>
<tr>
<td>Morocco</td>
<td>2.31</td>
</tr>
<tr>
<td>Syria</td>
<td>1.52</td>
</tr>
<tr>
<td>Yemen</td>
<td>1.67</td>
</tr>
</tbody>
</table>

**Sources:** Authors’ calculations based on consumption data from the World Bank.

At this stage of the analysis, the difference between MENA and other country groups should be interpreted with caution because we do not control for the effects of other determinants of spatial inequality. In order to draw relevant conclusions regarding the link between spatial imbalances and governance indicators, as well as regarding the degree of spatial inequality in MENA compared to the rest of the world, we need to run econometric regressions.
3. Econometric Analysis

3.1 Background: Model of Ades and Glaeser (1995)

We take advantage of the model of Ades and Glaeser (1995) to analyse the determinants of spatial imbalances. These authors develop a political-economy model of spatial imbalances. More specifically, Ades and Glaeser show that in democratic countries, so in countries where people enjoy a higher level of political rights, one should observe less urban concentration, because politicians need the support of the median voter or “the hinterland people” in order to stay in office. The argument of Ades and Glaeser (1995) implies that, in democratic countries, policymakers are more sensitive to the interest and well being of hinterland people, who may not need to migrate towards cities or urban areas to improve their lives. Based on this argument of Ades and Glaeser, we expect lower spatial imbalances in more democratic countries, both in terms of activities agglomeration, as well in terms of livings standard difference.

In their paper, Ades and Glaeser (1995) also show that in countries where the government is susceptible to political instability (coup and violence), the government is threatened by its direct neighbour citizens, i.e. the urban population. In order to prevent threats from the urban population, in countries with a high level of political instability, the government offers some premium (in form of lower income tax) to the urban population. By so doing, the government induces a concentration of the population in urban areas, as all citizens would like to benefit from the “urban premium”. The implication of this argument from Ades and Glaeser (1995) is that, in countries with a high level of political stability, one should observe less urban concentration and less difference in consumption between urban and rural areas, as the “urban premium” offered by the government would be lower.

3.2 Empirical Strategy

We introduce some changes to the original model of Ades and Glaeser (1995). The first modification is the change of the indicator of spatial agglomeration. As we mentioned before, our preferred measurement of the degree of economic activities concentration is the agglomeration index, which is not the case for Ades and Glaeser who used the primacy index. Moreover, in this paper we also run regressions with an indicator of livings standard
disparities and not only with an indicator of economic activities concentration as did Ades and Glaeser.

The second modification that we introduce in the model of Ades and Glaeser (1995) is taking into account the non linearity in the relationship between spatial disparities and economic development. Indeed, it is possible to imagine that economic activities concentration increases with the level of GDP per capita until a certain threshold after which an increase in GDP per capita would be accompanied by a reduction in the degree of agglomeration, possibly because of congestion effects. In order to reduce the congestion effects, there is a need to shift economic activities to other areas. Consequently, the degree of agglomeration and differences in living standards across areas should decline with the level of development, after a certain threshold.

The idea of non linearity in the relationship between spatial disparities and economic development has also been highlighted by the authors of the 2009 WDR. However, in the model of Ades and Glaeser, only the level of GDP per capita is used as an explanatory variable and not its quadratic value, therefore they do not analyse the possibility of non linearity in the link between spatial disparities and economic development. To the best of our knowledge, our analysis is the first rigorous attempt to estimate a non linear relation between spatial imbalances and economic development, even though the idea is well shared by many scholars.

The third change that we introduce compared to the original model of Ades and Glaeser, is the use of continuous values for the political rights index, instead of a dummy for dictatorship versus democratic character of a political regime. As we mentioned before, one of our objectives is to quantify the benefit for MENA countries in terms of spatial inequality reduction if these countries were to reach the level of political rights granted in comparator countries. For this kind of empirical investigation, the continuous values of the governance indicators are much more suited. Moreover, though our indicator of political rights is computed by the Freedom House, as in the case of Ades and Glaeser (1995), in this paper we use data over the period 1972-2008. Ades and Glaeser used the average values of a dummy variable related to the index of political rights for the years 1970, 1975, 1980 and 1985. By taking the average values of the political rights index over the period 1972-2008, not only do we use updated data for the political rights index, but we also reduce potential measurement errors associated with this variable.

In the context of this paper, the last and important modification that we introduce to the model of Ades and Glaeser (1995) is the use of a MENA dummy variable as an
explanatory variable of spatial imbalances. By doing so, we can quantify the gap between MENA countries and the rest of our country sample, after having controlled for the determinants of spatial imbalances.

3.3 Econometric specification, data and sources of data

Besides the modifications, we keep in our model some of the control variables that were used by Ades and Glaeser (1995). Hence, the models that we estimate are as follows:

\[
\text{aglomeration index}_i = c + \text{polrights}_i + \text{polstab}_i + \text{mena}_i + X_i + \epsilon_i \quad (1)
\]

\[
\text{Consumption ratio}_i = c + \text{polrights}_i + \text{polstab}_i + \text{mena}_i + X_i + \epsilon_i \quad (2)
\]

The dependent variables are indicators of spatial imbalances. In equation (1), the dependent variable is the agglomeration index, and in equation (2) it is the urban-rural consumption ratio. Therefore, equation (1) is related to the concentration of economic activities, whereas equation (2) is used to analyse the determinants of differences in living standards between rural and urban populations within countries.

The list of explanatory variables comprises an index of political rights and an index of political stability; both are respectively denoted \( \text{polrights}_i \) and \( \text{polstab}_i \) in our models. As we explained before, based on the model of Ades and Glaeser (1995), we expect a negative effect of the indexes of political rights and political stability on the agglomeration index and the urban-rural consumption ratio.

We introduce in our models a dummy variable for MENA countries, which is denoted \( \text{mena}_i \). The MENA dummy is a variable taking the value of one for the 13 countries from the MENA region and zero otherwise. Given the results of our statistical analysis related to the gap between MENA and other country groups, both in terms of agglomeration rate and political governance quality, we expect a positive effect of the MENA dummy on the indicators of spatial imbalances. The coefficient associated with the MENA dummy may be significant or insignificant in our regressions. In the case that the MENA coefficient is significant, this may suggest the existence of some specific factors which determine spatial imbalances in the MENA region that the model does not properly incorporate. On the other hand, if the coefficient associated with the MENA dummy is not significant, this reveals that
our model incorporates sufficient variables and that there are no additional factors that make spatial imbalances look different in MENA compared to the rest of the world.

In this paper, the indexes of political rights, political stability and the MENA dummy are our main variables of interest. In addition to these three variables, based on Ades and Glaeser (1995), we also control for other determinants of spatial imbalances. These variables are represented by $X_i$ in our econometric models. Except otherwise indicated, all the explanatory variables are from the World Bank (2009), World Development Indicators database. We calculate the average values of the explanatory variables over the period 1960-2007 for each our country sample.

The list of $X_i$ variables comprises an indicator of trade openness, i.e. the degree of a country’s participation in international trade. We expect a negative effect of trade openness on the indicators of spatial inequality. Indeed, Krugman and Levias (1996) show that when tariff rates are very high for trade with the rest of the world, manufacturing and workers tend to concentrate in one primate city. However, when trade is liberalized, centripetal forces decline causing manufacturing and workers to disperse to other cities. Hence, according to Krugman and Levias (1996) trade liberalization or trade openness causes spatial equality\(^8\). Our indicator for trade openness is the sum of exports and imports as a share of GDP.

We also control for the share of paved roads in a country’s total road network. The data on the share of paved roads are from the CIA Factbook and are estimated for the most recent year for each our country sample. In this paper, the share of paved roads is a proxy for government expenditure in transportation infrastructure\(^9\). We expect a negative effect of the share of paved roads on spatial imbalances. The higher the share of paved roads, the lower transportation cost. And Krugman (1991) shows that when transportation is expensive, activities group together to save on travel costs, and goods become cheaper in the urban compared to the rural area. Based on this theory, we can predict that spatial disparities and spatial agglomeration would be higher when transportation is more costly.

Still following the tradition of the model of Ades and Glaeser, we control for the logarithm of the population working in the agricultural sector, i.e. the labour force working in

---

\(^{8}\) For other theoretical arguments related to the link between trade openness and spatial disparity, one can refer to the works of Kim (2008), Puga and Venables (1999) and Paluzie (2001).

\(^{9}\) We prefer the share of paved roads instead of government expenditure on transportation, because the former is available for most of our country sample. Using data on government expenditure for transportation will generate missing observations because these data are available for only few countries. In addition, government expenditure in transportation and the share of paved roads are very likely linked; therefore we can use the percent of paved roads as a proxy for public expenditure on transportation infrastructure.
farming, forestry, hunting and fishing. The proportion of population employed in the agricultural sector provides an indication of a country’s level of industrialization. The higher the labour force working in the agricultural sector, the lower urban concentration, as this population is less willing to abandon its assets in the hinterland to migrate in the city. Hence, we expect a negative relation between the number of the population in the agricultural sector and the agglomeration index. We also expect a negative link between the size of the agricultural labour force and the ratio of urban-rural consumption, as the higher the number of agricultural population, the higher rural consumption.

Spatial disparities may also be related to country size (Williamson, 1965). Therefore, in our model, we also control for the size of countries. This is generally measured either by the size of the population or by the land area. In this paper, we use both indicators of country size by including the logarithm of the population size and the logarithm of country land area as explanatory variables.

Land area may have an ambiguous effect on spatial imbalances. Indeed, big countries in terms of land area are countries where transportation cost may be high because of distance between different localities. In this case, the link between land area and spatial imbalances is probably positive. However, a large country is very likely to be endowed with many natural resources located in different areas of the country. It is likely that, in order to exploit these natural resources, inhabitants spread-out across the country, thus reducing urban concentration and consumption disparities. Based on this argument, it is possible that land area and spatial imbalances are negatively associated.

The link between spatial imbalances and population size is probably positive, i.e. population size might increase spatial inequality. When the population size is high, the number of opportunities per capita is reduced; therefore people are concentrated in the area where they can mostly take advantage of the existing opportunities. Moreover, countries with a large population are generally more heterogeneous, and are countries where sub-national governments may follow very different policies, inducing spatial imbalances (Rodriguez-Pose and Ezcurra, 2010; 2009a,b).

In this paper we control for the effect of economic development on spatial imbalances. Since the pioneer work of Williamson (1965), the empirical literature on spatial inequality has emphasized the importance of the level of economic development in explaining spatial imbalances (see for instance, Amos, 1988; Terrasi, 1999; Petrakos, Rodriguez-Pose and Rovolis, 2005). However, in this paper, we assume that the relationship between spatial imbalances and economic development might not be linear. The idea of non linearity in the
relationship between spatial imbalances and economic development is also shared by many other authors (see Petrakos and Brada, 1989; Thisse, 2000)\(^\text{10}\).

In order to take into account the non linear relation between the level of economic development and spatial imbalances, we use as explanatory variables of the agglomeration index and the urban-rural consumption ratio, the logarithm of GDP per capita and its quadratic value. The non linear effect should be characterised by a positive and significant effect of the logarithm of GDP per capita and a negative and significant effect of its quadratic value on the spatial imbalances indicators. Data on GDP per capita are expressed in 2000 constant dollar.

We run regressions using OLS and estimate the two models presented above. The dependent variables, i.e. the agglomeration index and the urban-rural consumption ratio are available for the year 2000, while most of the explanatory variables cover the period 1960-2007. This unintentional situation contributes to reduce potential simultaneity errors and thus endogeneity issues in our econometric regressions.

4. Basic Results

The basic results of our econometric analysis are reported in Table 3. It appears that for the same explanatory variables, we obtain different results depending on the indicator of spatial imbalances considered. In the exception of trade openness and land area, which have a negative effect whichever the indicator of spatial imbalances considered, the coefficients associated with the other explanatory variables change with the indicator of spatial inequality. Moreover, the coefficients associated with land area and trade openness are significant at 1% level in the agglomeration model, whereas they are not significant in the model relating to spatial consumption disparities\(^\text{11}\).

Of over 10 dependent variables, 7 are statistically significant in the model related to the agglomeration index, whereas only 3 dependent variables are significant in the model

\(^{10}\) New economic geography models show that economic growth is often associated with an uneven spatial development (Krugman, 1998; Fujita and Thisse, 2002).

\(^{11}\) When we run simple correlations between the variables, we also find differences between the two models. For instance, we find a positive correlation between the agglomeration index and the governance indicators: the correlation between the agglomeration index and the political rights index is 0.40 and the correlation between the agglomeration index and the political stability index is 0.39. Both correlations are significant at 1% level. Differently, the correlation between the urban-rural consumption ratio and the political rights index is -0.09 and not significant, whereas the correlation between urban-rural consumption ratio and the political stability index is -0.22 and significant at 10% level. These correlations are not shown but are available upon request.
related to the ratio of urban-rural consumption. When observing the goodness of fit (adjusted
R-squared) of the two models, we can see that the data fit the agglomeration model by far
better than the model of consumption disparities. The results show that 75% of the variation in
the agglomeration index is explained, whereas only 22% of the variation in consumption ratio
is explained by the explanatory variables. Further research is needed to understand why such a
difference exists between the two models. The remainder of this paper will focus on the
results of the agglomeration model, in light of its superior performance.

In Table 3 we can see that the coefficient associated with the MENA dummy is
positive but insignificant. While the results of our statistical analyses had suggested that the
degree of economic activities agglomeration in MENA countries is 11.7 percentage points
higher than in the rest of the world, after controlling for other determinants, our econometric
analysis finds that the gap between MENA countries and the rest of the world is no longer
significant. Moreover, our results confirm that our model incorporates sufficient relevant
factors, meaning that there are no additional factors specific to the MENA region that affect
spatial imbalances differently in this region compared to the rest of the world.

When we look at the coefficients associated with the political governance indicators,
from Table 3, we can see that the coefficient associated with the political rights index is
negative and significant at 1% level. Improving the level of political rights is favourable to
agglomeration reduction; this result confirms one of the predictions of the model of Ades and
Glaeser (1995). The result suggests that, a one standard deviation increase in the political
rights index (0.29) would roughly induce a reduction of 5 percentage points in the
agglomeration index (0.29 x -16.657).

Based on the results in Table 3, it is possible to quantify the potential gain in terms of
agglomeration reduction that MENA countries would achieve if they were to improve their
political governance to the levels of comparator countries. Everything else equal, the results in
Table 3 suggest that, if MENA countries were to bridge the political right’s gap between the
region and other developing countries, the degree of agglomeration would fall by 2.2 points.
Furthermore, if MENA countries were to reach the level of political rights granted in the rest
of the world, the agglomeration rate in MENA would be reduced by 3.7 percent points. Let’s
imagine that MENA countries reach the level of political rights of countries with a similar
level of income per capita, what would be the effect on the agglomeration index? The results
in Table 3 suggest that in this case, MENA countries would benefit from a reduction of 1.3
percent point in the level of agglomeration.
Our second variable of interest related to political governance is the political stability index. Based on the model of Ades and Glaeser (1995), we expect a negative effect of the political stability index on the agglomeration index. However, the result in Table 3 shows a positive but insignificant effect between the two indexes.

In addition to our main variables of interest, another result that is interesting to examine is the effect of economic development on the agglomeration rate. We expect a non-linear relation between the agglomeration rate and economic development, and this is what the data show. Indeed, the coefficients associated with the logarithm of GDP per capita and its squared are respectively positive and negative, and both are statistically significant. According to the results in Table 3, *ceteris paribus*, higher GDP per capita is associated with higher agglomeration rates until approximately the threshold of $11,200 (2000 US constant dollar), from which increased GDP per capita would be associated with lower concentration of...
economic activities. This is a reasonable threshold. Only 30 countries in our sample have reached this threshold and most of them are rich or high income countries according to the World Bank classification\textsuperscript{12}.

From Table 3 we can see that the effect of trade openness on the agglomeration index is negative and significant at 1\% level. This result suggests that an increase of 1 percentage point in trade openness would induce a reduction of 0.06 percentage point in the agglomeration rate.

We obtain a negative and significant effect of the political rights index on the agglomeration index; our results also reveal an inverted-U relationship between the level of economic development and the agglomeration index. We also find a negative relationship between trade openness and the agglomeration rate. One final question we must ask ourselves is whether our findings are robust.

4.1 Robustness Checks

The results of all the robustness checks performed are reported in the appendix. The first robustness check that we carry out consists in changing the political rights index. Instead of the political rights index from the Freedom House, we use another indicator from the Polity IV; this is the polity 2 index. The polity 2 index measures the level of democracy, corrected from the level of dictatorship of political regime. Polity 2 ranges between -10 and +10, with a high value indicating a high level of democracy.\textsuperscript{13} The results of this first robustness check reported in Table A.2 show that our main results are not affected by this change: we still obtain a negative and significant effect of the political rights index on the agglomeration index. The MENA dummy as well as the political stability index remain statistically insignificant. We also find an inverted-U relationship between GDP per capita and the agglomeration index. Despite the change of the political rights index, the link between the agglomeration index and trade openness is negative and significant.

Another indicator of political rights that we use is the voice and accountability index from Kaufmann et al. (2009). This index ranges between -2.5 and 2.5, with a high value corresponding to countries where policy makers are more accountable vis-à-vis the people.

\textsuperscript{12} In our sample the list of countries which have reached this threshold is as follows: Australia, Austria, Bahamas, Belgium, Brunei, Canada, Denmark, Finland, France, French Polynesia, Germany, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Kuwait, Luxembourg, Macao, Netherlands, Norway, Qatar, San Marino, Singapore, Sweden, Switzerland, United Arab Emirates, United Kingdom and United States.

\textsuperscript{13} The data of Polity 2 can be downloaded freely from \url{http://www.systemicpeace.org/inscr/inscr.htm}. 

19
they govern. When we use the voice and accountability index there is no change in our initial findings.

Instead of changing the index of political rights, this time we change the indicator of political stability. In place of the political stability index from Kaufmann et al. (2009), we use data on coups events from the Polity IV project. The data compile descriptive information on all coups occurring in countries with a population greater than 500,000 during the period 1960-2006. A coup is defined as a forceful seizure of executive authority and office by a dissident/opposition faction within the country’s ruling or political elites that results in a substantial change in the executive leadership and the policies of the prior regime. For the purpose of our analyses, we focus on the annual number of successful coups over the period 1960-2006, and compute the average over that period. In order for a coup to be considered “successful”, effective authority must be exercised by new executive for at least one month. When we use the new indicator for political stability, the results in the appendix show that the political rights index is still negative and significant. The coefficient associated with the number of “successful” coups is negative but not significant. We still obtain a non-linear relation between spatial agglomeration and economic development, and the MENA dummy is positive but not significant as we previously found.

As a measurement of the level of economic development, we initially used data on GDP per capita (2000 constant US dollar) from the World Development Indicators. As a robustness check, we change the measurement of GDP per capita. We use data from the Pen World Table 6.2. The GDP per capita from Pen World Table is corrected for purchasing power parity. When we use GDP per capita from the Pen World Table, as it appears in Table A.5 in appendix, our main results are not affected by this change. We still obtain an inverted-U relation between spatial agglomeration and the level of income per capita. This time, the turn point is approximately estimated at $8,550 (PPP converted).

Most of the independent variables that we use cover the period 1960-2007. As an additional robustness check of our results, we consider data over the sub period 1970-2007. It is possible to imagine that the oil crisis induced some behavioural changes, including that of a change in the habit of people in their places of residence. In a period of crisis, people may decide to return to their villages instead of living in cities where the social network is less effective. Therefore, we rerun our regressions with most our independent variables covering

---

14 For more description on coup d'état data, one might refer to the following link: [http://www.systemicpeace.org/inscr/inscr.htm](http://www.systemicpeace.org/inscr/inscr.htm).

15 The Pen World Table 6.2 data are freely accessible at: [http://pwt.econ.upenn.edu/php_site/pwt_index.php](http://pwt.econ.upenn.edu/php_site/pwt_index.php).
the period 1970-2007. In spite of this change, our main results remain unaffected: we still obtain a negative and significant effect of the political rights index on the agglomeration index, and the MENA dummy is still not significant. We also find a non linear relation between the agglomeration index and GDP per capita. The return point is estimated at $9,782 (2000 US constant dollar).

We also test the robustness of our results compared to the indicator of spatial economic activities concentration. Instead of the agglomeration index, we use the urbanisation rate data. We obtain data on the urbanisation rate for year 2000 from the same source as the agglomeration index, i.e. from Table A2 of 2009 WDR. As we can see from Table A.7, despite this change our main results remain unaffected.

5. Conclusion

In this paper we have analyzed the gaps in terms of political governance and spatial imbalances between MENA countries and other world countries. We use two indicators for spatial imbalances: the agglomeration rate and the ratio of urban-rural consumption. The agglomeration rate measures the concentration of economic activities, while the ratio of urban-rural consumption is a proxy for spatial differences in living standards between rural and urban populations. Both indicators of spatial imbalances are from the World Bank. As measurements of political governance, we use data on political rights from the Freedom House (2009), and the political stability index from Kaufmann et al. (2009). Based on the model of Ades and Glaeser (1995), we estimate the effect of political governance indicators on the indicators of spatial imbalances. We use the results of these regressions to quantify the potential gains for MENA countries in terms of spatial imbalances reduction if these countries were to improve the quality of political governance.

In terms of political rights and political stability, the results of our statistical analysis suggest that, the quality of political governance in MENA is lower compared to other country groups: rest of the world, other developing countries and other lower middle income countries. However, the degree of agglomeration in MENA is higher compared to the other world countries.

We use cross-sectional data to estimate two different econometric models: one related to the agglomeration of economic activities and the other related to the difference in consumption per capita between urban and rural populations. The results of our regressions
show that the agglomeration model performs better. Indeed, for the same explanatory variables, 7 out of 10 variables are significant in the agglomeration model, whereas only 3 variables are significant in the model related to the ratio of urban-rural consumption. Moreover, the goodness of fit of the agglomeration model is 0.75, compared to 0.22 for the consumption ratio model. Further research is needed to understand why this difference between the two models exists. We focus our comments on the agglomeration model.

Our regressions, based on a sample of 182 countries, show that political rights index is negatively and significantly related to the agglomeration index. An increase in the level of political rights is therefore favourable for a reduction in spatial agglomeration. According to our results, if MENA countries increased their average level of political rights (0.18) to the average of the rest of the world (0.40), the payoff for MENA countries would be a reduction of 4 percentage points in the agglomeration rate. The data also reveal an inverted-U relationship between the agglomeration rate and the level of economic development. In particular, we find a positive and significant relationship between the agglomeration rate and GDP per capita up to the threshold of $11,200 (2000 US constant dollar), a level from which an increase in GDP per capita would be accompanied by a reduction in the agglomeration rate. This is a reasonable threshold; only 30 countries of our sample have reached such a level of income per capita. We also find a negative and significant relationship between trade openness and the agglomeration index. This result suggests that an increase in trade openness would reduce spatial agglomeration. The main findings of this paper are robust.

Our results suggest that MENA countries should improve the quality of political governance. More specifically, an improvement in the level of political rights would help MENA countries to reduce spatial agglomeration. Our findings also suggest that MENA countries could use other instruments associated with lower spatial concentration of economic activities. Indeed, according to our results, MENA countries could take advantage of trade openness to reduce spatial agglomeration.
Appendix

Table A.1: Description of Main Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observations</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agglomeration index</td>
<td>182</td>
<td>50.48</td>
<td>23.49</td>
<td>0</td>
<td>99.8</td>
</tr>
<tr>
<td>Consumption ratio</td>
<td>77</td>
<td>1.91</td>
<td>0.75</td>
<td>0.00</td>
<td>4.61</td>
</tr>
<tr>
<td>Political rights</td>
<td>170</td>
<td>0.38</td>
<td>0.29</td>
<td>0.14</td>
<td>1</td>
</tr>
<tr>
<td>Political stability</td>
<td>181</td>
<td>-0.14</td>
<td>0.94</td>
<td>-2.63</td>
<td>1.49</td>
</tr>
<tr>
<td>Log (GPD)</td>
<td>173</td>
<td>7.53</td>
<td>1.53</td>
<td>4.81</td>
<td>10.37</td>
</tr>
<tr>
<td>Log (GDP) squared</td>
<td>173</td>
<td>59.04</td>
<td>23.56</td>
<td>23.10</td>
<td>107.55</td>
</tr>
<tr>
<td>Log (population)</td>
<td>182</td>
<td>15.46</td>
<td>1.82</td>
<td>10.31</td>
<td>20.74</td>
</tr>
<tr>
<td>Trade openness (%)</td>
<td>174</td>
<td>77.68</td>
<td>45.67</td>
<td>16.00</td>
<td>414.74</td>
</tr>
<tr>
<td>Log (land area)</td>
<td>182</td>
<td>11.63</td>
<td>2.33</td>
<td>3.34</td>
<td>16.61</td>
</tr>
<tr>
<td>Share paved roads</td>
<td>176</td>
<td>2.21</td>
<td>22.57</td>
<td>0.01</td>
<td>1</td>
</tr>
<tr>
<td>Log (population agri)</td>
<td>176</td>
<td>13.35</td>
<td>2.23</td>
<td>6.10</td>
<td>19.86</td>
</tr>
<tr>
<td>MENA</td>
<td>182</td>
<td>0.07</td>
<td>0.26</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

List of countries sample
(Countries indicated by asterisk are our group of MENA countries)

Our sample comprises: Afghanistan, Albania, Algeria*, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Central African Republic, Chad, Chile, China, Colombia, Congo, Dem. Rep, Congo, Rep, Costa Rica, Cote d’Ivoire, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Djibouti*, Dominican Republic, Ecuador, Egypt, Arab Rep*, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Polynesia, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Islamic Rep*, Iraq*, Ireland, Israel, Italy, Jamaica, Japan, Jordan*, Kazakhstan, Kenya, Korea, Dem. Rep, Korea, Rep, Kuwait, Kyrgyz Republic, Lao PDR, Latvia, Lebanon*, Lesotho, Liberia, Libya*, Lithuania, Luxembourg, Macao, Macedonia, FYR, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Mauritius, Mayotte, Mexico, Moldova, Mongolia, Montenegro, Morocco*, Mozambique, Myanmar, Namibia, Nepal, Netherlands, Netherlands Antilles, New Caledonia, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russian Federation, Rwanda, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovak Republic, Slovenia, Solomon Islands, Somalia, South Africa, Spain, Sri Lanka, St. Lucia, Sudan, Suriname, Swaziland, Sweden, Switzerland, Syrian Arab Republic*, Taiwan, China, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Trinidad and Tobago, Tunisia*, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela, RB, Vietnam, West Bank and Gaza*, Yemen, Rep*, Zambia, Zimbabwe.
## Table A.2: Robustness check with the Polity 2 index

<table>
<thead>
<tr>
<th></th>
<th>OLS</th>
<th>Agglomeration Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polity 2</td>
<td>-0.581</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.85)***</td>
<td></td>
</tr>
<tr>
<td>Political stability</td>
<td>1.177</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.79)</td>
<td></td>
</tr>
<tr>
<td>Log (gdp per capita)</td>
<td>39.220</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.52)***</td>
<td></td>
</tr>
<tr>
<td>[Log (gdp per capita)]²</td>
<td>-2.230</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.30)***</td>
<td></td>
</tr>
<tr>
<td>Log (population size)</td>
<td>17.017</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(6.55)***</td>
<td></td>
</tr>
<tr>
<td>Trade openness</td>
<td>-0.055</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.06)**</td>
<td></td>
</tr>
<tr>
<td>Log (land area)</td>
<td>-3.992</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.05)***</td>
<td></td>
</tr>
<tr>
<td>Share of paved roads</td>
<td>1.803</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.57)</td>
<td></td>
</tr>
<tr>
<td>Log (population in agricultural sector)</td>
<td>-10.553</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.07)***</td>
<td></td>
</tr>
<tr>
<td>Mena</td>
<td>3.742</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.79)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-184.475</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(7.04)***</td>
<td></td>
</tr>
</tbody>
</table>

| Observations             | 148                  |
| R-squared (adjusted)     | 0.76                 |

Note: ***, ** respectively denote significant coefficients at 1% and 5% level. Figures in Parentheses are robust t-statistic.
<table>
<thead>
<tr>
<th></th>
<th>OLS Agglomeration Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice &amp; accountability</td>
<td>-4.389 (2.55)**</td>
</tr>
<tr>
<td>Political stability</td>
<td>3.467 (1.94)*</td>
</tr>
<tr>
<td>Log (gdp per capita)</td>
<td>37.561 (5.77)*****</td>
</tr>
<tr>
<td>[Log (gdp per capita)]²</td>
<td>-2.115 (4.62)*****</td>
</tr>
<tr>
<td>Log (population size)</td>
<td>17.008 (7.22)*****</td>
</tr>
<tr>
<td>Trade openness</td>
<td>-0.059 (2.49)****</td>
</tr>
<tr>
<td>Log (land area)</td>
<td>-4.100 (5.18)*****</td>
</tr>
<tr>
<td>Share of paved roads</td>
<td>0.319 (0.10)</td>
</tr>
<tr>
<td>Log (population in agricultural sector)</td>
<td>-10.419 (4.45)*****</td>
</tr>
<tr>
<td>Mena</td>
<td>3.296 (0.72)</td>
</tr>
<tr>
<td>Constant</td>
<td>-178.620 (7.48)*****</td>
</tr>
<tr>
<td>Observations</td>
<td>159</td>
</tr>
<tr>
<td>R-squared (adjusted)</td>
<td>0.74</td>
</tr>
</tbody>
</table>

Note: ***, **, * respectively denote significant coefficients at 1%, 5% and 10% level. Figures in Parentheses are robust t-statistic.
## Table A.4: Robustness check with coup d’état index

<table>
<thead>
<tr>
<th></th>
<th>OLS</th>
<th>Agglomeration Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political right</td>
<td>-15.569</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.26)***</td>
<td></td>
</tr>
<tr>
<td>Coup d’état</td>
<td>-14.424</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.50)</td>
<td></td>
</tr>
<tr>
<td>Log (gdp per capita)</td>
<td>31.672</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.87)***</td>
<td></td>
</tr>
<tr>
<td>[Log (gdp per capita)]²</td>
<td>-1.656</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.66)***</td>
<td></td>
</tr>
<tr>
<td>Log (population size)</td>
<td>16.199</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(7.90)***</td>
<td></td>
</tr>
<tr>
<td>Trade openness</td>
<td>-0.057</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.63)***</td>
<td></td>
</tr>
<tr>
<td>Log (land area)</td>
<td>-3.669</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.74)***</td>
<td></td>
</tr>
<tr>
<td>Share of paved roads</td>
<td>2.338</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.72)</td>
<td></td>
</tr>
<tr>
<td>Log (population in agricultural sector)</td>
<td>-10.562</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.10)***</td>
<td></td>
</tr>
<tr>
<td>Mena</td>
<td>4.582</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.03)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-146.597</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(6.38)***</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>147</td>
<td></td>
</tr>
<tr>
<td>R-squared (adjusted)</td>
<td>0.77</td>
<td></td>
</tr>
</tbody>
</table>

Note: ***, denote significant coefficients at 1%. Figures in Parentheses are robust t-statistic.
<table>
<thead>
<tr>
<th>OLS</th>
<th>Agglomeration Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political right</td>
<td>-14.904 (2.52)**</td>
</tr>
<tr>
<td>Political stability</td>
<td>3.931 (2.64)**</td>
</tr>
<tr>
<td>Log (gdp per capita, PPP)</td>
<td>44.647 (2.95)**</td>
</tr>
<tr>
<td>([\text{Log (gdp per capita, PPP)}]^2)</td>
<td>-2.466 (2.33)**</td>
</tr>
<tr>
<td>Log (population size)</td>
<td>18.532 (7.83)**</td>
</tr>
<tr>
<td>Trade openness</td>
<td>-0.071 (3.09)**</td>
</tr>
<tr>
<td>Log (land area)</td>
<td>-3.886 (4.65)**</td>
</tr>
<tr>
<td>Share of paved roads</td>
<td>0.322 (0.08)</td>
</tr>
<tr>
<td>Log (population in agricultural sector)</td>
<td>-12.405 (4.96)**</td>
</tr>
<tr>
<td>Mena</td>
<td>7.578 (1.63)</td>
</tr>
<tr>
<td>Constant</td>
<td>-209.973 (4.00)**</td>
</tr>
<tr>
<td>Observations</td>
<td>158</td>
</tr>
<tr>
<td>R-squared (adjusted)</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Note: ***, ** respectively denote significant coefficients at 1% and 5% level. Figures in Parentheses are robust t-statistic.
Table A.6: Robustness check with data over the period 1970-2007

<table>
<thead>
<tr>
<th></th>
<th>OLS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agglomeration Index</td>
</tr>
<tr>
<td>Political right</td>
<td>-15.526</td>
</tr>
<tr>
<td></td>
<td>(2.52)**</td>
</tr>
<tr>
<td>Political stability</td>
<td>2.065</td>
</tr>
<tr>
<td></td>
<td>(1.48)</td>
</tr>
<tr>
<td>Log (gdp per capita)</td>
<td>32.482</td>
</tr>
<tr>
<td></td>
<td>(5.07)***</td>
</tr>
<tr>
<td>[Log (gdp per capita)]²</td>
<td>-1.768</td>
</tr>
<tr>
<td></td>
<td>(3.84)***</td>
</tr>
<tr>
<td>Log (population size)</td>
<td>16.550</td>
</tr>
<tr>
<td></td>
<td>(7.46)***</td>
</tr>
<tr>
<td>Trade openness</td>
<td>-0.075</td>
</tr>
<tr>
<td></td>
<td>(3.04)***</td>
</tr>
<tr>
<td>Log (land area)</td>
<td>-3.925</td>
</tr>
<tr>
<td></td>
<td>(5.13)***</td>
</tr>
<tr>
<td>Share of paved roads</td>
<td>2.871</td>
</tr>
<tr>
<td></td>
<td>(0.92)</td>
</tr>
<tr>
<td>Log (population in agricultural sector)</td>
<td>-10.741</td>
</tr>
<tr>
<td></td>
<td>(4.68)***</td>
</tr>
<tr>
<td>Mena</td>
<td>4.704</td>
</tr>
<tr>
<td></td>
<td>(1.04)</td>
</tr>
<tr>
<td>Constant</td>
<td>-147.368</td>
</tr>
<tr>
<td></td>
<td>(6.54)***</td>
</tr>
<tr>
<td>Observations</td>
<td>158</td>
</tr>
<tr>
<td>R-squared (adjusted)</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Note: ***, ** denote significant coefficients at 1% and 5%. Figures in Parentheses are robust t-statistic.
**Table A.7:** Robustness check with urbanization data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Robust t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political right</td>
<td>-13.939</td>
<td>(2.83)***</td>
</tr>
<tr>
<td>Political stability</td>
<td>1.079</td>
<td>(0.65)</td>
</tr>
<tr>
<td>Log (gdp per capita)</td>
<td>31.410</td>
<td>(5.25)***</td>
</tr>
<tr>
<td>[Log (gdp per capita)]²</td>
<td>-1.475</td>
<td>(3.53)***</td>
</tr>
<tr>
<td>Log (population size)</td>
<td>9.977</td>
<td>(3.46)***</td>
</tr>
<tr>
<td>Trade openness</td>
<td>-0.027</td>
<td>(0.95)</td>
</tr>
<tr>
<td>Log (land area)</td>
<td>1.449</td>
<td>(1.66)*</td>
</tr>
<tr>
<td>Share of paved roads</td>
<td>-3.946</td>
<td>(1.05)</td>
</tr>
<tr>
<td>Log (population in agricultural sector)</td>
<td>-10.422</td>
<td>(3.95)***</td>
</tr>
<tr>
<td>Mena</td>
<td>4.669</td>
<td>(0.82)</td>
</tr>
<tr>
<td>Constant</td>
<td>-118.070</td>
<td>(5.08)***</td>
</tr>
<tr>
<td>Observations</td>
<td>157</td>
<td></td>
</tr>
<tr>
<td>R-squared (adjusted)</td>
<td>0.74</td>
<td></td>
</tr>
</tbody>
</table>

Note: ***, * respectively denote significant coefficients at 1% and 10% level. Figures in Parentheses are robust t-statistic.
References


MENA Working Paper Series

No. 1  Has Labor Migration Promoted Economic Integration in the Middle East?  

No. 2  The Welfare Effects of Oil Booms in a Prototypical Small Gulf State.  

No. 3  Economic and Social Development in the Middle East and North Africa.  

No. 4  The Link Between Trade Liberalization and Multi-Factor Productivity: The Case of Morocco.  

No. 5  Labor Markets in the Middle East and North Africa.  

No. 6  International Competitiveness of the Private Industry and the Constraints to its Development: The Case of Morocco.  

No. 7  An Extended RMSM-X Model for Egypt: Quantifications of Market-Oriented Reforms.  

No. 8  A Report on the Egyptian Tax System.  

No. 9  Economic Development and Cooperation in the Middle East and North Africa.  

No. 10  External Finance in the Middle East: Trends and Prospects.  

No. 11  Tax Incidence on Agriculture in Morocco (1985-1989).  

No. 12  The Demographic Dimensions of Poverty in Jordan.  

No. 13  Fertility and Family Planning in Iran.  

No. 14  Investment Efficiency, Human Capital & Migration A Productivity Analysis of the Jordanian Economy.  
May 1995.  Gaston Gelos, Yale University, Department of Economics.

No. 15  Tax Effects on Investment in Morocco.  

No. 16  Reconstruction in Lebanon: Challenges for Macroeconomic Management.  
No. 17 Towards a Virtuous Circle: A Nutrition Review of the Middle East and North Africa.

No. 18 Has Education Had a Growth Payoff in the MENA Region?

No. 19 Rationalizing Public Sector Employment in the MENA Region.

No. 20 Achieving Faster Economic Growth in Tunisia.

No. 21 Trade Options for the Palestinian Economy: Some Orders of Magnitude.

No. 22 Human Capital and Growth: The Recovered Role of Educational Systems.

No. 23 Governance And The Business Environment In West Bank/Gaza.


No. 25 Reform and Elusive Growth in the Middle-East – What Has Happened in the 1990s?

No. 26 Risks and Macro-Economic Impacts of HIV-AIDS in the Middle East and North Africa: Why waiting to intervene can be costly.

No. 27 Exchange Rate Regime and Competitiveness of Manufactured Exports: The Case of MENA Countries.

No. 28 Governance and the Investment Climate in Yemen.

No. 29 Exporting Labor or Goods? Long-term Implications for the Palestinian Economy.

No. 30 Poverty and Transfers in Yemen.

No. 31 Yemen and the Millennium Development Goals.

No. 32 Making Trade Work for Jobs : International Evidence and Lessons for MENA.


No. 34 Growth, Private Investment and the Cost of Doing Business in Tunisia.
No. 35  **Current World Trade Agenda - Issues and Implications for the MENA Region.**  

No. 36  **Reforms and Growth in MENA Countries - New Empirical Evidence.**  

No. 37  **Gainers and Losers from Trade Reform in Morocco.**  

No. 38  **Fiscal and Public Debt Sustainability in Egypt.**  

No. 39  **Trade and Foreign Exchange Liberalization, Investment Climate and FDI in the MENA Countries.**  

No. 40  **Migration and Trade in MENA – Problems or Solutions?**  

No. 41  **Do Basic Services and Poverty Programs Reach Morocco’s Poor? Evidence from Poverty and Spending Maps**  

No. 42  **Economic Growth in Egypt: Constraints and Determinants**  

No. 43  **Lebanon – Trade and Competition Policies for Growth: A General Equilibrium Analysis**  

No. 44  **Trade and Investment Integration of the Maghreb**  

No. 45  **Total Factor Productivity in Tunisian Manufacturing Sectors: Convergence or Catch-up with OECD Members?**  
June 2006. Mohamed El Arbi Chaffai, Patrick Plane and Dorra Triki Guermazi

No. 46  **Implicit Pension Debt in the Middle East and North Africa: Magnitude and Fiscal Implications**  

No. 47  **Water, Food Security and Agricultural Policy in the Middle East and North Africa Region**  

No. 48  **Explaining Large Inventories: the Case of Iran**  

No. 49  **Job Creation in a High Growth Environment: The MENA Region**  
No. 50  Economics of "Policy-Induced" Fragmentation: The Costs of Closures Regime to West Bank and Gaza

No. 51  Centralization, Decentralization and Conflict in the Middle East and North Africa