

Dreger, Christian; Rahmani, Teymur; Eckey, Hans-Friedrich

Working Paper

Economic convergence and rent-seeking in Iran

DIW Discussion Papers, No. 741

Provided in Cooperation with:

German Institute for Economic Research (DIW Berlin)

Suggested Citation: Dreger, Christian; Rahmani, Teymur; Eckey, Hans-Friedrich (2007) :
Economic convergence and rent-seeking in Iran, DIW Discussion Papers, No. 741, Deutsches
Institut für Wirtschaftsforschung (DIW), Berlin

This Version is available at:

<http://hdl.handle.net/10419/27265>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Discussion Papers

741

**Christian Dreger
Teymur Rahmani
Hans-Friedrich Eckey**



DIW Berlin

German Institute
for Economic Research

Economic Convergence and Rent-seeking in Iran

Berlin, November 2007

Opinions expressed in this paper are those of the author and do not necessarily reflect views of the institute.

IMPRESSUM

© DIW Berlin, 2007

DIW Berlin

German Institute for Economic Research

Mohrenstr. 58

10117 Berlin

Tel. +49 (30) 897 89-0

Fax +49 (30) 897 89-200

<http://www.diw.de>

ISSN print edition 1433-0210

ISSN electronic edition 1619-4535

Available for free downloading from the DIW Berlin website.

Economic convergence and rent-seeking in Iran¹

Christian Dreger, DIW Berlin, cdreger@diw.de

Teymur Rahmani, University of Tehran, Department of Economics , trahmani@ut.ac.ir

Hans-Friedrich Eckey, University of Kassel, eckey@wirtschaft.uni-kassel.de.

Abstract: The neoclassical growth model predicts convergence of productivity or per capita output levels across regions. If participation in the labor force is constant, convergence of per capita income is implied. We investigate this hypothesis for the Iranian economy using data on demand deposits as a proxy for GDP. Furthermore, the analysis controls for the effects of rent seeking. Due to its impact on the allocation of resources, rent-seeking is likely an impediment to overall growth. The results support absolute β -convergence across Iran's provinces and provide some evidence on the adverse effect of rent seeking on regional convergence.

Keywords: Regional convergence, rent-seeking, economic growth

JEL: O43, O47, R11

¹ The research was supported by DAAD funds, that are gratefully appreciated.

1. Introduction

A hypothesis implicitly embedded in the neoclassical model of economic growth is productivity convergence across regions. If participation in the labor force is constant convergence of per capita income is implied. Therefore, there should be an inherent tendency for poorer regions to catch up to richer ones. Due to its relevance for regional economic policy, convergence has been an active area of research for many years [see Barro and Sala-i-Martin (1991, 1992) and Mankiw, Romer, and Weil (1992) as seminal contributions].

On the other hand, the effects of rent-seeking and corruption on economic growth have been under study since the early 1990s. Theoretical analysis implies that rent-seeking is likely harmful for the economic performance. The main reason for an adverse effect is the allocation of most talented people to rent-seeking activities rather than innovation and entrepreneurship. Rent seeking activities can also influence the process of regional convergence, if they are concentrated in particular regions of a country.

In this paper economic convergence is examined on the base of regional data for 25 Iranian provinces. In contrast to previous studies, β convergence can be established. Moreover, evidence on the adverse effect of rent-seeking on the process of regional convergence is provided.

The paper is organized in five sections. The next two sections review the literature on convergence (section 2) and on the relationship between economic growth and rent-seeking (section 3). Section 4 is devoted to data issues and holds the empirical results. Finally, section 5 concludes.

2. Economic convergence across regions

Convergence of productivity and per capita income is an important prediction of the neoclassical growth model [see Barro and Sala-i-Martin (1991, 1992)]. Although this approach has been heavily criticized by the endogenous growth theory, β -convergence is still a workhorse of empirical research. It is theoretically well founded and provides insights into the speed of adjustment. Because of diminishing marginal returns of the reproducible input factors, regions should converge to a steady state, where the evolution is solely driven by technological progress. Given that the steady state growth path is the same across regions, absolute β -convergence will hold. However, if regions differ in their steady state determinants like savings rate and population growth, they will converge to individual paths, implying that β -convergence might only hold in a conditional sense (Mankiw, Romer, Weil, 1992). The more homogeneous the regions are, the more appropriate the absolute concept. Although convergence has been examined initially by cross sections of countries, the interest has shifted to regions within a country. The drivers of the convergence process, like capital mobility and labor migration are more pronounced, and culture or institutions are more similar within the country borders. Hence, convergence should be more visible at the regional level.

Barro and Sala-i-Martin (1991, 1992, and 2003) and Sala-i-Martin (1996) have detected β -convergence for US states, European regions and Japanese prefectures. The estimated speeds of convergence are extremely slow, but surprisingly similar across different data sets: regions tend to converge at a speed of approximately 2 percent per year. According to Coulombe and Lee (1995) changes in the terms of trade, government transfers, and taxes have supported convergence between Canadian provinces. Cashin (1995) examined convergence for Australian states and concluded that convergence occurred espe-

cially in earlier periods. Note that convergence might not be interpreted in favor of the theoretical concept, as the evidence may be linked to structural forces, like the shift from agriculture to manufacturing [see Paci and Pigliaru (1997) and Caselli and Coleman (2001)].

Many studies are also available for EU countries. For example, Kosfeld, Eckey, and Dreger (2006) found absolute and conditional β -convergence for German regions and reported adjustment speeds in the range of 5 to 7 percent. Also, Persson (1997) detected a high speed of convergence for Swedish counties. However the evidence is not unique and seems to depend on the time span considered in the analysis. McGuinness and Sheehan (1998) and Gripiaios, Bishop and Keast (2000) reported an increase in regional dispersion in the UK. Similar results have been obtained for Italian and Greek regions [see Terassi (1999), Siriopoulos and Asteriou (1998), Petrakos and Saratsis (2000)]. Gezici and Hewings (2004) are unable to find convergence for Turkish provinces, but reported a high degree of spatial dependencies.

While convergence is often confirmed for earlier periods, the process came to a halt in the 1980s [see also Lopez-Bazo, Vaya, Mora and Surinach (1999) and Cuadrado-Roura (2001) for EU regions]. However, Karras (2001), Maurseth(2001) and Dall'erba (2005) found results in line with β -convergence in later periods. After a temporary halt in the 1980s, a re-emergence in convergence might have occurred. But there is little support for the claim that the introduction of the European Monetary Union is an important driver in this regard (Martin, 2001).

Empirical evidence is available not only for industrial, but also for developing countries and NICs. Serra, Pazmino, Lindow, Ramirez and Sutton (2006) looked at some Latin American states and revealed evidence in favour of convergence within Argentina, Bra-

zil, Chile, Colombia, Mexico and Peru. The speed of convergence is often very low, but it doubles after controlling for different regional steady states. National disparities in per capita output increased temporarily after each country pursued measures of trade liberalization.

Jian, Sachs and Warner (1996) and Fujita and Hu (2001) have detected convergence across Chinese coastal provinces, but an increase in disparities between the coast and the interior, probably due to the increase in globalization and the liberalization of markets [see also Lin and Song (2002)]. Also in India, a small group of states is pulling away, thereby causing a second peak in the income distribution (Trivedi, 2003). Hossain (2000) found β -convergence of per capita GDP for most regions in Bangladesh. Kim (2005) has analyzed Korean regions and reported a very high speed of convergence of about 8 percent per year.

3. The adverse impact of rent-seeking on economic growth

The wide dispersion of per capita income across countries might be related to differences in social infrastructures [see Hall and Jones (1999)]. Social infrastructure refers to the overall environment of economic activities, including government policies [see also North (1990) and Baumol (1990)]. For developing countries, Sachs and Warner (1995), Mauro (1995), Knack and Keefer (1995), Acemoglu, Johnson, and Robinson (2001, 2002), and Engerman and Sokoloff (2002) have explored the role of geography in the adoption of appropriate institutions from Western world which foster economic growth and development. A favourable social infrastructure supports productive activities and encourages physical and human capital accumulation, invention, and technology trans-

fer. Private and social returns are kept close together, thereby providing incentives for productive activities. Properly defined institutions cause agents to be rewarded by the full amount of their production. Individuals do not need to invest resources in avoiding diversion.

Rent-seeking and corruption can hamper the economic performance. This kind of behaviour covers all activities in which an individual obtains an amount not from productive activities, but from predation, bribery, suing someone in the court, using public facilities for private purposes and so on. The economic analysis of the consequences of rent-seeking started with the pioneering work of Tullock (1967, 1971) and Krueger (1974). Baumol (1990, 2004) has emphasized the allocation of entrepreneurship, which can be crucial factor to explain the different growth experience across countries. Although levels of entrepreneurship may be similar, the economic performance can be very different as a result of different allocations of talents. The allocation of entrepreneurship to productive and rent-seeking activities depends on the reward structure in the economy.

Murphy, Shleifer, and Vishny (1991, 1993) presented a formal analysis of the allocation of talent and how people decide to be workers, producers, or rent-seekers. The most talented people are attracted either to productive or rent-seeking activities, depending on the market size, the compensation contract, and the returns to scale in those activities. If the most talented people decide to be rent-seekers as a result of the reward structure, the growth rate will be lower. In the model of Acemoglu (1995) the reward structure is determined endogenously. Rent-seeking exhibits increasing returns to scale. This raises the existence of multiple equilibriums and underdevelopment traps.

Grossman and Kim (1995), Grossman (1998) and Mehlum, Moene and Torvik (2003) have demonstrated how economies may get stuck in clubs of predators with vicious cycles of poverty and predation. Interest groups can deter the introduction of new technologies or the adoption of existing technologies [see Acemoglu and Robinson (2000)]. In effect, individuals or political groups who benefit under the existing political system can be a barrier for growth and development. Countries can also suffer from a weak institutional framework (Bjorvatn and Selvik, 2005). Competing bureaucrats impose independent and high levels of bribes on private businesses. Also, the necessity of secrecy can shift public investment from high value to useless alternatives if the latter have better opportunities to veil corruption. Darby, Li and Muscatelli (2004) analyzed the effect of uncertainty on the outcome of political elections on the composition of public expenditures. Inefficiencies can arise as government expenditures are switched from investment to consumption.

From an empirical point of view, the lack of data on rent-seeking is a serious obstacle. Magee, Brock and Young (1989) found lower growth rates in countries with more lawyers. Barro (1991) suggested high levels of government consumption and political coups as indications for rent-seeking. Murphy, Shleifer and Vishny (1991) have proposed the ratio of college enrolments in law and in engineering to total enrolments. The idea is that a higher ratio of college enrolments in engineering is a measure of allocation of talent to innovative and productive activities, while a higher ratio of college enrolments in law is an implication of allocation of talent to rent-seeking. They reported positive and significant effects of engineering enrolments, while the effects of law enrolments are insignificant. Brumm (1999) looked on employment in public and legal services. By using the numbers of interest organizations registered to lobby in the legis-

lature process and interest organization densities, Cole and Chawdhry (2002) provided evidence for the negative effects of rent-seeking on economic growth, public investment and public services.

Mauro (1998) reported a negative relationship between corruption and government expenditure on education, which is critical for growth, but not an attractive area for rent-seeking [see also Guetat (2006)]. According to Baland and Francois (2000) a resource boom increases rent-seeking and lowers GDP growth especially if the share of entrepreneurs in the economy is low.

Under some circumstances rent-seeking might also contribute to economic growth. This is observed in some East Asian countries [see Kang (2002), Haggard (2004) and Rock and Bonnett (2004)]. The rationale for the existence of high levels of corruption and high growth is attributed to patron-client networks. State patrons are strong relatively to clients and corruption networks are organized and managed by a centralized state. Therefore, policies made protect new growth enhancing property rights. Li and Zhou (2005) provide some evidence on the relationship between political turnover and economic performance in China. The promotion of provincial leaders with a better economic record explains much of the success of the economic performance in China.

4. Rent seeking and regional convergence in Iran

Iran is a developing country rich in natural resources, especially in oil and gas. A special problem that has been discussed for countries with rich natural resources is the resource curse; that is, these countries often have experienced lower rates of economic growth (Auty, 1993). One explanation for the resource curse in Iran is massive rent-

seeking and corruption [see Alizadeh (2003), Renani and Khezri (2005) and Bjorvatn and Selvik (2005)].

Iran experienced high and sustained economic growth with low inflation in the 1960s, when oil incomes accounted only for a small share in Iran's GDP. After periods of rising oil prices in the 1970s, Iran experienced lower growth rates on average while it encountered double digit inflation rates. In the 1980s, growth rates lowered and became even negative while inflation remained high, mainly due to the war between Iran and Iraq. At the same time, Iran's economy became more regulated and state-owned with the natural result of spreading regulatory rents. In the early 1990s, a surge in government expenditures to reconstruct the damages of the war and the semi-liberalization of the economy caused very high inflation and moderate growth rates. In the time period 1996-2005, Iran became gradually more stable with economic reforms and less expansionary policies. Thus, the economy experienced decreasing inflation and a mild sustained growth path accompanied by oil incomes that were not massively injected into the economy. Under the new government, this process came to a halt.

Iran's economy has been under the influence of rent-seeking since the early 1970s. It does not mean that there was no rent-seeking before the 1970s. Rent-seeking was quite centralized among a limited group of elites, mainly linked to Shah's relatives. Thus, the situation was more or less similar to the successful East Asian countries. The surge in oil incomes in the 1970s caused rent-seeking to get out of control, while there was no change in Iran's political system or institutions. In fact, the massive increase in government expenditures to pursue ambitious but inaccessible development goals provided the ground for high and destructive competition for rent-seeking. While almost all large businesses came under the control of the government after the revolution, rent-seeking

continued. The driving force was the nationalization of almost all big firms and the tendency for a more state-owned economy. Although our purpose is not to test for the effects of rent-seeking on economic growth here, but a look at the Log of non-oil GDP for the time period 1959-2005 shows a break in the growth path in 1975. This is consistent with the literature. In fact, the spread of rent-seeking after the sharp increase in oil incomes and thereby ambitious government expenditures 1970s caused a permanent decrease in the economic growth. What we are interested in here is to provide some preliminary results on the effect of rent-seeking on regional convergence. So, we consider as given the adverse effect of rent-seeking on economic growth.

Most rent-seeking activities are organized by establishing some kinds of businesses. Examples can include import licenses, subsidized loans, contracts to provide goods and services for government sector or implementing development projects, to obtain ownership of lands for urban or other uses etc. The concentration of rent-seeking activities in Tehran is important. Even many businesses located in other regions are organized from Tehran. Although government activities could have positive effects on the level of incomes in all regions, a substantial amount of rents are created in or transferred to Tehran. This is the main reason for the attractiveness of Tehran for the most talented and highly educated people. The dominance of Tehran could undermine the growth performance in the overall country, but also regional convergence between the provinces. Therefore, the empirical analysis is based on a test of regional convergence and the impact of Tehran in this process. Although there may be explanations for regional disparity on the basis of the presence of ethnic groups in poor regions, the main problem is rent-seeking and its concentration in Tehran. In fact, some provinces without ethnic groups and close to Tehran are not more developed than provinces with ethnic groups.

Convergence regressions are carried out by measures for per capita output. However, regional GDP is available only for 5 years. The data are not very reliable and subject to revision. Hence private sector demand deposits are used as a proxy for GDP instead [see also Rahmani and Eckey (2004)]. They are drawn from banking system balance sheets and have a high degree of precision. As public sector deposits are excluded, they have also a high correlation with real private economic activities and incomes. In fact, GDP includes oil income that is a public business without strong correlation to regional economic activities. Demand deposits are even better suited than industrial GVA as large manufacturing firms are under state control.

Policy and infrastructural variables are included in the regressions to examine the effects of certain policies on economic growth. These measures refer to government investment and consumption, road length, and the number of telephones including mobiles. The series are expressed in real per capita terms, where the consumer price index is used as a deflator (1997=100).

Data are gathered from different issues of Statistical Yearbook of the Center of Iran Statistics and inside reports of the Central Bank of the Islamic Republic of Iran. The analysis is based on annual data covering the 1996-2005. Currently, Iran has 30 provinces, while there were only 25 in 1996. Therefore, we have used the provinces as they were in 1996 to have a consistent dataset. The regional dimension allows an assessment of convergence at the national level. However, dependencies between the regions have to be taken into account. They may stem from common or idiosyncratic shocks, which can generate spillovers between the cross sections. Eventually, variables are spatially auto-correlated over the regions, and this can bias the regression results (Anselin, 1988).

To get an impression on the extent of spatial autocorrelation the Moran test is applied to all variables in the analysis. Moran's I is a global measure of spatial autocorrelation for each variable [see table 1]. The statistic is significant only for the growth rate of demand deposits and the average level of government investment. But even in these cases, the degree of spatial autocorrelation is rather modest. Due to this evidence, a parsimonious model is estimated without spatial effects. This decision does not affect any of the conclusions, since the residuals from the convergence regressions show no signs of spatial dependencies (table 2).

-Table 1 about here-

For convergence the mean growth rate of per capita demand deposits is regressed on the initial level of per capita demand deposits. In contrast to Rahmani and Eckey (2004), β -convergence can be detected with a speed 3.75% per annum [see table 2]. This figure should be interpreted as an upper limit for the true convergence process. In particular the increasing use of demand deposits in transactions in underdeveloped regions as a result of development of banking in recent years might have raised the β coefficient. At the same time, the decline in the growth rates of population in poor regions have been more in recent decade that could have increased the growth rates of per capita demand deposits in those regions temporarily. In the next step, the model is extended by the inclusion of mean growth rates of government investment and consumption expenditures (table 2). Measures of the infrastructure like road length or the number of telephones are largely insignificant.

Government investment expenditures have positive significant effects on real economic activities. This could mean that government development expenditures are effective in fostering convergence, while government consumption exert insignificant effects. However, the speed of convergence is lower when these additional regressors are embedded. This could imply some ineffectiveness of government activities, probably because of rent-seeking.

-Table 2 about here-

In fact, the special kind of rent-seeking in Iran is a weakening factor against regional convergence. Since rent-seekers are mainly located in Tehran and other rich provinces, distribution of rents can cause these rich provinces to grow more. This may account for the lack of convergence in earlier periods. The study of Rahmani and Ectey (2004) focused on the early 1990s, which are characterized by the reconstruction after the war with Iraq. The sharp increase in government expenditures in the early 1990s provided an opportunity to obtain large amounts of rents and as mentioned there is a strong force to offset regional convergence in such periods. In contrast, the period 1996-2005 is more stable. Initially lower oil prices squeezed oil incomes, implying that the government could not continue the pace of rising expenditures. Although the oil price rose in the second half of the time period under study, the government did not fully inject the oil incomes into the economy. As a consequence, there was less opportunity for rent-seeking.

There is a high tendency for rent-seekers to concentrate in Tehran to be able to lobby for rents. To explore this hypothesis Tehran is excluded from the panel [see table 3 for the regression results].

-Table 3 about here-

Overall, the evidence is quite similar to those obtained in the entire sample. Again, β -convergence can be established. Nevertheless, there are some striking differences. The speed of convergence is higher when Tehran is excluded. Moreover, the inclusion of government investment and consumption expenditures increases the speed of convergence. The speeds of convergence are more than 1 percent higher when conditional β -convergence is examined for the sample without Tehran. Therefore, Tehran can be seen as a province that weakens regional convergence. If rent-seekers are mainly located in rich provinces and especially in Tehran, income growth is higher and offsets the path of convergence to some extent. To be sure that the results of the exclusion of Tehran are implying the effect of rent-seeking and not just a statistical phenomenon, we ran the regressions with the exclusion of Khozestan province (but not Tehran) from which most of Iran's oil income is obtained. The results were the same as those in table 2. Since oil production does not have strong link to other economic activities and there is no significant rent-seeking in this province, there is no significant change in the regressions when this province is excluded. This is in line with our analysis. It is widespread rent-seeking in Tehran that weakens regional convergence.

Another piece of evidence that deserves attention is that the mean growth rates and the levels of banks loans are not significant in any regression. From a theoretical point of

view, there should be a strong relationship between loans and demand deposits. Hence, the insignificance of loans in the regressions can imply that there is a high degree of rent-seeking in those loans.

5. Conclusions

This paper has analysed regional economic convergence using a sample of Iranian provinces. The analysis is based on demand deposits as a proxy for regional GDP. In addition, the impacts of rent seeking on convergence are explored. Due to the lack of high quality data only some indirect insights are provided. The results indicate that the provinces converge. At the same time, the presence of rent-seeking activities seems to weaken the convergence process. The impact of rent-seeking turns out to be higher if there is an increase in government expenditures which provides the opportunity for more rent-seeking. An extension of this paper could be deeper analysis of rent-seeking by finding some indicators of this behaviour.

References

Acemoglu, D., 1995. Reward structures and the allocation of talent. *European Economic Review* 39, 17-33.

Acemoglu, D., Johnson, S., Robinson, J.A., 2001. The colonial origins of comparative development: An empirical investigation. *The American Economic Review* 91, 1369-1401.

Acemoglu, D., Johnson, S., Robinson, J.A., 2002. Reversal of fortune: Geography and institutions in the making of the modern world income distribution. *Quarterly Journal of Economics* 117, 1231-1294.

Acemoglu, D., Robinson, J.A., 2000. Political losers as a barrier to economic development. *The American Economic Review* 90, 126-130.

Alizadeh, P., 2003. Iran's quandary: Economic reforms and the "structural trap". *The Brown Journal of World Affairs* 9, 267-281.

Anselin, L., 1988. *Spatial econometrics: Methods and models*. Kluwer Academic Publishers, Dordrecht.

Auty, R.M., 1993. *Sustaining development in mineral economies: The resource curse thesis*. London: Routledge.

Baland, J., Francois, P., 2000. Rent-seeking and resource booms. *Journal of Development Economics* 61, 527-542.

Barro, R.J., 1991. Economic growth in a cross section of countries. *Quarterly Journal of Economics* 106, 407-443.

- Barro, R.J., Sala-I-Martin, X., 1991. Convergence across states and regions. *Brookings Papers On Economic Activity* 1, 107-182.
- Barro, R.J., Sala-I-Martin, 1992. Convergence. *Journal of Political Economy* 100, 223-251.
- Barro, R.J., Sala-I-Martin, X., 2003. *Economic Growth*, 2nd Edition, Cambridge, MA: MIT Press.
- Baumol, W.J., 1990. Entrepreneurship: Productive, unproductive, and destructive. *Journal of Political Economy* 98, 893-921.
- Baumol, W.J., 2004. On Entrepreneurship, growth and rent-seeking: Henry George Updated. *The American Economist* 48, 9-16.
- Bjorvatan, K., Selvik, K., 2005. Destructive competition: Oil and rent seeking in Iran. Unpublished Paper.
- Brumm, H.J., 1999. Rent seeking and economic growth: Evidence from the States. *Cato Journal* 19(1), 7-16.
- Caselli, F., Coleman W.J., 2001. The U.S. structural transformation and regional convergence: A reinterpretation, *Journal of Political Economy* 109, 584-616.
- Cashin, P., 1995. Economic Growth and Convergence across the Seven Colonies of Australasia: 1861-1991. *The Economic Record* 71, 132-144.
- Cole, I.M., Chawdhry, M.A., 2002. Rent-seeking and economic growth: Evidence from a panel of U.S. States. *Cato Journal* 22(2), 211-225.
- Coulombe, S., Lee, F.C., 1995. Convergence across Canadian Provinces, 1961 to 1991. *Canadian Journal of Economics* 28, 886-898.

- Cuadrado-Roura, J.R., 2001. Regional convergence in the European Union: From hypothesis to the actual trends. *The Annals of Regional Science* 35, 333-356.
- Dall'erba, S., 2005. Distribution of regional income and regional funds in Europe: An exploratory spatial data analysis. *The Annals of Regional Science* 39, 121-148.
- Darby, J., Li, C., Muscatelli, V.A., 2004. Political uncertainty, public expenditure and growth. *European Journal of Political Economy* 20, 153-179.
- Engerman, S.L., Sokoloff, K.L., 2002. Factor endowments, inequality, and paths of development among New World Economies. NBER Working Papers Series 9259.
- Fujita, M., Hu, D., 2001. Regional disparity in China 1985-1994: The effects of globalization and economic liberalization. *The Annals of Regional Science* 35, 3-37.
- Gezici, F., Hewings, G.J.D., 2004. Regional convergence and the economic performance of peripheral areas in Turkey. *Review of Urban and Regional Development Studies* 16, 113-132.
- Gripiaios, P., Bishop, P., Keast, S. (2000). Differences in GDP per head in UK Counties: some suggested explanations, *Applied Economics*, 32, 1161-1167.
- Grossman, H.I., 1998. Producers and predators. NBER Working Papers Series 6499.
- Grossman, H.I., Kim, M., 1995. Swords or plowshares? A Theory of the security of claims to property. *Journal of Political Economy* 103, 1275-1288.
- Guetat, I., 2006. The effects of corruption on growth performance of the MENA countries. *Journal of Economics and Finance* 30, 208-221.
- Haggard, S., 2004. Institutions and growth in East Asia. *Studies in Comparative International Development* 38, 53-81.

- Hall, R.E., Jones, C.I., 1999. Why do some countries produce so much more output per worker than others? *The Quarterly Journal of Economics* 114, 83-116.
- Hossain, A., 2000. Convergence of per capita output levels across regions of Bangladesh: 1982-1997. IMF Working Paper WP/00/121.
- Jian, T., Sachs, J.D., Warner, A.M., 1996. Trends in regional inequality in China. NBER Working Papers Series 5412.
- Kang, D.C., 2002. Bad Loans to Good Friends: Money Politics and the Developmental State in South Korea. *International Organization* 56(1), 177-207.
- Karras, G., 2001. Long-run economic growth in Europe: Is it endogenous or neoclassical? *International Economic Journal* 15, 63-76.
- Kim, J., 2005. Convergence hypothesis of regional income in Korea. *Applied Economic Letters* 12, 431-435.
- Knack, S., Keefer, P., 1995. Institutions and economic performance: Cross-country tests using alternative institutional measures. *Economics and Politics* 7, 207-227.
- Kosfeld, R., Eckey, H., Dreger, C., 2006. Regional productivity and income convergence in the Unified Germany, 1992-2000. *Regional Studies* 40, 755-767.
- Krueger, A.O., 1974. The political economy of the rent-seeking society. *The American Economic Review* 64, 291-303.
- Li, H., Zhou, L., 2005. Political turnover and economic performance: The incentive role of personnel control in China. *Journal of Public Economics* 89, 1743-1762.
- Lin, S., Song, S., 2002. Urban economic growth in China: Theory and evidence. *Urban Studies* 39, 2251-2266.

- Lopez-Bazo, E., Vaya, E., Mora, A.J., Surinach, J., 1999. Regional economic dynamics and convergence in the European Union. *The Annals of Regional Science* 33, 343-370.
- Magee, S.P., Brock, W.A., Young, L., 1989. *Black hole tariffs and the endogenous policy theory*. Cambridge: Cambridge University Press.
- Mankiw, N.G., Romer, D., Weil, D.N., 1992. A contribution to the empirics of economic growth. *The Quarterly Journal of Economics* 107, 407-437.
- Mauro, P., 1995. Corruption and growth. *The Quarterly Journal of Economics* 110, 681-710.
- Mauro, P., 1998. Corruption and the composition of government expenditure. *Journal of Public Economics* 69, 263-279.
- Maurseth, P.B., 2001. Convergence, geography and technology. *Structural Change and Economic Dynamics* 12, 247-276.
- McGuinness, S., Sheehan, M., 1998. Regional convergence in the UK, 1970-1995. *Applied Economics Letters* 5, 653-658.
- Mehlum, H., Moene, K., Torvik, R., 2003. Predator or prey? Parasitic enterprises in economic development. *European Economic Review* 47, 275-294.
- Murphy, K.M., Shleifer, A., Vishny, R.W., 1991. The allocation of talent: Implications for growth. *The Quarterly Journal of Economics* 106, 503-530.
- Murphy, K.M., Shleifer, A., Vishny, R.W., 1993. Why is rent-seeking so costly to growth? *The American Economic Review (Papers and Proceedings)* 83, 409-414.
- North, D.C., 1990. *Institutions, institutional change, and economic performance*. Cambridge: Cambridge University Press.

- Paci, R., Pigliaru, F., 1997. Structural change and convergence: An Italian regional perspective. *Structural Change and Economic Development* 8, 297-318.
- Persson, J., 1997. Convergence across the Swedish countries, 1911-1993. *European Economic Review* 41, 1835-1852.
- Petrakos, G., Saratsis, Y., 2000. Regional inequalities in Greece. *Papers in Regional Science* 79, 57-74.
- Rahmani, T., Eckey, H., 2004. Testing regional convergence in Iran's economy. *Iranian Economic Review* 9, 103-119.
- Rock, M.T., Bonnett, H., 2004. The comparative politics of corruption: Accounting for the East Asian paradox in empirical studies of corruption, growth and investment. *World Development* 32, 999-1017.
- Sachs, J.D., Warner, A., 1995. Economic reforms and the process of global integration, *Brookings Papers on Economic Activity* 1, 1-95.
- Sala-I-Martin, X., 1996. Regional cohesion: Evidence and theories of regional growth and convergence. *European Economic Review* 40, 1325-1352.
- Shleifer, A., Vishny, R.W., 1993. Corruption. *The Quarterly Journal of Economics* 108, 599-617.
- Siriopoulos, C., Asteriou, D., 1998. Testing for Convergence Across the Greek Regions. *Regional Studies* 32, 537-546.
- Terrasi, M., 1999. Convergence and divergence across Italian regions. *The Annals of Regional Science* 33, 491-510.

Trivedi, K. (2003): Regional convergence and catch up in India between 1960 and 1992.

University of Oxford, Nuffield College Economics Paper 2003-01.

Tullock, G., 1967. The Welfare Costs of tariffs, monopolies, and theft. *Western Economic Journal* 5, 224-232.

Tullock, G., 1971. The cost of transfer, *Kyklos* 27, 629-642.

Table 1: Moran's *I* of variables for the analysis

		Moran coefficient	z-value
Demand deposits	Growth rate	0.147	1.58
	Initial level	0.205	2.06*
Government investment	Growth rate	0.031	0.60
	Average level	0.249	2.43*
Government consumption	Growth rate	-0.221	-1.50
	Average level	-0.031	-0.09

Note: 25 Iranian provinces, 1996-2005. Variables in real per capita terms. * shows significance at least at the 0.05 level.

Table 2: Convergence regressions

Variable	Coefficient		
	Constant	0.030*	0.003
Initial level	0.038*	0.030*	0.029*
Gov. investment		0.289*	0.236*
Gov. consumption			0.995
Moran's <i>I</i> (error)	0.099	0.065	0.068
R2 Adj	0.342	0.657	0.670

Note: 25 Iranian provinces, 1996-2005. Nonlinear least squares. Variables in real per capita terms. Dependent variable is the mean growth rate of demand deposits. Initial level is the initial level of demand deposits. Government investment and consumption refer to the average level. * shows significance at least at the 0.05 level.

Table 3: Convergence regressions excluding Tehran

Variable	Coefficient		
Constant	0.028	-0.014	-0.042*
Initial level	0.040*	0.042*	0.044*
Gov. investment		0.319*	0.256*
Gov. consumption			0.124
Moran's <i>I</i> (error)	0.107	-0.025	-0.093
R2 Adj	0.237	0.653	0.692

Note: 25 Iranian provinces, 1996-2005. Nonlinear least squares. Variables in real per capita terms. Dependent variable is the mean growth rate of demand deposits. Initial level is the initial level of demand deposits. Government investment and consumption refer to the average level. * shows significance at least at the 0.05 level.