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Has Kelantan Grown Faster than Other States in Malaysia? A Panel Data Analysis

(Sudahkah Kelantan Membangun lebih Pantas Berbanding Negeri Lain di Malaysia? Satu Analisis Data Panel)

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ABSTRACT

Kelantan has been the poorest state in Malaysia for the past five decades. Despite the various Malaysian Development Plans for the past several decades, regional disparity between states remains in Malaysia. Thus, the objective of the present paper is to address the question whether Kelantan has been narrowing their income gap with other states in Malaysia. Using annual data for the period 1961 to 2003, our panel unit root test result suggest that (1) Kelantan converges towards Kedah, Negeri Sembilan, Perak, Pahang, Perlis and Selangor; (2) Kelantan is catching-up to Johor, Melaka, Penang, Sabah, Terengganu and Wilayah Persekutuan; and (3) Kelantan show divergence with Sarawak. In this respect, the government has an important role to play in enhancing growth by continuously providing stable economic environment for investment and other productive economic activities. This will ensure full convergence can take place in the future.

Keywords: catching-up; convergence; income disparity; regional inequalities

ABSTRAK

Semenjak lima dekad yang lalu, Kelantan merupakan negeri yang paling miskin. Meskipun pelbagai Rancangan Pembangunan Malaysia untuk beberapa dekad yang lalu, ketaksamaan kawasan di antara negeri-negeri masih berlaku di Malaysia. Maka, objektif kertas kerja ini adalah untuk menangani persoalan tentang samaada Kelantan dapat mengurangkan jurang pendapatan dengan negeri-negeri lain di Malaysia. Dengan menggunakan data tahunan untuk tempoh 1961 hingga 2003, hasil ujian punca satu untuk panel mencadangkan bahawa (1) penumpuan (convergence) berlaku di antara Kelantan dengan negeri Kedah, Negeri Sembilan, Perak, Pahang, Perlis dan Selangor; (2) kemajuan negeri Kelantan telah dapat menghampiri (catching-up) dengan kemajuan negeri Johor, Melaka, Pulau Pinang, Sabah, Terengganu dan Wilayah Persekutuan; dan (3) Kelantan telah mencapah (divergence) dengan negeri Sarawak. Dalam hal ini, kerajaan memainkan peranan yang penting untuk meningkatkan pertumbuhan Negara dengan menyediakan persekitaran ekonomi yang stabil untuk pelaburan dan aktiviti-aktiviti ekonomi lain yang produktif. Ini akan memastikan penumpuan penuh boleh berlaku di masa akan datang.

Kata Kunci: mengejar; penumpuan; ketaksamaan pendapatan; ketidakseimbangan serantau

INTRODUCTION

Malaysia's economic growth has surpasses that of the other ASEAN nations including also the industrialized countries. Nevertheless, disparity in income across states in Malaysia continues to be a matter of concern. The existence of regional inequalities and the prospect that these inequalities may widen were recognized by the Malaysian government. As a matter of fact, the eight volumes of the 5-Year Malaysia Plan reflects the sincerity of the Malaysian government in eradicating if not elevating the problem of regional or states imbalances. Accordingly, in their quest to achieve both development and equity at the same time, policies and strategies are continuously being formulated and implemented across the states.

Table 1 and Table 2 show some interesting observations on the performance of the fourteen states in Malaysia for the period 1970 and 2000. In the year 1970, five states - Negeri Sembilan, Perak, Selangor, Sabah and Wilayah Persekutuan registered real GDP per capita that is above the national average. However, in the year 2000, Melaka, Penang, Selangor, Terengganu and Wilayah Persekutuan has been acting as the engine of growth for

TABLE 1. Real GDP per Capita, 1970-2000 (Malaysia=100)

States	1970	1980	1990	2000
Johor	84	89	91	96
Kedah	73	61	59	60
Kelantan	44	60	38	42
Melaka	72	75	83	104
Negeri Sembilan	104	101	84	93
Perak	103	93	79	81
Pahang	93	79	82	67
Perlis	72	60	66	66
Penang	96	113	118	143
Selangor	148	156	142	124
Sabah	118	101	85	65
Sarawak	92	80	88	90
Terengganu	81	71	159	154
Wilayah Persekutuan	176	197	191	205
Malaysia	100	100	100	100

Note: Authors' calculation from Table 5.

TABLE 2. Ranking by States According to Real GDP per Capita, 1970-2000

States	1970	1980	1990	2000
Johor	9	8	5	6
Kedah	11	13	13	13
Kelantan	14	14	14	14
Melaka	13	10	9	5
Negeri Sembilan	4	5	8	7
Perak	5	9	11	9
Pahang	7	6	10	10
Perlis	12	12	12	11
Penang	6	4	4	3
Selangor	2	2	3	4
Sabah	3	7	7	12
Sarawak	8	11	6	8
Terengganu	10	3	2	2
Wilayah Persekutuan	1	1	1	1

Note: Authors' calculation from Table 1.

Malaysia, contributing to real GDP per capita that is above the national average. Take for example the state of Sabah, where in the year 2000, Sabah has been lagging behind the national average by 35% of real GDP per capita. In terms of her ranking, in 1970, Sabah ranked third after Wilayah Persekutuan and Selangor. However in 2000, Sabah ranked twelve followed by Kedah (13^{th}) and Kelantan (14^{th}). The statistics suggest that in 2000 Sabah is the 3^{rd} poorest state in Malaysia, despite her high ranking as the third richest states in 1970.

As for the state of Kedah, she was ranked 11^{th} in 1970, but since 1980 the state of Kedah has been the second poorest state in the country. Kelantan, however, remain the poorest of all the states in Malaysia for the last four decades. The states of Melaka and Terengganu are two good examples where poor states catch up to the richer states in Malaysia. The state of Melaka was ranked 13^{th} in 1970 and by 2000 she was ranked 5^{th}, while Terengganu was ranked 10^{th} in 1970 but in 2000, the state of Terengganu is the second riches state in Malaysia in terms of real GDP per capita. On the other hand, the states of Selangor and Wilayah Persekutuan remain the richest states in Malaysia for the past decades.

The purpose of the present paper is to assess empirically whether the states of Kelantan has been converging, diverging or catching-up with the rest of the thirteen states in Malaysia. In a case of convergence, the existence of market forces will eventually lead to similar living standards across states. On the other hand, the catching-up hypothesis suggests that the poorer states with low initial income and productivity will tend to grow more rapidly by copying the technology from the leader country, say by replacing existing older capital stock with more modern equipment, implying that capital investment is necessary to import the more advanced technology embodied in new equipment (Lim & McAleer 2004). One good example of transferring foreign technology and knowledge to the host country is through foreign direct investment.

In this study, time-series data for the period 1961 to 2003 will be used to evaluate the convergence hypothesis between Kelantan and other states in Malaysia. In a time-series approach, stochastic convergence asks whether permanent movements in one country's per capita income are associated with permanent movements in another countries' income, that is, it examines, whether common stochastic elements matter, and how persistent the differences among countries are. Thus, stochastic convergence implies that income differences among countries cannot contain unit roots. In other words, income per capita among countries is stationary.

The paper is organized as follows. In the next section we present the three panel unit root tests procedure to test the convergence hypothesis. In section 3 we interpret and discuss the results of the analysis. The last section contains our conclusion.

METHODOLOGY

Following Bernard and Durlauf (1995), stochastic convergence occurs if relative log per capita GDP, y_{iqt}, follows a stationary process, where $y_{iqt} = \log Y_{it} - \log Y_{qt}$, and Y_{it} is the log of real per capita GDP for state i, and Y_{qt} is log of real per capita GDP of a reference state, and both series is $I(1)$. Stochastic convergence is commonly tested by using the conventional univariate augmented Dickey-Fuller (ADF) regression of the following form (empirical studies on testing stochastic convergence, among others include Bernard (1991), Bernard and Durlauf (1995), Campbell and Mankiw (1989), Cogley (1990), Greasly and Oxley (1997), St. Aubyn (1999), Cellini and Scorcu (2000) and Carlino and Mills (1993)).

$$\Delta y_{iqt} = \alpha + \lambda t + \beta y_{iqt-1} + \sum_{j=1}^{p} \theta_{ij} \Delta_{iqt-j} + \varepsilon_{iqt}, \quad t = 1,...,T \tag{1}$$

where $i = 1, ..., N$ states, and $j = 1, ..., p$ ADF lags. In a time series framework, a distinction is made between long-run convergence and convergence as catching-up. The statistical tests are interpreted as follows. First, if y_{iqt} contains a unit root (i.e. $\beta = 0$), real GDP per capita for state i and q diverge over time. Second, if y_{iqt} is stationary (i.e. no stochastic trend, or $\beta < 0$) and (a) $\alpha = 0$ and $\lambda = 0$ (i.e the absence of a deterministic trend) indicates absolute convergence between states i and q. In this case, poor states is growing faster than the rich states given the initial condition so that the gap between two states becomes zero; (b) $\alpha \neq 0$ and $\lambda = 0$ indicates a conditional convergence whereby the gap between the two states diminishes in the course of time and finally becomes a constant; (c) $\alpha \neq 0$ and $\lambda \neq 0$ indicates catching-up (or narrowing of output differences) between states i and q.

According to Oxley and Greasley (1995) catching-up differs from conditional convergence in that the latter relates to some particular period T equated with long-run steady-state equilibrium. In this case the existence of a time trend in the non-stationary log Y_{it} – log Y_{qt} would imply a narrowing of the (per capita income) gap or simply that the states though catching-up had not yet converged. Conversely, the absence of a time trend in the stationary series implies that catching-up has been completed. The literature on catching-up suggests that due to diffusion and imitation, relatively backward countries should grow at a faster rate. Through diffusion and imitation it is supposed that a 'follower' country experiencing a technological gap can increase its rate of economic growth by catching-up with the technology of the 'leader'. As pointed by Skonhoft (1995), a main premise for the process of convergence is the existence of differences in the level of technology embodied in a country's capital stock compared to the level of technology embodied in the leading country's capital stock. Catching-up therefore implies that the capital stock in a country following behind becomes relatively more recent than in the leading country as time goes by. Lim and McAleer (2004) further elaborate that technological catching-up is associated with innovation (e.g. R & D) and capital investment (importing advanced technology). Besides innovation and investment, the level of education (social capability) also plays a crucial role in determining the technical competence of the labor force.

However, one important drawback of using the univariate ADF unit root test procedures is that the power of the test is quite low. Some authors recognised that the power could be significantly improved if panel data are used instead of a univariate time-series (Levin et al. 2002; Im et al. 1997). Furthermore, the panel approach appears extremely appealing because the inclusion of a limited amount of cross-sectional information induces significant improvement in term of power. For the panel unit root test procedures, Levin et al. (2002) proposed to perform the augmented Dickey-Fuller tests based on the following regression model. For a sample of N groups observed over T time periods, the panel unit root regression of the ADF test is written as

$$\Delta y_{it} = \alpha_i + \beta_i y_{it-1} + \sum_{j=1}^{p_i} \gamma_{ij} \Delta y_{it-j} + \varepsilon_{it}, \quad i = 1,...,N, \quad t = 1,...,T \tag{2}$$

where α_i, β_i and γ_{ij} are parameters and the error terms ε_{it} are uncorrelated across regions. The Levin-Lin-Chu tests for the H_0: $\beta_i = 0$ against H_a: $\beta_i < 0$. Under the null hypothesis, they show that the test statistics, τ^* is asymptotically distributed according to the standard normal distribution.

On the other hand, Im et al. (1997) extent the work of Levin et al. (2002) to allow for heterogeneity in the value of β_i in Equation (2). Im et al. (1997) proposed a t-bar statistic, which is based on the average of the individual ADF t-statistics. The null hypothesis of a unit root in the panel data is defined as $\beta_i = 0$ for all i against the alternatives that all series are stationary processes $\beta_i = 0$, $i = 1, 2, ..., N_1$; $\beta_i = 0$, $i = N_1 + 1, N_2 + 2, ..., N$. This equation of the alternative hypothesis allows for $\beta_i = \beta < 0$ for all i.

To test the hypothesis, Im et al. (1997) propose a standardised t-bar statistic given by

$$\Psi_{\bar{t}} = \frac{\sqrt{N}\left\{\bar{t}_{NT} - (1/N)\sum_{i=1}^{N} E[t_{i,T}(p_i, 0) \mid \beta_i = 0]\right\}}{\sqrt{(1/N)\sum_{i=1}^{N} Var[t_{i,T}(p_i, 0) \mid \beta_i = 0]}} \tag{3}$$

where $\bar{t}_{NT} = \frac{1}{N}\Sigma t_{i,T}(p_i, \beta_i)$ and $t_{i,T}(p_i, \beta_i)$ is the individual t-statistic for testing $\beta_i = 0$ for all i. $E[t_{i,T}(p_i, 0)|\beta_i = 0]$ and Var $[t_{i,T}(p_i, 0)|\beta_i = 0]$ are reported in Table 2 of Im et al. (1997). Under the null hypothesis, the standardised t-bar statistic Ψ_i is asymptotically distributed as a standard normal distribution ($\Psi_i \sim N(0,1)$). The Im et al. (1997) panel unit root test is derived assuming that the series are independently generated, and they suggested subtracting cross-sectional means to remove common time specific effects. This assumes the error term in Equation (2) consists of two random components, $\varepsilon_{iqt} = \delta_t + v_{iqt}$ where v_{iqt} is the idiosyncratic random component, and δ_t is a stationary time-specific effect that accounts for correlation in the errors across economies.

Another commonly used panel unit root test is the one based on Fisher (1932). Maddala and Wu (1999) propose the test statistic which is based on combining the p-values of the test statistics (of β_i) of N independent ADF regressions from Equation (2). The test statistic (the Fisher test $P(\lambda)$) is as follows

$$P(\lambda) = -2\sum_{i=1}^{N} \log(\pi_i) \tag{4}$$

where π_i is the p-value of the test statistic for unit i. The Fisher test statistic $P(\lambda)$ is distributed as a chi-squared distribution with $2N$ degree of freedom.

SOURCES OF DATA

The data used in this study are annual observations on per capita gross domestic product (GDP) in constant 2000 prices for fourteen states. These states are Perlis, Kedah, Kelantan, Terengganu, Penang, Perak, Pahang, Selangor, Negeri Sembilan, Melaka, Johor, Sabah, Sarawak and Wilayah Persekutuan. The sample covers the period 1961 to 2003. Data for states GDP at constant prices are collected from the various issues of the 5-Year Malaysia Plan. A complete range of time-series data for states per capita real GDP were interpolated using information on time, time-squared, time-cubed and lagged one-period Malaysia's per capita real GDP. The reference state, q, used in this study is the average real GDP per capita of all the 14 states' real GDP per capita. The full data set is presented in Table 5.

EMPIRICAL RESULTS

Before testing for convergence based on Equation (2), it is essential to determine the order of integration for each of the states income series. The standard ADF tests are used to test for the presence of unit roots in the logarithm of per capita states income. The result of the ADF test are reported in Table 3, with series in levels are run with constant and trend, while series in first difference are run with a constant only. The chosen lag length is selected based on SIC. (EViews6.1 was used in this study and the software automatically selects the optimal lag length based on SIC). The estimated t-statistics for the ADF test reported in Table 3 indicate that all states real GDP per capita series are processes. The null hypothesis of unit root cannot be rejected at the 5% level of significance for series in levels, while for series in first difference, the null hypothesis of $I(2)$ can be rejected at the 5% level of significance. In other words, the states per capita income series achieve stationarity after first differencing.

Having determined that all states per capita GDP are integrated of order one, that is, they are $I(1)$ processes; we proceed for the testing of stochastic convergence by using Equation (2). We do this by employing the panel unit root test due to Levin et al. (2002), LLC-test; Im et al. (1997), IPS-test; and Maddala and Wu (1999), MW-test, on the differential between Kedah per capita real GDP and the rest of the Malaysian states per capita real GDP. The result is presented in Table 4.

In testing for convergence hypothesis in the panel setting, we follow the strategy suggested by Jungmittag (2006). In the first step, all the 13 income differential variables, y_{iqt}, is estimated using Equation (1) and each

TABLE 3. Result of Unit Root Test for State per Capita Real Income Series

Per capita real GDP by state	Levels (Constant and trend)	Lag length	First difference (Constant)	Lag length
Johor	-2.26	0	-5.36	0
	[0.44]		[0.00]*	
Kedah	-2.64	4	-5.08	0
	[0.26]		[0.00]*	
Kelantan	-2.66	9	-6.84	1
	[0.25]		[0.00]*	
Melaka	-2.34	1	-7.69	0
	[0.40]		[0.00]*	
Negeri Sembilan	-2.78	0	-7.47	0
	[0.21]		[0.00]*	
Perak	-2.40	2	-5.74	0
	[0.36]		[0.00]*	
Pahang	-2.70	0	-7.92	0
	[0.24]		[0.00]*	
Perlis	-2.56	0	-7.12	0
	[0.29]		[0.00]*	
Penang	-2.05	0	-6.87	0
	[0.55]		[0.00]*	
Selangor	-2.84	1	-9.44	0
	[0.18]		[0.00]*	
Sabah	-2.79	0	-8.11	0
	[0.20]		[0.00]*	
Sarawak	-1.76	2	-7.81	1
	[0.70]		[0.00]*	
Terengganu	-3.03	2	-6.30	0
	[0.13]		[0.00]*	
Wilayah Persekutuan	-2.77	0	-7.80	0
	[0.21]		[0.00]*	

Notes: All unit root estimations were done using EViews6.1. EViews6.1 automatically select lag length based on SIC as default and was used throughout the analysis. The square brackets [.].contain the p-values. Asterisk (*) denotes statistically significance at 5% level. Critical values for unit root test are referred to MacKinnon (1996).

of the individual equations are check for the significant of the constant and trend. The individual estimated equation that shows significant constant and trend (or trend) is cluster into Group 3. Group 2 should contain that show significant in the constant term (with no trend) while Group 1 should contain y_{iqt} that show insignificant constant term or no constant (and no trend). In the second step, the panel unit root tests-LLC-test, IPS-test and MW-test, by using Equation (2) are carried out for the subgroups of test equations without a (or with insignificant) constant (if stationary: absolute convergence), with a constant (if stationary: conditional convergence), and with a constant and a time trend (if stationary: convergence as catching-up).

Table 4 shows the results of clustering of using Equation (1). Group 1 consists of Sarawak only. Group 2 comprises of Kedah, Negeri Sembilan, Perak, Pahang, Perlis and Selangor, while Group 3 compose of Johor,

TABLE 4. Panel Unit Root Tests for Convergence

States	*ADF*-statistic	*p*-values	Lags	Remarks
Group 1: No constant, no trend				
Sarawak	0.6821	0.859	2	Divergence
Panel data tests for Group 1				
LLC-test[a]	-	-		-
MW-test[b]	-	-		-
IPS-test[c]	-	-		-
Group 2: Constant, no trend				
Kedah	-3.7036*	0.007	0	Convergence
Negeri Sembilan	-4.0051*	0.003	0	Convergence
Perak	-3.5377*	0.011	0	Convergence
Pahang	-4.1206*	0.002	0	Convergence
Perlis	-3.8883*	0.004	0	Convergence
Panel data tests for Group 2				
LLC-test	-4.1521*	0.000		Convergence
MW-test	64.7558*	0.000		Convergence
IPS-test	-6.6116*	0.000		Convergence
Group 3: Constant and trend				
Johor	-4.1333*	0.011	0	Catching-up
Melaka	-3.6492*	0.037	1	Catching-up
Penang	-4.2490*	0.008	0	Catching-up
Sabah	-4.8340*	0.001	0	Catching-up
Terengganu	-3.8767*	0.022	0	Catching-up
W. Persekutuan	-4.1685*	0.011	5	Catching-up
Panel data tests for Group 3				
LLC-test	-5.0204*	0.000		Catching-up
MW-test	54.2344*	0.000		Catching-up
IPS-test	-5.9247*	0.000		Catching-up

Notes: [a]Under the null hypothesis that all series in the panel are unit root against the alternative that all series are stationary, the adjusted *t*-statistic τ^*, obtained from the pooled regression has a limiting distribution of a standard normal distribution. [b]Under the null hypothesis, the Fisher test statistic $P(\lambda)$ is distributed as a chi-squared distribution with $2N$ degree of freedom. [c]Under the null hypothesis the standardised *t*-bar statistic $\psi_{\bar{t}}$ (the - test statistic) is asymptotically distributed as a standard normal distribution. Lag length chosen is based on SIC which is automatically selected by EViews6.1. Asterisk (*) denotes statistically significance at 5% level.

Melaka, Penang, Sabah, Terengganu and Wilayah Persekutuan. For Group 1, since Sarawak is the only state in this group, the valid unit root test is the univariate ADF test procedure. Our result indicates that the null hypothesis of a unit root cannot be rejected at the 5% significant level. Thus, this suggests divergence between Kelantan and the state of Sarawak.

For Group 2, the results of univariate ADF unit root tests indicate that the state of Kedah converge stochastically with the states of Kedah, Negeri Sembilan, Perak, Pahang, Perlis and Selangor. For all these states the null hypothesis of a unit root can be rejected at the 5% level of significant. On the other hand, the panel unit root test of LLC, IPS and MW clearly suggest that there is stochastic convergence between Kedah and all the states in the group. Thus, a permanent technology innovation, for example, does not affect long-run relative real GDP since the differential between economies is temporary. State-specific economic shocks do not cause permanent or persistent deviations in relative per capita real income.

Lastly, for Group 3, we can observe that Kedah showing convergence in catching-up with states in the group. The univariate ADF test results suggest that Kedah has been catching-up with the states of Johor, Melaka, Penang, Sabah, Terengganu and Wilayah Persekutuan. Similarly, our panel unit root test results overwhelmingly suggest that Kedah has been catching-up with all the states in the group. Results indicate that the null hypothesis of a unit root in the panel can be rejected at the 5% level of significant for all three panel unit root tests-LLC, IPS and MW.

In summary our panel unit root test results suggest that the state of Kedah converges stochastically towards Kedah, Negeri Sembilan, Perak, Pahang, Perlis and Selangor, while catching-up with Johor, Melaka, Penang, Sabah, Terengganu and Wilayah Persekutuan.

TABLE 5. GDP per Capita by States (Constant 2000) in Malaysia

Year	Malaysia	Johor	Kedah	Kelantan	Melaka	Negeri Sembilan	Perak	Pahang	Perlis	Penang	Selangor	Sabah	Sarawak	Terengganu	Wilayah Persekutuan
1961	3617	3059	3240	1461	3891	4038	4036	3468	2689	3454	5077	1022	2138	5520	5005
1962	3675	3045	3079	1534	3699	4006	3986	3399	2661	3526	5271	1614	2399	4653	5168
1963	3155	3022	2616	1806	3091	4226	3587	3547	2281	2990	5480	1835	2424	3396	4964
1964	3303	2959	2778	1775	2827	3446	3796	3741	2509	3168	5588	2595	2565	3346	4934
1965	3521	3084	2681	1619	2752	3609	3901	3580	2477	3257	5266	3009	2857	3002	5488
1966	3589	3022	2713	1464	2978	3836	3796	3612	2640	3347	5301	3310	3083	2805	5948
1967	3464	2897	2713	1464	2639	3706	3796	3418	2737	3347	5588	4031	2930	3002	6099
1968	3540	2804	2681	1526	2601	3706	3692	3418	2965	3436	5445	4167	3132	2854	6282
1969	3957	3022	2616	1588	2978	3771	3761	3386	2770	3391	5337	4133	3098	2805	6941
1970	3933	3053	2616	1619	2601	3771	3726	3354	2607	3480	5337	4270	3334	2953	6338
1971	3962	3691	2874	1981	2859	4418	4441	4048	2857	3653	7131	4811	3472	3103	8512
1972	4102	3615	2766	2105	2764	4341	4128	4172	2928	4118	6681	5225	3711	2863	7972
1973	4769	4035	2969	2341	3277	4779	4512	4439	3280	4962	7456	5677	4159	2989	8890
1974	4846	4302	3200	2396	3324	5052	4788	4869	3505	5078	7343	5610	4318	3806	9654
1975	4417	4715	3242	3196	3998	5308	4915	4206	3185	5970	8254	5311	4239	3744	10381
1976	5299	4533	3221	2590	3705	5161	4789	4896	3583	5689	8418	6438	4783	4047	10118
1977	5671	5015	3606	2729	4033	5681	5308	5487	4009	6180	8497	6333	5086	5106	11310
1978	6199	5573	3824	3318	4426	6286	5852	5759	3697	6948	9206	7203	4824	5117	12327
1979	7154	6126	4294	3225	5332	6844	6380	6341	4947	8089	9915	6830	6056	6368	13696
1980	7502	6294	4542	3224	4959	7419	6178	6875	4895	7860	9940	6622	4951	8022	13725
1981	7190	6614	4763	3272	5493	7273	6810	7106	5298	8222	9663	6518	6316	8544	14991
1982	7191	6587	4691	3287	5574	7124	6607	6970	5170	8273	10080	6849	6438	8842	14852
1983	7545	6821	4895	3469	5723	8259	7114	7884	5345	9161	10184	6961	5656	8921	15376
1984	8032	7234	5059	3568	6450	7673	7064	7340	5603	9433	11195	7299	7093	10081	16125
1985	7593	7097	5010	3735	5900	8137	6909	8236	5598	9000	10247	7057	6836	9961	17680
1986	6776	6635	4747	3178	5942	6674	6021	6835	5051	8162	10385	7456	7653	12106	14397
1987	7437	6906	4735	3407	6305	6883	6155	6778	4938	8911	11752	7897	7165	11449	15184
1988	8055	7144	5113	3345	6569	7205	6526	7308	5400	9279	11523	7823	7994	12467	15901
1989	8697	8025	5470	3796	7593	7976	7195	7589	5814	10646	12730	7973	8025	13406	17509
1990	9318	8657	5608	3684	7924	8011	7507	7832	6283	11179	13481	8035	8382	15060	18124
1991	9899	9110	6165	4158	8851	9010	8183	8319	6640	12333	13639	8024	8856	15329	19738
1992	10245	9509	6425	4259	9278	9349	8511	8584	6908	12872	13858	7976	9148	16298	20559
1993	10991	10443	7056	4179	9787	9537	9085	9089	7810	14130	15242	7714	9570	17161	21723
1994	11717	10685	7092	4692	10777	10453	9556	9170	7785	14937	15093	8218	10112	17868	22867
1995	12552	11439	7367	5156	13314	10633	10698	8874	8714	16810	16515	8484	10929	18527	24501
1996	13480	12134	7943	5206	12518	11880	10945	9976	8922	17392	16310	8331	11218	19633	25793
1997	14232	12832	8368	5420	13284	12561	11624	10400	9466	18470	16686	8263	11708	20626	27237
1998	13299	12551	8484	4699	11904	11575	11386	10336	9103	16719	14901	7488	11216	22774	26592
1999	13291	12418	7948	5097	12816	11701	10773	9647	8741	17624	16134	8269	11490	21454	26168
2000	14447	13253	8253	5786	14371	12798	11149	9292	9182	19699	17118	9013	12490	21226	28208
2001	13734	13068	8236	5188	13471	12126	11227	9754	9062	18526	16141	8129	11949	22807	27436
2002	14287	13208	8037	5331	14065	12063	11093	9158	8984	19402	17200	8873	12341	22182	27362
2003	15074	13600	8094	5640	14464	12940	11476	9601	8995	20400	17850	9074	13196	22063	27979

Notes: States' per capita real GDP were interpolated using time, time-squared, time-cubed and lagged one period in Malaysia's per capita real GDP. Interpolation were done using information on various states real per capita GDP collected from the various issues of the 5-Year Malaysia Plans and Mid-Term Review of the Malaysia Plans. All values in Ringgit Malaysia.

CONCLUSIONS

Since independence, Malaysia has undergone profound transformations and has been considered as one of the fastest growing economy in the Asian region. Despite having recognized as the new emerging market economies, Malaysia's regional income disparity has been a major concern of the Malaysian authority. There are instances that rich states become richer and poor states become poorer over time for the past 40 years. However, the state of Kelantan is an exception in this case. It ranked fourteen as the poorest state in 1970 and over 40 years Kelantan performance has sustained as the poorest state in Malaysia in 2000. Nevertheless, despite this poor ranking, our question is has Kelantan been converging, diverging or catching-up with other states in Malaysia for the past four decades.

Using annual data of states' real GDP per capita for the period 1961 to 2003, we employed three panel unit root test procedure for testing the hypotheses of stochastic convergence, divergence or convergence as catching-up between Kelantan and the rest of the thirteen states in Malaysia. Our results using both univariate and panel unit root tests suggest that the state of Kedah has been catching-up with the states of Johor, Melaka, Penang, Sabah, Terengganu and Wilayah Persekutuan, while stochastic convergence is shown between Kelantan and Kedah, Negeri Sembilan, Perak, Pahang, Perlis and Selangor. However, the case for divergence is shown between Kedah and Sarawak.

Generally, the lack of convergence and the existence of lagging states imply that resources are being underemployed. Thus, one way of improving economic welfare is to put these unused resources to productive use. It follows that national GDP per capita could be increased by raising the productivity of these lagging regions; and regional policy provides a means of achieving this objective. In this respect, the local government has an important role to play to promote economic growth and development in the state of Kelantan.

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