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ON THE EXISTENCE OF A MIDDLE INCOME TRAP

by

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Abstract

The term "middle income trap" has been widely used in the literature, without having been clearly defined or formally tested. We propose a statistical definition of a middle income trap and derive a simple time-series test. We find that the concept survives a rigorous scrutiny of the data, with the growth patterns of 19 countries being consistent with our definition of a middle income trap.

Keywords: Economic Growth, Convergence, Economic Development.

JEL: O1, O40, O47

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1 Introduction

The term "middle income trap" was coined by Gill and Kharas (2007) to describe apparent growth slowdowns in many former east Asian miracle economies. Along with other recent studies they raised the concern that sustaining growth through the middle income band requires significant reforms to the institutions of economic policy making and political processes (Yusuf and Nabeshima 2009, Woo 2009, Ohno 2010, Reisen 2011). Likewise a growing literature claims to find evidence of middle income traps across a wide number of countries (Eichengreen, Park and Shin 2011, The World Bank 2011, Kharas and Kohli 2011, Felipe, Abdon and Kumar 2012, The World Bank 2012).[1]

But does such a thing as a middle income trap really exist? The literature so far is based only on informal and descriptive evidence. Specifically the time series properties of the per-capita income data have not been considered. Hence what appears to be a lack of catch-up in per capita income levels, may in fact reflect phenomena that are inconsistent with the notion of a trap, such as slow convergence or a stochastic trend. Conversely short run transitional dynamics in the growth process may cause an appearance of strong growth over some finite period, even if a country were in a middle income trap. In both cases identifying the true growth path may be further confounded by the presence of structural breaks.

Hence we argue that convergence of growth rates, within a middle income band, is a necessary condition for a middle income trap (MIT hereafter). To see if the concept of a MIT stands scrutiny, we therefore apply time-series tests to a sample of middle income countries. We find that nearly half of the sample satisfy our definition, including two former east Asian miracle economies.

2 Defining a Middle Income Trap

In order to operationalize the idea of a MIT, first consider a reference country that is growing on a balanced path at a rate equal to the growth rate of the world technology frontier. It will be convenient to define a middle income band as a range of per capita incomes relative to this reference country.[2]

Then a necessary condition for country i to be in a MIT is that the expected value, or

[1] The idea has gained considerable attention in the popular policy debate (Schuman 2010, Izvorski 2011, Reisen 2011, The Economist 2012, The Economist 2013).

[2] This implicitly assumes that the world relative distribution of per capita incomes is time invariant.

long term forecast, of i's per capita income relative to the reference country is: (i) time invariant, and; (ii) lies within this middle income band.

Specifically let $y_{i,t}$ be the natural logarithm of country i's per capita income in year t, and $y_{r,t}$ be the log income of the reference country in year t. Note that if $y_{r,t}$ and $y_{i,t}$ contain a common deterministic trend, then $x_{i,t} \equiv y_{i,t} - y_{r,t}$ is stationary. Further let $\overline{y}_{r,t}$ and $\underline{y}_{r,t}$ define a middle income range for countries' per capita incomes. Then, if I_t denotes the information set at time t, a compact expression for a MIT is

Definition of a MIT. Country i is in a MIT if

$$\lim_{k\to\infty} E(x_{i,t+k}|I_t) = \bar{x}_i, \tag{1}$$

$$\underline{y}_{r,t} - y_{r,t} \leq \bar{x}_i \leq \overline{y}_{r,t} - y_{r,t}, \tag{2}$$

where $\bar{x}_i$ is a constant.

Equation (1) is familiar from the convergence literature such as Bernard and Durlauf (1996), Greasley and Oxley (1997) and Li and Papell (1999).[3] It requires that the series $x_{i,t}$ be stationary with a nonzero mean. In particular the presence of a stochastic trend in $x_{i,t}$ violates (1) since the mean of a stochastic trend is not time invariant. In addition (2) requires that $\bar{x}_i$ lies in the middle income band. This is important since, if $x_{i,t}$ is stationary, the long run mean $\bar{x}_i$ may differ substantially from the current value of $x_{i,t}$, or the simple mean calculated over some finite interval, due to short run dynamics.

3 A Test Procedure

We test for a presence of a MIT using the following Augmented Dick-Fuller (ADF) unit root test specification,

$$\triangle(x_{i,t}) = \mu + \alpha(x_{i,t-1}) + \sum_{j=1}^{k} c_j \triangle(x_{i,t-j}) + \varepsilon_{i,t} \tag{3}$$

Suppose we consider the null hypothesis (H_0) that $x_{i,t}$ has a unit root, namely, $\alpha = 0$.

[3]See Durlauf, Johnson and Temple (2005) for a survey.

The alternative hypothesis (H_1) is that $x_{i,t}$ is stationary, $\alpha < 0$.[4]

If the null is rejected we then check to see if (2) is satisfied by checking that the estimated mean of the series, $\bar{x}_i = -\mu/\alpha$, is within the middle income band.

We begin by performing the above ADF unit root tests on each country in our sample country. If the null is not rejected for some country, we then consider the possibility of structural breaks. We allow for (i) a simple break in the level of the series $x_{i.t}$, and; (ii) a short run time trend t in any period, prior to structural breaks, in both of the level and the slope.[5]

To allow for one structural break we include the "intercept" dummy DU_t and "slope" dummy DT_t, where, for some endogenous break date, T_B: $DU_t = 1$ if $t > T_B$, 0 otherwise, and; $DT_t = t - T_B$ if $t > T_B$, and 0 otherwise. To allow for a second structural break, we simply include another set of "intercept" and "slope" dummies.

We therefore consider a sequence of tests, first allowing no breaks for each sample country. Then if the unit root cannot be rejected, we further allow for one structural break, and tests for unit root in x_{it} in the last period following any break. Finally if the null is not rejected we then consider two structural breaks.[6] The lag length is chosen using the procedure described by Bai and Perron (1998).[7]

4 Data

The natural candidate for a reference country is the USA. As shown by Jones (2002), over the last 125 year the average growth rate of GDP per capita in the USA has been a steady 1.8 percent per year. It is therefore natural to think of the USA as lying close to the technological frontier and on a balanced growth path. This contrasts with many European economies that experienced significant catching-up during the early post WWII period - the golden age (Landon-Lane and Robertson 2009).

[4]A time trend in $x_{i,t}$ means that one country will grow infinitely large relative to another. In (3) we therefore do not include a time trend. In particular if all countries have the same long run growth rates, $x_{i,t}$ must either be level stationary or have a unit root. Below however we do consider the possibility of a short run time trend followed by a structural break.

[5]Note that any short run trend will be finally eliminated by the breaks, so this is consistent with our earlier statement that there should be no long run time trend.

[6]The test procedure for one or two breaks reservedly follows Zivot and Andrews (1992) and Lumsdaine and Papell (1997) respectively, albeit in a different context.

[7]That is, working backwards from k=$k_{max} = 8$, the first value of k is chosen such that the t statistic on c_k is greater than 1.65 in absolute value and the t statistic on c_p for $p \geq k$ is less than 1.65.

Table (1) provides the list of middle income countries, defined as the middle 40% of countries ranked by $PPP GDP per capita in 2010, taken from Heston, Summers and Aten (2012). This corresponds with a range of 8%-36% of the USA per capita GDP.[8] According to this definition, 46 out of 189 countries are middle income countries.[9]

[Table 1 about here]

In order to contrast our approach with the existing literature, Table (1) also lists the simple mean growth rate of relative income (i.e the mean of $x_{i,t} - x_{i,t-1}$) for each country. If this is significantly different from zero it indicates that there has been catch-up, or divergence, relative to the USA over the sample period. Alternatively if the growth rate of income for country i, relative to the USA is approximately zero, that country may appear to be in a MIT. This corresponds to an informal test of a MIT similar to approaches used in the existing literature. It can be seen that all but nine countries in our sample pass this informal test. Thus we have a list of 37 suspect MIT countries, from a total of 46.

This estimate of the growth rate of relative income, however, is only valid if there are no short-run dynamics present in the underlying data generating process for the growth rate of per capita incomes. As disused above, a better definition of a MIT would consider whether the long run mean value $\bar{x}_i$ is: (i) stationary and (ii) in the middle income band.

5 Results

Table (2) lists the countries for which the null hypothesis can be rejected at some stage in the test sequence described above. It includes information on the number and type of endogenous trend breaks, the dates of any trend breaks, and the estimated value of $\bar{x}_i$.[10]

We find that, of our sample of 46 middle income countries, there are 23 for which we can reject the null that $x_{i,t}$ is non-stationary and 23 for which we cannot reject the null. Furthermore, of the 37 countries which appear to have no tendency for catch-up – that is where the simple mean growth rate of relative incomes is zero – there are 21 for which we

[8] We exclude countries with populations under one million and countries whose data on GDP per capita start later than 1970.

[9] Since the shape of the world distribution of country incomes (relative to the USA) has been very constant over the last 50 years, the choice of 2007 as a reference year is innocuous. Also the choice of 2007 mitigates the disturbance brought by the global financial crisis. Including the financial crisis period until 2010, however, does not make any substantive difference to our results.

[10] Detailed results for ADF tests, ZA tests and LP tests are available upon request.

cannot reject the null hypothesis of a non-stationarity. Hence our first conclusion is that by ruling out stochastic trends we eliminate approximately half (21/37) of our suspect MIT countries.

Second, of the nine countries in Table (1) that have mean growth rates of relative incomes that are significantly different from zero, there are seven where we find that we can also reject the null hypothesis, implying a stationary trend. Thus, despite the appearance of strong catch-up, or divergence, in many middle income countries, we find that this catch-up has been interrupted by a structural break or is insufficiently strong to break out the middle income band.

Finally of the 23 countries where we find a stationary trend, there are four – namely Bolivia, Indonesia, Mongolia and Morocco – for which $\bar{x}_i$ is below our pre-specified middle income band. For these countries, therefore, it might be argued that their income levels are not high enough to qualify as being middle income. None of countries in our sample have $\bar{x}_i$ above the middle income band. Thus overall we find there are 19 out of 46 countries that satisfy our strict definition of a MIT.

The results for the 23 countries with stationary trends can be seen visually in Figure (1). Each panel illustrates the short run and long run dynamics of one country by showing the actual path of the log of relative income $x_{i,t}$ and the predicted long run mean $\bar{x}_i$. The middle income band in this figure corresponds to the range $\ln 0.36 = -1.02$ to $\ln 0.08 = -2.53$.

Thus, for example, it can be seen that relative income in Botswana has increased, implying catch-up. Nevertheless this can be seen to be a result of short dynamics of convergence to a mean that is still within the middle income band.

A similar pattern is evident for Indonesia and Thailand which are of interest since much of the motivation for looking at the existence of MITs was the relatively sudden growth slowdown in these former east Asian miracle economies. In these cases our results confirm a deterministic trend followed by a structural break at about the time of the financial crisis. Hence since the 1990's both country's growth paths of relative income are consistent with a MIT. Note, however, that in the case of Malaysia we cannot reject the null hypothesis.

Finally Figure (1) also also shows that some countries, particularly Iran and Mexico, have fallen into a MIT after several decades of strong convergence which took then temporarily above the middle income band.

[Table 2 about here]

[Figure 1 about here]

6 Conclusion

Does a middle income trap really exist? We provide a testable definition of a MIT. Our definition requires that the long-term forecasts of income levels show no tenancy to converge to the wealthy group of countries, or diverge below the middle income band. This differentiates between middle income traps and other short run phenomena such as: (i) middle income slowdowns, which may be due to standard convergence arguments; (ii) structural breaks, and; (iii) stochastic trends.

Naturally other definitions and test procedures are possible. Likewise we have not commented on the likelihood of middle income traps, versus non-convergence at any other level of income. Nevertheless our results show that the concept of MITs stands scrutiny in a statistical sense. Specifically the growth trajectories of a large number of current middle income countries are consistent with what we would expect to observe if they were in a middle income trap.

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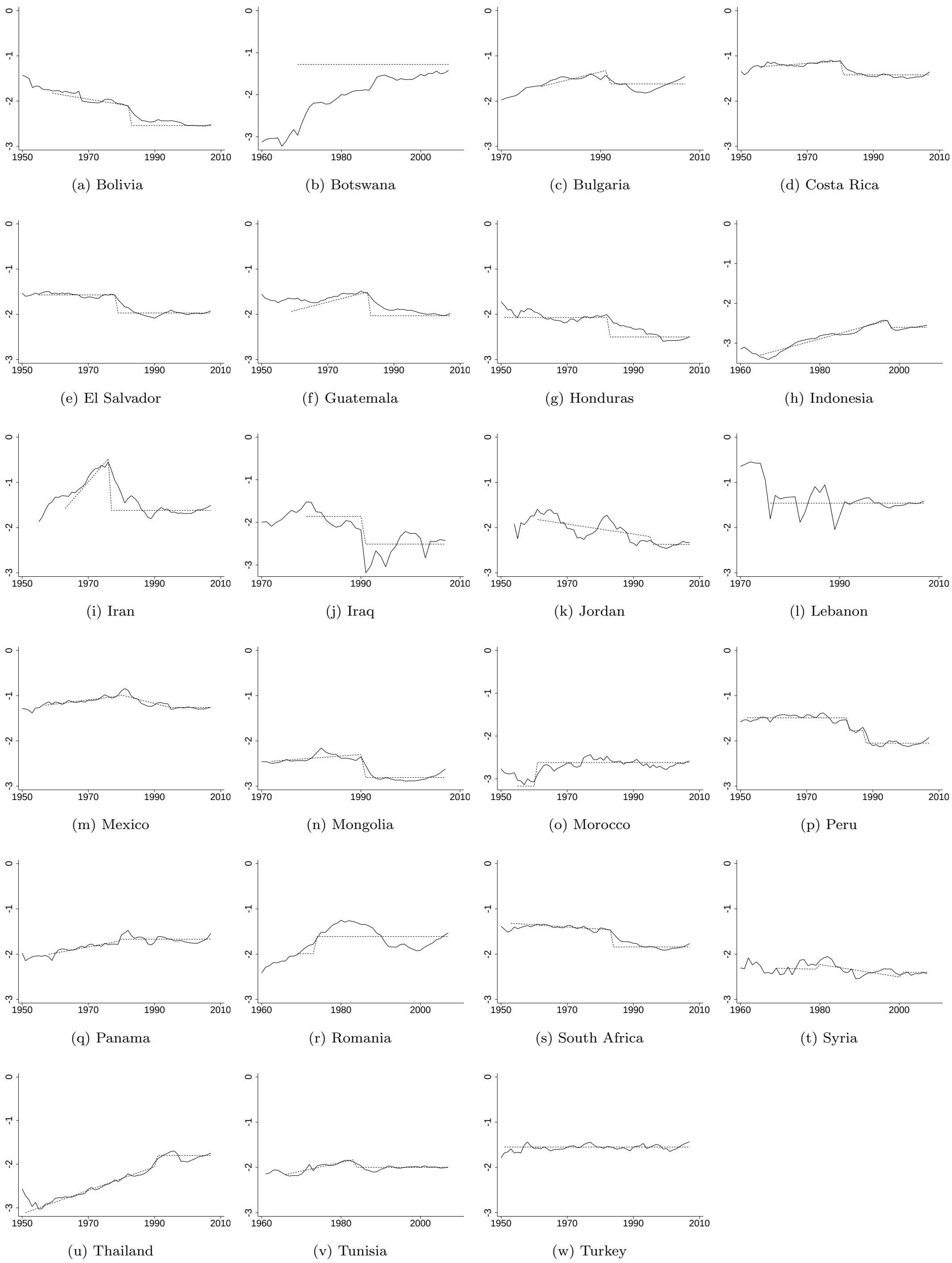
The Computation of $\bar{x}_i$

Assume X_t is autoregressive level stationary of order p, namely, $X_t = \mu + \alpha_1 X_{t-1} + \alpha_2 X_{t-2} + ... + \alpha_p X_{t-p} + \varepsilon_t$, where $t = p+1, p+2, ...$ Equivalently, it can be written as: $\triangle(X_t) = \mu + \alpha(X_{t-1}) + \sum_{j=1}^{p-1} c_j \triangle(X_{t-j}) + \varepsilon_t$, where $\alpha = -(1 - \alpha_1 - \alpha_2 - ... - \alpha_p)$. The formula of $\bar{X}$ is $-\mu/\alpha$.

If X_t is autoregressive trend stationary of order p, $X_t = \mu + \beta t + \alpha_1 X_{t-1} + \alpha_2 X_{t-2} + ... + \alpha_p X_{t-p} + \varepsilon_t$, then it can be equivalently transformed as (**?**): $X_t = a + bt + x_t, t = 1, 2, ...,$ where x_t is zero mean stationary process. The formula of $\bar{X}$, which is a function of t, is $a + bt$, where $b = \beta/(1 - \alpha_1 - \alpha_2 - ... - \alpha_p)$, and $a = [\mu - b(\alpha_1 + 2\alpha_2 + 2\alpha_3 + ... + p\alpha_p)]/(1 - \alpha_1 - \alpha_2 - ... - \alpha_p)$.

Based on estimated coefficients reported in Table (3), Table (4) and Table (5), we can calculated the $\bar{x}_i$ by adopting the appropriate formulas above, with dummy coefficients taken into account when there are structural breaks.



(a) Bolivia (b) Botswana (c) Bulgaria (d) Costa Rica (e) El Salvador (f) Guatemala (g) Honduras (h) Indonesia (i) Iran (j) Iraq (k) Jordan (l) Lebanon (m) Mexico (n) Mongolia (o) Morocco (p) Peru (q) Panama (r) Romania (s) South Africa (t) Syria (u) Thailand (v) Tunisia (w) Turkey

Figure 1: $\bar{x}_i$ for Countries in a MIT
Source: Penn World Table Version 7.1.
Note: For the computation of $\bar{x}_i$ see supplements.

Table 1: 46 Middle Income Countries

Country	GDP per capita	% of the USA	Observations	Growth Rate of Relative Incomes
Albania	6617	16.00	38	−0.0020
Algeria	6263	15.14	48	−0.0136
Angola	5108	12.35	38	−0.0027
Argentina	12340	29.83	58	−0.0081
Bolivia	3744	9.05	58	−0.0191 * **
Botswana	9675	23.39	48	0.0363 * **
Brazil	8324	20.12	48	0.0055
Bulgaria	10590	25.60	38	0.0140
Chile	12525	30.28	57	0.0035
China	7746	18.73	56	0.0242 * **
Colombia	7536	18.22	58	−0.0034
Costa Rica	11500	27.80	58	−0.0002
Cuba	11511	27.83	38	0.0032
Dominican Republic	10503	25.39	57	0.0093
Ecuador	6227	15.05	57	−0.0018
Egypt	4854	11.73	58	0.0084
El Salvador	6169	14.91	58	−0.0069
Gabon	9896	23.92	48	−0.0071
Guatemala	6091	14.73	58	−0.0075*
Honduras	3580	8.65	58	−0.0135 * *
India	3477	8.41	58	0.0069
Indonesia	3966	9.59	48	0.0127*
Iran	9432	22.80	53	0.0071
Iraq	9432	22.8	38	−0.0116
Jamaica	8539	20.64	55	−0.0054
Jordan	4463	10.79	54	−0.0078
Lebanon	12700	30.70	38	−0.0207
Malaysia	11956	28.90	53	0.0214 * **
Mauritius	10164	24.57	58	−0.0005
Mexico	11939	28.86	58	0.0005
Mongolia	3523	8.52	38	−0.0044
Morocco	3622	8.76	58	0.0032
Namibia	4810	11.63	48	−0.0110
Panama	10857	26.25	58	0.0076
Paraguay	4070	9.84	57	−0.0066
Peru	7415	17.93	58	−0.0060
Romania	9378	22.67	48	0.0189 * *
South Africa	7513	18.16	58	−0.0067
Sri Lanka	4063	9.82	58	0.0096
Swaziland	3692	8.93	38	0.0029
Syria	3793	9.17	48	−0.0026
Thailand	8065	19.50	58	0.0144*
Tunisia	6105	14.76	47	0.0033
Turkey	10438	25.23	58	0.0062
Uruguay	11718	28.33	58	−0.0077
Venezuela	9071	21.93	58	−0.0108

Source: Penn World Table Version 7.1.

Notes: GDP per capita is PPP adjusted, at 2005 constant prices. The growth rate of each country is reported for the time period ending in 2007 which corresponds to the number of observations. ***, ** and * denote statistical significance of the t test: growth rate of relative incomes is zero at the 1%, 5% and 10% level, respectively.

Table 2: MITs

Country	$\bar{x}_i$	Model	Break Year
ADF Tests: No Structural Break			
Botswana	-1.28	/	/
Lebanon	-1.46	/	/
Turkey	-1.55	/	/
ZA Tests: One Structural Break			
Bolivia	-2.06/-2.60	A	1982
	-2.54	C	1982
Bulgaria	-1.62	C	1991
Costa Rica	-1.17/-1.43	A	1980
	-1.42	C	1980
EI Salvador	-1.57/-1.97	A	1978
	-1.97	C	1978
Guatemala	-2.03	C	1982
Honduras	-2.07/-2.50	A	1982
Indonesia	-2.60	C	1997
Iran	-1.62	C	1976
Iraq	-1.86/-2.51	A	1990
Jordan	-2.37	C	1995
Mongolia	-2.37/-2.81	A	1990
	-2.81	C	1990
Morocco	-3.17/-2.62	A	1960
Panama	-1.67	C	1979
Romania	-1.99/-1.61	A	1973
	-1.61	C	1973
South Africa	-1.41/-1.84	A	1983
	-1.84	C	1983
Thailand	-1.80	C	1990
Tunisia	-2.00	C	1983
LP Tests: Two Structural Breaks			
Mexico	-1.26	CC	1979/1994
Peru	-1.49/-1.77/-2.05	AA	1982/1987
Syria	-2.40	CC	1979/2000

Source: Authors' calculations.

Notes: Model "A" denotes a structural break in the level of series $x_{i,t}$ only, Model "C" for a break in both of the level and the slope. The estimated mean $\bar{x}_i$ is reported for both pre-break and post-break intervals if Model A applies, and only post-break $\bar{x}_i$ is reported if Model C applies. For the computation of $\bar{x}_i$ see supplements.

Table 3: ADF Unit Root Tests

Country	Number	Lag	α	μ	$\bar{x}_i$
Botswana	48	8	-0.1080	-0.1384	-1.28
			(-3.0865)*	(-2.2828)	
Lebanon	38	5	-1.019	-1.4891	-1.46
			(-5.2748)***	(-5.4338)	
Turkey	58	0	-0.3776	-0.5856	-1.55
			(-4.0785)***	(-4.0322)	

Notes: ***, ** and * denote statistical significance of the test $\alpha = 0$ at the 1%, 5% and 10% level respectively, based on critical values derived from 5000 pseudo-series.

Table 4: ZA Tests Allowing for One Structural Break

Country	Number	Model	TB	Lag	α	$\beta(-\gamma)$	θ	μ	$\bar{x}_i$
Bolivia	58	A	1982	8	-0.1985	/	-0.1053	-0.4099	-2.06/-2.60
					(-4.0239)*	/	(-3.7681)	(-4.2382)	
Bolivia	58	C	1982	8	-0.2922	-0.0035	-0.114	-0.5437	-2.54
					(-4.8457)*	(-2.4346)	(-4.2952)	(-5.1146)	
Bulgaria	38	C	1991	7	-0.7271	0.0197	-0.1407	-1.3109	-1.62
					(-5.4029)*	-4.1085	(4.0909)	(-5.2985)	
Costa Rica	58	A	1980	5	-0.2879	/	-0.0748	-0.3371	-1.17/-1.43
					(-5.1963)**	/	(-4.5851)	(-5.1634)	
Costa Rica	58	C	1980	5	-0.3186	0.0016	-0.0994	-0.3944	-1.42
					(-5.7199)**	-2.0141	(-4.9799)	(-5.6956)	
El Salvador	58	A	1978	4	-0.2516	/	-0.0992	-0.3953	-1.57/-1.97
					(-6.3516)***	/	(-5.9758)	(-6.3606)	
El Salvador	58	C	1978	4	-0.2619	-0.0008	-0.0945	-0.4019	-1.97
					(-6.4363)***	(-1.0754)	(-5.5095)	(-6.4467)	
Guatemala	58	C	1982	8	-0.215	0.004	-0.1394	-0.393	-2.03
					(-6.1781)**	(4.9317)	(-6.6618)	(-6.3444)	
Honduras	58	A	1982	0	-0.1767	/	-0.0743	-0.3668	-2.07 /-2.50
					(-4.1308)*	/	(-3.8179)	(-4.2167)	
Indonesia	48	C	1997	4	-0.5295	0.0144	-0.0761	-1.7748	-2.60
					(-5.5549)**	-5.4716	(-3.8897)	(-5.5109)	

Continued on next page

Country	Number	Model	TB	Lag	α	$\beta(-\gamma)$	θ	μ	$\bar{x}_i$
Iran	53	C	1976	7	-0.2244	0.0189	-0.3082	-0.319	-1.62
					(-6.2314)***	(4.2407)	(-6.4038)	(-4.9467)	
Iraq	38	A	1990	8	-1.7471	/	-1.1274	-3.258	-1.86/-2.51
					(-5.3619)**	/	(-4.9685)	(-5.4268)	
Jordan	54	C	1995	6	-0.587	-0.0065	-0.1171	-1.0457	-2.37
					(-5.3918)*	(-3.8751)	(-3.2825)	(-5.4553)	
Mongolia	38	A	1990	1	-0.3738	/	-0.164	-0.8867	-2.37/-2.81
					(-5.1554)*	/	(-4.9369)	(-5.1139)	
Mongolia	38	C	1990	1	-0.409	0.0034	-0.2081	-1.0047	-2.81
					(-5.5152)*	-1.5976	(4.8851)	(-5.4384)	
Morocco	58	A	1960	4	-0.3757	/	0.2066	-1.1912	-3.17/-2.62
					(-4.9482)**	/	(5.3765)	(-5.1872)	
Panama	58	C	1979	7	-1.0796	0.0148	0.0855	-2.219	-1.67
					(-5.0132)*	(4.2123)	(3.1302)	(-4.9440)	
Romania	48	A	1973	8	-0.245	0.0937	/	-0.4876	-1.99/-1.61
					(-5.2790)*	(3.2649)	/	(-5.0177)	
Romania	48	C	1973	8	-0.2653	0.0164	0.0702	-0.5787	-1.61
					(-5.3779)*	(1.1602)	(2.0047)	(-4.6500)	
South Africa	58	A	1983	2	-0.2362	/	-0.103	-0.3324	-1.41/-1.84
					(-5.0787)**	/	(-5.3245)	(-5.0456)	
South Africa	58	C	1983	2	-0.2501	-0.0012	-0.0898	-0.332	-1.84
					(-5.5517)**	(-2.2973)	(-4.6174)	(-5.2505)	

Continued on next page

Table 4– continued from previous page

Country	Number	Model	TB	Lag	α	$\beta(-\gamma)$	θ	μ	$\bar{x}_i$
Thailand	58	C	1990	0	-0.3686	0.0099	0.0796	-1.139	-1.80
					(-5.3754)**	(6.3543)	(2.6214)	(-5.5178)	
Tunisia	47	C	1983	4	-0.8509	0.0164	-0.1267	-1.8701	-2.00
					(-5.5998)**	(4.9841)	(-4.7056)	(-5.5684)	

Notes: Results for either Model A or C or both are reported for countries where the null hypothesis is rejected.

Both pre-break and post-break means ($\bar{x}_i$) are reported if Model A applies, while only post-break mean reported for Model C.

***, ** and * denote statistical significance of the test $\alpha = 0$ at the 1%, 5% and 10% level respectively, based on critical values derived from 5000 pseudo-series.

Table 5: LP Tests Allowing for Two Structural Breaks

Country	Number	Model	TB	Lag	α	$\beta_1(-\gamma_1)$	$\beta_2(-\gamma_2)$	θ_1	θ_2	μ	$\bar{x}_i$
Mexico	58	CC	1979/1994	6	-1.1638	0.0327	-0.0220	0.1269	-0.0602	-1.4470	-1.26
					(-7.0282)**	(6.3758)	(-5.8715)	(4.2084)	(-2.9850)	(-6.9744)	
Peru	58	AA	1982/1987	1	-0.5079	/	/	-0.1371	-0.1486	-0.7554	-1.49/-1.78/-2.05
					(-7.2067)***	/	/	(-5.2270)	(-4.7926)	(-7.1908)	
Syria	48	CC	1979/2000	8	-1.9239	0.0224	-0.0264	0.3144	0.0991	-4.4269	-2.40
					(-7.5762)**	(2.9106)	(-6.6598)	(4.9001)	(2.9750)	(-7.4744)	

Notes: The means ($\bar{x}_i$) of the three sub-intervals are reported if Model AA applies, while only the mean after the second break reported for Model CC. ***, ** and * denote statistical significance of the test $\alpha = 0$ at the 1%, 5% and 10% level respectively, based on critical values derived from 1000 pseudo-series.

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