Procyclicality of fiscal policy in Emerging Countries: The cycle is the trend

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ABSTRACT

This paper uses Aguiar and Gopinath (JPE 2007) methodology in order to estimate whether "the cycle is the trend" in 23 Emerging Markets and 22 OECD economies. These estimates are then used to check whether procyclical fiscal policy in emerging countries is due to persistent shocks to per-capita GDP. We find support for this hypothesis. While both developed and emerging countries have a procyclical policy for investment expenditure, procyclicality is evident in emerging countries also for government consumption and transfers. After the nineties, during a period of increasing globalization, there are signs of a reduction in the extent of procyclical expenditure policy in emerging countries. We also found that in countries with high levels of Foreign Direct Investment (FDI) procyclicality is milder.

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1. Introduction

In recent years economic research on fiscal policy has shown that while developed economies tend to run countercyclical fiscal policies, Latin American countries had been characterized by procyclical policies. Some of the explanations given to this phenomenon is that high external debt causes severe constraints on the capability of achieving new loans, and consequently countries are constrained to cut budget deficits. Other explanations are related to optimal behavior against political constraints (Talvi and Vegh, 2005). In this paper we test a different channel, related to the characteristics of business cycles. Aguiar and Gopinath (2007) found that in developing countries "the cycle is the trend"; i.e., in these countries business cycles turn to become persistent, and determine the fundamentals of economic performance of those countries. In particular, one possible channel is fiscal policy: in times of recessions (booms) the erratic character of the crisis (good times) forces developing economies to cut (increase) expenditures, acting procyclically. This procyclical behavior may characterize other sectors of the economy, far beyond fiscal policy reaction (Kaminsky et al., 2004: "When it rains, it pours").

The recent renewed interest in cyclicality of fiscal policy is mainly empirical. This new empirical literature began with Galí (1994), Fiorito and Kollintzas (1994), and Fiorito (1997), who found that fiscal expenditures are counter-cyclical or a-cyclical in developed countries. In contrast Gavin and Perotti (1997) found that fiscal policy is highly pro-cyclical in Latin American countries. These findings led to much research that re-examined these findings and corroborated them to a large extent.

Lane (2003) shows that cyclicality of fiscal policy varies significantly across categories and also across OECD countries, but in most advanced economies they are counter-cyclical. Arreaza, Sørensen, and Yosha (1999), Gali and Perotti (2003) and Strawczynski and Zeira (2009) find further support for counter-cyclical fiscal policy in EU and in OECD countries. Gali (2005) even finds that fiscal policy is counter-cyclical in all industrialized countries and that counter-cyclicality even intensified after 1991. Darby and Melitz (2007) find that social expenditures account for the vast majority of countercyclical fiscal policy. Fatas and Mihov (2003) find that most of the counter-cyclicality of deficits in developed countries is a result of the automatic stabilizers. As mentioned above, the findings in developing countries are very different. Talvi and Vegh (2005) show, based on a large sample of less developed countries, that government spending and taxes are highly pro-cyclical. This finding is also corroborated by Akitoby et al. (2004), by Alesina and Tabellini (2005), and by Ilzetzki and Vegh (2008). The main explanation for this difference in fiscal policy between developed and less developed countries is that governments in less developed countries face credit constraints, which force them to cut expenditures during recessions. Recently other explanations were offered, based on political economy, as in Talvi and Vegh (2005), Alesina and Tabellini (2005) and Ilzetzki (2008).

The paper is organized as follows: in section 2 we characterize procyclicality of government expenditure against per-capita GDP shocks and describe the methodology for assessing whether "the cycle is the trend". In section 3 we show empirical results on the relationship between "the cycle is the trend" variable and total expenditure, expenditure cuts during recessions and government expenditure composition

(consumption, transfers and investment); we also test for a change in behavior after the nineties. In this section we additionally check whether procyclicality is milder for countries with high FDI, high international reserves, low Public Debt and inclusion in Emerging Markets stock exchange index. Section 4 concludes and the appendices present our method for choosing the length of moving averages, a regression analysis under GMM, Granger Causality Tests and a summary of our definitions and sources.

2. Procyclicality of Government Expenditure against permanent shocks

In order to study the impact of permanent shocks on fiscal policy variables we will concentrate mainly on expenditure. Ideally we would like to test also the impact on taxes and on the deficit. However, the straight interaction between the cycle and tax revenues, and thus the deficit, makes this mission not possible. The inavailability of data on statutory tax rates further difficults studying the impact on taxes.

Similarly to Barro (1979), we consider output and real interest rate to be exogenous. However, opposed to Barro's model we take the tax rate as given and assume that government expenditure is endogenous. The government chooses G_t (real government expenditure) in all periods (t=1,2,…) so as to maximize a utility function (with decreasing marginal utility in government consumption):

$$(1)\ MAX \sum_{t=1}^{\infty} \frac{1}{(1+r)^{t-1}} \left[-(g^* - g_t)^2 \frac{Y_t}{2} \right]$$

Where r is an exogenous interest rate, Y is the exogenous level of output, g^* is the maximum level of government expenditure over output (G/Y), and g is its actual level. The inter-temporal budget constraint is given by:

$$(2)\ \sum_{t=1}^{\infty} \frac{1}{(1+r)^{t-1}} (\tau_t - g_t) Y_t + (1+r) Y_0 b_0$$

Where τ is the exogenous statutory tax rate and b is the ratio of initial general government debt to output. The Lagrangian of this problem is:

$$(3)\ L = \sum_{t=1}^{\infty} \frac{1}{(1+r)^{t-1}} \left[-(g^* - g_t)^2 \frac{Y_t}{2} \right] - \lambda \left[\sum_{t=1}^{\infty} \frac{1}{(1+r)^{t-1}} (\tau_t - g_t) Y_t + (1+r) Y_0 b_0 \right]$$

And the F.O.C.are:

$$\begin{aligned} & g^* - g_1 = \lambda \\ (4) \qquad & g^* - g_2 = \lambda \\ & \ldots\ldots\ldots \end{aligned}$$

The optimal solution in equation 4 is to choose a smooth g in all periods. Plugging the optimal value of G in the inter-temporal budget constraint, and taking the yearly constant GDP that fits the present value of the different GDP values over the whole period, we get:

$$(5)\ \tau \tilde{Y} = \tilde{G} + (1+r) B_0$$

The supra-index ~ stands for the permanent value of a variable.[2] This equation states that the tax rate finances the permanent level of expenditure and the initial debt using the permanent level of output as the tax base.

If there is an exogenous permanent shock on output, and given that debt and real interest rate are exogenous, the single way of restoring the equality would be to adjust government expenditure.[3] In a recession (expansion) the equality requires cutting (rising) expenditure; i.e. – procyclical fiscal policy. It is worth to note that this policy shall be similar for both developed and emerging economies. However, the difference

[2] Barro uses the present value of these variables. Another way to put it would be to calculate the fixed payment that is consistent with the present value (for the given interest rate).

[3] Hercowitz and Strawczynski (2004) consider the case in which both the tax rate and government expenditure are endogenous.

among them may be based on: i) the degree of permanent shocks: in emerging markets cycles may become persistent ("the cycle is the trend"), while in developed economies these shocks maybe purely transitory. If this is the case we expect fiscal policy to be acyclical (or countercyclical[4]) in developed economies, and procyclical in emerging markets; ii) a different response to these shocks – which may differ as a consequence of the risk perception by economic agents.

To calculate the variable representing the phenomenon "The cycle is the trend' we use the methodology adopted by Aguiar and Gopinath (2007). While they used this methodology for Canada and Mexico, we extend the calculation to 22 developed economies and to 23 emerging countries.[5]

The methodology is based on looking at the variability of output over long horizons:

(6) $K^{-1}\,\mathrm{var}(y_t - y_{t-K})$,

where y_t = log GDP per capita at time t and K is the amount of lagged differences.

We then correct the sample variance for small sample bias, by including a degree of freedom correction term $T/(T-K+1)$:

(7) $T/[K(T-K+1)]\,\mathrm{var}(y_t - y_{t-K}) = \sigma^2{}_{\Delta\tau}$

For each K we calculate:

(8) $\sigma^2{}_{\Delta\tau} / \sigma^2{}_{\Delta y} = C_K$,

where $\sigma^2{}_{\Delta y}$ is the value of $\sigma^2{}_{\Delta\tau}$ where $K=1$. Thus, for all countries the value of (8) at $K=1$ is 1.

This value is giving us the ratio between the long-term variability of output compared to the short term one, and thus it is providing us with measure of to what extent "the

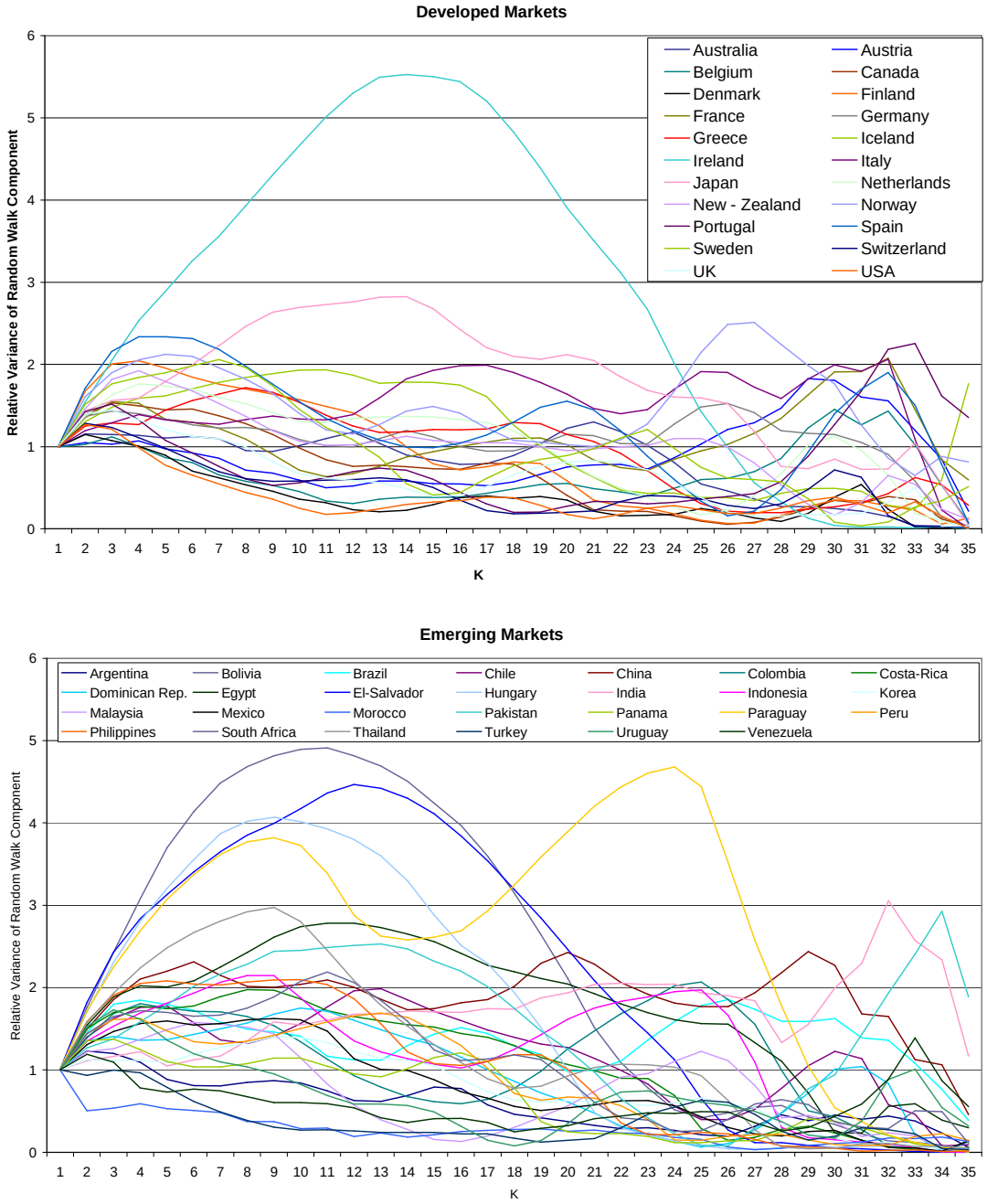
[4] See Strawczynski and Zeira (2009).

[5] There is no single accepted definition for emerging markets. Some well-known definitions are based on indexes (MSCI and FTSE) that include different lists of countries, and on the Economist list. In our sample 17 out the 22 countries are included in these lists, and 5 countries are not.

cycle is the trend". The higher this coefficient, the higher countries are expected to be affected by changes in output.

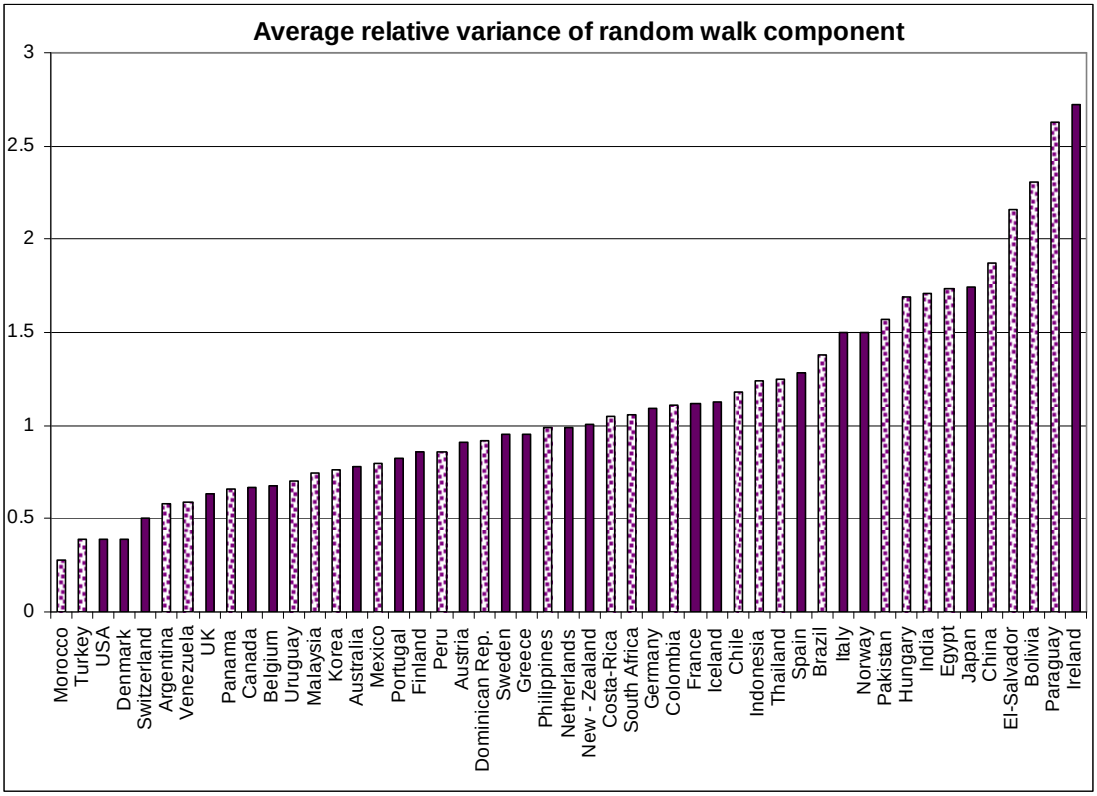
Figure 1 shows the result of this measure for the different countries.

Figure 1: The cycle is the trend – developed and emerging countries
Period: 1960-2006



In order to compare the results internationally, we take the average value of this measure for each country. We expect the value for developed markets to be lower than for emerging markets.

Figure 2



In general we see in Figure 2 that emerging countries have a higher value: 15 countries are over the median (which equals 0.992), while 12 are below. In developed countries we see the opposite: 13 countries are below the median and 9 above it. The average of all developed countries is 1.03 (and 0.95 excluding Ireland), compared to 1.19 for emerging countries.[6]

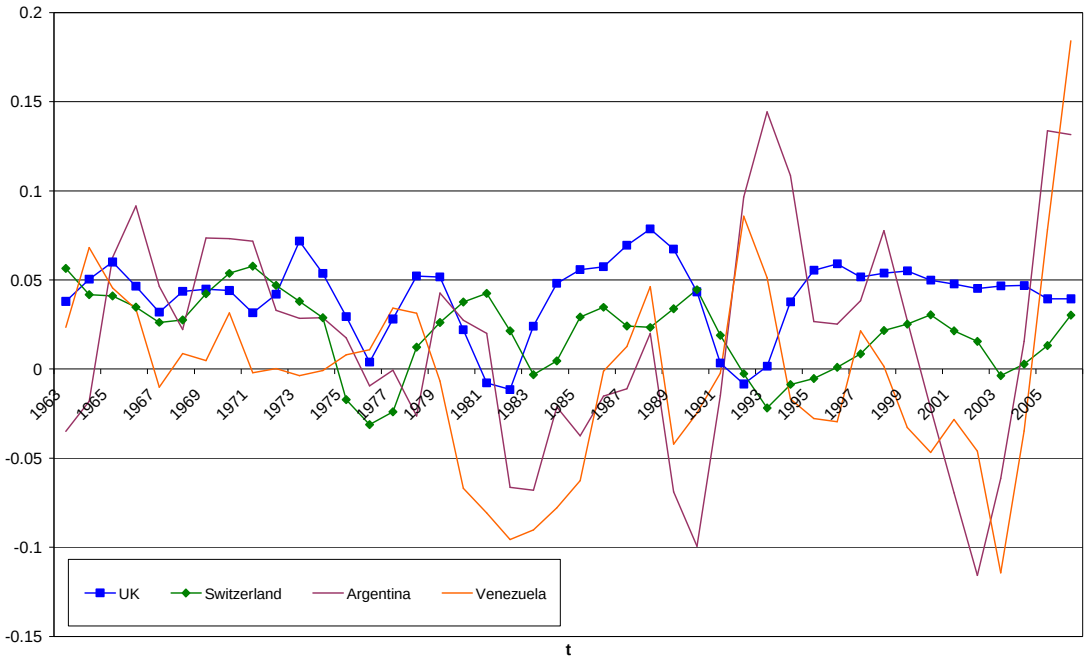
The average value is then multiplied with the sum of growth over 3 years (the reason for choosing three years is explained in appendix A):

(9) $\mathrm{CITT_t} = ave(C_K)\sum_{n=t}^{t-3} d(y_t)$.

[6] This average was computed using all available observations for GDP per-capita over 49 countries. Not all these observations are included in the regressions for lack of consistent data on expenditure.

Figure 3 shows this formula applied on two developed countries and for two emerging countries. All four countries have similar and relatively (to other countries) low average variance of the random walk component. Nevertheless, the erratic behavior in emerging markets is evident in the graphs.

Figure 3: The cycle is the trend and three-year changes in output



In the regressions below we will use CITT as an independent variable in regressions on total government expenditure, government consumption, social transfers and subsidies and capital expenditure.

3. Data and Empirical results

3.1 Data

For estimating the CITT variable we use per-capita GDP in constant prices. Data for developed countries was taken from OECD Economic Outlook and OECD Historical Statistics. Data for Emerging Markets is taken from the Government Financial Statistics (see Appendix E). Data relates to the General Government.

In the regressions we base our analysis on 22 developed economies (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Netherland, New Zealand, Norway, Portugal, Spain, Switzerland, U.S.A.) and 23 emerging markets (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Egypt, Hungary, India, Indonesia, Korea, Malaysia, Morocco, Mexico, Pakistan, Panama, Peru, South Africa, Thailand, Turkey, Uruguay and Venezuela).[7]

In four emerging countries among those appearing in Figure 2, data is insufficient or inconsistent: China, El-Salvador, Paraguay and Philippines. Thus, we do not include these countries in the regression analysis.

3.2 Empirical Specifications for total expenditure

In all the regressions we use unbalanced pool LS method.

We estimate the following types of regressions:

$$d\log(G) = C + \beta_2 CITT + \beta_3 ratio + \beta_4 d\log(POP) + \beta_5 (POP15 + POP65) + \beta_6 K\_ave + \beta_7 HyInfl.$$

$$d\log(G) = C + \beta_2 CITT + \beta_3 EMERGING + \beta_4 CITT * EMERGING + \beta_5 ratio + \beta_6 d\log(POP) + \beta_7 (POP15 + POP65) + \beta_8 K\_ave + \beta_8 HyInfl.$$

where: G is real government expenditure, deflated by GDP prices; CITT is the "cycle is the trend" variable as defined above; dlog(POP) is the population growth rate; POP15 and POP65 are the populations under 15 and over 65, respectively, as a percentage of total population; K_ave is the average of the random walk component

[7] In some regressions particular countries are excluded because of a lack of local governments data (Mexico and Chile, in transfers and total expenditure), or a lack of observations (Colombia, in transfers).

as explained above[8]; RATIO refers to the ratio between GDP per capita (in PPP values) of the country and the GDP per capita (in PPP values) of the USA; EMERGING is a dummy variable which equals 1 for emerging countries and 0 otherwise; HyInfl is a dummy variable which equales 1 when yearly inflation is over 100% and is consistent over two or more years.

We repeat these regressions in two models – a simple OLS regression with period fixed effects and an autoregressive model. Furthermore, we examine these models with several different moving averages (1 to 4 periods). For space considerations tables below show only the results for three periods moving average using the AR approach.

Ilzetski and Vegh (2008) emphasize the importance of taking into account the mutual relationship between expenditure and GDP when checking the impact of one on the other. In particular, we must consider causality from GDP to expenditure. For this purpose we perform two types of analysis: i) we use an instrumental variable, based on the increase of real exports[9] - which is correlated with GDP and not with expenditure - and then run a GMM estimation (see appendix B); ii) we check Granger causality between these variables (see appendix C).

3.2.1 Budget Cuts

Since in emerging countries fiscal policy is procyclical in hard times, it is particularly interesting to learn about budget cuts. Table 1 summarizes the number of budget cuts and whether they followed a recession period (which would indicate procyclical behavior), the amount of persistent budget cuts, and the depth of the budget cuts.

[8] Technically, introducing this variable in the regression does not allow including at the same time country fixed effects. Including country fixed effects instead of this variable does not affect our main results.

[9] Jaimovich and Panizza (2007) use the weighted average of export partners GDP.

Table 1: **Budget Cuts**

	Developed Economies	**Emerging Economies**
Average number of observations with a budget cut	5.7	6.8
Average number of events (when real government expenditure was cut) as percent of total years available	12.7	25.6
Average number of persistent events (a cut in two consecutive years or more) as percent of total years available[1]	5.5	10.2
Average number of persistent events (two years or more) as percent of total number of events	43.2	39.9
Average number of persistent events (a cut in three consecutive years or more) as percent of total years available[1]	2.4	4.1
Average number of persistent events (three years or more) as percent of total number of events	19.2	16.1
Average number of events with parallel reduction in growth as percent of total number of events	6.4	30.1
Average number of events with one period lagged reduction in growth as percent of total number of events	15.2	20.3
Average cut in government expenditure (percent)	-2.2	-6.8
Average cut in government expenditure when there was a parallel reduction in growth (percent)	-4.0	-10.3
Parallel reduction in growth – average percent of change in GDP	-2.0	-5.2

*number of emerging countries in which data for total government expenditure is available and consistent.
[1]Each year in the group of consecutive years is counted as an event.

We will estimate the following regression:

$$d\log(G) = C + \beta_2 CITT + \beta_3 EMERGING + \beta_4 (G\_neg * Y\_neg) + \beta_5 EMERGING * CITT + \beta_6 (CITT * EMERGING * G\_neg * Y\_neg) + \beta_7 ratio + \beta_8 d\log(POP) + \beta_9 (POP15 + POP65) + \beta_{10} K\_ave + \beta_{11} HyInfl$$

Where G_neg and Y_neg are dummy variables that take the value 1 when government consumption and real GDP, respectively, have a negative growth rate.

3.2.2 A change in policy after the 90's

Another feature is to examine whether there was a change in the emerging markets government behavior after the 90's, when the globalization increased, allowing the emerging countries' governments to be exposed to international markets. This is indeed an important point: in order to cause a change in behavior and avoid emerging countries to be "on their own" (by cutting expenditure), agents must be convinced that in hard times there will be some kind of insurance through aid from other countries. If the stock exchange is exposed to citizens from other countries, and if there is confidence that countries will recover in the future, the low prices at the stock exchange during hard times will be perceived as an investment opportunity and may provide such a mechanism.

For this purpose we define a dummy variable that takes the value of 1 after 1990, and 0 otherwise. We multiply this dummy to the fiscal variables explained above.

3.3 Empirical results for total government expenditure

Results for total government expenditure are shown in table 3. From equation 2 we learn that while in developed economies permanent shocks are not a crucial variable since the coefficient of CITT is 0, in emerging markets the coefficients is around 0.3 in normal times and it is even higher in hard times (equation 4): the coefficient in periods of parallel reductions in G and Y adds to 0.4 (obtained as the sum of coefficients) and is significant at 5 percent. We take these results as first evidence of our main hypothesis – i.e., GDP shocks in emerging countries are associated to a procyclical reaction in government expenditure. These results are confirmed in appendix B under a GMM methodology.

Table 3: Total government expenditure (Auto-Regressive model)

Dependent variable: dlog(G)	1	2	3	4	5
no. of observations (unbalanced)	1233	1233	1233	1233	1233
Period	1971-2006				
Constant	0.054	0.018	0.024	0.018	0.021
	(1.36)	(0.42)	(0.57)	(0.43)	(0.5)
dlog(pop)	1.549	1.240	1.247	1.173	1.235
	(3.59)***	(2.78)***	(2.83)***	(2.66)***	(2.83)***
pop15+pop65	-0.001	0.0001	-0.0001	0.0001	0.00002
	(-0.8)	(0.14)	(-0.07)	(0.15)	(0.03)
hyper inflation	-0.052	-0.040	-0.038	-0.038	-0.035
	(-4.44)***	(-3.36)***	(-3.21)***	(-3.24)***	(-2.99)***
Ratio	-0.004	0.008	0.008	0.008	0.008
	(-0.27)	(0.32)	(0.34)	(0.32)	(0.37)
K average	-0.012	-0.003	-0.002	-0.002	-0.002
	(-1.9)*	(-0.47)	(-0.37)	(-0.37)	(-0.32)
Emerging		-0.017	-0.015	-0.013	-0.012
		(-1.21)	(-1.09)	(-0.92)	(-0.91)
G_neg*Y_neg				-0.011	-0.014
				(-2.5)**	(-3.04)***
CITT	0.187	0.021	0.021	0.017	0.017
	(8.66)***	(0.68)	(0.71)	(0.56)	(0.58)
(emerging)*CITT		0.304	0.359	0.274	0.316
		(7.58)***	(7.8)***	(6.73)***	(6.69)***
(emerging)*CITT*dum90			-0.098		-0.067
			(-2.46)**		(-1.65)*
(emerging)*CITT*g_neg*y_neg				0.116	0.177
				(1.87)*	(2.6)***
(emerging)*CITT*dum90*g_neg*y_neg					-0.368
					(-2.82)***
Adj. R^2	0.544	0.564	0.566	0.568	0.572
Durbin-Watson	1.655	1.689	1.698	1.691	1.684

t statistic in parenthesis. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Equations 3 and 5 test whether there was a change in behavior in emerging countries' government expenditure during the nineties, a period characterized by increasing globalization. Coefficients are negative and significant, and thus we conclude that there are signs for such change.

3.4 Government Expenditure Composition

We perform the same analysis for government consumption, transfers and subsidies and capital expenditure. Results are shown in tables 4, 5, and 6.

While cuts in capital expenditure are evident also for developed economies, results show that it is particularly procyclical in emerging markets during hard times (Table 6). However, this result is not confirmed in the GMM regression (Appendix B).

Procyclical policy in emerging countries is evident also for government consumption (Table 4) and subsidies and transfers (Table 5).

Table 4: government consumption (Auto-Regressive model)

Dependent variable: dlog(GC)	1	2	3	4	5
no. of observations (unbalanced)	1289	1289	1289	1214	1214
period	1971-2006				
Constant	-0.005	-0.026	-0.024	-0.030	-0.029
	(-0.15)	(-0.64)	(-0.61)	(-0.74)	(-0.72)
dlog(pop)	1.054	0.891	0.890	0.945	0.973
	(2.57)**	(2.13)**	(2.14)**	(2.2)**	(2.27)**
pop15+pop65	0.001	0.001	0.001	0.002	0.002
	(0.66)	(1.54)	(1.5)	(1.64)*	(1.6)
hyper inflation	-0.050	-0.040	-0.040	-0.036	-0.035
	(-4.71)***	(-3.8)***	(-3.75)***	(-3.11)***	(-2.98)***
ratio	0.012	0.008	0.008	0.008	0.009
	(0.9)	(0.36)	(0.36)	(0.38)	(0.39)
K average	-0.015	-0.007	-0.007	-0.008	-0.008
	(-2.5)**	(-1.08)	(-1.06)	(-1.19)	(-1.19)
Emerging		-0.025	-0.024	-0.025	-0.025
		(-1.94)*	(-1.91)*	(-1.85)*	(-1.88)*
G_neg*Y_neg				-0.006	-0.007
				(-1.27)	(-1.53)
CITT	0.243	0.079	0.079	0.077	0.077
	(12.19)***	(2.64)**	(2.64)**	(2.55)**	(2.56)**
(emerging)*CITT		0.274	0.285	0.276	0.290
		(7.26)***	(6.55)***	(6.83)***	(6.05)***
(emerging)*CITT*dum90			-0.020		-0.022
			(-0.51)		(-0.52)
(emerging)*CITT*g_neg*y_neg				0.112	0.145
				(1.79)*	(2.1)**
(emerging)*CITT*dum90*g_neg*y_neg					-0.185
					(-1.4)
Adj. R^2	0.559	0.576	0.576	0.575	0.575
Durbin-Watson	1.726	1.764	1.764	1.759	1.761

t statistic in parenthesis. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table 5: government transfers and subsidies (Auto-Regressive model)

Dependent variable: dlog(GT)	1	2	3	4	5
no. of observations (unbalanced)	1064	1064	1064	1055	1055
period	1971-2006				
Constant	0.050 (0.87)	0.020 (0.32)	0.018 (0.29)	0.017 (0.28)	0.012 (0.2)
dlog(pop)	1.635 (2.58)**	1.500 (2.22)**	1.501 (2.22)**	1.228 (1.81)*	1.284 (1.89)*
pop15+pop65	-0.0002 (-0.17)	0.001 (0.41)	0.001 (0.46)	0.001 (0.49)	0.001 (0.59)
hyper inflation	-0.069 (-3.77)***	-0.051 (-2.76)***	-0.052 (-2.8)***	-0.049 (-2.68)***	-0.049 (-2.67)***
ratio	-0.014 (-0.69)	-0.010 (-0.3)	-0.010 (-0.31)	-0.009 (-0.29)	-0.010 (-0.3)
K average	-0.010 (-1.07)	-0.000003 (-0.0)	-0.0004 (-0.04)	0.001 (0.13)	0.001 (0.07)
Emerging		-0.025 (-1.26)	-0.026 (-1.32)	-0.014 (-0.7)	-0.017 (-0.85)
G_neg*Y_neg				-0.022 (-2.52)**	-0.022 (-2.53)**
d(U)	0.006 (4.12)***	0.006 (3.98)***	0.006 (3.96)***	0.006 (4.16)***	0.006 (4.12)***
CITT	0.136 (3.59)***	-0.026 (-0.52)	-0.025 (-0.51)	-0.032 (-0.65)	-0.031 (-0.64)
(emerging)*CITT		0.350 (5.18)***	0.319 (4.0)***	0.291 (4.18)***	0.225 (2.7)***
(emerging)*CITT*dum90			0.056 (0.74)		0.116 (1.47)
(emerging)*CITT*g_neg*y_neg				0.188 (1.69)*	0.292 (2.4)**
(emerging)*CITT*dum90*g_neg*y_neg					-0.464 (-1.8)*
Adj. R^2	0.433	0.446	0.446	0.446	0.448
Durbin-Watson	1.604	1.637	1.638	1.615	1.620

t statistic in parenthesis. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

Table 6: government capital expenditure (Auto-Regressive model)

Dependent variable: dlog(GI)	1	2	3	4	5
no. of observations (unbalanced)	1248	1248	1248	1189	1189
period	1971-2006				
Constant	0.023	0.108	0.117	0.098	0.103
	(0.22)	(0.97)	(1.05)	(0.87)	(0.91)
dlog(pop)	3.563	4.073	4.130	4.207	4.215
	(3.12)***	(3.48)***	(3.53)***	(3.58)***	(3.57)***
pop15+pop65	-0.002	-0.001	-0.001	-0.0002	-0.0004
	(-0.72)	(-0.43)	(-0.56)	(-0.06)	(-0.14)
hyper inflation	-0.085	-0.069	-0.066	-0.062	-0.060
	(-2.99)***	(-2.44)**	(-2.31)**	(-1.98)**	(-1.93)*
ratio	0.058	-0.068	-0.067	-0.083	-0.082
	(1.51)	(-1.1)	(-1.07)	(-1.36)	(-1.34)
K average	-0.006	-0.012	-0.011	-0.023	-0.022
	(-0.37)	(-0.7)	(-0.64)	(-1.29)	(-1.24)
Emerging		-0.111	-0.108	-0.133	-0.131
		(-3.07)***	(-2.99)***	(-3.68)***	(-3.61)***
G_neg*Y_neg				-0.026	-0.026
				(-2.2)**	(-2.14)**
CITT	0.427	0.267	0.266	0.276	0.275
	(8.01)***	(3.3)***	(3.29)***	(3.39)***	(3.38)***
(emerging)*CITT		0.281	0.385	0.286	0.345
		(2.72)***	(3.29)***	(2.61)**	(2.7)***
(emerging)*CITT*dum90			-0.194		-0.100
			(-1.89)*		(-0.89)
(emerging)*CITT*g_neg*y_neg				0.051	0.015
				(0.3)	(0.08)
(emerging)*CITT*dum90*g_neg*y_neg					0.071
					(0.2)
Adj. R^2	0.540	0.545	0.546	0.551	0.551
Durbin-Watson	1.814	1.808	1.811	1.811	1.813

t statistic in parenthesis. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

3.5 Other issues to consider

So far we found that fiscal policy in emerging countries is procyclical, with some signs of a change in behvior after the nineties. In this sub-section we explore other issues that may shed lights on the mechanism underlying this process.

3.5.1. Foreign Direct Investment and International Reserves

One possibility for the improved performance in the nineties is that countries are less "on their own" and the need for cutting expenditure in hard times has been reduced in countries increasingly exposed to investors around the world. One possible indicator of exposure is the level of Foreign Direct Investments (FDI). Table 7 shows the levels of FDI for developed and emerging countries.

Table 7: Average net FDI inflows as percent of GDP.

	1970's	1980's	1990's	2000-2006
Developed countries				
Australia	**1.37**	**1.84**	1.78	2.46
Austria	0.44	0.31	1.04	2.56
Belgium	--	--	--	**10.67**
Canada	**1.99**	**0.98**	1.73	**3.41**
Denmark	0.43	0.25	**1.98**	**3.50**
Finland	0.15	0.25	**1.95**	**3.68**
France	0.42	0.52	1.60	**3.10**
Germany	0.35	0.16	0.57	2.73
Greece	**0.60**	**1.02**	0.78	0.85
Iceland	**0.89**	0.47	0.60	**8.12**
Ireland	**1.25**	**0.89**	**4.77**	**7.19**
Italy	0.33	0.30	0.37	1.29
Japan	0.03	0.02	0.06	0.11
Netherland	**1.23**	**1.24**	**4.03**	**6.94**
New Zealand	**1.60**	**0.92**	**3.87**	2.70
Norway	**0.95**	0.53	1.71	1.73
Portugal	0.48	**1.11**	**1.94**	**3.72**
Spain	0.53	**1.25**	**2.06**	**3.96**
Sweden	0.13	0.46	**5.16**	**4.81**
Switzerland	--	**0.80**	1.66	**3.78**
UK	**1.42**	**1.59**	**2.58**	**4.45**
U.S.A	0.18	**0.78**	1.12	1.40
Average Developed countries	*0.74*	*0.75*	*1.97*	*3.78*
Median developed countries	*0.50*	*0.78*	*1.73*	*3.45*

Emerging countries				
Argentina	0.26	**0.65**	**2.59**	2.29
Bolivia	**1.50**	**0.60**	**5.61**	**4.12**
Brazil	**1.03**	**0.65**	1.40	2.92
Chile	0.39	**2.00**	**4.80**	**5.80**
Colombia	0.36	**1.30**	**2.14**	**3.33**
Costa Rica	**2.27**	**1.53**	**3.06**	**3.95**
Dominican Republic	**2.07**	**1.04**	**2.25**	**3.76**
Egypt	**1.01**	**2.66**	1.38	2.98
Hungary	--	--	**6.10**	**5.47**
India	0.04	0.04	0.39	1.11
Indonesia	**1.84**	0.37	1.13	0.03
Korea	**0.68**	0.24	0.60	0.91
Malaysia	**2.96**	**3.18**	**6.64**	2.94
Mexico	**0.64**	**1.36**	**2.26**	3.09
Morocco	0.18	0.37	1.68	**3.21**
Pakistan	0.13	0.27	0.86	1.32
Panama	**0.73**	0.00	**5.28**	**6.28**
Peru	0.34	0.13	**3.07**	2.70
South Africa	0.49	0.01	0.59	1.59
Thailand	**0.61**	**0.99**	**2.62**	**3.80**
Turkey	0.13	0.17	0.41	1.18
Uruguay	**0.80**	0.55	0.60	**3.18**
Venezuela	-0.11	0.30	**2.77**	1.87
Average Emerging countries	*0.83*	*0.84*	*2.53*	*2.96*
Median Emerging countries	*0.62*	*0.57*	*2.25*	*2.98*
Average all countries	*0.79*	*0.79*	*2.26*	*3.36*
Median all countries	*0.56*	*0.60*	*1.86*	*3.10*

Source: UNCTAD, May 2010.
In bold are the countries whose FDI is higher than the median FDI for the full sample of countries in the corresponding decade.

One clear feature arising from this table is that after the nineties there was a huge increase in globalization, with a more than double (cuadruple) FDI level in the nineties (2001-06) for developed economies, and more than triple for emerging markets.

Another interesting feature of this table is that there is a high variance on the FDI flows, with some developing countries being "discovered" by foreign investors only in the last decade.

In Table 8 we check whether the level of FDI has some explaining power for procyclical fiscal policy in emerging countries. For this purpose we use perform two regressions: i) using an interaction variable between fiscal policy and FDI (equation 1); ii) using an interaction between fiscal policy and a dummy variable that takes the value of 1 when FDI is higher than the median in each decade or 0 otherwise. Results are significant and in the expected direction: for countries with high levels of FDI the coefficient of procyclicality goes down from 0.32 to 0.25.

Kandil and Morsy (2010) found that a high level of international reserves helps for performing countercyclical policy in emerging countries. We use their methodology for testing the role of international reserves by building a dummy variable that takes the value 1 if the total international reserves in the end of the year are equal or higher than the sum of 3 months of imports (using average month imports of the corresponding year). Regressions 3 and 4 at the GMM analysis show that the coefficient has the expected sign, but significance is obtained only at 10 percent (Table B.5).

Table 8: FDI and International Reserves (Auto-Regressive model)

Dependent variable: dlog(G)	1	2	3	4
no. of observations (unbalanced)	1140	1182	1207	1207
Period	1973-2006		1971-2006	
Constant	0.051	0.039	0.028	0.034
	(1.17)	(0.88)	(0.66)	(0.82)
dlog(pop)	1.426	1.330	1.31	1.30
	(2.89)***	(2.83)***	(2.95) ***	(2.98) ***
pop15+pop65	-0.001	-0.0003	-0.0001	-0.0003
	(-0.89)	(-0.3)	(-0.1)	(-0.3)
hyper inflation	-0.038	-0.039	-0.039	-0.038
	(-3.17)***	(-3.31)***	(-3.36)***	(-3.24)***
Ratio	0.005	0.001	(0.004)	(0.004)
	(0.21)	(0.04)	(0.17)	(0.18)
K average	0.001	-0.003	-0.005	-0.005
	(0.1)	(-0.46)	(-0.79)	(-0.72)
Emerging	-0.011	-0.018	-0.19	-0.17
	(-0.76)	(-1.22)	(-1.4)	(-1.3)
FDI_Y	-0.001			
	(-0.68)			
FDI_dum_ave		-0.005		
		(-1.01)		
Reserves_dum			0.004	0.004
			(1.22)	(1.37)
CITT	0.003	0.029	0.031	0.032
	(0.08)	(0.93)	(1.01)	(1.05)
(emerging)*CITT	0.372	0.321	0.327	0.341
	(8.3)***	(7.23)***	(6.39)***	(6.67)***
FDI_Y *(emerging)*CITT	-0.036			
	(-3.5)***			
FDI_dum_ave*(emerging)*CITT		-0.074		
		(-1.54)		
Reserves_dum*(emerging)*CITT			-0.04	0.012
			(-0.97)	(0.27)
Reserves_dum*(emerging)*CITT*dum90				-0.12
				(-2.75) ***
Adj. R2	0.561	0.559	0.559	0.561
Durbin-Watson	1.707	1.688	1.685	1.694

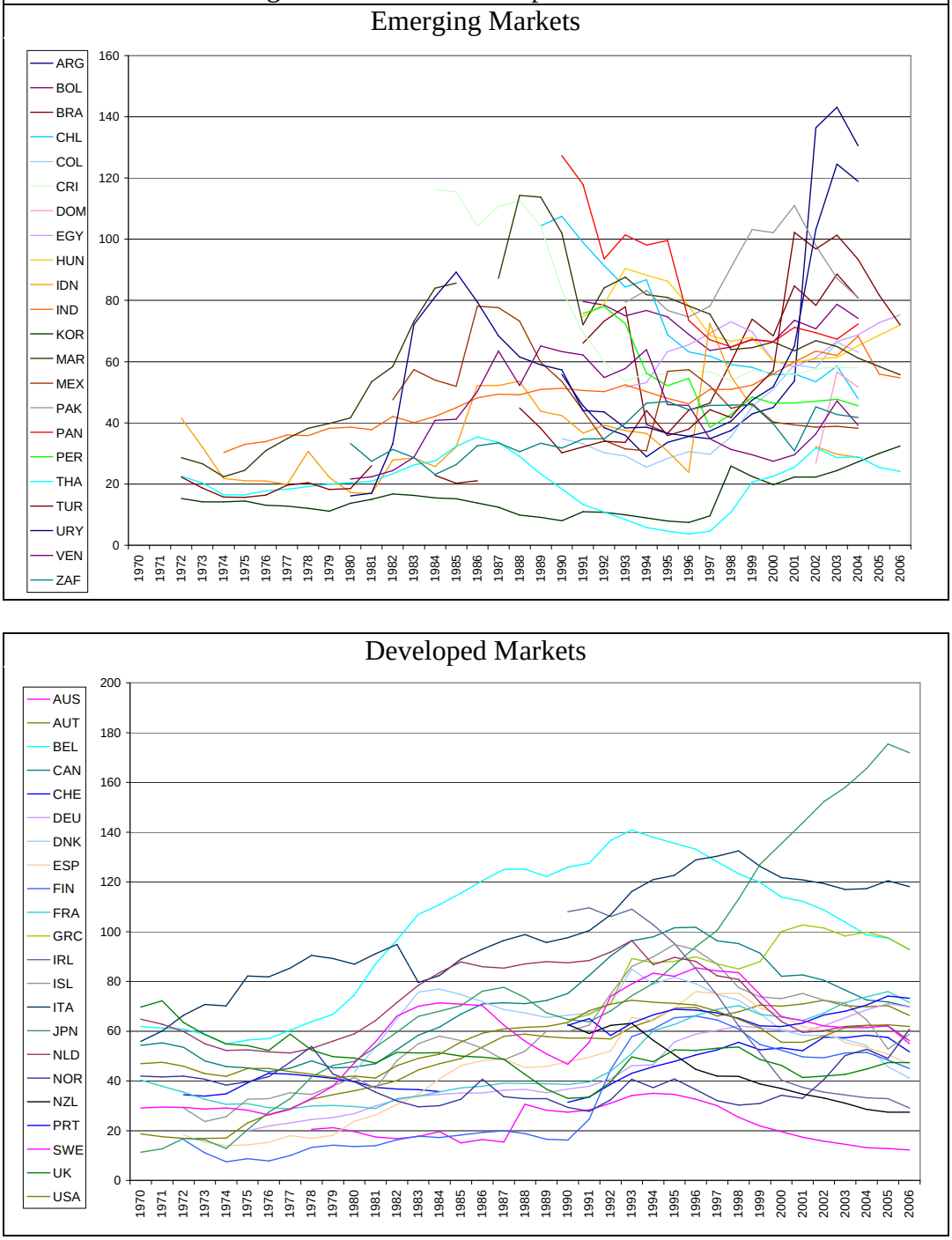
3.5.2 Government Debt

As mentioned in the literature survey, government debt is considered as one of the main explanators for procyclical fiscal policy in developing countries.

Figure 4 shows the levels of debt in emerging countries compared to developed economies. It is evident from the graph that in many emerging countries the levels of debt are high, and that there is a high variability of debt levels among different countries.

Government Debt

Figure 4: Total Debt as a percent of GDP



In table 9 we run regressions that include the level of debt as an independent variable. Equation 1 shows that the coefficient of debt as a percent of GDP is negative and significant, which means that countries with high debt tend to reduce government

expenditure. This means that debt can be considered as an alternative explanation for government expenditure.

Consequently, we include debt as an additional variable in our basic specification, and we further create an interaction variable between the "cycle is the trend" and debt. Ex-ante we expect a positive coefficient for the interaction term; however, it turned out that it is not significant.

Table 9: Debt (Auto-Regressive model)

Dependent variable: dlog(G)	1	2	3
no. of observations (unbalanced)	900	900	970
Period	1973-2006		
Constant	0.069	0.060	-0.007
	(1.63)	(1.41)	(-0.17)
dlog(pop)	0.456	0.472	0.969
	(0.96)	(1.00)	(2.06)**
pop15+pop65	-0.0002	-0.0004	0.00003
	(-0.22)	(-0.39)	(0.03)
hyper inflation	-0.019	-0.013	-0.015
	(-1.05)	(-0.71)	(-0.97)
Ratio	-0.016	0.004	0.038
	(-0.69)	(0.18)	(1.63)*
K average		0.007	0.005
		(1.09)	(0.76)
Emerging	0.037	-0.001	0.020
	(2.22)**	(-0.05)	(1.4)
debt_tot_y	-0.0004	-0.0005	
	(-3.51)***	(-5.37)***	
debt_tot_dum_ave			-0.006
			(-1.46)
CITT		-0.004	0.007
		(-0.14)	(0.25)
(emerging)*CITT		0.146	0.186
		(2.46)**	(4.42)***
debt_tot_y*(emerging)*CITT		0.001	
		(0.69)	
debt_tot_y*(emerging)	-0.0007		
	(-3.23)***		
debt_tot_dum_ave*(emerging)*CITT			0.029
			(0.48)
Adj. R2	0.589	0.603	0.582
Durbin-Watson	1.659	1.639	1.575

5.3.3 Emerging vs. developing

In our sample there are five markets that are not considered "Emerging Markets" by either the MSCI or FTSE emerging markets index (see appendix C for further information of the countries included in these indices). Table 10 repeats the

regressions reported in Table 3 excluding the following countries: Bolivia, Costa Rica, Dominican Republic, Panama and Uruguay.

Interestingly, we found that the coefficient of procyclicality is lower for these countries: 0.23 instead of 0.3, and after the nineties 0.2 instead of 0.26.

Table 10: Total government expenditure - excluding five developing markets not included in the "Emerging Markets Index" (Auto-Regressive model)

Dependent variable: dlog(G)	1	2	3	4	5
no. of observations (unbalanced)	1119	1119	1119	1119	1119
Period	1971-2006				
Constant	0.068 (1.69)*	0.035 (0.8)	0.040 (0.92)	0.035 (0.82)	0.035 (0.84)
dlog(pop)	1.395 (3.24)***	1.166 (2.59)**	1.161 (2.6)**	1.123 (2.52)**	1.159 (2.64)**
pop15+pop65	-0.001 (-0.95)	-0.0002 (-0.22)	-0.0004 (-0.36)	-0.0002 (-0.21)	-0.0002 (-0.22)
hyper inflation	-0.066 (-5.2)***	-0.054 (-4.13)***	-0.051 (-3.95)***	-0.050 (-3.84)***	-0.043 (-3.35)***
Ratio	-0.012 (-0.85)	0.001 (0.05)	0.001 (0.06)	0.001 (0.03)	0.001 (0.05)
K average	-0.009 (-1.4)	-0.003 (-0.37)	-0.002 (-0.35)	-0.002 (-0.3)	-0.002 (-0.34)
Emerging		-0.011 (-0.75)	-0.010 (-0.7)	-0.008 (-0.53)	-0.009 (-0.62)
G_neg*Y_neg				-0.013 (-2.76)***	-0.018 (-3.81)***
CITT	0.126 (5.81)***	0.016 (0.56)	0.017 (0.6)	0.012 (0.43)	0.013 (0.44)
(emerging)*CITT		0.229 (5.63)***	0.273 (5.75)***	0.206 (5.00)***	0.237 (4.95)***
(emerging)*CITT*dum90			-0.075 (-1.83)*		-0.044 (-1.08)
(emerging)*CITT*g_neg*y_neg				0.109 (1.46)	0.248 (2.95)***
(emerging)*CITT*dum90*g_neg*y_neg					-0.576 (-3.76)***
Adj. R^2	0.555	0.567	0.567	0.570	0.576
Durbin-Watson	1.763	1.785	1.789	1.779	1.765

t statistic in parenthesis. *** significant at 1 percent; ** significant at 5 percent; * significant at 10 percent.

4. Summary and Conclusions

Emerging countries tend to pursue procyclical fiscal policy due to persistent shocks to the GDP. While both developed and emerging countries act procyclicaly regarding investment expenditure, procyclical policy in emerging countries is particularly evident and implemented also in government consumption and transfers. However, after the nineties, during a period of increasing globalization, there are signs of a reduction in the extent of procyclical expenditure policy in emerging countries. Countries with a high level of FDI, and those included in Emerging Markets indices, perform milder procyclical policy.

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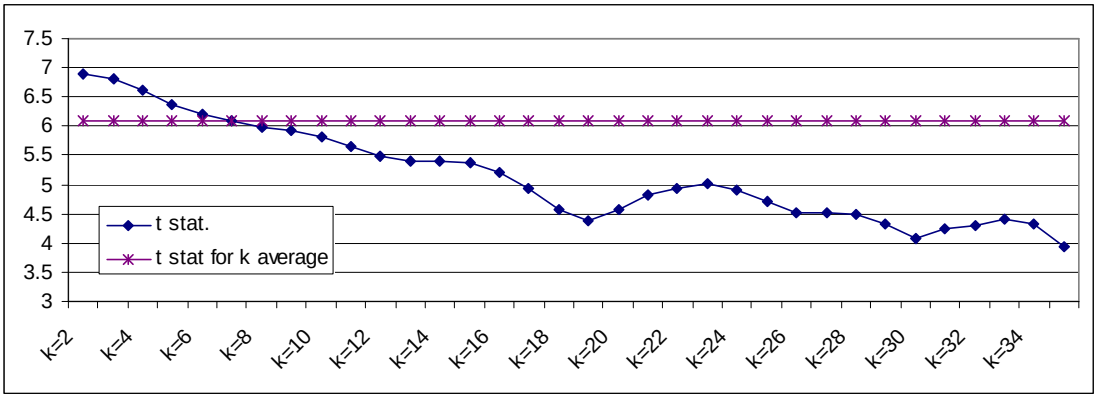
Appendix A – Evaluating the optimum number of shocks affecting government expenditure.

The interaction between the sum of the three period shocks and the "cycle is the trend" component is the central explanatory component of our regressions. As stated in Aguiar and Gopinath, there is a trade off between precision (if we use a shorter K) and an unbiased sample (using a larger K). In order to find the optimum length of K we use the following regression:

$$\Delta G_t = C + \beta_2 (C_K) \sum_{n=t}^{t-\#} d(y_t) + \beta_3 ratio + \beta_4 d\log(POP) + \beta_5 (POP15 + POP65)$$

[where G_t is real government expenditure, deflated by GDP prices; C_K – is the "cycle is the trend" component (for different values of K), y_t is the log GDP per capita (with different number of moving sums, where # takes the values 1-4), dlog(POP) is the population growth rate; POP15 and POP65 are the populations under 15 and over 65 respectively as a percentage of total population; RATIO refers to the ratio between GDP per capita (in PPP values) of the country and the GDP per capita (in PPP values) of the USA.]

Results for the 4 different possibilities of accumulated shocks show that the highest t statistic of β_2 and adjusted R^2 occur when K = 2. Since such a short K increases the potential bias of our estimation, and given that the t statistic for the average value of C_K (for all K's) is quite high and not far from the maximum, we use the average value in our regressions. The graph below presents the t statistic of the regressions depending on K.



Second, we chose to show results for three period accumulated shocks and three periods moving averages for all other variables (excluding dummy variables) to capture a medium term perspective. The t-statistic of the CITT variable in some of the regressions is usually lower under this specification compared to moving averages with a smaller number of periods. On the other hand, the adjusted R^2 is significantly higher in the three period specifications. Results for other lengths are available from the authors.

Appendix B – Regressions using Generalized Method of Moments (GMM)

In this section we repeat the regressions in the paper using a GMM estimation. For this purpose we use constant dollar exports as an instrumental variable for GDP.

Table B1: Total government expenditure (GMM)

Dependent variable: dlog(G)	1	2	3	4	5
no. of observations (unbalanced)	1221	1221	1221	1221	1221
Period	1971-2006				
Constant	0.059	0.029	0.031	0.031	0.033
	(1.47)	(0.67)	(0.71)	(0.72)	(0.77)
dlog_pop	1.640	1.370	1.366	1.357	1.470
	(3.75)***	(3.04)***	(3.04)***	(3.05)***	(3.3)***
pop15+pop65	-0.00093	0.00001	-0.00005	-0.000003	-0.00012
	(-0.9)	(0.01)	(-0.05)	(0.0)	(-0.12)
Ratio	-0.004	0.001	0.001	0.000	0.003
	(-0.26)	(0.04)	(0.03)	(-0.01)	(0.12)
Hypinflation	-0.047	-0.033	-0.035	-0.029	-0.020
	(-3.84)***	(-2.64)**	(-2.84)***	(-2.44)**	(-1.6)
k_average	-0.018	-0.009	-0.009	-0.011	-0.011
	(-2.52)**	(-1.25)	(-1.2)	(-1.49)	(-1.55)
Emerging		-0.023	-0.021	-0.019	-0.023
		(-1.55)	(-1.48)	(-1.36)	(-1.62)
g_neg*y_neg				-0.0049	-0.0080
				(-0.97)	(-1.45)
CITT	0.249	0.079	0.079	0.097	0.094
	(6.3)***	(1.53)	(1.55)	(1.91)*	(1.86)*
(emerging)*CITT		0.311	0.295	0.273	0.427
		(4.25)***	(3.82)***	(4.37)***	(5.26)***
(emerging)*CITT*dum90			-0.002		-0.149
			(-0.03)		(-2.24)**
(emerging)*CITT*g_neg*y_neg				0.205	0.233
				(1.84)*	(1.94)*
(emerging)*CITT*dum90*g_neg*y_neg					-0.510
					(-2.02)**
Adj. R^2	0.538	0.558	0.559	0.559	0.555
Durbin-Watson	1.633	1.664	1.664	1.672	1.665

Table B2: Government consumption (GMM)

Dependent variable: dlog(GC)	1	2	3	4	5
no. of observations (unbalanced)	1277	1277	1277	1202	1202
period	1971-2006				
Constant	-0.005	-0.011	-0.014	-0.026	-0.018
	(-0.13)	(-0.28)	(-0.35)	(-0.63)	(-0.45)
dlog_pop	1.033	0.977	0.990	1.159	1.126
	(2.48)**	(2.31)**	(2.36)**	(2.65)**	(2.59)**
pop15+pop65	0.00058	0.00105	0.00116	0.00160	0.00133
	(0.61)	(1.11)	(1.23)	(1.62)	(1.35)
ratio	0.012	0.004	0.004	0.005	0.005
	(0.88)	(0.17)	(0.2)	(0.21)	(0.22)
hypinflation	-0.050	-0.043	-0.037	-0.027	-0.026
	(-4.62)***	(-3.89)***	(-3.41)***	(-2.31)**	(-2.13)**
k_average	-0.014	-0.011	-0.012	-0.016	-0.015
	(-2.11)**	(-1.48)	(-1.65)*	(-2.29)**	(-2.1)**
emerging		-0.019	-0.024	-0.031	-0.028
		(-1.41)	(-1.81)*	(-2.29)**	(-2.05)**
g_neg*y_neg				-0.0028	-0.0021
				(-0.55)	(-0.37)
CITT	0.239	0.149	0.145	0.159	0.156
	(6.93)***	(2.98)***	(2.92)***	(3.2)***	(3.16)***
(emerging)*CITT		0.165	0.253	0.290	0.343
		(2.45)**	(3.6)***	(4.72)***	(4.34)***
(emerging)*CITT*dum90			-0.042		-0.102
			(-0.63)		(-1.55)
(emerging)*CITT*g_neg*y_neg				0.089	0.089
				(0.78)	(0.73)
(emerging)*CITT*dum90*g_neg*y_neg					0.068
					(0.27)
Adj. R^2	0.560	0.574	0.575	0.570	0.569
Durbin-Watson	1.731	1.755	1.762	1.757	1.760

Table B3: Government transfers and subsidies (GMM)

Dependent variable: dlog(GT)	1	2	3	4	5
no. of observations (unbalanced)	1062	1062	1062	1053	1053
period	1971-2006				
Constant	0.050	0.025	0.009	0.015	0.004
	(0.87)	(0.4)	(0.15)	(0.25)	(0.07)
dlog_pop	1.614	1.482	1.492	1.222	1.194
	(2.53)**	(2.18)**	(2.13)**	(1.77)*	(1.71)*
pop15+pop65	-0.00026	0.00045	0.00108	0.00077	0.00122
	(-0.17)	(0.29)	(0.68)	(0.51)	(0.79)
ratio	-0.015	-0.010	-0.014	-0.009	-0.012
	(-0.71)	(-0.32)	(-0.43)	(-0.28)	(-0.36)
hypinflation	-0.070	-0.056	-0.065	-0.049	-0.053
	(-3.78)***	(-2.9)***	(-3.27)***	(-2.55)**	(-2.71)***
d(U)	0.006	0.006	0.005	0.006	0.006
	(3.82)***	(3.66)***	(3.39)***	(3.95)***	(3.79)***
k_average	-0.008	0.001	0.005	0.006	-0.001
	(-0.79)	(0.1)	(-0.22)	(0.17)	(-0.08)
emerging		-0.020	-0.029	-0.014	-0.019
		(-0.97)	(-1.34)	(-0.7)	(-0.89)
g_neg*y_neg				-0.0218	-0.0197
				(-2.18)**	(-1.97)**
CITT	0.119	-0.023	-0.013	-0.040	-0.029
	(2.16)**	(-0.31)	(-0.17)	(-0.55)	(-0.4)
(emerging)*CITT		0.289	-0.012	0.302	0.089
		(2.65)**	(-0.09)	(2.79)***	(0.71)
(emerging)*CITT*dum90			0.490		0.330
			(3.86)***		(2.81)***
(emerging)*CITT*g_neg*y_neg				0.201	0.339
				(0.99)	(1.56)
(emerging)*CITT*dum90*g_neg*y_neg					-0.060
					(-0.1)
Adj. R^2	0.433	0.445	0.427	0.447	0.441
Durbin-Watson	1.603	1.631	1.639	1.617	1.631

Table B4: Government capital expenditure (GMM)

Dependent variable: dlog(GI)	1	2	3	4	5
no. of observations (unbalanced)	1245	1245	1245	1177	1177
period	1971-2006				
Constant	0.045	0.149	0.154	0.146	0.141
	(0.42)	(1.32)	(1.37)	(1.29)	(1.24)
dlog_pop	3.718	4.350	4.349	4.597	4.658
	(3.2)***	(3.64)***	(3.65)***	(3.83)***	(3.85)***
pop15+pop65	-0.00249	-0.00186	-0.00203	-0.00111	-0.00095
	(-0.92)	(-0.7)	(-0.76)	(-0.41)	(-0.35)
ratio	0.056	-0.087	-0.089	-0.104	-0.103
	(1.44)	(-1.39)	(-1.43)	(-1.71)*	(-1.69)*
hypinflation	-0.070	-0.056	-0.066	-0.050	-0.047
	(-2.41)**	(-1.85)*	(-2.26)**	(-1.57)	(-1.41)
k_average	-0.021	-0.031	-0.030	-0.041	-0.043
	(-1.12)	(-1.56)	(-1.49)	(-2.08)**	(-2.14)**
emerging		-0.117	-0.109	-0.138	-0.143
		(-3.15)***	(-2.98)***	(-3.76)***	(-3.82)***
g_neg*y_neg				-0.0185	-0.0205
				(-1.35)	(-1.39)
CITT	0.596	0.477	0.491	0.491	0.492
	(6.29)***	(3.46)***	(3.56)***	(3.63)***	(3.63)***
(emerging)*CITT		0.220	0.057	0.179	0.221
		(1.17)	(0.3)	(1.07)	(1.01)
(emerging)*CITT*dum90			0.064		0.006
			(0.35)		(0.03)
(emerging)*CITT*g_neg*y_neg				0.108	0.074
				(0.35)	(0.23)
(emerging)*CITT*dum90*g_neg*y_neg					-0.228
					(-0.33)
Adj. R^2	0.535	0.540	0.540	0.547	0.545
Durbin-Watson	1.807	1.800	1.801	1.798	1.792

Table B5: FDI and International Reserves (GMM)

Dependent variable: dlog(G)	1	2	3	4
no. of observations (unbalanced)	1130	1170	1195	1195
period	1973-2006		1971-2006	
Constant	0.065	0.053	0.042	0.042
	(1.46)	(1.17)	(0.99)	(0.98)
dlog_pop	1.549	1.405	1.45	1.448
	(3.1)***	(2.86)***	(3.25) ***	(3.24) ***
pop15+pop65	-0.00110	-0.00065	-0.0003	-0.0003
	(-1.05)	(-0.6)	(-0.33)	(-0.32)
ratio	-0.003	-0.003	-0.003	-0.003
	(-0.11)	(-0.1)	(-0.13)	(-0.14)
hypinflation	-0.031	-0.028	-0.033	-0.034
	(-2.44)**	(-2.21)**	(-2.70) ***	(-2.70) ***
k_average	-0.005	-0.010	-0.013	-0.013
	(-0.69)	(-1.24)	(-1.72) *	(-1.71) *
emerging	-0.016	-0.020	-0.02	-0.02
	(-1.11)	(-1.3)	(-1.72) *	(-1.72) *
fdi_y	-0.001			
	(-0.86)			
fdi_dum_ave		-0.0002		
		(-0.04)		
Reserves_dum			0.006	0.006
			(1.80) *	(1.79) *
CITT	0.059	0.085	0.10	0.010
	(1.13)	(1.6)	(2.06) **	(2.06) **
(emerging)*CITT	0.390	0.423	0.385	0.383
	(4.95)***	(4.89)***	(4.35)***	(4.29)***
fdi_y*(emerging)*CITT	-0.044			
	(-2.71)***			
fdi_dum_ave*(emerging)*CITT		-0.276		
		(-3.08)***		
Reserves_dum*(emerging)*CITT			-0.13	-0.13
			(-1.88) *	(-1.76) *
Reserves_dum*(emerging)*CITT*dum90				0.009
				(0.12)
Adj. R^2	0.555	0.545	0.550	0.550
Durbin-Watson	1.680	1.670	1.661	1.660

Table B6: Debt (GMM)

Dependent variable: dlog(G)	1	2	3
no. of observations (unbalanced)	900	894	963
Period	1973-2006		
Constant	0.069	0.035	-0.011
	(1.63)	(0.84)	(-0.25)
dlog_pop	0.456	0.648	1.054
	(0.96)	(1.41)	(2.21)**
pop15+pop65	-0.00022	0.00017	0.00011
	(-0.22)	(0.17)	(0.11)
Ratio	-0.016	0.002	0.038
	(-0.69)	(0.11)	(1.6)
Hypinflation	-0.019	-0.010	-0.012
	(-1.05)	(-0.57)	(-0.73)
k_average		0.006	0.001
		(0.86)	(0.18)
Emerging	0.037	-0.009	0.015
	(2.22)**	(-0.6)	(1.03)
debt_tot_y	0.000	0.000	
	(-3.51)***	(-4.22)***	
debt_tot_dum_ave			-0.003
			(-0.8)
CITT		0.013	0.052
		(0.3)	(1.09)
(emerging)*CITT		0.395	0.253
		(3.77)***	(3.27)***
debt_tot_y*(emerging)	-0.001		
	(-3.23)***		
debt_tot_y*(emerging)*CITT		-0.004	
		(-2.34)**	
debt_tot_dum_ave*(emerging)*CITT			-0.130
			(-1.36)
Adj. R^2	0.589	0.589	0.576
Durbin-Watson	1.659	1.593	1.533

Table B7: Total government expenditure - excluding five developing markets not included in the "Emerging Markets Index" (GMM)

Dependent variable: dlog(G)	1	2	3	4	5
no. of observations (unbalanced)	1107	1107	1107	1107	1107
Period	1971-2006				
Constant	0.074	0.045	0.050	0.053	0.050
	(1.85)*	(1.01)	(1.15)	(1.25)	(1.17)
dlog_pop	1.528	1.324	1.288	1.316	1.391
	(3.5)***	(2.89)***	(2.84)***	(2.95)***	(3.13)***
pop15+pop65	-0.00113	-0.00027	-0.00046	-0.000487	-0.00038
	(-1.11)	(-0.26)	(-0.45)	(-0.48)	(-0.38)
ratio	-0.011	-0.006	-0.007	-0.009	-0.007
	(-0.76)	(-0.25)	(-0.28)	(-0.38)	(-0.3)
hypinflation	-0.057	-0.041	-0.048	-0.042	-0.029
	(-4.35)***	(-2.85)***	(-3.5)***	(-3.15)***	(-2.12)**
k_average	-0.017	-0.009	-0.008	-0.010	-0.012
	(-2.34)**	(-1.21)	(-1.01)	(-1.33)	(-1.59)
emerging		-0.022	-0.016	-0.013	-0.021
		(-1.46)	(-1.08)	(-0.92)	(-1.44)
g_neg*y_neg				-0.0089	-0.0151
				(-1.78)*	(-2.78)***
CITT	0.206	0.064	0.065	0.089	0.088
	(4.99)***	(1.27)	(1.31)	(1.8)*	(1.82)*
(emerging)*CITT		0.286	0.225	0.180	0.306
		(3.64)***	(2.84)***	(2.84)***	(3.68)***
(emerging)*CITT*dum90			-0.008		-0.079
			(-0.12)		(-1.16)
(emerging)*CITT*g_neg*y_neg				0.166	0.205
				(1.33)	(1.62)
(emerging)*CITT*dum90*g_neg*y_neg					-0.629
					(-2.77)***
Adj. R^2	0.546	0.558	0.562	0.562	0.563
Durbin-Watson	1.725	1.747	1.752	1.748	1.727

Appendix C – Granger causality testing

In this section we use Granger causality tests for the relationship between GDP per capita and government expenditure. At first we test whether GDP per capita causes government expenditure (with three lags). Then, we test again this hypothesis after adding fixed effects for the different countries. At last, we run a full regression including all the control variables used in our paper [dlog(pop), pop15+pop65, hyper inflation, ratio]. The null hypnosis is that each of the coefficients of GDP per capita up to three lags equals 0. In all three specifications the null hypnosis is rejected.

To check reverse causality, we test all three specifications replacing the dependent variable by GDP per capita. The null hypnosis is that each of the coefficients of government expenditure up to three lags equals 0. The null hypnosis can not be rejected in all three specifications at 5 percent significance.

The table below summarizes the results.

	GDP per capita does not cause G			G does not cause GDP per capita		
Type of regression	Simple Granger Causality	With Cross section fixed effects	Full regression	Simple Granger Causality	With Cross section fixed effects	Full regression
F-statistic	14.0	11.4	14.2	1.87	1.96	2.19
significant at	under 1%	under 1%	Under 1%	14%	12%	9%
	The null hypnosis **can** be rejected	The null hypnosis **can** be rejected	The null hypnosis **can** be rejected	The null hypnosis **can not** be rejected	The null hypnosis **can not** be rejected	The null hypnosis **can not** be rejected

Appendix D – Emerging markets classification

We use the classification definitions of two emerging markets indices (as defined at the end of our sample period; 2006).

The MSCI Emerging Markets Index includes the following countries (the countries in bold are included in our sample): **Argentina, Brazil**, **Chile,** China, **Colombia**, Czech Republic**, Egypt, Hungary, India, Indonesia,** Israel, Jordan, **Korea, Malaysia, Mexico, Morocco, Pakistan, Peru,** Philippines**,** Poland**,** Russia**, South Africa,** Taiwan**, Thailand, Turkey and Venezuela.** The countries that are not in bold (excluding Israel) are not included do to insufficient data on government expenditure for the full sample period. Israel is excluded from the sample since Israel has been "upgraded" to a "developed market" classification.[10] On the other hand, Argentina, Pakistan and Venezuela have been "downgraded" from the Emerging Markets Index since 2006, but they are still included in our sample.

The FTSE Emerging Markets Index is similar to the MSCI index except that it does not include Korea and Venezuela.

Five countries are included in the sample and are not officially classified as emerging markets: Bolivia, Costa Rica, Dominican Republic, Panama and Uruguay.

[10] Strawczynski and Zeira (2007) show that in fact fiscal policy in Israel has evoluted from strongly procyclical in the past to mildly procyciclical after 1985.

Appendix E – data coverage and source

The data used in this research is taken from several databases. In the table below is a summary of the sources for the different variables used.

Variable name		Coverage (Maximum, for some countries coverage is only for part of the sample)	Source
Total Government expenditure and Government composition	Developed markets	1960-2006	OECD Historical Statistics
	Emerging markets	1972-2006	GFS
GDP = Y		1960-2006	OECD Historical statistics, IFS and WDI
Ratio		1960-2006	The Conference Board and Groningen Growth and Development Centre, Total Economy Database [except for Panama for which data is taken from WDI for the period 1980-2006]
Population		1960-2006	WDI
Population under 15		1960-2006	WDI
Population above 65		1960-2006	WDI
FDI		1970-2006	UNCTAD and IFS to supplement data for Indonesia and Panama
Government Debt – total, domestic and foreign	Developed Markets	1970-2006	GFS and OECD Historical statistics
	Emerging markets in Latin America + south Africa and Pakistan	1980-2004	Kevin Cowan, Eduardo Levy Yeyati, Ugo Panizza, and Federico Sturzenegger, "Sovereign Debt in the Americas: New Data and Stylized Facts", IADB Research Department Working Paper 577.
	Emerging markets not mentioned before	1972-2006	GFS supplemented with data from Ugo Panizza, "Domestic and External Public Debt in Developing countries", UNCTAD discussion paper (from: http://sites.google.com/site/md4stata), to supplement data for several countries.
International reserves and imports		1960-2006	IFS