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TO FLOAT OR NOT TO FLOAT? CURRENCY REGIMES AND GROWTH

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One recent line of research on exchange rates is the effect of fixed or floating currencies on long-term growth. One difficulty with such studies is that emerging market countries with certain imbalances and potentially hard-to-observe policy distortions are more likely to choose a fixed exchange rate regime, and thus estimates of the effect of exchange rates on growth are likely to be biased upward in magnitude. Results here indicate that when a measure of domestic distortions and macroeconomic imbalances is added to the model the exchange rate regime at most exacerbates existing distortions, and no longer appears to have an independent, significant effect on growth, contrary to some recent findings.

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JEL classification: F3, F41, O4

1. INTRODUCTION

Choosing the proper exchange rate regime has come to be seen as an increasingly vital task for emerging market policymakers. Wrenching balance of payments crises, in which devaluation is followed by sharp recession, have plagued many nations, Argentina being the most recent prominent example. Some research indicates the right currency policy is the key to avoiding such episodes (Eichengreen and Hausman (1999)). Other research finds a very important role for the exchange rate in greatly promoting cross-country trade (Rose and Van Wincoop (2001)).

One topic that has received recent attention is the effect the exchange rate has in affecting long-term growth. Ghosh, Gulde and Wolf (2002) find that intermediate regimes (as opposed to purely floating or fixed) have, depending on the estimator, a positive effect on growth. Levy-Yeyati and Sturzenegger (2003) make a major contribution by compiling an index of exchange rate policy based on actual, rather than stated policy.

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This is a major advance as officially stated exchange rate policy is often misleading (Calvo and Reinhart (2002), Reinhart and Rogoff (2004)). Having created the index, the authors' findings are that fixed and intermediate regimes have a clear, significantly negative impact on growth, although this holds only for emerging markets and not for industrial nations.

It is somewhat puzzling, given economic theory, that the exchange rate-a monetary variable-should affect *long*-run growth, especially negatively. A difficulty that plagues studies of the impact of exchange rates on growth has been articulated by Eichengreen (2001). Commenting on similar obstacles to accurately gauging the impact of trade policy or capital account openness on growth, the author points out that nations which have a given policy on say, trade, also likely have many other common policies and attributes, some of which may be hard to observe or measure, and thus the estimated effect of trade, or the exchange rate, or whatever policy is being investigated, is likely to be quite biased upward in magnitude. Similarly, Quinn, Inclan and Toyoda (2001), when investigating the effect of capital controls on growth, develop the notion of a "policy cluster" - nations with closed capital accounts are also likely to have rigid exchange rates, weak central banks, trade restrictions, high inflation, etc. so isolating the effect of capital controls by themselves is difficult.

Fixed exchange rates are certainly associated with many other policies, some of which are hard to observe. Thus, in this paper, we offer a new approach to help determine whether the exchange rate regime itself truly exerts an independent effect on growth. We will run the same types of regressions (five-year average panel, annual panel and cross-sectional) that Levy-Yeyati and Sturzenegger ran, to which we will add an overall measure of domestic distortions and macroeconomic difficulties. When this measure is added, the most reliable results indicate that fixed exchange rates at most exacerbate the impact of existing distortions, but have no independent impact on growth. That is, the negative impact, if any, of fixed exchange rates on growth is *contingent* on policies and attributes which are inconsistent with a currency peg.

This paper proceeds as follows. In section two, the previous literature on exchange rates and growth is reviewed. Section three estimates and reports results from three different specifications-five-year average panel, annual panel, and cross-sectional. Section four concludes.

2. PREVIOUS LITERATURE

In theory, there have been few mechanisms through which exchange rates are thought to affect growth, and thus the currency regime is rarely discussed as one of the major determinants of income. After all, exchange rates are an aspect of monetary policy, and if money is neutral in the long run, it is not initially obvious how such policy can affect growth. However, there have been two channels recently suggested through which exchange rates, at least in their most extremely fixed variety (common currencies) can

positively affect growth. One was posited by Dornbusch (2001). In this mechanism, a common money lowers currency risk and hence interest rates, thus spurring investment and growth. Similarly, Shambaugh (2004) finds that countries which peg their currencies follow the interest rate movements of the base nation more closely than flexible exchange rate regimes, thus conferring an interest-rate advantage for fixed exchange rates.

Another means through which a common currency could impact growth is through lowering the transactions costs associated with international trade. Rose (2000) and Rose and Van Wincoop (2001) present evidence that a single currency raises cross-country trade in goods very substantially. Increased trade has sometimes, but not always been found to raise economic growth (see Ben-David (1993), Sachs and Warner (1995) and Slaughter (2001)).

Both of these channels suggest that if fixed exchange rates affect growth at all, the impact should be positive. Accordingly, Ghosh, Gulde and Wolf (2002) find that intermediate regimes have a positive effect on economic growth compared to flexible exchange rates systems. The results are not robust to several changes in specification, however, such as allowing for fixed effects and controlling for the endogeneity of the regime through a treatment effects model. Ghosh, Gulde and Wolf (2000) examine the effects of currency boards on growth and find a positive, significant result that remains even when a treatment effects model is employed. Edwards and Magendzo (2003), however find that economies which have dollarized have achieved lower levels of economic growth than those which have not.

Theoretically, it is not immediately clear how a *floating* rate can increase the long-term rate of output growth. There is a large literature on the insulating and stabilizing properties of flexible currencies with respect to external shocks, such as changes in the terms of trade. While it is true that fixed rates could in some circumstances provide better insulation depending on the nature and definition of shocks, there is often a presumption that floating rates lower the volatility of economic aggregates, including income growth. But this effect is only on the volatility of output, not its long-term growth rate. However Ramey and Ramey (1995) have documented a negative effect of output volatility on growth, and thus flexible rates may have this indirect effect of raising the economic growth rate.

Levy-Yeyati and Sturzenegger (2003) find that floating rates do lead to increased growth for a sample of emerging market countries. These results are robust to several alternative specifications (pooled annual data, pooled five-year data, and cross-sectional models) and other checks, such as a treatment effects model.

In addition to convincing results, an excellent contribution of the authors is the development and use of a new data set on the actual exchange rate regime in place in given countries since 1974 on an annual basis, based on the behavior of exchange rates and reserves. The authors point out that the *de jure* classification system reported by the International Monetary Fund and employed in most studies may give a misleading picture of the true exchange rate regime prevailing in many nations. For instance, a

country may claim to float, but actually subject its currency to substantial intervention. Calvo and Reinhart (2002) denote this situation as "fear of floating," and present evidence that many nations, even after publicly switching to flexible currencies in the wake of the Asian crisis, continued to operate *de facto* pegs or bands. Alternatively, fixed exchange rates are abandoned in the midst of crises. Accordingly other authors such as Reinhart and Rogoff (2004) have begun developing their own de facto classification of exchange rate arrangements (although Reinhart and Rogoff did not attempt to employ theirs in a growth regression). Thus studies based on de jure exchange rate classifications are suspect, and Levy-Yeyati and Sturzenegger have made a major contribution through the construction of the new classification.

A central difficulty remains with all previous studies of the effect of the exchange rate on growth, however. This was pointed out by Eichengreen (2001), and is shared by papers on the effect of trade openness, as well as those concerning the impact of capital account opening. A country that adopts a fixed exchange rate may well have other policies that also affect growth (perhaps, even if fixed rates indeed have a negative impact, these other policies may as well). Some of these other policies and attributes may be difficult to measure; therefore a regression of growth rates on currency regimes may yield a coefficient that is picking up the effect of these policies.

In the context of studying the effect of capital account regulations on growth, Quinn, Inclan and Toyoda (2001) develop the notion of a "policy cluster." They report that countries which have capital account restrictions are also likely to have high inflation, weak central banks, fixed exchange rates and trade restrictions. Presumably other problems such as persistent fiscal deficits, and internal restrictions on commerce also characterize such economies. Some of these impediments to economic activity are obviously hard to measure directly. Thus, if only one indicator of such a cluster, such as the current or capital account, is included in the model, results could reflect the impact of many other variables.

The Levy-Yeyati and Sturzenegger (2003) paper, while it has made an important contribution in the development and use of a new dataset, suffers from the above problem of the fixed exchange rate possibly proxying for a cluster of other policies. The authors do acknowledge that endogeneity may be a problem, in that growth may impact exchange rate regime choice. They attempt to control for this endogeneity by using a variant of the treatment effects model. Ghosh, et al. and Edwards and Magendzo (2003) also employ treatment effects models to control for the possibility that countries with various macroeconomic problems may self-select into choosing fixed exchange rates.

The treatment effects model involves a continuous dependent variable, in this case growth, determined in part by a dummy variable regressor, the exchange rate regime (fixed, intermediate or flexible). Since the dummy is potentially endogenous, the treatment effects method has two stages. In the first, the dummy is regressed on a set of instruments in a probit or logit regression. In the second, the fitted values from this first model are employed as instruments in the growth equation. In principle, the technique controls for the simultaneity of the exchange rate regime. However, research by Angrist and Krueger

(2001) has found that using a nonlinear first stage to generate fitted values for a second stage regression results in inconsistent estimates "unless the nonlinear model happens to be *exactly* right."

Levy-Yeyati and Sturzenegger do attempt, in one of their three specifications, to add measures of poor macroeconomic performance and see the effect on their results. They add inflation, as well as dummies for banking and currency crises to the model, and find that, while the coefficients are slightly lower, fixed rates still exert a significant, negative impact on growth. We propose a measure which we believe to be a more complete and better indicator of overall economic policy problems, both for the macroeconomy and other distortions and restrictions on activity-the black market premium on foreign exchange.

The black market premium on foreign exchange is the difference between the unofficial (black market) and official price of foreign currency. It thus is positive in nations with dual exchange rate systems. Countries that have such a system often run macroeconomic policies inconsistent with a fixed exchange rate, such as high inflation and fiscal deficits. As the inflation rate rises, the BMP tends to rise as well. Hence the BMP is a measure of macroeconomic imbalances.

Additionally, high BMPs tend to be associated with trade restrictions and corruption, and hence are also a sign of domestic distortions. In their famous textbook on economic growth, Barro and Sala-i-Martin (2004) employ the measure. This measure has been employed in studies such as Arteta, Eichengreen and Wyplosz (2001), who were facing a comparable research problem: How to determine the effect of capital account restrictions on growth. Similarly, we will employ the measure here to see if it leaves any significance for the independent effect of exchange rates. Furthermore, we will see if the effect of fixed exchange rates is contingent on the existence of such distortions by interacting the exchange rate regime and the black market premium.

3. PANEL AND CROSS SECTION REGRESSIONS

In the Levy-Yeyati and Sturzenegger (2003) paper, three types of models are presented to assess the impact of exchange rate regimes on growth-panel models based on five-year averages of growth and its determinants, a panel with annual data over 1976-2000, and a cross country "Barro-style" growth regression. We therefore perform the same three types of estimation here, beginning with a five-year averaged panel model. We will not be able to use the full sample of countries that the authors used, for two reasons. First, since they found significant effects only for developing countries, we will accordingly restrict our sample to exclude industrialized economies. Secondly, we had to restrict the sample to those countries for which we could find data on the black market premium. Still, our sample is fairly large by growth regression standards. The countries are listed in the appendix.

As the aforementioned authors note, it is not the intention of such studies to "re-examine

results profusely analyzed in the growth literature" (p. 1177), and we accordingly follow with a non-controversial specification. The dependent variable will be the average growth rate of per-capita GDP in five-year increments over the period 1975-2000. The regressors will initially include investment as a fraction of GDP (averaged over the five-year periods), per-capita GDP in 1974, the level of secondary schooling for those over age 25 in 1970 (labeled "ED" in the tables), and openness, measured as the fraction of imports and exports relative to GDP, the total population, the lag of government consumption, all averaged over five years, and regional dummies for sub-Saharan Africa and Latin America. We then add the variable LYSAVG. This is computed based on the classification developed by Levy-Yeyati and Sturzenegger. Here, if a country was classified as floating in a given year, the index equals zero. If the currency regime was intermediate, the value is one, and if exchange rates were fixed, the value is two. The average of the index for the five-year periods over the years available from 1975-2000 is then taken and utilized as the regressor for the currency regime (there were two countries-Hungary and Malta-for which we used the classification system of Ghosh, Gulde and Wolf (2002), rather than Levy-Yeyati and Sturzenegger, as the latter's system was unavailable for them. We employed the Ghosh, *et al.* classification as these two nations generally operated uncontroversial fixed rates). Before turning to the regression results, note that the annual correlation coefficient between growth and LYSAVG is -0.102, which, while not overwhelming, is clearly negative. We seek to determine whether this negative association holds conditional on other factors.

To help capture the effect of these other factors, we will include also the black market premium, since as mentioned we want to control for macroeconomic imbalances and microeconomic distortions. In the absence of the BMP, the coefficient on the exchange rate regime might pick up some of these effects. We also will interact the BMP and the LYSAVG exchange rate regime variable. In employing an interaction term, we are testing here for whether the effect of the exchange rate regime is contingent on the level of overall distortions and imbalances in the economy. In a regression model, (abstracting from the other variables), an interaction term would be modeled as follows:

$$Y = \alpha + \beta_1 \,\mathrm{LYSAVG} + \beta_2 \,\mathrm{BMP{*}LYSAVG} + \varepsilon \,.$$

And therefore $\partial Y / \partial \,\mathrm{LYSAVG} = \beta_1 + \beta_2 \,\mathrm{BMP}$, and the parameter β_2 shows how the impact of the LYSAVG variable is affected by the level of BMP. That is, does exchange rate rigidity have a greater effect on output in the presence of distortions and macroeconomic problems than without such difficulties? Including an interaction term in the regression will help us answer that question.

Of course, whenever an interaction term is included in a regression, and the researcher suspects that it will be significant, it means that the regressors are not independent of each other. Of course, it would be rare to have a regression model where all of the independent variables were orthogonal to each other, but if there is high correlation among some of the regressors, it could lead to multicollinearity. When a

model exhibits high multicollinearity, it is correctly specified from the point of view of economic theory, but the statistical results entail low t-statistics, since correlation among the regressors makes it difficult to distinguish the effects of particular variables. We will return to this point in discussing the results of the model, and see whether multicollinearity is a problem in our estimation.

Table 1. Five-Year Averaged Panel Results

	(i)	(ii)	(iii)
INV	0.102785	0.103849	0.105948
	(0.0022)	(0.0017)	(0.0017)
GDP74	-0.000113	-0.000163	-0.000145
	(0.1406)	(0.0481)	(0.0954)
ED	0.42348	0.04227	0.040517
	(0.0500)	(0.0665)	(0.0724)
POP	2.16E-09	2.20E-09	1.98E-09
	(0.0028)	(0.0014)	(0.0065)
POPGR	-4.279265	-15.86486	-16.28607
	(0.8323)	(0.5179)	(0.5045)
OPEN	0.008414	0.009305	0.008727
	(0.0268)	(0.0126)	(0.0183)
GC	-0.112534	-0.093697	-0.093634
	(0.0017)	(0.0087)	(0.0082)
LA	-1.104297	-0.881684	-0.819281
	(0.0049)	(0.0209)	(0.0308)
AFRICA	-1.149399	-1.238437	-1.17641
	(0.0123)	(0.0079)	(0.0138)
LYSAVG	-0.819802	-0.734760	-0.350710
	(0.0709)	(0.0961)	(0.4685)
BMP		-0.251565	0.93446
		(0.0804)	(0.0534)
LYSAVG*BMP			-1.343386
			(0.0043)
	$R^2 = 0.25$	$R^2 = 0.25$	$R^2 = 0.26$
			RESET P - Value: 0.403192

Newey-West Standard Errors are employed; p-values in parentheses. N=322.

Since some studies on growth have used panels based on five-year growth averages (Islam (1995)), Levy-Yeyati and Sturzenegger perform the same exercise in their paper (results on p. 1182). The authors did not employ fixed effects, and we considered adding

country-specific effects to our estimation. Fixed effects could in principle be especially useful here, as results thus far indicate that fixed exchange rates are part of a policy "cluster" and allowing for some aspects of this cluster to be unobserved could lead to a more accurate assessment of the true impact of pegged regimes. For growth regressions, however, the presence of initial income acts as a lagged dependent variable, and standard fixed effects estimation will lead to inconsisitent estimates (Hsiao (1986)). Arellano and Bond (1991) have developed a dynamic panel estimator that can be employed in such a situation, that will lead to consistent estimates if there is no second-order autocorrelation. We did estimate a panel with the Arellano-Bond technique, but unfortunately we rejected the null of no second-order autocorrelation at nearly the five percent level, and thus our results (available upon request) were not likely reliable. However, it is important to note that when fixed effects were allowed for, the exchange rate regime no longer exerted a significant effect. But again, we could not reject the null of no second-order autocorrelation and thus we must rely on standard pooled data, as did LYS.

We present our results in table one. Growth, in its five year averages from 1975-2000 is the dependent variable. It should be noted that while for the cross-section regression White's standard errors will be employed, as in the LYS paper, for the panels we employ the Newey-West variance-covariance estimator. This estimator is robust to both heteroscedasticity and autocorrelation, and the latter can cause spurious inference in panels. For the set of panel estimates reported in table one, LYSAVG is computed over five years for each period (if only say two years were available in a given interval, the average of those years was taken).

As can be observed, in the initial specification, LYSAVG is negative and significant at the ten percent level. The effect seems fairly palpable. A country going from an intermediate to a floating regime (or to an intermediate from a fixed regime) could, based on the results, expect to grow by more than eight-tenths of a percent faster per year. This seems a bit much to expect from exchange rates alone, and we suspect that exchange rate rigidity is picking up effects of other policies and distortions. When BMP is added, LYSAVG continues to be just significant at the ten percent level, but the magnitude is slightly lower (data for BMP was obtained from the website of Xavier Sala-i-Martin at www.columbia.edu/~x23/indexnetscape.htm). When the interaction term is added as well, however, LYSAVG*BMP is significant at the five percent level, BMP is significant at the ten percent level, and LYSAVG is no longer significant. Thus the exchange rate, while associated with growth, no longer exerts an independent effect once the impact of other distortions is taken into account.

Interpreting this result is not straightforward. The most that can be said for fixed exchange rates is that they exert no independent negative impact on growth. They only, at most, exacerbate other distortions if they exist. For instance, in the presence of inflationary distortions, maintaining a fixed rate may lead to substantial overvaluation, with attendant negative consequences. Or, fixed rates may be viewed as part of a package of implicit guarantees by the government, encouraging over-borrowing, mis-allocation of

capital and recurrent crises (see Krugman (1999) and Eichengreen and Hausmann (1999)). But again, this effect of the exchange rate regime is contigent, and not direct. In fairness to the role of exchange rates on growth, it should be noted that a Ramsey RESET test was performed, and the null of no missing variables was not rejected at anything close to a standard level of significance. There is of course a large literature on empirical growth model specification, concerning which variables have true significance (Levine and Renelt (1992), Sala-i-Martin (1997)) and it is at least a positive sign that this specification doesn't appear to suffer from omitted variable bias. It is also noteworthy that initial income, BMP, the interaction term, investment, education, population, openness, government consumption, and the regional Africa dummy are all significant at the ten percent level or less, and thus multicollinearity does not appear to be a problem.

Levy-Yeyati and Sturzenegger also estimated a panel with annual growth data from 1975-2000. The authors argue that since exchange rate regimes "change rapidly over time..longer-term classification may be less informative" than using the annual frequency (p. 1181). And it is true that a nation which had an intermediate exchange rate regime for the entire period had a different policy than one which, say, floated half the time and fixed the other half. Of course it is not usual in growth studies to use annual data, but we will attempt to replicate their results for as many countries as possible for which the black market premium is available. In this case, since the data is annual, we can exploit greater variation in the Levy-Yeyati and Sturzenegger index. The authors differentiate between floating, intermediate and fixed regimes. A value of zero is given for floating, one for intermediate (INT) and two for fixed.

The results are displayed in Table 2. In the initial specification, we add the change in the terms of trade (TOT), since it was included in the Levy-Yeyati and Sturzenegger paper. As noted, neither the FIXED nor the INT coefficients are significant. The rest of the results are mostly what would be expected from the literature, with the exception of the coefficient on openness. Though small in magnitude, it is significantly negative. We believe this may result from specification problems with using annual data in a panel for growth, a point we will shortly elaborate on.

When BMP is added to the model, it is insignificant, as remain the FIXED and INT coefficients. However, when we add the interaction terms BMPINT and BMPFIXED, the coefficient on INT is negative and significant at the ten percent level, while BMP is negative and significant at the five percent level, and both interaction terms are *positive* and significant at the five percent level. Interpreted literally, this means a country with an intermediate exchange rate regime suffers negative direct effects from the currency policy, as well as negative direct effects from distortions, but that the currency regime helps ameliorate the effects of the distortions (or that distortions decrease the negative effect of the currency regime). This result is counterintuitive, and contrary to the results from the cross section model and five-year average panel models, in which distortions exacerbated rather than lessened the negative impact of inflexible currency rates.

Table 2. Annual Panel Results

	(i)	(ii)	(iii)
INV	0.052368	0.052515	0.050092
	(0.0237)	(0.0240)	(0.0356)
GDP74	-0.000178	-0.000183	-0.000221
	(0.0497)	(0.065)	(0.0336)
ED	0.014114	0.014395	0.018519
	(0.3799)	(0.3663)	(0.2319)
POP	1.28E-09	1.30E-09	1.77E-09
	(0.2386)	(0.2325)	(0.0999)
POPGR	-8.116942	-9.217553	-7.914423
	(0.5954)	(0.5880)	(0.6339)
OPEN	-0.012933	-0.012978	-0.012581
	(0.0067)	(0.0082)	(0.0108)
GC	-0.012892	-0.010965	-0.017735
	(0.7444)	(0.7947)	(0.6735)
LA	0.300046	0.320500	0.137470
	(0.5170)	(0.5153)	(0.7873)
AFRICA	0.226631	0.232530	0.035998
	(0.593)	(0.5858)	(0.9359)
TOT	0.005249	0.005203	0.005335
	(0.4126)	(0.4154)	(0.4063)
FIXED	0.307231	0.306107	-0.457235
	(0.4573)	(0.4590)	(0.3659)
INT	-0.07405	-0.074686	-0.947741
	(0.8544)	(0.8531)	(0.0603)
BMP		-0.028251	-3.026757
		(0.8447)	(0.0151)
BMPFIXED			3.050045
			(0.0193)
BMPINT			3.238974
			(0.0131)
	$R^2 = 0.027$	$R^2 = 0.0272$	$R^2 = 0.0419$
			RESET P - Value: 0.000388

Newey-West Standard Errors are employed; p-values in parentheses. N=1,484.

We suspect that these results, both on exchange rates and openness, are driven by specification problems with the model. Again, while the index is compiled annually, it is not at all usual to have regressions for long-term growth done with annual data. As Levy-Yeyati and Sturzenegger themselves note, there is a large literature on the short-run impact of exchange rates on economic performance, which is why they perform other estimation besides an annual frequency panel. We thus perform the Ramsey RESET test on this model, and we can reject the null hypothesis of correct specification at the five percent level. We are thus inclined to find the results of the

five-year average regressions more reliable. Of course, even if the results were to be believed, they again indicate that the effects of exchange rates are highly contingent on other economic factors.

Table 3. Cross-Section Results

	(i)	(ii)	(iii)
INV	0.148925	0.143342	0.141282
	(0.0011)	(0.0014)	(0.0015)
GDP74	-0.000184	-0.000286	-0.000265
	(0.0291)	(0.0005)	(0.0011)
ED	0.051327	0.040058	0.042498
	(0.0977)	(0.2099)	(0.1880)
POP	3.41E-09	3.49E-09	3.55E-09
	(0.0027)	(0.0004)	(0.0008)
POPGR	-27.86239	-68.90992	-62.17733
	(0.3268)	(0.0079)	(0.0154)
OPEN	-0.000584	0.004572	0.003842
	(0.9254)	(0.3275)	(0.4505)
GC	-0.044263	-0.041672	-0.038353
	(0.2852)	(0.2958)	(0.3361)
LA	-0.866773	-0.464605	-0.452157
	(0.0704)	(0.2612)	(0.2706)
AFRICA	-0.784485	-0.856829	-0.843043
	(0.1799)	(0.1478)	(0.1487)
LYSAVG	-0.235357	-0.223898	-0.049633
	(0.4888)	(0.5209)	(0.8793)
BMP		-0.973946	
		(0.0546)	
BMP*LYSAVG		0.281817	-0.301497
		(0.3252)	(0.0050)
	$R^2 = 0.577$	$R^2 = 0.633$	$R^2 = 0.623$
			RESET P -Value: 0.558

Notes: the correlation coefficient between GROWTH and LYSAVG was -0.102355. White's standard errors are employed; p-values are in parentheses, N=71.

Finally, Barro and Salai-Martin run a cross-sectional "Barro" regression for data averaged 1975-2000. Table 3 contains results for this specification. White's standard errors are employed for robustness with respect to heteroscedasticity. Investment and initial income are both significant at the five percent level, as expected, and education is positive and significant at the ten percent level. The level of population is positive and

significant, but population growth, while negative, has no significant impact. Openness is negative, which is counterintuitive except for the fact that it is also insignificant.

In this specification, LYSAVG is negative but not significant, which indicates that the exchange rate, despite its negative correlation with growth, has no palpable impact conditional on other factors. When both the black market premium (BMP) and its interaction with the exchange rate (BMP*LYSAVG) are added, LYSAVG remains insignificant, as does the interaction term, while BMP is negative and significant at the ten, although not the five percent level. However, when BMP is dropped, leaving only BMP*LYSAVG in the model, LYSAVG is still insignificant, while the interaction term is negative and significant at the five percent level.

Interpretation is again not straightforward. Perhaps the specification with both BMP and BMP*LYSAVG is most appropriate, and even if the last specification with BMP*LYSAVG but not BMP is taken as acceptable, fixed exchange rates again appear to exert no *independent* impact on growth, and they only exacerbate existing distortions. The RESET test for the last specification does fail to reject the null of no misspecification, so the phenomenon of currency pegs magnifying the negative impact of other detriments to growth does appear reasonable.

4. CONCLUSION

Results here indicate that the effect of fixed exchange rates on growth in emerging markets is not direct, but rather contingent on the existence of macroeconomic imbalances and other distortions in place in the domestic economy. These results seem to conform more closely with exchange rate theory, which posits mostly positive, and few negative channels for pegged currencies to impact growth over the long run.

These results highlight a point made in Calvo and Mishkin (“The Mirage of Exchange Rate Regimes for Emerging Market Countries” (2003)). The authors argue that standard theory on exchange rates is based on industrial-nation assumptions which are misplaced for emerging markets. For pegs, it is typically assumed that the authorities will make a time-consistent commitment to a peg, when in reality there are frequent devaluations and crises in developing countries. Also, it is assumed that the authorities can maintain a stable price level, but developing countries, while they have made substantial progress against inflation in the last several decades, still suffer from higher inflation than wealthy nations. This price pressure comes in the form of weak central banks (as in the case of Argentina in 2001), as well as contingent liabilities form weak banking systems and other fiscal pressures to monetize government obligations. It is uch distortions that fixed exchange rates, in our empirical estimation, appear to magnify and exacerbate. Pegs by themselves, contrary to findings by LYS, do not appear, however to have an independent impact on growth.

These results have implications for debates over what steps are necessary for dollarization in Latin America or Euroization for the transition economies of Eastern

Europe. Some observers believe that the act of firmly pegging by joining a currency union generates the necessary reforms by itself to make such a peg sustainable and beneficial. Others, however, believe that such firmly fixed exchange rates require reform *prior* to their adoption, especially in terms of macroeconomic policy, to avoid overvaluation other problems (Eichengreen (2002)). Our results indicate that while fixed exchange rate regimes exert no direct impact on growth, they will exacerbate the effects of existing policies if such policies are inconsistent with the peg.

APPENDIX

Countries in the Regressions

Algeria, Argentina, Bangladesh, Barbados, Benin, Botswana, Brazil, Burkina-Faso, Burundi, Cameroon, Central African Republic, Chile, China, Colombia, Republic of the Congo, Costa Rica, Cote Ivoire, Dominican Republic, Egypt, El Salvador, Gabon, Gambia, Ghana, Greece, Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Iran, Jamaica, Kenya, Korea, Lesotho, Luxembourg, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Mexico, Morocco, Nepal, Niger, Nigeria, Pakistan, Paraguay, Peru, Philippines, Portugal, Rwanda, Saudi Arabia, Senegal, Singapore, Spain, Sri Lanka, Suriname, Swaziland, Syria, Thailand, Togo, Trinidad, Tunisia, Turkey, Uruguay, Venezuela, Zambia, Zimbabwe.

REFERENCES

Angrist, J., and A. Krueger (2001), "Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments," *Journal of Economic Perspectives*, 15, 69-85.

Arellano, M., and S. Bond (1991), "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *Review of Economic Studies*, 58, 277-297.

Arteta, C., Eichengreen, B., and C. Wyplosz (2001), "When Does Captial Account Liberalization help More than it Hurts?" NBER Working Paper, 8414.

Barro, R., and X. Sala-i-Martin (2004), *Economic Growth*, MIT Press, Cambridge, Massachusetts.

Ben-David, B. (1993), "Equalizing Exchange: Trade Liberalization and Income Convergence," *Quarterly Journal of Economics*, 108, 653-79.

Calvo, G., and C. Reinhart (2002), "Fear of Floating," *Quarterly Journal of Economics*, 117, 379-408.

Calvo, G., and F. Mishkin (2003), "The Mirage of Exchange Rates for Emerging Market

Countries," NBER Working Paper, 9808.
Dornbusch, R. (2001), "Fewer Monies, Better Monies," *American Economic Review*, 91, 238-42.
Edwards, S., and I Magendzo (2003), "Dollarization and Economic Performance: What Do We Really Know?" *International Journal of Finance and Economics*, 8, 351-63.
Eichengreen, B. (2001), "Capital Account Liberalization: What do the Cross-Country Studies Tell Us?" *The World Bank Economic Review*, 15, 341-365.
Eichengreen (2002), "When to Dollarize," *Journal of Money, Credit and Banking*, 34, 1-24.
Eichengreen, B., and R. Hausmann (1999), "Exchange Rates and Financial Fragility," NBER Working Paper, 7418.
Ghosh, A., Gulde, A.M., and H. Wolf (2002), *Exchange Rate Regimes*, MIT Press, Cambridge, Massachusetts.
_____ (2000), "Currency Boards: More than a Quick Fix?" *Economic Policy*: *A European Forum*, 269-231.
Hsiao, C. (1986), *Analysis of Panel Data*, Cambridge, Massachusetts: Cambridge University Press.
Islam, N. (1995), "Growth Empirics: A Panel Data Approach," *Quarterly Journal of Economics*, 110, 1127-70.
Judson, R., and A. Owen (1999), "Estimating Dynamic Panel Models: A Guide for Macroeconomists," *Economics Letters*, 65, 9-15.
Krugman, P. (2000), "Crises: The Price of Globalization?" *Federal Reserve Bank of Kansas City Proceedings*, 75-106.
Levine, R., and D. Renelt (1992), "A Sensitivity Analysis of Cross-Country Growth Regressions," *American Economic Review*, 82, 942-63.
Levy-Yeyati, E., and F. Sturzenegger (2003), "To Float or to Fix: Evidence on the Impact of Exchange Rate Regimes on Growth," *American Economic Review*, 93, 1173-93.
Quinn, D., C. Inclan, and A.M. Toyoda "How and Where Capital Account Liberalization Leads to Economic Growth," presented at 2001 APSA convention in San Francisco.
Ramey, G., and V. Ramey (1995), "Cross-Country Evidence on the Link Between Volatility and Growth," *American Economic Review*, 85, 1138-51.
Reinhart, C., and K. Rogoff (2004), "The Modern History of Exchange Rate Arrangements: A Reinterpretation", *Quarterly Journal of Economics*, 119, 1-48.
Rose, A. (2000), "One Money, One Market? The Effects of Common Currencies on International Trade," *Economic Policy*, 15, 7-46.
Rose, A., and E. Van Wincoop (2001), "National Money as a Barrier to International Trade: The Real Case for Currency Union," *American Economic Review*, 91, 386-390.
Sachs, J., and A. Warner (1995), "Economic Reform and the Process of Global Integration," *Brookings Papers on Economic Activity*, 0, 1-95.
Sala-i-Martin, X. (1997), "I Just Ran Two Million Regressions!" *American Economic Review*, 87, 178-183.
Shambaugh, J. (2004), "The Effects of Fixed Exchange Rates on Monetary Policy," *Quarterly Journal of Economics*, 119, 301-352.

Slaughter, M. (2001), "Trade Liberalization and Per Capita Income Convergence: A Difference-in-Differences Analysis," *Journal of International Economics*, 55, 203-228.

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