THE PROSPECT OF DOLLARIZATION:

Are the Americas an Optimum Currency Area?

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Abstract

This paper examines the prospect of dollarization by asking whether the Americas constitute an optimum currency area. Economic theory suggests that dollarization is likely to be beneficial if the dollarizing economy's country-specific shocks are mild and synchronized with those of the U.S.; whereas in the presence of major asynchronous shocks, floating exchange rates are likely to be more stabilizing. Using annual data from the 1950-1997 period, real output fluctuations of 19 (North, Central, and South) American countries are decomposed into common and country-specific shocks. The decomposition reveals that country-specific shocks are large and generally asynchronous, so that the Americas, *as a whole*, are not an optimum currency area. Ranking *individual* countries in terms of stabilization costs, the results suggest that Canada, Honduras, and Colombia are among the best candidates for dollarization, while Peru and Argentina are among the worst.

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1. Introduction

Enthusiasm for "dollarization," the replacement of national currencies in the Americas by the U.S. dollar, is spreading fast and for a growing number of countries. Despite cautious comments by the U.S. Treasury Secretary (Summers, 1999), the prospect of dollarization has been endorsed by academic economists (Barro, 1999) and the business community (Wall Street Journal, 1999a, 1999b; Financial Times, 1999).

This paper asks whether the Americas constitute an optimum currency area and, thus, whether dollarization is likely to be stabilizing. Economic theory suggests that the answer depends on the relative magnitude of, and synchronization between, the U.S. and the dollarizing economy's shocks: dollarization is more likely to be beneficial if the dollarizing economy's country-specific shocks are mild and synchronous with U.S. shocks; whereas in the presence of major asynchronous shocks, monetary independence with floating exchange rates is more likely to be more stabilizing than dollarization.

Annual data from the 1950-1997 period are used to decompose the real output fluctuations of nineteen North, Central, and South American countries (including the U.S.) into common and country-specific shocks. The decomposition reveals that while common shocks are of sizable magnitude, they pale in comparison to most of the country-specific disturbances. At the low end, Canada, Guatemala, Colombia, and the U.S. have the smoothest country-specific shocks, whereas Argentina, Chile, Panama, and Peru have been the most volatile.

Next, the paper examines the degree of synchronization between the U.S. and each of the other eighteen economies. Canada, not surprisingly, is the most highly correlated with the U.S., while Peru is the most negatively correlated with the U.S.

In summary, the paper finds that country-specific shocks in the Americas are both large and generally asynchronous. This implies that the Americas, *as a whole*, are not an optimum currency area. *Individual* countries, however, can be ranked in terms of the stabilization costs dollarization would impose on them. The results suggest that Canada, Colombia, and Honduras are among the best candidates for dollarization, while Argentina and Peru are among the worst.

The remainder of the paper is organized as follows. Section 2 discusses the optimum currency area concept and the economics behind the criteria used in this study. Section 3 describes the data and the econometric methodology, and section 4 presents the empirical results. Section 5 concludes with a discussion of the implications of these findings.

2. Theoretical Background

Dollarization is a special case of monetary unification. In a typical monetary union (such as the European monetary union or the monetary union of the 50 U.S. states), the participating economies adopt a common currency (the euro or the dollar) and establish a common central bank to which they surrender monetary authority. Under dollarization, the participating economies also adopt a common currency (the U.S. dollar) and surrender monetary authority to a single central bank, but now it is the currency and the central bank of one of the participants, the U.S. While there is a difference, therefore, which has to do with the distribution of power within the common monetary authority, the rest of the economic considerations are very similar. In particular, in both cases participation means effective loss of independent monetary policy for all participants (except

the U.S. under dollarization). In other words, the question of whether the U.K. should join the European monetary union and adopt the euro is economically similar to whether Argentina should dollarize.

When is monetary union among several economies desirable? The answer depends on whether the economies in question constitute an *optimum currency area*. The concept was introduced by Mundell (1961) who used factor (labor and capital) mobility as its most important criterion. The concept, closely related to the debate between fixed and floating exchange rates, very quickly attracted wide attention. McKinnon (1963) identified openness as a superior criterion, Kenen (1969) suggested product diversification as a crucial consideration, and several other economists have proposed a number of different criteria.[1]

While these approaches focused mainly on the costs of monetary unification, more recently the discussion has evolved to a comparison of costs and benefits. Corden (1973) in an early contribution, Cohen (1989), De Grauwe (1992), and Eichengreen (1992), among others, classify and weigh the pros and cons of monetary integration. The list of benefits includes a reduction in transaction costs, elimination of exchange-rate uncertainty, and enhanced credibility for the monetary authority. Costs (all deriving from the inability to conduct independent monetary policy) include loss of seignorage, inability to select the most desired point on a short-run Phillips curve, and inability to devalue or revalue for stabilization purposes.

Focusing on dollarization, when are the benefits more likely to exceed the costs for a given candidate-economy? Just as in the more general case of monetary union, the answer critically depends on the nature of shocks that hit the economy (see the Appendix for a more

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[1] See Ishiyama (1975) for a survey of the early literature.

formal discussion in the context of a simple, but widely used, model). For any set of economies, there are two types of such shocks: *common* shocks that affect all the economies in a similar way (oil shocks, for example), and *economy-specific* shocks that are associated with a single economy (domestic fiscal disturbances, for example). First suppose there is no dollarization, so that each economy can pursue its own independent monetary policy. In principle, this enables each monetary authority to respond both to common and economy-specific shocks and minimize their business-cycle effects. The disadvantage is that this discretionary policy will create credibility problems that will raise the long-run (expected and actual) inflation rate.

Now suppose an economy dollarizes. Independent monetary policy is now ruled out. The U.S. Federal Reserve is still quite able (and, assume, willing) to respond to common shocks, but much less so to (non-U.S.) economy-specific ones. While in practice, some (non-U.S.) economy-specific shocks may receive some attention, the average dollarized economy will be left with less ability to counteract its domestic disturbances. Therefore, the cost of dollarizing will be small only if most of the shocks that impinge on the economy are common rather than economy-specific. More formally:

Proposition 1. The milder economy-specific shocks are relative to common shocks, the more likely is a set of economies to be an optimum currency area (see the Appendix for a proof).

But there is an additional complication. Presumably, the Fed will still try to smooth some U.S. economy-specific shocks. But because monetary policy is now common, this will spread the consequences of the U.S. shocks to the dollarized economies. For example, a monetary tightening designed to limit inflationary pressures in the U.S. will also affect a dollarized Argentina. Is this propagation of the responses to U.S.-specific shocks desirable or detrimental? The answer depends on how the dollarized economies' country-specific shocks are correlated with

those of the U.S. If these shocks are highly synchronized, so that overheating in the U.S. and

Argentina are always simultaneous, then the actions of a common monetary authority are a very

good substitute for monetary independence. If, however, economy-specific shocks are

asynchronous, monetary union will actually amplify domestic fluctuations. More formally:

Proposition 2. The more positively correlated economy-specific shocks are, the more

likely is a set of economies to be an optimum currency area (see the Appendix for a proof).

Despite the wide recognition of the importance of these propositions as criteria for an

optimum currency area,[2] empirical research along these lines is limited.[3] Furthermore, most of the

existing studies do not distinguish between common and economy-specific shocks, and as a result,

their estimates of overall correlations should considerably overestimate the correlations between

economy-specific shocks. Stockman (1988) and Emerson (1992, Annex D), are two studies that

separately identify common and nation-specific shocks for several European countries, finding

that both types are empirically important. Both studies, however, address only the issue of the

relative magnitude of the two types of shocks (Proposition 1), and not their correlations

(Proposition 2). The next section describes how Stockman's technique is used in this paper to

evaluate both propositions for a set of American countries.

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[2] For similar discussions, see Emerson (1992, Chapter 6), Gros and Thygesen (1992, chapter 7), and Eichengreen (1992, chapter 3) for the European monetary unification, and Summers (1999) and Berg and Borensztein (2000) for dollarization. Also see Lane (1999). It must be pointed out that Propositions 1 and 2 depend on the presence of nominal rigidities that render monetary policy (potentially) stabilizing.

[3] And it is mostly focused on Europe; see for example Bayoumi and Eichengreen (1992) and Alesina and Wacziarg (1999). Bayoumi and Eichengreen (1994) examine whether NAFTA is an optimum currency area, while Eichengreen (1998) asks the same for Mercosur. See also Eichengreen (2000) for why success or failure of dollarization will depend on its timing.

3. Data and Methodology

Two data sets are utilized. *Data Set I* (PWT 5.6) uses GDP from the Penn World Tables, Mark 5.6, expressed in PPP-adjusted constant 1985 prices, as documented in Summers and Heston (1991) and updated in 1995. These series are available annually from 1950 to 1990. *Data Set II* (IFS) uses annual real GDP, in 1990 prices, from the International Financial Statistics of the IMF (IFS on CD-ROM, March 1999). The period covered is from 1968 to 1997. Both data sets include the same nineteen American countries: Canada, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Panama, the U.S.A., Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela.[4]

Let $\Delta y_{it} = (GDP_{it} - GDP_{it-1})/GDP_{it-1}$ denote the rate of growth of real GDP in economy *i* at time *t*. Following Stockman (1988), the following equation is estimated:

$$\Delta y_{it} = w_i + v_t + u_{it}$$

(1)

where w_i is a constant term specific to economy *i*, v_t is a shock common to all economies at time *t*, and u_{it} is the *i*-th economy's specific shock. Econometrically, w_i and v_t are treated as fixed economy- and time-effects, respectively.

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[4] Country selection has been dictated by data availability only.

Columns (1) and (4) in Table 1 estimate the equation for Data Sets I and II, respectively. For both data sets, the time fixed effects, the v_t's, are jointly highly significant, and the hypothesis that they do not statistically significantly vary by year can be safely rejected. In addition, the w_i's are also statistically different from each other. Equations (1) and (4), however, ignore persistence in output growth, which turns out to be statistically significant. In order to allow for persistence, the equation has been respecified as

$$\Delta y_{it} = w_i + \rho \Delta y_{it-1} + v_t + u_{it}$$

(2)

and

$$\Delta y_{it} = w_i + \rho_i \Delta y_{it-1} + v_t + u_{it}$$

(3)

In Table 1, columns (2) and (3) for Data Set I, and columns (5) and (6) for Data Set II, report the results. Note that the estimated AR(1) coefficients in (2) and (4) are highly statistically significant. In addition, allowing for persistence has not affected the properties of the v_t's, although it reverses the rejection of the hypothesis that the w_is are not statistically different from each other for Data Set II. As the hypothesis that the ρ_i's in (3) and (6) are statistically equal

across countries cannot be rejected, the analysis that follows is based on specifications (2) and (4)

which impose the same autoregressive parameter on all economies in order to gain efficiency.[5]

4. Empirical Results

4.1. Size of Common and Country-Specific Shocks

Let's turn our attention first to Proposition 1. The top panel of Figure 1 plots the common

shocks (the v_t's) for the 1951-1997 period. The solid line (1952-1992) is based on Data Set I,

and the dashed line (1970-1997) on Data Set II. The common shocks are sizable and have ranged

from 2.41% in 1962 to -7.30% in 1982. In addition, the patterns of the two data sets agree

remarkably well over their common range (1970-1992). These shocks, together with the

estimated w$_i$s, can be used to simulate the "common trend" output path of any of the nineteen

economies over time. The bottom panel of Figure 1 conducts this exercise for the U.S.

How does the common shock compare in size with the economy-specific shocks? Despite

its significant variability, the common shock is much milder than most economy-specific shocks.

Table 2 compares the two types of disturbances for both data sets. For Data Set I, the variance of

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[5] The results are virtually identical if specifications (3) and (6) are used. Moreover, AR(2) and
AR(3) processes were also tried for Δy , but the estimated higher-order autoregressive
parameters were usually statistically insignificant.

the common shock is 4.50, whereas that of the economy-specific shocks ranges from 4.40 in

Guatemala to 35.16 in the Dominican Republic. Put differently (second column of Table 2),

during 1950-1992, Guatemala-specific shocks were almost exactly as volatile as the common

shock, whereas Dominican Republic-specific shocks were eight times more volatile. From Data

Set II, the variance of the common shock is 3.22, whereas that of the economy-specific shocks

ranges from 1.81 in (again) Guatemala to 26.65 in Panama. The "Ordering" columns of Table 2

rank the nineteen economies in ascending order of economy-specific variance. Note that the

orderings are very similar between the two data sets: the correlations coefficient of the two

orderings is 0.74. On the basis of Proposition 1, Guatemala, Colombia, Canada, and Costa Rica

have the least to lose from giving up monetary independence and dollarizing. At the other

extreme, the costs for Peru, Panama, Chile, and Argentina are likely to be the greatest.[6]

4.2. Synchronization and Symmetry of Economy-Specific Shocks

By itself, the fact that most of the economy-specific shocks are more sizable than the

common shock is only necessary, but not sufficient to rule out an optimum currency area for these

nineteen economies. It might still be the case that the economy-specific shocks are mostly

positively correlated so that, despite their size, they can be largely smoothed by a common

monetary authority. This, however, does not appear to be the case.

Table 3 reports correlation coefficients between each of the eighteen (non-U.S.) country-

specific shocks and the U.S.-specific shock. It is worth emphasizing again that these do not test

the overall synchronicity of each of the economies with the U.S., but rather the synchronicity

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[6] Panama, of course, has long been dollarized. Ecuador also replaced the sucre with the dollar
as of April 1, 2000.

between their country-specific shocks only. Thus, it is possible that two countries with completely asynchronous (or even negatively correlated) economy-specific shocks, might appear overall to be in phase, simply because of the effects of the common shock.

Table 3 shows that very few strong positive correlations exist, while the number of negative statistically significant correlations equals ten in both data sets. The "Ordering" columns of Table 3 rank the eighteen non-U.S. economies in descending order of correlation with the U.S. Once more, note that the orderings (and the correlations themselves) are remarkably similar between the two data sets: the correlation coefficient of the two orderings is 0.94. In both data sets, Canada is by far the most highly correlated with the U.S., distantly followed by Honduras. Also in both data sets, Peru is the most negatively correlated with the U.S. On the basis of Proposition 2, there is very little evidence that these nineteen economies constitute an optimum currency area.

4. Conclusions and Discussion

This paper examined the prospects of dollarization by asking whether nineteen countries in the Americas comprise an optimum currency area. Economic theory suggests that dollarization will be stabilizing if (i) economy-specific shocks are small relative to the common shocks, or (/and) (ii) economy-specific shocks for countries other than the U.S. are positively correlated with U.S.-specific shocks. The empirical results presented here imply that none of these conditions is satisfied for the majority of the economies in the Americas. Simply put, the Americas are not an optimum currency area: monetary integration is unlikely to have any stabilization benefits for most

of the countries, and it may actually have severe adverse effects on output variability for several of them.[7]

In practice, of course, this conclusion should be qualified for four (at least) reasons. First, the stabilization costs must be balanced against any political and economic gains derived from monetary unification. These gains will be generated not only by the absence of exchange-rate fluctuations, but also by the achievement of generally lower steady-state inflation rates which will result from dollarization because of the enhanced credibility of monetary policy, as suggested by the paper's theoretical model. Second, dollarization itself may enhance the structural similarities of the economies adopting it and reduce some of the large asymmetries estimated here. This is the argument made by Frankel and Rose (1998) about the "endogeneity" of optimum currency area criteria (but see also Eichengreen, 1992; and Krugman, 1993). Indeed, a similar argument has been made in defense of the European Monetary Union and the euro. The extent to which this is likely to happen is one of the most promising areas of future research.

The third and perhaps most important qualification of our general conclusion that the Americas, *as a whole*, are not an optimum monetary area, is that it does not necessarily apply to every *individual* country. In fact, it is easily shown to be less true for some of the economies than for others. The paper's empirical results can be used to evaluate which of the economies examined here would be good candidates for dollarization, in the sense that adopting the dollar will not destabilize them, and which ones would be less good because they would have to pay a higher price in terms of stabilization costs. Figure 2 plots the correlation of each country's specific shock with that of the U.S. against the variance of each country's specific shock. This is

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[7] This is consistent with the findings of Bayoumi and Eichengreen (1994) for monetary union in NAFTA.

carried out for both the PWT 5.6 (1) and the IFS (2) data sets.[8] Propositions 1 and 2 suggest that the closer an economy is to the (0,1) point, i.e. the "northwest" corner of the graph, the lower the stabilization costs associated with dollarization. Hence, Canada is clearly the best candidate for dollarization: not only is its country-specific shock highly positively correlated with the U.S., but it has also a low variance. Honduras, Colombia, and Costa Rica appear to be the next best candidates. On the other hand, Peru and Argentina appear to be the worst candidates for dollarization: not only are their country-specific shocks negatively correlated with the U.S., but they have also a high variance. It follows that dollarization by Peru or Argentina (despite its political attractiveness and potential credibility gains) may substantially amplify the business cycle there and end up being *de*stabilizing.[9] The cases of Mexico and Brazil are somewhere in between: their correlations with the U.S. are negative, but the variances of their country-specific shocks are more moderate. Finally, Chile is particularly difficult to rank as a dollarization candidate: its correlation with the U.S. is positive (albeit low), but its country-specific variance is among the highest.

Lastly, it has to be acknowledged that dollarization is, at least partly, a political process, involving more than strictly economic decisions. This is almost always the case with similar international arrangements, other examples of which are NAFTA, the accession of China to the WTO, and membership in the EU and the *euro* for various European countries. The fact that political issues are highly important, however, does not change the economic parts of the

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[8] It may be interesting to point out that the two data sets give similar points on Figure 2 for most of the countries in the sample. The prominent exceptions are Bolivia, the Dominican Republic, and Paraguay.

[9] Kydland and Zarazaga (1997) have conducted a comparison of the business cycle in Argentina and the U.S.

equation. If political criteria are more prominent than economic ones, an economy may dollarize

when it is not optimal to do so, or may be prevented from dollarizing when the situation is

optimal. In this case, fulfilling the economic criteria may not be a good predictor of actual

dollarization. However, the economic effects will always depend on these criteria. Thus, whether

dollarization will benefit or harm a country's economy depends on the economic criteria only.

Appendix

This Appendix demonstrates Propositions 1 and 2 using a simple model. Suppose there are N economies indexed by i (i=1,2,...,N). The first economy (i=1) is assumed to be the U.S., so that the corresponding currency is the U.S. dollar. Following Kydland and Prescott (1977), and Barro and Gordon (1983), each economy's loss function is

$$L_i = \tfrac{1}{2} E[\alpha_i (y_i - \hat{y}_i)^2 + \pi_i^2]$$

(A1)

where y denotes output, π inflation, $\hat{y}$ a target level of output, E the mathematical expectation, and α captures the importance of the output target relative to the inflation target. Aggregate supply is given by an expectations-augmented Phillips curve (with slope normalized to unity and the "natural" rate normalized to zero for simplicity):

$$y_i = (\pi_i - \pi_i^e) + v + u_i$$

(A2)

where π^e is expected inflation, $v \sim (0, \sigma_v^2)$ is a shock common to all N economies, and $u_i \sim (0, \sigma_i^2)$ are economy-specific shocks. By assumption, the realizations of v and u become known after inflationary expectations are set, but before the central bank determines π.[10]

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[10] Rogoff (1985), Alesina and Grilli (1992, 1994), De Grauwe (1994), and Alesina and Wacziarg (1999) have examined similar models. The main difference between these models and the present formulation is that, in addition to the economy-specific shocks, the stochastic part of (A2) has also a common component.

Without dollarization (i.e., without a monetary union), when each economy's central bank can pursue independent monetary policy, minimizing (A1) subject to (A2) leads to the following dynamically consistent (Nash) equilibrium:

$$\pi_i = \alpha_i \hat{y}_i - \frac{\alpha_i}{1+\alpha_i}(v+u_i)$$

(A3)

and

$$y_i = \frac{1}{1+\alpha_i}(v+u_i).$$

(A4)

The variability of output is then given by

$$\mathrm{var}(y) = \frac{1}{(1+\alpha_i)^2}(\sigma_v^2 + \sigma_i^2).$$

(A5)

Note that there is a trade-off between average inflation $(\overline{\pi}_i = \alpha_i \hat{y}_i)$ and output variability: if α_i is very low (so that the central bank is very "conservative"), average inflation will be very low, but output very unstable.[11]

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[11] Rogoff (1985) examines the optimal value for α_i. Fischer and Summers (1989) show that a similar trade-off exists if the source of uncertainty is the central bank's inability to determine the inflation rate without error.

Next, consider dollarization: assume the N economies form a monetary union, monetary authority is delegated to the U.S. ($i=1$), and the dollar is adopted by all N economies. Then, at equilibrium, $\pi_i = \pi_1$ and thus $\pi_i^e = \pi_1^e$ for all i, where π_1 is given as in (A3). So,

$$y_i = (\pi_1 - \pi_1^e) + v + u_i = \frac{1}{(1+\alpha_1)}v + u_i - \frac{\alpha_1}{(1+\alpha_1)}u_1$$

and thus

$$\text{var}(y_i) = \frac{1}{(1+\alpha_1)^2}\sigma_v^2 + \sigma_i^2 + \frac{\alpha_1^2}{(1+\alpha_1)^2}\sigma_1^2 - 2\rho_{i1}\frac{\alpha_1}{1+\alpha_1}\sigma_i\sigma_1$$

(A6)

It follows, therefore, that dollarization (provided the U.S. has a more "conservative" monetary authority, so that $\alpha_1 \leq \alpha_i$ and $\hat{y}_1 \leq \hat{y}_i$) will reduce the dollarizing economy's average inflation rate: $\bar{\pi}_i^{DOLLARIZTION} = \alpha_1\hat{y}_1 < \alpha_i\hat{y}_i = \bar{\pi}_i^{INDEPENDNT}$. At the same time, however, comparing (A6) to (A5) shows that dollarization may very well raise output variability. This is the cost of dollarization. From (A6), this cost will be smaller, the smaller is σ_v^2 compared to σ_1^2 (Proposition 1). At the same time, the cost will also be smaller, the closer ρ_{i1} is to unity (Proposition 2).

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Table 1

Three Time-Series Specifications

	Data Set I: PWT5.6 (1950-1992)			Data Set II: IFS (1968-1997)		
	(1)	(2)	(3)	(4)	(5)	(6)
$\overline{\rho}$	----	0.12**	----	----	0.28**	----
		(0.04)			(0.04)	
R^2	0.26	0.28	0.31	0.29	0.34	0.37
DW	1.76	1.92	1.93	1.43	1.95	1.94

F-Tests for the Null:

$w_i = \overline{w}, \forall i$	2.47**	2.15**	1.44	2.03**	0.95	0.84
$v_t = 0, \forall t$	5.20**	4.55**	4.37**	5.90**	4.36**	4.35**
$v_t = \overline{v}, \forall t$	5.19**	4.67**	4.48*	6.01**	4.46**	4.46**
$\rho_i = 0, \forall i$	----	----	1.81*	----	----	3.30**
$\rho_i = \overline{\rho}, \forall i$	----	----	1.29	----	----	1.13

Notes. Standard errors in parentheses. **: significant at 1%, *:significant at 5%.

(1) and (4): $\Delta y_{it} = w_i + v_t + u_{it}$,

(2) and (5): $\Delta y_{it} = w_i + \rho \Delta y_{it-1} + v_t + u_{it}$,

(3) and (6): $\Delta y_{it} = w_i + \rho_i \Delta y_{it-1} + v_t + u_{it}$.

Table 2

Common and Country-Specific Shocks

	COMMON SHOCK	
Data Set I: PWT5.6 (1950-1992)	Data Set II: IFS (1968-1997)
$\sigma_v^2 = 4.50\%$	$\sigma_v^2 = 3.22\%$

	COUNTRY-SPECIFIC SHOCKS					
	Data Set I: PWT5.6 (1950-1992)			Data Set II: IFS (1968-1997)		
i	σ_i^2	σ_i^2/σ_v^2	Ordering	σ_i^2	σ_i^2/σ_v^2	Ordering
Canada	7.85%	1.75	5	3.70%	1.15	3
Costa Rica	14.69	3.27	8	5.91	1.84	6
Dominican Rep.	35.16	7.82	19	11.33	3.52	12
El Salvador	11.69	2.60	7	9.92	3.08	9
Guatemala	4.40	0.98	1	1.81	0.56	1
Honduras	7.81	1.74	4	7.55	2.34	8
Mexico	10.83	2.41	6	10.07	3.13	10
Panama	22.27	4.95	14	26.65	8.28	18
U.S.A.	7.78	1.73	3	4.45	1.38	5
Argentina	24.16	5.37	16	22.45	6.97	15
Bolivia	14.90	3.31	10	4.26	1.32	4
Brazil	14.83	3.30	9	12.24	3.80	13
Chile	26.84	5.97	18	30.55	9.49	19
Colombia	4.94	1.10	2	2.18	0.68	2
Ecuador	15.30	3.40	11	22.84	7.09	16
Paraguay	26.41	5.87	17	7.21	2.24	7
Peru	24.03	5.34	15	24.73	7.68	17
Uruguay	19.41	4.32	12	10.69	3.32	11
Venezuela	21.35	4.75	13	16.03	4.98	14

Notes. See notes to Table 1. $\sigma_v^2 = \mathrm{var}(v_t)$ is the variance of the common shock; $\sigma_i^2 = \mathrm{var}(u_{it})$ is the variance of a country-specific shock. "Ordering" ranks the countries in ascending order of country-specific variance.

Table 3

Country-Specific Shocks: Correlations with the U.S.

i	Data Set I: PWT5.6 (1950-1992)		Data Set II: IFS (1968-1997)	
	$\rho_{i,US}$	Ordering	$\rho_{i,US}$	Ordering
Canada	0.72	1	0.77	1
Costa Rica	0.27	4	0.27	3
Dominican Rep.	-0.21	12	0.17	6
El Salvador	0.34	3	0.19	5
Guatemala	-0.03	9	-0.13	11
Honduras	0.48	2	0.34	2
Mexico	-0.22	13	-0.09	10
Panama	-0.28	14	-0.25	16
U.S.A.	1.00	--	1.00	--
Argentina	-0.16	11	-0.14	12
Bolivia	0.14	6	-0.23	15
Brazil	-0.28	15	-0.07	9
Chile	0.11	7	0.15	7
Colombia	0.23	5	0.25	4
Ecuador	-0.14	10	0.07	8
Paraguay	-0.30	17	-0.18	13
Peru	-0.34	18	-0.48	18
Uruguay	-0.29	16	-0.21	14
Venezuela	0.06	8	-0.30	17

Notes. See notes to Table 1. $\rho_{i,US} = corr(u_{i,t}, u_{US,t})$. "Ordering" ranks the countries in descending order of correlation with the U.S.

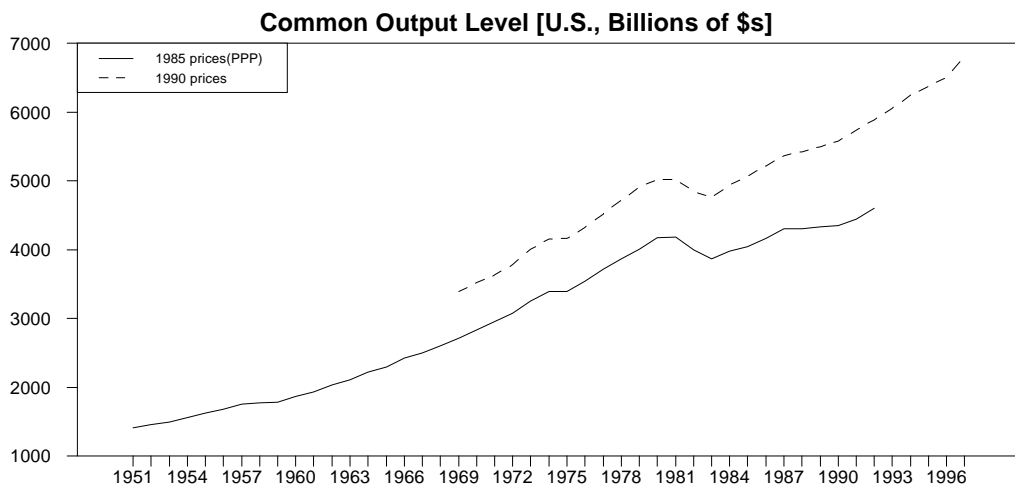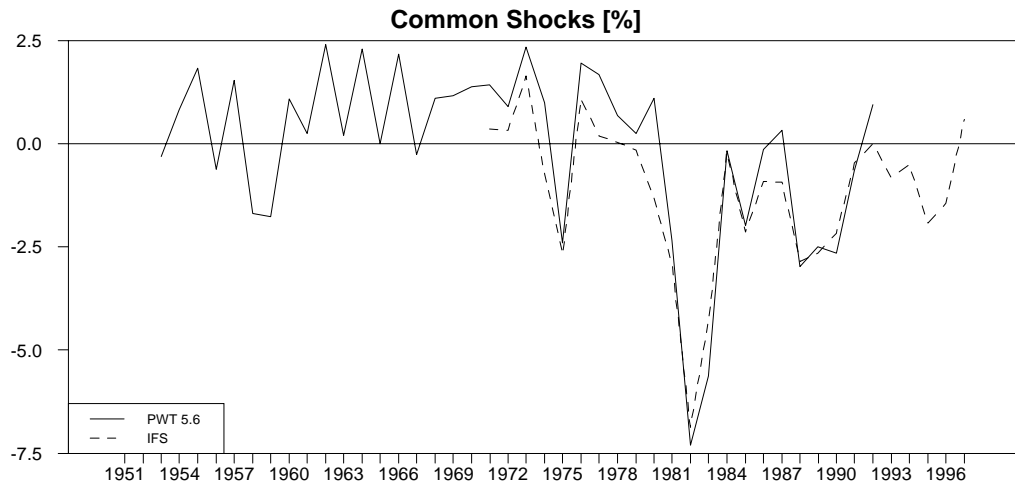# Common Shocks and (Implied) U.S. Common Trend: 1951-1997

Common Shocks [%]

Common Output Level [U.S., Billions of $s]

FIGURE 1

Common Shocks and (Implied) U.S. Common Trend
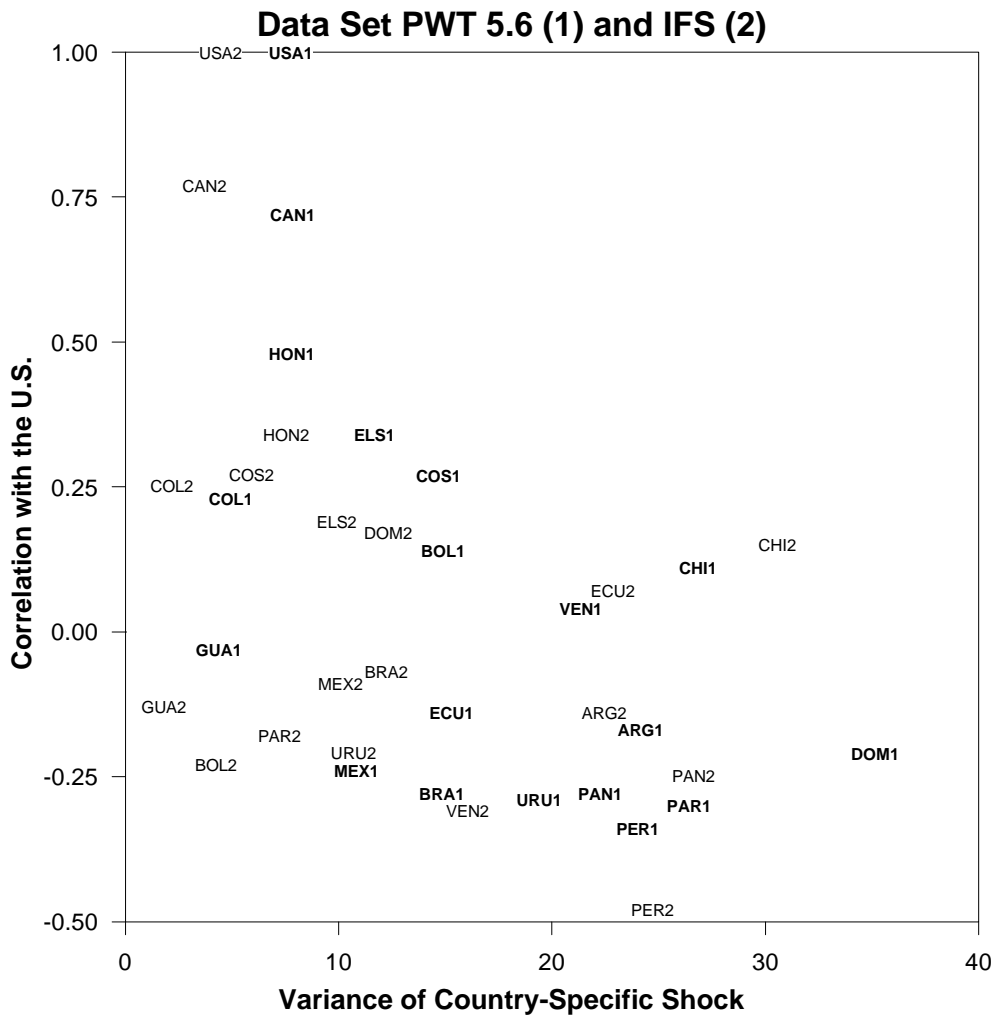
Data Set PWT 5.6 (1) and IFS (2)

FIGURE 2

Correlation with the U.S. vs Variance of Country-Specific Shocks