Inflation and the Monetary Regime During the Cuban Economic Transition

Bryan W. Roberts, Dept. of Economics, Univ. of Miami, Florida [1]

I. Introduction

Serious economic reform will begin in Cuba only after the current regime has relinquished power. As in Eastern Europe, serious reform necessarily entails a move to a free-market economy relying primarily on private ownership of property. The history of third-world and socialist economic development shows that there is no third way. The last two years have witnessed the introduction of a variety of half-measures to liberalize the Cuban economy and promote private enterprise. They are remarkably similar to many of the half-measures undertaken in Hungary in 1970-89, Poland in 1981-89, and the Soviet Union in 1986-91. The experience of these countries shows that half- masures inevitably lead to tensions and contradictions. The government either continues to liberalize or retreats to old ways. Under Castro, Cuba has usually chosen to retreat. What little credibility the government may have enjoyed among the Cuban population in earlier days is now gone.

However, the Cuban situation is unusual in that unlike Eastern Europe, Cuba has already suffered the worst real shocks before her transition has begun. The collapse of the socialist trading system, elimination of Soviet subsidies, and massive terms-of-trade shock have produced a dramatic fall in national income. Cuba can also learn from Eastern European experiences in order to decide what policies are optimal and what might happen over the course of transition.

This paper will focus on two key aspects of the upcoming transition: the inflationary process and choice of monetary regime. East European experiences are particularly relevant here, as lessons have been learned that generalize to the Cuban case. I will not discuss other critical policies that must be addressed in any coherent economic transition plan: privatization, trade liberalization, institutional reform and protection of property rights, labor market reforms, and the creation of a social safety net.

At the onset of transition, Cuba should fully liberalize prices for goods and services. A one-month burst in the official price level will result. This burst is a primarily a consequence of the sudden unification of official and parallel markets for goods and services. Macroeconomic indicators such as the real wage cannot be used to make inferences about change in economic welfare under these conditions. Use of official exchange rates to translate Cuban income and wages into dollars is also extremely misleading. Although well-trained economists are aware of this, particularly the problem with official exchange rates, journalists and many government officials and policymakers will routinely misuse figures and paint misleading pictures.

The average level of price inflation after the initial burst will depend on fiscal and monetary policies. These policies can be critically influenced by the choice of monetary regime. I will argue that Cuba should choose a currency board as its monetary regime. A currency board issues and redeems domestic currency against a reserve currency according to a predetermined nominal exchange rate schedule. Domestic money issue is tied completely to changes in foreign reserve holdings.

A currency board is desirable because it eliminates monetary discretion and provides instant credibility. It is also an alternative to stabilization using money as the nominal anchor, which is desirable when money demand is subject to many shocks that may be difficult to predict. The primary drawback of a currency board is that negative terms-of-trade shocks induce domestic monetary contraction and deflation. Cuba has already suffered her biggest terms-of-trade shocks. However, if the island continues to be dependent on sugar exports, the currency board may want to use a nominal exchange rate depreciation rule that is tied to the terms of trade.

II. Price Liberalization and the Initial Inflationary Burst

Experience in Eastern Europe and the former Soviet Union suggests that immediate and decisive liberalization of prices for goods and services at the very beginning of transition is optimal. Cuba has built up a very high level of repressed inflation with resulting shortages and parallel markets. Shortages lead to widespread queuing and searching for goods, and economic welfare falls as a result. Price liberalization eliminates shortages, queuing and searching and immediately increases consumer welfare. Gradual liberalization only delays this increase in welfare. Even if real income falls as a result of other transition policies, the increase in welfare due to shortage elimination may more than offset this fall.[2]

Price liberalization also increases government credibility. Although post-liberalization inflation depends primarily on monetary and fiscal policies, an early and decisive price liberalization signals to the public that the new government is intent on making a fundamental break with the past. This lends credibility to other reform and stabilization efforts. Gradual price liberalization may also undermine the very program of price liberalization by increasing the probability of reform failure.[3]

Why would one wish to delay price liberalization? The most important reason is that it has serious distributional consequences. Theoretical models show that liberalization might hurt the poor and benefit the rich.[4] In the Chinese case, liberalization was pursued gradually to avoid a major redistribution between rural and urban areas. These redistributional problems are unlikely to be important in the Cuban case. As most goods and services are now traded on parallel markets, few people obtain rents on goods sold at official prices. Cuba has in fact already pursued gradual price liberalization: the extent of parallel markets has risen sharply over the past five years, and many households now probably buy most goods and services at freely-set prices.

Gradual liberalization of prices for goods and services has been attempted in China over the 1980's and in Ukraine over the last two years. The Ukrainian transition experience to date must be considered an abject failure. Price controls and extraordinarily loose monetary and fiscal policies have resulted in an explosion of shortages, deadweight loss, and barterization of the economy. These policies are clearly unsustainable.

The Chinese transition experience is regarded by some as the most successful to date. China probably did not have much repressed inflation and deadweight losses from shortages and queuing. When the Chinese authorities decided to liberalize prices, they did so rapidly. Finally, it is extremely doubtful that a post-Castro Cuban government could maintain a dual-pricing system, which was the hallmark feature of Chinese price policy. In a dual-pricing system, some output is sold at officially-set prices and some on free markets. Dual pricing creates opportunities for arbitrage and corruption, both of which undermine the purported goals of the institution. A powerful communist government may perhaps be able to limit the extent of these activities, or repress protest over their appearance, but not (hopefully) the new Cuban government.

Immediate price liberalization results in a one-time inflationary burst in the official price level. It is easiest to see this in a very simple formal model. Consider a single-good, representative-agent economy before official prices are liberalized.[5] This economy is characterized by an official price level that does not equate the supply of consumer goods with the nominal demand for consumer goods, and shortage and a parallel market emerge that bring about an equilibrium. The following condition holds:

$P_S x_T < I$, where PS is the official price, xT is the real supply of the consumption good, and I is nominal monetary income consumers desire to spend on consumption. Because of this disequilibrium, a free market appears on which some of the good is sold at a market-clearing price.

The emergence of shortage and a parallel market serve to bring about equilibrium. In this equilibrium,

the budget constraint

$P_S x_S + P_F x_F = I$, binds, where PF is the free-market price and xS and xF are amounts of the good sold at the official price and the free-market price respectively.[6] Normalizing with respect to the official price, this budget constraint can be written as

$x_S + p_F x_F = \frac{I}{P_S}$, where pF is the relative free-market price.

After price liberalization, all of the good will be sold at a new market-clearing price PM, so that the budget constraint

$P_M x_T = I$ holds.

Dividing both sides of (3) by xT, we obtain

$\frac{x_S}{x_T} + p_F \frac{x_F}{xsubT} = \left(\frac{1}{x_T}\right)\frac{I}{P_S}$. Rewriting (4) as xT=I/PM, and substituting this into the RHS of (5), we get

$\frac{x_S}{x_T} + p_F \frac{x_F}{xsubT} = \frac{P_M}{P_S}$, or

$\frac{x_S}{x_T} + p_F \frac{x_F}{xsubT} = p_M$.

(7) is the key equation. pM measures the increase in the *official* price index at the moment of liberalization, as it is the new unified market-clearing price relative to the old official price.[7] It is a weighted sum of the relative free-market price and the official price, which has been normalized to 1. The weights are the proportion of the good sold at the official price and at the free-market price prior to liberalization respectively.

To determine empirically how much official price inflation at the moment of price liberalization was due to market disequilibrium, it is necessary to obtain data on pF and xF/xT. Once data on xF/xT and pF are obtained, table 1 can be used to determine how much inflation in the official price level would have been necessary in order to move to a unified market. For example, if 50 per cent of all goods were sold at free market prices, and the relative free-market price was 5, then price liberalization would have resulted in an official price inflation rate of 200 per cent.[8]

This simple model neglects changes in money velocity. Using the quantity equation and the fact that household money and other money flow through very separate channels in socialist regimes, the budget constraints can be reexpressed as

$x_S + p_F x_F = v_0 M_H$ and

$p_M x_T = v_1 M_H$, where v0 and v1 are pre- and post-liberalization velocity and MH is nominal household money holdings. Velocity rises after price liberalization because repressed inflation is turned into open inflation.[9]

The evidence from Eastern European experiences shows the initial price bursts quite clearly. Tables 2 and 3 give data on official consumer price inflation before, during, and after the month of price liberalization for several East European countries. There was an extraordinary burst of inflation in the month in which prices were fully liberalized.[10] In the following month, the rate of inflation declined

drastically and attained a new longer-run post-liberalization level. The longer-run level varies across countries primarily according to differences in monetary and fiscal policies.

The model and evidence makes quite clear that using statistics such as change in the real wage to make inferences about change in economic welfare over the first year of transition is highly misleading. *The initial inflation burst does not reduce the purchasing power of the nominal wage.* It reflects only the unification of the official and parallel markets. In the absence of any other shocks, real consumption should not be affected by price liberalization. To see this clearly, consider a situation where xS equals 0, so that all goods are sold on the parallel market. Then pF = pM, and inflation relevant to those prices which consumers are *actually* paying is 0%. However, *measured* inflation is greater than zero and equals (pF-1)*100. This reflects an increase in the completely irrelevant official price level.

Actual East European experience illustrates this point. The real wage in Poland rose dramatically over 1987-1990. This rise does not reflect any increase in household welfare: it reflects only a buildup of repressed inflationary pressure.[11] This buildup is shown in Figure 1, which graphs an index of the free-market food price relative to the official food price. After price liberalization, the real wage fell dramatically, but this vastly overstated the fall in household welfare. The fall in the real wage over 1989-1990 was 20 per cent.[12] The fall in real consumption as recorded by the state statistical authority for the same period was 12.5 per cent.[13] The real consumption statistic is calculated by direct measurement of the physical quantities of goods and services consumed by households. A reestimate of change in real consumption that corrects for problems with the official measure claims that the fall was 5 per cent.[14]

In the Cuban case, casual empirical evidence suggests that xS is very low, perhaps close to zero. Most goods and services appear to be flowing through legal or illegal parallel markets. The initial inflationary burst is likely to be quite high, perhaps in the hundreds of percents. However, official prices are largely irrelevant to economic activity, and this burst will have little impact on the Cuban population. With xS close to zero, liberalization will also have little redistributional impact. *In order to properly evaluate change in welfare, a direct measure of consumption must be used.*

Another important mistake made by many analysts is using the official exchange rate to convert domestic wage levels into dollar wage levels so as to compare transition-economy living standards with those of the West. Most transition economies have significantly depreciated the official exchange rate at the beginning of their programs. As a result, the official exchange rate greatly exceeds the purchasing-power-parity (PPP) exchange rate, which is the appropriate one for making welfare comparisons. Over the next two or three years, these two exchange rates converge and attain a longer-run equilibrium in which the ratio of official to PPP rates is approximately 2 to 1. This reflects differences in the prices of nontradable goods, which are relatively cheaper in poorer countries. Figure 2 shows what happened in several East European countries in 1990-93.

In this section, I have argued that price liberalization should be immediate and decisive and that standard macroeconomic indicators cannot be used to make inferences about changes in welfare. After this initial period, the Cuban government will be challenged to produce monetary and fiscal policies that return the economy to a desirable long-run growth path. Mistakes at this stage will prove to be very costly in both the short and long run.

III. The Cuban Monetary Regime

Cuba will face serious risks of falling into high inflation and a prolonged era of macroeconomic instability. The effects of such instability on growth and the standard of living are amply illustrated by what happened to many Latin American countries in the 1980's and Ukraine today. Many transition

economies now considered to be success stories, such as China and Poland, continue to struggle to curb overly expansionary macroeconomic policies or to lower an inflation rate high by Western standards.

High inflation is fundamentally driven by loose monetary and fiscal policies. Government budget deficits must be financed, and if they are financed primarily through seigniorage, a high rate of inflation will usually result. Transition economies generally must rely on seigniorage financing. Domestic capital markets do not exist or are very undeveloped so that domestic debt cannot be issued. The creation of a new taxation system appropriate for a market economy takes time, and the East European and FSU experiences show that tax revenues usually fall significantly in the first years of transition. Foreign borrowing or aid has not been made available on a large scale to transition economies. This may well be different in the case of Cuba --the expatriate community *might* invest heavily, and the US government *might* provide a great deal of aid.[15] It is more likely that foreign investors, including those in Miami, will wait until the government proves that its policies do not result in low expected returns.[16]

The three major inflation stabilization alternatives at the onset of transition are to let the exchange rate float and conduct tight monetary policy, to fix the nominal exchange rate, and to establish a currency board. The first alternative is undesirable. The monetary authority will have discretionary power and no track record, and it will face a great deal of pressure from a variety of interest groups for loose money. The cases of Russia and Peru suggest that this approach to stabilization is the most costly in social welfare terms.

The second approach, fixing the nominal exchange rate, has been taken in many of the transition economies. The monetary authority enjoys discretion in the short run, but if its policy is loose and inflation is high, a large real appreciation, growing trade deficits, and falling reserves force the government either to abandon the fixed exchange rate or rein in money emission. There are risks to this method of stabilizing.[17]

The currency board approach eliminates these risks by eliminating monetary discretion. Under a currency board, emission of domestic money is tied completely to changes in a reserve asset whose stock is not under control of the board or the government.[18] Although currency boards have used valuable metals as the reserve asset in the past, modern boards use a foreign currency or basket of currencies. It is desirable to choose a reserve currency of a large trading partner that is stable (low inflation in the partner country). For Cuba, the U.S. dollar is the obvious choice.

A currency board prevents money printing to cover fiscal deficits. It also prevents discretionary money surprises, perhaps intended to deflate the stock of outstanding claims on the state. If a fixed nominal exchange rate is chosen, then the domestic inflation rate equals the inflation rate of the reserve-asset country. As a result, the real exchange rate is very stable as the nominal exchange rate is fixed and inflation rates are the same. Real exchange rate stability is very important for a small, soon-to-be open economy like Cuba's. It encourages foreign and domestic investment and will be watched intensely in the early phases of Cuban transition as a signal of credibility. Also note that the domestic government does collect seigniorage revenues on its foreign currency reserves when the reserve-asset country generates positive inflation.[19]

The major drawback of a currency board is that a negative terms-of-trade (TOT) shock or a monetary contraction in the reserve-asset country leads to a decrease in the domestic money stock, producing deflationary pressures.[20] If prices are downward-sticky, the welfare costs of the money stock contraction may be high. Price stability comes with the possibility of greater output and employment volatility. This problem may be particularly acute in the case of economies dependent upon a small number of commodity exports. Commodity prices are volatile, and TOT shocks are likely to be frequent and large. If a country faces imperfect capital markets and cannot borrow abroad to finance a temporary

deficit induced by a negative TOT shock,[21] then TOT volatility is translated into real economic volatility.

Cuba will probably fit this profile, as she will continue to depend on exports of sugar. In order to reduce the real effects of TOT volatility, the Cuban currency board should consider adopting a nominal exchange rate rule that is tied to changes in the TOT. If there is a fall in the TOT, the board depreciates the exchange rate to offset the TOT shock's effect on the domestic money supply. However, it is absolutely essential that the use of such a rule be transparent and free from state manipulation. Designing an optimal exchange rate policy is not straightforward in the Cuban case. The costs of diminished credibility and possible state manipulation of a TOT rule may more than offset the gains from reduced real variability.

What should the initial exchange rate be? The most straightforward approach is to set it at the current free-market rate. This has been the policy in most of the East European transitions, whether a currency board was involved or not. The risk of this approach is undervaluing the Cuban peso, causing a large domestic inflation shock, and choking off critical imports of intermediate goods. The suitability of using the free-market rate would seem to depend on the degree of the dollarization of the economy and the thickness of the parallel market for foreign exchange. If the degree of dollarization is high and the parallel market is thick, then the free-market rate is appropriate. It might also be extremely difficult to calculate an appropriate exchange rate through comparison of purchasing-power-parities when markets are fragmented into official and parallel channels. If xF is quite high, then an appropriate rate might equal pF/pUS, but only in the absence of extensive import and export quotas.

V. Conclusion

The countries of Eastern Europe designed their transition policies with a very clear goal in mind. They intend to become like the "normal" countries of Western Europe. This goal gives them good benchmarks according to which they can judge their progress. Will Cuba have a similar goal? Some surely find the goal of "becoming like the United States" to be too controversial, given the nature of relations between these two countries in the past. However, the example set by the successful Cuban emigre community in Miami will surely influence Cubans as they attempt to define their future. Any "Latin American" development model that could have served as an alternative has now been discredited. I believe that "becoming like southern Florida" will probably be the goal of a new Cuban society.

The speed of achieving this goal is in direct proportion to the quality of policies implemented at the beginning of the transition. Rapid price liberalization and the introduction of a currency board are the best policies for a transforming Cuba. Choosing between a currency board and dangerous monetary discretion is like choosing between a strict diet and indulgence. Indulgence may be pleasurable in the short run but leads to obesity and heart failure. Those who want to survive will eventually start dieting, and the longer the delay, the more difficult it is to start.

Bibliography

Alexeev, M. "If Market Clearing Prices Are So Good then Why Doesn't (Almost) Anybody Want Them?" *Journal of Comparative Economics* 15:380-90.

Bennett, A. "The Operation of the Estonian Currency Board." International Monetary Fund Paper on Policy Analysis and Assessment 1992-3.

Berg, A. and J. Sachs. "Structural Adjustment and International Trade in Eastern Europe: The Case of Poland." Economic Policy 1992.

Boone, P. "Why Prices Rose So Much: Collapsing Monetary Bubbles in Socialist Transforming Economies." Mimeo, Harvard Institute for International Development, 1992.

Cardoso, E. and A. Helwege. *Cuba After Communism* (Cambridge: MIT Press, 1992).

Dornbusch, R. "Credibility and Stabilization." *Quarterly Journal of Economics* 106(August 1991): 837-850.

Osband, K. and D. Villanueva. "Independent Currency Authorities: An Analytic Primer." International Monetary Fund Working Paper 1992-50.

Roberts, B. "The Initial Welfare Consequences of Price Liberalization and Stabilization in Poland." In Schipke, A. and A. Taylor, *The Economics of Transformation* (Berlin: Springer-Verlag, 1994).

Roberts, B. "The Initial Welfare Consequences of Price Liberalization and Stabilization in Russia." Unpublished manuscript, 1994.

Polterovich, V. "Rationing, Queues, and Black Markets." *Econometrica* 61(January 1993): 1-28.

Sah, R. "Queues, Rations, and Markets: Comparison of Outcomes for the Poor and the Rich." *American Economic Review* 77:69-77.

Van Wijnbergen, S. "Should Price Reform Proceed Gradually or in a "Big Bang?". International Monetary Fund Working Paper no.702.**Table 1. Values of pM For Various Values of xF/xT and pF**

xF/xT	pF							
	1.25	1.5	2	3	4	5	6	7
0.25	1.06	1.13	1.25	1.5	1.75	2	2.25	2.5
0.5	1.13	1.25	1.5	2.0	2.5	3	3.5	4
0.75	1.19	1.38	1.75	2.5	3.25	4	4.75	5.5
1	1.25	1.5	2	3	4	5	6	7

Calculated using equation (7).

Table 2. Month-on-Month Consumer Price Inflation

(percentage change)

Montha	Bulgaria	Czechoslovakia	Polandb	Russia
-5	4.5	2.3	39.5	0.5
-4	4.1	0.7	34.3	1.1
-3	4.9	1.0	54.8	3.5
-2	10.4	2.2	22.4	8.9
-1	13.6	0.0	17.7	12.1
0	122.9	26.3	79.6	245.0
+1	50.5	6.2	23.8	38.3
+2	2.5	4.3	4.3	29.8
+3	0.8	2.4	7.5	21.6
+4	5.9	1.9	4.6	12.0
+5	8.4	1.7	3.4	18.6

a : Month 0 is the month in which prices were fully liberalized.

Month 0 dates for the individual countries:

Bulgaria : February 1991

Czechoslovakia : January 1991

Poland : January 1990

Russia : January 1992

b : See footnote 9.

Source : *PlanEcon Report*, various issues.

Table 3. Average Monthly Consumer Price Inflation Rate

(percentage change)

	Bulgaria	Czechoslovakia	Polanda	Russia
Year preceding month 0	5.7	1.3	18.8	8.5
Month 0	122.9	26.3	79.6	245.0
Year following month 0	8.2	1.2	6.2	19.3

a : See footnote 9.

Source: Calculated from data given in *PlanEcon Report*, various issues.

Footnotes for:
Inflation and the Monetary Regime During the Cuban Economic Transition

Bryan W. Roberts, Dept. of Economics, Univ. of Miami, Florida

[1] I would like to thank Andrew Berg of the IMF for valuable discussion on this paper. Back to Text

[2] Roberts (1994a) develops a formal model and applies it to the Polish transition. The empirical results show that household welfare probably *increased* in the first year after the Polish big bang of 1990. Welfare also probably went up in Russia in 1992 (see Roberts 1994b). Back to Text

[3] Van Wijnbergen (1992) develops a model linking price liberalization, government credibility, inter-temporal speculation, and goods hoarding. He shows that gradual price liberalization increases the chance of political failure of the reform program, due to the fact that a gradual liberalization leads to a small observed supply response. Back to Text

[4] See Sah (1987), Alexeev (1991), and Polterovich (1993). Back to Text

[5] See Roberts (1994a and 1994b) for a more extensive development of this model. Back to Text

[6] Note that xS + xF = xT. Back to Text

[7] Of course, the unified market price is treated as the post-liberalization official price by statistical agencies. Back to Text

[8] The inflation rate equals (pM-1)x100. Back to Text

[9] See Boone (1992) for a careful analysis. Back to Text

[10] In the case of Poland, price liberalization actually occurred in two stages. Official food prices were fully liberalized in August 1989, and other consumer prices in January 1990. Between August and January, official price inflation was high, probably as a result of the efforts of sellers to realign relative prices and the government's willingness to accommodate demands for price increases. Thus, the inflation burst associated with price liberalization is better viewed as taking place over August 1989-January 1990, and months -5 to -1 are March-July 1989. Monthly and average annual inflation rates become:

March (-5) 8.0%

April (-4) 9.8%

May (-3) 7.2%

June (-2) 6.1%

July (-1) 9.6%

8/88-8/89 (year prior to month 0) 7.1%

[11] See Sachs (1993) for a careful discussion. Back to Text

[12] Roberts (1994a), p.77. Back to Text

[13] *Rocznik Statystyczny 1990*. Back to Text

[14] Berg and Sachs (1992). Back to Text

[15] Some have argued that large-scale aid from the U.S. is unlikely (Cardoso and Helwege 1992). I find their view to be too pessimistic. The U.S. government already feels a great deal of pressure to prevent a massive Cuban migration. This pressure may intensify if the Castro government falls, as the successor government will presumably weaken its rights to impose draconian restrictions on those wishing to leave. Back to Text

[16] There has not been a massive flow of foreign capital into the Eastern European and FSU countries. A great deal of capital has been invested in China, but the Chinese government enjoys a level of credibility that the initial post-Castro government will not. Back to Text

[17] See Dornbusch (1987) for a formal treatment. Back to Text

[18] See Osband and Villanueva (1992) for an excellent review of currency board operation and associated analytic issues. Back to Text

[19] The currency board holds foreign currency in interest-bearing notes of the reserve-asset country. The interest paid on those notes includes an expected inflation component. See Osband and Villanueva (1992), p. 5. Back to Text

[20] Say that the economy has reached a long-run equilibrium. A fall in the terms-of-trade produces a trade deficit, fall in reserves and monetary contraction. A reserve-asset country monetary contraction increases the foreign interest rate which attracts domestic capital, causing a domestic monetary contraction. Back to Text

[21] Commodity prices appear to move as random walks, making liquidity constraints more likely. Back to Text