

# **'Guiding the Invisible Hand'<sup>1</sup>: Market Equilibrium and Multiple Exchange Rates in Brazil, 1953-1961**

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Capital controls have been constant topic for economic historians since the emergence of the Bretton-Woods (BW) system in 1944. Specifically during the 1950s, the shortage of dollar liquidity and the lack of currency convertibility made capital controls with the use of parallel or multiple exchange rates (MER) largely common in Europe and Latin America (Bordo, 1993; Reinhart & Rogoff, 2002). These controls were generally not welcome by the IMF, which was only in favour of restrictions to capital account transactions, and are also largely seen partly as cause for balance of payments crisis and large currency devaluations in some of these experiences (Magud et al., 2011; Konig, 196; Edwards, 1999).

This paper revisits this assumption questioning whether capital controls are not the cause but mostly a symptom of the large currency misbalance of Bretton-Woods. It focuses on an example of capital controls in the form of MER which was effective to help markets in balancing the economy. This was the unique case of MER in Brazil between 1953 and 1961, when a centralized system of foreign exchange auctions successfully managed to stabilize the balance of payments and reach macroeconomic equilibrium, with decent growth rates, inflation under control and without the emerge of a black market for the exchange rate.

Historians see it as a successful case, but the mechanics behind its effectiveness were never revealed<sup>2</sup>. By performing two simple econometric tests - random walk and granger causality - this paper argues that the Brazilian MER system was effective because officials were responsive to market demand *despite* using a centralized system for foreign currency distribution. While there are no records of the exact intentions of policymakers, these exercises suggest a pragmatic response to changes in market fluctuations and a centralized regime which was replicating a market clearing process. By 'guiding the invisible hand' this use of capital controls complemented markets and was effective for the needs of that period.

## **Peak and Decline of Brazil's MER System**

In 1945 the Brazilian currency (Cruzeiro) was fixed at its 1939 (pre-war) level to keep inflation under control and based on the belief the exports (mostly coffee) were inelastic to currency depreciation. But this overvaluation and the shortage of global dollar liquidity originated large problems to stabilize the balance of payment, which remained under pressure for eight years even with some attempts to restrict imports with ineffective quantitative controls (Lago, 1982). In 1952 the current account deficit peaked at US\$ 600 million (2.7% of GDP) nearing a balance of payments crisis.

In October 1953, the Brazilian monetary authority (Sumoc) created the multiple exchange rates regime targeting to correct this disequilibrium. It replaced the pegged official currency by auctions of foreign exchange for imports, which were distributed in categories according to their level of priority. To regulate outflows, Banco do Brasil, the operator of the system, established the quantities of dollars to be

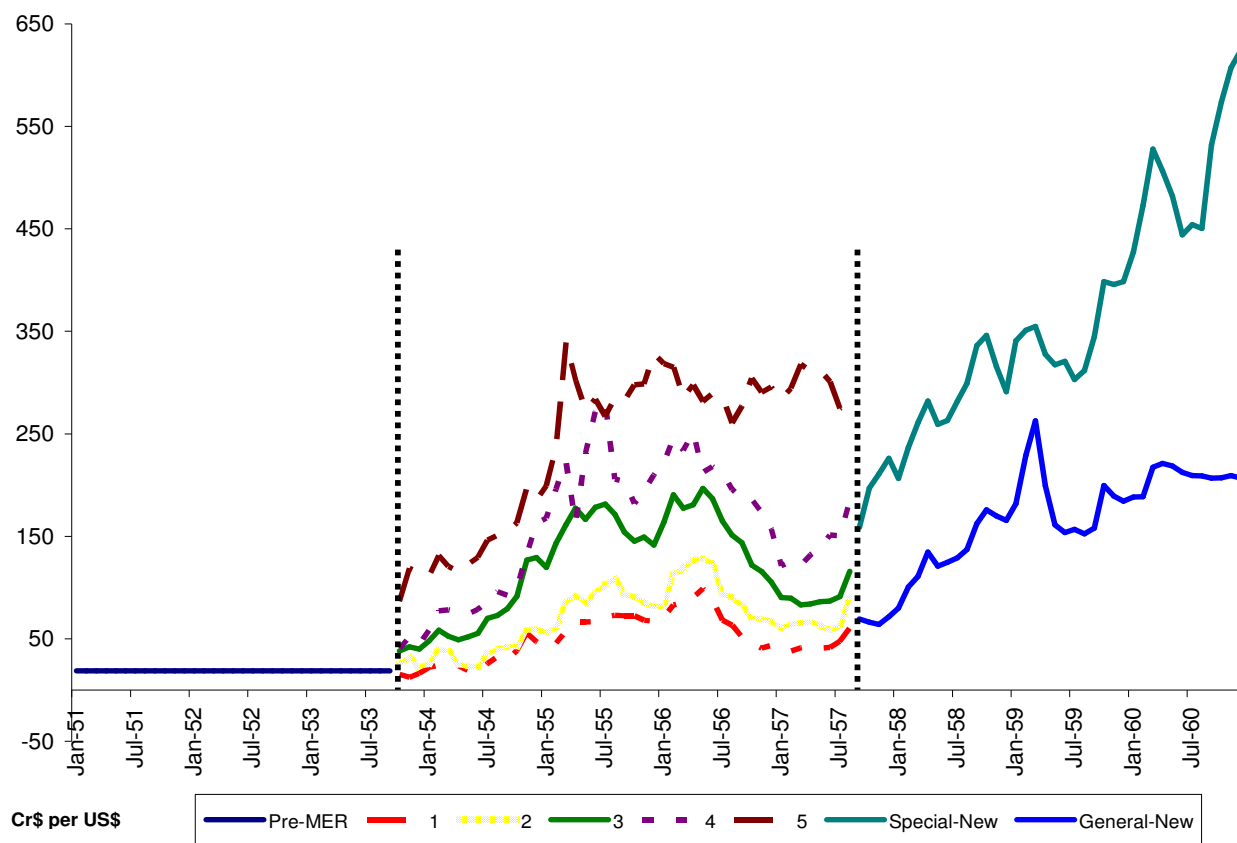
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<sup>1</sup> The title echoes the book by Love, Joseph and Nils Jacobsen. 1988. Guiding the invisible hand: economic liberalism and the state in Latin American history. New York: Praeger

<sup>2</sup> Kafka (1956), Huddle (1964), Baer (2009). Figueiredo Filho (2005), Lago (1982), Vianna (1987), Sochazewski, (1980), and Caputo (2007).

auctioned daily in each category in regional marketplaces (Vianna, 1987). With fixed quantities, bidders then defined the price of foreign exchange. The rationale was to rank sectors and differentiate their import prices and the higher the category, the smaller the volume of foreign exchange offered, inducing a selective depreciation of the exchange rate for each category. Category 1 included the most essential sectors such as food, chemistry, agricultural equipment and medicine. Category 2 production inputs, electrical material and medical equipment. Category 3 all industrial equipment, capital goods and vehicles. Category 4 all non-essential equipment and Category 5 all remaining sectors. Chart 1 shows the average monthly exchange rate for each category. Chart 1 shows the average monthly exchange rate for each category.

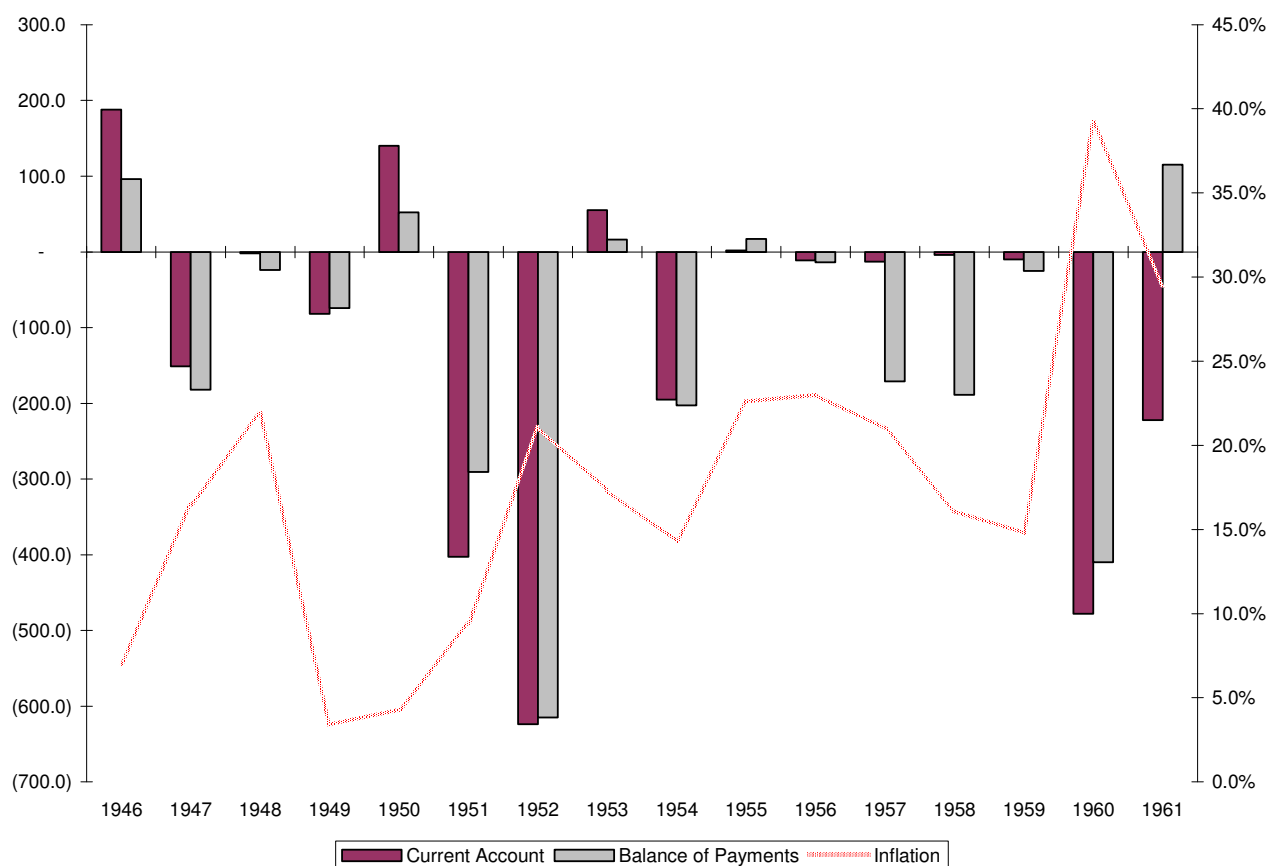
Chart 1: *Multiple Exchange Rates (Cr\$ per US\$)*



Source: Annual Reports of Banco do Brasil (1951-1961)

The devaluation reached in all categories was impressive. In extreme cases, the exchange rate reached 1700% of depreciation, with the official Cr\$ 18.5 rate being kept as the reported parity to the IMF (Vianna, 1987). With all foreign exchange centralized and auctioned, the immediate result of the new system was effective to reduce imports and the current account and balance of payments quickly stabilized. And all of these happened without the emergence of a black market or a major spike in inflation which remained around 15-20% as shown in chart 2, which shows the current and the balance of payments recovering rapidly between 1953 and 1955.

Chart 2 - *Balance of Payments (US\$ million) and Inflation (%)*



Source: Estatísticas Históricas do Brasil - Instituto Brasileiro de Geografia e Estatística (IBGE)

In 1956 there was a change in the Brazilian government (Juscelino Kubistchek assumed the Presidency) which brought about significant modifications to economic policies in an effort to accelerate growth and substitute imported manufactures). This was the trigger for the auction system to slowly start to decline. The government reformed it by reducing the number of categories from five to three, reintroducing ad valorem tariffs and creating a large number of exemptions for imports to take place outside the MER system. The objective was to reduce restrictions to foreign exchange liquidity and to further stimulate industrialization through additional differentiation; but these changes also rapidly led to a deterioration of the macroeconomic equilibrium (Sochczewski ,1980). By replacing the quantitative restrictions of the MER with import tariffs and exemptions, the new system severely distorted the controls of outflows; imports rose quickly and the dollar shortage reappeared. At the same time, to fund infrastructure investments monetary expansion also surged at an annual growth rate of 15% y/y on 1955 to 60% y/y in 1958 in the monetary base (Lago, 1982)<sup>3</sup>.

These populist policies further pressured imports and inflation, and the balance of payments deteriorated to a deficit of almost \$500 million dollars (2.3% of GDP) by 1960, forcing the cash out of reserves and the end the MER regime in 1961. According to the policymaker responsible for ending the system, Mr. Bulhoes (1990, pg 131), , there was no other option at that moment rather letting the currency depreciate and fight its inflationary impacts with monetary control. A gradual depreciation of the exchange rate had been ruled out.

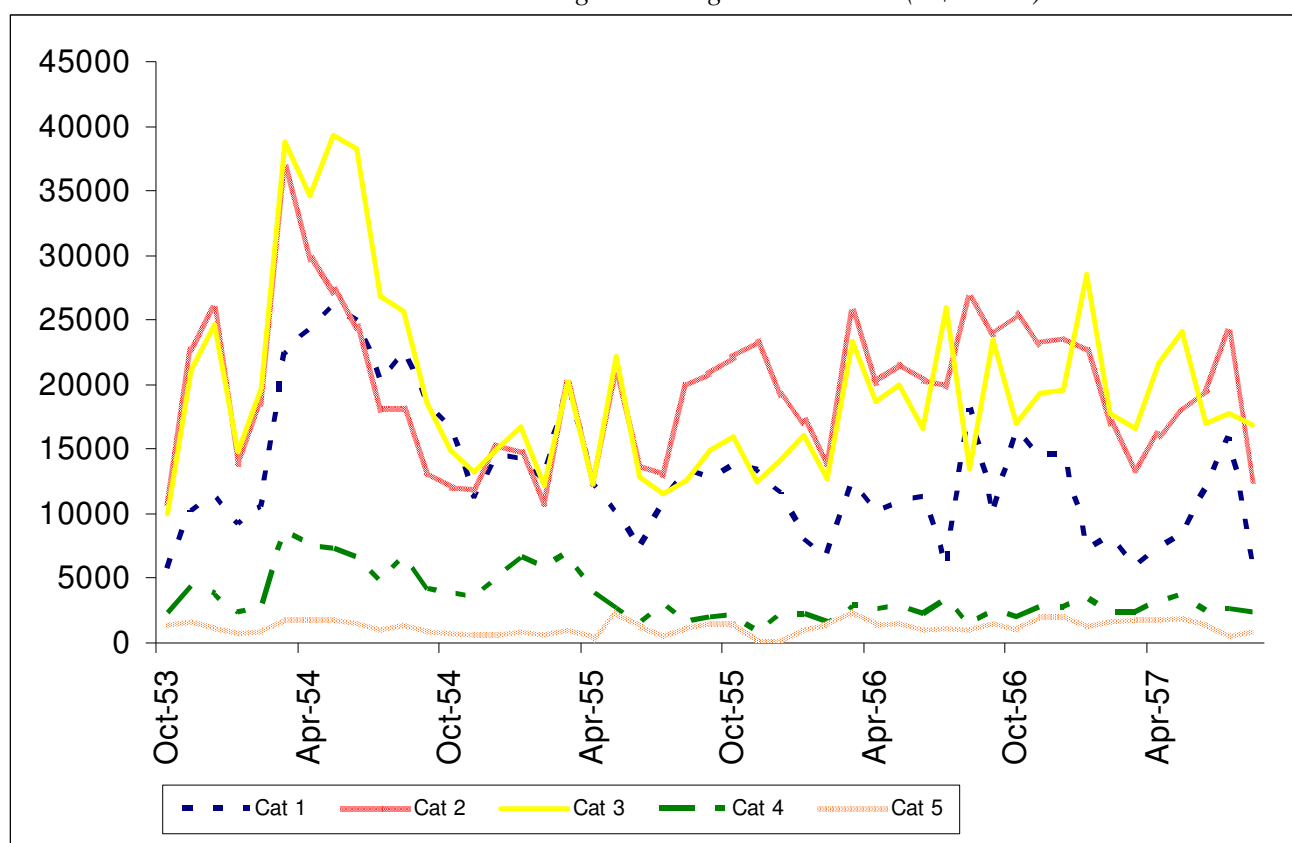
<sup>3</sup> And to fund the construction of the new capital of the country, Brasília.

## Responsive Allocation of Foreign Exchange

But while Mr Bulhoes did not have an option in 1961, did previous policymakers know why the original system was working so well before? The singularity of the first phase of the system was how the discretionary distribution of foreign exchange resulted in a balanced economy. Authorities had to reconcile demands for liquidity in each category while managing restrictions on the access to foreign exchange to the economy as a whole. In a way, they were almost replicating a market clearing process. To test the role of the government – in the absence of explicit records in these regards – a double econometric experiment helps to test the government responsiveness.

First, a random walk exercise on the quantities of foreign exchange allocated to each category should test whether there was no exogenous distribution of foreign exchange, an indication that good macroeconomic results were probably just pure luck; or the existence of some exogenous choices, an indication officials were looking at markets. In so doing I use the series of effectively auctioned foreign exchange in each of the five categories between 1953 and 1957, compelled in a new database<sup>4</sup>. The data is presented below in Charts 3 and 4.

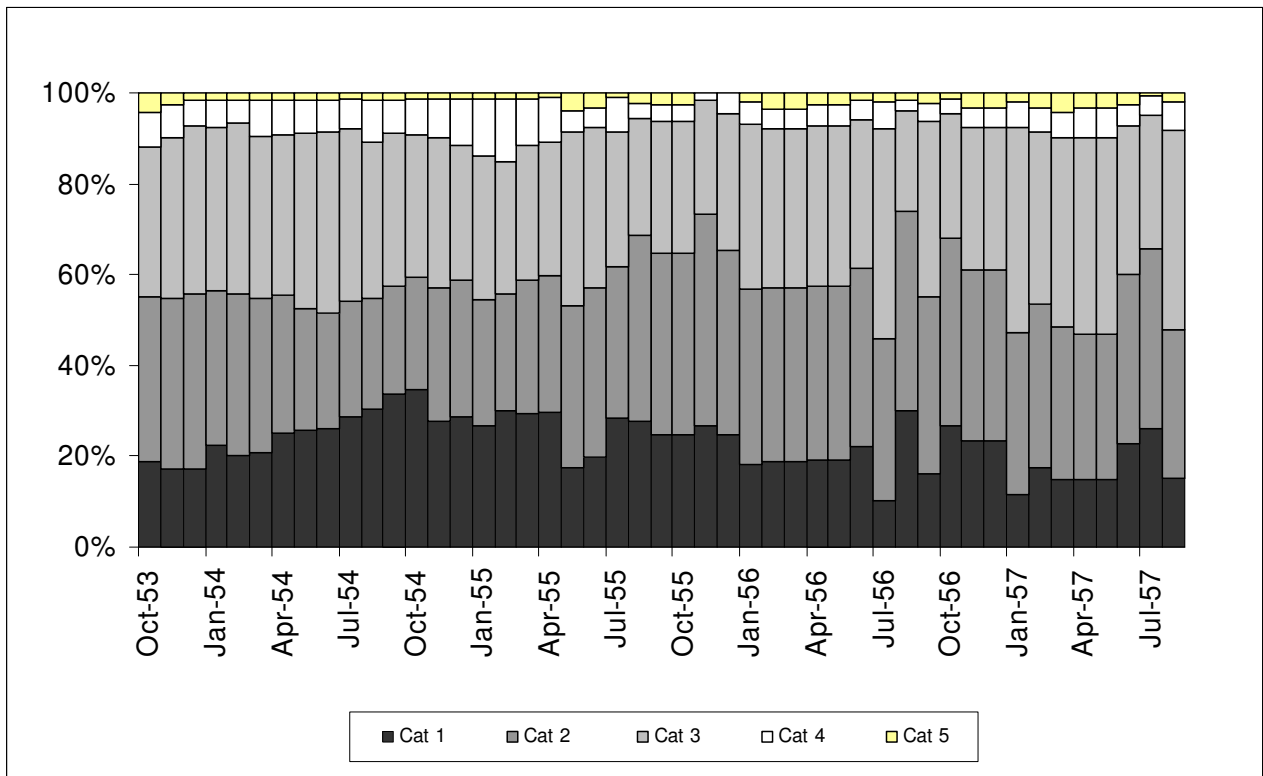
Chart 3 - Auctioned Foreign Exchange - 1953-1957 (US\$ 1.000)



Source: Sumoc Annual Bulletins, 1953-1961. IBGE National Statistic

<sup>4</sup> Banco do Brasil and Sumoc only reports the quantities effectively purchased by category for the between 1953 and 1955. To obtain the remain distribution between 1955 and 1957, we collected the import data and aggregate them for each of the five categories. Few gaps in the series were interpolated.

Chart 4 - Auctioned Foreign Exchange - 1953-1957 (Percentage of Total)



Source: Sumoc Annual Bulletins, 1953-1961. IBGE National Statistic

Both charts insinuate that officials did follow some form of pattern of allocation over time, maintaining similar relative shares for each category. But the distribution also varied a lot, mostly between the three main categories which included the most essential (such as food or chemicals) and capital goods. If this variation can be considered not random, then there is indication that the distribution between categories was an exogenous choice. The simple random walk equation is  $Y_t = Y_{t-1} + E_t$  and the standard test is the ADF (Augmented Dickey-Fuller) (Enders, 2004). I opted for an ADF with a random walk function including intercept and only one lag. The results are presented below in table 1.

Table 1 - Random Walk Test - ADF

	T-Statistic	P-value	Rejects Random Walk?
<b>Caterory 1</b>	-3.24	0.0238	Yes
<b>Caterory 2</b>	-4.3	0.0013	Yes
<b>Caterory 3</b>	-3.698	0.0073	Yes
<b>Caterory 4</b>	-2.852	0.059	Yes*
<b>Caterory 5</b>	-4.571	0.0006	Yes

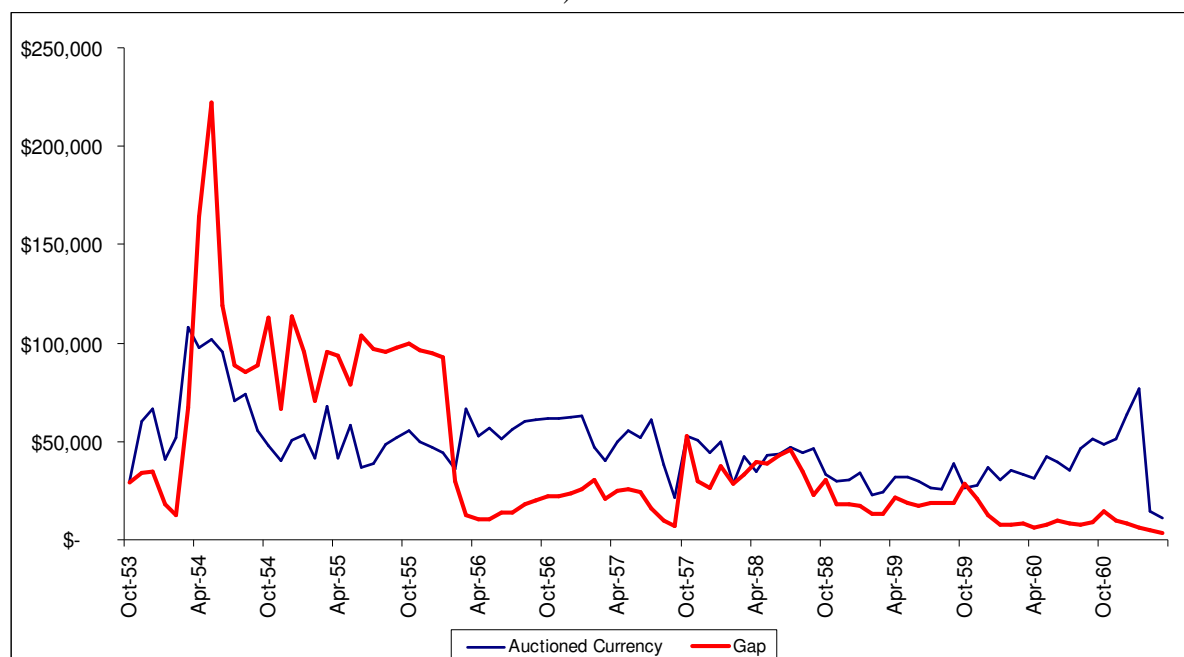
\* Only at 10% confidence

The table shows that the null hypothesis of existence of a random walk is rejected in all tests. This is consistent with changes in the allocation of foreign exchange over time, indicating that officials were making an exogenous decision on this distribution.

The second test, , gives further evidence that this non-random allocation was indeed a response to market demand. Since there is no direct qualitative evidence of how officials were allocating between categories, this helps to show if there are indications they were responding to market fluctuations. I perform two Granger casualty tests. In the first one, I use one interesting characteristic of the available new database: the separation between a) the quantities of foreign exchange offered in the MER system and

b) the quantities effectively purchased by markets. The difference between the quantities offered and auctioned is a good indicator of the size of the market demand. A huge gap means there was over allocation of foreign exchange, while a very small gap indicates a more adequate distribution. If officials were being responsive to market demand the volume of currency effectively auctioned should help to predict - granger cause - the gap in the following period, an indication that the result at a specific moment helped to determine the new offers in the following one. Charts 5 presents the results of this test.

Chart 5 - Auctioned Foreign Exchange and Gap between Auctioned and Offered Foreign Exchange (US\$ million) - 1953-1961



Source: Sumoc Annual Bulletins, 1953-1961

Chart 5 shows the changes in the pattern between auctioned foreign exchange and the gap. In the beginning of the series, the gap was much larger, including a peak in 1954 which is not related to any specific policy changes. In time, the gap fell rapidly while the amount of auctioned currency shows a smoother downward trend. And this learning process apparently took place even before the policy changes in 1957, which reduced the amount of foreign exchange in the system. This suggests policymakers were looking at the results of the auctions to gradually offer more accurate quantities and reduce the gap over time. The test results is presented in table 2:

Table 2 - Granger Causality Test 1

Direction of Causality		F-Statistic	P-value	Granger Cause?
<b>GAP</b>	<b>Auctioned Currency</b>	0.7	0.4	No
<b>Auctioned Currency</b>	<b>GAP</b>	3.41	0.0681	Yes*
<b>Offered Currency</b>	<b>Auctioned Currency</b>	0.7	0.4	No
<b>Auctioned Currency</b>	<b>Offered Currency</b>	0.1	0.749	No

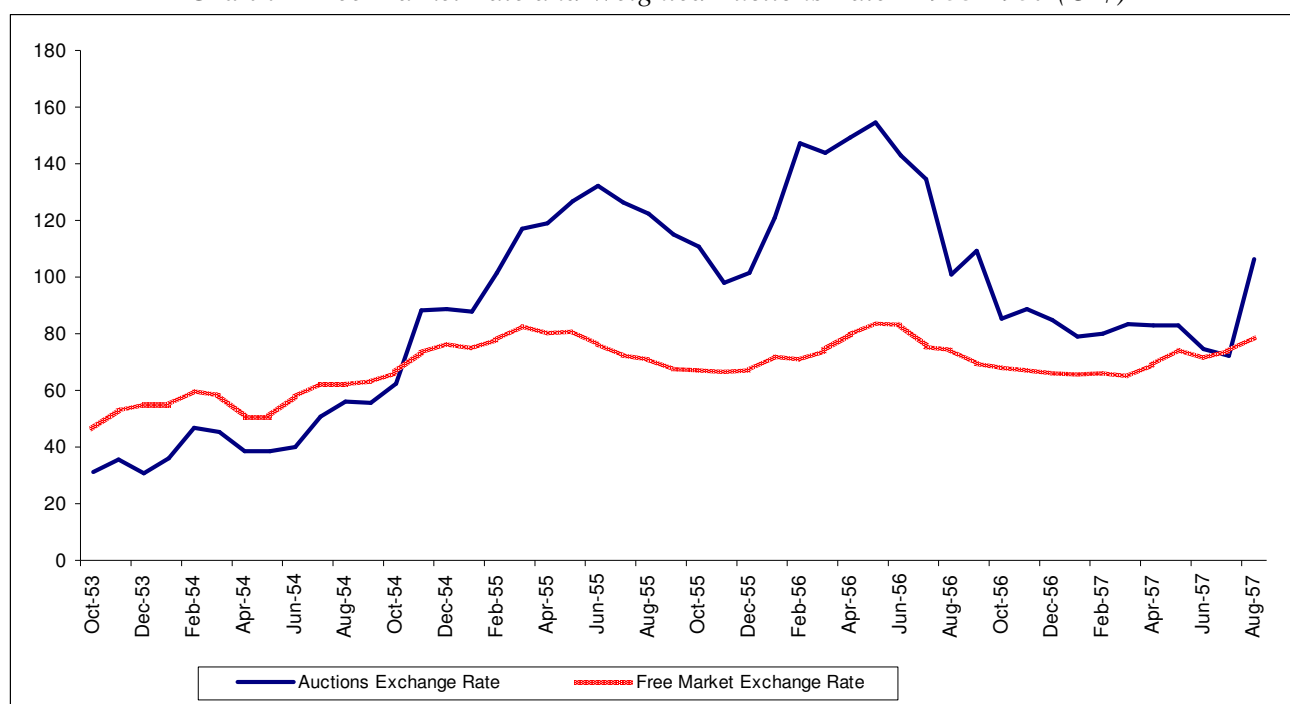
\* Only at 10% confidence

As expected, the granger causality is only statically significant when the auctioned currency is tested to granger cause the gap. This indicates that the currency effectively auctioned helps to predict the gap in the following period.

An additional test helps to confirm that officials were responding to markets; it follows the same concept but focuses on exchange rate prices. there is available price data for free market exchange rates. .

While all trade operations went through the auctions, there was a free floating exchange rate market only for service and capital account operations in place before the auctions. It as a very small part of the economy since the capital account was mostly closed, but this market clearing was free from any control over foreign exchange supply. A granger causality between the free market price of exchange rate and that of the weighted average auctions based on the quantities allocated in each sector can test whether officials responded to the free market rate to distribute foreign exchange and thus if they controlled the pace of depreciation in the auctions rate. The two series are presented in Chart 7.

Chart 7 - Free Market Rate and Weighted Auctions Rate - 1953-1957 (Cr\$)



Source: Sumoc Annual Bulletins, 1953-1961; Banco do Brasil Anual Repots, 1953-1961

The two series follow different trends. While the free market exchange rate depreciated in a more stable path over time, the weighted auctions rate had a more volatile course, reflects the variation in the distribution of foreign exchange discussed above. The test result is presented in table 3.

Table 3 - Granger Causality Test 2

Direction of Causality		F-Statistic	P-value	Granger Cause?
Market	Auctions	4.17	0.047	Yes
Auctions	Market	0.03	0.85	No

The test shows that only the market exchange rate granger causes the auctions rate. This confirms that while these were two separate markets, it seems that officials were observing the free market rate to determine how much to distribute and this control the path of depreciation in the auctions rate.

## Conclusions

This paper concludes that the responsiveness from Brazilian officials to market demand helps to explain the effectiveness of the Brazilian MER system between 1953 and 1957. The distribution of foreign exchange was not random and there is an econometric indication –that his was a response to results of the previous auctions and to the free market rate to determine the distribution of foreign exchange in the following periods without causing noticeable major macroeconomic disequilibria.

It contributes to the literature on capital controls and Bretton-Woods (Bordo, 1993; Reinhart & Rogoff, 2002; Magud et al., 2011, König, 1968) and contests that general assumption that capital controls were part and parcel of the balance of payments difficulties. It reveals the mechanics of a unique and effective use of exchange controls during Bretton-Woods. Brazilian officials were 'guiding the invisible hand' to help markets balancing the economy, an outstanding result in a time when most similar experiences failed to reach macroeconomic stability.

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