



Crises, Stabilizations, and Reforms: An Analysis of Structural Breaks in Latin American Economies (1950–2000)

Samuel A. S. Ceccon¹

Resumo: Este artigo investiga as principais mudanças estruturais nas trajetórias macroeconômicas da Argentina, Brasil, Chile e México entre 1950 e 2000. Com base nos dados de PIB real e estoque de capital da Penn World Table 10.01, utiliza-se a metodologia de Bai e Perron (2003), que permite a identificação endógena de múltiplos pontos de quebra em séries temporais. Os resultados apontam para marcos comuns entre os países — sobretudo no início da década de 1980, em meio à crise da dívida externa e ao aumento das taxas de juros nos Estados Unidos —, mas também evidenciam o peso de dinâmicas domésticas, como transições políticas e reformas institucionais. Ao articular indicadores macroeconômicos consistentes com uma estratégia econométrica robusta, o estudo oferece uma perspectiva histórica comparada sobre os impactos simultâneos de choques globais e transformações internas no desenvolvimento econômico da América Latina.

Palavras-chave: América Latina, quebras estruturais, história econômica, Bai e Perron, Penn World Table

Abstract: This paper identifies major structural breaks in the macroeconomic trajectories of Argentina, Brazil, Chile, and Mexico between 1950 and 2000. Using real GDP and capital stock data from Penn World Table 10.01, it applies the Bai and Perron (2003) methodology, which endogenously detects multiple breakpoints in time series. The results reveal shared turning points—especially in the early 1980s, amid the debt crisis and rising U.S. interest rates—but also highlight the role of domestic factors such as political transitions and institutional reforms. By combining consistent macroeconomic indicators with a robust econometric approach, the study offers a comparative historical perspective on how global shocks and national shifts jointly shaped Latin America’s economic path.

Keywords: Latin America, structural breaks, economic history, Bai and Perron, Penn World Table

JEL Codes: N16, C22, O11

¹ Universidade de Brasília



1. Introduction

Latin America's economic trajectory in the second half of the twentieth century was characterized by distinct turning points, encompassing phases of rapid growth, deep crises, and substantial structural reforms. These critical moments reflect fundamental shifts in the region's macroeconomic regimes, including the ascent and decline of the import substitution industrialization (ISI) model, the debt crisis of the 1980s, and the liberalization reforms implemented during the 1990s. These turning points can be understood as structural breaks - abrupt and enduring changes in the underlying parameters of economic time series, such as shifts in the mean or trend, signaling significant transformations in the prevailing economic environment. Detecting these structural breaks is especially crucial in periods marked by historical instability, where recurrent external shocks and institutional reforms have generated persistent and profound effects over time.

Despite the frequency and magnitude of these changes, there is limited empirical work that systematically analyzes structural breaks across Latin American countries using consistent macroeconomic indicators. To empirically capture these turning points in the region, this paper addresses the following questions: When did major structural breaks occur in Latin American economies during the second half of the 20th century, and to what extent were these breaks common across countries or shaped by domestic factors? The Bai and Perron (2003) methodology can be used for detecting multiple structural breaks in time series to a panel of four Latin American countries—Argentina, Brazil, Chile, and Mexico—using data from the Penn World Table 10.01 (PWT 10.01; Feenstra, Inklaar e Timmer, 2015) covering the period 1950–2000. We focus on the growth of two key macroeconomic indicators: real GDP and capital stock.

By identifying and comparing the timing of breaks across countries, this study contributes to a better understanding of how common externalities interacted with country-specific changes, including political transitions and institutional reforms. In doing so, it adds a historical and empirical dimension to the literature on macroeconomic volatility and development in emerging markets.

2. Literature Review

The analysis of structural changes in linear regression relationships has been a central topic in statistical and econometric research (Zeileis *et al.*, 2003). A structural break is understood as a sudden and persistent change in the parameters of a time series, such as its mean or variance. According to Stock and Watson (2004), these parameter changes can occur either at a precise date or evolve gradually over a period. Timmermann (2001) argues that the main difference between a structural break and a one-time shock is that the former has a lasting effect on macroeconomic dynamics.



Shikida, Paiva, and Araujo (2016) classify methods for detecting structural breaks into three main categories: (1) tests for the existence of structural breaks; (2) tests for estimating the break dates; and (3) tests examining the relationship between unit roots and structural breaks. Early methods for identifying structural breaks relied on F-statistics developed by Chow (1960) and Quandt (1960). These methods compare a restricted model—estimated up to a candidate break date—with an unrestricted model that uses the entire sample, with the null hypothesis being no break (Hansen, 2001). However, a key limitation of these early approaches is their reduced power when multiple breaks are present but not accounted for, which can lead to underdetection of structural changes (Shikida, Paiva, and Araujo, 2016).

Regarding tests that estimate break dates, the foundational framework was developed by Bai (1994) and later extended to multiple breaks by Bai (1997a, 1997b) and Bai and Perron (1998, 2003) (Zeileis *et al.*, 2013). Bai and Perron (2003) propose an algorithm that identifies multiple structural breaks by dividing the sample into candidate segments, estimating parameters using ordinary least squares (OLS), and computing the residual sum of squares (RSS) for each. The break dates are then selected to minimize the total RSS across the entire sample, ensuring the best fit in the presence of potential breaks (Shikida, Paiva, & Araújo Junior, 2016).

Structural breaks may result from both internal and planned factors—such as deliberate changes in economic policy—and unexpected events, including internal or external shocks. The presence of these breaks can compromise the validity of econometric inferences, as the assumption of parameter stability over time no longer holds. If these changes are not properly accounted for, estimated parameters may be biased and the performance of econometric tests, such as unit root tests, may be adversely affected (Hansen, 2001; Perron, 1989).

In Latin America, the second half of the twentieth century was marked by deep economic and political transformations, many of which likely caused lasting shifts in macroeconomic relationships. Beginning in the 1950s, most countries in the region embraced a development strategy centered on import substitution industrialization (ISI), a model that, according to Tavares (2016), had its roots in the trade disruptions and policy responses of the interwar period, where successive foreign-trade crises between 1914 and 1945 had already exposed the vulnerabilities of export-led growth, pushing governments to adopt protective measures such as import restrictions and exchange-rate adjustments to preserve domestic income. These earlier policies stimulated local production by raising the relative price of imported goods, paving the way for the ISI model that became the cornerstone of Latin America's economic strategy in the postwar decades until its decline in the 1980s.

From the 1960s onward, Latin American countries faced an increasingly polarized political and ideological environment, leading to direct confrontations between right-wing military regimes and revolutionary left-wing movements in several nations. In Brazil, the process materialized with the establishment of a military government in 1964, while in Chile and Argentina similar authoritarian regimes emerged later in the decade, lasting from 1973 to 1990 and from 1976 to 1983, respectively.



Economically, the 1960s marked a period of rapid expansion for Latin America, with average annual growth of around 6.7%, which lasted until the end of the global economic boom in 1973 (Bielschowsky, 2016). During the 1970s, however, the region was hit by three major external shocks that profoundly altered its macroeconomic dynamics: the first oil crisis in 1973, the second oil crisis in 1979, and the sharp increase in U.S. interest rates at the end of the decade.

The 1973 oil crisis led to a sharp increase in oil prices, placing severe balance-of-payments pressures on oil-importing economies across Latin America. According to Bielschowsky (2016), the regional response relied heavily on external borrowing, facilitated by the abundance of petrodollars in international financial markets, as oil-exporting countries recycled their surpluses through international banks eager to lend. The 1979 oil crisis, in turn, caused oil prices to quadruple, directly fueling global inflation and prompting a rise in world interest rates. Consequently, the third and final major external shock of the 1970s that affected Latin America was the decision, made in late 1979, by the Federal Reserve (Fed) Board of the United States to sharply increase interest rates — the so-called *Volcker shock*, named after the Fed Chairman at the time.

The *Volcker shock* aimed to curb the inflationary spiral then affecting the U.S. economy, but it also marked a turning point for Latin America. The sudden tightening of U.S. monetary policy had an immediate impact on the region's debt service, as a large share of its external liabilities had been contracted at floating interest rates. These conditions exposed the region's external vulnerabilities and set the stage for the subsequent debt crisis. Volcker's disinflation policy had severe repercussions for Latin American economies, many of which had accumulated short-term, dollar-denominated loans at variable interest rates throughout the 1970s (Ocampo, 2014).

Despite the circumstances of the global economy, Latin America recorded relatively robust growth between 1974 and 1980, with an average annual rate of 5.1%. This performance, however, contrasts sharply with the subsequent decade, during which the region's average annual growth declined to merely 1.2% between 1981 and 1990. The 1980s crisis pushed most countries to abandon their import substitution industrialization (ISI) models (Bielchowsky, 2016).

As international credit flows contracted, many Latin American governments resorted to “printing money” to finance persistent fiscal deficits, effectively relying on the inflation tax. This policy response led to a rapid acceleration of inflation throughout the region and, in several countries, culminated in severe inflationary crises that eventually escalated into episodes of hyperinflation, as in Argentina in 1985 and 1989, and Brazil in 1990². Thus, it is not surprising that the 1980s came to be remembered as Latin America's “lost decade,” characterized by chronic inflation, low economic growth, and a prolonged external debt crisis.

² Earlier episodes of hyperinflation had already occurred in the region, notably in Chile in 1973 and in Argentina in 1975, following periods of fiscal imbalances and monetary expansion prior to the debt crisis of the 1980s.



As noted by Bielschowsky (2016), the period from 1985 to 1990 brought increasing relief for Chile and Mexico. However, most countries in the region only emerged from the crisis after the debt renegotiations under the Brady Plan³ in 1989–1990, the new international financing environment that followed the sharp decline in interest rates during the 1990s, and the implementation of structural reforms, including trade and financial liberalization, privatization, and greater labor market flexibility.

Stabilization plans were generally associated with fiscal discipline but often coincided with a widening of the current account deficit, largely due to the generalized appreciation of the exchange rate. This appreciation reflected strong inflows of foreign financing frequently used to control inflation and was reinforced by substantial foreign direct investment, partly linked to privatizations. As a result, the region's external vulnerability continued to pose a threat to macroeconomic stability. The crises in Mexico and Argentina in 1994–1995, followed by the Asian crisis of 1997–1998, underscored these concerns. Overall, the 1990s saw a moderate economic recovery accompanied by significant price stabilization, with average GDP growth of 3.5% between 1990 and 1997.

All these episodes can be identified as potential structural breakpoints in the macroeconomic series of Latin American countries, as they triggered profound changes in their economic, social, and political environments. Detecting these structural breaks is thus essential for understanding how external shocks and institutional changes shaped the region's economic trajectory. Table 1 summarizes key economic events across four Latin American countries.

By combining empirical identification of structural breaks with a historical review of each country's trajectory, this study aims to uncover which shocks were strong enough to trigger lasting changes in macroeconomic indicators. This approach allows for a robust interpretation of growth dynamics and instability in Latin America by linking statistical breakpoints to concrete events—such as crises, regime transitions, or shifts in economic policy.

Table 1 - Major Economic Events in Argentina, Brazil, Chile, and Mexico (1950–2000)

Country	1950	1960	1970	1980	1990	Source
Argentina		1962: Balance of payments crisis	1975: First hyperinflation 1978: Stabilization plan with crawling peg (tablita)	1981: Balance of payments crisis 1982: Banking crisis and default on government debt 1985: Second hyperinflation Stabilization plan (<i>Austral Plan</i>)	1990: Mandatory swap of short-term bank deposits for long-term government bonds (Bonex Plan) 1991: Currency board that pegged the Argentine peso to the U.S. dollar	Buera and Nicolini (2019); Cavallo and Cottani (1997); Dornbush and de Pablo (1990)

³ By 1989, it had become evident to the U.S. government that debtor nations could not repay their loans without jeopardizing economic recovery. The Brady Plan, proposed by Treasury Secretary Nicholas Brady, introduced permanent reductions in loan principal and debt-servicing obligations. Between 1989 and 1994, eighteen countries joined the plan in exchange for commitments to domestic economic reforms. Source: Federal Reserve History, "Latin American Debt Crisis of the 1980s," by Jocelyn Sims and Jessie Romero, November 22 2013, Federal Reserve Board, <https://www.federalreservehistory.org/essays/latin-american-debt-crisis>



				with fixed exchange rate. From 1986 onward, the government adopted mini devaluations to avoid a deterioration of external competitiveness. 1988: New stabilization plan (Spring Plan) 1989: Third hyperinflation	until 2001 (Cavallo Plan) 1993: Public debt refinanced (Brady Plan) 1995: Banking crisis due to an external shock (Mexican devaluation crisis)	
Brazil	1956-1961: Targets Plan	1964: Military Regime, Stabilization Plan (PAEG ⁴) 1965: Establishment of central bank 1968-1970: Strategic Development Program (PED ⁵) 1968: Beginning of “economic miracle”	1972-1974: I National Development Plan (I PND) 1973: End of “economic miracle” 1975-1979: II PND 1979: Maxi-devaluation of the currency ⁶	1982: Default 1986: Stabilization Plan (Cruzado) 1987: Stabilization Plan (Bresser) 1989: Stabilization Plan (Verão)	1990: Stabilization Plan (Collor I) and temporary freezing of private assets 1993: External debt renegotiation (Brady Plan) 1994: Stabilization Plan (Real Plan), adoption of crawling-peg regime and the end of hyperinflation 1999: End of the crawling-peg regime and adoption of the macroeconomic tripod: inflation targeting, a floating exchange rate, and primary surplus targets.	Ayres <i>et al.</i> (2019); Abreu (2014); CPDOC-FGV (n.d.)
Chile		1962: Balance of payments crisis 1966: Moderate success in	1973: Hyperinflation and Military regime 1975: Recession	1981: Inflation stabilized to one-digit levels	1990: Stabilization plan based on exchange rate bands and	Caputo and Saraiva (2019)

⁴ Programa de Ação Econômica do Governo (PAEG) was introduced to stabilize the currency and restore economic growth through structural reforms, such as tax, financial, and capital market reforms, aimed at increasing savings and government revenues. To finance the public deficit in a non-inflationary manner, the government created Obrigações Reajustáveis do Tesouro Nacional (ORTNs) — long-term bonds indexed to inflation (Barbosa, 2014)

⁵ PED aimed to establish the basic objectives that would guide economic policy during the 1968–1970 period. The new development strategy outlined by the program was closely linked to the expansionary cycle of the Brazilian economy observed between 1968 and 1973 (economic miracle). The program sought to define a new economic and social development strategy for the country. Its main components included an investment program focused on strategic sectors and a set of indirect policy tools to influence the private sector (CPDOC – Center for Research and Documentation of Contemporary History of Brazil. Retrieved on November 6, 2025).

⁶ In 1979, the government adopted a price control policy followed by a major currency devaluation: the *cruzeiro* was devalued by 30% against the U.S. dollar in a single move, ending the system of small monthly devaluations that had been in place for more than a decade, in an attempt to influence inflation expectations. At that time, the global economy was heading into recession, driven by the second oil shock and rising interest rates in the United States. The policy proved unsuccessful, leading to a rapid loss of reserves, accelerating inflation, and declining economic growth, which would turn negative in the following years (Abreu, 2014).



		inflation stabilization	1979: Fixed exchange rate to stabilize inflation	1982: Balance of payments crisis and Abandonment of fixed exchange rate regime 1983: First debt restructuring episode 1985: Treasury transfers to Central Bank due to operational losses 1987: Creation of the Copper Stabilization Fund (CSF) 1989: Central Bank independence	declining inflation targets 1999: Abandonment of exchange rate band and Establishment of inflation targeting	
Mexico	1954: Fixed exchange rate	1968: Interruption of oil exports	1973: Oil shock and resumption of exports 1976: Balance of payments crisis and devaluation, and Discovery of oil fields	1982: Balance of payments crisis and devaluation; Default; Capital controls; Nationalization of banks 1987: Stabilization plan, "Pacto Solidaridad"; Establishment of exchange rate bands 1989: Brady Plan	1991: Adoption of exchange rate band 1991–1992: Privatization of banks 1993: Central bank autonomy, mandate to preserve purchasing power of the peso 1994: Balance of payments and financial crisis; Abandonment of exchange rate band 1995: Debt crisis and Clinton bailout; Banks bailout	Meza (2019)

Note. Prepared by the author based on *A Monetary and Fiscal History of Latin America, 1960-2017* by Kehoe and Nicolini (2019)

3. Methodology and Data

To identify structural breaks in macroeconomic relationships in Latin American countries during the second half of the twentieth century, this study employs the methodology proposed by Bai and Perron (2003), which allows for the endogenous detection of multiple breakpoints in time series data.

First, the existence of structural breaks in the series is tested under the null hypothesis of no breaks. The *OLS-CUSUM* and *supF* tests are applied, which detect potential breaks without requiring prior knowledge of their number or location. Once the presence of breaks is confirmed, the Bai and Perron (2003) algorithm is used to endogenously estimate multiple



breakpoints. The optimal number of breaks is selected based on the Bayesian Information Criterion (BIC), which Bai and Perron (2003) demonstrate to be effective in the presence of structural shifts.

This methodology is particularly well-suited for analyzing macroeconomic time series in Latin America. Its ability to identify multiple breakpoints endogenously (i.e., without the need to pre-specify their number or timing) is a key advantage when analyzing long historical series. In contrast, classical methods such as the Chow test require *a priori* knowledge of the breakpoint and only test for a single shift. Similarly, unit root tests with structural breaks (e.g., Vogelsang & Perron, 1998; Saikkonen & Lütkepohl, 2002) typically allow for a single break and are less suited for capturing the multiple regime shifts common in developing economies.

The results are analyzed to trace changes in regression parameters across the identified segments, enabling the association of structural breaks with historical events and broader shifts in economic regimes in Latin America during the studied period.

3.1. Methodology

The model on which the structural break tests are performed is specified as a linear regression of the form:

$$y_t = x_t' \beta_t + \mu_t \quad (t = 1, \dots, n) \quad (1)$$

Where t represents time, y_t is the vector of dependent variables, x_t' is the vector of independent variables, β_t are the estimated coefficients, and μ_t are the residuals. The null hypothesis of the tests is:

$$H_0: \beta_t = \beta_0 \quad (t = 1, \dots, n) \quad (2)$$

That is, the null hypothesis of no structural breaks is tested against the alternative hypothesis that at least one coefficient varies over time. Zeileis *et al.* (2003) propose rewriting model (1) to consider that there are m breaks, so that the equation incorporates $m + 1$ segments in which β takes distinct values:

$$y_t = x_t' \beta_j + \mu_t \quad (t = t_{j-1}, \dots, t_j, \quad j = 1, \dots, m + 1) \quad (3)$$

Where j is the segment index, $T_{(m,n)} = \{t_1, \dots, t_m\}$ is the set of breakpoints (m – *partition*), and by convention, $t_0 = 0$ e $t_{m+1} = n$ (Zeileis *et al.*, 2003).

Zeileis *et al.* (2003) present two approaches to test for structural breaks: (i) tests based on the F-statistic; and (ii) tests of generalized fluctuations.



The F-statistics test against the alternative hypothesis of a single structural change at an unknown point in time, that is, model (3) with $m = 1$ (Zeileis *et al.*, 2003). Tests for this alternative are based on a sequence of F-statistics for a change at time t : the residuals of the ordinary least squares, $\hat{\mu}(t)$, obtained from a segmented regression—i.e., a regression for each subsample with a breakpoint at t — are compared to the residuals $\hat{\mu}$ of the unsegmented model through:

$$F_t = \frac{\hat{\mu}'\hat{\mu} - \hat{\mu}(t)'\hat{\mu}(t)}{\frac{\hat{\mu}(t)'\hat{\mu}(t)}{n - 2k}} \quad (4)$$

These F-statistics are computed for segments $t = n_h, \dots, n - n_h$ ($nh \geq k$) and the null hypothesis H_0 is rejected if the supremum function (i.e., or the average or exponential function) exceeds the critical values (Zeileis *et al.*, 2003). In practical applications, $n_h = nh$ is a trimming parameter that can be chosen by the researcher — typically, $h = 0.1$ or $h = 0.15$. Bai and Perron (1998) extend this approach to F-tests between 0 and l breaks, and between l e $l + 1$ breaks, respectively, with l being fixed but arbitrary (Zeileis *et al.*, 2003).

Regarding fluctuation tests, the *OLS-CUSUM* test will be applied, which is based on the cumulative sums of standardized residuals obtained through Ordinary Least Squares

$$W_n^0(t) = \frac{1}{\hat{\sigma}\sqrt{n}} \sum_{i=1}^{nt} \hat{\mu}_i \quad (0 \leq t \leq 1) \quad (5)$$

The limiting process for $W_n^0(t)$ is a standard Brownian bridge $W^0(t) = W(t) - tW(1)$, where $W(\cdot)$ represents a standard Brownian motion. Under the null hypothesis, the cumulative sum of residuals $W_n^0(t)$ follows this process, while under the alternative hypothesis, it crosses the process boundaries indicating a structural break. The test not only helps identify the number of breaks (how many times the process crosses the boundaries) but also indicates their locations (Zeileis *et al.*, 2003).

Regarding the Bai-Perron (2003) algorithm for identifying structural break dates, Zeileis *et al.* (2003) explain that, based on equation (3) and a partition of the time series into segments m — *partition* $t_1, \dots, t_m$, the estimator β_j for each segment can be easily obtained via OLS. The algorithm selects the break dates by minimizing the overall RSS, given by:

$$RSS(t_1, \dots, t_m) = \sum_{j=1}^{m+1} rss(t_{j-1} + 1, t_j) \quad (6)$$

Where $rss(t_{j+1} + 1, t_j)$ represents the usual minimum residual sum of squares for the $j - th$ segment. Thus, the problem of identifying the structural break dates consists of finding the breakpoints $\hat{t}_1, \dots, \hat{t}_m$ that minimize the following objective function:



$$(\hat{t}_1, \dots, \hat{t}_m) = \underset{(t_1, \dots, t_m)}{\operatorname{argmin}} RSS(t_1, \dots, t_m) \quad (7)$$

under all segments $(t_1, \dots, t_m)$ with $t_j - t_{j-1} \geq n_h \geq k$.

Bai and Perron (2003) propose a dynamic programming algorithm grounded in Bellman's principle of optimality to identify the m breakpoints that minimize the residual sum of squares in a model with $m + 1$ segments. This procedure requires that each segment has a minimum length of $n \times h$, where h is typically set to 0.1 or 0.15—the same threshold used in F-statistic-based tests. Since the number of breaks m is generally unknown a priori, models with different numbers of breakpoints are estimated, and the optimal specification is selected using an information criterion, such as the Bayesian Information Criterion (BIC).

Once $(\hat{t}_1, \dots, \hat{t}_m)$ has been obtained, confidence intervals for each estimated break date can be constructed using the formulas given in Bai and Perron (1998). As discussed in Bai and Perron (2003), the coverage rates for the estimated break dates are generally adequate, except when the structural change is either too small or too large. In practice, when breaks are very small, the intervals often fail to include the true break date, reflecting the inherent difficulty in detecting weak structural changes. When breaks are very large, the intervals still contain the true value but yield a conservative assessment of precision, overstating uncertainty.

3.2. Data

To identify structural breaks in macroeconomic series of Latin American countries during the second half of the 20th century, this study uses data from the PWT 10.01 covering Argentina, Brazil, Chile, and Mexico from 1950 to 2000. The analysis focuses on key macroeconomic variables listed in Table 2. To improve comparability and interpretability, the variables are transformed using natural logarithms, a common practice in economic literature that helps smooth variance. Log differences are then taken to approximate percentage growth rates, which are particularly useful for capturing macroeconomic dynamics over time.

Table 2 - Variables

Variables	Description (Millions of US\$)	Transformation Applied
<i>rgdpna</i>	Real GDP at 2017 constant national prices	Log difference (real GDP growth)
<i>rnna</i>	Capital stock at 2017 constant national prices	Log difference (capital stock growth)

Note. Prepared by the author.



4. Results

Structural break tests were applied to the log-difference series of real output (*rgdpna*) and capital stock (*rnna*) for Argentina, Brazil, Chile, and Mexico. The analysis began with the application of the *sup-F* and *OLS-CUSUM* tests to detect the presence of structural breaks in the series of interest. Once the existence of breaks was confirmed, the Bai-Perron (2003) procedure was employed to precisely estimate the dates of the structural breaks. The selection of the optimal number of breaks was based on the Bayesian Information Criterion (BIC), which, according to Bai and Perron (2003), performs efficiently in the presence of structural breaks.

The tests identified several episodes of structural breaks throughout the second half of the twentieth century. These episodes largely reflect macroeconomic shocks, political instability, institutional reforms, and regime transitions that shaped the economic trajectory of the region. Table 3 summarizes the breakpoints identified in the series, and the results suggest relevant patterns for understanding the economic evolution of the countries analyzed.

Table 3 - Results of Structural Break Tests

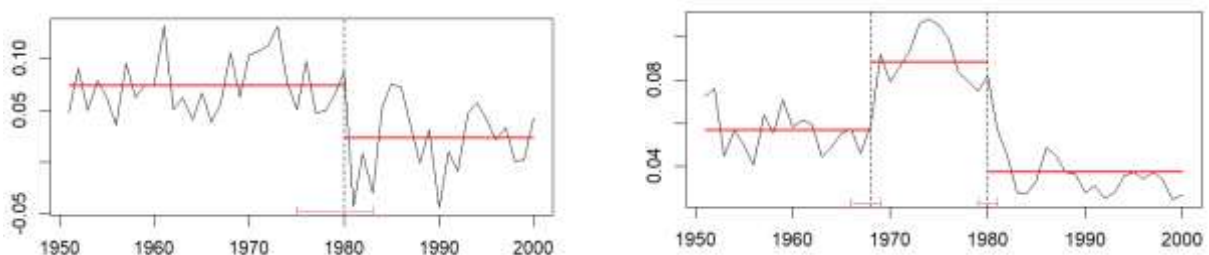
Country/Variable	<i>rgdpna</i>	<i>rnna</i>
Argentina	–	1961, 1980, 1991
Brazil	1980	1968, 1980
Chile	–	1963, 1971, 1988
Mexico	1981	1982

Note. Prepared by the author.

4.1. Brazil

In the case of Brazil, the BIC criterion reached its minimum value when identifying one structural break in the real GDP growth series (*rgdpna*) and two breaks in the capital stock growth series (*rnna*). Figure 1 displays both series with segment means before and after the breaks, the estimated break dates, and their confidence intervals. Table 4 details the break years alongside the 95% confidence interval bounds.

Figure 1 - Structural Breaks in Macroeconomic Series for Brazil (1950-2000):



Note. The left panel shows the real GDP growth series (*rgdpna*), and the right panel shows the capital stock growth series (*rnna*). Prepared by the author.



Table 4 - Break Dates and Confidence Intervals Identified by the Bai-Perron Procedure (2003) (Brazil)

Series	2.5%	Data	97.5%
<i>rgdpna</i>	1975	1980	1983
<i>rnna</i>	1966	1968	1969
<i>rnna</i>	1979	1980	1981

Note. Prepared by the author.

A simultaneous structural break is observed in the analyzed variables in 1980, indicating the exhaustion of the growth model based on external debt and the transition to a period of economic stagnation, high inflation, and increasing fiscal vulnerability—key elements of the so-called “lost decade” in Latin America.

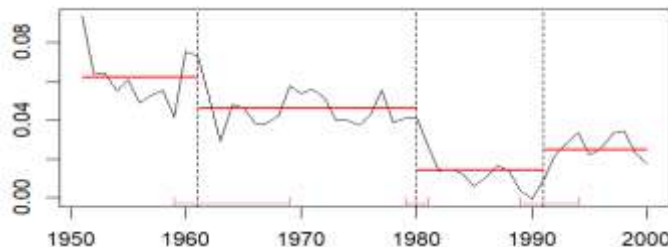
Kang and Pessoa (2024), when investigating structural breaks in the Brazilian per capita GDP growth series from 1901 to 2022, also identify a break in 1980. They argue that this year is a widely recognized turning point in the literature associated with the end of the import substitution industrialization (ISI) model and the beginning of a new macroeconomic environment characterized by persistent imbalances.

Furthermore, the positive structural break observed in 1968 in the capital stock growth series coincides with the onset of the Brazilian “economic miracle” (1968–1973), a period marked by high GDP growth rates (exceeding 10% per year), strong investment expansion, and intensified industrialization under the military regime, which led to an increase in capital stock growth.

4.2. Argentina

In the case of Argentina, structural breaks were identified only in the capital stock growth series (*rnna*). Figure 2 provides details about the series, and Table 5 shows the break years along with the 95% confidence interval limits.

Figure 2 - Structural Breaks in Macroeconomic Series for Argentina (1950-2000)



Note. The panel shows the capital stock growth series (*rnna*). Prepared by the author.



Table 5 - Break Dates and Confidence Intervals Identified by the Bai-Perron Procedure (2003) (Argentina)

Series	2.5%	Data	97.5%
<i>rnna</i>	1959	1961	1969
<i>rnna</i>	1979	1980	1981
<i>rnna</i>	1989	1991	1994

Note. Prepared by the author.

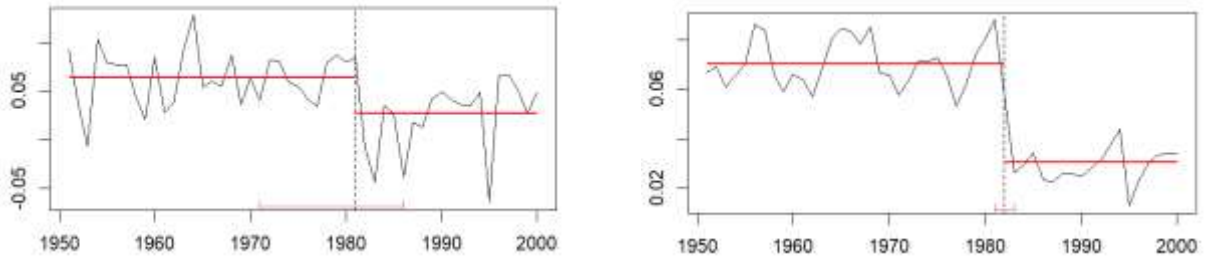
The structural break in 1961 in the capital stock growth series largely reflects the deterioration of the stabilization regime initiated in 1959, which was anchored on a fixed exchange rate to control inflation. According to Buera and Nicolini (2019), the absence of a compatible fiscal adjustment, with a growing primary deficit financed by monetary issuance, triggered capital flight and a rapid drop in international reserves by half throughout 1961. This scenario of exchange rate and fiscal instability reduced incentives for private investment and limited the State's capacity to finance investments, causing the slowdown in capital accumulation observed from that period onward, which helps explain the wide temporal horizon observed in the confidence interval for the structural break.

The break identified in 1980 is associated with the collapse of the stabilization plan based on the “*tablita*,” when, after brief success, fiscal deficits resumed growth and the Central Bank began financing the deficit through the expansion of domestic credit, leading to a fall in reserves and an inflation explosion, negatively impacting the capital stock. Moreover, as in the Brazilian case, 1980 marks the beginning of the so-called “lost decade” throughout the Latin American region.

The positive inflection in 1991, in turn, marks the adoption of the convertibility regime, which fixed the parity between the peso and the dollar and eliminated the Central Bank's monetary financing of the deficit, aiming to break the fiscal dominance cycle and control hyperinflation, which reached over 700% annually in 1990 (Buera & Nicolini, 2019). Additionally, new legislation guaranteed the Central Bank's independence, initiating a regime of monetary dominance that sought economic stability after decades of fiscal and monetary instability. These episodes highlight the importance of exchange rate dynamics and institutional credibility for the evolution of the capital stock in the Argentine economy.

4.3. Mexico

Mexico showed structural breaks in 1981 (*rgdpna*) and 1982 (*rnna*), the early years of the deep balance of payments crisis the country faced. Figure 3 provides details on the series, and Table 6 lists the years of the breaks along with the 95% confidence interval bounds.

**Figure 3** - Structural Breaks in Macroeconomic Series for Mexico (1950-2000)

Note. The left panel shows the real GDP growth series (*rgdpna*), and the right panel shows the capital stock growth series (*rnna*). Prepared by the author.

Table 6 - Break Dates and Confidence Intervals Identified by the Bai-Perron Procedure (2003) (Mexico)

Series	2.5%	Data	97.5%
rgdpna	1971	1981	1986
rnna	1981	1982	1983

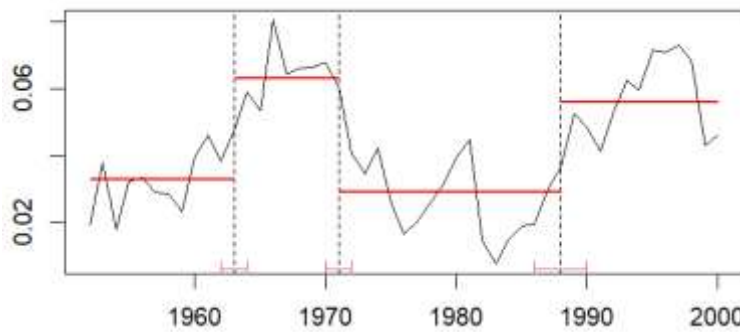
Note. Prepared by the author.

As detailed by Meza (2019), the country experienced an abrupt increase in public spending and debt following the discovery of oil fields in 1976 with the expectation of higher permanent revenues from oil exports. The combination of large primary deficits and external debt financing made the economy vulnerable to adverse external shocks. Starting in 1981, the international environment deteriorated: oil prices began to fall and real interest rates in the U.S. had risen sharply since 1979, increasing the cost of servicing Mexico's debt.

This deterioration in external financing conditions triggered a reversal of the growth cycle: in 1981, real GDP growth started to deviate negatively from the trend, signaling the structural break captured in the data. The following year, with the collapse of the investment model based on oil revenues and external credit, a structural break was observed in capital stock growth, reflecting the contraction of both public and private investment. These two breaks therefore captured different phases: the first, the immediate impact on output; the second, the slower but structural adjustment in capital formation.

4.4. Chile

Chile, similar to Argentina, showed structural breaks only in the capital stock series, with two positive inflections in 1963 and 1988, and one negative inflection in 1971. Figure 4 provides details on the series, and Table 7 presents the years of the breaks along with the 95% confidence interval limits.

**Figure 4** - Structural Breaks in Macroeconomic Series for Chile (1950-2000)

Note. The panel shows the capital stock growth series (*rnna*). Prepared by the author.

Table 7 - Break Dates and Confidence Intervals Identified by the Bai-Perron Procedure (2003) (Chile)

Series	2.5%	Data	97.5%
rnna	1962	1963	1964
rnna	1970	1971	1972
rnna	1986	1988	1990

Note. Prepared by the author.

The positive structural break in the growth of Chile's capital stock in 1963 can be interpreted in light of the macroeconomic context described by Caputo and Saraiva (2019). In the early 1960s, after a stabilization attempt that temporarily reduced inflation, fiscal deficits resumed growth, reaching about 3% of GDP between 1961 and 1964. From 1964 onward, with the arrival of the new government, the role of the state in the economy intensified through a program focused on income redistribution and increasing public investment capacity. In this context, the break observed in 1963 may reflect a turning point in Chilean public policies, marking the beginning of a greater emphasis on state investment and the expansion of the capital stock, even amid persistent fiscal imbalances.

The negative structural break in the growth of Chile's capital stock in 1971 is associated with the economic context of the socialist government led by Salvador Allende, which included structural reforms such as the nationalization of strategic sectors and a strong expansion of public spending, raising the fiscal deficit to 23% of GDP in 1973. Financing this deficit through monetary issuance led to a scenario of hyperinflation and a severe economic crisis marked by strikes and a decline in production, resulting in reduced investment and the observed structural break.

The decline in capital stock growth identified in 1971 was not immediately reversed. Following the establishment of the military government in 1973, the new administration adopted liberal reforms that restricted public investment, which, per the analysis, contributed to the persistence of the negative structural break throughout the 1970s. Despite a significant increase in credit to the private sector and economic activity between 1979 and 1981 — as shown in Figure 4, which displays a rise in capital stock growth during these years — this expansion proved unsustainable



and did not lead to a lasting structural reversal in investment. An abrupt reversal of capital flows, the collapse of the fixed exchange rate regime, and the 1982 financial crisis demonstrated the fragility of this expansion, limiting its effects to the short term.

The structural recovery of capital stock growth in Chile only consolidated starting in 1988, when the economic reforms implemented throughout the 1980s began to show more lasting effects. As highlighted by Caputo and Saraiva (2019), the period between 1974 and 1981 had already been marked by spending cuts and increased public revenues, which partially prepared the ground for post-crisis adjustments. From the end of the decade onward, the confidence of economic agents was reinforced by institutional measures such as granting independence to the Central Bank in 1989, contributing to the resumption of investments and the reversal of the negative trend in capital stock.

5. Discussion

The temporal coincidence of structural breaks in several Latin American countries — particularly in the early 1980s — suggests that these ruptures cannot be attributed solely to domestic dynamics. This period was marked by major external shocks, including the sharp rise in U.S. interest rates and the onset of the Latin American debt crisis. These shocks had widespread effects on investment and economic growth, underscoring the region's structural vulnerability to global financial conditions. The patterns identified highlight the persistent sensitivity of Latin American economies to exchange rate volatility, capital flows, and the monetary policy of advanced economies, especially the United States (e.g., Canova, 2005; Adler, 2014).

Despite some alignment in timing, the results also point to considerable heterogeneity among countries. Many structural breaks appear to be linked to domestic events, such as political regime changes, democratic transitions, military coups, and shifts in economic policy frameworks. These findings indicate that internal factors also played a decisive role in shaping national trajectories, reinforcing the need for a dual lens — domestic and international — in analyzing macroeconomic developments in the region.

From a methodological perspective, these results underscore the importance of accounting for structural breaks in econometric modeling. Ignoring such breaks can compromise inference, particularly in unit root and cointegration tests. Traditional tests that assume parameter constancy may falsely reject stationarity (Hansen, 2001; Perron, 1989). Thus, explicitly incorporating structural breaks is essential to more accurately model economic relationships and avoid misspecification.

While some findings confirm hypotheses long discussed in the literature, the debate remains open and relevant from a historical perspective. As Kang and Pessoa (2024) note, there is still disagreement regarding the timing and interpretation of key macroeconomic shifts. Studies like



this help refine the periodization of structural events and contribute to better-informed public policy by learning from the past and identifying persistent patterns of vulnerability.

Finally, the analysis reveals that capital stock growth exhibited greater volatility than GDP growth. The number of structural breaks in capital stock series was higher, consistent with the literature that identifies investment as one of the most shock-sensitive components of aggregate demand (e.g., Bernanke, 1983; Bloom, 2009). This volatility can be traced to multiple sources, including the collapse of the import substitution model, balance-of-payments crises, and abrupt shifts in external financing conditions. These factors make investment particularly responsive to uncertainty, highlighting the importance of macroeconomic frameworks that enhance predictability and mitigate exposure to external shocks.

6. Final Considerations

This study aimed to contribute to the understanding of Latin America's macroeconomic dynamics by identifying structural breaks in economic growth and capital stock series. By employing a common and internationally standardized dataset — the PWT 10.01 — comparability across countries was ensured, avoiding distortions that could result from heterogeneous national methodologies. This consistency is particularly crucial for regional analyses covering long historical periods.

Instead of focusing on individual country trajectories, the study adopted a regional perspective on structural breaks. By simultaneously analyzing a set of Latin American economies, it was possible to identify patterns of coincident breaks, which point to the impact of common external shocks such as abrupt shifts in global financial conditions, commodity price cycles, or systemic crises. This regional lens is especially pertinent for Latin America, a region historically characterized by external dependence and recurring vulnerability to international volatility. The findings reinforce the importance of regional coordination and institutional resilience in facing global economic disruptions.

A key limitation of this study lies in the absence of explanatory variables in the empirical tests. While the Bai and Perron methodology allows for accurate identification of structural breaks, it does not explain the underlying causes of such shifts. Consequently, the interpretation of results relied on complementary qualitative analysis, drawing from the historical and institutional contexts of each country — including debt crises, regime changes, political transitions, and major reforms. Future research could benefit from integrating explanatory variables directly into the model, thereby allowing for a more detailed investigation of the mechanisms behind the structural changes identified.

As a potential extension, future studies could apply unit root tests with endogenous breaks to analyze the persistence of shocks. These methods allow for testing non-stationarity while accounting for structural breaks that are determined from the data itself. Applying these



techniques in a comparative Latin American context would help distinguish between permanent and transitory shocks and improve the modeling of macroeconomic dynamics in the region.



7. References

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