CEMLA
CENTRO DE ESTUDIOS MONETARIOS LATINOAMERICANOS

# Central Banking, An Introduction

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# I. Costs of Inflation to Society

1. *A high rate of inflation leads to distortions in relative prices and, thus, misallocation of good and services.*
2. *It is a regressive tax. It affects more those that have less, as they cannot protect their income (and/or wealth), since a big portion of it is held as cash.*
4. *It is an anti-democratic tax, i.e., it is not legislated.*
5. *High inflation will mean that there will be almost no contracts, save for some short-term ones. Debt markets will not develop. Thus, there would exist great difficulties to transfer resources intertemporally.*
6. *This will lead to under-investment and limit consumption smoothing.*
7. *In particular, there will be no long-term contracts in the economy. That is, there will be no long-term (private) investment.*
8. *In most cases, deflation can be as harmful as inflation (next slide).*
9. *Others…*

# I. Costs of Deflation to Society

1. *Agents may have incentives to postpone their consumption, so why consume something if by waiting they could do so at lower prices?*
2. *Real wages would increase, which could make negotiation and subsequent adjustments difficult.*
3. *In an economy with a high level of debt, deflation would particularly affect debtors, as their debt in real terms would increase. This would benefit creditors. In effect, there will be a transfer of resources from debtors to creditors.*
4. *By way of the previous point, deflation affects more those who already face adverse financial conditions which, overall, could be costly to the economy.*
5. *Others…*

# I. General Equilibrium Macroeconomic Model

$$L\left(\frac{W}{P}, \frac{E}{P}; A_l\right) = 0 \qquad \text{(1) Labor Market}$$

$$Y\left(\frac{W}{P}, \frac{M}{P}, \frac{E}{P}; A_y\right) = 0 \qquad \text{(2) Goods and services market}$$

$$\mathrm{F}\left(\frac{E}{P}, \frac{W}{P}; Y_f\right) = 0 \qquad \text{(3) External Market}$$

These are excess-demand equations, where $W$ is the nominal wage, $P$ the price level, $E$ the nominal exchange rate, $M$ the nominal assets of the economy (monetary base), $A$ are exogenous factors that can affect each equation, and $Y_f$ is external output, respectively.

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# I. General Equilibrium Macroeconomic Model

Equilibrium prices:

$$\begin{pmatrix} \frac{E}{P} \\ \frac{W}{P} \\ \frac{M}{P} \end{pmatrix} \Rightarrow \begin{pmatrix} \frac{\lambda E}{\lambda P} \\ \frac{\lambda W}{\lambda P} \\ \frac{\lambda M}{\lambda P} \end{pmatrix} \text{ for all } \lambda > 0$$

Different options to anchor the nominal system:

1. $W$?
2. $E$?
3. $M$?
4. $P$?

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5. $\mathbb{E}(\dot{P}/P)$

# I. Possible changes to Real Equilibria due to various frictions

Reasons why "inflating" can change Real Equilibria:

- ✓ *Sluggish adjustment of inflation expectations;*
- ✓ *Incomplete information;*
- ✓ *Asymmetric information (e.g., Lucas 1972);*
- ✓ *Rational inattention (Reis and Mankiw 2002);*
- ✓ *Wage contracts determined in a staggered manner (e.g., Taylor 1979, 1980);*
- ✓ *Monopolistic competition combined with tiered pricing (e.g., Calvo 1983);*
- ✓ *Menu costs (Sheshinski and Weiss 1977);*
- ✓ *Other…*

# II. Incentives to have a higher level of inflation

1. Authorities could seek to “surprise” individuals by inducing a higher level of inflation with the aim of reaching a lower rate (than natural) level of unemployment.
2. Similarly, the authorities could seek to “surprise” society by inducing a higher level of inflation in order to finance a larger fiscal deficit.

*The ability to surprise depends on how you shape your expectations and the institutional setting. If individuals update their inflationary expectations quickly, it will be more difficult for them to be “surprised”.*

References: Barro, Robert J.; Gordon, David B. (1983). "A Positive Theory of Monetary Policy in a Natural-Rate Model" . JPE. 91 (4): 589–610

# II. Seignioriage and Optimal Rate of Inflation

- $d = h\,\pi$, where:

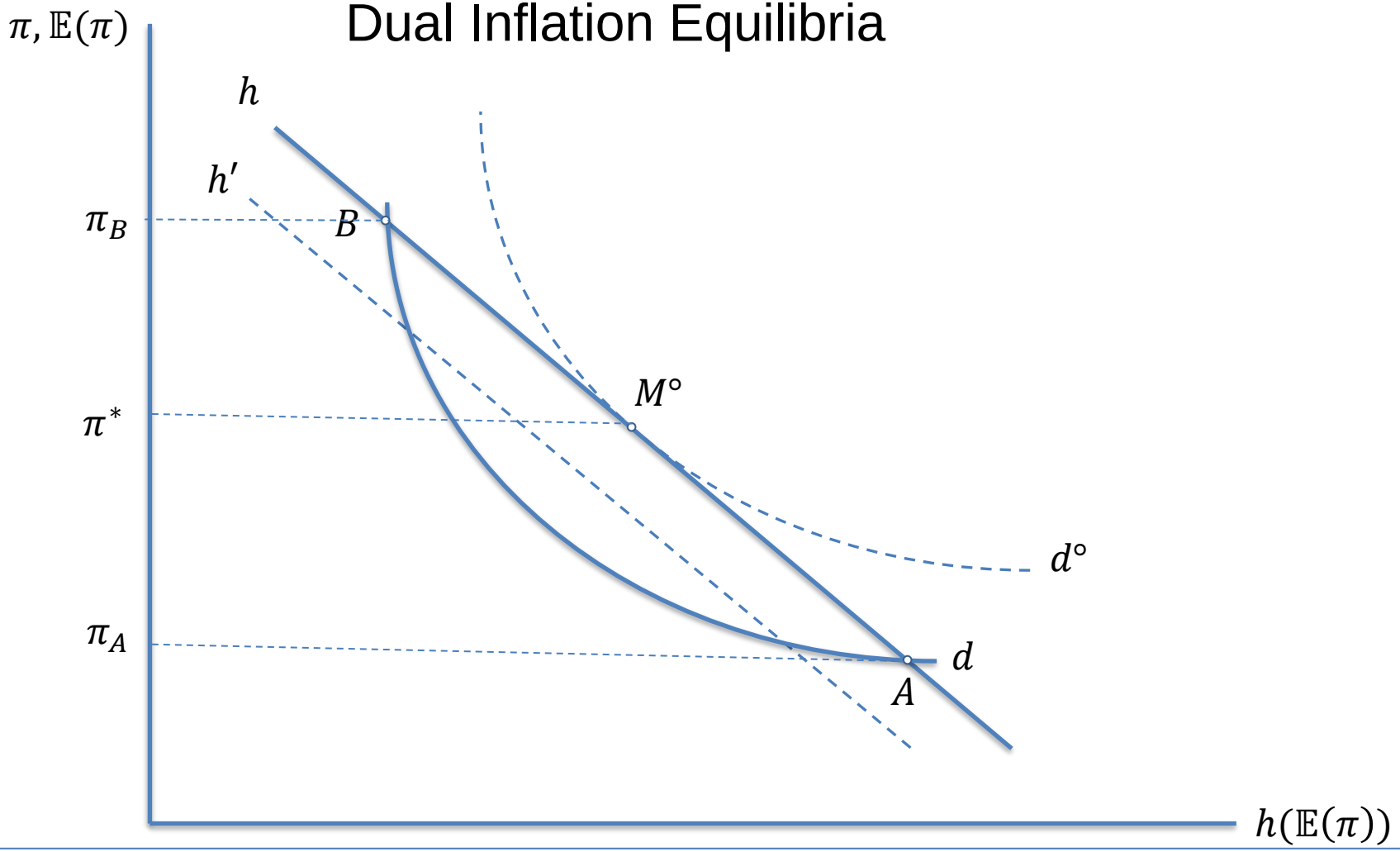
  $d$ is the fiscal seigniorage-financed deficit;
  $h$ is the demand for money;
  $\pi$ is inflation.

- In the stationary state, we have $\pi = \dot{H}/H$, where $H$ is the nominal monetary base and $\dot{H}$ is its change through time.

- Following Cagan (1956), we have:

  $h = \exp(-\alpha \mathbb{E}(\pi))$;
  $d^0 = \max[\pi \exp(-\alpha\,\pi)] = 1/(\alpha e)$ (maximum seignorage);
  $\pi^* = 1/\alpha$ (inflation at such a maximum).

# II. Seignioriage and Optimal Rate of Inflation



# III. Consolidated Government and Central Bank Budget Constraint

$$\frac{B_t}{P_t} = \mathbb{E}_t \sum_{j=1}^{\infty} \frac{(T_{t+j} - G_{t+j})}{(1+y)^j} + \mathbb{E}_t \sum_{j=1}^{\infty} \frac{(M_{t+j} - M_{t+j-1})}{(1+y)^j}$$

(1) (2) (3)

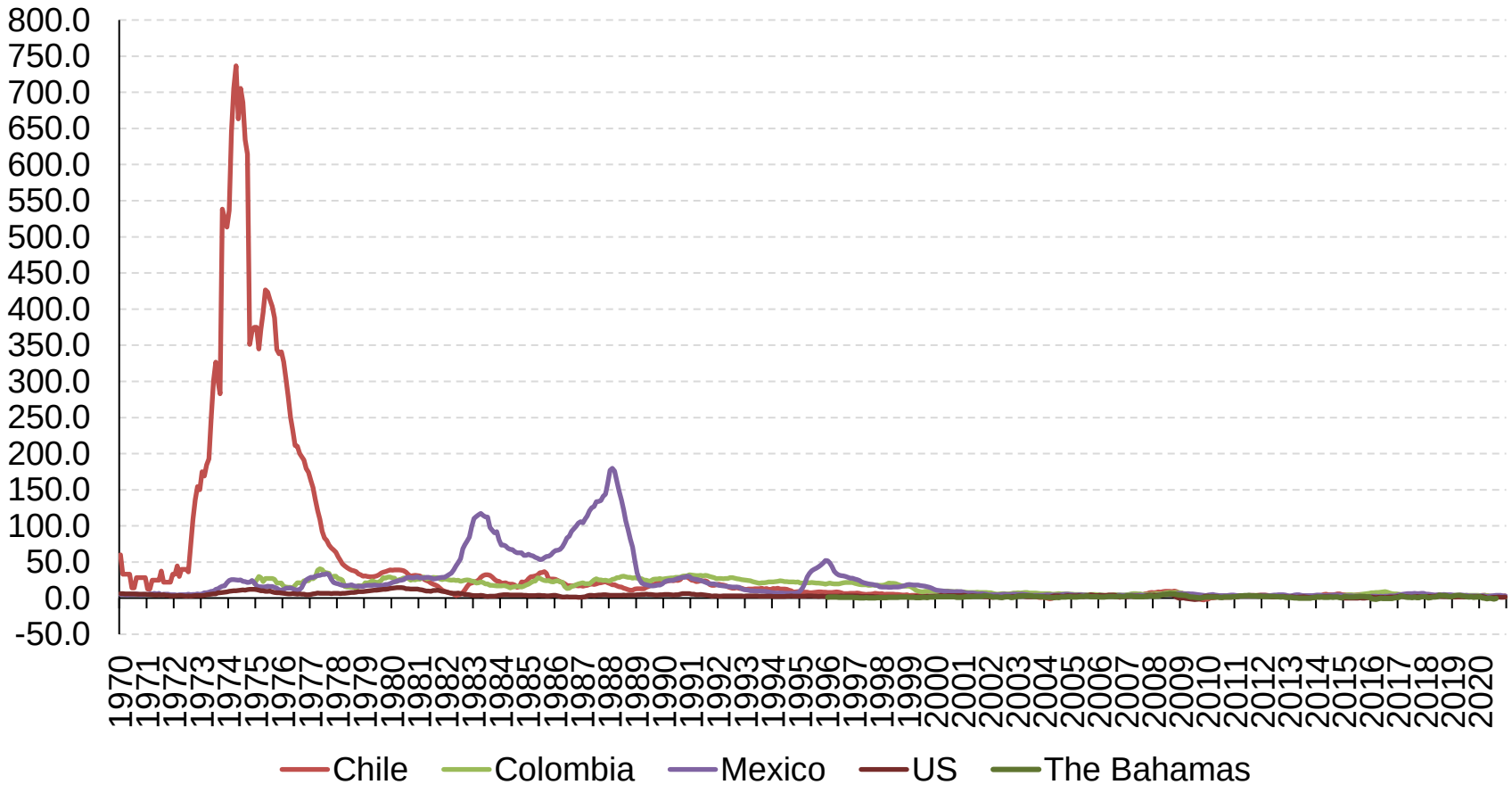
and $\lim_{j \to \infty} \frac{B_{t+j}}{(1+y)^j} = 0$

where:

- $B_t$ is the nominal debt of the government in period $t$;
- $P_t$ is the general price level in period $t$;
- $\mathbb{E}_t$ is the conditional expectation operator;
- $T_{t+j}$ are taxes in period $t+j$;
- $G_{t+j}$ are government expenditures in period $t+j$;
- $M_{t+j} - M_{t+j-1}$ is seigniorage in period $t+j$;
- Finally, $y$ is the interest rate.

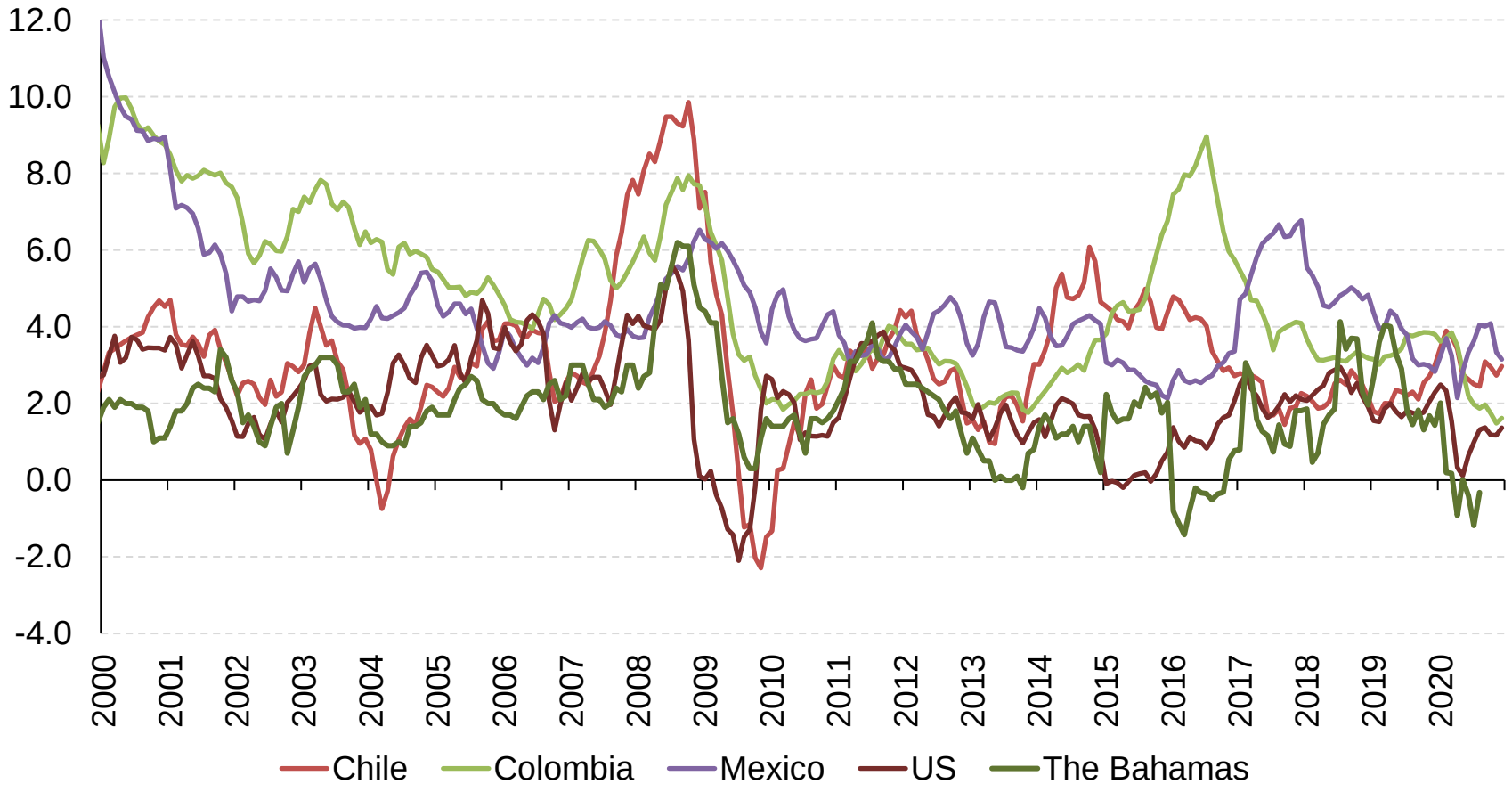
**References**: Thomas J. Sargent & Neil Wallace, 1981. "Some unpleasant monetarist arithmetic," Quarterly Review, Federal Reserve Bank of Minneapolis, vol. 5(Fall).

# Some Regional Inflations




**Notes:** Changes from year to year of the corresponding consumer price index. Data with monthly frequency. The last data corresponds to December 2020, and to August 2020 for The Bahamas.
**Source:** Haver Analytics, and with data from Department of Statistics and Bloomberg for The Bahamas.

# Regional Inflations

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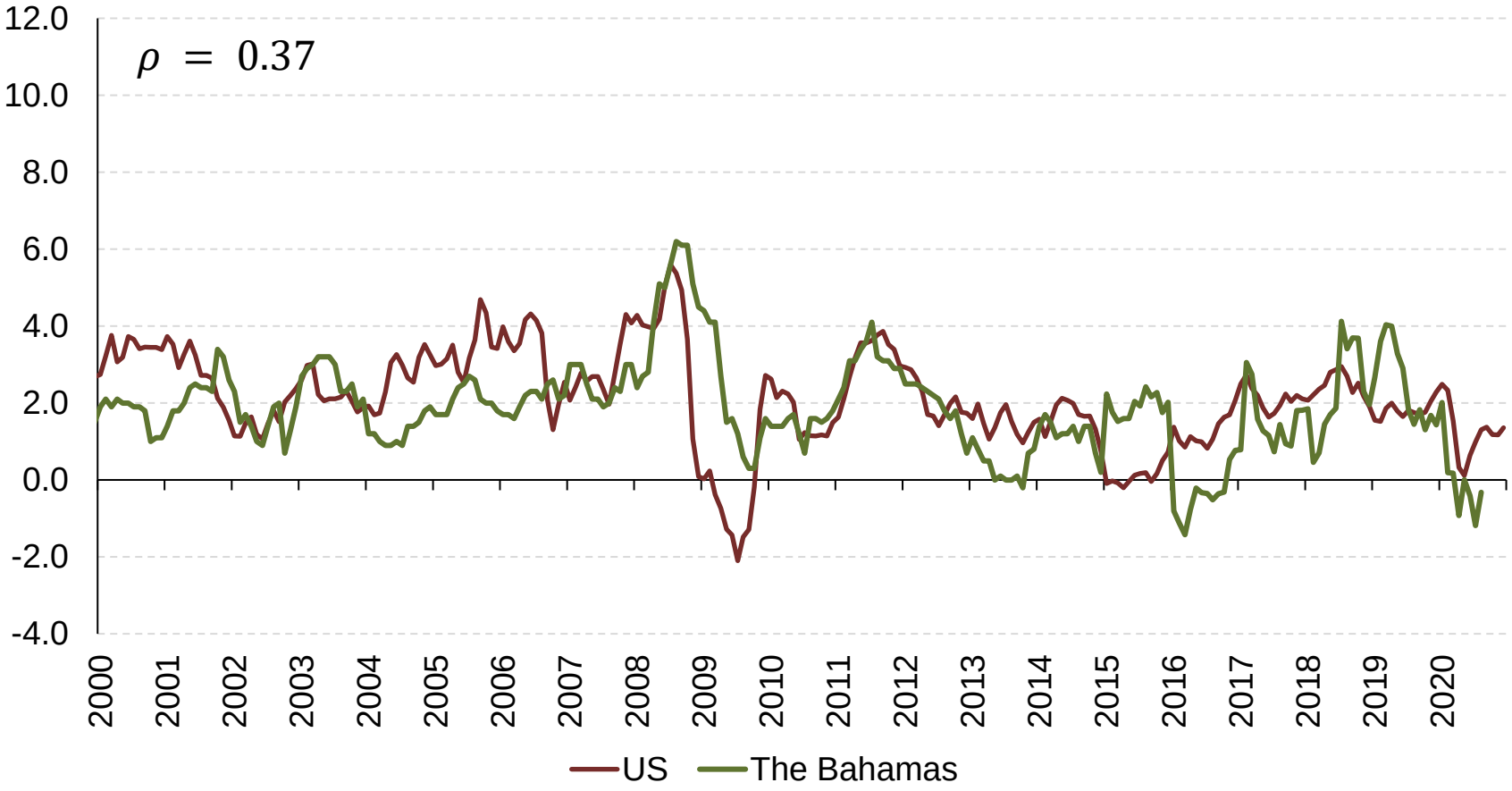


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# References


1. Barro, Robert J.; Gordon, David B. (1983). A Positive Theory of Monetary Policy in a Natural-Rate Model. Journal of Political Economy. 91 (4): 589–610
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4. Reis and Mankiw (2002) Sticky information versus sticky prices: A proposal to replace the new Keynesian Phillips curve. Quarterly Journal of Economics 117(4): 1295-1328.
5. Sheshinski and Weiss (1977). Inflation and Costs of Price Adjustment. The Review of Economic Studies. 44(2). June.
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7. Taylor (1980). Aggregate Dynamics and Staggered Contracts. Journal of Political Economy, 88(1), pages 1-23, February.