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Copulas and Macroeconomics: the Quantity Theory of Money

by

Ernst Juerg Weber

Business School
The University of Western Australia

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Ernst Juerg Weber
Department of Economics
University of Western Australia

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Abstract

The quantity theory of money remains a cornerstone of modern macroeconomics that provides a benchmark for the long-run behaviour of macroeconomic models. The direct empirical evidence for it is, however, less conclusive than suggested by scatterplots and the exaggerated correlations between money growth and inflation that can be found in the macroeconomic literature. Copulas with upper tail dependence show a considerably weaker relationship between money growth and inflation than Pearson's r . Even so, the quantity theory will continue to be part of macroeconomics because economics as a science is driven both by observation and by the inherent structure of the accumulated body of economic theory.

Most macroeconomists agree that the quantity theory of money holds in the long-run in the modern monetary system with fiat money that emerged after the breakdown of the Bretton Woods system in 1971. The empirical evidence for this long-run relationship is, however, less conclusive than suggested by scatterplots between money growth and inflation that can be found in the macroeconomic literature. In this article copulas are used to model the statistical relationship between money growth and inflation. It is found that Pearson's correlation coefficient is misleading because the relationship between money growth and inflation is non-elliptical. Rank-based correlation coefficients, which are related to copulas, show a weaker association between money growth and inflation. But this does not mean that the quantity theory should be abandoned, because the development of economics as a science is driven both by empirical evidence and by the inherent structure of the accumulated body of economic theory.

Scatterplots provide a convenient graphical tool illustrating the long-run relationship between money growth and inflation. Figure 1 shows a scatterplot between the annual average growth rate of the money stock M1 and the inflation rate for 144 countries for time periods that are determined by the availability of data. Moving along the vertical axis, Ukraine, Peru, Brazil and Bolivia experienced average annual inflation rates between 100 and 400 percent and Zimbabwe hit 2401 percent. The data points of all five countries lie fairly close to the solid line that runs through the origin with slope one. This suggests an equiproportional relationship between money growth and inflation as proposed by the quantity theory. Figure 2 magnifies the indistinguishable mass of observations in the lower left corner of Figure 1, excluding the five countries whose currencies suffered the most extreme loss of purchasing power. A positive relationship between money growth and

Figure 1. Inflation Versus Money Growth

144 Countries

Figure 2. Inflation Versus Money Growth

139 Countries

Note: The dataset with 139 countries excludes Ukraine, Peru, Brazil, Bolivia and Zimbabwe.

Sources: See text.

inflation also shows up at low to moderate inflation rates, although most observations lie below the 45-degree line. In most countries money growth exceeded inflation because economic growth increases money demand, permitting some non-inflationary monetary expansion. In Ukraine, Peru and Bolivia inflation exceeded money growth because the inflation tax on money holdings reduces money demand.¹

The Data

This study uses a new dataset that includes the annual average growth rate of the money stock M1 for 144 countries since the collapse of Bretton Woods in 1971. The money stock M1 is used because that definition of money stresses its medium of exchange function, which is central to the quantity theory.² To be included a country must be a sovereign nation with a national currency that provides the primary means of payment in domestic transactions. This excludes members of monetary unions, countries where a foreign currency provides the dominant medium of exchange, and – except for Hong Kong – dependent territories. The Euro replaced national currencies when the third and final stage of European monetary unification was implemented on January 1, 1999. Afterwards, the dataset includes the Euro, while the former national currencies are considered until 1998 or – for late adopters – until they joined the Eurozone. Similarly, the members of the West African Economic and Monetary Union, the Central African Economic and Monetary Community and the Eastern Caribbean Monetary Union do not operate domestic currencies

¹ A scatterplot between the logarithm of money growth and the logarithm of inflation, as drawn in Mankiw (2019, ch. 5.1), also dissolves the mass of data points at low money growth rates. But even a double logarithmic scatterplot exhibits a non-elliptical distribution.

² Benati et al. (2019) estimated demand functions for M1 money for 38 countries that are based on Baumol's model of the transactions demand for money. Their finding of a stable money demand supports the validity of the quantity theory.

but union-level data are available for the West African franc and the East Caribbean dollar. Only countries with more than 100,000 people are considered, excluding many island nations. This cut-off was adopted because micro-countries commonly rely on foreign currencies. Zimbabwe is included until the dollarization of its monetary system in 2009. The inflation rate is the average annual growth rate of the consumer price index, except for a small number of countries where the GDP deflator is used. For a country to be included at least 10 years of overlapping data for M1 money growth and inflation must be available since the emergence of the modern monetary system in 1971.³

Correlation

The Pearson correlation coefficient requires that the joint probability distribution of two random variables is elliptical. Figure 3 shows the contour lines of an elliptical bivariate distribution and Figure 4 provides a non-elliptical distribution with upper tail dependence. The Gaussian (normal) distribution and the t -distribution are elliptical. As can be seen in Figures 1 and 2, hyperinflations are associated with extreme money growth rates. Clearly, the relationship between money growth and inflation is non-elliptical, exhibiting strong upper tail dependence. Using all 144 countries, Pearson's correlation coefficient between money growth and inflation is 0.996 (Table 1). This matches the correlation reported by Barro (1997, p. 239) at two digits and it is close to the value of 0.96 that is implied by the R^2 of the linear regression of inflation on money growth in Fischer et al. (2002, Table 6, col. 1). Walsh (2017, pp. 1-2) mentioned several studies that show correlations between money

³ The money stock M1 and inflation are from the *International Financial Statistics* (IFS), *International Monetary Fund* (IMF), except for the inflation rate of Zimbabwe, which is from *Federal Reserve Economic Data* (FRED), *Federal Reserve Bank of St. Louis*. The Appendix lists the countries covered by IFS that are included/excluded in this study.

Figure 3. Contour Lines for Elliptical Distribution

Figure 4. Contour Lines for Non-Elliptical Distribution

Table 1. Correlations Between Money Growth and Inflation

	139 Countries	143 Countries ¹	144 Countries ²
Pearson's r	0.87	0.95	0.996
Kendall's tau	0.55	0.57	0.58
Spearman's rho	0.74	0.77	0.77

¹ With Peru, Ukraine, Brazil and Bolivia.

² Complete dataset with Zimbabwe.

Sources: See text.

growth and inflation that are close to one. But those high correlations are misleading because the basic assumption of Pearson's r of an elliptical distribution does not hold for the relationship between money growth and inflation.

When the distribution is non-elliptical, a non-parametric correlation coefficient should be used that does not require an assumption on the distribution of variables. Table 1 compares Pearson's r with the rank-based Kendall's tau and Spearman's rho for three datasets that include 139 countries with an average annual inflation rate of less than 100 percent; those countries plus Ukraine, Peru, Brazil and Bolivia; and the full dataset that also includes Zimbabwe. Three observations strike the eye: (1) For all datasets the rank-based correlations are much smaller than Pearson's r , ranging from 0.55 to 0.58 for Kendall's tau and 0.74 to 0.77 for Spearman's rho. Therefore, any inference on the quantity theory that is based on Pearson's r is spurious. (2) Both rank-based correlations depend less on the countries that experienced hyperinflations than Pearson's r . Adding Ukraine, Peru, Brazil and Bolivia increases Pearson's r from 0.87 to 0.95, and also adding Zimbabwe raises it to 0.996. In contrast, Kendall's tau and Spearman's rho barely move if the high-inflation countries are added. Thus, it is the small number of observed hyperinflations that drives

Pearson's r close to 1.⁴ (3) As is usually the case, Spearman's rho exceeds Kendall's tau. In this study, Kendall's tau will be used because it is more robust⁵ and, as will be seen, it is related to the Gumbel copula.

Copulas

A copula is a multivariate probability distribution with uniform marginal distributions. There are many types of copulas including, among others, the Gaussian copula that is based on the normal distribution and the Gumbel copula that features upper tail dependence. Copulas separate the dependence structure of jointly distributed random variables from their marginal distributions. This makes it possible to model the dependence structure and the marginal distributions separately. In his paper three copula models of the stochastic relationship between money growth and inflation are estimated: a Gaussian copula, a Gumbel copula and a survival (reflected) Clayton copula.

An elementary proposition for probability distributions holds that the values $F(x)$ of a univariate cumulative distribution function (CDF) are always uniformly distributed, whatever the distribution of the random variable X .⁶ Sklar's Theorem (1959) applies this property of CDFs to the univariate marginal CDFs of a multivariate distribution. The theorem states that every CDF $F(x_1, x_2, \dots, x_d)$ can be written as a copula C using the uniformly distributed values

⁴ There exists an extensive literature on hyperinflations. In an influential study, Cagan (1956) investigates the hyperinflations in Germany and some eastern European countries after World War I.

⁵ See Croux, C. and Dehon, C. (2010).

⁶ Let $Z = F(x)$, then Z has the uniform distribution on $[0,1]$. This proposition is known as the probability integral transform because moving from the PDF to the CDF requires integration. See Rice (1995, p. 60, Proposition C).

$u_i = F_i(x_i)$ of the marginal CDFs, $i = 1 \dots d$. Moreover, the copula is unique if the marginal distributions are continuous.⁷

$$F(x_1, x_2, \dots, x_d) = C(u_1, u_2, \dots, u_d) \quad (1)$$

Here, the x_i are realizations of the random vector $(X_1 \dots X_d)$ and the u_i are those realizations transformed by the marginal distributions, $u_i = F_i(x_i)$. Note that the arguments u_i of the copula CDF C are uniformly distributed on the interval $[0,1]$, whereas each argument x_i of F may have any continuous marginal distribution $F_i(x_i)$.

Copulas make it possible to model a multivariate distribution F in two steps that separate the dependence structure among variables from their marginal distributions. First, the marginal CDFs are determined either by fitting some probability distributions or by taking the empirical marginal distributions. In this paper the latter approach is being taken, using the empirical marginal CDFs of the bivariate distribution of money growth and inflation. Second, the parameters of the copula C are estimated by maximum likelihood using realizations of the random vector

$$\mathbf{u} = (u_1, u_2, \dots, u_d) = (F_1(x_1), F_2(x_2), \dots, F_d(x_d)). \quad (2)$$

The marginal CDFs F_i transform the observed realizations x_i into so-called pseudo-observations u_i that are used as inputs in the copula. Since the F_i are monotonically increasing, these transformations do not affect the rank or ordering of observations from the lowest to the highest value. As only the rank of observations matters, the pseudo-observations are ordinal variables whose statistical properties can be analysed using non-parametric methods.

⁷ See McNeil et al. (2015, p. 223) for a proof of Sklar's Theorem.

Empirical Marginal Distributions of Money Growth and Inflation

The empirical CDF of a univariate random variable is determined by the rank of its realizations j in ascending order.⁸ Thus, the pseudo-observation j of variable i is

$$u_{ij} = F_i(x_{ij}) = \frac{\text{Rank}(ij)}{n + 1} = \frac{\text{number of observations} \leq x_{ij}}{n + 1}. \quad (3)$$

$(i = 1 \dots d \text{ and } j = 1 \dots n)$

Here, the random sample includes two variables, money growth and inflation, and 144 realizations or observations if all countries are considered ($d = 2$, $n = 144$). The rank of observation j of variable i equals the number of observed values that are smaller or equal to the observation x_{ij} . Equation 3 differs from the usual definition of the empirical CDF that uses n in the denominator. Dividing by $(n+1)$ forces pseudo-observations below 1 to avoid density calculations at point 1 and is asymptotically equivalent to using n .⁹

Figures 5 to 8 show the empirical marginal probability density functions (PDF) and cumulative distribution functions (CDF) of money growth and inflation. The former are just histograms of each variable in isolation and the latter are step functions that rise by $1/(n+1)$ at each observed value of x_i . The figures are drawn for the countries with less than 100 percent inflation because including the five countries with the most extreme inflation rates again renders the graphs unreadable. As can be seen, both the average annual money growth rate and inflation rate exhibit a strong positive skew even without including the five countries with extreme inflation rates. For the entire dataset, the skewness of the annual money growth rate is 11.2 and that of the inflation rate is 10.8.

⁸ See Rice (1995, pp. 346-348).

⁹ See McNeil et al. (2015, p. 270).

Figure 5. Marginal PDF of Money Growth
139 Countries

Figure 6. Marginal PDF of Inflation
139 Countries

Figure 7. Marginal CDF of Money Growth
139 Countries

Figure 8. Marginal CDF of Inflation
139 Countries

Copulas of Money Growth and Inflation

In this section, two types of copulas are used to model the stochastic relationship between money growth and inflation: a Gaussian copula and a Gumbel copula with upper tail dependence. The Gaussian copula, which is parametrized by Pearson's r , can only be represented by an integral, whereas the Gumbel copula has the closed-form expression¹⁰

$$C(u_1, u_2; \theta) = \exp\left(-\left[(-\ln u_1)^\theta + (-\ln u_2)^\theta\right]^{1/\theta}\right). \quad (\theta \geq 1) \quad (4)$$

An increase in the parameter θ strengthens the association between the random variables X_1 and X_2 . For $\theta = 1$, the variables are independent and the Gumbel copula becomes the independence copula, $C(u_1, u_2; 1) = u_1 u_2$.

The Gumbel copula exhibits upper tail dependence, which is the conditional probability of one variable to be high, given that the other variable is high; it is therefore bounded by 0 and 1. The upper tail dependence is

$$\lambda_U = 2 \cdot 2^{1/\theta}. \quad (5)$$

The following equation relates Kendall's tau to the copula parameter θ :¹¹

$$\tau = 1 - \frac{1}{\theta}. \quad (6)$$

This shows that $\tau = 0$ for the independence copula, and $\tau \rightarrow 1$ as $\theta \rightarrow \infty$. But note that $\tau = 0$ is only a necessary condition for no association between two random variables. It also follows that Kendall's tau can be used to calibrate the Gumbel copula, provided $\tau \geq 0$. Simply compute tau for the given data and then solve Equation 6 for θ . This calibration

¹⁰ See Alexander (2008, ch. II.6.4.3), McNeil et al. (2015, ch. 7.1.2) and Nelsen (1999, Table 4.1.).

¹¹ See Alexander (2008, vol. II, p. 280) for the connection between Kendall's tau and a Gumbel copula.

method is convenient if one is not interested in the value of the likelihood function to compare models or the marginal distributions whose inverses $x_i = F_i^{-1}(u_i)$ are needed in simulations of the random variables X_i .

Turning first to the Gaussian copula, the estimates of Pearson's r are 0.77 for the countries with less than 100 percent inflation and 0.79 if the high-inflation countries are included (Table 2). These estimates are more realistic than the exaggerated values in Table 1. It is also noteworthy that the estimates do not much depend on the small number of countries with extreme inflation rates. The reason for this is that in Table 1 Pearson's r is based on the original observations that confound the correlation between money growth and inflation with the highly skewed distributions of each variable, whereas in Table 2 the copula captures the ordinal association between the pseudo-observations of money growth and inflation that is unaffected by the extreme skewness of the original observations.

Still, the Gaussian copula is ill-suited for modelling the statistical relationship between money growth and inflation. In Table 2, both the Akaike (AIC) and the Bayesian information criterion (BIC), which are commonly used to discriminate between copulas, are much more negative for the Gumbel copula than the Gaussian one. Using 143 countries, the AIC for the Gaussian copula is -131.31 and that for the Gumbel copula is -151.04 , while the corresponding BIC values are -128.35 and -148.08 . Similarly, the AIC and BIC for the other two datasets are much more negative for the Gumbel copula. Therefore, the value of the likelihood function of the Gumbel copula strongly exceeds that of the Gaussian one.

The θ -parameter of the estimated Gumbel copula ranges from 2.30 to 2.54 for the three datasets and the corresponding Kendall's tau lie between 0.57 and 0.61. As the reader can verify, Equation 6 holds for the estimated values of θ and tau in Table 2. The Gumbel

copula picks up the upper tail dependence between money growth and inflation after separating out the extreme skewness of both variables. Therefore, λ_U is not much affected by the high-inflation countries, rising from 0.65 to 0.69 if they are included. Also note that the estimated Gumbel copula produces values for Kendall's tau close to the empirical values in Table 1, which are based on the original data. This indicates that the Gumbel copula provides an adequate model for the joint distribution of money growth and inflation.

Table 2. Bivariate Copulas of Money Growth and Inflation*

Gaussian Copula			
	139 Countries	143 Countries	144 Countries
Pearson's r	0.77	0.79	0.79 [†]
AIC	−116.30	−131.31	−135.32
BIC	−113.37	−128.35	−132.35
Gumbel Copula			
Kendall's τ	0.57	0.60	0.61
θ	2.30	2.47	2.54
λ_U	0.65	0.68	0.69
AIC	−130.08	−151.04	−158.65
BIC	−127.14	−148.08	−155.68

* Estimated with maximum pseudo-likelihood estimator (mpl).

† Possible convergence problem; estimated value is confirmed by inversion-of-Kendall's tau estimator (itau).

Figures 9 and 10 visualize the ordinal association between money growth and inflation using the estimated Gumbel copula. The scatterplot in Figure 9 shows the association between the pseudo-observations u_1 and u_2 of money growth and inflation, with the extreme skewness of the original data being separated out. Similarly, the empirical density function in Figure 10 is plotted with the ordinal pseudo-observations u_1 and u_2 on the lower axes. The scatterplot shows an accumulation of observations in the upper right corner and the density plot confirms that high money growth is associated with high inflation even after correcting for the extreme skewness of the original data.

Figure 9. Gumbel Copula of Money Growth and Inflation
144 Countries, 1000 simulated points

Figure 10. Gumbel Density of Money Growth and Inflation
144 Countries

Are There Other Suitable Copulas?

Surely, the Gumbel copula is better suited for modelling the relationship between money growth and inflation than the Gaussian copula, but are there still other copulas that may be even better than the Gumbel copula? This warrants a short digression. Bivariate copulas can easily be extended to more variables. But the problem is that a copula that captures a bivariate relationship may not adequately accommodate a third variable. For example, adding national income or output to the Gumbel model of money growth and inflation would be inappropriate because there is no positive relationship between either money growth or inflation and output growth.¹² For this reason, a multivariate relationship is usually modelled by first estimating the bivariate copulas among all variables and then combining them in a so-called vine copula. Now, the R package “VineCopula” (Nagler et al., 2019) provides a convenient command that evaluates 40 commonly used copulas as candidates for each bivariate relationship in a vine copula.¹³ By default the copula with the most negative AIC statistic is selected. Here, R is used to find the copula with the lowest AIC for the relationship between money growth and inflation.

It turns out that the survival Clayton copula has the lowest AIC if all countries are considered and also if Zimbabwe is excluded, making it the preferred copula for those two datasets. But the Gumbel copula remains the favoured model for the countries with less than 100 percent inflation. Like the Gumbel copula, the survival Clayton copula is a one-parameter copula with upper tail dependence.¹⁴ Table 3 shows the output for the survival Clayton copula for 143 and 144 countries without repeating the output for the Gumbel

¹² See Walsh (2017, pp. 6-7) for research on the relationship between money growth and output growth, and inflation and output growth.

¹³ R command BiCopSelect() in the R Package “VineCopula”.

¹⁴ See Joe (2014, ch. 4; 1997, ch. 5.2).

copula for 139 countries that can be found in Table 2. The estimated copula parameter θ is 2.61 for 143 countries and 2.78 for 144 countries. The AIC of the survival Clayton copula is -153.07 and -163.34 , which is somewhat more negative than for the Gumbel copula in Table 2. The upper tail dependence λ_U of 0.77 and 0.78 exceeds the corresponding values in Table 2, indicating that the survival Clayton copula is well suited to capture strong upper tail dependence.¹⁵ Thus, searching over 40 commonly used copulas yields two models for the relationship between money growth and inflation that both exhibit upper tail dependence. The Gumbel copula provides a better fit for countries with less than 100 percent inflation, whereas the survival Clayton copula is more apt when all countries are considered.

Table 3. Survival Clayton Copula

	143 Countries	144 Countries
Kendall's τ	0.57	0.58
θ	2.61	2.78
λ_U	0.77	0.78
AIC	-153.07	-163.34
BIC	-150.11	-160.37

The Quantity Theory of Money

The quantity theory of money remains a cornerstone of modern macroeconomics that provides a benchmark for the long-run behaviour of macroeconomic models. The direct empirical evidence for it is, however, less conclusive than suggested by scatterplots and the exaggerated Pearson's r between average annual money growth and inflation that can be found in the macroeconomic literature. This paper highlights the pitfalls of Pearson's r when the joint distribution between two random variables is non-elliptical. It is shown that a

¹⁵ The upper tail dependence of the survival Clayton copula is $\lambda_U = 2^{-1/\delta}$.

copula with upper tail dependence provides a better statistical model for the long-run relationship between money growth and inflation than a Gaussian copula that is parameterized by Pearson's r . The models are implemented by purging the skewness from the marginal PDFs of money growth and inflation and using ordinal pseudo-observations to estimate the copula. The copula-estimated Kendall's tau, which lie between 0.57 and 0.61 (Tables 2 and 3), indicate a considerably weaker association between money growth and inflation than suggested by Pearson's r . The small number of high-inflation countries has only a minor effect on the copulas and Kendall's tau because they are both based on the ordinal association between money growth and inflation.

These empirical findings do the quantity theory no favours but they do not mean that it should be discarded. Leading economic theorists tend to be sceptical about the relevance of empirical research in the evolution of economic theory. In his renowned *Foundations of Economic Analysis*, Paul Samuelson (1947, p. 117) wondered how much economic theory would have changed if consumer theory were found to be empirically untrue and then answered, "I suspect, very little." Expressing the same doubts about empirical research, Jurg Niehans (1993) proposed that economic as a science was mostly driven forward by the desire to overcome logical flaws in existing theory: lack of precision, inconsistency and lack of generality. This also applies to the quantity theory, which underwent an inexorable process of enhancement and refinement over time.

On the cusp of modernity, Bernardo Davanzati (1529 – 1600) and Jean Bodin (1530 – 1596), among others, commented on the relationship between the availability of precious metal and commodity prices. In the seventeenth century, John Locke (1632 – 1704), William Petty (1623 – 1687) and Richard Cantillon (1680 – 1734) discovered the concept of income

velocity of money. David Hume (1752) enhanced the precision of the quantity theory, proposing that an unexpected increase in money would lead to an equiproportional increase in prices in the long-run, with the price-specie flow mechanism accounting for movements in prices, output and the balance of payments in the short-run. In the nineteenth century, many authors wrote on the adjustment process that would take place after an increase in the money stock. In the early twentieth century, algebraic formulations of the quantity theory enhanced its rigour. Drawing upon the literary exposition by John Stuart Mill (1848, p. 494), Irving Fisher (1911, ch. 2) formalized the equation of exchange; and Arthur Cecil Pigou, Alfred Marshall and John Maynard Keynes put forward the Cambridge equation, which emphasizes money demand. The mathematical formulation of consumer theory, which showed that Marshallian demand functions are homogeneous of degree zero in all prices and income, led to a deeper understanding of the concept of monetary neutrality that is fundamental for the quantity theory. Building upon these advances in economic theory, Milton Friedman (1956) restated the quantity theory as a theory of money demand in an economy with money and other financial and real assets.

The emergence of marginalism, however, posed a challenge to the quantity theory. Léon Walras's (1834 – 1910) attempt to generalize utility theory to the determination of the price level, which can be found in the final edition of *The Elements of Pure Economics*, is now largely forgotten and Paul Samuelson's (1947, pp. 117 – 120) related effort to extend consumer theory to money demand met the same fate. But Don Patinkin's (1965) book, which put forward the utility theory of money in Chapters 5 and 6, became a popular reading in graduate economics programs; and Miguel Sidrauski (1967), who also included money holdings in the utility function, achieved a breakthrough in his research on the

consumption-saving decision that became a stepping stone for macroeconomics in the last quarter of the twentieth century.

So, it is only fairly recently that macroeconomists extended utility maximization to dynamic macroeconomic models with microeconomic foundations. A prerequisite for this analytical innovation was that in the second half of the twentieth century, economists had become knowledgeable in the use of the tools of dynamic mathematical analysis, including difference/differential equations and optimal control/dynamic programming. This made it possible to generalize the concept of monetary shock from an unexpected one-time change in the money stock as envisaged by David Hume to a change in the stochastic process of the money growth rate that captures central bank behaviour. And the effect of a monetary change on economic variables could now be traced from the old equilibrium along the adjustment path of the economy toward the new equilibrium, as debated by nineteenth century economists. Carl Walsh (2017, ch. 2) presents an archetypal dynamic model in which the effect of monetary policy on real and nominal variables depends on consumer preferences and the nature of the money supply process that shapes expected inflation. In particular, monetary policy has no real effects if the marginal utility of consumption does not depend on money holdings or the policy change is unexpected. Thus, modern macroeconomic models show the conditions for the quantity theory of to hold.

Economics is unlike the natural sciences because it is driven both by observation and by the inherent structure of the accumulated body of economic theory that constitutes mainstream economics. On that account, the quantity theory of money will continue to be part of mainstream economics as long as people will hold a meaningful amount of fiat money for daily transactions. But the exaggerated Pearson's correlations between money

growth and inflation that can be found in the macroeconomic literature should be dismissed in the discourse on monetary policy. In this connection, one may wonder what fuelled the controversy between Monetarists and Keynesians in the second half of the twentieth century? Both parties had a point. It appears that Monetarists emphasized mainstream economic theory, whereas Keynesians wished to be convinced by empirical evidence. This may explain why the controversy led to a stalemate in macroeconomics in the 1960s that lasted until the advent of dynamic macroeconomic models with optimizing behaviour in the 1980s.

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Appendix: Data Sources					
International Monetary Fund (IMF), International Financial Statistics (IFS), bulk download, July 31, 2019.					
Zimbabwe: World Bank, Consumer Price Index for Zimbabwe [DDOE02ZWA086NWDB], retrieved from Federal Reserve Economic Data (FRED), Federal Reserve Bank of St. Louis.					
Countries and territories that are set in parentheses are not included in the dataset.					
		Money Stock M1	Indicator Code	Inflation Rate	Indicator Code
1	Afghanistan, Islamic Republic of	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
2	Albania	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
3	Algeria	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
4	Angola	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
5	(Anguilla)				
6	(Antigua and Barbuda)				
7	Argentina	Monetary, M1, Domestic Currency	FM1_XDC	Gross Domestic Product, Expenditure Approach, Deflator, Percent Change, Previous Period, Percent	NGDP_D_PC_PP_PT
8	Armenia, Republic of	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
9	Aruba	Monetary, Narrow Money, Domestic Currency	FMN_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
10	Australia	Monetary, M1, Seasonally Adjusted, Domestic Currency	FM1_SA_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
11	Austria	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
12	Azerbaijan, Republic of	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT

13	Bahamas, The	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
14	Bahrain, Kingdom of	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
15	Bangladesh	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
16	Barbados	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
17	Belarus	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
18	Belgium	Currency Outside Banking System + Demand Deposits (14A_XDC + 34B_N_XDC)		Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
19	Belize	Monetary, M1, Domestic Currency	FM1_XDC	Gross Domestic Product, Expenditure Approach, Deflator, Percent Change, Previous Period, Percent	NGDP_D_PC_PP_PT
20	(Benin)				
21	(Bermuda)				
22	Bhutan	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
23	Bolivia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
24	Bosnia and Herzegovina	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
25	Botswana	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
26	Brazil	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
27	(Brunei Darussalam)				
28	Bulgaria	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
29	(Burkina Faso)				

30	Burundi	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
31	Cabo Verde	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
32	(Cambodia)				
33	(Cameroon)				
34	Canada	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
35	(Cayman Islands)				
36	(Central African Economic and Monetary Community)				
37	(Central African Republic)				
38	(Chad)				
39	Chile	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
40	China, P.R.: Hong Kong	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
41	(China, P.R.: Macao)				
42	China, P.R.: Mainland	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
43	(CIS)				
44	Colombia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
45	(Comoros)				
46	Congo, Democratic Republic of	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
47	(Congo, Republic of)				
48	Costa Rica	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
49	(Côte d'Ivoire)				

50	Croatia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
51	(Cuba)				
52	(Curaçao)				
53	(Curaçao and Sint Maarten)				
54	Cyprus	Monetary, M1, Domestic Currency	FM1_XDC	Gross Domestic Product, Expenditure Approach, Deflator, Percent Change, Previous Period, Percent	NGDP_D_PC_PP_PT
55	Czech Republic	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
56	(Czechoslovakia)				
57	Denmark	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
58	Djibouti	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
59	(Dominica)				
60	Dominican Republic	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
61	Eastern Caribbean Currency Union (ECCU)	Monetary, M1, Domestic Currency	FM1_XDC	Gross Domestic Product, Expenditure Approach, Deflator, Percent Change, Previous Period, Percent	NGDP_D_PC_PP_PT
62	(Ecuador)				
63	Egypt	Monetary, M1, Domestic Currency	FM1_XDC	Gross Domestic Product, Expenditure Approach, Deflator, Percent Change, Previous Period, Percent	NGDP_D_PC_PP_PT
64	(El Salvador)				
65	(Equatorial Guinea)				
66	Eritrea	Monetary, M1, Domestic Currency	FM1_XDC	Gross Domestic Product, Expenditure Approach, Deflator, Percent Change, Previous Period, Percent	NGDP_D_PC_PP_PT
67	Estonia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
68	(Eswatini, Kingdom of)				
69	Ethiopia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT

70	Euro Area	Monetary, M1, Seasonally Adjusted, Euros	FM1_SA_EUR	Prices, Consumer Price Index, Harmonized, Index, Percent Change , Previous Period, (calculated using PCPIHA_IX)	
71	(Europe)				
72	(Faroe Islands)				
73	Fiji	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
74	Finland	Currency Outside Banking Institutions + Demand Deposits (14A____XDC + 34B_N_XDC)		Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
75	France	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
76	(French Territories: French Polynesia)				
77	(French Territories: New Caledonia)				
78	(Gabon)				
79	Gambia, The	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
80	Georgia	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Gross Domestic Product, Expenditure Approach, Deflator, Percent Change, Previous Period, Percent	NGDP_D_PC_PP_PT
81	Germany	Monetary, M1, Seasonally Adjusted, Domestic Currency	FM1_SA_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
82	Ghana	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
83	(Gibraltar)				
84	Greece	Currency Outside Banking Institutions + Demand Deposits (14A____XDC + 34B_N_XDC)		Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
85	(Greenland)				
86	(Grenada)				

87	Guatemala	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
88	(Guernsey)				
89	Guinea	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
90	(Guinea-Bissau)				
91	Guyana	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
92	Haiti	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
93	Honduras	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
94	Hungary	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
95	Iceland	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
96	India	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
97	Indonesia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
98	Iran, Islamic Republic of	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
99	Iraq	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
100	Ireland	Currency Outside Banking Institutions + Demand Deposits (14A____XDC + 24____XDC)		Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
101	(Isle of Man)				
102	Israel	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT

103	Italy	Currency Outside Banking Institutions + Demand Deposits (14A__XDC + 34B_N_XDC)		Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
104	Jamaica	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
105	Japan	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
106	(Jersey)				
107	Jordan	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
108	Kazakhstan	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
109	Kenya	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
110	(Kiribati)				
111	Korea, Republic of	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
112	(Kosovo, Republic of)				
113	Kuwait	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
114	Kyrgyz Republic	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
115	Lao People's Democratic Republic	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34__XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
116	Latvia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
117	Lebanon	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
118	(Lesotho)				
119	Liberia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT

120	Libya	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
121	Lithuania	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
122	Luxembourg	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
123	Madagascar	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	
124	Malawi	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
125	Malaysia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
126	Maldives	Monetary Survey, Money (until 2008) + Narrow Money (afterwards) (34____XCD + FMN_XDC)	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
127	Mali	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
128	Malta	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
129	(Marshall Islands, Republic of)				
130	Mauritania	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
131	Mauritius	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
132	Mexico	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
133	(Micronesia, Federated States of)				
134	Moldova	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT

135	Mongolia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
136	(Montenegro)				
137	(Montserrat)				
138	Morocco	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
139	Mozambique	Monetary, M1, Domestic Currency	FM1_XDC	Gross Domestic Product, Expenditure Approach, Deflator, Percent Change, Previous Period, Percent	NGDP_D_PC_PP_PT
140	Myanmar	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
141	Namibia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
142	(Nauru)				
143	Nepal	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
144	Netherlands	Currency Outside Banking Institutions + Demand Deposits (14A_XDC + 34B_N_XDC)		Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
145	(Netherlands Antilles)				
146	New Zealand	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
147	Nicaragua	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
148	(Niger)				
149	Nigeria	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
150	North Macedonia, Republic of	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
151	Norway	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT

152	Oman	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
153	Pakistan	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
154	(Palau)				
155	(Panama)				
156	Papua New Guinea	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
157	Paraguay	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
158	Peru	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
159	Philippines	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
160	Poland	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
161	Portugal	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
162	Qatar	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
163	(Reunion)				
164	Romania	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
165	Russian Federation	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
166	Rwanda	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
167	Samoa	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT

168	(San Marino)				
169	São Tomé and Príncipe	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
170	Saudi Arabia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
171	(Senegal)				
172	Serbia, Republic of	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
173	Seychelles	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
174	Sierra Leone	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
175	Singapore	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
176	(Sint Maarten)				
177	Slovak Republic	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
178	Slovenia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
179	Solomon Islands	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
180	(Somalia)				
181	South Africa	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
182	South Sudan	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
183	Spain	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
184	Sri Lanka	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
185	(St. Kitts and Nevis)				

186	(St. Lucia)				
187	(St. Vincent and the Grenadines)				
188	Sudan	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
189	Suriname	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
190	Sweden	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
191	Switzerland	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
192	Syrian Arab Republic	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
193	(Taiwan Province of China)				
194	Tajikistan	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
195	Tanzania	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
196	Thailand	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
197	(Timor-Leste, Dem. Rep. of)				
198	(Togo)				
199	Tonga	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
200	Trinidad and Tobago	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
201	Tunisia	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT

202	Turkey	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
203	(Turkmenistan)				
204	(Turks and Caicos Islands)				
205	(Tuvalu)				
206	Uganda	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
207	Ukraine	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
208	United Arab Emirates	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
209	(United Kingdom)				
210	United States	Monetary, M1, US Dollars	FM1_USD	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
211	Uruguay	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
212	(Uzbekistan)				
213	Vanuatu	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
214	Venezuela, Republica Bolivariana de	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
215	Vietnam	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
216	West African Economic and Monetary Union	Monetary, M1, Domestic Currency	FM1_XDC	Gross Domestic Product, Expenditure Approach, Deflator, Percent Change, Previous Period, Percent	NGDP_D_PC_PP_PT
217	(West Bank and Gaza)				
218	(Yemen Arab Rep.)				
219	(Yemen, P.D. Rep.)				

220	Yemen, Republic of	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
221	(Yugoslavia, SFR)				
222	Zambia	Monetary, M1, Domestic Currency	FM1_XDC	Prices, Consumer Price Index, All items, Percentage change, Previous period, Percent	PCPI_PC_PP_PT
223	Zimbabwe	Monetary, Monetary Survey, Money (Non-Standardized Presentation), Domestic Currency	34____XDC	World Bank, Consumer Price Index for Zimbabwe [DDOE02ZWA086NWDB], retrieved from FRED, Federal Reserve Bank of St. Louis	